Harrison Hunter

REPORT ON SURVEY

DEPARTMENT OF FISH AND GAME

SACRAMENTO, CALIFORNIA

Report of

BOOZ, ALLEN and HAMILTON
Management Consultants

to the

JOINT LEGISLATIVE BUDGET COMMITTEE

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December 8, 1958

LETTER OF TRANSMITTAL

JOINT LEGISLATIVE BUDGET COMMITTEE
STATE CAPITOL, SACRAMENTO, CALIFORNIA
December 12, 1958

To the President of the Senate,
the Speaker of the Assembly, and
to Members of the Senate and Assembly:

Pursuant to the provisions of Chapter 1887, Statutes of 1957, as implemented by Senate Concurrent Resolution No. 126 of the same session, authorizing and directing the Joint Legislative Budget Committee to execute "a contract for a study of existing and future programs and plans of the Department of Fish and Game and the policies of the Fish and Game Commission," this report of the firm of Booz, Allen and Hamilton is respectfully transmitted to the 1959 General Session of the Legislature.

Although numerous recommendations of the survey firm are contained in the report, in accordance with their contract, the Joint Legislative Budget Committee has not undertaken to hold hearings or to consider these recommendations for approval or disapproval by the committee. Rather, the report in its entirety and as submitted by the firm is transmitted for the information and use of the 1959 Legislature, as was intended by the resolution.

Respectfully submitted,

ARTHUR H. BREED, JR.
Chairman

BOOZ · ALLEN & HAMILTON
Management Consultants

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December 8, 1958

HONORABLE ARTHUR H. BREED, JR., *Chairman*
Joint Legislative Budget Committee
Room 306, State Capitol, Sacramento, California

DEAR SENATOR BREED:

We submit herewith our report on the survey of the Fish and Game Department authorized by Senate Concurrent Resolution No. 126. In this letter, we give a brief summary of the important conclusions reached.

After the introductory chapter of our report, you will find a series of chapters on the wildlife management programs of the department—big game, small game, inland fisheries and marine fisheries—following which we cover water projects, pollution, salmon-steelhead management, wildlife protection and conservation education. These are the basic programs for carrying out the purposes of the department. In each chapter we give our findings, analyses and recommendations.

As a general conclusion it can be said that, in the opinion of our survey team, the department's concepts of wildlife management, with few exceptions, are sound and up to date. Our quarrels are not so much with what should be done as with why it is not being done. There is much detail to be read on this score in each of the wildlife management chapters. Here we omit the detail and say only that we derived from our analysis of the wildlife programs the major conclusion that the greatest opportunities for improvement lie in the areas of administration per se and in the effect of administration on departmental unity and public relations.

From the basic wildlife management chapters we have evolved, then, a following chapter which evaluates the administration of the department in carrying out these programs. For reasons which will be apparent later, this evaluation led us to chapters on departmental planning, organization, teamwork and control.

During the course of our studies of administration, some cost reduction opportunities appeared to which we have devoted a chapter. And we have another commenting on the Fish and Game Commission.

The next to the last chapter is a summary of our conclusions and recommendations as they relate to the five points specified in the resolution. Our final chapter translates the summary into a plan of action for carrying out the recommendations in the report.

In this letter we shall summarize the summary. Out of the several hundred pages in the report, we have distilled a few fundamental observations which we shall record here.

Before doing so we should like to say that this report is more concerned with the future than with the past. It looks at the present only as a takeoff point to future action.

You retained us to make an objective survey productive of practical and constructive results. This has been our endeavor. In making it we have had the highest degree of co-operation from all with whom we have dealt in the department. Since we were retained by your committee and not by the department, we have not discussed our final conclusions and recommendations with department personnel.

We have had unstinting co-operation from individual sportsmen and from sportsmen's groups. Our survey team members in the field profited greatly from the interested comments of these hunters and fishermen.

Unfortunately, our report may not please all of them. Nor will it please everyone in the department. We hope, and believe, however, that it will serve as a starting point for pulling together the majority to the end that they get behind a commonly agreed upon program.

For, if there is one thing that is overridingly apparent in fish and game matters in California, it is lack of unity. There is lack of unity in the department itself. Department people in the field often do not agree with the department's actions, nor do they agree among themselves. And without unity within, unity without is difficult to achieve. The disagreements and criticisms by department personnel filter quickly into the sportsmen's groups.

A number of the disagreements have to do with wildlife management programs. Here we must record that in wildlife management the definitive, conclusive research has yet to be done on a number of subjects.

It is necessary to rely on pooled judgments of experienced authorities.

As you know, we made extensive inquiry nationally as to whom we might retain to assist us in the wildlife management portions of the survey. We sought someone nationally respected and fully acceptable to the various parties concerned. Our selection of Mr. Ernest Swift, Executive Director of the National Wildlife Federation in Washington, D. C., was made after assurances to this effect.

Mr. Swift, in turn, suggested the names of four other wildlife management people whom he would like to round out his team. Each of these men has written sections of this report. Their work has been directed, reviewed and approved by Mr. Swift. Each member of the team has reviewed the work of the others and we have their mutual concurrence.

We hope that their conclusions and recommendations will assist in the development of departmental plans fully understood by and acceptable to sportsmen's groups and governmental bodies and agencies concerned. There is a crying need for this. It is very difficult for people to unify if they have nothing around which to unify.

We strongly urge, therefore, that the department develop, record formally and gain the approval of its

—Goals; what it proposes to accomplish;
—Policies; by which it will be guided in moving toward these goals;
—Programs; the scheduled, budgeted steps it proposes to take toward the goals.

This is the first basic step toward unification of the department and the sporting public. It will provide something around which interested parties can rally and get to work. We are not so naive as to believe that everyone will be in agreement on everything which is finally recorded. We do say, however, that such formal planning, if fully understood and implemented intelligently, will move the situation a long way in this direction.

To this end we have recommended the creation of the position of associate director—plans, reporting to the director. His primary responsibilities will be to develop and keep current a unified long-range, say 10-year, plan for the department, and a unified short-range plan for the year immediately ahead. He would have all of the present branch chiefs reporting to him.

This will relieve the deputy director of the headquarters staff load and permit him to concentrate on direction of field operations. We suggest he be called deputy director—operations.

To give the deputy director a more effective basis for directing operations, we have recommended a set of management controls to be implemented by an associate director—control. One facet of this will be control by program. We have made a rather extensive analysis of the revenues and expenses of each basic program being carried out by the department. We believe planning and controlling by program will not only be effective but will provide a means for open, honest, factual appraisal and understanding by the sportsmen and other interested groups.

In recognition of the important need for this understanding, we suggest a position reporting to the director called assistant director—information. The task here will be to further the understanding and acceptance of the plans and operations of the department, both internally and externally.

The organization which will carry out the plans is a field organization. In analyzing it we have kept this in mind. We have moved toward decentralized operations and centralized services. We have attempted to take all possible paperwork out of the field and centralize it at headquarters. This has led to a substantial reduction in the need for the so-called business service function at regional headquarters.

The 1953 decentralization to regions was a sound one. It is not yet fully digested in that there still is not uniform understanding of who is supposed to do what, but this can be cured.

We propose now a further decentralization. We believe this will improve operational efficiency and further departmental unification. We propose creation of 22 districts in the State. These should be strictly field units of 10 to 15 men under district managers. The field supervisory authority now exercised by functional supervisors at regional headquarters would be transferred to the district managers. Thus we move authority closer to where the action is.

We further propose that the people in the districts be generalists. We propose that these men be trained to perform all the field duties carried out by the department. Each would be required to qualify in law enforcement, game management and fisheries management. Thus, each would be trained and required to meet the needs of the area where he would be assigned and the situations as they would be encountered. This should materially assist in meeting shifting workloads and reducing travel duplication. It should also tend to unify the department personnel for two reasons: first, they would have to fully understand all of the field programs, not just one; and, second, they would be under closer local supervision for purposes of indoctrination and direction.

In the generalist concept, we have emphasized their place in "field activities." There is and always will be a need for highly trained specialists in the department. We place this need at the regional and headquarters level. Of course, staff specialists are needed for research and planning at headquarters. They are

needed at the regional level too: first, to supervise specialized activities such as hatcheries and game farms; and, second, to provide specialized advice to people in the region.

The decentralization to districts permits the elimination of one region—Region III. With supervisory authority exercised at 22 local points in the State instead of at five regions, a region can be larger as there is less need for travel. We have suggested that each of the remaining four regions extend across the State to the ocean.

These field organization moves will not add to the costs of operating the department. Nothing has been added. Authority has simply been moved further out into the field. which is where it belongs in an essentially field organization. The elimination of one regional headquarters. plus a few other economies, more than cover the costs of setting up the decentralized organization.

Previously we spoke of setting up program controls. First, there should be performance controls. Timely reports should be prepared by the associate director—control by which actual performance on wildlife management programs is compared to goals or budgets as contained in mutually agreed-to plans. In this way, the department will be able to evaluate actual progress against planned progress and to take timely action if necessary. Present budgetary accounting control does not provide this type of performance control.

There is another type of control which warrants discussion here. This is compliance control. Some effort, but not nearly enough, has gone into manualization. The department badly needs to manualize its organization, policies and procedures in order to standardize them throughout the State. It then needs a regular schedule of field inspections by headquarters personnel to check for compliance.

In summary, then, we urge for the department

—Plans fully developed, recorded and accepted by all interested parties possible;
—An organization designed to carry out these plans effectively;
—A personnel plan designed to unify the employees and improve their effectiveness;
—Controls to provide a factual basis for direction of the personnel within the organization in accordance with the plans;

We further believe that there is a need for a closer working relationship between the department and the commission and that the concept of the commission's responsibilities should be broadened. As one facet of this we feel that the need for the Wildlife Conservation Board is past and that its responsibilities can be assumed by the commission.

We would like here to express our gratitude to the commissioners, the personnel of the department and the sportsmen of California whose interest and cooperation have contributed immeasurably in the conduct of this survey. Once the intelligence and energies of these groups are unified around one set of commonly accepted plans, California has every reason to expect an outstanding fish and game program.

Very truly yours,

Booz, Allen & Hamilton

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FOREWORD

ERNEST F. SWIFT

The Wildlife Conservation Act, Chapter 1325, Statutes of 1947, states in part the following:

> "SECTION 1: It is hereby declared that the preservation, protection and restoration of wildlife within the State of California is an inseparable part of providing adequate recreation for our people in the interest of public welfare; and it is further declared to be the policy of the State to acquire and restore to the highest possible level, and maintain in a state of high productivity those areas that can be successfully used to sustain wildlife and which will provide adequate and suitable recreation. * * *"

In this beginning statement, there are three words of profound significance — preservation, protection and restoration; and it is their proper interpretation versus lack of proper interpretation wherein arises much of the endless conflict in the management of wildlife resources.

Many sincere and honest citizens attempt to interpret the broad ecological implications contained in these three words. Some are capable of interpreting, but many have only their limited and, at times, very meager experiences to use as a yardstick.

A keen and sincere interest in all natural resources is not only highly commendable but vital to survival. It is far better to have some emotional misdirection than have these vital issues become a matter of public apathy. Far greater dangers lie in the latter than in the former.

Natural resources of this State and the Nation, however, cannot be considered as elements of separate evaluation from the economic factors that govern the lives of human beings. All life is a product of the land, and man utilizes the products of the land to gain economic security. It is this profound understanding that we are seeking, and those who would turn back the clock are indulging in daydreams and wishful thinking.

Even wilderness and park areas supposedly set aside as primeval and untouched feel the impact of man-made civilization from outside their borders. In this endless compromise and conflict of interests, wildlife has to adjust to the encroachments of the human animal or cease to exist. Some species are able to do this: they not only survive but increase.

Agriculture destroyed most of the original prairie chicken range, but the pheasant found these conditions acceptable for survival. The wolf could have survived under altered conditions in many regions, but he was hunted to death as an enemy of both wildlife and farmers. The grizzly has all but disappeared for the same reason. On the other hand, deer, with certain protection and due to man-made conditions from logging, etc., have been able to adjust themselves and live in areas of rather high human populations. In fact, there are instances where they are more numerous today than under original wilderness conditions. The buffalo took too much room and were competitive with cattle raising and farm crops.

Management of our natural resources, both renewable and nonrenewable, has become a specialized business in both public and private affairs; but anyone professionally concerned will humbly admit that there is much more to be learned than has yet been discovered. Resource management is now definitely recognized as a profession, although that philosophy is periodically challenged by some segments of the public, particularly hunters and fishermen.

Private forest industry not only has accepted the technical forester as a valuable adjunct, but the forester pretty much runs that business today. Our national and state forests are all managed by professional foresters. The commercial fishing industry not only demands research by the federal and various state governments but invests (like forest industry) its own money in research.

In the field of agriculture the farmer has accepted the farm engineer, the agronomist, the entomologist, the seed expert, etc. Reclamation and flood control programs are under the direction of professional engineers.

The public has long since accepted the architect, the engineer, the physician, the actuary, the nuclear physicist; but when it comes to professionally trained men in the field of wildlife management, many persons still insist on pitting their casual and fragmentary knowledge against men who have devoted their entire lives to the subject. This shows a lack of maturity so far as this phase of resource management is concerned.

This statement in no way implies that every boy from a game management school knows all the answers and the public none. In fact, a graduate is only at the threshold. Neither does it imply that he will become highly successful because of his formal education and never make any mistakes; but attention can be called to the fact that a degree will not guarantee a first-class lawyer or engineer.

The word "conservation" is difficult to define, because of the thousands of different philosophies, concepts, and ideas regarding its significance. The management of resources is not only concerned with plants, animals, soils, and water, but with industry, standards of living, education, legislation, courts, and —through it all—with people. It is also a meeting ground of many sciences and forms of endeavor in the biological, engineering, economic, and social fields.

For over a hundred years, California has been exploiting its extensive and infinitely valuable storehouse of resources. Some has been wise use, some has been unwise. Resources have been subjected to many shortsighted and abusive policies, not only in California but throughout the Nation. In California, much of it comes from the impact of tremendous increase of human populations. Changes, some of them rather violent, have affected the State's resources. The concern over an adequate water supply, especially for the south, is a pertinent case in point.

But people wishing to have bad land use and other shortcomings immediately corrected fail to realize that many of these abuses have been going on for from 50 to 100 years.

In the field of wildlife, both people and wildlife must adjust to changing conditions; and it must be recognized that abuses which have been tolerated for generations cannot be rectified over night, nor without much planning, hard work and money. Above all, it must be remembered that man cannot separate himself from his environment.

Many of the natural resources, because of their increased use, have become subject to some sort of regulations. This has been true with fish and game since colonial times. Actually, these regulations are a form of rationing. If everyone took all they wanted, there would be none left. Overuse has led to extermination of some species of fish and game. Consequently, law enforcement of regulations constitutes one of the most important phases of conservation.

As human populations increase, there is an increasing conflict of interests from economic and recreational interests. Wildlife management has been subjected to severe growing pains during the last quarter century. These growing pains are reflected in the increasing public concern and the rapid expansion and growth of the conservation agencies. Many conservation departments have been repeatedly forced to reorganize due to expanded responsibilities thrust upon them.

This has been true with the California Department of Fish and Game. It did not expand of its own volition, but because of a greater demand by the public for wildlife preservation and recreational opportunities.

To many sportsmen, reorganization of the department is a magic formula which should immediately produce more game and fish almost over night. No wildlife program will succeed without long years of continuity and a minimum of interference. The elements manipulated are a part of the universe, things natural and wild, and nature is often temperamental and not altogether co-operative with the desires of man.

These factors should be kept in mind in demanding results.

Among those interested in wildlife there are many schools of thought. Some people are primarily interested in the kill; others have an interest in a reasonable take as well as the aesthetic; still others look upon hunting and fishing as a sin. Only sound game management practices will approach satisfying all, and then there must be compromise.

CHAPTER I

INTRODUCTION

California is rich in wildlife resources, with a wide variety of fresh water fish and game within its borders and of marine fish along its shores. But California has a large and rapidly growing population which generates heavy hunting and fishing pressures. Furthermore, the wildlife resources are not evenly spread throughout the State for ready access by all. Evolution in land and water uses is reducing natural habitat and there are limits to the amount of hunting and fishing pressures which each species of game and fish can stand without eventual extinction. Consequently, conservation of state wildlife resources—preserving the basic stock of each wildlife species and allowing hunters and fishermen to take the annual surplus—constitutes a considerable task.

This task is the administrative responsibility of the State Department of Fish and Game, a state agency which received departmental status in 1951 and a new organization structure in 1953. Both moves were made in recognition of the steadily increasing administrative burden which the department must carry. Both moves were due to the continuous and close scrutiny which state fish and game matters are given through the Legislature by the many sportsmen, conservation, commercial, and other interested groups and individuals throughout the State.

In its Wildlife Conservation Act of 1947, the Legislature declared:

> * * * "The preservation, protection and restoration of wildlife within the State is an inseparable part of providing adequate recreation for our people in the interest of public welfare; and it is the policy of the State to acquire and restore to the highest possible level, and maintain in a state of high productivity, those areas that can be most successfully used to sustain wildlife and which will provide adequate and suitable recreation."

By this statement, the Legislature has indicated the right of all people in the State to enjoy the recreational benefits of observing, hunting, and fishing state wildlife in its natural habitat.

Since the department revenue is derived primarily from license fees for various types of hunting and fishing activities, those paying the fees, including commercial fishermen, have an interest in obtaining the greatest possible benefit from the department for their fee dollar. Those who pay no fees believe, and properly so, that they too should have a voice in wildlife management.

It may be said that every interested group, body, and individual in the State has the common objective of conserving state wildlife resources but for their own purpose and with conflicting views on the approaches and methods which the department should use in achieving the common objective.

Thus, it has been the responsibility of the Legislature to evaluate these many interests and opinions concerning conservation of fish and game and to create the agencies and codes necessary to preserve, protect and restore adequate wildlife for state recreation needs.

Four agencies have direct responsibilities in fish and game matters—the Department of Fish and Game, the Fish and Game Commission, the Wildlife Conservation Board, and the Marine Research Committee. For many years, the Legislature has maintained careful watch on the department's operations and has constantly sought ways and means for improving the status under which the department and the three other agencies operate.

During its 1957 Session, the Legislature decided that a penetrating "* * * study of existing and future plans of the Department of Fish and Game and of the policies of the Fish and Game Commission" should be made. Study results are to provide the basis for future legislation concerning the department and the commission and to provide answers for the many questions which were arising concerning wildlife management and department administrative practices.

This report summarizes the findings, conclusions and recommendations developed in the survey. It is pertinent that the following subjects be discussed as a common basis for understanding survey results presented in this report:

(1) Authorization for the survey;
(2) Scope of the survey;
(3) Position of the Department of Fish and Game in state government;
(4) The Fish and Game Commission;
(5) The Wildlife Conservation Board;
(6) The Marine Research Committee;
(7) Present Department of Fish and Game organization.

Each of these subjects is discussed separately in the following sections.

1. AUTHORIZATION FOR THE SURVEY

Senate Bill No. 325, Section 16, authorized up to $100,000 for use in contracting for the study. Senate Concurrent Resolution No. 126 directed that the Joint Legislative Budget Committee, through the Legislative Analyst, contract with a qualified firm to conduct the survey.

2. SCOPE OF THE SURVEY

The resolution further specified that the survey include but not be limited to:

"(1) An evaluation of the artificial propagation programs of the Department of Fish and Game with the aim of establishing levels of emphasis and expenditures for these programs in relation to the emphasis and expenditure that should be accorded improvement of habitat and natural conditions.

"(2) A review of the methods and procedures of administration of the department both on the headquarters and regional levels to determine if general business functions are operating with all possible efficiency and to ascertain if there is a possibility of effecting any consolidation of regional administrative operations.

"(3) A survey of the conservation education activities of the department with the aim of evaluating the function of this branch and the publications and printing of the department.

"(4) Consideration of the effectiveness of the department's use of funds received under the Pittman-Robertson Federal Aid in Wildlife Restoration Act and the Dingell-Johnson Federal Aid in Sport Fish Restoration Act to determine if the best possible utilization is being made of these funds.

"(5) A survey of predatory animal control, particularly existing duplicating activities * * *"

These specific studies were made an integral part of the total survey which has been conducted by Booz, Allen & Hamilton.

In our proposal letter, we outlined our conception of the total survey as an enlargement of the five specific areas described above to include examination of:

(1) The purposes for which the department exists.
(2) The policies within which it pursues these purposes.
(3) The plans developed within the limitations of these policies.
(4) The programs developed to carry out the plans.
(5) The organization set up to put the programs into effect.
(6) The methods and procedures by which the organization is administered.
(7) The controls established to assure effective and economical administration.

In the above outline, department purposes, policies, plans, and programs are all-inclusive terms which cover not only the purely administrative aspects of the department but all technical and biological wildlife management phases as well.

3. POSITION OF THE DEPARTMENT OF FISH AND GAME IN STATE GOVERNMENT

Exhibit I, following page 8 at the end of this chapter, is a chart of the present position of the Department of Fish and Game in State Government and of the major internal organization units within the department. Exhibit I can be folded out for reference purposes while the remaining sections of this chapter are being read.

In 1951, the Legislature raised the Division of Fish and Game, which had been in the Department of Natural Resources since 1927, to the level of a department. The Fish and Game Code, 1957, states that the department shall be administered by a director who shall be appointed by the Governor.

As stipulated in the code, general policies for conduct of the department are formulated by the Fish and Game Commission, and the director is responsible to the commission for administration of the department in accordance with commission policies. The department is responsible for administering and enforcing the Fish and Game Code.

Both the Wildlife Conservation Board and the Marine Research Committee indirectly set policies for the department since both agencies are empowered by the code to request and direct the department to take certain actions, as discussed in subsequent sections.

Although the department is subject by law to certain decisions of the commission, the board and the Marine Research Committee, the director, as head of a major state department, is responsible to the Governor. The department is required by the code to report biennially to the Governor.

4. THE FISH AND GAME COMMISSION

This commission is a constitutional body consisting of five appointed members serving staggered six-year terms with no more than one regular appointment per year. Members are appointed by the Governor subject to Senate confirmation.

The commission possesses only such powers as are delegated to it by the Legislature. In general, the Legislature has granted the commission power to regulate the taking or possession of birds, mammals, fish, amphibia, and reptiles except for commercial purposes. These powers have been delegated for two-year intervals, although the Legislature has renewed the delegation each biennial. Other regulatory powers pertaining

to less significant fish and game matters have been granted on an unrestricted basis.

One of the major responsibilities of the commission is to hold public meetings to hear and consider the recommendations of interested citizens and groups for setting fish and game regulations. By law, the commission must hold four formal meetings a year—one meeting each in January and February to establish fishing regulations, and one meeting each in April and May to establish hunting regulations.

In 1957, the statutes under which the commission regulates the taking of antlerless deer were modified by the Legislature to require that the commission shall not authorize taking of antlerless deer in a county where the board of supervisors opposes such action by resolution. This statute change is referred to as the Busch Bill in Chapter III on big game.

5. THE WILDLIFE CONSERVATION BOARD

As part of the Wildlife Conservation Act of 1947, the Legislature created the Wildlife Conservation Board which consists of the president of the commission, the Director of the Department of Fish and Game, and the Director of Finance. In addition, three members of the Senate and three members of the Assembly meet with the board and participate in its activities.

Primary responsibilities of the board consist of selecting and authorizing the acquisition of land and property suitable for recreation purposes and for preservation, protection and restoration of wildlife. An important element in this activity is the acquisition of access property or rights-of-way to existing state land or water. The board is also empowered to authorize construction of facilities on property it has authorized for acquisition consistent with the purpose for which the property was acquired.

All acquisition and construction which the board authorizes is financed out of the Wildlife Preservation Fund. In 1955, the Legislature established an annual appropriation to this fund of $750,000 from parimutuel revenues.

In carrying out its responsibilities, the board employs a co-ordinator of wildlife projects, an assistant to the co-ordinator, a consultant and three clerks to assist in screening and selecting proper wildlife projects.

6. THE MARINE RESEARCH COMMITTEE

Several years ago serious declines in marine fish available for commercial use caused the commercial fishing industry to support legislation designed to increase marine fisheries research. As a result, in 1947 the Legislature established the Marine Research Committee.

Present statutes require that the nine-member committee be composed of five members representing commercial fish processors, at least one member representing organized sportsmen groups and at least one member representing organized labor. Each member of the committee is appointed by the Governor to hold office for two years or until a successor is appointed.

The committee is empowered to employ personnel to conduct or contract research in the development of commercial fisheries of the Pacific Ocean and of marine products susceptible to being made available to the people of California.

Financial support for the committee support and research work is derived from a special privilege tax on fish dealers and packers.

7. PRESENT DEPARTMENT OF FISH AND GAME ORGANIZATION

At the same time that the Legislature raised the Fish and Game Agency to department status in 1951, a Senate concurrent resolution called for development of a new department organization plan on a regional basis. The new organization plan was developed and adopted early in 1953. Except for minor changes, this organization structure remains in effect in the department today.

Essentially, the department organization consists of the director and a headquarters staff at Sacramento; five regional managers, each responsible for fish and game operations in his portion of the State; and the Marine Resources Operations group with head offices at Terminal Island. Exhibit II, following this page, is a map of the State showing the boundaries of the five regions together with the location of their respective headquarters.

Exhibit I, following page 8 at the end of this chapter, as previously mentioned, charts the main organization structure of the department. Major responsibilities of the positions shown on Exhibit I are outlined in the following paragraphs:

(1) *The Director*

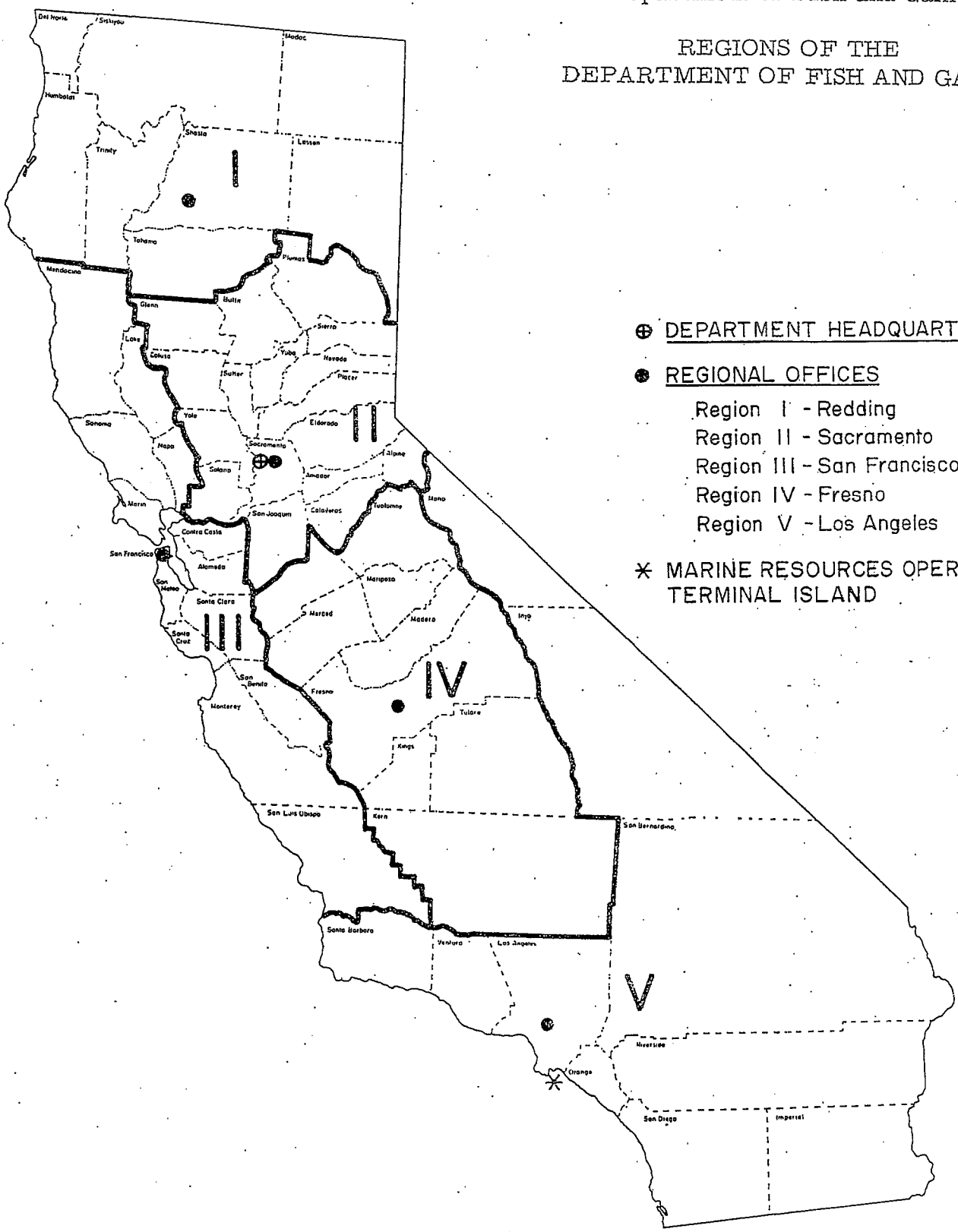
By statute, the director is appointed by and serves at the pleasure of the Governor. The statutes also hold the director responsible to the Fish and Game Commission for administration of the general policies for the department set by the commission. In his position, the director is responsible for planning, organizing, directing, and controlling the administration and operation of the department.

(2) *Deputy Director*

Reports to the director with responsibility for directing and controlling all fish and game operations of the department, includ-

EXHIBIT II
State of California
Department of Fish and Game

REGIONS OF THE
DEPARTMENT OF FISH AND GAME



⊕ DEPARTMENT HEADQUARTERS

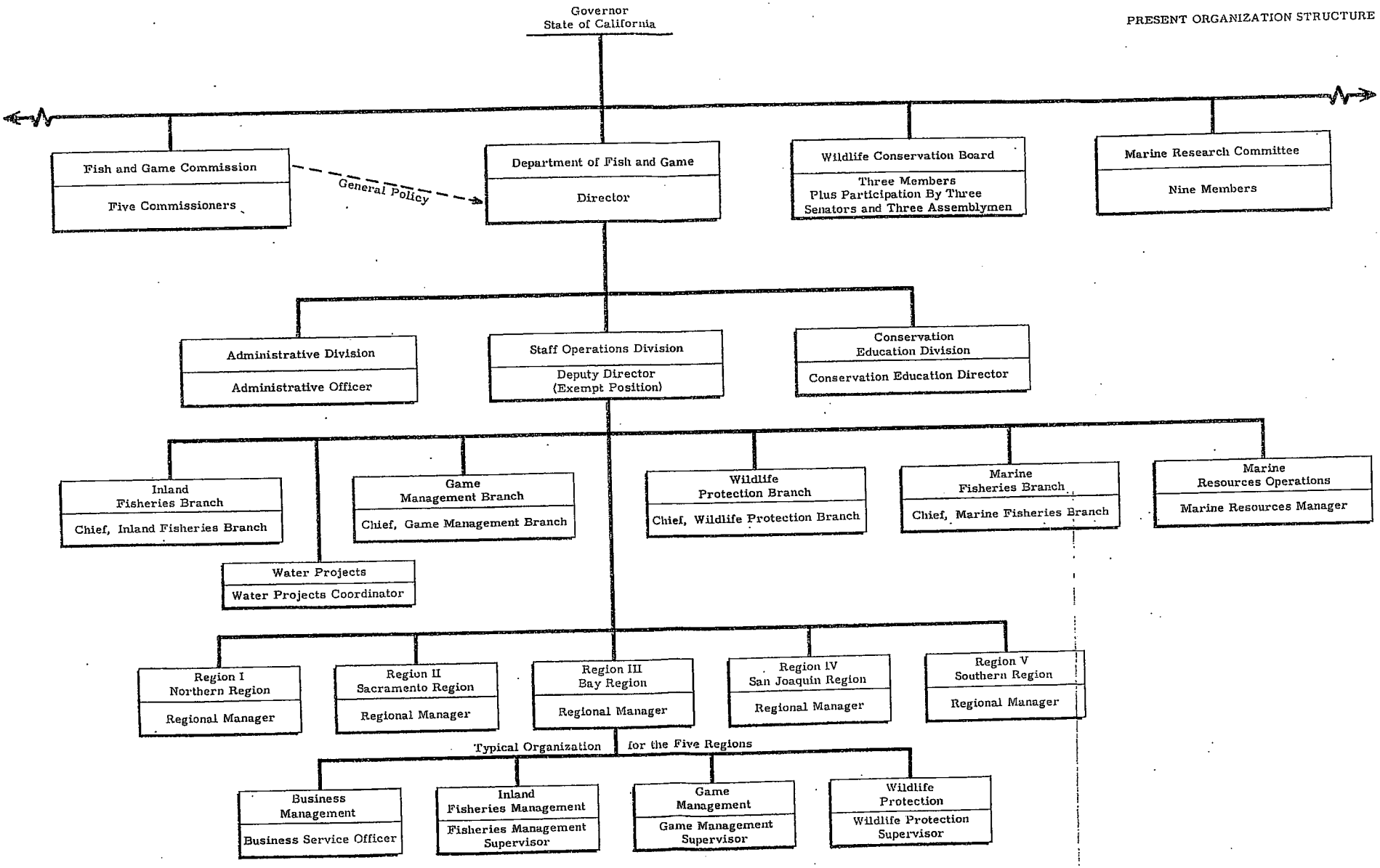
● REGIONAL OFFICES

Region I - Redding
Region II - Sacramento
Region III - San Francisco
Region IV - Fresno
Region V - Los Angeles

✳ MARINE RESOURCES OPERATIONS-
TERMINAL ISLAND

EXHIBIT I
State of California
Department of Fish and Game

PRESENT ORGANIZATION STRUCTURE



ing research conducted at headquarters and throughout the State. In the absence of the director, the deputy director assumes the director's responsibilities.

(3) *Administrative Officer*

Reports to the director with responsibility to plan, organize, direct and co-ordinate the administrative and business management activities of the department. Among the important elements of this position are:

—Supervising the making of studies of administrative organization and procedures;
—Directing the preparation of budgetary estimates;
—Maintaining budgetary control over department expenditures;
—Directing negotiation of leases and agreements;
—Directing maintenance development of financial and property records and personnel functions;
—Supervising of central licensing function and co-ordinating regional licensing.

In general, the administrative officer has functional responsibility for regional business and administrative activities.

(4) *Conservation Education Director*

Reports to the director with responsibility to develop, direct, co-ordinate and evaluate conservation and hunter safety education, public information and public relations programs of the department.

(5) *Chief, Inland Fisheries Branch*

Reports to the deputy director with responsibility for inland fisheries research; inland fisheries program planning; and inspection and co-ordination of activities relating to inland fisheries development and management, lake and stream improvement, construction of fish screens and ladders, operation of fish hatcheries, and fish planting and rescue. It should be noted that this position has no direct line responsibilities for inland fisheries operations in the regions, although the position has responsibility for providing technical guidance on regional inland fisheries operations.

(6) *Chief, Game Management Branch*

Reports to the deputy director with responsibility for game research; game management program planning; the inspection and co-ordination of activities relating to operation of game farms, waterfowl refuges, game management areas, co-operative hunting areas, and public shooting grounds; and predator control work. This position is responsible for providing technical advice to regional personnel concerned with game management although it has no direct responsibility for regional game management operations.

(7) *Chief, Wildlife Protection Branch*

Reports to the deputy director with responsibility for program planning and for inspection and co-ordination of activities relating to administering and enforcing the laws and regulations protecting fish and game. This position is responsible for providing technical guidance to regional personnel concerned with wildlife protection, although it has no direct responsibility for regional wildlife protection operations.

(8) *Chief, Marine Fisheries Branch*

Reports to the deputy director with responsibility for program planning and inspection and co-ordination of activities relating to administering marine resources research and operations.

(9) *Marine Resources Manager*

Reports to the deputy director with responsibility for organization, direction and review of marine resources research and operations.

(10) *Water Projects Co-ordinator*

Reports to the deputy director with responsibility for representing the Department of Fish and Game in matters relating to the California water development program; analyzing plans for public or private water developments to develop recommended measures for protecting and increasing fish, game, and recreational resources; and co-ordinating water development and water pollution control activities of the department.

(11) *Regional Manager*

Reports to the deputy director with responsibility within established policies and procedures for overall administration of fish and game programs in one of the five administrative regions of the State. Within the respective region, the regional manager is responsible for all fish and game operations, wildlife protection, business management, public relations and personnel.

(12) *Business Service Officer*

Reports to a regional manager with responsibility for providing the following services for the region: personnel management; issuance, sale and inventory of licenses; clerical and administrative services; procurement, maintenance and repair of facilities, equipment and supplies; maintenance of property records; and budgeting and accounting services.

(13) *Fisheries Management Supervisor*

Reports to a regional manager with responsibility to plan, organize and direct all regional fisheries management and survey activities including fish hatchery and planting operations, stream and lake improvements, water use projects investigations, fish rescue, stream and lake surveys, and processing of special permits.

(14) *Game Management Supervisor*

Reports to a regional manager with responsibility to plan, organize and direct all regional game management activities, including operation of game farms, waterfowl management areas, and game management units; game habitat improvement; predator control; and game surveys.

(15) *Wildlife Protection Supervisor*

Reports to a regional manager with responsibility to plan, organize and direct the work of a staff engaged in enforcement of the provisions of the Fish and Game Code, the rules and regulations of the Fish and Game Commission and the federal laws relating to migratory birds.

Comments on the effectiveness of the department's present organization structure and recommendations for modifying the present organization plan which have been developed during conduct of the survey are contained in subsequent chapters.

In the next chapter, the manner in which we conducted the survey is described briefly.

CHAPTER II

CONDUCT OF THE SURVEY

Review of the conduct of the survey is important due to the engagement by Booz, Allen & Hamilton of five respected wildlife management authorities to work with and as a part of the survey team. It is important that the role of the wildlife authorities in the conduct of the survey be properly defined for full understanding of survey results.

Wildlife management questions posed in the concurrent resolution as enumerated in the previous chapter are fundamental in nature. Answers to such questions should be couched in decisive terms and practical recommendations which only respected men can offer with the expectation of ready acceptance by all concerned.

Prior to our designation as the firm to conduct the survey, we had compiled a list of outstanding wildlife authorities from which we might select special members of our team. This list was compiled by having our firm's offices throughout the country poll informed sources for appropriate names. These sources included national sporting magazines, societies, foundations, institutes and the Fish and Wildlife Service of the Department of the Interior.

1. PRELIMINARY STUDY OF SURVEY REQUIREMENTS

After being designated responsible for the survey, we performed a preliminary study in which we contacted commission members, representatives of sportsmen groups and commercial interests, and the Legislative Analyst. Our purpose during these meetings was to discuss the specifics of our assignment to obtain a full understanding of the kinds of wildlife management authority needed to complete our survey team and to obtain comment on the list of men from which we expected to select our team members.

2. SELECTION OF A LEADING WILDLIFE MANAGEMENT AUTHORITY

As a result, then, of our own analysis and of this preliminary study, we invited Mr. Ernest F. Swift, Executive Director of the National Wildlife Federation, to head the wildlife management phases of our survey. Mr. Swift accepted our invitation.

Ernest F. Swift has had a distinguished career in fish and game conservation and has the reputation of being one of the foremost wildlife management administrators in the Country. Positions he has held in this field are as follows:

Year	*Organization*
1926-54	Wisconsin Conservation Department
1926-35	Conservation Warden and Forest Ranger
1935	Supervisor of Fur Farms
1935-47	Deputy Director
1947-54	Director
1954-55	Assistant director in charge of Game Management Activities and Administration of Regional Offices, U. S. Fish and Wildlife Services
1955 to present	Executive Director, National Wildlife Federation

At the same time Mr. Swift has been active in these organizations:

Midwest Association of Fish, Game, and Conservation Commissioners President 1938-39 and 1949-50
International Association of Game, Fish, and Conservation Commissioners, Chairman of Executive Committee
National Waterfowl Council, Chairman 1953-54
National Resources Committee of Wisconsin State Agencies Vice Chairman 1951-54

American Fisheries Society
Society of American Foresters
Wildlife Society
Pacific Science Board on Micronesia
Wisconsin Academy of Sciences, Arts and Letters
Wilderness Society

Mr. Swift was recipient of the first Haskell Noyes Conservation Warden Award and the Nash Conservation Citation in 1953. He is the author of many articles, books and reports on deer, other wildlife and conservation. In September, 1958, Mr. Swift was honored by being selected as one of the three top delegates of a United States delegation to an international wildlife conservation conference in Athens, Greece.

In conjunction with Mr. Swift, our next step was to select additional wildlife management authorities to complete our survey team.

3. SELECTION OF SPECIALISTS IN WILDLIFE MANAGEMENT

Our analysis of the survey requirements with Mr. Swift disclosed that several specialists in fish and game management were needed to give adequate attention to the many important questions raised in regard to wildlife management. Accordingly, these respected authorities were engaged to handle the special survey areas indicated below:

Small Game—Mr. I. T. Bode, retired Director, Missouri Conservation Commission;

Big Game—Mr. J. Burton Lauckhart, Chief of Game Management Division, Washington State Department of Game.

Marine Fisheries—Mr. Milton C. James, Research Coordinator, Pacific Marine Fisheries Commission

Inland Fisheries—Mr. C. J. Campbell, Chief, Department of Basin Investigation, Oregon State Game Commission

Background data on each of these gentlemen are contained in Exhibits III through VI, which follow.

EXHIBIT III

State of California, Department of Fish and Game

BACKGROUND DATA—MR. I. T. BODE

Education—B.S. Forestry, Iowa State College, 1915; M.S. Forestry, Iowa State College, 1921.

Positions

1915-1919	In charge of Forest Experiment Station, Hays, Kansas.
1919-1921	Member, Forestry Faculty, Iowa State College.
1921-1932	Extension Specialist, Forestry and Wildlife Conservation, Iowa Extension Service.
1932-1935	Director, Iowa Fish and Game Commission.
1935-1937	Head, Organization and Development of Co-operative Wildlife Research Units at Land Grant Colleges in Present U. S. Fish and Wildlife Services (Then Bureau of Biological Survey).
1937-1957	Director, Missouri Conservation Commission.
1957-Present	Retired.

Organizations

Midwest Association of Fish, Game, and Conservation Commissioners, Member of Executive Committee and President.
International Association of Game, Fish, and Conservation Commissioners, Member of Executive Committee and President.
Society of American Foresters.
Wildlife Society.
Rotary International.
National Wildlife Federation.

Mr. Bode received the merit award for outstanding service in conservation from Iowa State College.

EXHIBIT IV

State of California, Department of Fish and Game

BACKGROUND DATA—MR. J. BURTON LAUCKHART

Education—B.S. Wildlife Management, Washington State College, 1935; graduate work, same college, 1936.

Positions

1936-Present	Chief Game Biologist, then Chief of Game Management Division, Department of Game, State of Washington.
	Instructor, Game Management, Washington State College (On leave of absence from Washington Department of Game).

Organizations

Wildlife Society—Western Regional Director.

In 1954, Mr. Lauckhart received a Nash Conservation Citation for outstanding contributions to big game management. He is the author of many articles and of a section of book edited by Durward Allen. He has been quoted in magazine articles: *Saturday Evening Post*, 11-31-56; *Sports Illustrated*, 11-21-55; and *Field and Stream*, August, 1958.

EXHIBIT V

State of California, Department of Fish and Game

BACKGROUND DATA—MR. MILTON C. JAMES

Education—B.S. University of Washington, 1923.

Positions

1923-1927	Aquatic Biologist, U. S. Bureau of Fisheries.
1927-1942	Assistant Chief, Division of Fish Culture, U. S. Fish and Wildlife Service.
1942-1943	Chief, Division of Fish Culture, U. S. Fish and Wildlife Service.
1943-1945	Co-ordination Officer, Office of Co-ordinator of Fisheries.
1945-1952	Assistant Director, U. S. Fish and Wildlife Service.
1951-1952	Deputy Administrator, Defense Fisheries Administration.
1952-1954	Consultant, Washington State Fisheries Department.
1954-1955	Executive Director, International North Pacific Fisheries Commission.
1956-Present	Research Co-ordinator, Pacific Marine Fisheries Commission.
10 Months	Director, Oregon State Fisheries.

Organizations

International Fisheries Commission, 1946-1952.
Pollution Control Advisory Board.
American Fisheries Society, President 1949-1950.
Wildlife Society.
Izaak Walton League.
Inter-American Tropical Tuna Commission, 1951.

Mr. James is the author of government reports and miscellaneous contributions to science, technical and trade publications.

EXHIBIT VI

State of California, Department of Fish and Game

BACKGROUND DATA—MR. C. J. CAMPBELL

Education—B.S. Fish and Game Management, Washington State College, 1938 Graduate work—same college, 1939.

Positions

1937-1940	Part-time and full-time work on biological lake survey, U. S. Forest Service.
1940-Present	Various positions in research and management for inland and anadromous fisheries, Oregon State Game Commission. Now Chief, Department of Basin Investigations.

Organizations

American Fisheries Society.
Pacific Fisheries Biologists.
Wildlife Society.
Izaak Walton League.

Arrangements were made for these wildlife management specialists to handle survey work in their own special fields and also to comment on department organization and administrative features as they impinge upon the effectiveness of wildlife management. The written findings, conclusions, and recommendations of these gentlemen are contained in these chapters:

Chapter Number	*Chapter Title*	*Author*
III	Big Game Management	J. Burton Lauckhart
IV	Small Game Management	I. T. Bode
V	Inland Fisheries Management	C. J. Campbell
VI	Marine Fisheries Management	Milton C. James
VII	Water Projects, Pollution and Salmon-Steelhead Management	Milton C. James C. J. Campbell
VIII	Wildlife Protection	Ernest F. Swift
IX	Conservation Education	Ernest F. Swift

Each of the wildlife management consultants has reviewed all of the chapters of this report, and all are in agreement with the conclusions and recommendations presented. Mr. Swift has given final review and approval to all of the analyses, conclusions, and recommendations. This report, therefore, represents the combined thinking of all who participated in its preparation.

The chapters on wildlife management are presented next, followed by chapters prepared by Booz, Allen & Hamilton on administration, organization planning and control and cost reduction opportunities.

CHAPTER III

BIG GAME MANAGEMENT

J. BURTON LAUCKHART

There has been a revolution in the field of animal sciences. The naturalist who studied animals as individuals has been replaced by the scientist who considers them wholly on the basis of populations. These scientists have demonstrated that all wildlife die at approximately the same rate at which they are born. If losses were less than reproduction, the population would overrun the earth; and if they were greater than the replacement rate, the species would become extinct.

Many animal populations have a high reproductive capacity which can provide rapid increase. However, all environment has a definite limit to the number of animals that it will carry over any one year. Thus, we find that all populations press this carrying capacity limit most of the time.

Losses are not accidents—they are inevitable and necessary. They are like the flow of a river into the sea; the only way that they could be stemmed would be to dry up the "springs" of reproduction. The more rapid the rate of reproduction, the shorter must be the life expectancy of the species.

Game management has graduated from the trial and error period to the stature of a mature science, similar to agriculture and forestry. They all maintain as their goal the full utilization of a crop produced by a renewable resource.

The so-called theories regarding the harvest of doe deer are now recognized as principles of good game management. All colleges and universities that teach wildlife courses adhere to these principles. Game managers the world over are solidly behind the premise that there is a surplus of both sexes which must be harvested every year for proper management.

It has been demonstrated many times that a healthy deer herd with adequate forage of good quality will double its numbers every three years. When an increase does not occur, it is ample proof that the capacity has been reached. Females are produced in equal numbers to males, and there is a large surplus over the number required for breeding stock replacements. Studies have shown that they are lost from natural causes if the hunters do not take them, a fact which is a predominant reason why doe harvesting is recommended by game management.

Deer are also healthier and raise more young on ranges where the hunter kill removes most of the annual increase. This is a second predominant reason for advocating regular doe harvest. This resultant improvement in both the quality and quantity of deer is largely attributable to improved nutrition, because of reduced competition for the better food plants. Although the deer herds receive some benefit from this better harvest afforded by "doe seasons," the greatest profit actually goes to the hunters through a great increase in the allowable deer kill. The hunter kill of deer in California can easily be doubled without endangering herd populations.

Whidbey Island in western Washington is a classic example of an area where an attempt to kill off a deer herd actually resulted in a four- to five-fold increase in the annual kill without any real herd reduction.

Most of the western states have been following this type of deer management for a number of years and their experiences prove its benefits. Washington, Oregon, Utah, Colorado, Wyoming and Montana have all doubled their annual deer kills through regular either-sex harvest programs. Idaho never did establish general deer seasons in which does were protected. It is pertinent to this survey to point out that in the states where either-sex deer hunting is now common, the initiation of such programs was not easily accepted by the public. People have found it difficult to accept the concept of either-sex harvest, but as full understanding of all the factors has been achieved, public acceptance materially increased.

Most of the individuals who oppose doe seasons are sincere in their beliefs, but they have failed to keep abreast of modern advances in scientific management. Others have allowed sentiment to prevail over good judgment. California sportsmen would also benefit greatly through the acceptance of a regular either-sex harvest program in their state.

1. SCOPE OF THE SURVEY

Senate Concurrent Resolution No. 126 of the 1957 Session of the California Legislature provided for the study of certain specific phases of the big game program, namely research and federal aid expenditures. However, the study was not to be limited to the specific areas identified. Because of the importance of big game management in California, considerable effort was devoted to its review.

Since deer constitute by far the most important big game group within the State, the primary emphasis has been on a study of deer problems. Consideration was also given to antelope and elk.

2. CONDUCT OF THE SURVEY

The four general phases of the survey were as follows:

(1) A review of all previously published reports and studies pertaining to game animals in this region.

(2) A study of the organization of the game management and research activities within the Fish and Game Department.

(3) A field survey throughout the State with the following objectives:

1. An actual visit to representative game ranges in all regions of California.
2. Conferences and discussion with field personnel of the Department of Fish and Game relative to various problems of management.
3. Conferences with leaders of sportsmen's groups and personnel of related land management agencies relative to local big game problems. Throughout the survey, approximately 80 such individuals were contacted and invited to express their opinions.

(4) This writing constitutes the final report and findings which have resulted from the work described above.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

The objective of game management is to provide the maximum annual harvest of game that still does not jeopardize the supply for the future. The Fish and Game Commission's Deer Management Policy, adopted in 1950, is in conformity with this objective. It states in part as follows: "To produce and maintain a maximum breeding stock of deer on all wild lands of California, public and private, consistent with other uses of such lands, and to utilize, through public hunting, the available crop of deer produced annually by this breeding stock." The policy declaration further states: "To permit the harvest of all surplus animals, of either sex, over and beyond what the range can carry in healthy condition."

These statements are sound management objectives; however, public opinion has prevented the department and commission from carrying out these policies. The matter of doe harvest is still the principal source of controversy concerning big game management in California. The so-called "doe slaughter" hunting season of 1956 was an error in administrative judgment, for although it did no real harm to any deer herd, it did cause some undesirable hunter concentrations, and it heaped criticism on a program that had received only qualified acceptance by the public. This resulted in considerable lack of confidence in the department's game program and brought on the passage of more restrictive laws by the Legislature. A more gradual expansion of doe seasons with management unit areas to vary the hunting pressure, and limited doe hunting by permits in many regions could have greatly lessened this criticism.

Although the passage of the Busch Bill did provide an orderly procedure for a deer harvest which would prevent such concentration of hunters, there is still a large segment of the population which does not accept scientific management.

Public education regarding deer management is one of the greatest tasks confronting the department and the Fish and Game Commission. It is not a responsibility which can be delegated to a few educational specialists and it cannot be achieved by game managers and public education personnel together. To adequately gain public acceptance and support for a program such as this requires the dedicated teamwork of all employees, including wardens as well as game management and fish management personnel. All employees should be trained to help with the duties of other divisions during critical periods, and they should support all department programs.

A serious lack of unity or team co-operation in some areas between various branches making up the Fish and Game Department is still the principal stumbling block to public education in deer management. There are indications that conditions are improving and there is excellent co-operation between all employees in some areas. Yet, in some large sections teamwork is far from being achieved.

Many of the early deer research projects conducted by the University of California and the Fish and Game Department were range studies and the first attempts to justify doe kill were based on the principle of harvest to protect the forage plants. This concept has remained entrenched in the minds of many technicians and sportsmen alike and has produced a rather complex management plan under which it is necessary to show range damage in every area where an antlerless animal is to be killed. In California a simpler approach to the same problem can be presented on the basis of herd management with a harvest of the yearly surplus of both sexes to provide more hunter kills. The department is emphasizing this latter approach at the present time.

With few exceptions, the game managers contacted were found to be competent and dedicated and willing to work against great odds for the principles they know to be correct. There is little indication that their salary alone would be enough to make them stand up under such abuse as they often receive over doe seasons if it were not for their dedication to the cause of good management.

We feel that the two most important factors that will contribute to a more successful big game program in California are the simple harvest approach to deer management and a dedicated team of all department

personnel to gain public acceptance of the program. If these objectives are achieved, the big game problems will be well on their way to solution.

4. SPECIFIC PROBLEMS IDENTIFIED

The following is an enumeration of specific problems which were considered in the survey of California's big game management:

General Game Management

(1) Teamwork and public relations.
(2) Public land withdrawals and hunting access roads.

Deer Management

(3) Control of the doe harvest.
(4) Simple harvest approach to big game management.
(5) Management units for deer.
(6) County supervisor veto.
(7) Big game research evaluation.
(8) Limitations on precise management.
(9) Brush burning.
(10) Deer seasons.
(11) Value of big game refuges.
(12) Livestock and game competition.
(13) Predator control:
  1. Mountain lion;
  2. Coyote.
(14) Depredation control.
(15) Interstate deer herds.
(16) Deer tags.

Other Big Game Management

(17) Elk.
(18) Antelope.

The analysis of each of these aspects of big game management is presented in the following pages.

5. ANALYSIS OF PROBLEMS AND DEVELOPMENT OF RECOMMENDATIONS

GENERAL GAME MANAGEMENT

(1) *Teamwork and Public Relations*

Through personal observations in all regions of the State, and in conferences with leaders of sportsmen's groups in many areas, it was found that lack of teamwork in public relations is the greatest single factor preventing the accomplishment of scientifically sound game management program in California. The public generally will not accept the program if there is dissension or lack of agreement within the ranks of the game personnel who administer these programs.

Sportsmen in every state are very strong in their opinions of how fish and game should be managed, and they are quite prone to oppose changes which they do not understand. Thus, the problem of educating the public regarding big game management is a tremendous task, requiring the concerted efforts of all department employees. There is a tendency among some department employees to try to be specialists and disregard all programs except their specific duties. This would make it necessary to maintain many more employees as specialists in each phase of work in each area, whereas one general game practitioner could provide all local services at much less cost. In most states it is the policy to have all employees trained as auxiliary public information officers to support all of the department's programs and policies.

We received the impression that there has been considerable improvement in teamwork in recent years, but there are still large areas where this cooperation does not exist.

RECOMMENDATIONS

1. Plan and Carry Out a Program to Educate All Department Personnel as to the Department's Deer Management Program

Full acceptance of the deer management program cannot be expected until the scientific principles and reasons underlying it are understood. It is illogical to expect people to reverse their beliefs and convictions of many years without a thorough understanding of new facts which lead to new conclusions. The basic first step in winning general public support of the deer management program is the winning of unqualified acceptance and support from all department personnel. Once this has been done, there then exists a sound base upon which to build public support.

It is therefore very important for the department to plan and carry out a comprehensive program to educate all department personnel, particularly those in contact with the public, as to the reasons underlying the deer management program.

2. Assign Specific Responsibility to All Department Personnel for Communicating the Department's Deer Management Program to the Public

The rate at which public acceptance of the deer management program will be won is in direct ratio to the total departmental effort to communicate the principles and reasons underlying the program. In order to accelerate the public acceptance, all departmental personnel should be assigned specific responsibility for positive participation in the information and education program. The combined efforts of all dedicated department people can accomplish a transformation in public acceptance of the deer program.

Actually, this recommendation applies to all programs of the department, not solely to deer management.

These important subjects are covered more fully in Chapter IX, Conservation Education.

3. Solicit All of the Outside Aid Possible in Communicating to the General Public

The educational task cannot be accomplished by the department alone. There exists in California a core of conservation-minded citizens who are more than willing to be a part of the effort to bring sound conservation concepts and facts to the general public. It is essential that these people be given every opportunity to be provided with the information they need to help communicate sound conservation principles to the public.

(2) *Public Land Withdrawals and Hunting Access Roads*

A most serious problem that California faces at the present time is that of providing a place for its residents to hunt and fish. The public land recreation withdrawals now being negotiated with the U. S. Bureau of Land Management are some of the most important projects ever undertaken. If consummated, these agreements will guarantee for public use large segments of land that might otherwise be converted to private ownership and use. They will guarantee, for all time, that these lands will remain in public ownership, and thus the State can spend funds to provide access for the public to use such lands.

The program to construct access roads to other isolated blocks of public land is another very constructive program that is to be commended.

The State may not be able to purchase large blocks of low value land for hunting and fishing but anything that can be done to keep land in public ownership will guarantee some recreation for the average citizen who cannot afford to pay for privileges on private land.

RECOMMENDATIONS

1. Assign a High Priority to Steps Which Will Increase the Withdrawal of Public Lands From Possible Conversion to Private Use

Hunting opportunities for future generations will be greatly affected by what is done now. There is a present responsibility to safeguard and increase the hunting opportunities in the years to come. This is an aspect of long-range planning which is very important, and one in which the passage of time will cause a diminishing potential.

2. Continue to Build Access Roads to Public Lands

The building of access roads to areas to which the general public has a legal right to access increases the actual utilization of such lands for the sportsmen. This program is of great benefit to California hunters.

DEER MANAGEMENT

(3) *Control of the Doe Harvest*

The principle of conducting an annual doe harvest on a controlled basis is entirely sound and proper from the game management point of view. As was stated in the introductory paragraphs of this chapter, there is ample scientific documentation that the reproductive capacities of deer are great and that food is the chief limiting factor to herd size. Each range has a carrying capacity, which is constantly placing a natural limit on the number of deer that can survive. Either the hunter can harvest the natural surplus or the processes of natural attrition will operate to take them. Game management believes that the hunter should reap this harvest.

Secondly, there is ample scientific proof that deer are healthier and raise more young on ranges where the hunter kill removes most of the annual increase. This improvement in herd quality and fawn production is largely attributable to improved nutrition, resulting from the fact that the available food supply is distributed to fewer deer.

These two basic facts logically result in the conviction that the principle of the doe harvest on a controlled basis is sound deer management.

Buck deer seldom, if ever, are overharvested, regardless of the hunting pressure. They are polygamous, like cattle, with one male capable of breeding 10, or even 20, does. Since they are cautious by nature, the law of diminishing returns makes it virtually impossible for hunters to crop them below 1 to 10.

However, it definitely is possible to overkill doe deer. It can be readily seen that if 90 out of 100 are antlerless, it would be much easier to find one of them. However, such an extreme seldom exists, but does are always more abundant than bucks. Thus, the doe kill must be controlled much more rigidly than the buck kill. Since the doe population generally increases about 20 percent yearly, the kill must be controlled somewhere near this figure. On the other hand, hunters may take as many as 50 percent to 60 percent of the antlered bucks.

To keep the kill within such a relatively narrow range, it is often necessary to confine antlerless hunting to special permit quotas. The best guide to what this quota should be is to make it equal to the antlered buck kill on the same unit of range during the previous hunting season. This is based on the fact that bucks are hunted regularly every year so that the

number killed is approximately equal to the number added each year by reproduction. This fact is basic to the concept of deer management. Since half of the reproduction is females, we can assume that the buck kill is also equal to the number of females added yearly. Thus the buck kill is a reliable guide for the doe harvest. As long as the antlerless kill does not exceed the antlered kill there can be no appreciable overharvest. Several western states now use such guides for managing deer herds.

Although quotas and permits are a necessity in many areas, to hold the doe kill at a proper level, there also are many areas in California where all factors favor the deer and are against the hunter. This is true in the dense chaparral brush found generally in the coast range, where studies show that hunters take only a small fraction of what is available. In such areas, an adequate control of the doe kill may be secured by limiting the number of days of either-sex hunting open to all hunters without establishing quotas.

Records show that the first either-sex deer season in California was held on Catalina Island in January of 1950. From that time special antlerless seasons were increased each year until there were 12 permit areas opened in 1955 with a total kill of 9,297 animals.

As a result of this experience, the department recommended, and the commission adopted in 1956, a more general type of either-sex deer season with rather extensive areas open to all hunters. Certain coastal areas were opened during the last three days of the early season and inland areas were opened during the last three days of the late season. This system was largely patterned after either-sex seasons which proved fairly successful in the State of Oregon.

EXHIBIT VII
State of California, Department of Fish and Game

COMPOSITION 1956 EITHER-SEX DEER KILL—COASTAL

(Figures used are only for counties in which either-sex hunting was permitted)

County of kill	*Antlerless*	*Bucks forked horn or better*	*Total deer*
Alameda	45	538	583
Contra Costa	89	187	276
Los Angeles	1,301	1,112	2,413
Monterey	819	2,585	3,404
Napa	461	1,144	1,605
Orange	93	181	274
San Benito	165	1,233	1,398
San Diego	32	179	211
San Joaquin	1	49	50
San Luis Obispo	724	2,222	2,946
San Mateo	50	134	184
Santa Barbara	685	1,571	2,256
Santa Clara	123	1,239	1,362
Santa Cruz	125	202	327
Solano	68	147	215
Ventura	847	1,138	1,985
Yolo	97	275	372
Not given	22	15	37
Total	5,747	14,151	19,898

The three-day coastal season apparently created no serious problems and receives only limited criticism from the public. Exhibit VII, on this page, summarizes deer tag returns showing a kill of 5,747 antlerless animals and 14,151 branched antlered bucks in the coastal areas. Only one county (Los Angeles) showed a kill of a few more antlerless than antlered animals. These figures indicate that the doe kill did not exceed the annual increase in any county, and it should have had no effect on the deer abundance during the following summer.

The three-day antlerless hunt at the end of the late season resulted in a much heavier kill of antlerless animals as shown in Exhibit VIII, on this page. Hunters apparently concentrated in large numbers and an untimely storm helped to concentrate the deer. This season was very severely criticized throughout much of the northern part of the State.

Although eight counties showed an antlerless kill greater than their kill of bucks, only one of those, Calaveras, had a kill of more than twice as many antlerless as antlered. Undoubtedly there were small areas in many counties that sustained some reduction in their deer herds, but generally the kill of does was not heavy enough to markedly reduce the population. The reproductive seasons of 1957 and 1958 will have eliminated all possible effects of the 1956 kill on the deer herds.

As an example, we may assume that Calaveras County carried the high ratio of one buck to two does at the start of the hunting season, or 100 bucks to 200 does. If the hunters made a harvest of half

EXHIBIT VIII
State of California Department of Fish and Game

COMPOSITION 1956 EITHER-SEX DEER KILL—INLAND

(Figures used are only for counties in which either-sex hunting was permitted)

County of kill	*Antlerless*	*Bucks forked horn or better*	*Total deer*
Amador	443	407	850
Butte	1,004	1,152	2,156
Calaveras	1,221	601	1,822
El Dorado	1,662	1,437	3,099
Glenn	726	859	1,585
Lassen	5,488	4,086	9,574
Modoc	6,170	4,817	10,987
Nevada	693	937	1,630
Placer	369	741	1,110
Plumas	2,450	1,915	4,365
Sacramento	30	34	64
San Joaquin	2	4	6
Shasta	2,748	3,415	6,163
Sierra	1,112	782	1,894
Siskiyou	4,012	5,651	9,663
Sutter	1	3	4
Tehama	3,860	3,116	6,976
Yuba	241	323	564
Not given	102	143	245
Total	32,334	30,423	62,757

the bucks, they would have taken 50 from the 100. If the doe kill was double the buck kill, it could have removed 100, or half the doe population. However, since fawns were also antlerless deer and were counted in the antlerless kill, the actual doe kill was something less than 50 percent. Two good fawn crops would be adequate to bring such a herd back to the pre-season level of 1956.

In this example it should be noted that the county used (Calaveras) was one which showed the heaviest doe kill of any county in the State.

Although a hunting kill approaching 50 percent seems extreme, it is very common for a natural "die off" to remove half of the deer herd. In fact, many herds increase for two or three years with little or no loss and then a "die off" strikes which removes about half of the animals. The herds then build for another three years to another loss period. Thus, the heaviest hunting kills were no more than the normal reductions sustained through a natural "die off" or "winter kill."

RECOMMENDATIONS

1. Continue to Harvest the Annual Surplus of Does on a Controlled Basis

The strong weight of scientific evidence clearly shows that there are annual surpluses of both male and female deer. This surplus can either be utilized to man's advantage, or natural attrition can be permitted to take the surplus. Game managers the world over agree that the surplus should be harvested, including doe surplus. Moreover, the harvesting aids in building healthier herds, with stronger reproductive capabilities. The harvesting should be controlled, however, so as to prevent damage to deer herds.

The following two tables illustrate the effects of the two basic alternative methods of managing deer herds in California. In Table A is shown the effects on a typical California herd of permitting buck harvesting only.

TABLE A

ILLUSTRATION OF BUCK HARVESTING ONLY TYPICAL HERD

		Male		*Female*	
Month		*Bucks*	*Fawn*	*Does*	*Fawn*
March, 1958—adults		30		100	
yearlings		25		25	
		55		125	
May, June, July	fawns born		50		50
May, June, July	natural losses poor nutrition		20		20
August, 1958, population		55	30	125	30
Fall harvest—hunting kill		20			
Late fall population		35	30	125	30
Winter and spring loss —natural causes		5	5	25	5
March, 1959, population— adults		30		100	
yearlings		25		25	
		55		125	

In Table B is shown the effects of either-sex harvesting on the same typical California herd on the same range.

TABLE B

ILLUSTRATION OF EITHER-SEX HARVESTING HERD ON SAME RANGE AS IN TABLE A

		Male		*Female*	
Month		*Bucks*	*Fawn*	*Does*	*Fawn*
March, 1958—adults		27		80	
yearlings		28		28	
		55		108	
May, June, July	fawns born		40		40
May, June, July	natural losses		7		7
August, 1958, population		55	33	108	33
Fall harvest—hunting		25	1	23	1
		(25 antlers)		(25 antlerless)	
Late fall population		30	32	85	32
Winter and spring loss— natural causes		3	4	5	4
March, 1959, population— adults		27		80	
yearlings		28		28	
		55		108	

The following key biological facts reflected in the two illustrations are essential to an understanding of the fundamental issues underlying the principle of either-sex harvesting:

—The size of the herd entering the winter season in relation to the available food supply on the winter range is the controlling factor which determines the extent of herd survival during the winter months and the health of the surviving herd.

—The health and condition of the does in the winter months is the controlling factor which determines the health and condition of the fawns at birth, which in turn determines the survival rate of the fawn during their first months.

Thus, in Table A the fawn survival rate during May, June and July is shown as only 60 percent, as compared to 82 percent in Table B. The improved survival of fawn in Table B results from the healthier condition of the fawn at time of birth, due to the healthier condition of the does during gestation.

Similarly, the winter and spring losses are higher in Table A than in Table B for the basic reason that the size of the herd in late fall and winter is larger in relation to the fixed food supply. Natural losses are therefore higher when food supply per head of deer is less.

These tables present a valid comparison between the two basic alternative deer management programs.

The hunting kill in Table B is two and one-half times the hunting kill in Table A.

If buck harvesting only is permitted, the herd will be less healthy and buck harvesting will tend to be lower. If either-sex harvesting is permitted on a controlled basis, herds will tend to become more vigorous and healthy and the harvest will be considerably increased.

In effect, the larger harvest under either-sex hunting reduces the overall adult population of the herd during the winter months, which is the more critical period for forage. As a result, with fewer adult deer, the forage available to the fawn as well as to the adults is proportionately improved, thereby creating a healthier herd. Natural losses during the winter months are reduced, and a larger herd (more yearlings) is available in the spring.

These conclusions are based on scientific fact demonstrated in many of the western states. Other western states follow either-sex deer harvest programs and have greatly increased the harvest to the hunters while improving the condition of the herds. In the final analysis, the basic facts are that the reproductive capabilities of the deer are so great that the carrying capacity of the range is being continually pushed up against. Consequently, losses will inevitably take place, either through natural causes or by harvest by the hunter. The objective of wildlife management is to maximize the harvest without jeopardizing the future supply. Either-sex deer harvest accomplishes this objective.

2. Control the Surplus Doe Harvest According to Conditions in Each Deer Management Unit

The Busch Bill limitation that all either-sex hunting be by limited permits is good management for a time until the harvest program is more generally accepted. However, there are many brushy areas in California where such limitations on doe hunters can be relaxed in the future. Areas of dense cover such as are found in much of the coast range can still support several days or possibly weeks of either-sex hunting, open to all, without danger of over harvest. On the other hand, either-sex hunting in the more open ranges found in much of the Sierras must always be closely controlled.

Although the 1956 inland either-sex season had no serious effects on the deer herd, it did result in severe overconcentration of hunters and it brought tremendous criticism on the deer management program. It was a type of season that could not be continued on these inland ranges, even if held before the winter storms. Either-sex harvests in this region must always be on a limited permit or quota basis.

The end result of the controls utilized should be to insure that the doe harvest should not exceed the annual surplus of does. In this way, the basic objective of maximizing the annual harvest without jeopardizing the future supply is attained.

(4) Simple Harvest Approach to Big Game Management

Many of the early deer studies in California were primarily range or forage plant studies which stressed overgrazing of food plants as a basis for harvesting deer. Recently there has been a trend in the Fish and Game Department toward deer herd management based on a study of herd productivity and away from the range or food study concept. However, the effects of the emphasis on range are entrenched in the minds of the public. They feel that they must be shown where all the forage has been eaten before there is justification for doe harvest.

This has created a serious problem because it is extremely difficult to explain thoroughly the complexities of forage problems to the average citizen. The value of a twig as deer food is dependent upon the type of plant, the site in which it grows, the age of the plant and the location of the twig on the plant. Deer use alone is the only true measure of the adequacy of a twig as forage. If it is not eaten, it undoubtedly is not good food.

Range management also stresses damaged areas and thus must propose substantial deer reductions to alleviate this damage. This is very unpopular in the face of the increasing hunting pressure. On the other hand, herd management contemplates no real herd reduction. It merely proposes to harvest this fall does and bucks equal to the number that can be replaced by next spring's fawn crop. It is a temporary reduction for the winter months only. Such a harvest program should come well before any more intensive management to benefit range. This harvest alone may provide enough grazing relief to halt further range depletion.

Forage studies generally are very tedious and time-consuming, whereas kill figures which provide reliable population statistics are relatively easy to secure. With more emphasis on the simpler herd management concept, it will be possible to considerably lessen deer management work loads in the future. Within the next five years it should be possible to lessen deer management work by from a third to a half of the time now required.

RECOMMENDATIONS

1. The Department Should Encourage the Harvesting of the Full Yearly Crop of Deer

Under conditions prevailing in California, the department should stress the harvesting of the full yearly crop of game presently available, and give minor consideration to deer forage studies.

2. The Department Should Develop Doe Kill Quotas on the Basis of Previous Year's Buck Kill Reports

The simple management approach of harvesting the yearly surplus is best. Reliable antlerless quotas for any unit can be developed from the previous year's buck kill with less field work involved. The effect of such a management approach has been illustrated in the prior section (3) on control of the doe harvest. This method of quota computation can eventually lessen game management work loads and free personnel for other duties.

If these recommendations are followed, within five years the reported deer kills should be increased to at least 150,000 a year or approximately double the number of bucks that are being killed at the present time. Every other western state has successfully doubled its deer kill in this manner and California can do the same.

If deer management work is simplified as proposed, within five years the work load on big game should be reduced to approximately one-half its present level. It is currently estimated that field work on big game involves at least a part of the time of 30 unit managers and 40 game technicians. We have estimated that they will average half of their working time on duties in some way related to big game. This would involve a saving of the equivalent of 17 employees or 17 man-years of work.

(5) *Management Units for Deer*

A management unit is an area of land, often the watershed of some stream, where a certain group of deer live during the entire year. It should have some fairly consistent type of cover such as brushy throughout or open throughout. With such areas it is possible to set different seasons or quotas for each unit to correctly harvest the herds involved. A very brushy unit can support a long either-sex season, open to all, while a unit of open grass land deer range must have a very restricted permit season on does.

The State of Colorado initiated deer management units something over 10 years ago, and other states soon followed its example. Colorado has 90 units; Utah, 60; Washington, 60; Wyoming, 50; and Montana, 50 or more. Oregon is presently establishing units, and California has been divided into 34 units and 114 subunits as instructed by the legislature through the Busch Bill. Exhibit IX, following this page, illustrates the present deer management units. The subunits are the important divisions for actual deer management.

All western states have found that such units are necessary to properly distribute the kill of antlerless deer.

RECOMMENDATIONS

1. Retain the Present Deer Management Units and Establish Controls Appropriate to Each Unit

The establishment of units as prescribed by the Busch Bill is good wildlife management. The division of California into 114 subunits is quite proper for the amount of deer range involved and the hunting pressure which must be distributed within this area.

(6) *County Supervisor Veto*

A much-discussed segment of the Busch Bill is that which gives the county supervisors authority to modify or veto any antlerless season within their county as proposed by the Fish and Game Commission. It is a delegation of the commission's authority which is intended to reflect more closely the opinions of the county residents. It is an indication of lack of confidence in the department and in the commission.

Such delegation of powers is not recommended procedure because it thereby is more difficult to take any action and it results in the expenditure of more of the sportsman's money. Each additional governmental board that must pass on a season makes the establishment of that season more difficult to achieve. Each group must be fully informed of all of the arguments for and against and of all of the facts involved. This consumes considerable time of many department employees.

However, this requirement is not an insurmountable obstacle to deer management. The majority of the residents of a county should understand the reasons for a season before it is established; and if they will indicate their support, the county supervisors will usually approve it.

This delegation of commission authority is an indication that the department has failed to adequately educate the public regarding deer management.

RECOMMENDATIONS

1. Return Full Regulatory Power to the Commission as Soon as Public Confidence in the Deer Management Program Is Restored

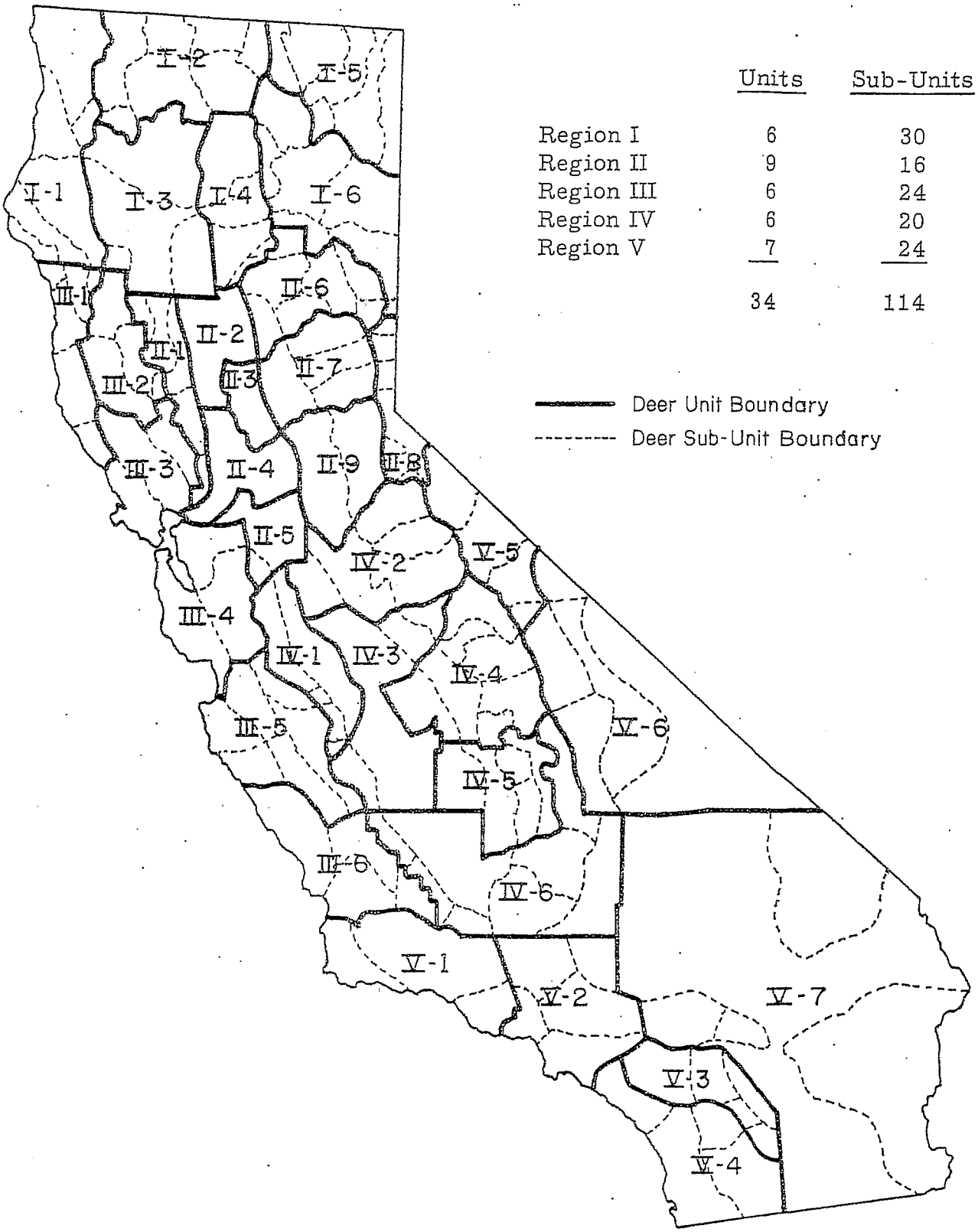
The department and commission will be forced to operate under this restriction until public confidence is established. Full regulatory authority should then be restored to the Fish and Game Commission, in order to simplify the establishment of sound deer management practices.

(7) *Big Game Research Evaluation*

California big game research has always been of a high caliber and the published reports are highly regarded by all game technicians. The research currently being conducted by the Department of Fish and Game is chiefly confined to two segments of their

EXHIBIT IX
State of California
Department of Fish and Game

DEER MANAGEMENT UNITS AND SUB-UNITS



	Units	Sub-Units
Region I	6	30
Region II	9	16
Region III	6	24
Region IV	6	20
Region V	7	24
	34	114

Deer Unit Boundary

Deer Sub-Unit Boundary

Federal Aid Big Game Investigations Project (W-51-R-3).

The Brush Removal Study segment is being conducted by the University of California through a contract with the department at a cost of about $37,000 a year. The work is being done chiefly in Madera County on the winter range of the San Joaquin deer herd. The study, which has protected browse plants from game use for two or three years after burning, has provided impressive results to date. In general, this research seems to be well planned and efficiently carried out.

The other research segment is entitled Game Range Restoration and is conducted by the California Forest and Range Experiment Station of the U. S. Forest Service. The expenditures on this project amount to about $35,000 a year. This project chiefly concerns planting of bitterbrush and other common browse species. It has worked out best seed treatments, depths of planting, time of planting and techniques for protection from rodents. The work is being done at three sites—one on the Devil's Garden Range in Northern California, and near Doyle, and one on the Buttermilk watershed in the vicinity of Bishop. This study appears to be efficiently handled.

Neither brush control nor reseeding can ever be a substitute for herd management. They both require heavy game harvesting to reduce grazing pressure, and thus help establish forage plants. Their ultimate value to the department will depend on the economics of how much it will cost to put another deer in a hunter's bag with these management techniques.

Since the university and the Forest Experiment Station are primarily engaged in research, they are well qualified to do such work for the Fish and Game Department. Our only criticism is that there seems to be some uncertainty regarding the plans for the future and we feel that each study should work toward some set completion date. This would establish more definite goals and timetables for the work.

RECOMMENDATIONS

1. **Establish Completion Dates for Research Projects and Work Toward Their Termination**

   We consider that the contracting with the University for basic research of this type is a good policy. The only suggestion would be that each project work toward some definite termination or completion date with the possibility of a new study when one is completed.

(8) *Limitations on Precise Management*

Game management is a biological science and can never be developed into an exact science such as mathematics or chemistry. The cropping of game surpluses will never be precisely controlled because hunters will not accept rigid controls, and the vagrancies of weather make hunting success uncertain. There will always be undercropped areas and, at the same time, some limited areas that are overharvested.

Still, in the field, there is some tendency to carry research into too much detail. In some instances technicians are attempting to measure in "millimeters" where they can only manage in "yards." The frustrations over failure to get public support for doe harvest have led into a maze of more detailed herd and range studies that have made it even more difficult to sell the program. Certain individuals who oppose doe seasons demand more detailed studies in their efforts to further delay any actual management.

RECOMMENDATION

1. **Adopt an Approach to Game Management Which Is Realistic and Practical**

   Since game management is not an exact science, we can never expect a perfect job of management. There will always be small areas of over or underharvest. In the future it will be necessary to develop confidence in the game manager as we have confidence in the physician. Adoption of the previously discussed simple harvest approach should do much to correct the overemphasis on precise game management.

(9) *Brush Burning*

It has been generally recognized and scientifically demonstrated that the burning of mature or decadent stands of brush is beneficial to wildlife generally and to deer in particular. Fire opens up the dense stands, makes feed conditions much better, and makes the deer more available for hunter harvest. Although brush burning is not applicable in all situations of dense brush, it is generally a useful and appropriate tool of habitat improvement.

In nearly all sections of the State, there is a cry from sportsmen for more burning. Some of this is an escape mechanism to keep from having to harvest or manage the present herds. Actually, burning is no substitute for harvest. If the capacity of the range is increased, the resulting larger herds will provide greater losses if they are not taken by hunting.

Many small, controlled burns that provide a maximum amount of edge and ample escape cover are the best for wildlife.

The principal problem involved in the use of fire is the tremendous hazard and the high cost of protective measures to overcome that hazard. For example, a sportsman on the coast who complained bitterly because the Department of Fish and Game did not burn enough, admitted that he did not dare to burn his own private land because of the possible damage suits that would result if his fire should go to other lands.

The Cow Mountain area is a demonstration of what can be done through controlled burning. Roads, fire

breaks and burned areas provide access so that hunters can cover the area and harvest the deer that are available, while the effect of burning stimulates new growth on browse plants which are of much higher food value and results in more and healthier deer. The burning benefits may last anywhere from 5 to 10 years, depending on the type of brush range Even on Cow Mountain, the costs are substantial to provide the necessary fire control lanes. Rough calculations currently indicate that about $15 in fire protection costs are involved in burning one acre of brush.

The Department of Fish and Game should cooperate and co-ordinate with other agencies responsible for fire control, and obviously cannot assume the risk or provide the controls that would be necessary for a general widespread burning program. It can provide the demonstration area and give technical advice to others, but private owners and public land managers will have to assume at least some of the costs and responsibilities for burning on their lands.

There is a possibility that agencies responsible for fire control may sometime abandon the idea that they can prevent all fires, and they may return to controlled burning and chemical and mechanical brush manipulation to lessen the extreme hazards. Under such programs, the department could pay a part of the costs and secure a much greater benefit per dollar expended.

RECOMMENDATIONS

1. **Continue the Present Program of Controlled Brush Burning**

The department should continue to carry out the present program of controlled brush burning. The benefits from such burning on selected sites are beneficial to range improvement and increased hunter accessibility. However, the heavy responsibilities and sizable costs preclude any expansion of this desirable program at the present time.

2. **Co-ordinate Brush-burning Activities With Other Agencies Responsible for Fire Control**

Brush burning involves more than game activities, and consequently the department should co-ordinate its brush-burning activities with all affected agencies interested in fire control.

3. **Provide Technical Advice and Demonstration on Brush Burning**

The department should provide technical advice to individuals and groups wishing to improve wildlife habitat by burning. It should continue burning demonstration to show the latest proven techniques.

4. **Encourage Private Land Owners to Assume Costs and Responsibilities of Burning**

The department should provide technical advice to any individual or group wishing to improve wildlife habitat by burning. It should continue burning demonstrations and research, including chemical and mechanical control of brush. Any recommended programs should be approved by the State Forestry Department and other land-management agencies.

5. **Work Actively With State and Federal Agencies to Promote Brush Burning and Reseeding**

The department should actively work with the State Forestry Department, the U.S. Forest Service and other state and federal agencies so as to further the study of range burning problems and to expand controlled burning and reseeding programs. Close co-operation with these other interested agencies offers one avenue for greater use of controlled burning as a tool of habitat improvement.

(10) *Deer Seasons*

The department and commission have a responsibility to establish seasons when the resource can be adequately harvested. In a part of California this is a problem, because sportsmen prefer to hunt at a time when they obviously cannot take all of the game surplus. This is true throughout most of the early deer season area where bucks are generally underharvested due to dense cover, and it is definitely true in the south where fire closures completely close much of the hunting area.

Hunters throughout the remainder of North America are amazed at the Californian's wish to hunt deer in August. Most other states hunt deer during or after the rut or breeding season (October and November). In California there is a prevalent popular opinion that the quality of meat seriously deteriorates with the onset of breeding activity. In fact, however, the scientific study conducted by the University of California did not bear out that there was any great change in the quality of California deer.

Thus, there are three principal problems to be considered in the setting of deer hunting season:

1. The fire hazards result in the closure of large sections of public land during the entire hunting season. The hazards last generally from July to late December and are most acute in the southern counties. There is some wishful thinking that fire control precautions may be relaxed to what they were before the war, and allow fall hunting, but there seems to be little possibility that such a change may occur.

2. Another problem is that of establishing a season when an adequate kill can be secured. In the very brushy coastal ranges, the August and September season obviously results in a harvest of only a fraction of the available crop of bucks. In such brushy habitat hunting should extend into the rut or breeding season when bucks are less cautious and more can be killed. Presently hunters experience some of their best luck during the last week of the early season because bucks are starting to move in search of does.
3. A third consideration is that of the quality of the meat. There is no uniform opinion as to how seriously the quality of deer meat deteriorates with the onset of breeding activity. Some feel that the change is slight while others declare that a deer killed in the rut is useless.

In the past, seasons were set primarily on the basis of meat quality without regard for the other problems. We feel that an improved kill would be accomplished by extending the coastal or early season so that it overlapped a part of the late season. There would be better hunting, going into the rut on the coast, and it would thus increase the coastal kill and keep some hunters out of the late season areas. It would cause some difficulties in patrolling the two overlapping seasons, but such problems could be solved.

The most logical solution for the fire closure areas in the south is to hunt after the fire season. Apparently hunters will never again get into fire areas in August and seldom in September. The fire control people might compromise, probably on a season in December. A controlled antlerless kill and a buck hunt at this time would be far better than little or no harvest at all.

RECOMMENDATIONS

1. **Lengthen the Early or Coastal Deer Season to Overlap Part of the Late Season to Increase Kill and Reduce Late Season Concentration**

   A lengthening of the early or coastal deer season to overlap the first part of the late season should increase the kill on the coast and slightly lessen late season concentration.

2. **Adopt a Late Deer Season in Southern California but at as Early a Date as Fire Control Agencies Will Allow**

   The southern counties having fire closures should adopt a late deer season at the earliest date that fire control will compromise for hunting. It should be before antlers are shed in January.

(11) *Value of Big Game Refuges*

In areas in which only buck harvesting is permitted, a big game refuge serves only to protect bucks during the open hunting season. Refuges are necessary only if hunting removes so many males that the females are not bred. There is no area in the West where hunting even approaches an overkill of bucks.

When does are killed, the harvest must be controlled and evenly distributed over the deer range. This cannot be accomplished with game refuges.

Most western states established such refuges in the 1920's, but California is the only one which still retains this outdated form of big game management. The 18 big game refuges still actively maintained by legislative statute are protecting many bucks that could be taken by hunters. These refuges are shown on Exhibit X, which follows. Most of these refuges were abolished by the Fish and Game Commission some years ago and then were reestablished by the Legislature with the commission's authority over them removed.

Two of these refuges, namely 2B in Marin County and 4G in Riverside County, apparently are maintained as substitutes for firearms closures to prevent shooting in populated areas. Such closures should be handled by the proper local authorities.

RECOMMENDATION

1. **Give the Commission Authority to Create and Abolish Refuges**

   The game commission should be given complete authority to create and abolish refuges in order that the objective of providing the maximum harvest without jeopardizing the future supply may be better achieved.

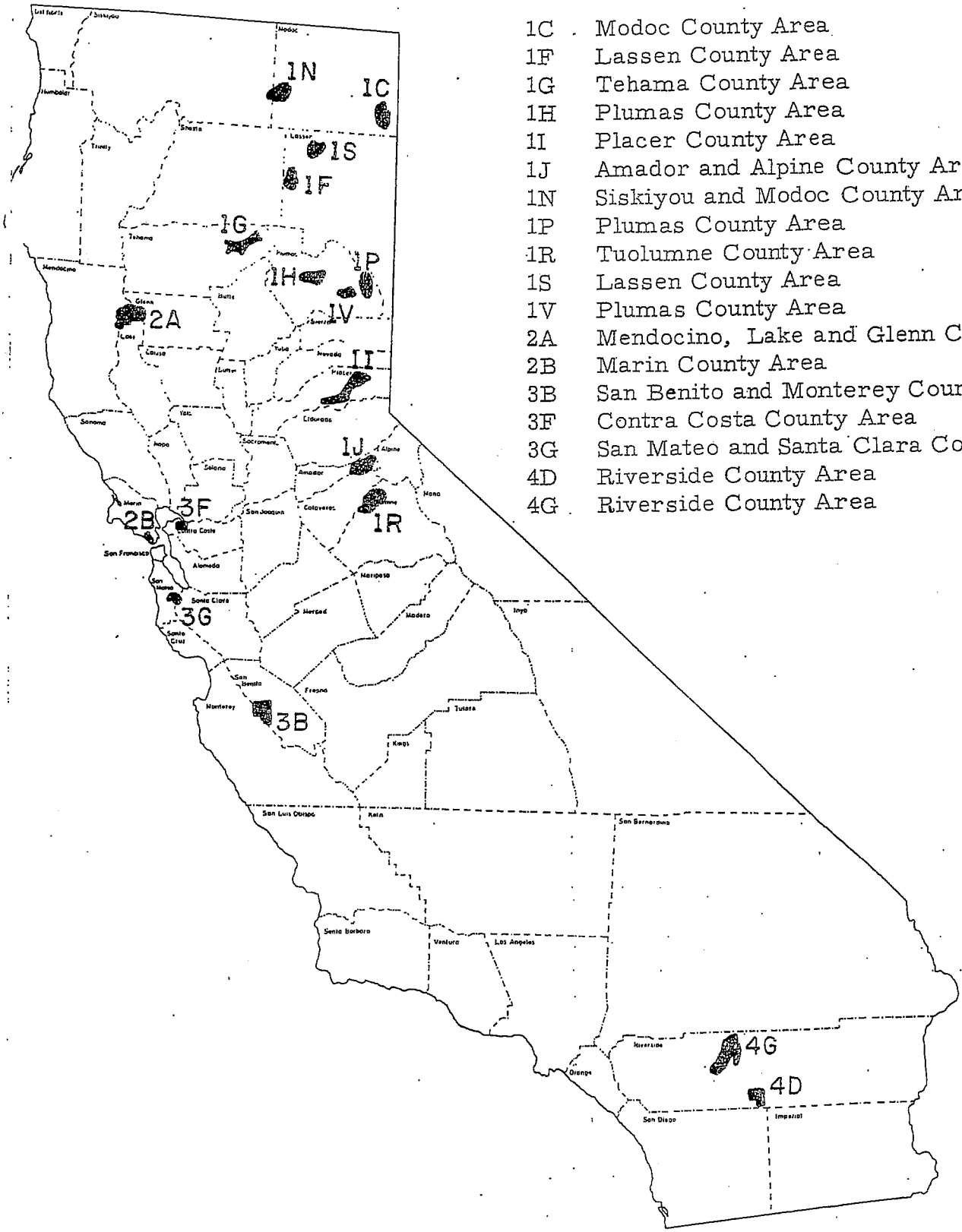
(12) *Livestock and Game Competition*

California range lands, along with those of other western states, have had a history of severe abuse through overgrazing over the past 50 years. However, there presently is a marked trend toward better management of both private and public lands in most of the states. In the opinion of the writer, California is lagging behind in this trend toward proper grazing for better land use. In travels throughout the state, many areas of public land were observed where all of the grass and a large portion of the browse were used by livestock before deer came down in the fall. This results in some less deer capacity, but it is a much more serious threat to the soil and water resources of the country. If such abuse continues, the soil will be further damaged or lost through erosion.

The Department of Fish and Game must accept conditions as they are and work with land management agencies; but sportsmen, as citizens, should work actively for conservation of the soil resource. Sportsmen should be determined to see that an equitable

EXHIBIT X
State of California
Department of Fish and Game

LEGISLATIVE BIG GAME REFUGES



1C	Modoc County Area
1F	Lassen County Area
1G	Tehama County Area
1H	Plumas County Area
1I	Placer County Area
1J	Amador and Alpine County Area
1N	Siskiyou and Modoc County Area
1P	Plumas County Area
1R	Tuolumne County Area
1S	Lassen County Area
1V	Plumas County Area
2A	Mendocino, Lake and Glenn County Area
2B	Marin County Area
3B	San Benito and Monterey County Area
3F	Contra Costa County Area
3G	San Mateo and Santa Clara County Area
4D	Riverside County Area
4G	Riverside County Area

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balance is maintained between public and private use of federal lands.

There is some competition between game and livestock for forage, but there is room for both wild and domestic animals on public land in California.

RECOMMENDATION

1. **California Sportsmen Should Campaign for a Constructive Program to Obtain Better Use of Public Land in California**

A campaign for better use of public lands is a constructive program that should be pressed by California sportsmen. The end objective of such a program should be to preserve the basic soil resource to provide both livestock and wildlife for future generations of Californians.

(13) *Predator Control*

THE MOUNTAIN LION

Authorities estimate that an adult cougar or mountain lion kills anywhere from 30 to 50 deer a year, with the average probably near the lower figure. The take of lions in California over the past 50 years indicates that there has been no appreciable change in their abundance over this period. The annual take of about 200 would indicate that hunters are cropping a top population of 700 to 800 animals, including 500 to 600 breeding adults. This would indicate that lions may be killing 15,000 to 20,000 deer a year. This may seem large, but under present conditions it has little effect on hunting because the lion kill comes from the surplus left unharvested by hunters.

The state currently pays a bounty of $50 on males and $60 on females and employs three full-time lion hunters. This apparently is the only state that still employs such hunters, but most states do pay some such bounty. The department has reduced its force of hunters and has indicated a policy of not replacing them when they retire. The cost per lion taken is much greater with hunters than with bounty.

There seems to be no justification to encourage a substantial increase in lions in any region, and at the same time there is no indicated desire to exterminate them in any area. The present policy is to exert some control over the population.

It is doubtful whether the $50 bounty actually encourages the killing of many additional lions, because most people hunt them for sport. However, the bounty does provide an accurate yearly record of the number killed. This in turn gives a very good index of the population trend.

The differential of $50 and $60 bounty according to sex contributes little to the kill and makes administration of the bounty considerably more difficult.

RECOMMENDATIONS

1. **Abolish the Remaining Lion Hunter Positions**

Lion hunters are expensive and are not necessary for the control of the mountain lion population. Consequently, the lion hunters are a luxury that could be dispensed with.

2. **Simplify Cougar Bounty Administration by Reducing Female Bounty to $50**

Inasmuch as the present additional $10 bounty on female cougars contributes little to the kill, a straight $50 bounty on cougar should be adopted. This would simplify the administration of the bounties paid.

COYOTE

It is a known fact that coyotes do kill some deer, and it is also known that deer herds can make substantial increases without the benefit of predator control. Coyotes tend to take the weaker animals and thus kill more deer from herds that are not adequately cropped by hunting. If deer herds are being harvested to the maximum, the removal of coyotes would probably make a few more deer available to hunters.

The old idea that the control of coyotes will result in a tremendous build-up of mice and other rodents has been generally disproven. It is now recognized by game managers that food supply and not predators determines the abundance of small animals.

Widespread coyote control cannot be justified economically for wildlife alone. However, in co-operation with farmers, the department could contribute to the U. S. Fish and Wildlife predator control program.

RECOMMENDATION

1. **Contribute Financially to the U. S. Fish and Wildlife Coyote Control Program**

The department should participate in coyote control through support and co-operation with the Federal agency rather than independently. Widespread coyote control by the department cannot be justified economically for wildlife alone.

PREDATOR CONTROL IN GENERAL

RECOMMENDATION

1. **Use Predator Control Only When and Where Studies Show That Game Is Being Damaged Severely**

Predator control should be considered a minor management tool to be used only when and where studies show that game is being seriously damaged.

(14) *Depredation Control*

Crop damage by deer is a common problem throughout the country. Scaring devices, repellents, fencing

and permits to kill animals have all been used with limited success.

A better harvest of California's deer herds by hunters will lessen population pressures in the hills and thus lessen the movement to the lowland farms. Special damage hunts, as provided by law, will give some relief.

County planning and zoning of certain areas for forest and game production and others for farming can be of great value in reducing agricultural damage by game. Such zoning can prevent the establishment of more isolated farms which are often subject to serious game damage. This is similar to the zoning in effect in most cities and it can also save many thousands of tax dollars. Keeping an owner from clearing and cultivating a small, isolated tract of land in an otherwise forested area would eliminate the necessity of providing expensive county services, such as road maintenance, school busses, etc., for a single isolated family.

Damage will never be eliminated, but it can be lessened by proper herd management and by proper exclusion of cultivated lands from forest game areas.

RECOMMENDATIONS

1. **Recognize That Increased Deer Harvesting by Hunters Will Reduce the Depredation Problem**

   The increased deer harvesting, as recommended earlier in this chapter, will reduce deer populations during the part of the year between the open season and the birth of the new fawn crop. Consequently, this seasonal lessening of population pressures will lessen the movement to lowland farms. The increased deer harvest will consequently reduce the depredation problem.

2. **Use Special Seasons to Reduce Deer Herds in Problem Areas**

   Special seasons should continue to be used to reduce deer herds in areas where depredation is an acute problem. This is the most effective control with respect to specific problem areas.

3. **Encourage County Zoning to Keep Agriculture Out of Forest Game Areas**

   County zoning programs should be encouraged so as to maintain forest game areas free from isolated agricultural plots. This will greatly reduce potential depredation problems, as well as reduce the necessity for expensive county services to such areas.

(15) *Interstate Deer Herds*

East of the Sierras there are a number of deer herds that summer in California and winter in Nevada, while in the north there are deer that summer in Oregon and winter in California. The Carson, West Walker, and Doyle are herds that winter in Nevada while the Interstate or Devil's Garden herd summers in Oregon.

Most of these herds are now being studied quite intensively, and each has an advisory committee made up of residents of both states to make recommendations on their management. The advice of these committees is undoubtedly the best that is presently available.

Where California sportsmen have prevented the harvesting of surpluses in California as recommended by the interstate committees, the States of Nevada and Oregon have increased their kills to take the desired animals. This has caused great concern in the minds of some California residents, but there is no remedy except to harvest the deer in California.

RECOMMENDATIONS

1. **Continue Participation in the Various Interstate Deer Herd Committees**

   A continuation of the various interstate herd committees is recommended.

2. **Follow the Recommendations of the Committees**

   The advice of the committees is the best that is available, and their recommendations should be followed.

(16) *Deer Tags*

No state has devised the perfect method to secure an accurate and entirely complete record of every deer killed. The present deer tag system in California, with its requirement that deer be validated and tags sent to the Fish and Game Department, is probably as accurate as that of any other state in the Country.

The record is not 100 percent complete because hunters do not have every deer validated. It is a conservative or minimum figure, and it should be consistent from year to year. From questioning many sportsmen, judges and wardens through the State, we found it generally assumed that about 75 percent of the deer killed are validated and reported.

RECOMMENDATION

1. **Continue Use of the Present Deer Tag**

   The California deer tag system is providing vital management data on the deer kill. The continued use of the present deer tag is therefore recommended.

OTHER BIG GAME MANAGEMENT

(17) *Elk*

There are two species of elk found in California. One is the Tule elk which formerly ranged in the

fertile valleys, and the other is the Roosevelt elk, found only in northwestern California.

There are a number of small bands of Tule elk transplanted throughout the State, but there is little indication that they will thrive or increase anywhere except on valley lands. Here they must be rigidly controlled to keep them in harmony with the agricultural uses of such lands. The small herd near Big Pine in the Owens Valley is such a group.

Roosevelt elk are found in fairly substantial numbers in northwestern California, and they could provide some limited elk hunting at the present time.

When considering the increase of elk herds in California, it should be remembered that big game animals utilize forage in relation to their body weight. One elk consumes the forage that would support five deer, and 100 elk will replace 500 deer on the range.

RECOMMENDATIONS

1. **Harvest Some Elk From Northwestern Herds**

   Some elk should be harvested from the herds in northwestern California. This could be accomplished without any permanent reduction in herd size. Studies indicate that these herds have reached the carrying capacity of the range and that there is a harvestable surplus.

2. **Maintain Present Levels of Elk Herds in California**

   The objective should be to maintain California elk herds as a means of preserving this species of wildlife for the future. Inasmuch as deer and elk compete for the same range, it is necessary to consider elk in relation to deer. Because elk consume considerably more forage per animal than deer, we recommend maintaining elk herds in California at present levels.

(18) *Antelope*

Northern California, along with southern Oregon and northern Nevada, supports fair numbers of antelope which have not increased in recent years.

Studies conducted in all three states indicate that they have reached the carrying capacity of the range, and probably they will not increase until ranges improve.

Currently, there is a surplus of bucks in these herds that could be taken by hunting, and such removal might actually benefit the herds. With no hunting they tend to approach one buck to one doe while one buck is adequate to breed 10 or more does. Removal of surplus bucks will save more food for does and their young.

RECOMMENDATION

1. **Reduce Antelope Buck Surplus Through a Controlled Hunt**

   Some bucks should be killed through a controlled hunt, as a means of providing more of the available food for does and their young. This will result in a healthier herd while giving the hunter a harvest which is now being lost to natural causes.

* * * * *

Big game management in California is based on the sound objective of providing the maximum annual harvest of game that does not jeopardize the supply for the future. Carrying out of this objective has been hindered by too much emphasis on the complex deer management program under which it has been necessary to show range damage in order to justify harvesting of antlerless deer; by a failure to win understanding and acceptance of the deer management program within the department; and by the lack of public understanding and acceptance of these programs, largely caused by the lack of understanding and unity within the department.

Development of understanding and teamwork within the department will do much to provide the basis for gaining more public acceptance of sound game management.

CHAPTER IV

SMALL GAME MANAGEMENT

I. T. BODE

While there are many definitions of "game management" the concept of what it is, as set out in Chapter III of this report, is very good: "The objective of game management is to provide the maximum annual harvest of game that still does not jeopardize the supply for the future."

It is evident, in the California situation, that the force of prior practice and of evolved precedent on the part of the public enters importantly into any consideration of what has been done and the rate with which any changes may be accomplished. This is true in varying degrees in almost all states, but it seems that in California it is a particularly important problem.

1. SCOPE OF THE SURVEY

Senate Concurrent Resolution No. 126, setting up this survey, so far as small game is concerned, indicated desired emphasis on:

(1) Evaluation of artificial propagation programs as related to habitat improvement emphasis.
(2) Consideration of effectiveness of use of Pittman-Robertson (federal aid) funds.

The resolution also indicated that the survey is not limited to items specifically enumerated in the resolution. The expenditure of federal aid funds, especially, is closely tied in with waterfowl and several species of upland game, and therefore this part of the survey includes review of such groups as seem pertinent to the major objective.

In order to evaluate fairly the present program, it is desirable to understand something of the history and background of the development of game management in California as it pertains to the species of wildlife considered. This history has been set forth in detail in prior studies made in the State. This is particularly the case with pheasants, as dealt with in Chester M. Hart's report on "California's Pheasant Program," January, 1957. Any extensive historical review here would be repetitious. Such highlights as seem pertinent to the present survey are incorporated.

So far as game management information and practice is concerned, there was available very good and reliable factual material developed as a result of sound studies and investigations. This is outstandingly the case with the Hart report on pheasants; and this report, with permission of the department, has been drawn on extensively in this section of the present study. It was unnecessary and a duplication to attempt to set up field research studies on habits of species, populations and management techniques. This study, however, has evaluated this research as well as other available material of import to the survey. The senate resolution further indicated the wisdom of confining the present study as nearly as possible to an attempt to pinpoint primary objectives and specific problem areas.

Among important background references used here and recommended for study by any group evaluating these findings are:

(1) California's Fish and Game Program, Revised May 15, 1950; Report to Wildlife Conservation Board, by Seth Gordon.
(2) Forty-fourth Biennial Report, California Department of Fish and Game, 1954-1956.
(3) Proposed Reorganization Plan, Department of Fish and Game, by Seth Gordon, 1952.
(4) Waterfowl of California, California Department of Fish and Game.
(5) Upland Game of California, by Donald D. McLean, California Department of Fish and Game.
(6) California's Pheasant Program, prepared by Chester M. Hart, January, 1957.
(7) The Chukar Partridge in California, by Harold T. Harper, Beverly H. Harry and William D. Bailey, California Department of Fish and Game, January, 1958.
(8) Administrative Survey of the California Department of Fish and Game, Parts I and II, prepared by Legislative Auditor, February, 1956.
(9) Miscellaneous progress and other reports of the Department of Fish and Game, Legislative Auditor and others.

2. CONDUCT OF THE SURVEY

Procedures determined upon for conducting the survey were as follows:

(1) A review of previous studies, surveys, programs and reports.
(2) A review of administrative and organizational plans as they pertained to small game.
(3) A field survey consisting of:
    1. Examination of areas, installations, field operations, equipment and facilities.
    2. Interviews and contacts with administrative and operational field personnel.

3. Interviews and discussions with representatives of the public and related co-operating agencies.

(4) A summarization of findings and recommendations.

Throughout this part of the survey, there was experienced on every hand a very genuine spirit of co-operation and desire to be helpful. The whole department, from the director down to the field forces, did all they could to facilitate the work. Any information that existed was made readily available. Any services required were given without hesitation. Problem areas were pointed out unhesitatingly, whether they were critical of the department or favorable. Public interest outside the department was likewise very co-operative.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

The California Department of Fish and Game, through its field investigations and research programs, has done a commendable job in establishing a fund of reliable knowledge upon which to found a sound basic upland game management program. Particularly important is the evidence that the work in this field has constantly held to a consciousness of the problems peculiar to California and has adjusted recommendations for practice to meet them. A good share of Pittman-Robertson (federal aid) money in the past has gone into this part of the program, but we believe not a disproportionate share. Until comparatively recent years, there was not much basic data in any state upon which to build sound game management. One important function of Pittman-Robertson funds was that of affording the states an opportunity to gather such data. We believe this State has been well within what most of the other states have done. California has drawn together a staff of technical workers and field game managers that can be commended for their knowledge, judgment, industry and foresight.

The fundamental concepts and basic recommendations for game management resulting from the field work of the technical staff are sound, but we cannot be as enthusiastic about the application which has been made of them.

Before some of the present knowledge about management of game species was known, there had developed in the minds of the public certain ideas of management, regulation and control which became rather firmly fixed. The perplexing situation arising from the pressures of increasing human populations and hunter demand, increasing competition in land use, resultant decreasing habitat for wildlife, and, in turn, the problems arising by virtue of California's being the area of winter-ground concentration of waterfowl have made the application of revised ideas in game management very difficult.

There is evidence that, basically, the department itself knows more about what ought to be done than what is being done. It appears to us that this stems not so much from failure on the part of the department but from the multiplicity and minuteness of the mandates under which the department must operate. Legislative control is, of course, a right of the people in our form of government, but we believe that, for sound game management, the detail and minuteness which is exercised in the California situation and a tendency on the part of those exercising these controls to evade the department's recommendations often operate to cancel out what department research and knowledge dictate to be best game management practice. We find a disturbing amount of determination being made on the basis of ideas of "horseback" knowledge and desires of pressure groups. In some cases this permeates the thinking of department personnel. Too frequently the ultimate test for establishing practices seems to be simply whether the public wants it, not whether it is good game management.

The multiplicity of jurisdiction as set up among the Wildlife Conservation Board, the Marine Fisheries Research Committee, the Commission with its independent secretary and the department itself creates a rather confusing and cumbersome overhead direction that we feel makes efficient administration and progress in program difficult.

As a result of the many complicated problems involved in the California upland game situation and of the attempts to solve them, there have evolved a number of practices which, among game managers generally, are at least questioned as being sound wildlife management objectives from the standpoint of the responsibility of a public game administration. Unfortunately they have become so firmly established in this State that it becomes a question of whether they can or should be abandoned, or whether they should be recognized in a category of recreational management and become a continuing function of a state game department. Examples of these are the program of propagation and release ahead of the gun of mature pheasants (the so-called "put-and-take" system), the complicated system of area administration for public use and certain phases of the waterfowl program. These are discussed in more detail later in this report. *They are all areas of activity which should be given careful scrutiny to determine whether continuation is justified, and, if so, how to get the job done within the financial limitations of the department. From the standpoint of this survey, their shortcomings can be pointed out; but the department and the public will have to determine whether they want to finance their continuation or expansion.*

Primarily, any such determination must consider how far it is the legitimate function of a game department to enter the category of recreational management. In nearly all states wildlife resources are

considered the property of the people, not of the landowner or of groups with limited membership or special privileges. The responsibility of the game department is considered to be that of protecting, perpetuating and managing those resources and the use made of them. The concept of furnishing recreation as such, and of meeting all hunter demand by other than management of species as they occur and thrive in a wild state, or as non-native species, established the same as native species, is of comparatively recent advent in this country. Artificial cropping and management of game species on the basis of private ownership is not new in Europe, but there the costs of carrying such management programs as well as the returns from any harvest become a private responsibility. Also, the privilege of participating in harvest does not extend to the public at large. Even so, the governments exercise a large measure of direction over operations so carried on.

The question, then, is whether, in an effort to give all hunters all they want, it is desirable to extend the functioning of the game department toward the European-type system and toward artificially providing the harvest ahead of the gun; and if so, how to pay for it. If it is done for pheasants, do hunters in all categories of game have a right to ask for the same? It is not difficult to foresee the elaborate and costly program that would develop or the problem of financing such extension. If the public desires programs providing harvest artificially, those sportsmen benefiting and participating in such programs should fully pay the cost of those programs.

With upland small game, we think the department should direct its efforts toward the native or naturalized game populations as they survive in a wild state. Any effort toward the artificialized concept should be a private endeavor (individual or group) under such regulation by the game administration as will safeguard native or naturalized populations against undesirable impact. The department should give preference to such utilization of game crops as is available to all the people. We wish to point out that this is applied here to upland small game only and should not be taken to be an evlauation with regard to fisheries or other wildlife categories.

The present organizational and operational plan of the department is fairly new. As with any major reorganization such as the department has attempted, there are growing pains which must be overcome. It is not the function of the small game part of this survey to dwell on organization and operation except to point out the several areas in which we think small game management procedure is slowed down or faulty. We feel these are as follows:

(1) Expediting of authority and directions from headquarters to field.

(2) Unification and standardization of operational procedures and overall concepts.

(3) Standards of co-operation between various groups of field workers.

(4) Uniform interpretation of overall objectives, regulations, policies and directives.

The relation of the above items to various areas of small game management are incorporated in the respective sections following.

4. SPECIFIC PROBLEMS IDENTIFIED

As stated earlier, for the purposes of this study it seems most objective to pinpoint emphasis on the essential problem areas. These have been arrived at as a result of our own appraisals, from analyses of the department or from expressed public interest.

The essential problem areas as we see them are:

(1) *Pheasants*

Involving practically all of the field of artificial propagation and stocking by the department.

1. Areas of natural adaptability.
2. Public hunting demand and pressures, involving the number of pheasant hunters in proportion to total hunters, and human population centers in relation to areas of pheasant range.
3. The "put-and-take" system, involving co-operative sportsmen's pens, co-operative public hunting areas, community hunting areas and private shooting clubs; and relation of distances and physiographic features to operation of propagation facilities.

(2) *Waterfowl*

Involving depredations problems and management of public waterfowl areas.

1. Problems arising by virtue of California's being a major wintering ground for the whole Pacific Flyway, and by a probable misleading picture of total waterfowl populations.
2. Extensively developed private shooting club system.
3. Heavy waterfowl hunter demand.
4. Intensity of agricultural and industrial land and water use in waterfowl areas.
5. Limitation of water supplies.
6. Necessary high cost of operation on waterfowl management areas due to type of operation required.
7. Problems of operating public use areas.

(3) *Doves and Pigeons*

Chiefly involving controversy over doves as a game bird vs. placing them on the protected list.

(4) *Quail and Chukar Partridge*

1. Habitat improvement.
2. Full utilization of harvestable crop.

(5) *Other Upland Game*

1. Habitat improvement.
2. Full utilization of harvestable crop.
3. Diversion of hunter interest.
4. Land posting.

(6) *Federal Aid (Pittman-Robertson) Program*

1. Realistic designation of Pittman-Robertson activities.
2. Proper understanding and recognition of the basic value and contribution to the management program on the part of both the public and department personnel.
3. Maintaining proper balance between investigations and operations.
4. Effectuating programs.

(7) *Organization and Administrative Problems in Game Management Function*

1. Training program.
2. Development of regulation recommendations.
3. Salary grades.
4. Organization and assignment of basic field functions.
5. Organization of research activities.
6. Public information and education program.

5. ANALYSIS OF PROBLEMS AND DEVELOPMENT OF RECOMMENDATIONS

(1) *Pheasants*

Factual Considerations

Throughout the past years, the department has done an extensive and commendable job in investigations and development of management practices with regard to pheasants. There is no dearth of basic knowledge upon which to found a sound program. It appears, however, that this has not found root in the minds of the public and in some places not in the minds of department personnel.

In addition to regular reports and findings of investigations, there are two pieces of work in particular which review in detail the history of the development of the pheasant in California and which point the way to a sound program. The need lies in effectuating what is already known about pheasant management. The works referred to are:

"California's Fish and Game Program" revised May 15, 1950; Report to Wildlife Conservation Board, by Seth Gordon.

"California's Pheasant Program" a report prepared by Chester M. Hart, Game Manager III for California, January, 1957.

Both reports are exceedingly important documents. They comprise a thorough and sound review of the pheasant situation in California. With permission of the department, considerable factual, historical and analytical data from the Hart report are included in this report. That report in the main coincides essentially throughout with the findings of this survey and it should become a part of any considerations that may be undertaken as a result of the present survey because the information is too voluminous to incorporate en toto here. There may be some variance in some of the statistical data between it and this survey due to the fact that the data in the Hart report were prior to 1957 and in this report an attempt has been made to use the most current data available.

1. HISTORY

The pheasant is not a native California species. Present populations are the result of introductions and propagation dating back as far as 1889. Artificial propagation in earlier years was necessary to establish the species. Hart points out that pheasants were no doubt well established in the State by 1920, which was well before the initiation and upsurge in the recent game farm program.

The pheasant program has continued over a long enough period of time, backed by repeated field studies, so that the areas where pheasants will establish themselves as permanent populations are capable of clear delineation. Exhibit XI, following this page, indicates the distribution of pheasants in California.

The difference in adaptability of the pheasant as between northern and southern parts of the State has given rise to several of the most perplexing management problems.

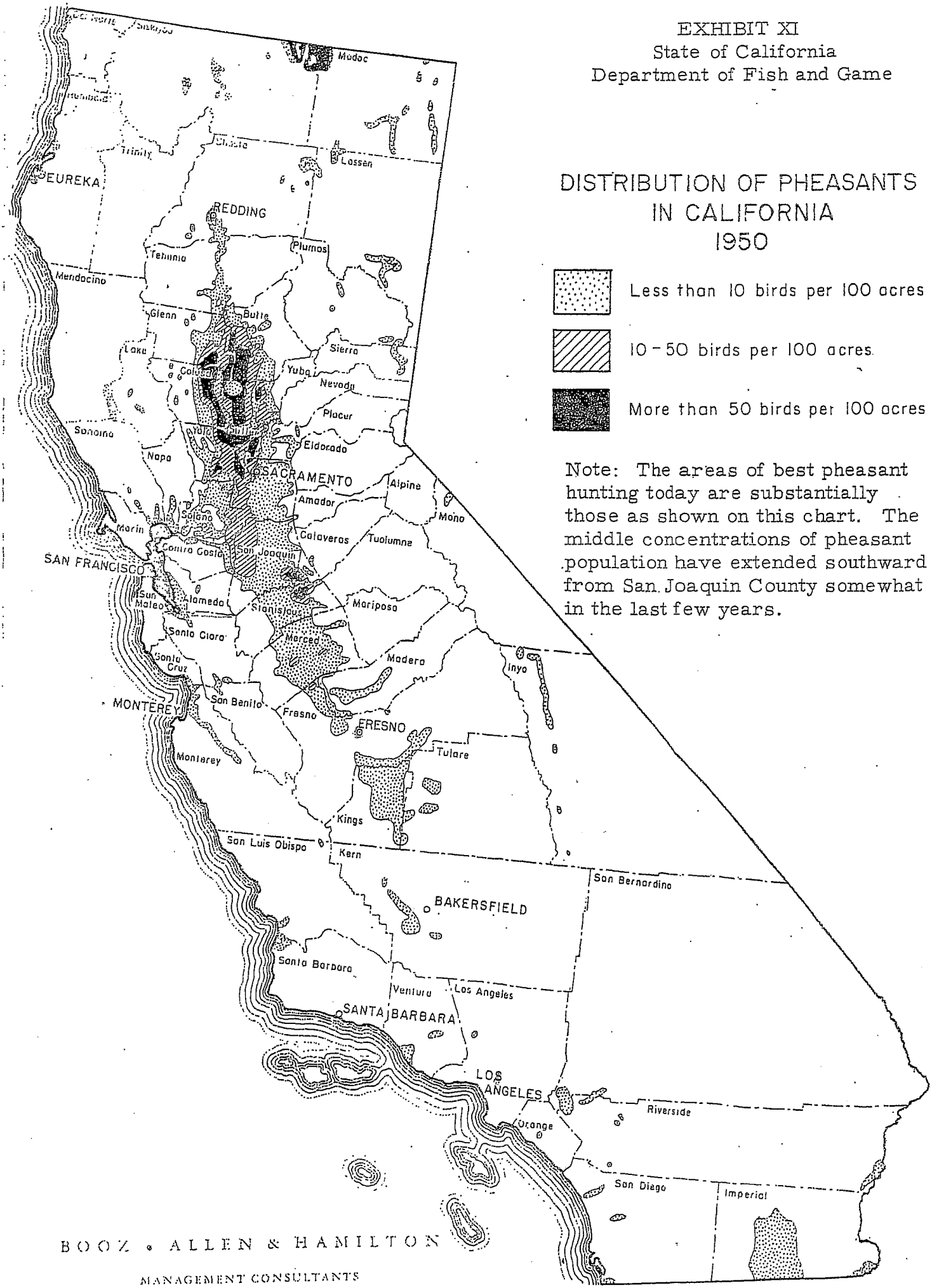
Success of early stocking in good habitat gave rise to public pressure for more stocking, the belief being that stocking was necessary to maintain populations; that if some stocking established the original populations, a lot more would continue to build up higher populations; and that stocking was a means of establishing pheasant populations in areas where, in fact, the species never could be expected to thrive in a natural state. Attempts to meet the pressure arising from this line of thinking, together with the pressure from one part of the State to have what any other part has, regardless of natural conditions, have evolved into the "put-and-take" system (stocking just ahead of the gun).

2. AREA MANAGEMENT

Popularity of the pheasant as a game bird, increasing hunting pressure and the limited area

EXHIBIT XI
State of California
Department of Fish and Game

DISTRIBUTION OF PHEASANTS IN CALIFORNIA 1950



Less than 10 birds per 100 acres

10 - 50 birds per 100 acres

More than 50 birds per 100 acres

Note: The areas of best pheasant hunting today are substantially those as shown on this chart. The middle concentrations of pheasant population have extended southward from San Joaquin County somewhat in the last few years.

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of good pheasant range naturally intensified the trespass problem. This has given rise to a somewhat complicated system of area management. The various types of areas are discussed in more detail later, but a brief definition of them is included here to assist in a better understanding of them.

(1) **Co-operating Sportsmen's Rearing Pens**

These are pheasant rearing installations operated by sportsmen's groups, which groups bear the cost of installations, labor, and feed for rearing birds and some distribution cost. The department furnishes young chicks from game farms and assists with distribution of mature birds. In return, the department gets 50 percent of the mature cocks for distribution on public areas. The remainder of the birds go to the sportsmen's groups for use as they see fit.

(2) **Public Shooting Areas**

Areas owned, leased or otherwise under complete control by the department. They are open for public use. Where necessary to limit the number of hunters for game management purposes, it is done on a "first come, first served" basis. Sometimes a fee is charged to help with cost of administration of the area. There is no selective membership arrangement.

(3) **Co-operative Game Management Areas**

Areas handled in almost the same manner as department-owned areas, except that the land is privately owned and is operated by the owner for regular farming operations, but by the department (under an agreement with the owner) for game management purposes.

(4) **Community Areas**

Areas organized by town or other community groups. They may or may not be sponsored by a sportsmen's group. The area upon which they operate is organized by them under arrangements with the landowner or group of owners. The group pays the landowner a fee and charges a fee for hunting privileges. Use of the area for hunting is restricted to members of the group or sometimes their guests.

(5) **Private Shooting Clubs**

These clubs are privately owned by individuals or groups and use is strictly limited to members or invited guests. The lands are owned or leased by the club. A membership fee, which is usually rather high for the average hunter, is charged. Membership is limited and on a selective basis.

3. PHEASANT KILL AND HUNTING PRESSURE

Popularity of the pheasant as a game bird has brought heavy pressure upon this game species, especially from the centers of heavy human population. According to the biennial report of the department for 1954-56, there were 635,100 small game hunters, and Hart reports that in 1956 there were 231,157 pheasant tags sold. On this basis, approximately 36 percent of all small game hunters hunt pheasants. Returns showed a take of 3.2 birds per hunter.

There are now approximately twice as many pheasant hunters as there were in 1943. Seventy-four percent of these come from San Francisco Bay area, San Joaquin Valley, and Sacramento Valley. Twenty-six percent come from Southern California and other parts of the State.

Past field studies show that while some pheasants occur throughout the State almost anywhere that irrigated grain crops are grown, the bulk of good habitat is found in the rice belt in the Sacramento Valley, in parts of the northern San Joaquin Valley, in parts of the Delta area, and in the Tule Lake-Lower Klamath Basin. (See Exhibit XI on page 31.) The top hunting is confined to about 800,000 acres of the best agricultural land. The area is located near some of the heavy hunter populations of the State. The result is obvious: an extreme hunting pressure and one that has been increasing, especially since 1949. This demand not only concentrates public attention on this one phase of game management but also, due to limitations of range, creates intense problems for the department by way of trespass and hunter access. In the attempt to combat this problem there has evolved a somewhat confusing and complicated system of co-operative public hunting areas, semipublic community co-operative areas and licensed private hunting clubs.

A report made for the 1957-58 biennium shows a total pheasant kill of 1,202,500 birds in addition to 78,875 taken on licensed private and commercial shooting clubs. These 121 clubs control an area of some 180,000 acres, furnished 32,693 man-days of hunting and planted 124,298 birds. The kill on these clubs amounts to approximately 6.5 percent of the State's total take of pheasants.

4. GAME FARMS AND REARING PROGRAMS AND COSTS

The original purpose of the game farm was to furnish stock to establish the pheasant as a game bird in California. It proved to be a valuable asset for the State as attested by the popularity of the bird and the large amount of hunting

furnished in those areas where it was suited. Hart's study pointed out: "It appeared by 1936 that the pheasant stocking program had reached its logical goal. However, it was in the following years that the greatest expansion in game farms and pheasant stocking took place." The reasons for this are outlined in the historical section preceding; but it would be helpful to review in more detail the development into the present system. In doing so, we quote from the Hart report, as follows:

"Game Farm Expansion"

"Seven new game farms were added in 1938. During the next 10 years an average of nearly 33,000 pheasants were stocked annually, in spite of production difficulties during World War II. This was nearly five times greater than the average annual output of about 6,800 ringnecks from 1926 to 1937.

"Five more game farms were established in 1947 and 1948, four as Wildlife Conservation Board projects and one by legislative action. Pheasant production mounted rapidly toward 100,000 annually and reached a peak of nearly 108,000 ringnecks in 1951.

"Reasons Behind Expansion"

"Evidently a number of reasons were behind this great expansion of pheasant propagation after its primary goal, that of establishing pheasants in the wild, already had been reached. Some of these reasons can be seen better from the vantage point of hindsight than they could years ago when the program was enlarged.

"One prevalent concept was that continued stocking was needed to maintain the pheasant population already established. Another was that the established population could be increased, apparently infinitely, by continued stocking. Unfortunately, these beliefs were not based on facts; no real evaluation of the program had been made. As can be seen now, the often erroneous idea that if a little proves good, then a great deal more would be much better, was being applied.

"Increased hunting pressure no doubt was a factor causing the belief that continued or intensified stocking of pheasants was necessary. In 1925, when the game farm system was started, 231,000 hunting licenses were sold. When the pheasant season was opened in 1933, the number of licensees had declined to 171,000, probably because of general economic conditions during the depression period of the early 1930's. An upward trend in license sales followed. By 1938, hunting licensees had increased to 252,000. By 1948, hunting license sales had increased to 504,000 and it was evident that further gains in hunting pressure could be expected.

"With the suitable range well-stocked with ringnecks by the mid-1930's, large-scale attempts were made to establish pheasants in marginal habitat, primarily the Mongolian subspecies in upland areas. This may have been a worthy venture, but it was generally unsuccessful and eventually was abandoned.

"Developing improved equipment and know-how had an important part in the expansion. The perfection of electrical incubation and brooding methods greatly facilitated the mass production of pheasants. Game farmers were enthusiastic about their work and pushed for production records.

"Sportsmen's groups increasingly entered the program by building rearing pens and completing, on a co-operative basis, the rearing of young pheasants obtained from state game farms. This in effect was an expansion of the game farms and increased total pheasant output.

"In summary, the pheasant stocking program appeared tangible, logical, and productive to sportsmen and the general public. Requests and demands for more pheasant stocking were made, and such pressure had to be satisfied in some manner."

The game farm system as now operated comprises:

(1) Four units where incubation is carried on, where a certain number of mature birds are produced and from which day-old chicks are furnished to other units for rearing.

(2) Five units where no incubation is carried on but where day-old chicks are brooded, where part are held for rearing to maturity and from which month-old birds are furnished to sportsmen's pens for rearing.

(3) Something less than 100 units of sportsmen's pens, where the department furnishes the chicks and assists with distribution of mature birds and where sportsmen's groups furnish pens, feed and care for rearing. From these units the department gets 50 percent of the male birds reared for use on areas to which the public supposedly has access and the other birds are given to the groups to dispose of as they see fit. The Hart report, which contains the best estimate we have been

able to get, shows that these units produce approximately 29,000 mature birds per year.

The best summary we have been able to obtain of costs of game farms are contained in the Hart report, as shown in Exhibit XII, which follows. Thus, the accumulated total of operating expenditures and capital investment in the present game farm system is close to $3,900,000, which represents the total amount of money which has gone directly into the game farm program.

EXHIBIT XII

State of California, Department of Fish and Game

EXPENDITURES FOR GAME FARM PROGRAM—1925-1955

Period	*Operating expenditures*	*Cumulative total*
1925-26	$48,224	$48,224
1926-27	19,968	68,192
1927-28	20,879	89,071
1928-29	25,364	114,435
1929-30	35,554	149,989
1930-31	44,440	194,429
1931-32	38,600	233,029
1932-33	44,444	277,473
1933-34	45,992	323,465
1934-35	49,713	373,178
1935-36	40,000*	413,178
1936-37	32,803	445,981
1937-38	66,387	512,368
1938-39	74,018	586,386
1939-40	64,132	650,518
1940-41	83,138†	733,656
1941-42	75,645	809,301
1942-43	89,792†	899,093
1943-44	66,231	965,324
1944-45	93,065	1,058,389
1945-46	115,680	1,174,069
1946	135,248	1,309,317
1947	177,278	1,486,595
1948	224,900	1,711,495
1949	225,395	1,936,890
1950	218,451	2,155,341
1951	250,560	2,405,901
1952	250,355	2,656,256
1953	257,328	2,913,584
1954	229,171	3,142,755
1955	282,088	3,424,843
Estimated capital investment (Gordon, 1950)		462,000
Grand total		$3,886,843

* Estimated; no expenditure or budget figure available.
† Amount budgeted; expenditures not available.

Capital investment in game farms is recently estimated to be approximately $500,150 and the annual operating cost approximately $333,000. This is slightly above the amount shown in Exhibit XII, which was as of 1950. There are 38 regular employees and 136 man-months of seasonal aid used on the farms. The annual rearing capacity for mature birds is estimated to be 50,000.

During 1956, the department operated 19 pheasant co-operative hunting areas with a total of 127,000 acres. These areas accommodated 97,988 hunters who took 43,285 birds.

Again, the best estimate we have been able to obtain indicates that the operational cost of the co-op program is estimated to be approximately $131,900 per year. This is an average of something over $6,000 per co-op area; and since these areas accommodate 97,158 hunter days, it results in the cost of $1.36 per hunter day.

Costs for rearing in sportsmen's pens are difficult to arrive at, because of the variation in records of the various groups. It is true that their costs are lower than the state game farms because of contributed labor and materials and because of the absence of other overhead costs which they do not have to carry. Their costs seldom if ever include overhead costs, costs of carrying over brood stock or of the chicks furnished them by the department. For this incomplete cost, however, probably $1.60 per bird is conservative. If they have reared 29,000 birds, the total cost is estimated to be $46,400. This brings the total rearing and stocking program and operation of co-op shooting areas to around $511,300, using the above figures.

The last biennial report shows a total of 218,587 pheasant tags sold at $1 each. This fee has since been increased to $2. If the same number of tags are sold under the new fee, then the return from pheasant tags would be $437,174.

The release of pheasants from game farms and sportsmen's pens for the past two years, according to the department's last biennial report, is 154,887 birds, or approximately 77,000 birds per year. Taking the cost figures above for game farms and sportsmen's pen birds, the cost per bird is a little over $6. While these figures may not be absolutely accurate, they are from the best estimates we have been able to obtain. We believe they are conservative because they do not include general overhead or administrative costs; and in the case of sportsmen's pens we find that the figures they give usually include only cost of materials, food and any labor that is actually paid for.

Field studies in California confirm what has been found in nearly every other state where similar studies have been carried on, such as Missouri, Oklahoma, Pennsylvania, Wisconsin and others; namely, that where suitable habitat exists for pheasants and other species like quail, and where proper seasons and bag limits are established, they will maintain their populations up to the carrying capacity of the habitat. These studies also show that populations as indicated by hunters' bags is often not a true picture because so many elements, such as hunting conditions, accessibility and hunter skill enter the picture.

Hunters' bags will fluctuate from year to year, regardless of the density of populations or intensity of stocking, except possibly when stocking is done immediately ahead of the gun.

In California the data on stocking of pheasants shows that the best pheasant populations now occurring are in areas where fewest birds were stocked. These are also the areas where by far the largest proportion of birds maintains itself and where the largest proportion of birds is taken. These facts are borne out by a study of Exhibit XIII, following this page, and the following table, taken from the study made by Hart.

Area of the State	*Percent of statewide bag of pheasants*	
Sacramento Valley	53	86
Delta area	18	
San Joaquin Valley	15	
Great Basin (mainly Tule Lake and Lower Klamath areas)	6	
Remainder of State	8	
	100	

Exhibit XIII, which follows, shows the pheasant bag trend since 1948 (from Hart's study) following a general upswing. A bag trend of this kind over a period of years is one index of pheasant population trend. If, then, the best pheasant populations exist in the areas of least stocking; if as is shown in a later paragraph, total stocked birds contribute only 10 to 13 percent of the hunter bag; if the bag trend has been upward; if 86 percent of the bag comes from areas of best population—then, it is not reasonable to attribute any important increase in pheasant populations statewide to the stocking program. On limited areas, such as community areas or private clubs, where only "put-and-take" birds are available, the situation is, of course, different and the question then becomes one of a purely recreational facility, of cost of operation and of whose responsibility it is to maintain such facilities. as discussed earlier in the report.

Hart. in his report, has this to say:

> "To begin with, the ring-neck is an introduced game bird. Because it was necessary to stock pheasants originally, many people feel that continued heavy stocking is required. However, in good habitat the pheasant population that has become established is as wild and self-sustaining as any of our native populations. This failure to see the roles of original and continued stocking in their true, present-day perspective has made it difficult to establish or modify a pheasant stocking program on a realistic basis.
>
> "The contribution of pen-raised pheasants to the bag taken on stocked areas depends primarily on the number of wild pheasants in the area and the number of game farm birds stocked.
>
> "Generally speaking, with the stocking intensity usually practiced on co-ops, areas in good pheasant habitat of the Sacramento Valley had between 10 and 35 percent of the bag provided by stocking. Co-ops in the medium-quality habitat of the Delta had 40 to 50 percent of the bag made up of game farm birds. In the poorer-quality habitat of the San Joaquin Valley and some sections of the Delta, from around 60 to 85 percent of the bag was provided by stocking. Finally, where strictly put-and-take hunting was provided in non-habitat areas of Southern California and portions of Northern California, stocked birds made up 97 to 100 percent of the bag.
>
> "It is difficult to determine the exact contribution to the statewide bag by stocking. To establish this, it would be necessary to know accurately the total numbers of wild and stocked pheasants bagged.
>
> "The checked bag on co-operative hunting areas provides the best available information on the contribution of game farm pheasants to the bag taken on heavily stocked, intensively hunted areas of this general type."

The total pheasant kill according to the department's latest biennial report was 1,202,500 birds for the biennium. The number of birds stocked by the department and from sportsmen's pens was 154,887. Assuming all the stocked birds got back to the hunter's bag, which of course does not happen, the stocking program still contributes only 12 to 13 percent of the birds taken statewide, including all types of areas (Hart estimates it as about 10 percent). It must be recognized that if areas of low or nonexistent populations and where stocking is done with mature birds just ahead of the gun are taken separately, these percentages would be different. However, it must be recognized also that, unless we are sure the fee for enjoying "put-and-take" shooting covers the cost of furnishing such activity, the higher the percentage of stocked birds taken under such practice the higher is the ultimate cumulative cost to the department of maintaining this type of program.

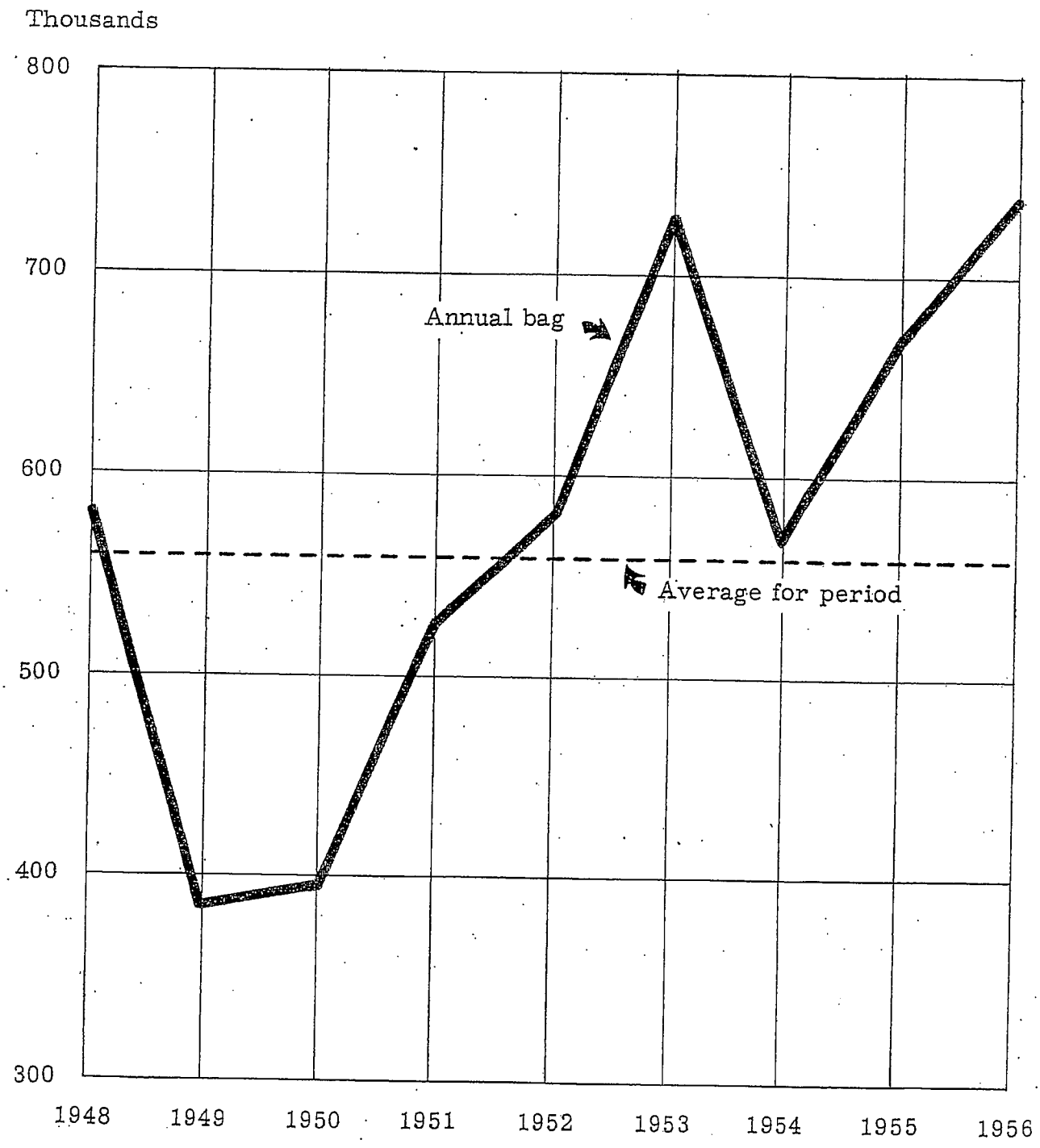
Analysis and Conclusions

1. RANGE POTENTIALS FOR PHEASANTS IN CALIFORNIA

The present range where pheasants have established good naturalized populations (Exhibit XI) carries a healthy stock of birds at about full capacity. On any given range there is a certain density of population which can be supported.

EXHIBIT XIII
State of California
Department of Fish and Game

PHEASANT BAG TRENDS
IN CALIFORNIA
1948-1956



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This is true of all species of wildlife. Natural productive processes provide a greater annual increment than nature can support. This surplus can be cropped by hunters without any damage to the population. If it is not cropped, it is lost by natural selectivity. These are established game management facts. On such ranges a limited number of females may be taken without jeopardizing the population. Under California conditions, the fullest possible utilization of any surplus is important in order to give the largest number of hunters a chance. Overcropping of females can be dangerous, of course, and that is why it is necessary to maintain annual evaluations of populations. When such continuing studies show that the population is not being endangered, there is no reason why females should not be permitted in the hunter's bag. As a matter of fact, it is only with such species in which male can be easily distinguished from female that we give consideration to prohibiting the take of females; and yet it has been demonstrated that populations can be maintained in these other species without such prohibition. We see no reason, therefore, why hen pheasants should not be permitted in the bag on a sound selective basis.

2. EXTENSION OF PHEASANT RANGE

The potential for extension of range where pheasants can be expected to establish themselves as naturalized populations does not seem very encouraging. Most of the suitable range is now occupied and is carrying about all it can carry. It may be that future land development and concurrent extension of certain types of land use will produce some additional suitable range. If this occurs and present populations do not extend themselves naturally, we feel that adequate facilities exist for stocking such areas from wild-trapped birds without endangering present populations. State-owned areas could very likely furnish adequate stock for this purpose.

3. TRENDS IN AREA MANAGEMENT

The present trend is for state co-operative areas to drop out of the picture. The extent of the co-operative system is shown in Exhibit XIV, which follows. Competition with community areas and private shooting clubs seems to be an important element in this picture. This results in a trend away from hunting opportunity for the unattached hunter. While the number of hunters at any one time on state co-operative areas is controlled, still, all hunters have an opportunity on a "first come, first served" basis; and, not being limited to a membership basis, more different hunters are apt to get an opportunity rather than fewer hunters getting a larger number of opportunities.

The reasons for this foregoing trend seem to be: (1) the willingness of limited groups of hunters to pay a premium for hunting under less crowded conditions and with greater assurance of a full bag; and (2) the opportunity of the landowner to receive a monetary return.

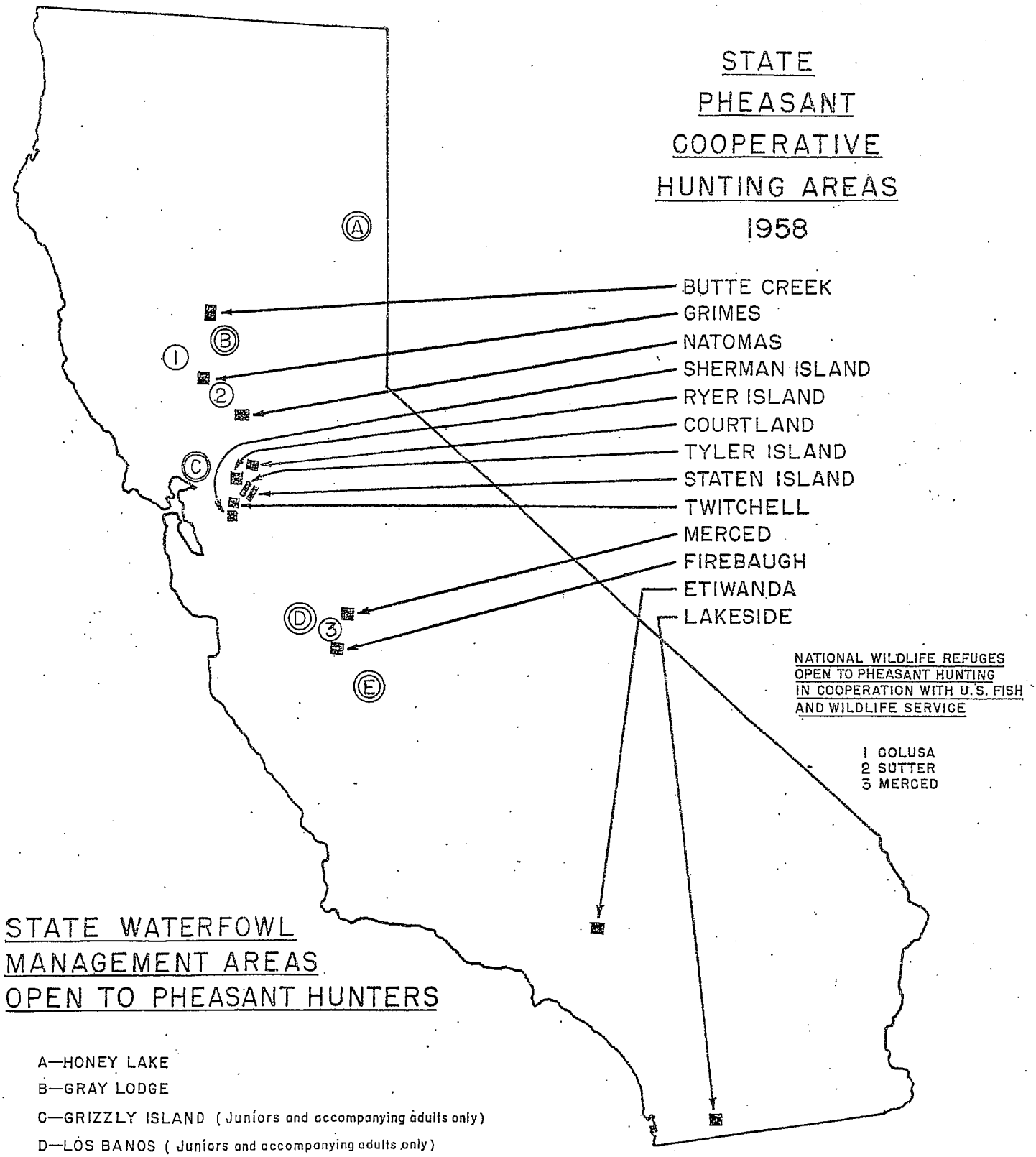
This trend away from use of the public co-op areas as now managed, and at the same time the trend toward increasing closure of land to hunter trespass, seems to us significant. It certainly raises the question of what can be done to preserve hunting opportunity for the unattached hunter. California's human population is going to increase and it may well be the State will be forced to face a situation where most pheasant hunting will be done under privately or semi-privately controlled conditions. We feel that everything possible should be done toward avoiding the advent of such a situation in the interest of preserving hunting for all the public.

The co-op program to date has, without question, served a very useful purpose. We believe, however, that developments since its inception point to a thorough review to determine its present status, its contribution in the light of its rather high cost of operation, and whether or not some form of leasing in connection with co-op areas, whereby the landowner receives a compensation, would come nearer meeting the problem of competition with community and private areas and the restricting of hunting to fewer and fewer people.

We see some important dangers in the present trends. Local sportsmen's groups in many cases now are able to carry on considerable programs of rearing birds by virtue of the moneys from fines in the counties, which are dedicated to wildlife work and amount to around $173,000 per year (according to our best estimates); and likewise the community areas with estimated receipts of around $175,000 per year. While the original concept of these systems was wholesome, in that it attempted to supplement the work of the department, the net result in our opinion is the setting up of a miscellaneous group of self-financed and independent wildlife agencies which may or may not make an attempt to co-ordinate their programs with that of the department. Estimates of funds handled by these groups are the best we can get, since their transactions are not subject to state reporting or auditing. In the examples we checked, there was no evidence of fraudulent use of funds, but there seemed a definite looseness in accounting procedures.

Wildlife resources belong to the State and the responsibility for their management is placed on the shoulders of the Department of Fish and Game. The activities of these groups exert a direct

EXHIBIT XIV
State of California
Department of Fish and Game



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impact upon the State's wildlife resources; in many cases, even though the groups raise and supply a part of the game they take, their operations to a greater or lesser degree depend upon the wild stock and money expended from the general fund supplied by all the hunters, through the department. In the interest of sound, statewide game management program, therefore, the State should have a right to exercise a certain amount of jurisdictional guidance and control over these activities. The independence of financing and lack of jurisdiction has led to a distinct lack of co-ordinated pattern in certain phases of the state program, although many of these groups have achieved much worthwhile accomplishment.

As a result, these groups, having independent financial resources, and often with programs not at all co-ordinated with statewide programs, have generated a pressure group psychology and a competitive attitude toward expenditure of department funds which leaves the department, the commission, and even the Legislature in a state of confusion. We do not question their sincerity, but too often their determinations are based upon inconclusive opinion and unsound findings and conclusions. The overall result is one not conducive to a sound, farseeing game management program.

Another danger to a unified state wildlife program lies in the evolution of the private and community-co-operative areas. Again, the original objectives of these areas and their sincerity of purpose are genuine. Inasmuch as they hold available for hunting areas of land which might otherwise be closed for a group of hunters, even though limited, they are making a contribution to preservation of hunting opportunities. But here again there is no co-ordinated jurisdiction or direction of their efforts. The returns from fees charged hunters in many cases are quite substantial. This furnishes financing for a lot of pressure group activity. The fact that in many cases the objective of the community area association has increasingly turned toward such things as financing community swimming pools, community buildings, and other community undertakings which have no relation to wildlife management gives the whole program a dangerous aspect from the viewpoint of wildlife resource management. There is nothing illegal about what is being done because, so far as land use is concerned, land owners have a right to arrange for the use of their land as they see fit. The question is one of how far this right extends to any activity which makes use of or exercises important impact upon the resource belonging to all the State. If we recognize that the foregoing practices are good for pheasant management, how long will it be before there comes a demand for the handling of many other forms of game in the same way and how long before the various fees, permits, licenses, and other charges—all of which constitute a sort of tax upon the hunter—will be furnishing subsidies for almost any undertaking a community or group wishes to undertake? Is the use of the wildlife resource toward such ends legitimate?

4. CONCLUSIONS ON THE "PUT-AND-TAKE" PHEASANT PROGRAM

It should be made clear that the discussions with regard to costs and returns on the "put-and-take" pheasant program are based on the best information available at the time. The lack of adequate cost accounting data has made it necessary to present these findings with certain qualifications. It has been indicated and will be again that any such specialized system must pay its own way.

With regard to this system, there are certain principles well recognized in most game management circles. Some of these are mentioned in the following paragraphs.

—It constitutes a costly operation. This was pointed out in a preceding section on costs of game farms. According to our best estimate, the cost per bird is somewhere around $6. We believe this is conservative, although we realize it may be questioned by some of the groups who have been rearing birds. But, as was also pointed out, the costs used by these groups are hardly complete in that they do not include costs of overhead administration, costs of the chicks furnished them, costs of supervision, part of the distribution costs, workmen's compensation charges, retirement pay costs, and perhaps others.

—Any phase of wildlife management which undertakes an activity of this kind should pay its own way so as not to place an unwarranted burden on the funds furnished by the rank and file of hunters. This is, of course, the foundation for California's special pheasant tag.

—It is too costly a system under which to attempt, through a public agency, to force any extensive area where it has been demonstrated a species cannot naturalize itself into hunting opportunity comparable to areas where such naturalization can and does occur. Most experience has been that, if and when such a specialized program does pay its way, the fee that must be charged if *all* costs are covered becomes so large that the average hunter rebels.

—If the public demands pheasant hunting in areas where only "put-and-take" will provide it, they should develop and maintain their own operation at their own expense. Such operation should be under proper license and guidance of the state department so as to avoid the pitfalls that were pointed out in preceding sections.

If we apply to pheasants the argument that because there is pheasant hunting in one part of the State it should be provided equally in all parts, even if it requires expensive "put-and-take" methods, then we might also apply it to, say, deer and conclude that for the convenience of the hunter we should put deer ahead of the gun in desert and other areas where deer will not thrive in a native state.

RECOMMENDATIONS

In view of the foregoing considerations, recommendations with regard to the game farm and pheasant programs are presented under two categories: (1) from the viewpoint of fundamental game management, and (2) as an alternative in view of the California background. We believe the State itself will have to decide which course it must follow.

RECOMMENDATIONS FROM THE VIEWPOINT OF FUNDAMENTAL GAME MANAGEMENT

1. Eliminate the Game Farm System and Stocking Ahead of the Gun as Rapidly as Possible

We believe the game farm system and stocking ahead of the gun *as a department undertaking* should be eliminated as rapidly as possible. If abandoned, the special pheasant tag should no doubt be eliminated also.

Since the game farms and artificial stocking are such prominent segments of the whole department activity, and since at present it is so difficult to arrive at definite cost analyses, some plan of accounting should be instituted to show clearly the relation of costs to returns for this part of the program and the proportionate emphasis which it merits, if any.

2. Obtain Stock From the Wild to Meet Disaster Conditions or to Stock Areas Determined to Be Good Pheasant Habitat but Not Occupied by Pheasants

If occasional stocking should be necessary to overcome disaster conditions or to initiate stock on predetermined suitable new areas, such stock could be obtained from the wild, probably from the state-owned areas. Maintenance of extensive game farms would not be necessary for such purposes.

If the State contemplates a program of trials of new or exotic species, it would no doubt be desirable to maintain one limited facility.

3. Use the Money Now Going Into the "Put-and-Take" Program on a Program of Making Additional Lands Available to the Public

The operation of game farms as shown earlier is estimated to cost approximately $333,000 per year. We believe that if at least part of this could be put into programs of leasing or otherwise making available lands for the use of the public, the problem of providing adequate opportunity for the general public to hunt pheasant could be partially met.

To accomplish this will require a vigorous educational and public relations effort, because it will not be easy to convert the thinking of the public from a concept which has become so firmly fixed; but unless it is done, it is our opinion that the department will face an ever-growing and intensifying political and local group pressure problem. We do not depreciate the system just because it is artificial. The game farm and the "put-and-take" programs with their ramifications of sportsmen's pens, co-operative and community areas, local pressure group problems, and others are important elements in the problems and headaches the department now faces. We think funds and effort devoted to other parts of the program would be far more productive of results for more people.

Other states have reached similar conclusions. The following is quoted from Wildlife Conservation Bulletin No. 11, State of Wisconsin:

"The trend of pheasant stocking has followed the trend of the pheasant kill quite closely, although the two are not necessarily related. Reports on studies made by Kellogg (1939), Buss (1946) and many out-of-state investigators indicate that hunter recoveries of game farm birds released in the wild each year were far from what was desired, and hardly justified the expenditures.

"By 1940, many states with small programs began to abandon the rearing of game farm birds——."

California's studies substantiate these findings and have led to the conclusion that only the method of release of mature birds ahead of the gun has resulted in any reasonable satisfactory recovery, and this recovery becomes less as the naturalized populations increase.

ALTERNATIVE RECOMMENDATIONS IN VIEW OF THE CALIFORNIA BACKGROUND

If the game farm and "put-and-take" systems are not eliminated, they should be materially reduced and

consolidated, and policies for use of output should be reviewed, standardized, and further controlled. This is necessary in order to overcome the dangers as pointed out in a previous section of this report. Also, serious consideration must be given to the possibility that such a program, with an inevitable increase in cost and resultant fees, may grow into a demand for the same things in all branches of the upland game program, resulting in such a confusion of specialized activities and charges that there would be a revolt of the hunters.

1. If the Game Farm and "Put-and-Take" Systems Are Continued, It Should Be Done Only if the Program Is Paying Its Own Way

2. Application of the Game Farm and "Put-and-take" Systems Should Be on a Differential Basis

"Put-and-take" should not be permitted in the zone where pheasants maintain themselves because it is costly and it opens the opportunity for hunting by groups with limited membership, which results in inequitable use of wild pheasant stock. On the other hand, a "put-and-take" system could be permitted in the zone where pheasants do not thrive in a wild state if it pays its own way. Hart in his studies divided the state into Zones A and B. Zone A comprises those areas where pheasants have pretty well naturalized and where native populations are maintaining themselves about to the carrying capacity of the environment. Zone B comprises those areas where few, if any, birds thrive in a wild state. These areas correspond essentially with those shown in Exhibit XI, on page 31.

The reasons for this are several. If, as has been pointed out earlier in this report, the total contribution to the hunters' bags from stocked birds is only 10 percent to 13 percent and the heaviest proportion of this comes from those areas of heaviest native pheasant populations, it is obvious that private, community, sportsmen-controlled and co-operative areas are operating largely on birds produced in the wild.

The existence of or any extension of a system of area control by groups with limited membership or use privileges, therefore, increasingly makes use of wild stock which was built up and is maintained and managed out of funds furnished by the rank and file of hunters. The argument that the birds released by these groups contribute materially to the native population is not very effective in the light of the findings relative to the small percentage of stocked birds in hunters' bags on areas of this class.

It is true that in some cases lands may have been made available for a certain number of hunters which otherwise might have been closed to all trespass; but we believe that if the money being expended for game farms and stocking were used to lease public hunting rights or otherwise make areas available to the public, many more people would benefit. We do not believe that in this class of areas any group should be able to capitalize financially on a public resource.

In areas where there is no potential for native stock, the same situation and reasoning does not hold. Here there is no impact on native stock and any opportunity is an added one. In these areas if hunters insist on the "put-and-take" plan, they should bear the expense of their own program under proper license and regulation by the State. States and other governmental agencies license many forms of private venture and regulate them.

This does not establish any new principle in game management. Many species are handled under regulations which vary in different parts of the State and are designed to meet the particular conditions existing in different zones.

3. If the Game Farm and "Put-and-Take" Systems Are Continued, We Recommend That the Production and Rearing Activities of the Department Be Consolidated at Two Present Installations: Yountville and Los Seranos

These plants, because of extent of present facilities, condition of facilities, and soil and climatic conditions seem to us to be the most logical for any such consolidation and for what small expansion might be required to absorb the other existing facilities.

This recommendation in no way reflects on the quality of operation of the other plants. With few exceptions we found them well operated, with diligent working forces and good housekeeping. We simply feel that the program could be as effectively handled with no diminution of output or service but with much less duplication and cost at the two installations. For example, at the Brawley game farm, the actual operation is of high quality and the quantity of birds produced is good. But because of climatic conditions, in order to produce eggs early enough to produce chicks soon enough to get them brooded and into the open to keep them from smothering, it is necessary to force the laying of hens with artificial light. The whole process then requires two to three months' extra feeding of mature birds in order to hold them for hunting season.

Some steps have been taken by the department to reduce this game farm operation and we believe that on the whole the department concurs in this recommendation; but local pressure groups, operating through political pressure, have been successful in preventing full consummation

of what to us seems a logical, business-like procedure. There might be some increase in transportation of birds at time of stocking but it would be nowhere near the present cost of operation of the present outlying plants.

The estimated cost of operation of these other plants is in the neighborhood of $150,000 per year and capital investment $307,548. The consolidation would not effect a saving of this entire cost because there would have to be some expansion of facilities and labor at the two plants kept in operation. However, there would be reduction of supervisory expense and capital investment and elimination of duplication. In the absence of adequate cost accounting data, we were unable at the time of writing this report to arrive at definite figures. We believe, however, that some two-thirds of operation and capital expenditures costs could be saved. If so, it would result in an annual savings of approximately $100,000 in operating costs, and a net reduction in capital investment of approximately $200,000.

At Los Serranos there is possibility of further reduction by arranging to carry out operations in connection with prison labor. This plan has some objections from the standpoint of dependability of labor forces, but it should be gone into. It would require consultation and planning with other state agencies before any conclusion could be reached. It would not compete with any private industry.

From one quarter of the State came an urgent recommendation that the whole operation at Los Serranos be moved to the Mendota Waterfowl Management Area, on the theory that this would reduce supervision and labor by utilization of what now existed at Mendota. We do not recommend this. Game farm birds are very susceptible to all sorts of poultry and fowl diseases. A heavy, poorly drained soil such as dominates the Mendota area is not desirable for game farms. The soil preferably should be sandy to sandy loam with good subdrainage, both from the standpoint of healthy birds and from the standpoint of the types of crops that are grown for the birds. Further, the proximity of any game farm birds to such concentrations of waterfowl and other wild species as occur at Mendota is a hazard to the production of healthy stock. We see no economy in manpower, machinery, or facilities, because the machinery and facilities at Mendota are poorly, if at all, adapted to game farming and the personnel at Mendota are already loaded with duties.

4. **For Reasons Enumerated in the First Part of This Section, Distribution of Reared Birds for Stocking Purposes From State Game Farms Should Be Limited to Lands Available to the General Public for Hunting**

We are sure this is in line with declared department policy and we mention it here only because in our conferences over the State it was reported to us that in practice there existed a liberalization of this policy. It is a matter that the department should control carefully, in order to avoid undesirable criticism.

5. **The Furnishing of Chicks to Sportsmen's Pens Should Be Reviewed**

The original objective of this program was wholesome, but we sense that there has been an evolved liberalization, which might result in a "kickback." There has been some deviation from the original plan of furnishing the groups only half the birds to do with as they see fit, and the justification is rather weak. We believe that the releasing of this 50 percent of the birds to sportsmen's groups is an element in perpetuating the problem of public nonacceptance of the sounder game management program. While this phase of the program needs to be flexible to a certain extent, it should be studied with the objective of unifying thinking and procedure among the regions and among the sportsmen's groups. Even the matter of giving half the birds to the groups for their own use in compensation for their cost in rearing the other half should be scrutinized. If these birds are used for the group's own restricted hunting area, is the public going to forget the compensatory feature and remember only the State's furnishing birds for closed areas?

6. **Utilize State-Owned Lands for Pheasant Hunting to Maximum Extent, Consistent With the Principal Objective of These Areas**

The areas which the department now owns, which are mostly waterfowl management areas, can furnish a sizable outlet for pheasant hunting. The department is already moving in the direction of opening these areas for this purpose. There is some question among members of the staff as to just how far this should go. In whatever is done, sight should never be lost of the principal objective of these areas, which is management for waterfowl. Use for pheasant hunting should fit around this primary use. We feel that there should be careful commission review of this potential and definite uniform commission policy established.

7. **Give Further Consideration to Acquisition of Additional Lands Available to the Public and to Habitat Improvement**

It is recognized that in California land costs are high. Nevertheless, if any savings can be made in such operations as consolidation of game farms, or their elimination, or in operation of co-op

areas, consideration should be given to the possibility of acquisition of areas for public use and to all habitat improvement possible. Both such acquisition and habitat improvement are legitimate items of expenditure from Wildlife Conservation Board funds.

8. Review the Policies Governing the Licensing of Private Shooting Preserves and Commercial Game Farms

The matter of private licensed shooting preserves and commercial game farms needs reconsideration. The department staff is aware of the abuses and potential dangers that are developing in this field. The number of these areas permitted and their location should be restricted so that large areas of pheasant territory cannot be monopolized by a few hunters or for commercial purposes. Perhaps only a limited number should be permitted in a county, with a maximum number of acres allowed, and with only one permit to one person for each area. They should be restricted to the Class B zone, where there is little chance of capitalizing on native birds. A number of states have found it necessary and desirable to establish this type of control in protection to native game population and in the interest of preserving maximum opportunity for the public. Any consideration of such areas for waterfowl should be especially thorough because of possible complication with federal laws. Our best estimate is that the returns to the department through licenses for such areas cover only about 70 percent of the cost of administering them. The fees should be large enough to cover this cost.

9. Review Policies Governing the Release of New Upland Game Species to the Wild

Recommendations in the matter of release of new upland game species to the wild are included here because any such activity is most likely to be closely related to game farms and their operation. This phase needs careful review. While there is some existing policy and regulation governing this, we do not feel it is adequate.

This is not to say that we are opposed to the search for additional species that may supplement or fill gaps where native species are absent; but, there are so many hazards involved and so many examples in our Country of bad results of injudicious introductions that such procedure should be only under the most careful scrutiny and supervision of the department. Game breeders are prone to become enamored of new things which give promise of easy propagation and increased commercial returns. They get sportsmen groups and others enthused to create a market, and before the implications are fully realized a department finds itself with a hazard on hand for native species, with a headache from new pressures to go into the game farm business and with other complications.

(2) *Waterfowl*

Factual Considerations

Because of California's position as the wintering ground for most of the waterfowl population of the Pacific Flyway it has had a long and complex history as a waterfowl area.

The accompanying two exhibits from "Waterfowl in California," by Frank M. Kozlik and Donald D. McLean, point out the background for much of the waterfowl problem. The heavy arrows on Exhibit XV show the funneling of heavy portion of the Pacific Flyway waterfowl through the Klamath-Tule Lake area into the Sacramento and San Joaquin Valleys, which are also the heavy agricultural crop areas. Exhibit XVI shows how this area becomes a major wintering ground for this large portion of Pacific Flyway waterfowl and also indicates the problem arising from large centers of population pouring large numbers of hunters into a small area of the State.

The State has approximately 180,000 waterfowl hunters. Estimates indicate that approximately 10,000,000 ducks and geese come to the wintering grounds in California and that 5,000,000 remain after the hunting season. Hunters take about 3,500,000 ducks and geese per year. (1955 Biennial Report.)

There is a total of some 559,000 acres of wetlands in the State. The composition of this area, together with the relative proportion available to the public, is shown later in this report. The significant fact here is that a very small area of the whole State is available for waterfowl use.

While there have been gradual inroads into original waterfowl habitat, there have been, to a certain extent, increases in habitat in other directions. The rice acreage has grown from 1,400 acres in 1912 to 485,000 acres in 1954, and these rice-growing areas are ideal duck habitat. This change has resulted in an intense duck depredation problem. It has also resulted in a major shrinkage of areas available to the public for waterfowl shooting.

All these factors have evolved into the situation shown in the exhibits following this page. Of the total managed waterfowl habitat, roughly 65 percent is in private duck clubs, 23 percent is in federally controlled areas, some of which is managed by the State for public hunting, and 12 percent is in state-owned areas available for public use, as per Exhibit XVII, which follows. These latter two categories are hereinafter designated as waterfowl management areas.

Of the 559,000 acres of wetland in the State, only about 317,000 acres are high-grade waterfowl habitat, as shown by Exhibit XVIII, following Exhibit XVII.

EXHIBIT XV
State of California
Department of Fish and Game

PACIFIC WATERFOWL FLYWAY

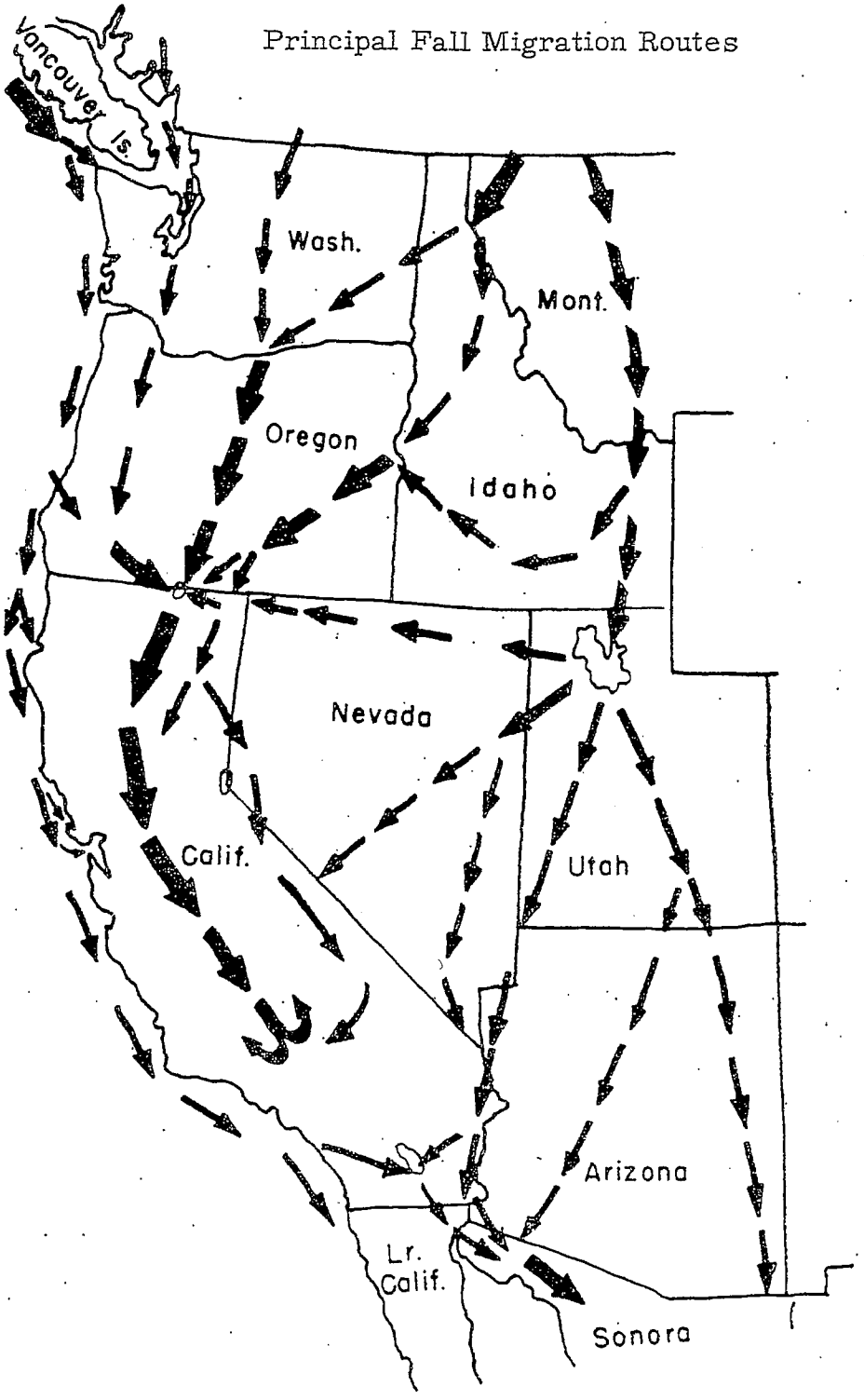

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EXHIBIT XVI
State of California
Department of Fish and Game

STATE AND FEDERAL WATERFOWL MANAGEMENT AREAS IN CALIFORNIA AND THE MAIN WINTERING GROUNDS

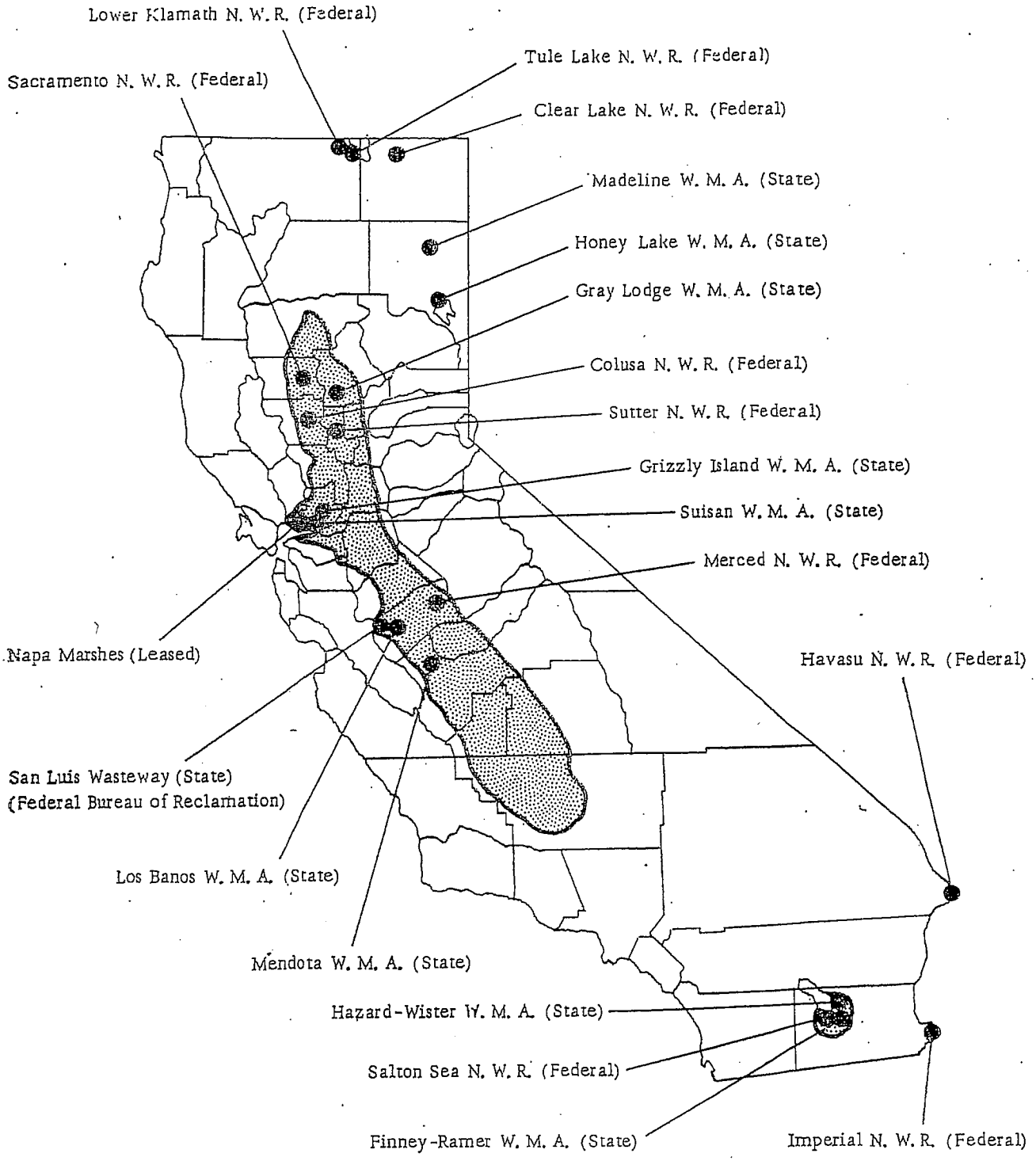

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EXHIBIT XVII
State of California
Department of Fish and Game

ACRES OF MANAGED WATERFOWL
HABITAT IN CALIFORNIA

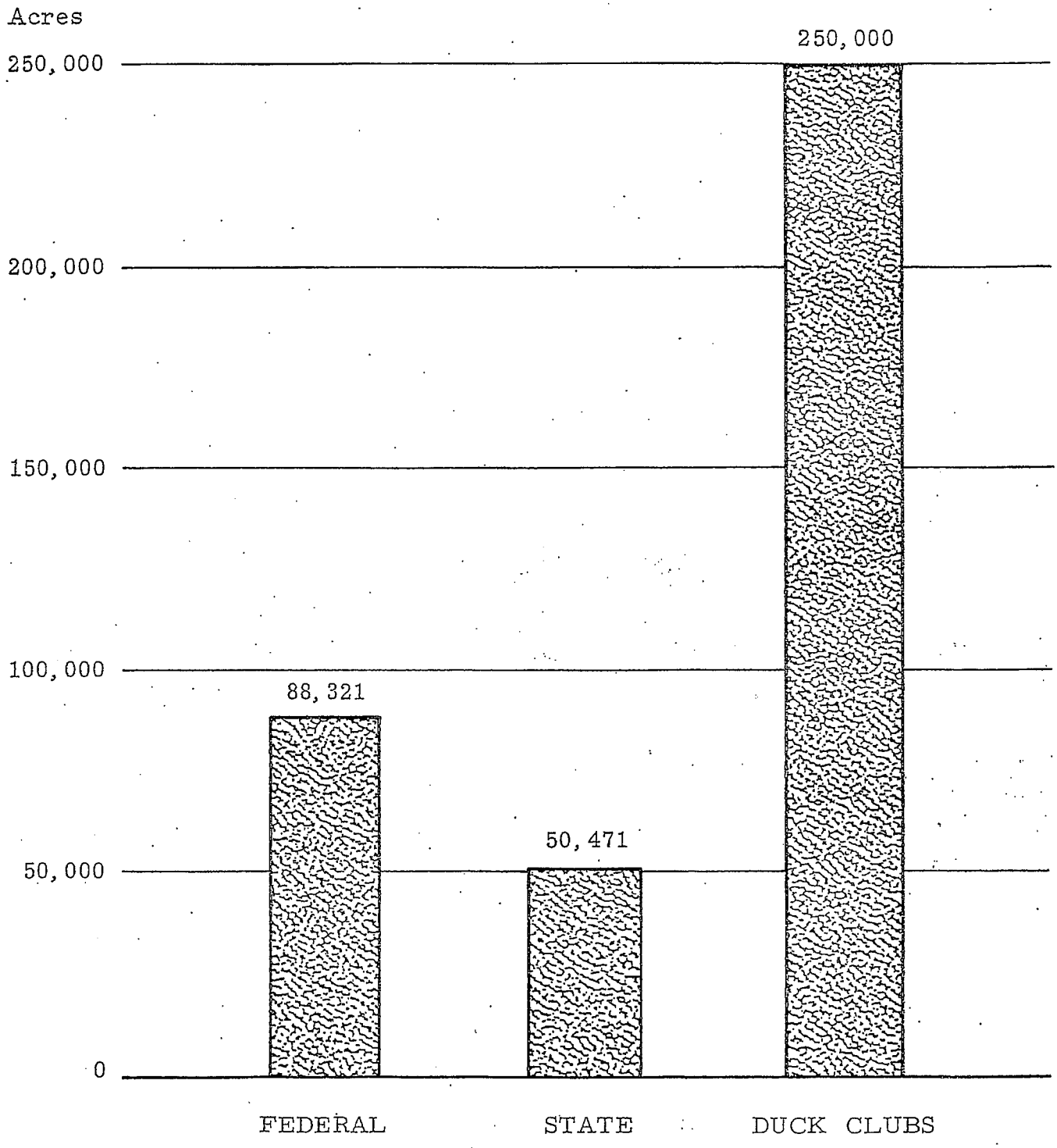

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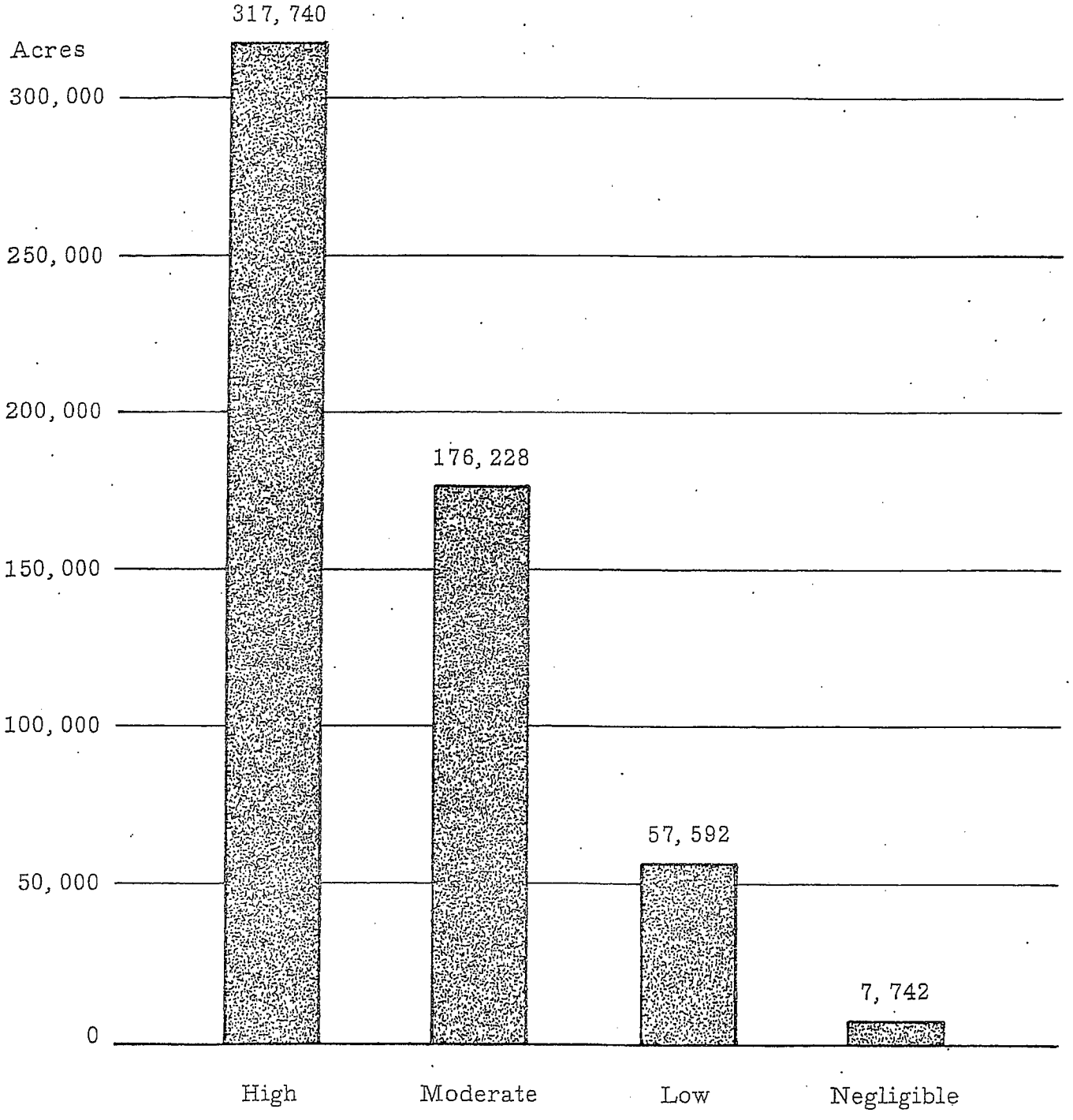
EXHIBIT XVIII
State of California
Department of Fish and Game

CALIFORNIA WETLANDS INVENTORY - 1954

Relative Value of California Wetlands
to Waterfowl
Total Wetlands Acreage - 559,302



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Since the 250,000 acres in duck clubs comprise, for the most part, the higher grade habitat, it is clear that only about 22 percent of high-grade habitat is available to the public. State-managed areas available to the public comprise some 62,000 to 63,000 acres, and federal areas open for public hunting under state control comprise about 5,000 acres.

A survey of duck clubs made in 1956-57 showed that duck clubs shot 950,010 waterfowl, as compared to 150,570 on state areas, and 82,000 on the Tule Lake-Lower Klamath federal area.

In order to partially cope with the situation and to preserve some public area and, just as important or more so, in order to meet the depredations problem, the Fish and Game Department has engaged in a program of acquisition, lease and co-operative agreement to establish waterfowl management areas. The extent of this program is shown in Exhibit XIX, following this page. Of the total department annual operating budget, as shown in the 1957-58 budget estimate ($10,293,687), 6.2 percent goes directly into waterfowl operations. It is very difficult to say just how much of the receipts of the department come from waterfowl hunters.

It is conceded by nearly everyone we contacted, both in and out of the department, including ranchers, that the cropping program on these areas has come as near to meeting the depredations problem as anything that has ever been done. We have heard only commendation of it.

Of the total Federal Aid (Pittman-Robertson) budget, some $600,000 can be charged to the waterfowl program. This includes the research and field investigations, but is very largely management and operations.

Analysis and Conclusions

No evaluation of the State's waterfowl program can be made without giving major emphasis to its obligation to the Flyway and the continental waterfowl population, by virtue of its being the natural wintering ground for such a large part of the Pacific Flyway waterfowl population and a not negligible nesting area. To arrive at a dollars-and-cents value for this is almost impossible. It is certain, however, that unless California is willing to make a substantial contribution to these considerations through its game management program, the waterfowl shooters of the state will see their sport disappear rather rapidly. This obligation must be looked upon as a continuing one.

An evaluation of the significance of the observations and comments of waterfowl shooters is also important. Because of the shrinking wintering habitat and resultant concentration of ducks and geese on the areas remaining, it is easy to gain the impression that there are as many as ever or even more. The following table from A. Starker Leopold's report to the Duck Hunter's Association of California in 1957 shows the estimated populations from 1952 to 1957, inclusive.

MIGRATORY WATERFOWL INVENTORIED IN CALIFORNIA 1952-57

COUNTED IN JANUARY OF THE PAST SIX YEARS

(In thousands)

Estimated total	*1952*	*1953*	*1954*	*1955*	*1956*	*1957*
Ducks	3,291	4,206	4,189	4,035	5,028	3,794
Geese	850	845	725	777	852	584
Coots	343	615	920	634	666	741
Swans	17	20	14	25	29	23

It would not be fair to present this table without Leopold's analysis of it. He says:

> "At the end of each season since 1953 there have been about four million ducks in California, except in 1956 when there were five million. What accounted for the sudden addition of a million ducks from 1955 to 1956 and the equally abrupt disappearance of more than this number from 1956 to 1957?
>
> "The winter of 1955-56, it will be recalled, was the year of the December floods in California. Without having to postulate any significant change in the number of ducks arriving from the North, the floods could have accounted for the high January inventory in California by (1) sharply reducing the normal kill in December and early January, most shooting grounds being inundated; and (2) attracting and holding on the flooded grain lands of California many ducks that would ordinarily have passed on through the State to more southerly or easterly wintering grounds.
>
> "By the same token, the past winter (1956-57) was so abnormally dry that the reduced count obtained in January, 1957, could be accounted for by the shrunken area of marshland and the unattractive condition of the winter habitat. More ducks than usual remained north of California through the winter. The migration through California may have drawn away an abnormal number of birds.
>
> "Therefore, as regards actual numbers of ducks in California, the figures as shown do not prove a change in population, one way or the other. The recent ups and downs in numbers could easily be due to year-to-year alterations in the *whereabouts* of the birds in January, as determined by rainfall.
>
> "But if over a million birds were displaced from California this year, because of drought, where did they go? About a quarter of a million mallards (above normal count) and many pintail and Widgeon stayed in Oregon and Washington. Presumably the rest of the birds went to Mexico, but most unfortunately the waterfowl inventory of Mexico was not conducted in 1957.

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EXHIBIT XIX

State of California, Department of Fish and Game

STATE WATERFOWL MANAGEMENT AREAS

Region	Name	Number of employees		Total acres	Acres farmed	Number of hunters Waterfowl	Number of hunters Other	Annual cost of operation P-R	Annual cost of operation Support	Annual cost of operation Total	Amount paid irrigation district	Estimated cost public shoot	Revenue public shoot 56/57
I	Madeline	--	(18)	5,176	None	No Check		$59,510	$32,257	$92,767	None	$9,000	$2,524
I	Honey Lake	5	(30)	4,789	1,154	2,139	686						
I	Sheepy Ridge [1]	None		320	None	No Check		None	None	None	---	---	None
II	Gray Lodge	10	(48)	6,735	3,485	4,812	1,424	102,300	20,024	122,324	$2,300	15,000	9,944 †
II	Grizzly Island	9	(60)	8,600	3,410	14,629	2,544)	82,200	37,520	119,720	None	20,000	24,652
II	Suisun	1	---	1,887	None	None	None	---	---	---	---	---	---
III	Napa Marshes [2]	None		5,000	None	611	None	None	800	?	None	800	1,447
IV	Mendota	12	(48)	8,536	1,830	7,764	1,874	91,200	13,579 *	104,779	9,150	15,000	10,790
IV	Los Banos	9	(27)	3,000	936	3,416	738	61,000	8,934 *	69,934	None	18,000	17,064 ‡
IV	San Luis Wasteway	--	---	2,887	None	4,275	None						
V	Imperial (Including Finney-Ramer)	12	(84)	11,892	1,920	6,299	?	107,800	27,809 *	135,609	14,250	20,000	13,306 §
	Total	58	(315)	58,852	12,735	43,945	7,266	$504,010	$141,923	$645,133	$25,700	$97,800	$79,601

( ) Man-months seasonal aid.

* Salaries and wages only. Other costs not available.

[1] Sheepy Ridge: This added because it is a land withdrawal and school land purchase area on which the State allows waterfowl shooting. It is not listed as a waterfowl management area in commission regulations due to no charge or no limitation on number of hunters.

[2] Napa Marshes: In co-operation with Leslie Salt Company—special fees.

† Includes Gray Lodge only.

‡ Includes Los Banos, San Luis Wasteway, and Merced.

§ Includes Imperial, Finney River, and Federal Salton Sea.

as it has been for ten years previously. The two Fish and Wildlife Service airplanes arrived at the border, as per normal schedule, but were denied entrance into Mexico apparently as a result of recent altercations between the two countries growing out of accusations of trespass by American Fishing boats in Mexican territorial waters. Hence we have no comparative figures this year of waterfowl numbers in Mexico, and the evaluation of what happened to a million ducks in January, 1957, will remain in doubt until the 1958 inventory is made.

"Considering the many uncertainties surrounding the movements of ducks in the past two years, and the possible effects of extreme conditions of rainfall, it is not possible to define with certainty any recent trend in the duck population. It could well be essentially level."

He concludes that while there are many factors which indicate reserved judgment as to how nearly the State is approaching a full harvest, it seems clear "that shooting to date has not been excessive in the aggregate, for the duck population as a whole is not shrinking. But we may be closer to the allowable upper limit of hunting pressure than has generally been admitted."

These considerations must become paramount in any program the department undertakes. Under growing human populations and possible accompanying increased hunting pressure, any future program will have to face up to the limitations of production of the waterfowl population. While some nesting occurs in California, the possibility of unlimited waterfowl population increase does not exist.

Hunter demand for waterfowl may continue to increase as human population increases. How far it will be possible to meet such increased demand may be problematical. All present waterfowl habitat is taken up by private clubs, state-operated areas and federal refuges and areas. There will be no decrease in agricultural land use. If rice farming and irrigation should increase waterfowl habitat, the increase will undoubtedly remain under some form of private control. More and more duck hunters seem to be turning to duck clubs or separate arrangements with land owners in order to assure their hunting opportunity. They seem to be willing to pay the price. More and more land owners are looking to leases or other forms of compensation as a part of their annual income.

State waterfowl management areas, which are those owned and operated by the State or owned by the Federal Government and operated by the State under agreement, do accommodate a sizable number of hunters. The costs of acquisition, maintenance and operation raise the question of how far the department can go in expanding this part of the program. These considerations all raise the question of whether the waterfowl hunting pressure will stabilize at somewhere near the present level.

Questions have been raised as to why the operation of these areas requires such large personnel and so much equipment; why equipment cannot be moved from one area to another to avoid duplication; why equipment cannot be rented at lower cost than purchasing; or farming operations farmed out to adjoining ranchers; why it is necessary to furnish so much housing on the areas.

We have given much study to these phases. We believe that the operations as conducted on any of these areas will stand up very favorably in comparison to operations on surrounding private land. We find an interested, industrious and intelligent personnel.

Careful consideration will show in most cases that the areas becoming available to the State are far from the best agricultural lands. Any cropping on them is, therefore, more complicated. If they are to serve as waterfowl areas, and especially as depredation control areas, the types of crops must be the kind waterfowl will use. These are not always the simplest to grow, but they must be grown if the areas are to attract waterfowl, especially at the proper time to be beneficial in the depredations program. There is a need for searching out still better crops to meet these objectives, and such testing work usually costs a little more and requires some additional personnel over ordinary cropping.

Practically all the operations on these areas are as highly seasonal as on any private land. The time for carrying on the various operations is limited by weather and other climatic conditions. When the time comes for a certain type of operation on any one area, it is time for the same operation on all other areas as well as on private lands. Equipment cannot be rented because it is not available. There is not time to move it from one place to another because of distances involved. Also, the moving of this type of equipment over the long distances required by location of the areas is very costly. In comparison with private ranches cropping areas of similar size we do not find any surplus of idle equipment. Each area must be equipped to handle the operations necessary on the area.

In evaluating the size of personnel, amount of equipment and costs of operation, it must be borne in mind also that, different from private farming, these areas serve as public use areas under a controlled shooting plan and in most cases have a multiple use: waterfowl hunting, pheasant and rabbit hunting, fishing, etc. The handling of such operations requires more personnel than is required on private ranches.

Housing permanent employees on the area is a necessity. Distances from other available housing are so great that cost of transportation to and from the

areas would soon eat up the cost of housing. Most of the work, especially at periods of heavy public use, requires a certain amount of manpower on the area constantly.

Our best figures show that 6.2 percent of the total department budget goes directly into the waterfowl program. We do not think that this is an over weighted emphasis, especially in the light of handling the depredations problem.

Consideration of the place of the private waterfowl shooting club in the California program is not only interesting but necessary. Probably nowhere in the United States is this impact so important. A study of duck clubs of California, from which Exhibits XVII, XVIII, and XX in this report were taken, was made in 1957. This report discusses much more thoroughly than space here will permit the problems and potential contributions duck clubs can make to the State's program.

The study referred to covered 750 duck clubs and estimated there are probably over 1,000 in the State, and some 10,000 license buyers who derive most or all of their duck hunting from private clubs. The areas they occupy and their comparative harvest are shown earlier in this report. The locations of the clubs studied are shown in Exhibit XX, which follows.

This study concludes:

> "Duck clubs, then, present the spectacle of the controlling interest of a valued wildlife resource —an interest replete with money, men and enthusiasm—but an interest generally un-co-ordinated and lacking in direction and information. Without this co-ordination, direction and information, piecemeal attrition by agricultural and industrial usurpation, urbanization, militarization, regulation, and taxation will destroy, quite needlessly, the entire waterfowl resource. Needlessly, for by wise management, waterfowl and human beings can exist together.
>
> "The enthusiasm and the emotional investment the clubs have in their duck clubs, used as a management tool, may prove to be our greatest biological resource in the waterfowl program."

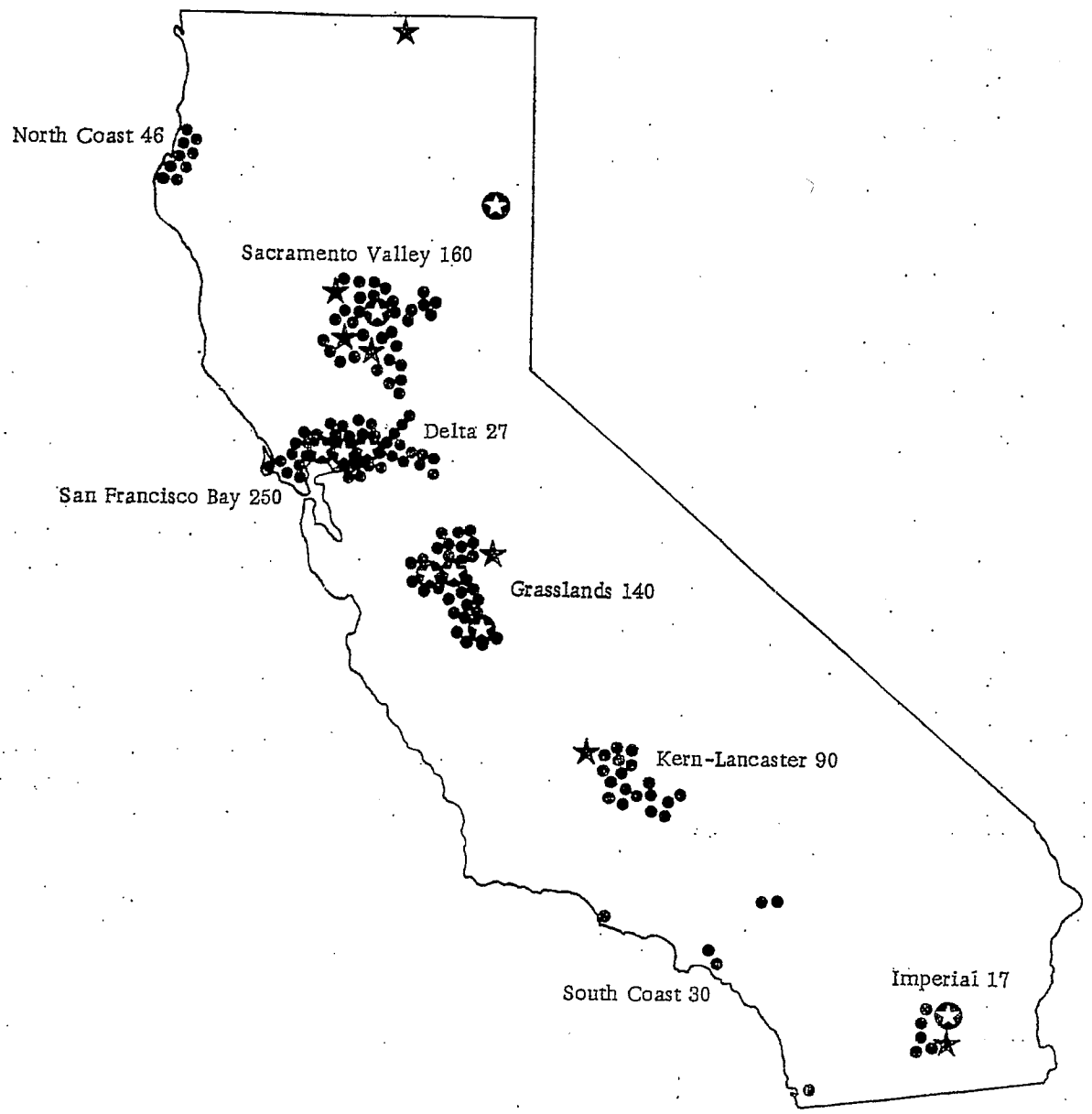
We concur in this observation but must point out that this is not a sanction for some of the practices of clubs, especially that commonly known as "sack feeding" to attract waterfowl. This is a practice far different from that of providing natural feeding areas as carried on by the department and we believe increasingly by some of the duck clubs. We believe the justification used that it is an aid in depredations control and in the feeding of waterfowl is superficial. As normally done, such feeding does not start at a time to draw ducks from depredation areas; ducks prefer other types of feeding, and it is usually discontinued before the period when ducks need feed most. We can see it only as a mechanism to attract more ducks over the hunters' guns and as an element which, if persisted in, will jeopardize waterfowling in this State with national repercussions. With the work the State has done, and with the successful experience a number of clubs have had, it would seem that the solution lies in programs of natural feeding such as the State uses on its areas.

In summary:

1. This part of the department's program is being well conducted. With information now available, it does not appear that an undue emphasis is being given to it; however, we would like to see some more complete method of comparison to determine the proper ratio of waterfowl expenditure in relation to waterfowl hunter interest, keeping in mind the element of contribution to the Pacific Flyway waterfowl population and of the necessity of facing the waterfowl depredations problem.
2. This part of the program is in the hands of capable personnel. As management areas progress and demonstrated practices become standardized, it should be possible to effect some reduction in personnel.
3. There is a good understanding of the State's waterfowl problem, and the approach being made to preserve as much as possible hunting for the unattached hunter and to handle the depredations problem through the management areas is about as sound and practical as we can envision. The personnel seems alert to future potentials both for expansion in areas and for increasing utilization on existing areas. There is a question of whether the State can ever meet all hunter demand. In the light of California's large and increasing human population, the shrinking, or at least stabilized, situation with regard to waterfowl population potential, the increasing restrictions imposed by private land ownership, and the large cost of providing and operating public use areas, we doubt this demand can ever be fully met. California waterfowl hunters will simply have to face restrictions.
4. The distribution of effort as evidenced in location of public areas is about as good as can be expected. This distribution is governed by availability of suitable habitat and the natural behavior pattern of waterfowl. Effort must go where waterfowl will go. The department is conscious of this and is apparently developing its opportunities to extend this effort as rapidly as funds become available. A point often lost sight of in this connection is that beyond actual acquisition and development of these areas is the necessity for providing annually-recurring operating funds to keep them going. Several new areas are under contemplation.

EXHIBIT XX
State of California
Department of Fish and Game

DISTRIBUTION OF DUCK CLUBS BY LOCATION



Legend

- Federal Waterfowl Areas
- State Waterfowl Areas
- Private Duck Clubs (5/dot)

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5. The federal aid (Pittman-Robertson) work being done on these areas, both in management practice and in working out more practical procedures of cropping and land use, is well justified.

RECOMMENDATIONS

1. Develop Cost and Revenue Studies by Which to Better Evaluate the Proper Emphasis on Waterfowl Management

It would be desirable to have some sort of an analysis to determine whether this part of the program is being overemphasized or underemphasized. This is especially desirable because of the intense waterfowl hunting interest and the necessity of meeting the depredations problem. The latter has a further involvement in the cost of obtaining water as discussed later. It would seem that such analysis is not possible with present methods of accounting in order to arrive at a very true picture or to determine whether the program can be expanded. Availability of land and water areas is a fundamental element in the waterfowl picture. Any projected evaluation of future demand should be made as nearly as possible now, and any steps toward additional acquisition should be initiated before it is too late to procure areas.

2. Give Immediate Consideration to a Program for Acquisition of Additional Waterfowl Areas

We recommend immediate consideration of:

(1) Additional withdrawals of public domain land before it becomes too late. This should be considered even if the department is not prepared for immediate development. It would seem that this would be a very good area of endeavor for Wildlife Conservation Board funds.

(2) Negotiations with the U. S. Fish and Wildlife Service to make available for public use the full area allowable under Federal law on existing areas and co-operation with this agency in establishing proposed areas and making available the allowable area for public use.

The department is aware of both these potentials and has taken steps to expedite them. Federal areas which have been made available for public shooting are:

	Acres
Tule Lake National Wildlife Refuge (Modoc and Siskiyou Counties)	10,000
Lower Klamath National Wildlife Refuge (Siskiyou County)	8,000
Colusa National Wildlife Refuge (Colusa County)	4,036
Sutter National Wildlife Refuge (Sutter County)	2,630
Merced National Waterfowl Management Area (Merced County)	2,562
Salton Sea National Waterfowl Management Area (Imperial County)	12,951
Total	40,179

Several other areas are under negotiation at the present time. Further analysis of the whole department's program may indicate increased effort in this field.

3. Simplify and Standardize Procedures for Operation of Shooting Programs

As to area management, we think construction, farming practice and development are good. In the handling of the public and operation of shooting programs, we think considerable simplification and improvement can be made. To cope with the impact of rush days at these areas is always difficult. But we feel that a better co-ordination of policy and procedure would help.

The mechanics of conducting the public hunting on the waterfowl management areas and regulating the public seem involved and complicated. There is a lack of standardization in setting up the regulations under which use of these areas is permitted. Apparently much is left to the judgment of the region and area manager. There must be enough elasticity, of course, to accommodate the peculiarities of individual areas. Many items should be determined, however, on an overall basis and at least done under an authority issued by the commission. Examples of such items are: whether parking and overnight camping should be permitted in the areas; whether dogs should be allowed; where fishing is to be permitted; what type of area sign is to be used and the wording on signs; permits to be required on all areas—what kind and what fee; what firearms are permitted and when, etc.

We believe a careful review needs to be made, under competent legal guidance, to determine how far the commission and area managers can go in setting up regulations that can be enforced in the courts. It is our opinion that some of the things now being done may not stand up and that officers of the department may be subjected to liability for false arrest. Regulations on many of these matters certainly should be uniform for all areas.

The matter of posters and posting should be carefully reviewed. It would appear that at present the origin of any kind of poster and the wording of posters is determined by some special need which arises for a special case. An examination of the stockpile of posters leaves one a bit

bewildered and with a definite feeling that the whole field of posters and posting should be studied with a view to reducing the various kinds and of determining which ones should carry designation of authority of the commission itself in order to be enforceable.

4. Explore Fully the Possibilities of Negotiating a Mutually Advantageous Arrangement to Utilize Unused Water for Waterfowl Management and Depredations Control

The department now spends $25,700 for water annually for its waterfowl management areas, mostly from irrigation districts. In the case of the Imperial management area, this water is either water which comes from irrigation drainage and therefore already used and paid for, or is surplus not used for irrigation (termed operational spillage). The waterfowl area is located at the terminus of the drainage and irrigation canals and, therefore, this water passes the refuge and flows on into the Salton Sea. Its use for waterfowl area purposes would in no way deprive any other farmland of water; but we understand that the irrigation district refuses the State the right to use it except at the regular rate of $3.50 per acre foot. There are some 3,000 acres of the 8,000 acres in the area now used for waterfowl management. The department cannot now develop the area fully for waterfowl hunters because of lack of water. They now pay some $13,000 to $17,000 per year to the district. Full use development at present water rates would cost around $60,000 per year. In view of the fact that one of the primary functions of the Imperial waterfowl management area is crop depredation control for ranchers around the area, there is an economic basis upon which the irrigation district might adjust its rates or even permit state use, at no cost, of the water which would otherwise flow unused into the Salton Sea. This matter should be discussed fully with the irrigation district officials in an effort to arrive at a mutually beneficial arrangement.

5. Dispose of Marginal Waterfowl Management Areas

At the Honey Lake-Madeline and the Imperial areas, there are parcels for which we recommend disposal.

The Madeline area is now operated in connection with the Honey Lake area. It lies some 50 miles from Honey Lake. The general situation makes it impossible to handle like Honey Lake and yet it is necessary to maintain a man at Madeline. It is somewhat off the main flyway for waterfowl and has minimum value as a wintering area, nesting area or hunting area.

In acquiring this land, the department also acquired responsibility of acting as water master for a reservoir, and agricultural lands get all the water they want first. The result is that in dry years when needs are greatest for waterfowl there is the least water available. Also enough water has to be maintained *in the reservoir to ensure against water shortage for agriculture for the next year ahead.* These difficulties, not being understood by waterfowl hunters, generate unjustified criticism.

The facilities for personnel and hunters on the area are not extensive, and disposal of the area would not seem subject to any pressure. Also, the Federal Government will no doubt establish a waterfowl area at Alturas, with 25 percent open to shooting under department control, and this will be much better than the Madeline area.

The area probably costs about $30,000 a year to maintain. This expense, in our opinion, is down the drain.

We feel it should be disposed of and our information is that the department concurs in this and is, in fact, making attempts at the present time toward this end. Any such efforts should be intensified.

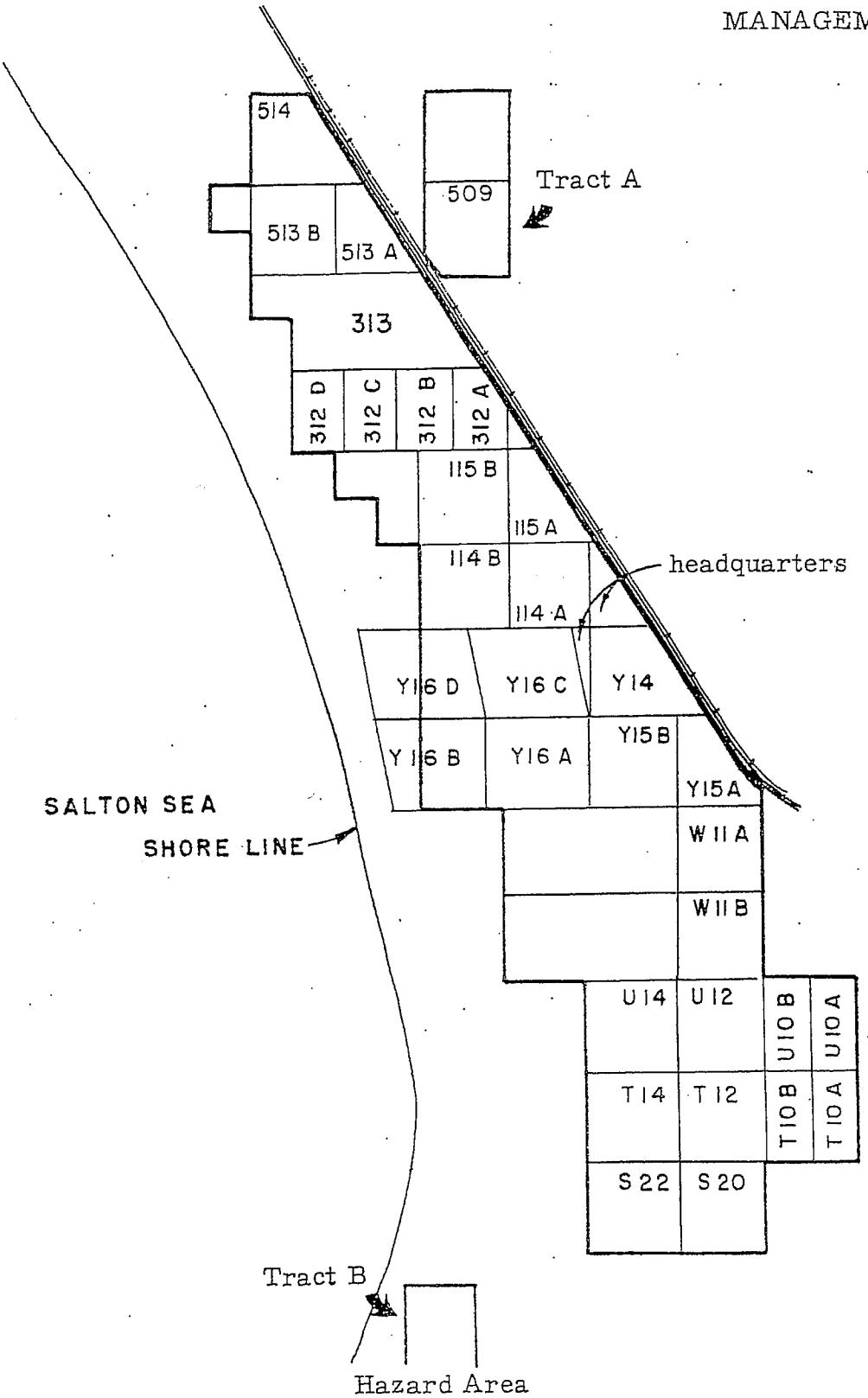
The experience with the Madeline area emphasizes the poor results from ill-conceived projects and the desirability of closer co-ordination between the department, the Wildlife Conservation Board, legislative authorization and other elements.

At the Imperial area there is a tract of some 320 acres which was acquired in a "take all or none" negotiation. It was wise to make the acquisition in order to get the important land needed. The tract, however, is separated from the usable area by a railroad and an undesirable grade and crossing (see Tract A on Exhibit XXI, opposite this page). The soil is rocky and poor and difficult to get water onto, and moving in of operational machinery is impractical. It would be difficult to manage as a controlled shooting area and probably never would be so used. We believe it has no value to the department.

On this same management area there is another unit, the value and practicability of which as a public shooting area we question, under presently existing conditions. It is marked Tract B on Exhibit XXI and is known as the Hazard area. This is good waterfowl area, but it is so situated that it serves only a few hunters and yet is expensive to administer and operate. The Hazard area is separated from the rest of the waterfowl management area. Farming equipment must be moved a long distance and over a roundabout approach. One of the employees of the Imperial area now lives there. There is a house of

EXHIBIT XXI
State of California
Department of Fish and Game

HAZARD-WISTER WATERFOWL MANAGEMENT AREA



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MANAGEMENT CONSULTANTS

only fair-to-low value and a few other low-value buildings on the area. The Hazard area could easily be divided into two or three separate areas, each one of which would make a very acceptable duck club. There is, however, a consideration which should be kept in mind. There seems a possibility that negotiations with the U. S. Fish and Wildlife Service may result in a large block of marsh now held by them and adjacent to the present state holdings being turned over to the State for management. If this materializes, the Hazard area would be a desirable integral part of the whole area and should be retained.

6. Make More Information on Waterfowl Available to the Public

Two pieces of information should be put in form to be made available for the public.

"Migratory Waterfowl in California, 1957," by A. Starker Leopold.

"A Survey of the Duck Clubs of California," by the Department of Fish and Game.

(3) *Doves and Pigeons*

Factual Considerations and Analysis

While there are several varieties of doves found in California, the mourning dove, the white-winged dove and the band-tailed pigeon are the only ones of significance as game birds. The mourning dove and the band-tailed pigeon are excellent game species. The 1954-1956 Biennial Report shows a take for 1955 of 2,571,500 doves and 135,000 pigeons.

We find no evidence that this take is in any way lowering either of the populations. The best available information indicates that close to 65 percent of the annual take of doves is of birds produced during the current year or "birds of the year." In game management, it has been demonstrated that the rise or fall of this index figure is a reliable indication of the trend in population of many game bird species. A sustained index of 65 percent gives every reason to conclude that the dove population is maintaining itself safely. In fact, it is likely that the take does not come up to the full annual production.

The white-winged dove, because of its wildness and the fact that it usually leaves the State by the latter part of September, is scarcely touched by any hunting pressure. The band-tailed pigeon is such a difficult target that it is comparatively safe from any danger of hunting pressure.

The combined distribution of these species covers a wide area of the State. Their importance as a game species is emphasized by the fact that they furnish hunting opportunity in many sections where there are no pheasants, waterfowl or deer.

In certain quarters, strong pressure is being generated by protectionist groups to get these species placed on the completely protected list. We can see no justification for this as long as populations are being maintained. Surplus production of such species may just as well be utilized. Such surpluses are dissipated by nature anyway whenever a habitat is maintaining a full population.

The study work and management effort on these species by the department are very conservative, perhaps too much so in light of the problem of retaining them as game species. There is no evidence that these species are being overharvested. In fact, the evidence points to the fact that there are produced every year in the State many more birds than are taken by hunters. The sportsmen are intensely interested in these birds and this interest and the work that goes into habitat improvement for upland game, including doves, supported by the funds from sportsmen's fees, contribute greatly toward actual perpetuation of the species.

RECOMMENDATIONS

1. Conduct a Thorough Public Information and Education Program on Doves and Pigeons

There is an immediate need for an intelligent and thorough educational program to bring about a realistic public understanding of the situation with regard to doves and pigeons. It seems there are several groups pretty well organized to bring pressure on legislators and on citizens groups who are indifferent or who do not understand the principles involved to get these species declared on a closed list for hunting. There is involved, of course, a sentimental appeal. One citizen stated to us that he conceded his interest to be purely a sentimental one and that regardless of any soundness of wildlife management principles he would fight to close any hunting season on doves. We feel that the full dissemination of facts bearing on the issues should become a special objective of the department's personnel from the Information and Education branches on down.

2. Continue Field Studies on These Species

Continuing inventory and field study is necessary to maintain a reliable picture of the status of the populations of these birds.

(4) *Quail and Chukar Partridge*

Factual Considerations and Analysis

There are three species of quail native in California: the California or Valley quail; the mountain quail; and the gambel or desert quail. They occupy different ranges and do not compete with each other or with other species of game birds in habitat or management. They are an important game bird, but probably are not being used by the hunter as much as they could or should be. From 1,300,000 to 1,500,000

birds, roughly, are taken by hunters each year. It is not possible to determine just how many quail hunters there are, but it seems certain that no undue pressure is being exerted upon quail populations.

The chukar partridge is a comparative newcomer to California. All present indications are that he will fill a niche in furnishing additional hunting opportunity.

Because of the terrain the chukar occupies and because in some places he has had a peculiar habit of vanishing from the picture after a considerable period of occupation, it is felt that the conservative approach being made by the department in managing this species is sound. Everything points to the fact that he has established himself well in suitable habitat and is filling a gap in California. The discontinuance of raising chukars at game farms for release is entirely justified. Experience indicates that if expansion is feasible and warranted, it can be accomplished by trapping and transplanting of wild stocks.

What expenditures, research and manpower are being expended are justified. The department has carried on studies and habitat improvement work for some time. Wherever this work has been done—such as installation of guzzlers, development of springs, and improvement of cover—the response in quail populations has been good. There are two important elements involved in this work. The wide expanse of territory that must be covered and the cost of construction and maintenance of improvements place a limitation on how far the department can go in this effort. Expenditures for cover improvement may not be justified on private land which is closed to hunter access.

There have been some 2,604 guzzlers established and 188 new springs located and developed. Usually, wherever brush manipulation has been carried on, it has proved as beneficial to quail as to deer.

There is general agreement among all we contacted, both in the department and elsewhere, that quail populations are adequate and that the department's quail program is good. In consideration of hunting pressure, adaptable range or future expansion of program, there is no need for artificial stocking and there are no quail being produced at the game farms. The findings of the department show clearly that any expenditure of funds should be in the area of habitat improvement. The mechanics for any such effort have been demonstrated.

RECOMMENDATIONS

1. Continue the Present Programs on Field Surveys and Field Management

Continuing inventory of populations and record of hunting pressure needs to be carried on. Studies should continue in an effort to find additional food and cover plants and ways of extending hunting opportunity on land now closed, but it is doubtful if any major research program is required. The need is for field management and extension of habitat improvement.

2. Continue the Maintenance of Guzzlers

Maintenance of installations, especially guzzlers, is important and should be continued. Maintenance of guzzlers is not inexpensive. We suggest that some study be given to the possibility of shifting some of this work to the wardens, if it can be done without sacrificing its thoroughness. Separate crews are now employed, and the department seems to feel that these crews, being familiar with the location of guzzlers and being equipped with tools and materials, can do the more efficient job. It might be, nevertheless, that because of the great distances that must be traveled and because of the fact that local wardens do or should cover these areas anyway, some saving could be realized in the cost of this maintenance work. It should require a minimum of warden time.

2. Better Inform the Public on the Opportunities for Quail and Chukar Hunting

Quail and chukar hunting, with a possible exception of valley quail, is arduous; we believe, however, they are prime sports and that some pressure might be taken off pheasants through a well-conceived and thorough educational program to divert hunter interest toward these species.

4. Refrain From Expending Effort to Introduce New Species of Game Birds at This Time

As a special item, mention is made of a small exotic bird that is receiving considerable attention just now. It is the coturnix or Japanese quail. With the native species California now has, we see no justification for the State's getting into any program for promoting this species. It has certain merits, of course, one of the chief of which is its prolific tendencies under game farm conditions and its promise as a profit-maker for the game farmer. But any money or effort the department has should be devoted to the native species at this time and under present conditions.

(5) *Other Upland Game*

Factual Considerations and Analysis

This category is made up chiefly of cottontail rabbits (brush rabbits), jackrabbits and squirrels.

All of these species are abundant and there are no critical situations with regard to them. The department is making only a minor expenditure of funds in this area, not because they are considered of little value but simply because they are taking care of

themselves. Under present trends in land use practice, experience is that they will continue to do so.

RECOMMENDATION

1. Inform the Public on the Hunting Opportunities in These Classes of Small Upland Game

A concerted effort should be made to divert hunter interest toward this class of small upland game. They are good game species capable of furnishing much good sport. They can stand heavy hunting pressure. They could absorb a lot of the pressure now being directed to pheasants and waterfowl. Most small upland game species are cyclic and subject to periodic and local losses. This should not be occasion for unwarranted panic regulations. It would be desirable for the department to develop a special informational effort toward encouraging hunters to appreciate more this category of upland small game. In many states the rabbit outranks any other species in popularity for the hunter. Any diversion of hunter interest toward these species would relieve pressure on some of the those now laboring under an overload.

(6) *Federal Aid (Pittman-Robertson) Program*

Factual Considerations

Game management research for upland small game is practically all under the Federal Aid or Pittman-Robertson Program. It is, therefore, not treated under a separate heading. For the sake of brevity, this federal aid program is hereinafter designated as the P. R. program.

Senate Concurrent Resolution No. 126 provides for "consideration of the effectiveness of the department's use of funds received under the Pittman-Robertson Federal Aid in Wildlife Restoration Act * * * to determine if the best possible utilization is being made of these funds."

The origin and evaluation of the P. R. program are not covered in this report because these phases are detailed in the Administrative Survey prepared by the Legislative Auditor, February, 1956, Part II. Briefly, this is the program under which the Federal Government allots to the states, under a formula set up in the federal law, the moneys derived from the excise tax on sporting arms and ammunition. It is alloted on the basis of 25 percent state to 75 percent federal money. The rules and regulations under which these funds are made available to the states are specific and diligently supervised by the federal agency. The chances for their being used not in accordance with the purposes and intents of the act are, therefore, slight. Under federal law, no state may spend more than 25 percent of its P. R. funds for maintenance and this must be on areas under the P. R. program.

The amount of these funds varies from year to year, depending upon the returns from the federal excise tax and the amount carried over from the previous year. Funds not entirely used in any one year may be carried over for one subsequent year before they revert to the Federal Government. We understand that there was only one year, during the last world war, when California did not make full use of P. R. funds.

Having had a direct part in the formulation of the P. R. program, the writer believes it was a full intent of the act to be flexible enough to meet the varying needs of the separate states. It was also the full intent to permit use of these funds to encourage basic fact finding, often termed research. The reason was that so many of the states found it almost impossible to carry on such work with their regular funds and yet found themselves helpless to develop sound game management programs without obtaining the essential factual information upon which to base them. Until comparatively recent years, game departments did the best they could with what information they had, but game management was generally a "hit-and-miss" affair. P. R. funds have been a major factor throughout the United States in overcoming this situation. We believe the State of California has had this same experience. This, in a large measure, accounts for the fact that in this State, as in most states, P. R. programs to date have shown a sizeable percentage of expenditure for research and investigation activities. From the overall national viewpoint, it would be difficult to say that this has not been an effective use of such funds.

In order to evaluate fairly the P. R. program in California, it is necessary to consider its relation to the whole game management program and to the whole department program. A study of the two following tables reveals some very significant facts. The following table shows a breakdown of receipts and expenditures of the department as of the Fiscal Year 1954-55.

SUMMARY OF 1954-55 FISCAL YEAR REVENUE AND EXPENDITURE

	REVENUE	
Source	*Amount*	*Percent of department total*
Fishing	$3,837,868	48.8
Hunting	2,402,827	30.5
Federal aid (Pittman-Robertson Game)	642,727	8.1
Federal aid (Dingell-Johnson Fisheries)	193,975	2.5
Fish landing taxes	383,835	4.9
Marine Research Committee	121,421	1.5
Court fines	144,615	1.9
Miscellaneous	139,879	1.8
Total revenues	$7,867,147	100.0
Fish and Game Preservation Fund	$7,030,445	
Federal aid	836,702	
Total revenues	$7,867,147	

EXPENDITURES

Branch of work	*Amount*	*Percent of department total*
Wildlife protection	$2,381,649	29.5
Inland fisheries	2,005,424	24.8
Federal aid (Dingell-Johnson)	195,208	2.4
Game management	1,539,675	19.1
Federal aid (Pittman-Robertson)	856,970	10.6
Marine fisheries	777,052	9.6
Federal aid (Dingell-Johnson)	63,425	.8
Conservation education	158,167	2.0
Marine Research Committee	84,733	1.0
Miscellaneous	15,000	.2
Total expenditures	$8,077,303	100.0
Fish and Game Preservation Fund	$6,961,700	
Federal aid projects	1,115,603	
Total expenditures	$8,077,303	

NOTE: Federal aid projects include State's share of 25 percent ($278,901).

The following table shows a breakdown of the expenditures for game management:

GAME MANAGEMENT EXPENDITURES FOR FISCAL 1954-1955

Branch of work	*Amount*	*Percentage of game management total*
Waterfowl	$819,156	34.2
Pheasants	624,890	26.1
Deer	621,268	25.9
Other upland game	246,896	10.3
Other big game	51,608	2.1
Furbearers	27,896	1.2
Bears and other	4,931	.2
Total	$2,396,645	100.0

NOTE: Includes federal aid projects.

The year 1954-55 is the last year for which such a breakdown is available. Percentage-wise, however, the figures would not vary greatly for later years since project emphasis has not changed materially. Analysis of these tables, together with figures furnished in the accompanying report and in a P. R. report for 1957-58 shown in Exhibit XXII, which follows, reveals the following:

1. Game management expenditures make up 29.7 percent of the department budget, or $2,396,645.

EXHIBIT XXII

State of California, Department of Fish and Game

1957-1958 PITTMAN-ROBERTSON PROJECTS

Type of project	*Project designation*	*Headquarters*	*Funds allotted*
Co-ordination	Overall supervision of P. R.	Sacramento	$40,800
Research	Life history and management of ring-necked pheasant	Sacramento	40,600
	Waterfowl studies	Sacramento	92,800
	Upland game investigations	Sacramento	60,900
	Big game investigations	Sacramento	160,300
	Wildlife investigation Laboratory — food habits, diseases, die-offs, etc.	Sacramento	101,700
Development and management	Gray Lodge Waterfowl Management Area	Gridley	102,300
	Imperial Waterfowl Management Area	Calipatria	107,800
	Honey Lake Waterfowl Management Area	Wendell	59,500
	Los Banos-San Luis Waterfowl Management Area	Los Banos	61,000
	Grizzly Island Waterfowl Management Area	Suisun	82,200
	Mendota Waterfowl Management Area	Mendota	91,200
	Game Habitat Development	Sacramento	194,000
	Tehama Winter Deer Range	Paynes Creek	14,000
			$1,209,100

2. Game research amounts to a total of $480,457, which is only 5.9 percent of the department budget and a little over 20 percent of the game management budget. P. R. funds make up 19.6 percent of this 20 percent.

3. Of the game management budget, 26 percent is for pheasants, 25.9 percent for deer, 34.2 percent for waterfowl, 10.3 percent for other upland game, and 3.5 percent for other big game (bear, etc.) and fur bearers.

4. The 1957-58 P. R. report shows a total of $1,209,000 for P. R. program. Of this, 3.4 percent goes into the co-ordination project (which should more properly be designated overall supervision of the whole program), 8.4 percent into the wildlife investigations laboratory, 29.3 percent into field and other research, and 58.9 percent into development and maintenance work. Of the P. R. budget, 42 percent is allocated to waterfowl management areas, which handle, in addition to waterfowl hunting, the duck depredation problem, fishing, pheasant hunting and some miscellaneous use. All funds so applied from P. R. relieve the department support funds of an equal amount which can be allotted to other work.

A breakdown of P. R. personnel on the basis of functioning is shown below:

Functional description	*Number of Personnel*
Co-ordination (overall administration)	5
Management	
Field supervision	3
Field operations	19
Field installations	44
Research	31

The designation of projects can be misleading if not properly interpreted. Designation of overall projects as research, management, etc., is made to meet

federal requirements. This does not always show the true classification of activities. Much of the activity, such as continuing censuses upon which to base seasons and limits, is nothing more or less than a management tool. To arrive at an accurate breakdown of this would require an involved analysis of payrolls, administrative costs, etc. A careful study of the individual projects shows rather clearly that the department's emphasis is on such investigative work as has immediate application value to the immediate problems of the department. The department states the following to be its policy with regard to research:

> "California's game research program is based on the premise that proper management of the game resource is possible only if founded on a sound scientific base. It should be emphasized that our program is geared strictly to answering the problems of management. Long-range research problems and gathering facts for the sake of facts alone (the academic approach) are largely avoided. Long-range research, although desirable, is more properly the field of such agencies as universities and the fish and wildlife service."

The Legislative Auditor's Report of 1956 comments on the possibility of greater emphasis in the P. R. program on maintenance and operation. Apparently steps have been taken to make such a shift so far as limitations of federal regulations permit. The foregoing breakdown of expenditures shows this.

At the present time the following research work is being "farmed out":

Co-operating agency	*Designation of project*	*State participation*
University of California	Brush control	approximately $37,000
U. S. Forest Service	Browse revegetation	approximately $35,000

Analysis and Conclusions

Questions have been raised concerning the justification of projects under the P. R. program. A study of the projects that have been carried on or are current shows that with few exceptions their origin is a result of: (1) direct interest or request of landowner or sportsmen interests; (2) direct relation to specific management or operational problems of the department requiring answers; (3) utilization of opportunities to carry out practices developed in earlier projects and to acquire, develop and manage additional areas for public use. The following list is not complete but is illustrative; it is not limited only to current projects.

1. Projects resulting from direct interest or request by land owner or sportsmen interests:
   - Sage Grouse Habitat Improvement.
   - Desert Game Habitat Improvement.
   - Management of Quail in the South Coast Counties of California.
   - Survey of Big Game in Northeastern California and in the Owens Valley.
   - Influence of Seasonal and Other Factors on Food Value of Meat of Game Animals.
   - Life History and Management of Mountain Quail.
   - Life History and Management of Ring-Necked Pheasant.
   - Headquarters Unit, Imperial Waterfowl Management Area.
   - Imperial Waterfowl Management Area.
   - Management Studies of Upland Game.
   - Economic Poisons Study.
   - Game Range Restoration.
2. Projects relating directly to specific management or operational problems:
   - Present Status of Beaver in California.
   - Management of Male Deer in Southern California.
   - Survey of Fur Resources of the State.
   - Survey, Marking and Posting of Legislative Game Refuges.
   - Tehama Winter Deer Range Preservation and Improvement.
   - Desert Game Water Supply Survey.
   - Beaver Transplanting.
   - Survey of Waterfowl Food Plants.
   - Survey of Critical Summer and Winter Deer Range.
   - Food Habits Investigations.
   - Game Habitat Development (In Co-operation With U. S. Soil Conservation Service).
   - Study of Deer Populations and Management.
   - Waterfowl Studies (Production in breeding areas, annual kill, effects of botulism, depredations, etc.).
   - Effects of Brush Removal.
   - Evaluation of Quail Development and Management Practices.
   - Maintenance of Upland Game Developments.
   - Deer Herd Studies (to determine basis for management plans and regulations).
   - Survey of Chukar Partridge.
3. Projects utilizing opportunities to carry out practices developed in earlier projects and to acquire, develop and manage additional areas for public use:
   - Development of Suisun Waterfowl Area.
   - Purchase of Lands for Honey Lake Waterfowl Area.
   - Development of Gray Lodge Waterfowl Area.
   - Purchase of Lands for Doyle Winter Deer Range.
   - Purchase of Lands for Madeline Plains Waterfowl Area.
   - Purchase of Lands for Bald Mountain Winter Deer Range.
   - Repair of Tule Lake Reservoir and Dam.
   - Development of Honey Lake Waterfowl Area.
   - Development of Madeline Plains Waterfowl Area.
   - Development of Los Banos Waterfowl Area.
   - Development of Grizzly Island Waterfowl Area.
   - Development of Tehama Winter Deer Range.
   - Development of Doyle Winter Deer Range.
   - Development of Mendota Waterfowl Area.

After studying the foregoing together with the details of the projects themselves, we come to the conclusion that very little, if any, of the P. R. or research work has originated other than from a specific need in the department's program of game management.

It is not at all surprising that to those who do not have opportunity to follow the program from month to month a question arises as to whether anything has been accomplished with funds spent for P. R. programs and research under P. R. This survey has

naturally gone into this in detail. Space will hardly permit a complete cataloguing of all these details, but some examples of accomplishments with expenditure of P. R. (Federal Aid or Pittman-Robertson) funds follow:

—Something over 110,000 acres of land and marsh acquired for waterfowl management areas and deer range and over 9,700 acres now being managed for waterfowl food plantings.

—Over 2,200 guzzlers established for upland game watering, and 200 or more springs mapped and developed.

—50,000 shrubs and plants put out and 25,000 acres of brush lands treated in habitat improvement work.

—227,000 acres of land made available to hunters under the co-operative shooting area program, through use of funds for operation and management.

—30,000 to 35,000 acres of public shooting management areas built with P. R. funds.

—P. R. projects have resulted in trapping and redistributing some 3,000 mature beaver and a change in regulations concerning beaver and other fur bearers.

—The habitat improvement projects have produced the basic information for present practices in deer ranges, waterfowl and pheasant management, quail and chukar range improvement.

—The development of the guzzler under P. R. projects has resulted in increase in quail populations and better regulation of the quail harvest.

—P. R. funds are now an important element in operation of the waterfowl management areas serving some 51,211 hunters of various types each year.

—The surveys of antelope and elk have made possible special hunts for these species at various times.

Waterfowl food plant studies have been and will continue to be of top importance in waterfowl management from the standpoint of the hunter and also the depredation control problem. These studies have demonstrated clearly that the methods of management now being used are the best that have yet been found to handle especially the depredations problem. They should be extremely valuable to duck clubs in managing their areas.

Studies of ring-necked pheasants have been extensive. They have resulted in a clear picture of the whole pheasant situation in California. They have formed the foundation for the State's pheasant management program. The pheasant has been discussed at length in another section of this report.

Research and P. R. studies have resulted in the adoption of the department's present deer management policies and the initiation of the "unit system."

Waterfowl studies, certain phases of which must be considered as permanent procedures the same as when a merchant inventories his stock every year, have resulted in solving many of the knotty waterfowl problems of the State. Like pheasants, waterfowl are discussed in a separate section of this report; and, like pheasants, it must be concluded that these studies have formed the foundation for the State's waterfowl program.

Studies on controlled burning have demonstrated the possibilities of increasing deer and quail production and have been an important influence in agricultural practice. It has been demonstrated that controlled burning can be used to manipulate brush for various purposes.

Increasingly it is becoming possible to base sound regulation and management of wildlife species in the State on factual information instead of fragmentary and casual observation or opinion. While this is true, we have run into a disturbing amount of criticism from the public and from some places in the department to the effect that the results produced through this program are ignored at the higher echelons of the administrative staff and by the commission when it comes to making application of them, especially in regulations. It is certain that a number of regulations finally established are not in keeping with the findings of field studies. Whether this is a result of lack of confidence within the department or a yielding to uninformed pressure groups we do not know. But it is a matter that needs careful review and correction.

There has been criticism of the P. R. program on the score that projects seem to run for many years, seeming never to terminate. Analysis of this situation reveals several elements:

1. Names of projects may not be too significant. Over the years, projects have been terminated as soon as completed. A good number of the projects are of a longterm nature, such as the waterfowl and pheasant studies. They involve work of a nature that is continuing, such as annual estimates of population from year to year upon which seasons, bag limits, etc., can be based. During the last two or three years uncompleted phases of a number of projects have been consolidated into single projects and carried under an existing designation. Many states terminate a project on the original termination date and if the work is not completed, originate a new project. California has handled such situations by amending the existing project. This would seem to simplify the whole procedure, but it can

easily lead to the impression that projects are stretched out unduly.

2. The California program has used P. R. projects, probably more than is the average, for carrying continuing basic management procedure. For example, if any species of game is going to be safely harvested, the amount available for harvest needs to be determined currently. This means annual estimates in some form or other of population or production. The waterfowl census program in co-operation with the U. S. Fish and Wildlife Service and the other Pacific Flyway states is a good example of this; projects utilizing P. R. funds on maintenance is another. Such projects, by their very nature, are long term.

We find the department has not hesitated to terminate projects upon completion or even as soon as it has become evident that nothing is to be gained by continuing them even though they have not reached the original termination date. There has been no hesitancy to adjust personnel accordingly, and we find no foundation for the criticism that projects have been dragged out simply to keep the personnel engaged in them from working themselves out of a job. There would be no point in failing to terminate projects upon completion, because the funds for P. R. are limited and the problems constantly arising in game management are nearly always greater than the funds to finance P. R. studies.

We have had opportunity to observe a large segment of the personnel in the P. R. group. We can only conclude that, on the whole, it is a group of well-qualified, intensely interested, hard-working individuals with a sincere consciousness of their problems and an appreciation of the need for practical application. There appears to be, however, a block somewhere along the line in expeditious procedure from staff to the field. This is especially manifest in a confusion of objectives, directives and definiteness of procedure. There is lack of unity in programing and procedure as between the various regions. We feel there needs to be a closer co-ordination.

RECOMMENDATIONS

1. Take Positive Steps to Inform the Public and the Individual Members of the Department of the Values and Contributions of the Pittman-Robertson Programs

There is a definite lack of understanding on the part of the public and also of too many individuals in the department itself of the functioning, application to the whole program and of the contributions to operations, problems and regulations of the P. R. and game management branch.

One of the first steps to be taken to overcome this is a systematic effort of indoctrination for the whole department. Some of the protection staff have a very meager knowledge of the game management program or its application. They know is exists, but they do not care too much whether it does or does not, nor do they concern themselves about the work it is doing. It is easy for such attitudes to be transmitted to outside groups, this does not build confidence in the department program. There appears to be a tendency to maintain too much independent group thinking. Steps to overcome this situation must originate at the central staff level and carry down through regional directors, regional game managers, regional protection supervisors, captains of patrol, unit game managers and to the rank and file of the personnel.

2. Consider More Frequent Termination and Rewriting of P. R. Projects

In view of the apparent misunderstanding over termination of projects, it might be well to consider more frequent termination and rewriting of P. R. projects. This would recognize changes in scope or direction of effort on P. R. projects and would serve to forestall any criticism that projects were being unnecessarily prolonged.

3. Review Desirability of "Farming Out" Disease Laboratory Work

The policy of handling under P. R. in the department only such work as directly pertains to management problems and of "farming out" other work to the university and other institutions is good. The one area that should be reviewed especially is the disease work at the laboratory. If proper arrangements could be worked out, we believe this could be more satisfactorily done at the university, Humboldt College or elsewhere. There exists the possibility of a net savings in salaries and equipment by "farming out" disease laboratory work.

4. Guard Against Creating Excessive Commitments for Continuing Operational and Maintenance Costs

In programing P. R. work, and especially the use of any extra funds made available a year or two ago from heretofore unallotted federal moneys, it will be desirable to maintain such a balance in the budgeting of those funds as will avoid an overload of acquisition and development of the kind that will, as the years go by, result in a pyramided load of supervision, maintenance and operation that cannot be met with current revenues. While some P. R. money can be used for operations on projects acquired and developed with P. R. funds, any costs over and above this

must be carried out of other department revenues. Some states have had to forego use of P. R. funds for further acquisition and development simply because their regular revenues would not permit them to operate the facilities so developed.

(7) *Organization and Administrative Problems in Game Management Function*

Factual Considerations and Analysis

In a state as large as California with such diversity of physiography, with such diversity and intensity of human populations, with the distances and difficulties involved in transportation, and with such diversity of wildlife populations, the regional setup is no doubt an efficient plan of organization. The basis for forming the regions, is, of course, that each region supposedly has its own peculiar problems, and therefore there must be leeway in the management within the region. The problem is to keep the regions tied together so that each one does not become a little empire within itself.

There is a tendency for each region to operate as a separate group. Overall interpretations of policies, directives and program procedures seem to vary widely among the various regions. There appears to be a hesitancy on the part of the central staff to issue co-ordinating and corrective directives, and a lack of frequent enough contact between the central office and the field offices of the kind that would keep things tied together. There seems to be some confusion about who is to give orders to whom.

We sense a lack of confidence in the game management recommendations on the part of the commission. Game managers, when pressured, confide that there is an ignoring of their findings and recommendations somewhere in higher echelons and that too many regulations seem to be made on the basis of which public group exerts the greatest pressure. Regulations seem to be determined frequently on the basis of whether or not they will be popular or whether enforcement well be easy or difficult. A part of this difficulty we think lies in the procedures, or lack of procedures, used in getting recommendations and their underlying reasons before the commission. Another part of the difficulty is the inability to inform the public on all the factors affecting the issues.

RECOMMENDATIONS

1. Develop and Carry Out a "Department-Oriented" In-Service Training Program

A thoroughly planned, in-service program of information, education and exchange of free discussion and even field activity should be developed and carried out. The various groups in the regions hold training conferences from time to time, but it is our observation that these are usually along subject matter group lines and that not enough emphasis is placed on interchange of information and ideas between groups. Consideration could well be given to a plan which, instead of embodying a large number of specialized group conferences, would bring together all groups in joint conferences where some time would be given to overall department and regional problems and directives and some time for consideration of their own problems by special groups. We believe this type of program, originating from the top down and participated in by central staff, would do much to break down isolationism of different branches of work.

2. Provide for Full Consideration of Regulation Recommendations by All Interested Functions

We think that, starting at the regional level and proceeding all the way through the central staff, regulations should be decided upon only after full consideration by enforcement as well as game management personnel. This does not mean determination by a majority vote; it does mean that all angles of a proposal should be presented to the final determining authority. There should never be an opportunity for the enforcement branch to be indifferent toward regulations or programs of work because they have not taken their part in discussions or been informed of what is transpiring.

3. Give Further Study to the Salary Grades of Game Management Personnel

There exists a consistent uneasiness on the part of the game manager group over the higher pay schedule of the warden group. The concern is not just that one group is getting higher pay, but that the discrepancy is draining off the best technical men as soon as they have reached the limit of their classification. We have not gone into the justifications for the differential in pay, but it is a matter to which attention should be given. Perhaps consideration should be given to establishing a classification of "biologist," with a higher pay rating so as to give opportunity to maintain skilled men in the technical group. This is done in the fisheries branch.

It could be that the causes of the salary differential are deeper rooted than is realized. Throughout the United States, game management is relatively new as a profession, and biologists have had to build confidence by demonstrating their worth. By and large they have done so. In California the progress does not seem to have been as good. Some groups are skeptical of biologists and technical findings. There is evidence that certain members of the protection force have not been convinced as to the soundness of the recommen-

dations of the game management group. Much of the resistance on the part of legislators and commissioners to the technical group may originate with this feeling on the part of the protection group.

4. Consider a Reorganization and Reassignment of Basic Field Functions

It is possible that some reorganization and reassignment of functions would help in attaining better co-ordination. One suggestion from the field contemplates putting all field personnel under three or more grades as wildlife area managers and assigning them all of the field duties, including protection, instead of organizing field activity on a subject matter basis. We doubt if this could be applied without exception, but we do recommend serious consideration of a plan for consolidating unit managers and patrol captains positions into one unit manager position and having the unit manager serve as supervising officer of all game management and enforcement activity. The mistake should not be made of interpreting the use of the term "unit" here in the same sense that it is now applied to game management units.

The "unit" plan of handling field activity seems to be working out well. It is, however, new and should be watched carefully, mainly to avoid setting up a standard pattern of in-unit organization based on subject matter groupings regardless of workload. For example, the question is raised whether all areas require separate waterfowl, pheasant, deer, etc., supervisory positions. While this is not necessarily the case in all units, still we believe there are places where further combining of two or more of these groups could be made under one supervisory setup and the number of positions reduced. Such a study should include also a thorough analysis to determine the possibility of segregating out a considerable amount of detailed and routine work such as inspections, banding, maintenance of guzzlers, public contacts, and so forth, and of reassigning these details to wardens, area managers and other fieldworkers. The objective should be to lighten the regional load of supervision so as to eliminate the position of assistant regional game manager.

A review of the organization charts of the game management branch leaves the impression of a heavy load of game managers. This no doubt occurs because the state civil service designations are used on these charts. About the only designation for biologists or fieldworkers is that of "game manager" of various grades. Without detailed study, this appears confusing and gives the impression that there is a whole corps of supervisors who supervise themselves. If the chart designation were on an actual functional basis, the picture given would be more accurate and better understood. The subject of departmental organization is discussed in detail in Chapter XII.

5. Consider a Consolidation of All Research Activities Under One Head

It is natural that, with the federal aid programs in fisheries and game management evolving as they have over a period of years, and with the department's own program developing as it has, research work, in trying to keep pace, has been organized without too much long-range planning. We feel the time has arrived when the whole research field should be reviewed with a view to consolidation into one branch.

Organized as it is under several different administrative directives, there is bound to be duplication in the overall structure. Such a move will no doubt meet with resistance, because each field has a certain amount of pride in its own organization and fears overshadowing if combined with another. We see no reason why this should be. It would seem that there is so much similarity in both federal aid programs, especially in research administration and perhaps even in other parts of the two programs, that consideration might well be given to a consolidated administrative setup for federal aid, instead of two separate structures. We believe this would lead to the possibility of eliminating several positions at the coordination or supervisory level. This study should include the present central office group now operating in an overall supervisory capacity.

Chapter XII, Departmental Organization, discusses this subject in relation to total department organization.

6. Implement a Stronger Public Information and Education Program

There is a definite necessity to increase the public acceptance of commission regulations and policies. Earlier in this report, some of the reasons for the present failure to gain wide public acceptance of wildlife management policies and programs are discussed. Perhaps one of the most important factors is that of inadequate public relations effort. It is not peculiar to California that many recent regulations proposals are not in keeping with what has been previously accepted as proper regulation. Even game managers are likely to forget that it may have taken them several years to convince themselves that their former concepts were not sound. It is not surprising, then, that the public is resistant to changes, especially if they depart rather radically from ideas that have persisted over a long period.

The public must be prepared for such changes, and to prepare them may require some time. It requires further a thorough plan of educational and informational effort. This needs to be more than a newspaper and magazine campaign. It needs first of all a thorough selling job to the department itself. It needs diligent effort by way of personal contacts, meetings and continual projection of ideas. We think failure to exercise the patience necessary to condition public thinking is one of the biggest factors in the turmoil created by some of the commission's actions. This sort of program is not propaganda. The public, by and large, wants sound game management and usually will respond wisely if given time to analyze the reasons for game management recommendations and to understand the soundness of any proposal. Chapter IX, Conservation Education, discusses this subject at length.

The department, through its field investigations and research programs, has done a commendable job in establishing a fund of reliable knowledge upon which to establish a sound basic upland game management program. However, the application of this fundamental knowledge has not been as effective as it should be. Too frequently the test for establishing practices seems to be simply whether the public understands and wants them at that moment, not whether they are sound game management in the long run.

Certain programs involving artificial propagation and release of pheasant have become so firmly established that modification or elimination of them would be difficult. If the public decides that these programs should be continued, they should be on a fully self-supporting basis and should be controlled so as not to infringe upon the rights of the general public.

Most important to the resolution of this and other problems is the pressing need for the department to gain greater public acceptance of sound game management programs through an effective information and education program. The public usually will respond wisely if given the pertinent facts and the necessary time to understand and accept them.

CHAPTER V

INLAND FISHERIES MANAGEMENT

C. J. CAMPBELL

Inland fisheries management has come a long way since individual states first began issuing licenses and hiring game wardens. Bag limits and closed seasons were perhaps the first steps taken, and today these tools are still in use but are modified, aided and supplemented by a considerably increased store of knowledge concerning fish and their needs. This store of knowledge, while large in comparison to that of 50 years ago, is still not enough to provide answers to all our questions. Management has come a long way but still has a long way to go.

Logically enough, when people found that losses among newly hatched fish were high in nature, they decided that by producing large numbers of fry in hatcheries and putting them in the streams they could produce more fish and better fishing. Millions of fish and many dollars were spent in this way. Gradually it was learned that waters have a definite productive capacity and the planting of additional small fish will not increase the productive capacity of a stream. Fry and fingerling plants in streams are now largely a thing of the past in most trout-producing states. Improved hatchery techniques have permitted the raising of fish in large numbers to substantial sizes. These large, artificially produced fish can be used where economic and sociologic circumstances warrant to produce fishing over and above this natural productivity.

Small fish planting still has its place primarily in lakes where natural reproduction opportunities are not adequate to realize the productive potential of the water. Many high lakes and numerous reservoirs fall into this category.

Another step taken in fisheries management was the introduction of species not native to the area involved. In early days a great deal was learned about this through trial and error. Thus, we obtained the carp that has been a thorn in the fisheries manager's flesh ever since, but we also obtained the black bass and the eastern brook trout and others that are popular game fish. Since then, much has been learned about the ecology and habits of fishes, but introductions still have an element of trial and error.

After years of continually reducing bag limits and open seasons more or less indiscriminately, recent trends, based on the results of carefully controlled investigations and experiments, are to liberalize both seasons and bag limits in many states. These studies have shown that some fisheries can support greater harvests without impairing the supply. Warm water fisheries are most apt to fall into this category. Some states have abolished all seasons and limits on some fish, while other states have found that conditions may warrant relaxation of regulation but to a lesser extent.

More and more management began to include the research and investigative work necessary to find valid answers and develop usable tools. The day-to-day procedures of protection, raising and planting fish, removing barriers, and similar activities are necessary and justified, but so is the research phase. Without it, the operational phases can go off in unproductive directions or be applied incorrectly. Investigation and research are getting the information and developing the tools needed to put fisheries management on a more firm footing.

1. SCOPE OF THE SURVEY

Senate Concurrent Resolution No. 126 states in part that the studies shall include, but not be limited to, an evaluation of the artificial propagation programs of the Department of Fish and Game in relation to the emphasis on improvement of habitat and natural conditions, and consideration of the department's use of federal aid in Sport Fish Restoration Act Money.

By not limiting the study to specific points, the Senate indicated its realization that a proper perspective requires attention to other phases as well. To understand these facets of the inland fisheries program, we must also understand related matters of organization and such interrelated programs as water projects and pollution. Consequently, all aspects of inland fisheries management come within the scope of this survey, with greatest emphasis on the specified points.

2. CONDUCT OF THE SURVEY

Since all activities of the inland fisheries function are involved, it was deemed advisable to obtain a wide view of the actual field conditions and operations. Itineraries were planned to include the most points of interest with the least amount of backtracking and lost motion. Local travel with department personnel permitted considerable discussion of programs and projects with the people operating them.

All hatchery installations were visited and the most representative areas of each region were surveyed. Major reservoirs, natural lakes of special interest, representative large and small streams, logging areas, present and planned water project sites, and department installations from Oregon to Mexico and from the Pacific to Nevada were covered. One major excep-

tion was the High Sierra lakes which were still snowbound and inaccessible at the time of the field survey.

It was evident throughout that May and early June of 1958 was not the time to be most impressed by problems of minimum water supplies and related difficulties. A long dry cycle was broken this winter with rains far in excess of normal and a heavy snow pack. Streams normally low at this time and dry or intermittent later were flowing copious quantities of fine-looking water, and we were constantly being asked to imagine areas as they would appear later in the summer and fall.

Reports and publications of the inland fisheries branch were reviewed and drawn upon heavily in the survey.

As time permitted, interviews were obtained with interested people outside the department. Generally such contacts were made with individuals who were in a position to speak for groups of sportsmen or organizations.

Throughout the survey, all those concerned, both in and out of the department, showed keen interest and a sincere desire to help. Without the complete cooperation given by the Fish and Game people, frequently on their own time, the survey would have been much more difficult.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

California is in an era of tremendous and dynamic change. Human population increase is so rapid as to appear explosive, and pressure for water for many varied uses approaches the unbelievable. The preoccupation of the State with water and its distribution results in much planning for and construction of water developments. The population increase results in an increasing demand for the provision of fishing at the same time that water, the essential basic raw material for producing angling, is being changed and manipulated with great enthusiasm by numerous organizations and agencies.

The Inland Fisheries Branch of the Department of Fish and Game is staffed by capable, conscientious people who have developed a program well fitted to California's problems and situations. Against considerable odds the branch (supported by the department) has been avoiding further increase in the physical plant for producing catchable trout with its attendant increase in operation expense. If more money beyond that necessary to overcome the recent deficit spending becomes available, the expansion of activities such as warm water fish research, water projects and pollution, and reservoir management should take priority over an increased catchable trout program.

On the whole, a fair balance among the various necessary activities is being maintained. Areas or functions not receiving the emphasis they need are generally recognized by branch personnel, and plans for rectification are being made. That the inland fisheries program is not seriously out of line is attested by the relative lack of severe criticism and complaint from the angling public directed at this activity.

One of the most valuable things that could be done for the inland fisheries program would be to acknowledge the soundness of the work being done, and to give encouragement and support to the dedicated people carrying out this work. Some program modifications and shifts of emphasis would be desirable, but no major changes or program reversals are necessary or advisable at this time.

4. SPECIFIC PROBLEMS IDENTIFIED

As a result of the general survey of the policies and programs of the department, several fields of activity were noted as those having problems or being the subject of various controversies. These fall into natural groupings and are listed for ease of recognition. They will be treated individually in more detail.

(1) Fish propagation facilities and operations.
(2) Catchable trout program.
(3) Trout program other than catchable.
(4) Salmon and steelhead program.
(5) Warm water fish program.
(6) Habitat and stream improvement.
(7) Federal aid and research.
(8) Water projects and pollution.
(9) Organization.

5. ANALYSIS OF PROBLEMS AND DEVELOPMENT OF RECOMMENDATIONS

(1) *Fish Propagation Facilities and Operations*

It is stated in "California's Fish and Game Program" by Seth Gordon that:

> "The fish hatchery program in this State dates back to 1870. Up to the early 1930s, the officials in charge depended almost wholly on fingerling stocking programs. Even then they were slow to follow the example of other states in the matter of stocking catchable-size trout."

This situation has changed substantially at the present time. In 1948, there were 2,169,000 catchables produced and in 1957 this figure was over 7¾ million.

These fish, plus those in other categories, are produced in 17 hatcheries and rearing stations and one additional steelhead egg-taking station. The 17 include an essentially experimental anadromous fish station and a warm water fish hatchery. All hatchery and rearing stations were visited. Several have been built in the last 10 years and some date back over 40 years, but in general the older plants are those which were capable of efficient production and which have been expanded and modernized. The newer ones em-

body construction features and laborsaving devices that have been developed as they were being constructed.

An integral part of hatchery operation as carried out in California is the distribution of the hatchery product to the streams and lakes. This requires manpower and equipment, and the costs involved become part of the cost of producing the fish. The mechanized fish loader and sight gauge for loading fish hauling trucks is an ingenious laborsaving device that has proved its worth in handling the tons of fish involved in hatchery production of this magnitude.

Exhibit XXIII, which follows, lists the fish planted and transferred from the various hatcheries during calendar year 1957 by species, size, categories, and in numbers and pounds. The figures are adapted from a mimeographed leaflet entitled "Trout and Salmon Hatchery Production, 1957 Calendar Year."

The 1950 publication, "California's Fish and Game Program," recommended the closing of 12 of the hatcheries then in operation for various reasons. All of these marginal stations have been discontinued, as well as some others since the 1950 report was written. Since eliminating a fish hatchery from a community, regardless of its efficiency or condition, is one of the more difficult things to accomplish, the department is to be complimented on this streamlining of its operations. It was made possible by the construction, with Wildlife Conservation Board funds, of new high-volume production stations like Darrah Springs and San Joaquin.

One relatively small hatchery that remains is the Sequoia station. Its water supply of one cubic foot per second is entirely pumped. Its cost of production is among the highest of those stations not having brood stock. The 25,000 pounds of production could be taken over by some expansion at the San Joaquin hatchery. A rough estimate, made by regional personnel, of $70,000 capital expenditure would be necessary to accomplish this, after which the same amount of fish would cost two thirds as much, if the production cost at San Joaquin did not change. In 1956-57 Sequoia trout cost $1 per pound and those from San Joaquin $0.66.

Stations such as Fillmore in Southern California where finding any water is a problem are subject to unusual costs. This station lost its surface water supply when springs dried up and had to change to a pumped supply. Constant attention is necessary to keep costs down when pumping expenses must be added. Stations keeping brood stock are subject to higher operating expense also, which is reflected in their cost of production. Mt. Whitney and Mt. Shasta are two examples.

The operation of the hatcheries is generally good. The housekeeping varies some from station to station but is not bad at any and is excellent at several.

The feeding of fish is undergoing rapid change at the present time. After some years of experimenting and feeling the way, dry diets in pellet form are being perfected and brought into use. While such foods cost more per pound than the old standbys of ocean fish and slaughterhouse byproducts, their conversion into fish flesh is much higher, actually making them more economical. They have other advantages such as ease of handling, no need for subzero storage, and clean, waste-free ponds. When people learn to handle them, they are much more satisfactory. Department personnel estimate that annual savings of approximately $100,000 are possible. Such reduction in operating cost is most desirable.

The transition to dry feed is a difficult one to make quickly, but California is making commendable strides. There are difficulties involved in utilizing dry feed both in obtaining a satisfactory product and in developing correct methods of feeding it. In addition, it is necessary to overcome the natural desire of many hatchery men to continue with known means of raising fish in preference to trying new methods.

This experimental work carried out at various places in the State has done much to develop acceptable methods and satisfactory products and to break down resistance to their use. Some stations are fairly close to being 100 percent on dry feeds now and the others are coming along, though some such as Whitney, Hot Creek, and Fish Springs more slowly than is necessary. Within a few years there will be little or no use for the grinders and hydroslicers now common in all hatcheries. California is taking a leading part in developing dry feeds and equipment and techniques for using them successfully.

A system has been worked out whereby a few stations equipped and situated to handle brood stock provide the eggs and fry for all stations. Transfer of eggs and fish between stations is planned in advance so that the most efficient use will be made of each and so that fish of the correct size will be available when and where needed. Such a system is complex and needs constant attention and adjustment, but it appears to be working well. The system crosses regional lines and calls for considerable healthy cooperation and co-ordination among regions.

The cost of fish produced is generally considered an indication of hatchery efficiency. The cost of a pound of fish at California's stations in Fiscal Year 1957 varied from 48 cents to $6.88. The latter figure is from a coastal station constructed on an essentially experimental basis and includes the cost of major flood damage repair. The overall cost statewide was 85 cents per pound. These costs compare favorably with other states and they include costs of getting the fish into the waters—and, in some cases, the costs of pumping the entire hatchery water supply.

EXHIBIT XXIII

Fish Planted and Transferred—1957

Hatchery	Species *	Fingerlings [1] Number	Fingerlings [1] Pounds	Subcatchables [2] Number	Subcatchables [2] Pounds	Catchables [3] Number	Catchables [3] Pounds	Total Number	Total Pounds
Cedar Creek	SH	98,810	1,611	24,052	1,816	39,567	5,027	160,429	8,454
Crystal Lake	RT	26,007	1,464	15,078	1,149	378,564	66,768	419,649	69,381
	CT	---	---	---	---	59	130	59	130
Darrah Springs	RT	1,504,872	13,728	855,155	81,725	1,464,200	207,723	3,824,227	303,176
	SS	---	---	70,070	7,290	29,600	10,000	99,670	17,290
	SH	4,404	14	---	---	---	---	4,404	14
Mt. Shasta	RT	2,865,713	13,087	---	---	370,003	68,066	3,235,716	81,153
	EB	665,882	1,824	---	---	---	---	665,882	1,824
	BN	128,578	309	---	---	1,315	246	129,893	555
	CT	84,840	191	---	---	---	---	84,840	191
	SH	173,100	280	---	---	---	---	173,100	280
	KS	1,482,305	1,478	---	---	---	---	1,482,305	1,478
	SS	50,644	624	---	---	---	---	50,644	624
Central Valleys	SH	93,026	1,227	---	---	---	---	93,026	1,227
	BN	---	---	2,000	200	---	---	2,000	200
Nimbus	SH	763,778	5,796	8,262	553	---	---	772,040	6,349
	KS	210,616	2,303	10,255	1,115	10,324	1,415	231,195	4,833
Kern River	RT	157,398	5,165	---	---	352,361	79,033	509,759	84,198
Moccasin Creek	RT	2,223,586	20,460	22,275	2,475	844,688	248,161	3,090,549	271,096
	EB	91,793	609	---	---	---	---	91,793	609
Moorehouse Springs	RT	1,500	31	---	---	124,581	24,780	126,081	24,811
San Joaquin	RT	2,024,946	9,082	11,088	1,760	893,531	194,476	2,929,565	205,318
	EB	336,757	1,346	---	---	---	---	336,757	1,346
Sequoia	RT	171,893	1,825	61,050	4,150	126,191	23,880	359,134	29,855
Fillmore	RT	473,384	10,330	---	---	312,775	76,270	786,159	86,609
	BN	39,985	269	---	---	---	---	39,985	269
	SH	235,520	663	---	---	---	---	235,520	663
Fish Springs	RT	57,120	3,220	296,770	28,600	790,535	163,892	1,144,425	195,712
Hot Creek	RT	3,285,962	6,149	223,653	22,528	586,663	143,491	4,096,278	172,168
	EB	555,451	1,975	---	---	---	---	555,451	1,975
	BN	253,992	412	---	---	---	---	253,992	412
	CT	403,928	1,044	---	---	---	---	403,928	1,044
	GT	3,528	10	---	---	---	---	3,528	10
Mojave	RT	419,522	14,586	38,000	2,950	1,043,115	226,220	1,500,637	243,756
Mt. Whitney	RT	1,000,597	2,512	8,181	1,010	463,494	114,508	1,472,272	118,030
	EB	715,180	1,962	---	---	---	---	715,180	1,962
	BN	681,524	817	---	---	5,010	935	686,534	1,752
	GT	156,900	48	---	---	---	---	156,900	48
						157,321	7,836,576	1,715,021	30,983,506	1,998,802
Total	---	21,503,041	126,460	1,645,889					

[1] Fingerlings are fish at 16 per pound or less.
[2] Subcatchables are fish at from 16 per pound to 6 per pound.
[3] Catchables are fish at 4 to 6 per pound, or larger.

* RT—Rainbow
BN—Brown
EB—Eastern Brook
CT—Cutthroat
SH—Steelhead
SS—Silver Salmon
KS—King Salmon
GT—Golden Trout

From a mimeograph leaflet entitled "Trout and Salmon Hatchery Production, 1957 Calendar Year."

The larger stations handling brood stock and large numbers of fish are supervised by a fisheries manager II with a fisheries manager I as assistant, and fish and game assistants and seasonal aides as needed. The other stations are supervised by fisheries manager I with similar assistance. The hatchery supervisors are immediately responsible to a fisheries manager III on the regional level. Two regions have two fisheries managers III, one presumably because of the large geographical distances involved and not because of the number of stations.

Fish disease work is carried on as a part of the hatchery program. Routine preventive treatment and general diagnosis and handling of disease is done at the hatcheries by the hatchery personnel. In addition to this there are three staff positions concerned with disease detection, prevention and cure. They are available for consultation and assistance in case of trouble at any station. These employees, one of whom is stationed in Region V, also make inspections at border stations of all live fish being brought into the State. Inspections are made by prior arrangement with the shipper, who pays a fee to cover the cost of this service to the State.

The trouble-shooting nature of this disease work, plus the time consumed in the border inspections, leaves little opportunity for research in this field. Neither does it allow for regular inspections at the stations with attendant opportunities for assisting the hatcherymen in disease recognition and prophylaxis. Warm waters are more conducive to the growth and spread of disease organisms, and most of California's stations have relatively warm water. With large numbers of fish in warm and limited water supplies, disease can spread rapidly and disastrously if it gets started. Emphasis must be on prevention rather than cure. Frequent examinations by a disease specialist would be good insurance and would aid the hatcherymen in keeping up to date on recognition and treatment.

A great deal could be written about the hatchery program, even as the result of such a cursory inspection. However, it should suffice to note that the character of the work is generally good, methods in most instances are progressive, and new methods and equipment such as drip incubators for hatching eggs, mechanical loaders, pellet feeders, and other labor-saving devices are being developed and used. That the product is good at least from one station is indicated by the following from "A Six-Year Study of the Survival and Vitality of Hatchery-Reared Rainbow Trout of Catchable Size in Convict Creek, California," by Reed S. Neilson, Norman Reimers, and Harry D. Kennedy of the United States Fish and Wildlife Service:

> "It is evident from these experiments that rainbow trout hatched and reared to catchable size at Hot Creek Hatchery, of both fall-spawning and spring-spawning stock, exhibited an ability to survive equal to that of resident wild brown trout of comparable size."

RECOMMENDATIONS

1. **The Dry Feeding Program Should Be Accelerated**

   The dry feeding program should be accelerated in those areas where acceptance has been slow. This will result in more efficient and economical operation as well as uniformity among stations.

2. **The Sequoia Hatchery Should Be Discontinued**

   Sequoia Hatchery, because of its small pumped water supply and high cost of production, should eventually be discontinued and its production taken over by San Joaquin. This will require a capital outlay of about $70,000 and should result in a net annual production and distribution cost saving of about $8,500.

3. **Disease Prevention Activities Should Be Increased**

   If increased funds become available, add another disease specialist to the staff so that periodic examinations can be made at the stations. The danger of severe disease outbreak will be reduced, both by the inspections and by the increased awareness of and knowledge about disease that will become available to the hatchery personnel.

(2) *Catchable Trout Program*

One phase of California's fisheries program upon which nearly everyone has opinions is the catchable trout or "put and take" fishing program. One conviction seems to be shared by all, regardless of other thoughts on the question, and that is that it cannot be discontinued. There is no question but that it provides a service desired by many people that cannot be supplied by other forms of management.

The catchable fish program is not fish management nor fish conservation in the usual sense of these terms. It has little or no relation to the natural productivity of waters and, in some instances, not much to their suitability for trout. It is simply a recreation program and should be recognized as such. Trout are raised to a size acceptable to the angler and are planted with the intention that they be caught within a short time.

Fish and Game Commission policy on catchable trout includes the provisions that they average between four and six per pound and that they be planted in such locations that at least 50 percent are caught. They are put in waters easily accessible by car. This provides a type of fishing much different from the trout angling of American tradition, but

one that nevertheless attracts swarms of practitioners. It has attendant evils such as the much disliked and frowned upon practice of hatchery truck following.

Expansion of the hatchery system in terms of production made possible by Wildlife Conservation Board funds from horse racing enabled the catchable program to grow rapidly. The following table shows this increase by fiscal years:

PRODUCTION OF CATCHABLES BY FISCAL YEARS

Year	*Number*	*Pounds*	*Percent of pounds produced to 1951-1952 base year*
1951-1952	3,675,305	539,554	100
1952-1953	4,580,840	747,721	138
1953-1954	5,261,740	796,384	147
1954-1955	7,590,769	1,186,108	220
1955-1956	7,584,721	1,240,576	230
1956-1957	8,034,675	1,627,341	300

As can be seen from this table, production in numbers has tended to level off, although the last year showed a 500,000 gain over the two preceding years. Production in pounds produced has continued to increase substantially.

Since this program is not dependent on the natural productivity of waters and is an artificial recreation program, the only limits are those provided by physical plant capacity and money. The present hatchery system could be expanded, if capital outlay for it were available, but this would increase operational costs still more and certainly not help to cure the deficit spending situation that existed prior to the license cost increase. The cost of the entire hatchery program, not including Nimbus Hatchery (operation paid for by the Bureau of Reclamation) and Central Valleys Hatchery (warm water fish), in Fiscal Year 1956-1957 was $1,530,278. About $1,250,000 of this is chargeable to the catchable trout and salmon.[1] This represents nearly 15 percent of the total Fish and Game Preservation Fund budget of $8,464,357 for the whole department for that fiscal year.[2]

The first responsibility of a fish and game department is the conservation and management of the fish and wildlife resource. The handling of an artificial program, such as that of the catchable trout, may properly become a duty of the department, but it should not be allowed to jeopardize that primary responsibility. Further expansion with increased demands on the financial structure would do just that. There are other things, such as correct handling of water project problems and reservoir management, much more important, in fact essential to the future of California's fishery resource.

The program can be improved without expansion, and steps to do so should be taken or continued. Distribution of the catch among the greatest possible number of anglers is an important aim for such a program. As far as possible, all those buying a license and desiring to catch these fish should have equal opportunity to do so. Work is under way to learn better methods of accomplishing this and it should be continued until answers are obtained.

One of the most obvious things that could be done to help spread the catch of these fish is the imposition of a more realistic bag limit. If we accept the position that the catchable trout program is a recreation program, it follows that the main goal is recreation in the form of fishing; but it does not necessarily follow that large numbers of fish must be caught. The fishing and not the fish is the important part of an outing. The presence of fish and a reasonable chance of catching some are necessary to make such recreation desirable, but catching a large number should not be necessary. A limit of 15 fish on a fishery of this nature seems much too large. A reduced limit would tend to spread the catch among more people and would tend to put emphasis on recreation instead of numbers in the bag. Catch figures generally show a high percentage of anglers catching no fish and a small percentage taking limit catches. If the limit is reduced, the expert anglers will take fewer fish leaving more for the less skillful fisherman. Writing of work done on Rush Creek in Mono County, Vestal said, "43 percent of all anglers caught nothing despite the heavy planting program. A reduced bag limit would probably distribute the fish more equitably and give the less expert anglers a better chance."[1]

fish would seem more reasonable for such a program. It would enable a larger number of anglers to catch the limit, a psychological boost regardless of the size of the limit, and should spread the benefits of the program over more of the fishermen.

This reduction would pose enforcement difficulties, particularly as it would apply to just certain waters. A precedent does exist in the five-fish limit at Lake Merced. Perhaps a more acceptable interim measure would be a state-wide 10-trout limit, with exceptions for those waters, generally mountain lakes, where a greater take is desirable for management reasons. It would not, however, alter the need for the eventual further reduction of the limit on catchable trout. For the last fiscal year with complete records, catchable trout cost $0.77 per pound planted in the stream. If 50 percent are caught, this means a cost of $1.54 per pound in the creel or, at five per pound, $4.62 for one 15-fish limit. This figure would be reduced in areas of greater than 50 percent return and increased anywhere it is lower. In any case, a few successful fishing trips more than utilize the revenue from an

[1] Adapted from "California Trout Production and Costs 1956-1957" by Robert Macklin and Robert Tharratt.
[2] From the General Budget, Natural Resources, Page 417.

[1] Elden H. Vestal "Creel Returns From Rush Creek Test Stream, Mono County, California, 1947-1951." California Fish and Game, Vol. 40, No. 2.

A reduction of the bag limit on catchables to five individual $5 fishing license. A reduced limit would help toward correcting this situation.

As previously stated, this program is only limited by production capacity and money. An illustration is the planting of 35,000 trout in a six-acre lake in a season. Certainly there is no relationship to productivity of the water. On this basis, the number of trout that could be utilized in some waters is essentially unlimited. The population pressure is there, and the number to plant becomes an arbitrary matter. The department's plan to aim at a predetermined level of fishing success and to try to handle the available fish so as to provide that level is probably as good as can be applied. Progress is being made in finding ways to accomplish this. If expansion becomes necessary to maintain this level of success and funds are available, it can be accomplished. Fishing quality rather than population increase would be the criterion.

There is a tendency for catchable trout planted in small streams to be caught rather quickly by a relatively few local anglers. This entirely artificial angling should be available to as many anglers as possible. Placing the fish in larger streams and in lakes accessible to more people would help to accomplish this. It would also tend to reduce costs by cutting down on planting expenses as fewer individual trips would be necessary.

Planting methods that tend to even out the catch success will also tend toward better utilization of the catchable trout. Progress is being made along these lines and, in general, points toward more frequent releases of smaller numbers. This will increase planting costs but will spread the available fish over more water as less fish are required to produce the same average level of fishing success in a given area.

Catchable trout should not be used to provide fishing in waters where reasonable angling for existing pressures is supported by natural reproduction or through fingerling plants. They should be used where water conditions are adequate to support trout for at least part of the year and pressure is heavy enough to remove most of them within a short time. Southern California, with a very small proportion of the State's water but a large proportion of its population, provides these conditions. Consequently the number of catchable trout planted in Southern California is out of proportion to the amount of water but not to the amount of population and fishing pressure.

Catchables are planted in most waters of Northern California that meet the policy criteria of accessibility and angling pressure. A product of this kind cannot or should not be apportioned on geographical lines but in such a way that it will be used to the best advantage for the whole State. Neither should the point of production govern planting location. Places where these fish can be produced economically are limited, but transportation of them over long distances is practical.

Allocation of the catchable trout to various areas of the State is determined by representatives of the various regions and the staff who take all factors into account. It is our opinion that a reasonable distribution is resulting, and that no matter what distribution were made it would meet with dissatisfaction in one area or another.

If future expansion of the catchable program becomes advisable, a more direct way of having the participants or those profiting from it support the increase should be developed. The department should not utilize a greater part of its income on this phase of its activities.

RECOMMENDATIONS

1. **Maintain the Present Level of Catchable Trout Production**

   Do not expand the catchable trout program at present in terms of fish or pounds. Better methods are being developed by the department to utilize the present production of catchable trout so as to maintain a more uniform level of fishing quality over a larger area. Later it may be necessary to increase production to maintain fishing quality as the angling pressure increases.

2. **Reduce the Catchable Trout Bag Limit**

   The limit on catchable trout should not be more than five fish. A 10-fish statewide limit with certain exceptions might be a more acceptable interim regulation, but eventually the limit on catchable trout waters should be no more than five.

3. **Plant Catchables More in the Larger Waters Where They Will Be Available to the Most Anglers and Less in the Small Streams**

4. **Do Not Plant Catchables in Waters Where Fishing Can Be Provided by Other Means**

5. **Any Further Expansion of the Catchable Programs Should Pay Its Way**

   It should be supported more directly by those participating in and profiting from it.

(3) *Trout Program Other Than Catchable*

Hatchery-produced catchable trout are not the only type of trout in California by any means. Wild native trout or wild trout descended from introduced ancestors provide greater numbers of fish in the creel than do hatchery-produced fish. They furnish the more traditional type of trout fishing in areas where the angling pressure is not too great. In their restricted range golden trout, the state fish, are in a class by themselves; eastern brook, cutthroat, and brown trout all provide angling in suitable water.

It has been learned from long experience and much investigation in many areas that fingerling planting

of trout in streams is not productive except in unusual circumstances. Perhaps if a stream has lost its population through some natural or man-made disaster, a fingerling plant can help it recover; but beyond this fingerling planting will accomplish little. This is just as true of brown trout as of rainbow or any other species. Planting fingerlings in streams is relatively inexpensive and the numbers involved are impressive, but the actual good accomplished is seldom significant. Fingerling plants are sometimes practically demanded in an area by influential people. This situation will require experimental work such as a marking program or a stream inventory by electrofishing to show conclusively the results of such plantings. There is considerable stream planting of fingerlings in the Inyo-Mono area.

On the other hand, plantings of fingerlings in productive lakes and reservoirs can be most rewarding when ecological conditions are conducive to good fingerling growth. When fish can be planted one summer at about one or two per ounce and be taken by the angler the following spring at approximately a pound each, it is good management. There are waters where this can be and is being done. Generally, such results are most likely to be obtainable from rainbow plants. High, inaccessible mountain lakes are obviously not catchable trout waters, but fingerling plants generally provide angling in them for those who make the effort to reach them. Eastern brook trout, rainbow, cutthroat, and goldens all have their place in this program. It is these fingerling plants in suitable waters that support a large share of the fishing. It is a method by which a great deal of angling can be provided economically and ways to expand the program should be sought. Cold water reservoirs, present and future, offer a potentially productive field here.

Where brown trout are established, they will continue to furnish angling for the expert fisherman for a long time. They are not easily caught and tend to persist, and perhaps because they are less easily taken are highly valued by a segment of the anglers. However, in most lakes they tend to eventually result in a small population of large individuals, seldom caught, and one that severely reduces the possibility of producing other fishing in the body of water. Thus, they do not tend to help produce the most fishing for the most people. There is some evidence being accumulated that catchable browns may be caught over a longer period, and a limited use for them in some areas may develop. Brown fingerling planting is no more productive of results in streams than that of other species.

A catchable program to be feasible must utilize fish that can be readily raised in large numbers in hatcheries. The rainbow being used meets these qualifications much more fully than does the brown, and is superior for the purpose. It is possible that, if browns were bred for catchable programs, in a few years much of the qualities of wariness for which their devotees admire them would be lost.

Kokanee, which are a landlocked form of the sockeye salmon, have been introduced in some waters and provide excellent angling when conditions are right. It is probable that more waters in the State have suitable conditions and that Kokanee introductions could add to their angling production. Where spawning areas exist, this species frequently becomes self-sustaining and, in any case, is generally susceptible to management by fry plants.

The use of trout other than catchable rainbow is an important facet of the inland fisheries picture. Methods of utilizing fingerlings should be developed in order to provide more fishing economically. Other species than rainbow are not generally adaptable to catchable programs but are of prime importance in furnishing some variety in trout fishing and in making the best use of varying waters.

RECOMMENDATIONS

1. **Maintain Sufficient Brown Trout to Replace Populations Lost by Disaster and to Complete Current Investigative Work Using Them**
2. **Continue the Program of Fingerling Plants of Eastern Brook, Cutthroats, and Goldens in Suitable Waters**
3. **Expand Kokanee Operations as Rapidly as Suitable Waters Are Found**
4. **Plan and Carry Out a Program to Demonstrate the Results of the Fingerling Planting in Inyo-Mono Area Streams. Base Future Management on the Outcome of This Work**

(4) *Salmon and Steelhead Program*

Anadromous fish, since they spend part of their lives at sea and part in fresh water, become involved with both the Inland Fisheries Branch and with Marine Resources. Generally king (chinook) salmon have been handled by the marine group and steelhead trout by inland fisheries, and all hatchery operations have been under the latter. The position of silver salmon which are now being raised and investigated is not clear except that in the hatcheries they are under the inland branch.

Steelhead and salmon frequently use the same streams for spawning, and factors affecting one will affect the other. Steelhead are caught on sport gear in the streams as adults and as immature downstream migrants. The king salmon are taken on sport gear in the rivers and by party boats and skiff fisheries offshore as well as commercially by offshore trollers.

These species are affected by changes in their fresh water environment, and fresh water environmental factors are more subject to man's control than are the marine ones. Pollution of streams by industrial or

domestic wastes may kill fish from direct toxic effects or by removal of essential oxygen. An area of polluted water in an anadromous fish stream may be as serious as pollution of the entire stream, as it forms a block to travel through the stream essential to the life cycle of these species. The problem of pollution is covered more fully in Chapter VII, Water Projects, Pollution and Salmon-Steelhead Management.

The reduction of stream flows through storage or diversion for irrigation, power development or other purposes may expose spawning beds, make migration impossible, or result in excessively high temperatures. The amount of available rearing area is also reduced. Sometimes stream flows below storage or diversion structures are fluctuated violently and small fish are stranded in pockets and shallow areas when the water level recedes. The time to assure adequate flows and water-level regulation is when a water project is being planned. A change in operation is more difficult to negotiate once a project is built.

Barriers, either natural or artificial, between the ocean and spawning grounds reduce the reproductive potential of a stream. Migration may be blocked just as effectively by an accumulation of logging debris as by a high concrete dam. If the adult fish cannot ascend the stream, they cannot reach their spawning areas and complete their life cycle. Retaining natural spawning and rearing areas of anadromous fish in production is the biggest single factor in maintaining these species; therefore, the removal or laddering of barriers is important.

Diversions for irrigation or power may carry downstream migrating young salmon and steelhead onto the fields or through turbines, thereby reducing the numbers reaching the sea and the potential number of returning adults. California has accomplished a great deal in the installation of ladders and screens, but more remains to be done. Problems very difficult of solution are involved in most instances, some of which are technical and mechanical, some legal and many financial. For instance, the Glenn-Colusa Canal diverts about 2,100 cubic feet per second of water from the Sacramento River and, according to department personnel, takes substantial numbers of fish. No way is known to screen it successfully at its point of diversion because of the type of structure and the characteristics of the terrain involved. Any method at any location will be extremely expensive, and the cost must be borne by the department since a device was once installed by the canal operators that, while it was unsuccessful, fulfilled their legal obligations. More adequate legislation may be needed as is indicated by department personnel (Outdoor California, Vol. 19, No. 3, March 1958 "Report Cites Salmon Woes, Suggests Solutions"). Chapter VII, Water Projects, Pollution and Salmon-Steelhead Management, treats this subject more fully.

Watersheds are subject to deterioration by unwise use. Logging done on a cut-out and get-out basis with little or no thought given to other values of the watershed may result in severe erosion. This erosion fills in pools and buries spawning riffles with silt and fine shifting rubble. When this happens, as it has on numerous north coast streams, the adult fish cannot spawn successfully and the stream cannot provide either food or satisfactory rearing area for young fish. Control of these activities is not easy. Much of it is on private land, and a great deal of time and manpower must be expended to make successful court cases when existing laws are violated. When a case can be made, the damage has probably already been done and its main value may be as a deterrent to someone else or to repetition.

Gravel operations reduce fish production by direct removal of gravel from spawning areas and by silt pollution which destroys utility of spawning gravel and reduces production of fish food.

The department has been carrying on a good campaign for better watershed use and for better logging practices. This should accomplish a great deal by focusing public attention on the problem and by showing how fish production and other uses can be compatible.

There has been progress in aiding the Sacramento steelhead through artificial propagation in recent years, and this is becoming a more valuable adjunct to natural production than it has been in the past. Investigations are under way to see if the same can be done on the coastal streams. The Cedar Creek experimental hatchery is producing fish for this purpose. As hatcheries on coastal streams are apt to be, Cedar Creek is beset by fluctuating water and temperature difficulties resulting in high production costs, so far at least. If it is determined that salmon and steelhead can be materially aided on coastal streams by artificial propagation, the possibility of raising the fish at more dependable inland stations could be considered. The additional cost of transportation might be far outweighed by the more difficult operations and danger of loss at coastal stations.

A possible aid to maintaining anadromous fish may be developed in impoundment rearing of these fish. It has not yet been thoroughly tested, but it offers sufficient hope that more work should be done on it. In essence an impoundment, from several acres to a hundred or more acres in size, is constructed or acquired and used to rear salmon or steelhead fry to migrating size. These can be located almost anywhere in anadromous fish watersheds where correctly situated land can be obtained. Fish, particularly silver salmon, have been found to grow rapidly—and cheaply—under such conditions. Other states are planning such rearing impoundments. The product of this natural type of rearing should be better equipped for survival than that from a hatchery.

The fact that anadromous species roam so far during their life cycles is no doubt responsible for the confusion that is generally found in administration of this resource. California is not unique in this regard. However, both marine and inland fisheries are under one department here and it should be easier to effect wise management for the benefit of the resource under that condition than it is where they are separated into different agencies entirely. The management of anadromous fish should be guided by what will benefit and maintain the resource and not by partisan pressures from any special interests.

The administrative problems resulting from the presently split responsibility for anadromous fish between the inland fisheries and marine resources functions is discussed fully in Chapter VII, Water Projects, Pollution and Salmon-Steelhead Management. The salmon program also receives further treatment in Chapter VI, Marine Fisheries Management.

Any analysis of the situation in which anadromous fish find themselves indicates that, regardless of the type of administrative machinery, regardless of who harvests them by what means, and regardless of who produces them in what hatchery, their future depends on maintaining a stream environment in which they can live, reproduce and migrate successfully.

RECOMMENDATIONS

1. **Continue, and Where Possible, Strengthen the Campaign for Better Watershed Use Practices**

   Public understanding of the need for good watershed management, and public demand that it be practiced, will result in better salmon and steelhead production.

2. **Continue and, If Possible, Accelerate Stream Clearance and Barrier Removal in Steelhead and Salmon Streams**

   The making of all posible spawning area accessible and productive is essential to the maintenance of this resource.

3. **Consider Raising Salmon and Steelhead at More Secure Inland Stations and Transporting Them to Coastal Streams Once the Best Methods for Handling Them Have Been Determined**

4. **Investigate, and If Suitable Locations Can Be Found, Try Impoundment Rearing of Anadromous Fish**

   If successful, this method of raising salmon and steelhead that is now being developed will produce substantial numbers of well-conditioned fish at migratory size, and do it economically.

5. Prepare a Comprehensive Program for Screening Diversions

   Compile the information available on unscreened diversions. From this compilation determine those that should be screened and the problems that are preventing screening. Use this material to draw up a realistic program of needed screen projects that can be used as a work plan and to sell its desirability to landowners, sportsmen, and legislators.

(5) *Warm Water Fish Program*

California has a rapidly increasing number of fishermen and a considerable number of present and incipient reservoirs with conditions more or less suitable for warm water game fish. These warm water fish can satisfy a large part of the angling demand and at more reasonable cost than raising and planting catchable trout. The contribution of the bass, bluegill, crappie, and catfish should not be played down. A recent survey made on seven warm water lakes and reservoirs [1] indicated that the average expenditure of anglers interviewed was $12.60 for a day's fishing for these species. On this basis, the total annual recreational value statewide was computed at over $46,000,000.

These figures point up the large part these fish now play in the angling scene and hint at what they may do for the State in the future. Isabella Reservoir on the Kern River had anglers and campers estimated in the tens of thousands on and around it on Memorial Day, and its fishery is primarily for warm water species.

In spite of this importance to the angling future, there is still very little factual knowledge for warm water fish management in western waters. Admittedly, many present reservoirs have widely fluctuating water levels and warm water populations are generally more complex than those of trout; but these should be reasons for more intense work in learning what is necessary to manage them effectively.

Many staff investigations have been relatively short term and lack continuity. There are no instances, with the possible exception of the Colorado River work and the work in the San Joaquin-Sacramento Delta area, where a warm water fishery has been closely followed sufficiently long to find out what makes it tick. The time, personnel and money devoted to warm water fish work have not been enough to accomplish this. It is remarkable that as much information of value to management has been obtained as there has, and the Colorado River studies, culminating in introduction of the thread fin shad, appear to be an unqualified success at this point.

If the fishery programs within regions were on a more nearly unit basis, the compiling of inventory data on various warm water lakes and reservoirs could be expedited and the available information that will eventually lead to solutions be obtained more quickly. With all or nearly all fishery personnel based

[1] "Economic Value of Warm Water Sport Fishing in California Lakes and Reservoirs"—J. B. Kimsey and Chris J. Axelgard.

in the regional headquarters, it is difficult for them to provide any continuity of observations on a single water. A start at putting fishery men out in areas has been made in some regions, but not in others.

Lakes or reservoirs with good populations of warm water fishes and satisfactory fisheries should be inventoried as well as those with problems. This does not seem to be done to any great extent at present.

One warm water fish hatchery is located in Region 2 and serves also as a holding depot for salvaged fish being held for distribution. Personnel at this station also work with other private ponds in the area in producing warm water fish available for transfer. They participate in recently commenced warm water inventory work on certain reservoirs in the vicinity as well.

This one warm water hatchery is sufficient for the entire needs of the State, as fortunately warm water fish, once established sustain themselves. Of interest is the success being realized in the early stages of propagation of channel catfish at this station.

Mention should be made of the use of municipal supply reservoirs for angling purposes in Southern California. These are warm water game fish reservoirs in which the public is allowed to fish under regulated conditions. San Diego pioneered in this field and has had such a program for 45 years. Water contact recreation such as swimming or water skiing is not allowed and sanitary regulations are strictly enforced. In an area where water is at a premium, such a program is of tremendous value. The practice is slowly spreading in the State over the understandable fears of those in charge of domestic water supplies. San Diego and others have shown that it can be done and these programs should be fostered and encouraged wherever the opportunity is available.

Bodies of water that fluctuate widely, as most flood control and irrigation reservoirs do, are difficult to manage and are seldom as productive as nonfluctuating ones. Relatively small lakes or impoundments of stable water level can provide a surprisingly large amount of angling for warm water fish on a sustaining basis. Situations where land and water for such a purpose is available in the southern half of California are rare, but if they can be found and developed they should pay big dividends. Atascadero Lake near Paso Robles is an example of such a lake constructed for recreation by the county.

Further advantage could be taken of the warm water fish and some of the pressure removed from the trout if the angler were made more aware of them. A conservation-education program aimed at telling more people where such fish were, how to find and fish for them, and how to utilize them, would be of great assistance. Warm water information could be included with the data given newspapers on fishing conditions and waters being planted with trout.

An analysis of the information on warm water game fish shows a valuable resource about which an inadequate amount of information is known. Partly because of this and partly because of the popular emphasis on trout fishing, this resource is not realizing its potential.

RECOMMENDATIONS

1. **Look for Opportunities to Construct Stable, Nonfluctuating Warm Water Impoundments**

   Self-sustaining fisheries of considerable magnitude can be developed in this way.

2. **Emphasize Collection of Inventory Data on Warm Water Areas on a Regional Management Basis**

   This can be done as an operational project and will result in accumulation of data that will eventually provide answers.

3. **Instigate a Program to Inform the Anglers of the Benefits Available in Warm Water Fishing and How to Get Them**

   In this way more of the existing potential in the warm water populations can be utilized, and some pressure may be diverted from the trout.

(6) *Habitat and Stream Improvement*

This subject is one that causes a great deal of discussion and one that was specifically mentioned in the Senate Resolution authorizing this survey. It can cover a variety of activities and can be of value under the right circumstances. Activities considered in this category are construction of flow maintenance dams, installation of small pool forming dams and deflectors, laddering and elimination of barriers, and chemical treatment of waters.

Flow Maintenance Dam Construction

The construction of flow maintenance dams at the headwaters of mountain streams is a method of habitat improvement with wide popular appeal. They generally take the form of a dam at the outlet of a lake which increases its volume through stored runoff. The additional water may be released during the low flow period to keep the stream below in a condition to support fish and perhaps fishing. If a stream is prevented from going dry the fish in it are, of course, saved and its aesthetic value is preserved. Its benefits are visible and definite but difficult to measure in terms of dollars. When such a dam can be built at a reasonable cost that will provide sufficient storage to maintain a live stream throughout the summer, it is a good project. However, one that can store only enough water to maintain the stream part of the dry period, or to maintain it with a bare trickle of water, does no significant good for the trout population.

Dams of this type in some instances may be used to increase and maintain the level of a lake. This enlargement and stabilization may increase its productivity and provide more angling.

This program was started in California about 30 years ago and was accelerated when Wildlife Conservation Board funds became available. Current information indicates that 60 of these flow maintenance dams had been constructed by 1956. Steadily rising construction costs have increased the expense of these projects until some sites are not feasible from this standpoint alone. The remaining known sites generally have doubtful possibilities for storing enough water to do any actual good or are exorbitant in cost. It is a good program that is essentially completed.

RECOMMENDATIONS

1. **Keep the Flow Maintenance Dams That Have Been Built in Repair**

   They are making a valuable contribution and their utility should not be lost.

2. **Do Not Overlook New Opportunities for Such Structures**

   From time to time sites may be located where careful investigation will show a flow maintenance dam to be feasible, although most of the satisfactory ones have been utilized.

Stream Improvement Devices

Installation of various types of small dams and current deflectors in streams to form pools and cover is another type of habitat improvement that has been used in various parts of the country. It generally seems more successful in streams of relatively low gradient that are not subject to severe flooding. Most western streams are not of this type. A number of various types of devices have been built in California with varying degrees of success. There is a definite tendency for floods to either wash out the structures or to create new channels around them, leaving them high and dry. Where they do remain in place they are successful in forming pools.

The purpose of such devices is generally to improve habitat and by this means increase the number of fish that will be produced in the stream and become available to the angler. It would be impossible to physically alter California trout streams to the point that they would produce the trout necessary to withstand the angling pressure on those that are available to the public; and it would probably be more expensive than providing trout through hatchery production. Unfortunately, this type of endeavor cannot provide unlimited fishing or make obsolete all trout planting. This again is a program that gives some benefit, but is only economically feasible when it can be done cheaply and generally in only specific locations. There is not opportunity for great expansion of this activity or of substantial savings in the hatchery program because of it.

Stream improvement devices have been built in some Southern California streams that probably do not enable the stream to produce any more trout but do serve a very useful purpose in providing places to plant catchable trout. In effect, they complement the hatchery program by providing waters into which the product can be placed and from which it can be caught. Some of these streams were shallow and fast-running in almost their entire length and offered little place for planting or fishing. However, again, places for such work are limited and most of those that can be profitably treated in this way have been treated. It is also an essentially completed program.

RECOMMENDATIONS

1. **Maintain the Improvement Devices That Have Been Built Successfully**

   They are serving a useful purpose and the work that has gone into them should not be wasted.

2. **In Instances Where New Construction May Prove Desirable, Use Only Structures Proven Stable in California Waters**

Chemical Treatment of Waters

Perhaps the most productive type of habitat improvement for either streams or lakes is the removal of undesirable fish populations by chemical means. California is making good use of this tool and has used it successfully in a large number of lakes and reservoirs as well as some streams like the Russian River. The latest biennial report shows that during 1954-56, 57 reservoirs and lakes and 244.5 miles of stream were treated. The lakes and reservoirs were for the most part small, under 50 acres, except for five in the southern part of the State. The rehabilitation of these areas to game fish has been a major contribution to the fishery.

There are larger lakes, natural and artificial, such as Echo Lake in Region 2, that would benefit from chemical treatment, but it seems difficult for the regions involved to get sufficient funds at one time to take on the larger projects. Treatment may often result in making possible the management of cold water impoundments through fingerling trout plants, and thus the provision of angling at less cost.

RECOMMENDATION

1. **Find Means of Financing Chemical Treatment of Some of the Larger Trash Fish Infested Lakes and Reservoirs That Should be Providing More Fishing**

   Department personnel are the best source of knowledge of which waters would profit from this treatment.

Habitat and stream improvement is an important phase of any fish management program, and all facets from flow maintenance dams to aquatic weed control have a place. However, it is not a complete cure for all ills and cannot replace all other activities. Control of fish populations through chemical means and barrier removal and laddering are the most productive forms in terms of fish produced for the creel. The story on stream improvement work in western waters and its limitations should be disseminated more widely. Opportunity for this type of work is rapidly decreasing while opportunities for chemical control of populations are increasing. When large populations of undesirable fish are removed and the productive potential they heve been using is turned to raising game fish, the angler profits. The chemical control program can stand considerable emphasis.

(7) Federal Aid and Research

The Senate resolution asked that the use of federal aid in Sport Fish Restoration Act funds be considered to see if the best use were being made of them. The State receives about $250,000 annually of such funds. These funds are to be used for fish restoration and management projects concerning sport fish in either marine or fresh water. According to the Dingell-Johnson Act, these projects include:

> "(a) such research into problems of fish management and culture as may be necessary to efficient administration affecting fish resources;
>
> "(b) the acquisition of such facts as are necessary to guide and direct the regulation of fishing by law, including the extent of the fish population, the drain on the fish supply from fishing and/or natural causes, the necessity of legal regulation of fishing, and the effects of any measures of regulation that are applied;
>
> "(c) the formulation and adoption of plans of restocking waters with food and game fishes according to natural areas or districts to which such plans are applicable, together with the acquisition of such facts as are necessary to the formulation, execution, and testing the efficacy of such plans;
>
> "(d) the selection, restoration, rehabilitation, and improvement of areas of water or land adaptable as hatching, feeding, resting, or breeding places for fish including acquisition by purchase, condemnation, lease or gift of such areas or estates or interests therein as are suitable or capable of being made suitable therefor, and the construction thereon or therein of such works as may be necessary to make them available for such purposes, and such preliminary or incidental costs and expenses as may be incurred in and about such works; * * *."

All work done with Dingell-Johnson funds is done under rules and regulations of the Federal Government administered by the Bureau of Sport Fish and Wildlife of the U. S. Fish and Wildlife Service. Preliminary plans must be submitted and approved and periodic reports prepared. All phases are closely supervised by the Fish and Wildlife Service personnel and there is little chance that these funds could be used other than as authorized under the act. However, the act is broad and the states have considerable latitude for determining how the funds will be used in their own particular set of circumstances. Consequently, different states use them for different purposes.

The California Department of Fish and Game determined in a survey that approximately 25 percent of the license holders fish in salt water and 75 percent in fresh water. The Dingell-Johnson funds are divided between marine and fresh water sport fisheries on this basis. It is as good a criterion for the division as any available and, if future information shows a significant change in this trend, the Dingell-Johnson expenditures can be adjusted accordingly. Individual projects are classified as co-ordination, research or development projects. The current division of funds, for all Dingell-Johnson projects between these classifications, as provided by the co-ordinator is as follows:

	Percent
Co-ordination	5.6
Research projects	72.7
Development projects	21.7

The marine projects are handled by the Marine Resources group, and only the flow of necessary paper work is handled by the co-ordinator. The fresh water projects are under the Inland Fisheries Branch and the regions, all co-ordinated and in some cases directed by the Dingell-Johnson co-ordinator. The percentage of available funds allocated between the types of projects for fresh water is:

	Percent
Co-ordination	7.24
Research projects	64.73
Development projects	28.03

The proportion of the funds allocated to research is higher than in the Nation as a whole, but has been so apportioned because of circumstances that do not occur in other states. When Wildlife Conservation Board money became available about 10 years ago it was—and is—earmarked for capital outlay only, and much of it was spent in developing the hatchery system to the point it is today. The hatchery plant requires a considerable sum for operation and maintenance which must come from the support budget. Thus, the Fish and Game Preservation Fund is drawn upon to operate and maintain the capital improvements built by the Wildlife Conservation Board funds. Necessary research was beginning to suffer. Research is specifically one of the purposes for which Dingell-Johnson funds can be used. Wildlife Conservation Board funds were available for capital construction and for land acquisition for fishing access.

It was natural for Dingell-Johnson money to take up the slack. Other states do not have funds like the Wildlife Conservation Board source which can be used for access acquisition and for some types of development. Since California does, it seems wise that the federal money be used to keep the overall program in balance.

The co-ordination project covers the planning of projects, handling of paper work, and liaison between the various interested groups within the State and the Federal Government, and also carries some direct supervision of certain projects. Considering the ramifications involved, the expenditures for this are not out of line.

All development work is done under one general project for stream and lake improvement. Each region carries on a share of the project. Such things as barrier removal, weed control, rough fish control, and construction of flow control devices are done under this project. Actually the Dingell-Johnson money is spread rather thin by the time it gets apportioned among the regions, and the support budget carries part of the load. Dingell-Johnson funds provide enough to plan and head up the projects and buy some materials; but, when something like a sizable lake treatment project comes up, the regions furnish personnel and equipment as needed which is not charged against federal aid. Use of the funds in this way seems to get a considerable amount of such development done, but it is difficult for the regions to handle large projects such as treatment of a major reservoir under this project. It does give all parts of the State some benefit from these funds.

Research work is done under separate projects, which are terminated when completed. According to organizational charts, the co-ordinator is directly responsible for the research projects concerned with trout work and co-ordinates the anadromous fish projects which are under the assistant chief of the Inland Fisheries Branch. In actual practice, project leaders exercise considerable authority and go to the co-ordinator or the assistant chief directly when they so desire regardless of whom they may be under in the organization chart. The flow of paperwork involved is illustrated in a chart included in the marine fisheries chapter and is not repeated here. In practice the Dingell-Johnson co-ordinator directs some projects, advises on others, and sees that the paperwork on all is in a form acceptable to the Fish and Wildlife Service. This is not clear on the organizational charts, nor perhaps in all minds.

The following table shows all Dingell-Johnson projects that have been authorized in the inland Fisheries Branch since they were started in Fiscal Year 1951-52.

There has apparently been no hesitation in closing out a project once its objectives have been reached. There does appear to have been an effort to broaden the scope of projects in order that emphasis on various phases of an overall problem can be varied without the necessity of closing one project and writing a new one. F8R is a project of this class so set up that nearly any phase of trout management can be included. This results in a more satisfactory arrangement for the State, and is apparently compatible with federal requirements.

Organizational and financial lines are sometimes crossed in the prosecution of research projects as well as in those of a developmental nature. Staff men on Dingell-Johnson research projects in some instances direct the activities of people, generally seasonal aids, hired and paid by the regions. Thanks to the people involved, this arrangement seems to work out to the benefit of all concerned.

An analysis of the federal aid in Sport Fish Restoration expenditures in the Inland Fisheries Branch shows nothing seriously wrong. If the Dingell-Johnson program were considered by itself then,

INLAND FISHERIES DINGELL-JOHNSON PROJECTS

Project	*Title*	*Date of inception*	*Present status*	*Current budget**
F2R	A Study of the Catfish Fishery in California	Jan., 1952	Terminated 1956	
F3R	Experimental Back-country Fish Management	April, 1952	Terminated 1954	
F4D	Stream and Lake Improvement	March, 1952	Continuing	$68,600
F6C	Fish Management Co-ordination	Sept., 1952	Continuing	26,300
F7R	Sacramento-San Joaquin Salmon and Steelhead Study	Oct., 1952	Continuing	58,000
F8R	Trout Management Study	Oct., 1953	Continuing	81,700
F9R	A Study of Sturgeon and Striped Bass	July, 1954	Continuing	22,800
F10R	Coastal Streams Anadromous Trout and Salmon Study	Feb., 1955	Continuing	39,500
F11R	Water Problems Study	July, 1954	Terminated	
F13R	Black Bass Tagging Study	July, 1954	Terminated	
F14R	Evaluation of Catchable Trout Stocking	Aug., 1954	Terminated (Activities transferred to FSR)	
F15R	Warm Water Forage Evaluation	May, 1957	Continuing	4,000

* Includes Fish and Game Fund share.

there would be a serious overbalance on the side of research work. But the particular circumstances in California, whereby access and other capital outlay programs are financed otherwise, and support budget funds must go for operation and maintenance, make such a criticism invalid. In general, Inland Fisheries research expenditures are in proper balance with the total Inland Fisheries budget.

The various research projects appear to be well conceived and are being efficiently carried out by capable people. The results are generally applicable to the department's fisheries management work and can be quickly applied to it.

RECOMMENDATIONS

1. **Clarify the Lines of Direct Control of Projects and of Co-ordination of Paperwork Responsibilities**

   The present system works because of personalities rather than organization. If the load increases, consider relieving the co-ordinator of responsibility for direct administration of project.

2. **Plan Ways to Consolidate Development Funds to Accomplish Needed Larger Projects**

   As the backlog of small rehabilitation projects becomes depleted, plan ways to consolidate development funds to accomplish needed larger jobs in the regions, such as Echo Lake in Region 2. The department personnel can identify desirable projects.

3. **Give Greater Emphasis to Research Relating to Utilization of Fingerlings**

   As current trout management research projects are completed, turn these resources to the problems of utilizing fingerlings to better advantage in management.

As noted in the preceding paragraphs, the federal aid program is largely devoted to research, but not all of the department's research and investigation activities are conducted under the federal aid program. Studies concerned with warm water game fish are not included in the Dingell-Johnson work but are financed by support budget money and are supervised entirely by the assistant branch chief.

The section on warm water fisheries pointed out that those species are of major present value and importance, and dependence on them in the future will be even gerater. Each year more water areas suitable for them are being formed and come under the administration of the department as far as their fishing aspects are concerned. Warm water fish populations are generally more complex and difficult to manage, and our knowledge of how to manage them successfully in the West has lagged far behind that concerned with trout.

In spite of the importance of this resource and the paucity of information on it, the personnel assigned and money available to this activity are very limited. This may account for the feeling that most of the warm water fish work is more of a trouble-shooting nature than research. The work leading to the introduction of the thread fin shad as a forage fish in the Colorado River is a notable exception. A perusal of many of the reports resulting from warm water fish research projects shows them to have been the result of a few days or weeks of work. This definitely limits their validity and usefulness.

Fortunately, some work being done by regional personnel as a management activity can supplement the staff research program in warm water fish. This is not the best way to accomplish results, however, as misunderstandings and jealousies of prerogatives are likely to result. Research people see their desired long-term studies disrupted by short-term action programs of regional people who are more under the gun and feel they must do something.

All warm water fish and resident trout research is done from the Sacramento headquarters, or more accurately the Carmichael Laboratory nearby. The anadromous fish work (under the Dingell-Johnson program) is based in the field. Since the actual work is done in the field and field points may be very far apart in California, much time is involved in travel. Also people based in or near a headquarters are more readily available for administrative and trouble-shooting chores at the expense of their research.

Analysis shows that the warm water fish research program has very good men, but too few of them. This resource is of sufficient present and future importance to merit more concentrated effort to improve management techniques.

RECOMMENDATIONS

1. **As Rapidly as Possible, Increase the Effort on Warm Water Fish Research**

   Some of the increased revenues from the increased license cost could well be spent here.

2. **Give Serious Consideration to One or More Projects of a More Long-term Nature With Personnel Based in the Vicinity of the Work**

The line between "research" and "investigation" is a nebulous one and an argument can always be obtained on whether or not some activity should be classed as research or management. Pure research is a search for knowledge for its own sake; applied research is a search for knowledge that can be utilized in solving some known problem. Investigation or management generally is amassing data or information that can be used by known methods to answer an immediate question. Research provides knowledge and methods of using it. Management, by acquiring data, uses the tools provided by research to handle prob-

lems that arise. But, however the definitions are drawn, the boundaries are difficult to maintain in actual practice.

In general, it is hard for a state fish and game department, which must deal with the day-to-day problems and pressures of natural resource administration, to engage in pure research for its own sake, however desirable that might be. By diligent effort the public can be convinced of the value of applied research to fisheries management. It is a pressing need country-wide. Just as in any endeavor, from utilizing crude oil to curing disease, it is research that makes progress possible.

(8) *Water Projects and Pollution*

These two important subjects are handled under a separate staff position on the branch level. They are discussed in Chapter VII, Water Projects, Pollution and Salmon-Steelhead Management, and so will not be covered here, except to emphasize their importance to inland fisheries. Without water sufficiently pure to support aquatic life, there would be no need for the Inland Fisheries Branch.

(9) *Organization*

The Inland Fisheries Branch, like the rest of the department, is organized on a line and staff basis. Line operations are carried out by the five regions, responsible to the deputy director. The staff at the headquarters level also reports to the deputy director.

Each region has an inland fisheries organization consisting of a fisheries management supervisor, one or more fisheries manager III positions, one or more fisheries biologists III, and personnel of lesser grades in numbers depending on the type and extent of operations in the region. In general the fisheries managers III are responsible for the operation of hatcheries and distribution of the fish, and the fisheries biologists III for the field operations in fisheries other than hatcheries. There is a tendency toward too much emphasis on supervisory work and too many levels of supervision.

The regions have considerable authority and responsibility, as was intended. However, there seems to be a tendency for their development to take five different directions which was not intended. After all, it is one department and many things can and should be handled the same in all.

The Inland Fisheries Branch staff in the Sacramento office consists of the branch chief, a fisheries management supervisor with appropriate staff for the hatchery and fish disease program, a fisheries biologist IV, who acts as assistant chief and is responsible for much of the fisheries program, and a second fisheries management supervisor who acts as Dingell-Johnson coordinator and as administrator for part of the research work under that program.

The research program is a staff activity. Work of this nature should have considerable continuity, and people doing research work must be free to concentrate on it. Interruptions and changes of work that are always prevalent in the operational phases of fishery management make impossible an adequate research project. If people in the operational end of things try to carry on a research program, they are continually interrupted by emergencies or jobs that have to be done at once at the expense of the research. Consequently, the research program is not well adapted to administration under the regions.

In addition to the research program, the staff should co-ordinate the whole fisheries program and provide expert assistance in developing such a program. To do so successfully requires an effective system of communications and exchange of information throughout the organization. It is here that some weakness is evident in spite of the development of several groups such as the brood stock committee to co-ordinate and improve fish production and others that have done considerable good.

Chapter XII, Departmental Organization, discusses the operation of the line and staff concept in more detail.

RECOMMENDATIONS

1. **Explore the Possibility of Reducing the Numbers of Supervisory Levels and Personnel in the Operational Phases**

   This could achieve a better balance of expenditure between supervision and actual operation.

2. **Maintain the Research Activity Under Headquarters Administration**

   Research, to be successful, cannot be subjected to the interruption it would encounter under operational phases.

3. **Achieve Greater Uniformity and Co-ordination Through a Better Operation of the Line and Staff Concept**

On the whole, a fair balance is being maintained among the necessary inland fisheries management activities. Perhaps foremost is the need to give added effort to expansion of fisheries which can support themselves in natural habitat. Also of great importance is the need to increase the effort with respect to overcoming water diversion and water pollution problems. Chapter VII treats this latter subject at length.

CHAPTER VI

MARINE FISHERIES MANAGEMENT

M. C. JAMES

Management of California's marine fisheries resources is effected generally by legislative enactments applying to commercial marine fishing. The Fish and Game Commission exercises some minor regulatory powers under specified code sections, such as Section 951.1, governing the shrimp fishery. On the other hand, taking of marine and anadromous fish by angling and taking shellfish for personal use is regulated by the commission.

The department's primary function with respect to marine fisheries is to ascertain, by scientific research, facts concerning the status of the marine resources which will serve as a basis for recommendations for statutory enactments by the Legislature or for the adoption of regulations by the commission. Discharge of this responsibility entails a greater degree of study, investigation and research than is presently exercised in the other areas of departmental interest. There is less opportunity for direct management by the department because of the powers retained by the Legislature and because many marine species are less susceptible to man's directing influences. The organizational units charged with the duty of studying and recommending are the Marine Resources Branch and the Marine Resources Operations.

1. SCOPE OF THE SURVEY

This portion of the survey is primarily directed toward a review and evaluation of the Marine Resources Branch and the Marine Resources Operations in terms of:

(1) Their organizational relationships to other functions and units of the department.
(2) The concepts of the department and of the branch as to necesary and fruitful research or management objectives.
(3) The effectiveness of present objectives and programs in widening the field of knowledge of the marine resources.

It should be mentioned that the language of the resolution which set up the survey did not mention, specifically, any problems involving the marine resources or the commercial fisheries. These subjects are included in the survey for the sake of completeness.

To be realistic and inclusive, the survey could not be limited to consideration of the Marine Resources Branch and of Marine Resources Operations. The welfare of one of the highly important marine fisheries—the ocean commercial troll and sport salmon fishery—is inextricably linked with the management of a segment of the inland sport fishery since they are jointly dependent upon a healthy environment in the coastal watersheds. It was therefore necessary to observe conditions in areas apart from the marine environment.

Since the marine resources activities lead to statutes and regulations governing the fisheries and since these call for enforcement, there was need to review the relationship between the marine resources activities and the wildlife protcetion function in the coastal regions.

The scope of the marine resources survey is further enlarged because the marine resources activities are producing the raw material of scientific data. Scientific findings do not invariably carry their own clear and self-evident conclusions. The results of research are of direct interest to the department at administrative levels; to the Fish and Game Commission; to the committees of the Legislature and to that body as a whole; to the commercial fishing industry; to a vast body of sportsmen and to those who cater to them and to the general public. Thus, dissemination and interpretation of research conclusions become essential if there is to be acceptance of such conclusions leading to their incorporation into rational management measures. This situation compels consideration of the contributions which the Conservation Education Division is making or should be making in providing a general understanding of the complex abstractions of research.

A further broadening of this section of the survey into intradepartmental relationships develops from the federal aid program. The federal aid to fisheries (Dingell-Johnson) program is administered in California to include both marine and inland sport fisheries. Policies as to the allocation of funds for projects within these respective fields as well as the possibility of duplication or overlapping in work performance have significance. The moneys involved are a total of some $350,000 of combined state and federal funds. An inquiry into the marine aspects of this federal aid program was intended to complement similar review in connection with the inland sport fisheries.

It will doubtless be readily recognized that the scope of the marine research normally and naturally extends to fish populations which are not a local California resource in a literal sense. The tropical tunas (yellowfin and skipjack) are caught in overwhelming volume far beyond the shores of the State. Nevertheless, the tunas and other pelagic species which are given to extensive wanderings in the high seas are the basis of fishing and industrial operations which make a California port (San Pedro) the leading fishing port of the Nation.

Evaluation of these collateral factors has required that the survey of the marine resources activities go further than a study of the program, staff, policies, facilities and performance of these separate components of the department.

2. CONDUCT OF THE SURVEY

Source material for the survey has come from diverse origins. Official records of the department were basic material. Interviews and discussions with staff members, both at Sacramento and in the field, were valuable sources of fact and opinion.

The views of certain segments of the commercial fishing industry were solicited through interviews with key individuals. Some concept of the attitude of sportsmen interested in the marine fisheries was obtained by calling upon persons known to be familiar with and concerned about the problems. Several operators of party boats catering to salt water sports fishermen were contacted. A special effort was made to elicit the views of scientists engaged in marine research at California institutions other than the department.

There was no noticeable hesitancy in expressing personal views and opinions as to the program and activities of the department, but there was a lack of outside interest in and familiarity with the precise internal organizational structure. It should be emphasized that these contacts were not made with the intention of conducting an opinion poll as such. Rather, they were an attempt to ascertain if there is a common "outside" cross section of opinion concerning the strengths or weaknesses of the marine resources activities. It can be said that the most consistent views were those expressed by the scientists; but, even here, sharply contrasting opinions exist.

At this point it should be mentioned that the response of the staff was frank and unhesitating. The co-operation received by this writer was beyond criticism, and all individuals contacted seemed to take the position that they welcomed the opportunity to aid in a study which might contribute to greater departmental efficiency and improved programs.

The field itinerary for the marine resources survey was, for obvious reasons, focussed upon the coastal area. The operating units of the marine resources activities are limited in number, in comparison with the field units of other branches which are regionalized. Adequate coverage of marine resources "on-the-job" functions and services could be gained by visits to San Diego and to the nearby marine research activities centered at La Jolla; by longer sojourns at the principal laboratory units of Terminal Island and Stanford University; and by a short visit at Eureka.

As indicated in Section 1 above, it was deemed desirable to get a firsthand picture of the watershed problems which so vitally affect the maintenance of runs of anadromous species. To accomplish this a trip from San Francisco to Eureka was arranged in company with Mr. C. J. Campbell, who conducted the inland fisheries survey. By this means a clear understanding was reached of the problems facing the department in preventing stream damage due to poor logging practices; in improving the normal productivity of streams; in developing fish management programs where new impoundments are created; and in meeting the threats of water diversion and pollution.

The general itinerary shown above permitted contacts with interested persons at the fishing ports of San Diego, San Pedro and Eureka, and with scientists of the Fish and Wildlife Service; Scripps Institution of Oceanography; Inter-American Tropical Tuna Commission; U. C. L. A.; Stanford University; California Academy of Sciences and Humboldt State College. Visits were made to the two department regional offices whose boundaries encompass most of the California coastline.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

(1) *The Approach to Marine Research*

The present Marine Resources Branch is traceable through prototype organizations as far back as 1915.* Any appraisal of present policies and programs can be more revealing by some consideration of the earlier activities of the predecessor organizations. The State Fisheries Laboratory at Terminal Island has long been the core of the State's marine fisheries program and it enjoyed high prestige as a center of progressive statistical and research activities over a long period. Former members of its staff have taken important parts in the development of fisheries science and management in other agencies as they have left the employ of the State. The past record is one of significant influence through the pioneering of statistical and research techniques and by the movement of personnel into other states, the Federal Government and international fisheries organizations. Research operations offer few tests which are measurable by any precise index; relative comparison of the past record with the present status is not valid under any truly objective criteria.

However, it may not be unfair to question whether the present branch programs reflect a tendency to adhere to past policies and to continue the pattern of earlier studies both as to aims and methods, and a hesitancy to adjust to new problems arising from new social and technological developments. In some respects, such a question can be answered affirmatively.

The general pattern of research shows no great change from the approach adopted in the initial era

* A separate administrative subdivision, the Department of Commercial Fisheries, was created in that year. It was subsequently designated as the Bureau of Commercial Fisheries.

of the organization. Reference to Exhibit XXIV, Marine Resources Operations Organizational Chart, March 1, 1958, following this page, shows a series of study projects on 14 different species or groups of fish and shellfish. For comparison, the titles comprising the first 44 numbers of the serial publication "Fish Bulletin," covering the years 1913 to 1935, show reports on 14 different species or groups of fish and shellfish. This list includes many of the species under study in 1958, although they are not completely synonymous. It is to be recognized that the 1958 studies employ techniques, facilities, concepts and financial support which were not available several decades earlier. It can also be conceded that there are still broad gaps in the knowledge concerning these stocks of fish and shellfish, but there is little evidence of any deliberate effort to develop newer approaches.

An alternative to this traditional research upon individual populations would be to focus investigations upon the several marine environments as entities and to extract necessary information regarding individual species or local biota from the more comprehensive data. The latter philosophy of research is not untried; the operations of Scripps Institution of Oceanography, of the Pacific Oceanic Fishery Investigations of the Federal Wildlife Service and of other institutions increasingly emphasized the accumulation of knowledge of broad general marine physical and biological interrelationships.

The question facing the Department of Fish and Game is whether such an approach, lacking any specific priorities, would provide it with the data needed to meet its responsibilities for management and regulation in the interest of maintaining a sustained yield from the marine resources. It is frequently asserted that the research staff is engaged in "putting out fires." This is another way of saying that there is a demand for immediate answers to specific questions; e.g. what measures will stem an apparent decline in salmon stocks. Long-term or basic research into fundamental marine ecology can have no timetable; but the department is confronted with deadlines as a direct result of its role as an action agency. Critics assert that answers have been long delayed under the present regime of studying species separately, and that only superficial answers can be elicited by a constant shifting of research emphasis to populations which "are in trouble."

From observations inside and outside the department, there is indication that the management of the marine resources is under impact of new and acutely troublesome problems. Some of these are the depreciation of fresh water spawning and rearing areas for anadromous fish due to competing water uses; pollution; the development of intensive marine sport fisheries; wide and presently inexplicable variations in the abundance or availability of species supporting prime commercial fisheries; development of new fisheries, e.g. shrimp; and the advent of interstate and international factors in the marine fisheries. The program of the branch or of the department has not been kept fully in alignment with the demands which these new conditions have created. This is particularly true in respect to the watershed problems which have outstripped the resources of the Water Projects Section, which is the mechanism designed to safeguard the endangered aquatic resources.

The creation of the Marine Research Committee (see Appendix A at the end of this chapter) as a separate instrumentality presents additional evidence of conflicting views as to the validity of the general research approach. Possibly it may be said that the broad research policy which the present department and commission inherited and is presently following is one which is overwhelmingly dictated by the fact that research is, under existing statutes (see Appendix B at the end of this chapter), a tool for achieving practical results and is not an end in itself.

If it is accepted that there is, for this reason, no practical choice but to engage in applied research, which means a somewhat piecemeal program of marine investigation, the appraisal can be directed toward:

—Evaluation of present performance within the existing program.

—Determination of desirable and feasible adjustments within existing limitations.

(2) *Evaluation of Present Performance Within the Existing Program*

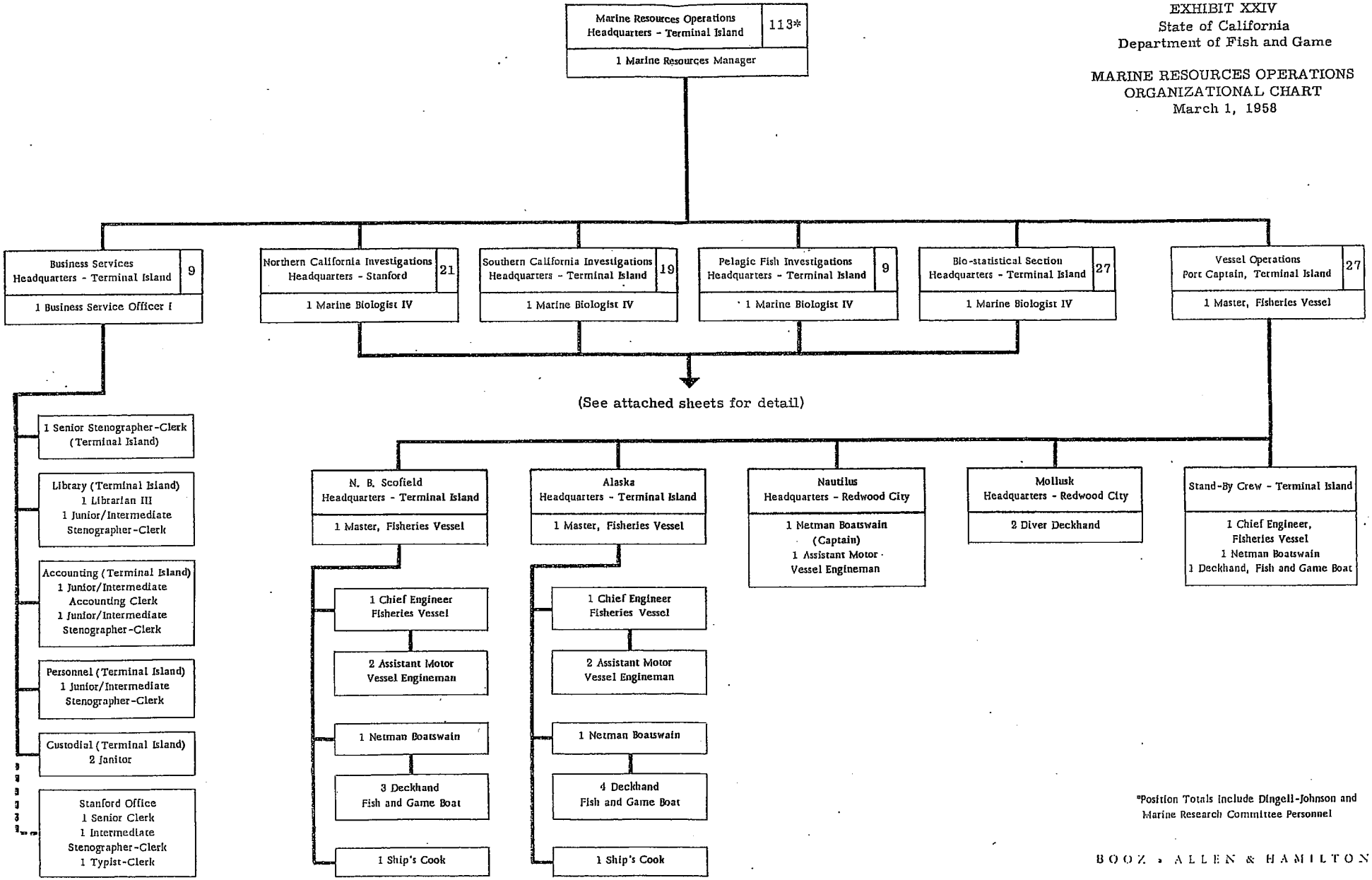
The evaluation of present performance embodies the practical management and administrative aspects. The collection, processing and publication of fishery statistics by marine resources is done with competence and vision. Adequate statistical systems are recognized as the basic element for modern fishery research and the staff and equipment devoted to this function at Terminal Island demonstrate continuing recognition of this primary need. A very recent action in assigning a biometrician and assistant to help design and monitor research projects, from the standpoint of statistical reliability, is evidence of a determination to keep in harmony with modern concepts. No criticism, rather commendation, is merited in appraising the statistical program.

(3) *Desirable and Feasible Adjustments Within Existing Limitations*

Most members of the branch and departmental staff who were interviewed stated that some changes in operating practices and policies are possible and needed. These ideas encompass both the research program and its application. Efforts beyond those now applied by the department are required, according to

EXHIBIT XXIV
State of California
Department of Fish and Game

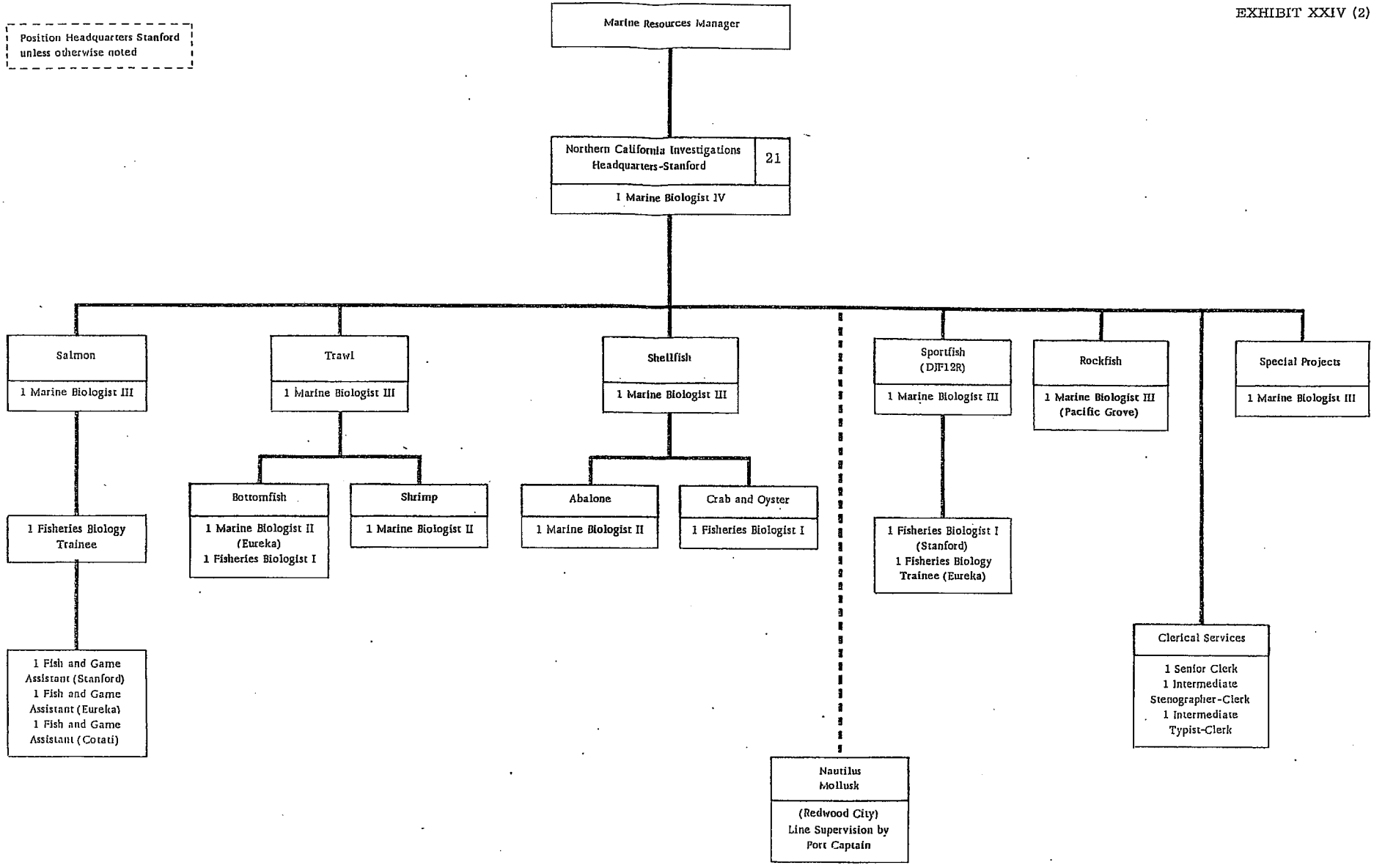
MARINE RESOURCES OPERATIONS ORGANIZATIONAL CHART
March 1, 1958



*Position Totals include Dingell-Johnson and Marine Research Committee Personnel

BOOZ · ALLEN & HAMILTON
MANAGEMENT CONSULTANTS

EXHIBIT XXIV (2)



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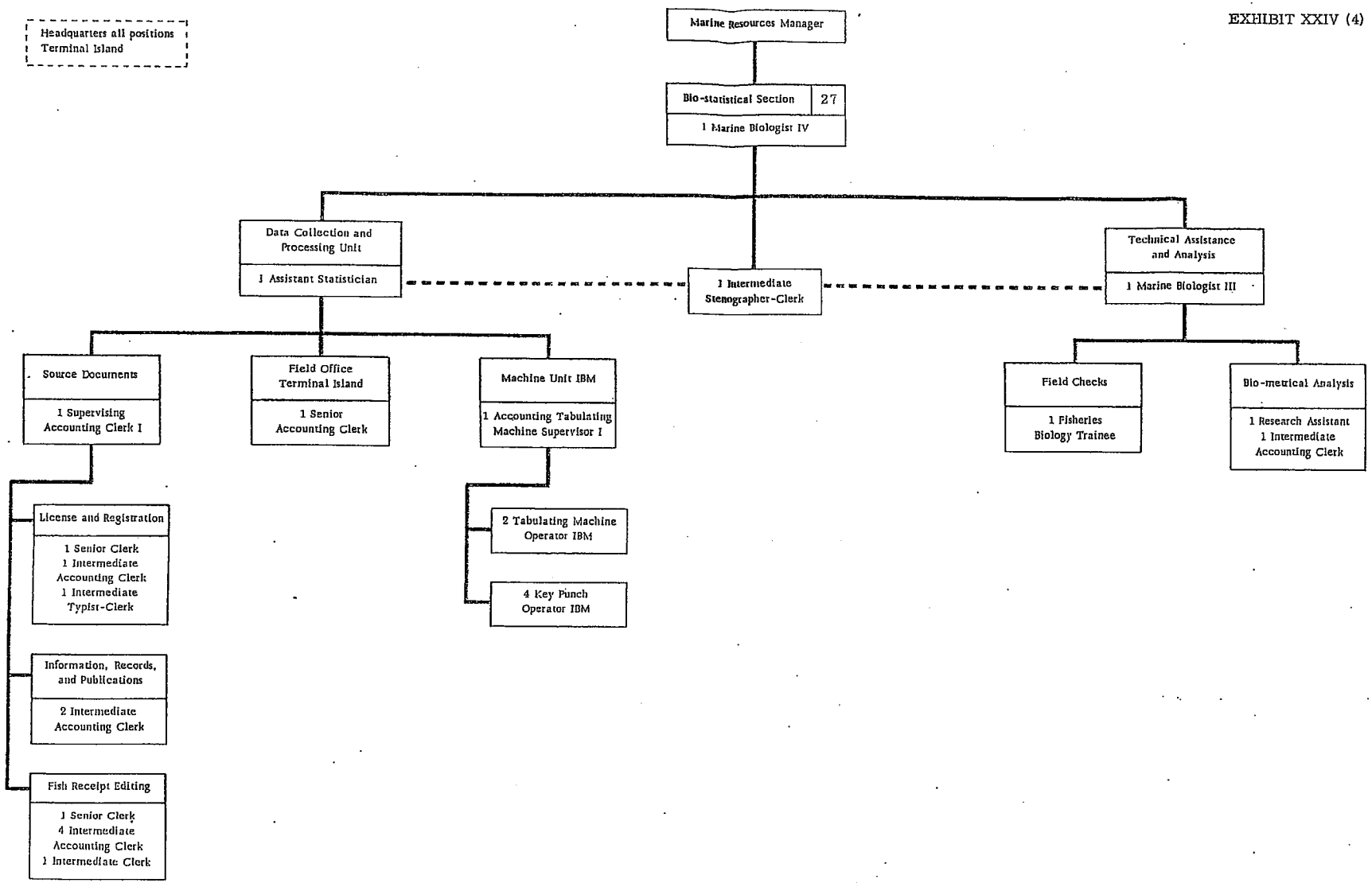

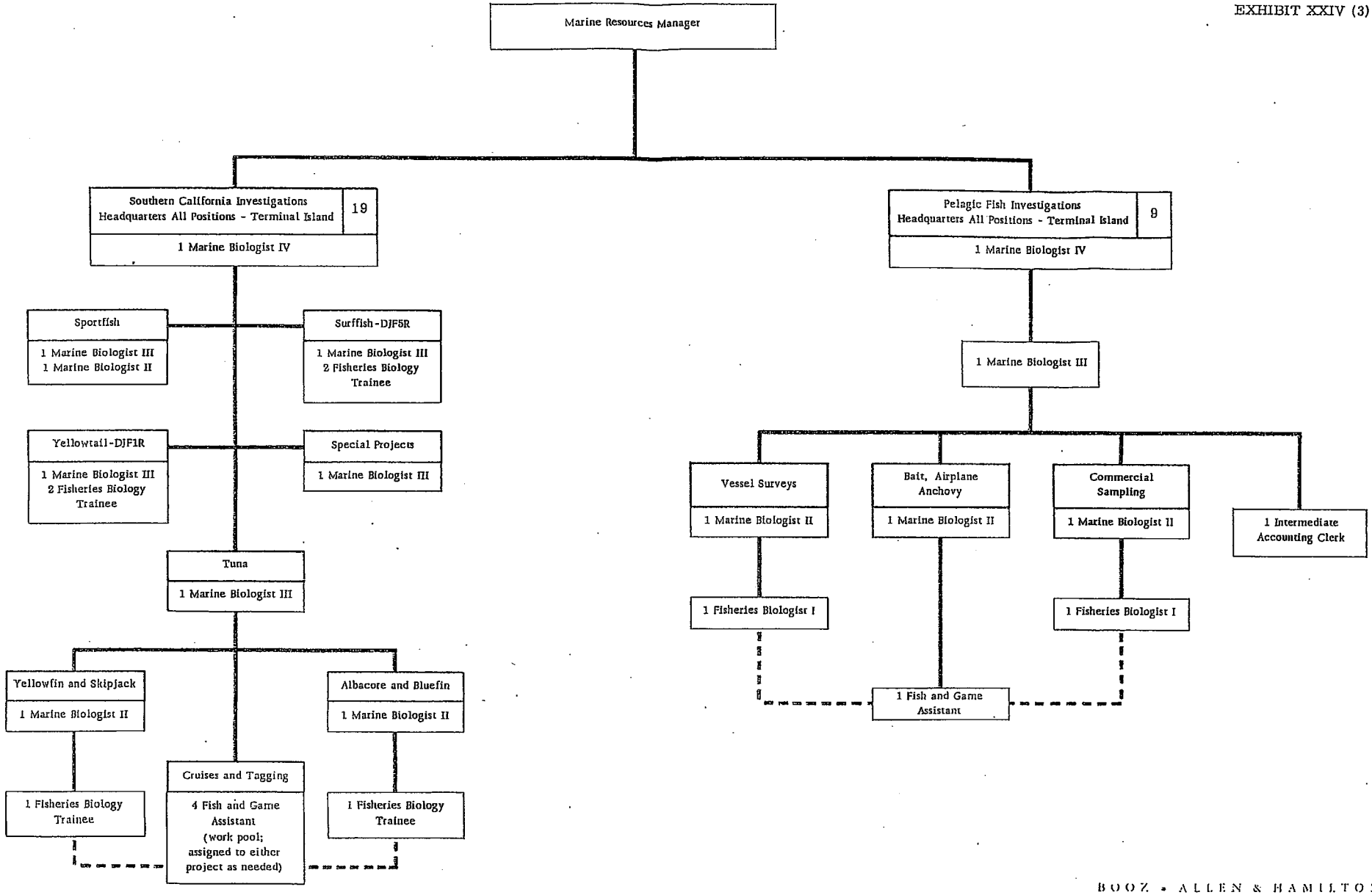

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the views of some members of the fishing industry. In general, it was theorized that the newer problems could be met by an expansion of the marine resources program, in terms of increased personnel and operating funds. However, expansion, under the policies now prevailing, creates its own special problems in that existing long-term research projects are disrupted by transfer of staff to man new operations.

Consideration of desirable adjustments within existing limitations immediately brings an encounter with the fact that shifts and adjustments incidental to the general reorganization of the past two years have already engendered obvious instability in the basic projects. The creation of new employment opportunities, whether by administrative reorganization or by program expansion, brings into play the departmental and statewide policy of promotion from within. The result is a series of replacements in the senior personnel of a number of individual projects. Many of the projects employ few persons (sometimes two or three) and the loss of the experience and familiarity of one-third or one-half of the total staff destroys continuity and sets back progress while replacements are becoming familiar with the specialized features of the project. The tabulation in Exhibit XXV, which follows, shows the extent to which personnel changes in the professional staff of Marine Resources have occurred in a period of 38 months. These facts are not recited in criticism of a personnel principle which is almost universally accepted; rather, they are mentioned to show that certain handicaps to maximum efficient performance are, under present policies, direct companions to expansion of the program or to recurring reorganizations.

If it be accepted as probable that the principle of career advancement within the department will remain in effect and that the scientific staff will be subject to frequent intergroup shifts, several possible remedial actions are open to consideration. One is to make maximum use of training sessions, seminars and handbooks or manuals of research procedures as a means of breaking down isolationism between projects and to promote greater interchangeability of staff. Marine Resources is already taking a commendable step in this direction by initiating the preparation of a series of so-called "Species Folios." These are, in essence, compilations of the data currently available on those species of fish and shellfish which are of major importance. They will start with historical backgrounds, include bibliographies, describe past and current research efforts and results and will be "open-end" for the addition of new data as they are accumulated. This undertaking should be accelerated.

A potential second avenue for assuring that the department's operations in the field of marine science [illegible] conducted intensively by persons of the highest technical competence is described in popular terms as "farming out research." This is the assignment

EXHIBIT XXV

State of California Department of Fish and Game

JOB CHANGES OCCURRING IN PROFESSIONAL STAFF OF MARINE RESOURCES OPERATIONS IN 38-MONTH PERIOD FROM JANUARY 1, 1955 TO MARCH 1, 1958

Number of Changes

Project or section	*Promotion to new position*	*New appointment or transfer from another project*	*Transfer to another project*	*Separation*	*Promotion from within project*	*Leave of absence*	*Temporary assignment to supervisory status*	*Total*
Marine Resources manager	1	--	--	--	--	--	--	1
Biostatistics	3	3	--	2	--	--	--	8
Pelagic fish	1	5	2	1	--	--	--	9
Special projects. (Terminal Island)	--	2	1	--	--	--	--	3
Sport fish	--	1	--	--	--	--	--	1
Tuna	--	2	1	--	2	--	--	5
Supervision, Northern California investigations	--	--	--	--	--	1	2	3
Bottom fish and shrimp	--	5	2	--	--	1	--	8
Salmon	--	5	2	1	--	--	--	8
Shellfish	--	2	3	--	--	--	--	5
Special projects, Northern California investigations	--	1	--	--	--	--	--	1
Federal aid projects—								
Northern California sport fish	--	4	1	--	--	--	--	5
Barracuda and white sea bass	--	3	1	--	--	--	--	4
Habitat development	--	3	1	--	--	--	--	4
Totals	5	36	14	4	2	2	2	65

NOTE: These personnel changes include normal promotions and the same individual may be involved in as many as three separate changes. The total of 65 personnel changes is related to a total force of 42 professional personnel, excluding fish and game assistants, as of March 1, 1958. Temporary reassignments of duties made to meet special conditions are not reflected in the above statistics.

of specific research projects, on a contract basis, to institutions such as the universities, which are capable of performing the desired investigations. Discussion of this expedient with individuals within and outside the department has revealed mixed opinions. However, several contractual arrangements have been made with California agencies to conduct certain investigations for the department and to render reports thereon.

The policy of farming out research on a contract basis should be continued when specific conditions indicate that superior research results will be obtained because of special qualifications. Contract research, however, should not be an exclusive means or a substitute for a departmental research program.

(4) *Summary Appraisal*

The generalized appraisal which can be derived from a review of broad policies is that the marine resources activity has not been able to keep fully abreast of an increase in the number and complexity of responsibilities; it is inhibited by restraints which are not of its making because they are inherent in any agency of government; it has undertaken, experimentally, ventures into different patterns of planning and conducting research but is still basically working along the lines which gave it eminence several decades ago. The latter statement should be qualified by the acknowledgment that there is no hesitancy, but rather eagerness, to adopt modern research techniques, facilities and concepts. The marine resources activity, as a group of professional men, exhibits the same interest in modern developments and advances that characterizes any other progressive professional group. The various administration levels recognize the existence of weaknesses without fully agreeing as to their nature or as to appropriate remedies, and there is no feeling of complacency.

One further comment should be expressed as the personal conviction of the writer, since it is not capable of proof from any source. Briefly, it is the belief that a drastic upheaval of the Marine Resources as a functional entity at this juncture would be untimely. The reason for such a view is the fact that the marine resources activity has just rounded out a major reorganization arising from a survey in 1956. Survey No. 799 by the Department of Finance was submitted to the Director of the Department of Fish and Game on July 25, 1956. The recommendations in that survey report have a sound and constructive ring. The director and staff of the Fish and Game Department proceeded with the implementation of the recommendations, with certain modifications. The series of proposed changes culminated in the establishment of a pseudo-regional structure (Marine Resources Operations) with headquarters at the Terminal Island Laboratory, as recently as August, 1957. There has, therefore, been barely a year's shake-down experience with a drastically changed structure of Marine Resources organization and administration. Longer experience under the new regime would have provided opportunity to correct weaknesses or inadequacies in administration and policies and to develop the full possibilities of a seemingly sound plan. The present survey is, therefore, being conducted at a time of transition when new procedures and policies are still on trial. Excellent proposals are already on record in Survey No. 799 and should be given an opportunity to prove out; although further changes are certainly not to be barred when fully justified. A more complete discussion of the organizational question is presented in Chapter XII, Departmental Organization. The realignment of the Marine Resources Operations under the direct line authority of the chief of the Marine Resources Branch, would not constitute a major upheaval in branch organization.

4. SPECIFIC PROBLEMS IDENTIFIED

The specific problems which bear upon the ability of the marine resources activities to perform their functions effectively may be blueprinted as follows. Subitems represent possible alternative choices:

(1) Relationships with other departmental activities.
   1. Organizational status of Marine Resources activities.
      (1) As presently constituted.
      (2) As a distinct region.
      (3) As an activity under the direction of existing regions.
      (4) As an element of a departmental branch of research (inclusive of all fish and game research).
   2. Relationships with Wildlife Protection Function.
      (1) Marine patrol to be incorporated in and supervised by Marine Resources Operations.
      (2) Patrol officers to act in behalf of Marine Resources Operations on nonenforcement matters.
   3. Relationships with Information-Education Function.
      (1) Development of within-branch facilities for public information.
      (2) Publication of research reports.
   4. Relationships with federal aid program.
      (1) Determination of general policy in allotting available federal aid (Dingell-Johnson) funds for marine or inland fishery projects.
      (2) Integration of marine federal aid projects within general marine resources program.

(2) Execution of the Research Program.

1. Program planning and supervision.
2. Utilization of outside agencies for contracted research.
3. Research orientation.
4. Co-operative research.

(3) Internal administration.

1. Personnel problems.
   (1) Transfers between projects.
   (2) Recruitment and salary competition.

5. ANALYSIS OF PROBLEMS AND DEVELOPMENT OF RECOMMENDATIONS

In this section are brought out facts, interpretations, conclusions and recommendations regarding the problems identified in Section 4 above.

RELATIONSHIPS WITH OTHER DEPARTMENTAL ACTIVITIES

(1) *Organizational Status of Marine Resources Activities*

The starting point for such analysis is the status of the marine resources activities within the departmental structure. The Marine Resources Branch is the staff advisory function reporting to the deputy director of the department. The Marine Resources Operations is now an individual entity substantially equivalent to a region in its relationship to headquarters at Sacramento but overlying a portion of three existing regions. Superficially this has the appearance of a gross administrative anomaly.

Since the inception of marine fishery activities, the pattern has been to retain a distinct, separate and unified agency to act within this field, although its organizational status has been changed superficially. Several critical studies of the State's fish and game administrative machinery have left this pattern virtually unchanged. The plan of reorganization developed by Mr. Seth Gordon in 1952 * disposed of this problem with the following statement:

> "The marine fisheries organizational branch will operate its programs directly rather than through the regions. While the activities of the three other present bureaus can be divided advantageously between the central (staff) office and the regional (line) offices, this cannot be done effectively for the marine fisheries branch. This is because the work is predominantly research, fact-finding, and statistical in nature—staff work calling for centralized administration.
>
> "Moreover, its operations are along the entire coast from Crescent City to San Diego, rather than on land. Therefore, its operations should remain controlled or directly operated by headquarters."

The administrative survey of the department prepared by the legislative auditor (January, 1956) summarized:

> "The main justification for keeping Marine Fisheries independent of the regional structure is that the work of this branch involves statewide research and statistical analysis that does not have any relationship to the geographical boundaries of the regions, since its concern is with coastal and deep-sea fisheries. . . . Consideration might be given to incorporating Marine Fisheries within the regional structure. One objection to such a course already pointed out is that most Marine Fisheries activities bear no relationship to the geographical boundaries of the regions."

Survey No. 799 by the Department of Finance in 1956 brought out no recommendation for any change in the status of the branch within the overall structure. No facts have come to light in the course of the present survey which would overturn the conclusions expressed above, unless it be concluded that research per se should be a separate activity centered at headquarters. Since the major volume of research conducted by the department is that performed by Marine Resources, the present branch would be the core of any new research unit. Any change toward centralizing research would amount to absorption of research on game and inland fish into an organization which would be primarily geared for marine investigations. While some agencies have combined marine and fresh water fishery research within a single unit (U. S. Fish and Wildlife Service,* Fishery Research Board of Canada) the general trend in the United States has been to give these two functions separate administrative status. In no case outside of educational institutions is there a consolidation of fishery and game bird or animal investigations within a single management grouping.

However, the biostatistical section of the Marine Resources Operations is a unit which is capable of facilitating and strengthening any type of biological research in which the department may be engaged. Questions of experimental design, statistical interpretation and analysis, or the processing of statistical data can be channeled to the biostatistical section by administrative direction at the headquarters. If this should entail a heavy, additional workload, some expansion of biostatistics might be required. By using this unit to handle all departmental statistical problems, a large part of the benefits which could arise from a central branch of research would be achieved.

The complete removal of all functions related to commercial fisheries from the department, and their

* Proposed Reorganization Plan, Department of Fish and Game. Published by the Senate of the State of California, March, 1952.

* The two research programs have been separated in a recent reorganization.

placement in some other agency of the State Government, has been mentioned as a possible step toward balanced management of marine resources. No statement of definite benefits to be gained by such a separation has been heard. The outstanding fact is that certain marine species are, in California, the basis of an extraordinarily active sport fishery. Management of a single species or a group of species by separate agencies for separate aims (recreational or commercial) is fraught with complications. California now avoids some of these complications by reason of the fact that unified management by a single agency provides a perspective for managing the resource as a whole. Any change would require justification on grounds other than the improvement of the techniques of research and management.

Conclusion on Organizational Status

There is no evidence that the effectiveness of marine resources management would be materially improved by any of the following possible actions:

—Dispersal into existing or new regions.

—Segregation into a departmental branch of research.

—Formal designation as a region.

—Complete removal from the department.

RECOMMENDATIONS ON ORGANIZATION STATUS

1. The Basic Organization Structure of a Separate Marine Resources Unit Within the Department of Fish and Game Should Be Retained

The recent alignment of all marine research and management activities under a Marine Resources Operations manager is sound. The placing of this manager under the direct line authority of the chief of the Marine Resources Branch is recommended in Chapter XII, Departmental Organization. Such a move would not be contrary to the need for stability at the operational level.

The outstanding fact that certain marine species in California are the basis of an extraordinarily active sport and also a very important commercial fishery is conclusive reason that marine resources and management should be on an integrated basis within the Department of Fish and Game.

2. Services of the Biostatistical Section Should Be Available for General Department Needs

Statistical analysis and interpretation is a requirement for scientific acceptability in general biological research, including those fields in which the department operates. The biostatistical section of Marine Resources Operations can refine and improve the reliability of all research projects. Such benefits can be achieved by administrative action which will place the biostatistics section in a consulting capacity for all branches and regions which carry on research. This will extend the utilization of a unit which is essential for marine resources investigations and which can render like services elsewhere in the department at a nominal, if any, increase in cost.

(2) *Relationships With Wildlife Protection Function*

Marine patrol was a unit of the former Bureau of Marine Fisheries. In its present regionalized status the marine patrol retains much the same duty relationships with Marine Resources Operations which existed earlier, but their supervision is from different sources. Marine patrol officers are housed at the Terminal Island laboratory. Here, at least, informal working relationships can facilitate the resolution of any interbranch problems. No evidence has been observed that the consolidation of all enforcement under regionalized supervision has reacted unfavorably to the marine resources program. Wardens and equipment may be shifted to meet emergencies. Co-ordination can be achieved, although it may be more cumbersome than was the case when there were no intervening channels between the local marine wardens and marine biologists or statistical personnel.

Since the wardens and some of the biologists cover the same territory in performing their duties and are interested in common information concerning local stocks of fish and shellfish and the fishing effort expended upon these stocks, there is need for maximum co-ordination. Wardens' reports on unusual phenomena in connection with abundance or movements of fish are of value to research. There are joint responsibilities in the prosecution of pollution violations. Some integration in the use of radio communications and transportation facilities by both organizations now exists. The marine patrol can be of help in assuring the fullest reporting of tagged or marked fish.

Administrative action can bring about a more extensive utilization of patrol manpower for supplementing the information-gathering activities of Marine Resources. It is noted that, individually, some patrol officers do make a special effort to observe and report facts and conditions which are of interest to other activities. The coastal streams frequented by salmon and steelhead runs are examples of an area where such observations can be particularly valuable.

It would appear possible to enlarge the duties and responsibilities of wardens beyond the detection of violations and apprehension of violators without detracting from these primary responsibilities. They have the most intimate grassroots contacts with people and conditions in their districts. A firm departmental policy involving some redescription of wardens' duties can reinforce the capabilities of those engaged in management or research. This involves nothing

more than reiterating administrative recognition and direction of activities which are now performed somewhat as a matter of individual option on the part of the enforcement officers.

Conclusions on Relationships With Wildlife Protection Function

1. The principal reason for considering a separate marine patrol unit is tradition. Present arrangements permit co-ordination within overall functions of enforcement.
2. A clear-cut statement of policy with followup would give mandate for patrol to render supplementary services of benefit to the Marine Resources Operations. Research and policing are not inherently related but do have limited common interests.

RECOMMENDATION ON RELATIONSHIPS WITH WILDLIFE PROTECTION FUNCTION

1. **Retain the Present Department-wide Enforcement Organization but Broaden Its Functions to Include, Specifically, the Acquiring and Dissemination of Information in Behalf of Marine Resources and Other Activities**

Studies by Marine Resources Operations and federal aid projects frequently depend on sampling, intermittent field observations and reporting from nondepartmental sources rather than collection of data for a complete time period or area by marine resources staff. Any increase in the coverage of field observations in time, area or number of observations strengthens the validity of the data. Patrol officers can provide a supplemental source of information by the nature of their activities. Under a recognized policy, their collaboration can be systematized and organized without undue interference with primary enforcement duties.

(3) *Relationships With Conservation-Education Function*

Marine Resources is no exception to the other functions of the department in that there is strong interest on the part of the public and the fishing industry in its objectives, programs and accomplishments. There is an evident feeling among the staff and among the industrial and sports groups that "communications" are not getting through. Scientific enterprises are notoriously difficult to interpret in popular terms, but public understanding is all the more necessary because of the more complex subject matter. Projects in which the fishing public can participate, as in the return of tagged fish, seemingly enjoy greater public understanding, acceptance and support.

It is taken for granted that the department desires to have its aims and policies with respect to management of the marine resources fully known to all interested groups to the end that any public evaluation will be based upon fact. It is likewise taken for granted that those groups to be affected by the program are anxious to be informed. In some instances the personnel are carrying on the research attempt to be their own information officers. This is helpful but can reduce their effectiveness in their primary duty by absorbing excessive amounts of time. Other investigators find public relations inherently difficult or distasteful.

Since there is evident desire on the part of Marine Resources to tell its story more completely, coupled with an eagerness on the part of the public to receive the information, the remedy seems to lie in establishing an additional channel for a greater flow of information. Two regions already have an information officer whose time is reported to be so fully occupied that they can do little toward publicizing marine resources activities. The Marine Resources Operations has many of the characteristics of a region and would profit by a comparable addition to its staff. This discussion does not pertain to the publication of reports of a strictly scientific nature which are of interest mainly to the scientific community. Further, the issuance of material which may be labeled "propaganda" will not be accepted by the public as filling its need for better understanding.

There is apparently some delay in the publication of research reports which are principally to augment the scientific literature. The research staff would welcome an opportunity to complete investigations, to analyze data and to write reports for publication more expeditiously than the present work load permits. Other scientists echo the disirability of a speedup in the publication of research findings.

Conclusions on Relationships With Conservation-Education Function

1. The present public relations program does not give enough coverage of the marine resources program.
2. Information officers assigned to two regions are reported to improve public understanding, but similar services are not presently available to Marine Resources.

RECOMMENDATIONS ON RELATIONSHIPS WITH CONSERVATION-EDUCATION FUNCTION

1. **Recognize That Marine Resources Activities Call for Interpretation to the Public No Less Than Activities of the Regions**

To accomplish this, provide an information officer to be stationed at Terminal Island (the source of information), but subject to staff relationship with the conservation-education director.

The duties should comprise the preparation of press material, nonscientific publications and visual material (photographs, moving pictures, graphic presentations such as illustrative charts, graphs and exhibits), all to demonstrate in popular terms the specialized characteristics of marine research and to interpret the results.

The information officer should be qualified to make personal presentation of such information and educational material before interested public groups. His primary qualification should be an ability to prepare and present scientific material in a form which will command public interest and understanding; professional standing as a research man is desirable but not essential.

2. Expedite the Issuance of Progress and Final Reports on Scientific Studies by Definite Scheduling in the Project Timetable

The timely issuance of reports should do much to improve public acceptance of the work being done. Positive recognition of the need to schedule such reports on each project's timetable should facilitate this program.

(4) *Relationships With Federal Aid Program*

Federal aid in fish restoration is carried on under the so-called Dingell-Johnson Act, which became effective in 1952. The funds allocated to the states are derived from the federal excise tax levied upon sport fishing tackle and equipment, and activities so financed are limited to the improvement of sport fishing. This has, in general, curtailed the use of Federal Aid funds for research or management of marine species. The states contribute 25% of the project costs.

California is one of six states which are able to conduct Dingell-Johnson financed work on marine or anadromous species because of the extensive sport fishery which is based upon at least 20 marine fishes. The total federal apportionment to California for Dingell-Johnson work for the Fiscal Year 1957 was $241,300, to which may be added some $17,000 of unobligated balance from the previous year. The department's policy in suballotting the federal aid funds to marine projects and to inland or fresh water projects (including salmon and steelhead) has been to base the split upon the ratio of fishing days in coastal waters including bays and estuaries to the number of fishing days in inland waters as determined by sampling surveys. The ratios are revised occasionally. This results in a present annual apportionment of approximately 28 percent of the federal aid program to projects operated in conjunction with the Branch of Marine Resources. This basis is a practical, workable method for making such a division of funds. Unusual or emergency conditions may give rise to a greater need for research or management and development on marine sport fisheries, in which event an adjustment to this ratio may be desirable to meet this emergency. Such an adjustment between the three projects* currently conducted in conjunction with marine resources has recently been effected.

All of the department's federal aid to fisheries projects come under the general administrative supervision of a co-ordinator stationed at Sacramento headquarters. One project leader is stationed at the headquarters for Northern California investigations at Stanford; two project leaders are located at Terminal Island. Each project leader is subject to a chain of supervision, beginning with the supervisor of Northern California investigations at Stanford and the equivalent supervisory position at Terminal Island. Combined supervisory authority is vested in the manager of Marine Resources Operations at Terminal Island. Ultimately the projects come within the administrative responsibility of the above-mentioned federal aid co-ordinator at Sacramento. There is further intermediate technical direction of marine federal aid projects by a marine resources operations co-ordinator, located at Terminal Island. The U. S. Fish and Wildlife Service, in monitoring the program, will look to the headquarters co-ordinator, not the Marine Resources Operations. The flow of papers for all types of federal aid is shown in Appendix C, Routing Plan—Dingell-Johnson Projects, at the end of this chapter. Supervision from the technical standpoint is not necessarily parallel to the flow of documents but does involve two levels within the Marine Resources Operations.

The federal aid projects are subject to requirement for periodical quarterly reports of progress. This is a more rigid standard of reporting than is applied to the normal marine resources projects. The project personnel do not find such a requirement oppressive; indeed, it seems to be a useful means of detecting areas for possible improvement of operating efficiency. A wider adoption of this system of progress reports is capable of yielding similar benefits to nonfederal projects.

Conclusions on Federal Aid Program

1. Federal aid projects are, in general, well conceived and executed. Basically, they meet the standards of the Federal Aid Act and of the administrative policies of the U. S. Fish and Wildlife Service.
2. Some oversupervision exists; possibly more on paper than in actuality.
3. The formula for allotting funds between marine and inland fisheries is a practical method for making such a division of funds.

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* Project designations and 1958-59 budget allotments:

Northern California Sport Fish Survey	DJF 12R	$30,300
Ocean Fish Habitat Development Project	DJF 5R	34,500
Barracuda-White Sea Bass Study		28,200

4. Designation of all projects as "research" may give false impression to public; actually, projects are initial stage "development" and may ultimately be designated as such.

RECOMMENDATIONS ON FEDERAL AID PROGRAM

No recommendations are offered as to the federal aid program for marine sport fisheries.

Execution of the Research Program

The execution of the research program is undergoing a new phase under the reorganization put into effect in 1957. The main feature of the reorganization was the establishment of the Marine Resources Operations unit at Terminal Island with full responsibility for field administration of all marine resources program activities. This unit is headed by a manager of Marine Resources Operations who reports to the director through the deputy director. The chief of the Marine Resources Branch does not exercise line authority over Marine Resources Operations. His assignment is as a staff adviser to the department director. Marine Resources Operations directs the various research projects located at Terminal Island and Stanford and at the minor field stations. It also directs the biostatistical section, business services and vessels operations subunits. The change affects centralized supervision of those marine resources activities which are performed outside of Sacramento.

The headquarters functions of the branch chief (and assistants) encompass the formulation of policies, objectives and program priorities for the review and approval of the director. The headquarters branch personnel represent the department in liaison relationships and contacts with some 65 other agencies and organizations. Marine Resources Operations is not relieved of the responsibility of contributing to policy determinations by submitting recommendations, although its principal purpose is policy implementation.

Some regrouping of projects may provide further advantages without disrupting the basic structure. Organizational stability is urgently needed.

(1) *Program Planning*

The basic question is whether the department can or should engage in "pure" research; can or should confine itself to the more superficial approach of studying troublesome situations as they arise; or try to combine the two approaches. It is doubtful that there has been any real choice open to the department. It has, by necessity, undertaken the difficult task of prosecuting research upon abstract fundamental biological problems while simultaneously seeking solutions to immediately critical situations which demand corrective action. Salmon and sardines are case histories. The same personnel and facilities are enlisted for these purposes, with the usual result that interruptions to the basic research leave great gaps in the knowledge required to cope with the short-term localized problems.

The ideal solution is a dual research organization with one group assigned to long-term basic research while another group is free for assignment to more cursory studies required by immediate management problems. As a result of this inherent unresolved issue, the branch does not appear to have yet arrived at a realistic setting for program planning (determination of main objectives, of project priorities, budgeting and assignment of personnel). Much of the work is a continuation of past programs, without critical reappraisal of relevance to present conditions. Other work stems from a direct mandate of the legislature as typified by the pelagic fish studies under the auspices of the Marine Research Committee. Since the formation of the Inter-American Tropical Tuna Commission in 1950, an entirely new factor has affected tuna research. It is not possible to forecast the advent of radical changes in the ocean environment and the consequent effects on fish populations. Planning will not compensate for such changes. Program adjustments can be more responsive to known factors, however. The Marine Resources Operations has made an effort to meet some of the most pressing emergency needs for working data by the establishment of the Special Projects Section, which is discussed later in this report.

RECOMMENDATION ON PROGRAM PLANNING

1. **Project Planning Should Be Given Greater Emphasis**

   The headquarters branch staff should give the highest priority to a critical review of the entire research program in order to bring up to date the project subject assignment and the distribution of personnel, funds and facilities. A new position, at the level of an associate or deputy director, with the primary function of analyzing all department programs would be an excellent stimulus toward this purpose. Once present program objectives are redefined, the maintenance of the "species folio" previously mentioned will keep activities current with future changes.

(2) *Contract Research*

Contracting research is a feasible practice for attacking problems which can be readily identified and separated from a long-term, inclusive research program. It provides flexibility for meeting unexpected demands and enlists specialized talents for particularized requirements. This practice is already utilized in a limited degree. It is not an adequate substitute for a full research program to be carried out by the department. Such a department program, when

adequately planned, is the only means whereby the department can be assured of scientific information, responsive to its needs for working data, on which to base judgment on resource management questions. There is no assurance that other research organizations will be able to enter into short-term contracts as their services are needed. Here, as in state agencies, specialist personnel cannot be picked up or dropped at will, nor can budgets fluctuate widely.

RECOMMENDATION ON CONTRACT RESEARCH

1. No All-out Policy for Contracting Research Should Be Adopted

This practice should be followed when specific problems or conditions, generally involving short-term studies, warrant. The question of when and where to undertake contract research hinges as much upon the availability of contracting agencies, with adequate facilities for specified work, as it does upon departmental policy and judgment.

The policy should recognize that contract research is a feasible means of getting research done but, by its limitations, it cannot be an exclusive means or a substitute for a departmental research program. Acceleration or deceleration should be applied as may be indicated by the factors of a given study; that is, whether Marine Research Operations is equipped with qualified personnel and facilities to perform an investigation adequately and whether outside agencies are qualified and available when needed. The department has contracted research and should continue to do so when definite advantages are to be gained. Determination of the advantages or disadvantages of contracting a given research project calls for the exercise of administrative judgment in the light of the existing circumstances. This is exemplified in the case of a recent study of kelp which was turned over to agencies outside the department because expert personnel were available in the other agencies.

(3) *Research Orientation*

Research orientation in terms of performance standards, techniques, timing and methodology is reasonably well developed—not perfect, but not seriously deficient. A procedural guide of six pages (prepared January, 1957) sets forth general guide lines as to objectives of marine investigations; methods of conducting them; criteria as to duration and amount of effort; statistical and intradepartmental co-ordination; and co-operation with other agencies; and it provides a graphic chart of general research procedures. This is an excellent foundation for promoting uniform staff recognition of program interrelationships and the steps toward accomplishment.

RECOMMENDATION ON RESEARCH ORIENTATION

1. Continue to Develop Research Orientation

The progress of the branch in organizing and orientating performance of its basic function, research, is such as to call for not specific recommendations. Usable basic outlines of general procedures are now in existence or in preparation. Individuals newly appointed to the staff or transferred to new projects can benefit further by personal consultation with supervisors to bring clear realization of objectives. Some greater use of manuals can be suggested; for example, a manual prescribing uniform procedures for cruises of research vessels is entirely practical.

(4) *Co-operative Research*

Co-operative research with other agencies is embodied in the program quite extensively. Statutory provisions require or encourage such co-operation; the activities directed through the Marine Research Committee and those conducted jointly through the Pacific Marine Fisheries Commission are typical. Through various informal committees, and through the fellowship of common scientific interest, the research personnel participate in joint endeavors which are more loosely organized. Seeming duplication or overlapping of effort is frequently a planned assignment of fieldwork among several agencies to assure thorough physical coverage of vast areas under study. The inclination toward co-operative effort is present; the branch is no impediment to a greater fusion of coastwide marine programs.

RECOMMENDATIONS ON CO-OPERATIVE RESEARCH

1. Give Greater Emphasis to Co-operation With Out-of-state Agencies

Co-operation with intrastate agencies is so well established as to call for no specific recommendation. Co-operation with out-of-state agencies, many of which work on identical problems, can be of direct benefit. There should be liberalization of the policy governing out-of-state travel to permit a more free interchange of information concerning management of coastwide species and to broaden staff viewpoints. New devices and techniques of an extremely complicated nature are currently being developed in Oregon, Washington and British Columbia to protect salmon runs. Visitors from all over the world come to view these developments. California research people should be free to familiarize themselves with these advances.

The only limit on co-operative research should be the degree to which satisfactory co-operative relationships can be established. Few agencies of the State Government can perform research in

fields which are of interest to the department, with the exception of pollution investigations and watershed studies which lead to better water use and conservation. Affiliation with educational institutions, with other states or with interstate and international bodies for the purpose of co-ordinated research is to be recommended but can only take place when the other agencies are prepared to merge their activities to some degree. A unilateral decision by the department in favor of more co-operative research is desirable but full implementation is not at the discretion of the department alone.

Internal Administration

The internal administrative organization of the marine resources activities has been subject to a major transformation with the last year. The changes were recommended by the Department of Finance and the recommendations reflect careful, competent study and judgment. Implementation of the recommendations has proceeded with reasonable celerity. Some confusion and uncertainty have appeared during the months in which changes were being effected. It would be unwarranted by any observed facts for this writer to project any major modification of the organization pattern with which Marine Resources is now becoming familiar. It may be desirable to consider modifying the organizational placement of the Marine Resources Operations Manager, as discussed in Chapter XII, Departmental Organization.

However, certain rough spots exist which need correction if the new organizational structure is to operate as intended. These are concerned with personnel policies and with certain activities which cut across organizational lines.

(1) *Project Assignments*

A foremost problem is that arising from the excessive frequency of transfers of scientific personnel between individual research projects. Exhibit XXV, on page 85, shows personnel changes occurring during a period of 38 months up to the time of this survey. It is to be noted that senior personnel, biologists III and IV, are heavily involved. Such shifts may be individually demoralizing in some cases, and they slow down research progress in most cases, since personnel newly assigned to a project must first familiarize themselves with past plans, operations and findings before they can go forward.

These movements are due to two causes. The first is reorganization itself, which may be expected to diminish if no new and sweeping changes are imposed upon Marine Resources. The second cause is the general policy of "promotion from within," coupled with the apparent fragmentation into small project units within Marine Resources.

It is accepted that no case can be made for abrogating the policy of staffing higher grade positions by promotion from the lower classification levels. The only avenue open to restrain the pace of interproject transfers is to stabilize the organizational structure so that personnel may look forward to some continuity in assignment, without, however, being immobilized. This calls for an early finalization of both the general organizational pattern and the operational project units. This situation involves intangible factors of morale and job satisfaction, as well as impairment of efficiency when men and jobs are not able to become fully acquainted with each other before they are dissociated. One final step of readjustment at the project level may slightly ameliorate this problem.

(2) *Compensation*

Salary considerations present themselves in any attempt to appraise an organization which employs professional people. Compensation of research personnel has recently become the subject of general public concern. To ascertain whether the general salary levels for professional employees of Marine Resources are such as to hamper recruitment and make difficult the retention of employees against outside competition, a comparison was made with scales prevailing elsewhere. The following table shows the best figures presently obtainable on the monthly compensation range of professional employees in agencies which have comparable classifications.

RANGE OF SALARY SCHEDULES AND PROPOSALS

	Washington		*California*		*U. S. Fish and Wildlife Service* *		*Oregon*	
Biologist I	$364	$432	$376	$458	$401	$513	$360	$440
Biologist II	397	471	436	530	482	596	400	500
Biologist III	451	537	505	613	573	669	460	575
Biologist IV	492	586	548	710	678	774	No grade	
Assistant Director of Research	537	639	--	--	805	902	500	625
Director of Research	639	762	782	950	925	1,021	575	715

* Administration proposal.

It appears that California is not at a disadvantage in comparison with salary levels prevailing in Oregon and Washington. A definite disparity exists with relation to the U. S. Fish and Wildlife Service. It should be noted that there are also four international fishery commissions on the West Coast which employ research biologists, oceanographers or statisticians. While a table of salary scales for these agencies is not available, it is known that their rates are geared closely to the level of the Federal Government, since the United States is deeply involved in their operations. Thus, there is an appreciable, and increasing, demand for marine research personnel from sources which can offer consistently higher salaries throughout the range. California is not at the lowest level of

comparable agencies but does face possible competition in salary inducements sufficient to present a problem of recruiting and retaining capable investigators.

(3) *Salary Classifications*

A related issue affecting the research personnel arises from the salary classifications commonly adopted under civil service systems. Such systems, including California's, preponderantly relate grade and salary to the number of lower grade positions supervised and to the administrative responsibility exercised. arine biologists III or IV are shown in the organization chart of the Marine Resources Operations as generally occupying positions which involve supervision over secondary units or over a number of persons of lower classifications.

Because of specialized requirements, investigators having requisite special talents can merit high classification grades while supervising no one and exercising no administrative authority whatever. Unless the classification standards are sufficiently flexible to bypass the usual criteria of supervisory and administrative responsibility, the organization wil be handicapped in obtaining and holding the services of individuals having unique qualifications for satisfying unique research essentials. The fact that the department is conducting scientific research is good reason for enjoying the same latitude in salary policies that exist in private research organizations, colleges and universities. In the latter organizations research capabilities alone can be the basis for a substantial salary. Applying this policy to Marine Resources would mean that an investigator who is pre-eminent in a single specialty, for example fish or shellfish parasitology, would as a matter of policy be eligible to receive a salary on a par with that received by the head of a large administrative unit.

That the department is aware of this need and has been partly successful in meeting it is shown by the establishment of two units designated as Special Projects. These, located at Stanford and Terminal Island, have been set up within the last year and each consists of one employee, a marine biologist III. The duty assignments are, with intent, indefinite. Any emergency or unexpected short-term problem calling for investigation, report and recommendation, or definite action is assigned to one or the other special projects. Management problems will be the primary field of activity, particularly those problems which are nonrecurring.

This device for conducting special studies upon special subjects of limited scope for the attainment of precise aims is manifestly an attempt to bridge the gap between pure research and fact finding for immediate management purposes. It is a difficulty which troubles most agencies engaged in resource administration, and the department has exhibited vision in devising this solution. The basic research projects will suffer less interruption and delay by diversion of their staffs to temporary trouble-shooting assignments.

Since two investigators may be unable, however versatile they may be, to develop comprehensive conclusions for the diverse biological questions facing them, there is likely to be occasion for further detail of other staff members to temporary deviations from planned programs. It remains to be seen whether the present two-man task force for special projects is adequate; the action already taken can only bring improvement to an area where other solutions have been disappointing.

RECOMMENDATIONS ON INTERNAL ADMINISTRATION

1. **The Basic Pattern of the Present Marine Resources Organization Should Be Disturbed as Little as Possible**

The present organization, based upon a small headquarters unit serving the director in staff capacity, with operating authority vested in the manager at Terminal Island, should be disturbed as little as posisble. It has not yet completed its shakedown period of trial and error. Some modification seems unavoidable, because of the prominence of the salmon-steelhead problems. There is also reason for considering the realignment of research activities at the project level, which was not reached in the reorganization effected as a result of Survey No. 799 (July, 1956). This proposed change in organization pattern contemplates the following:

2. **Establish a Section of Anadromous Fish**

This recommendation is developed in considerable detail in Chapter VII. However, it is mentioned here for purposes of reader orientation.

3. **Consolidate Research Activities at the Project Level Into Two Groups**

All project activities should be consolidated into two groups under the supervision of the manager of Marine Resources Operations. Working titles for the two groupings might be the benthonic and shellfish investigations and the pelagic investigaitons. The former should include, as subprojects, all present and future studies on bottom fishes which are the objective of the trawl and long-line fisheries: shrimp, crab, abalone, oysters, clams and spiny lobsters. The pelagic investigations should take in those studies which are administered through the Marine Research Committee (sardines, anchovies, mackerel, etc.), the tunas, and those species which are the object of marine sport fisheries.

The nature of the investigatory responsibilities would logically place the headquarters of the pelagic investigations at Terminal Island. The other investigation would be directed from the

Stanford laboratory. The present segregation into Northern California and Southern California investigations would be dropped as a criterion for field operations, although the present natural division would undergo little change. It is recognized that some anomalies would exist under the proposed regrouping; sport fish studies could well fall into both groupings. It is believed that some arbitrary assignments of research subject matter are unavoidable under any pattern of organization which can be devised.

This establishment of two broad project areas should do much to bring about stability and continuity in project reassignments. The remedy does not lie in freezing everybody in his present assignment. Some interchange is desirable, but it should be within broad areas which are sufficiently closely related that new assignments can be picked up without loss of time and progress due to a necessary period of training and familiarization in the new post. The point to be made is that while marine biologists do have a certain common competence within the general field, they do employ special techniques and methods in pursuing different types of investigations. A study of shellfish calls for different treatment than an investigation of tuna or bottom fish. Shifting from one to the other is desirable to broaden experience and knowledge but it should not be so frequent as to constantly change the staff complement of individual projects.

The charts contained in Exhibit XXVI, following this page, are offered as a basis for consideration of the proposed changes. The job designations are intended to reflect the present staffing levels; implementing the change would doubtless point to some desirable modifications in the staffing pattern.

Organizational adjustments alone will not wholly provide stability and continuity in project assignments. Change of personnel assignment is inherent in a diverse program manned by persons of different training and competence. It may be minimized by a regrouping and consolidation of individual projects so as to set up two main project assemblies to include respectively those investigations which are, in general context, biologically relevant. The benefit to be assumed is that transfers can be effected within either of these two groups without serious disruption of project integrity, because the staff members involved will be more familiar with the broad biological classification and will be prepared to take new work without marking time during a period of orientation. This is an organizational area which has not been reached in prior reorganizations and is not far-reaching or drastic since it affects only the final step in the alignment of marine resources activities. The specific benefits are (1) greater proficiency in research, and (2) better morale.

The main effect of this proposal will be to reduce the total number of designated research projects from 14 to 5, plus the two special projects. Supervisors will have fewer separate functions to supervise; fewer channels from which reports will emanate. Staff will enjoy a greater familiarity with the activities of their colleagues within the two major groupings and will have a more favorable opportunity for transfer or promotion without dissociating themselves from a sphere of work in which they are most proficient and which may command their greatest interest. The designation of one or two individuals as an organizational unit under the prevailing pattern seems to me to be the antithesis of good organizational structure. The individual may perforce work by himself and be the sole contributor to a specialized study but a factual relationship to a broader subdivision of the marine resources program is inescapable. Some exceptions are recognized (i.e. special projects assignments); but integration wherever feasible, rather than fragmentation, is good organizational management. The recommendation will not yield any benefits in dollar savings; it should produce more consistent, more competent, more reliable research accomplishments.

No change is proposed for the presently constituted units of business services; biostatistical section; vessel operations; special projects or the federal aid projects involving any direct integration into Marine Resources Operations.

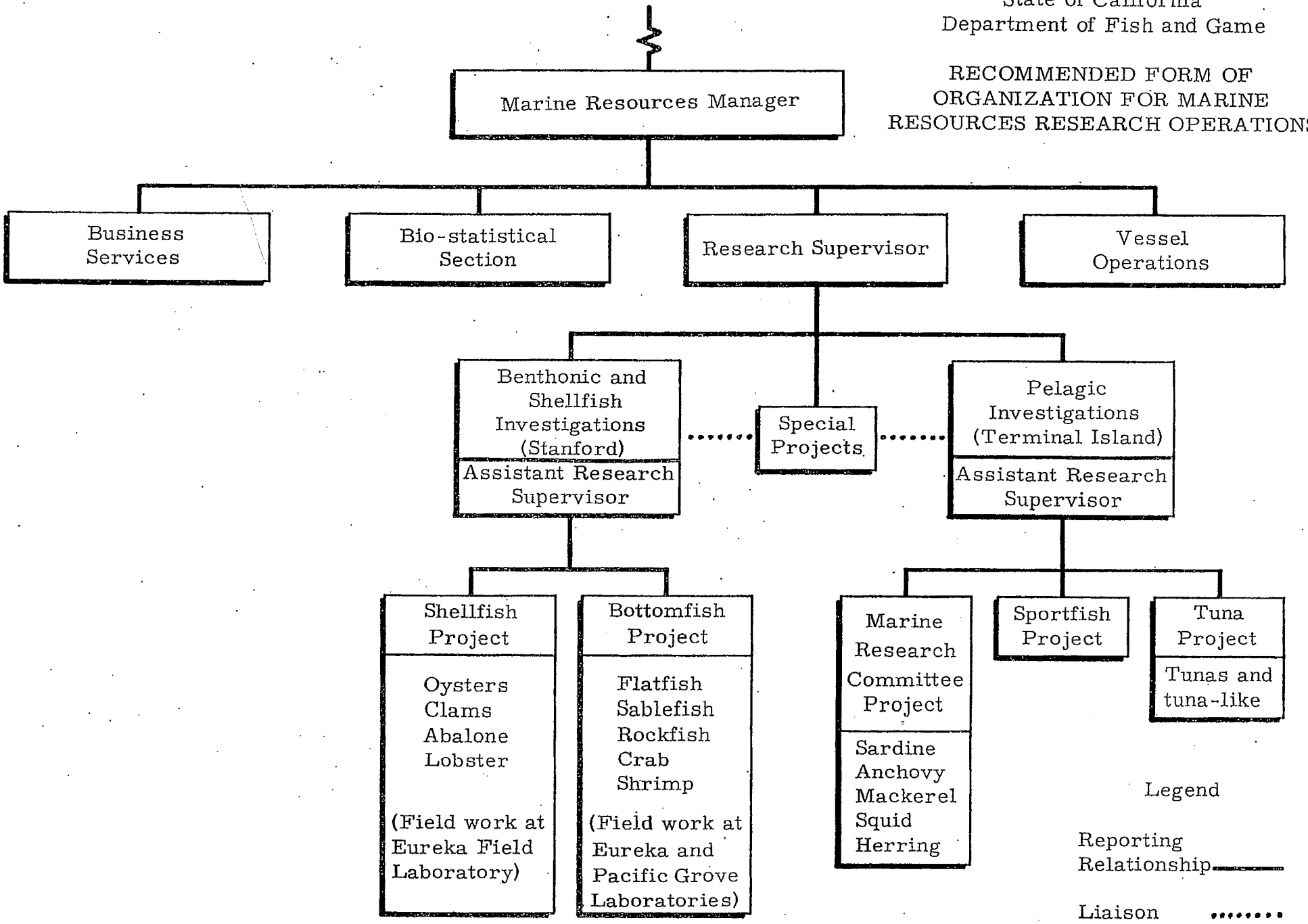
4. Improve the Facilities of the Stanford Laboratory

The Stanford laboratory, headquarters of the present Northern California Investigations, has few of the physical facilities which represent good working conditions for a research organization. Crowded, antiquated basement quarters, with little privacy, occasional flooding and inadequate lighting are some of the handicaps which justify definite planning for more suitable housing for this office.

These unsuitable, inadequate working conditions are considered as an impediment to efficient performance of the functions of the laboratory. There is, admittedly, no standard of measurement to evaluate the loss of efficiency due to substandard working quarters, although interruption to work due to intrusion of water into the basement space is somewhat tangible. Comparison with facilities now commonly provided for technical and research staffs of industry and educational

EXHIBIT XXVI
State of California
Department of Fish and Game

RECOMMENDED FORM OF ORGANIZATION FOR MARINE RESOURCES RESEARCH OPERATIONS



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MANAGEMENT CONSULTANTS

institutions is one visible reason for recommending that the Stanford Laboratory be housed in more modern surroundings. The present quarters provide little more than inadequate desk space, lacking the privacy which contributes to intellectual productivity; storage for equipment, and reasonable facilities for handling specimens are wanting, as is space for small group conferences. A volunteer painting bee by the staff as a personal contribution to better surroundings has not materially relieved the handicap of outmoded accommodations. The department should renew previous recommendations for improved housing at a location on the Stanford campus or within the same general area.

Bringing about stability and continuity in project assignments should be a major target in the management of the Marine Resources Operations. This is not a recommendation to immobilize research personnel in fixed pigeonholes for long periods of time. It is, rather, a suggestion that assignments be correlated, as far as possible, with the term of a specific investigation or a recognizable phase of a long-term project. Creation of the "Special Projects" units is a significant move toward this end. Reorganization and personnel reassignments are cause and effect, and the early termination of both is needed to permit concentration upon the basic functions of Marine Resources.

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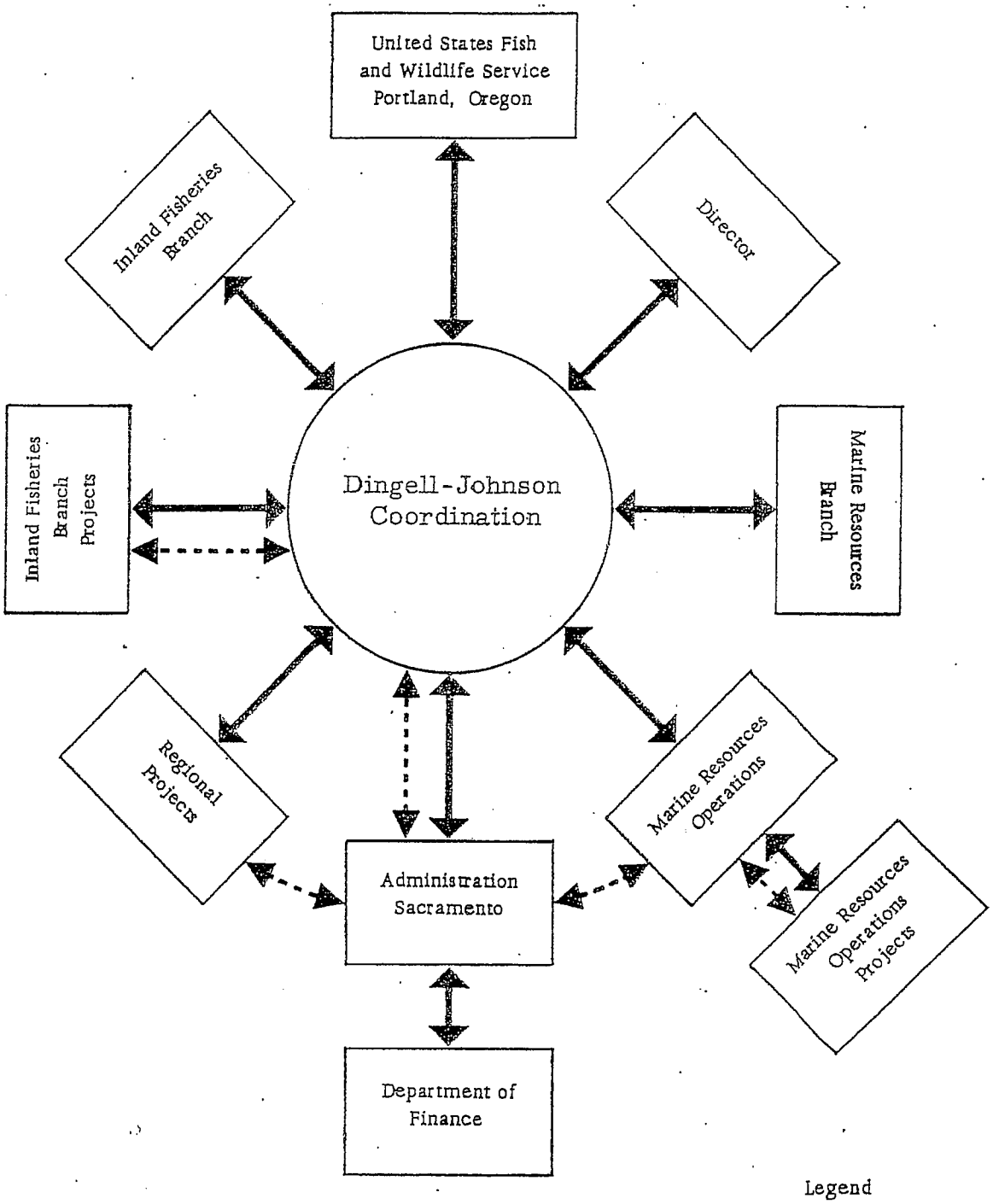
APPENDIX C (3)
State of California
Department of Fish and Game

ROUTING PROCEDURES
DINGELL-JOHNSON
PROJECTS



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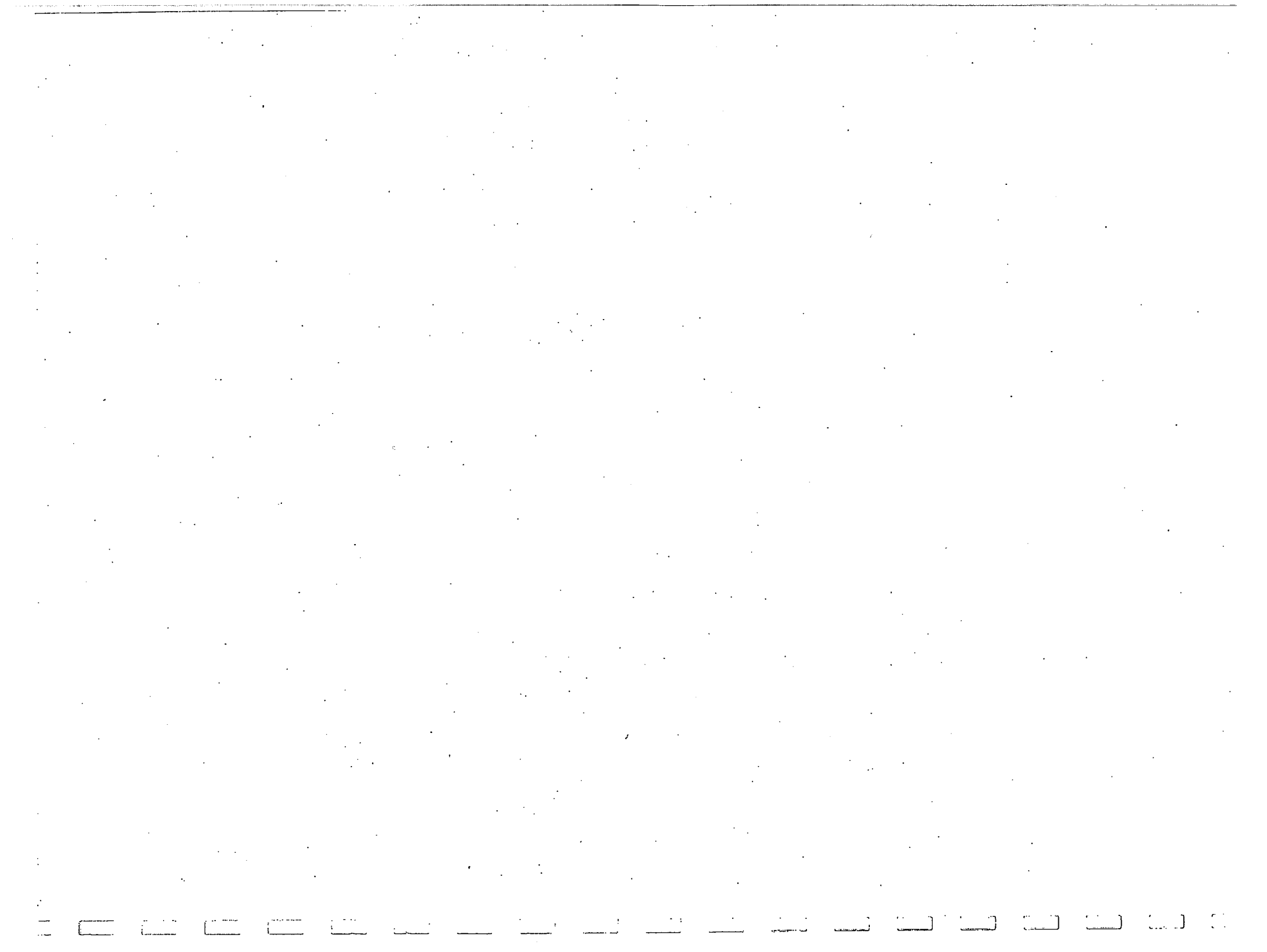


CHAPTER VII

WATER PROJECTS, POLLUTION AND SALMON-STEELHEAD MANAGEMENT

M. C. JAMES AND C. J. CAMPBELL

Water is one of our basic natural resources, necessary in some form to all life. This dependence upon water is most obvious for fishes; and the water must be in adequate amounts and of correct physical and chemical characteristics to permit the successful consummation of their life cycles. Changes in an aquatic environment may eliminate desirable fish populations by making life itself impossible or by eliminating a single step in their life histories. Any change in quantity or quality of water is bound to be reflected in some way in the fish and wildlife dependent upon it. Since water and changes in it are of such importance to fish and wildlife, they are also of vital importance to those charged with management of that resource. Changes in the water situation of a given area may be detrimental to fishery management or may present opportunities for increased fish production.

1. SCOPE OF THE SURVEY

This portion of the survey is directed toward identification and evaluation of the problems of assuring water supplies, adequate in abundance and quality, for the needs of anadromous and resident inland fishes.

As a corollary, the practices and policies followed by the Fish and Game Department, the State Department of Water Resources and the State Water Pollution Control Board were reviewed insofar as necessary to determine the working relationships between these agencies and their separate or combined influence on the management of the living aquatic resources. These observations pointed to conclusions and recommendations concerning programs and organization within the Fish and Game Department to enable it to meet its responsibilities in this sphere. The basic premise for devoting attention to water problems is the conviction that without proper management and conservation of the surface water supplies, no effective management of the aquatic wildlife resources is possible. The investigation did not extend directly to any agency other than the Fish and Game Department.

2. CONDUCT OF THE SURVEY

The collection of information relevant to the various factors of water supply was a part of the primary survey activities for both Marine Resources and Inland Fisheries. It was a matter of normal routine to examine the local conditions and to discuss water problems in all the areas visited in the course of investigating both specialized subjects.

In addition, the investigators who were making the specialized studies traveled together for several days along the north coastal area in order to give joint attention to the closely related problems of the anadromous species—the salmon and steelhead. The material making up this chapter is the combined result of separate observations which have been reconciled by personal discussion and of the conclusions which were reached as a result of collaborative field examination.

In order to facilitate the clear presentation of the appraisal of policies and programs, the identification of specific problems, and the development of recommendations, these matters are covered separately under each of the following major subjects:

Water Projects
Pollution
Salmon-Steelhead Management

WATER PROJECTS

It is axiomatic that neither anadromous nor resident inland fishes can prosper, or even survive, if adequate water of acceptable quality is not maintained in the streams and lakes of the State. It is part of the responsibility of the Department of Fish and Game to try to insure that satisfactory flows of water are maintained below water diversion structures, and that usable minimum pools are provided above them, and also that necessary protective facilities are included in construction.

Water diversion problems come from a number of different sources, such as projects licensed by the Federal Power Commission, those of the Corps of Engineers, the Bureau of Reclamation, private utility companies, irrigation districts, municipal domestic supply groups, the State Water Plan, the small watersheds projects under Public Laws 984 and 566, and private applications to divert water. Perhaps the one thing all these types of projects have in common is that they affect fish and wildlife to some degree. It is reported that one forecast of construction made by the California Department of Water Resources indicates that 79 major water development projects will go into the construction stage during the next 13 years.

Another water project activity of considerable magnitude is the processing of applications to appropriate

water for various purposes. Approximately 150 to 200 of these applications are received annually. A routine and satisfactory procedure for routing them to and from the regions and conveying the results of investigations to the Water Rights Board has been developed. Of course the majority are small and entail little effort, but others, on the contrary, are the forewarning of major water projects. The latter present the opportunity for the department to become a party to proceedings in order to protect the interests of the fish and game resources. As such they develop into the major undertakings.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

It requires very little review of water matters to be impressed by the number of water projects completed, under construction or being planned in California. The advent of such construction becomes a matter of immediate concern to fish and game people—in effect, a fire to be put out. Other programs, no less essential but lacking the aura of emergency, must be postponed while technicians acquire the data, analyze the information, decide on what should be done for fish and wildlife, and prepare a case that will assure the recognition and protection of that resource in the construction and operation of the project. This means two things: one, the work is done by people not versed in the specialized field of water projects as a diverison from or interruption of regular work; and, two, the essential inventory and management program of the department must be neglected and suffers.

A major water project requires much specialized work for the Department of Fish and Game. Exhaustive knowledge of fish runs and populations and wildlife uses of the area concerned are essential, but also water flow data must be found, interpreted and applied to the problems presented. Engineering and legal skills are needed in developing satisfactory protective devices and in welding all information into cases that can be presented successfully in hearings and in courts.

The principal part of the work to process applications to appropriate water also falls on regional departmental personnel and must be superimposed on their regular management activities. Fisheries management supervisors in all regions want men whose primary work would be with water projects so that these developments can be handled adequately without detracting so much from their continuing programs.

In summary, the water projects people in the Department of Fish and Game have turned out a large amount of work of commendable quality. This has been possible because of the dedicated interest and extreme devotion to the job of the skeleton water projects staff and of regional personnel who took on additional burdens at considerable expense to their regular programs and to their own leisure.

4. SPECIFIC PROBLEMS IDENTIFIED

At present, the water projects co-ordinator in the Department of Fish and Game has one man for water projects on his Sacramento office staff, and there are three men in regions assigned to this activity. One more regional man is approved for the 1958-59 Fiscal Year. The regions have the responsibility of actually obtaining the necessary information and preparing the cases for water projects. In large part they utilize their inland fisheries personnel for the work, with the headquarters water projects staff providing coordination and advice. With so many water projects it is obvious that other regional management programs will suffer, inasmuch as the water projects cannot be ignored. More personnel are needed on the regional level whose primary function is in this field in order to handle the water projects more satisfactorily and in order to maintain the other work standards of the department. Headquarters staffing is also inadequate.

The State Department of Water Resources, which is developing the long-range plans for development and use of California's water, has recognized the desirability of including fish and wildlife matters in its planning. This agency pays for the services of Department of Fish and Game personnel who work in the offices of the Department of Water Resources with its engineers in developing water project plans. This is a commendable procedure and refreshingly progressive. There are now four men on this assignment, two more are currently authorized and two additional positions will be available July 1, 1958.

Perhaps an inference could be drawn from the fact that the Department of Water Resources employs as many or more fish and wildlife specialists on potential future water projects as does the Department of Fish and Game for water projects actually being constructed or currently up for licensing. It is well to prepare for the future, but if the present is neglected the future may not turn out as anticipated.

5. RECOMMENDATION ON WATER PROJECTS

(1) *Increase the Water Projects Staff*

It is recommended that additions be made to the personnel of water projects on the regional and headquarters levels. Precise estimates of immediate and future requirements should be dependent upon analysis of a number of related factors and an intimate knowledge of the problems in California. A good start toward this has been made by the present staff, and their efforts should be used in administrative planning for expansion of this section.

Without a material increase in qualified technical staff augmented by larger operating funds, the department will be unable to perform effectively one of its most vital functions.

(2) *Investigate Possibility of Co-operative Sharing of Water Projects Costs*

The possibility of outside financing of some of the water projects work should be explored. The constructing agencies are responsible for making this additional work necessary for the department and should pay the additional cost. There are precedents for this in other states and in effect in the California Water Resources Board planning, as it pays for department people to work with it.

POLLUTION

The department has specific legal responsibilities * to enforce antipollution provisions and to report on pollution conditions not subject to its control. There is an apparent limitation on the department's enforcement powers under the basic state antipollution law (the Dickey Act), which restricts action to "one-shot" cases of pollution, such as an oil spill. Beyond this direct duty, the department has the responsibility to submit reports and recommendations to the State Pollution Control Board or the nine semiautonomous regional pollution control boards. In practice, the latter action is performed by regional personnel of the department with assistance and guidance from the staff section in the control office.

6. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

As is true of water projects problems, water pollution problems require a great amount of time-consuming work in detecting sources of pollution, ascertaining the species and magnitude of fish stocks affected, and determining what remedial action is necessary. This task requires more personnel than the department has available to devote to it. As a result, water pollution control is not as effective as it should be.

Moreover, all information or evidence noted during the course of this survey indicated that the Dickey Act is not a forceful instrument for abating forms of pollution which are destructive to fish and wildlife. The department is justified in seeking stronger legal measures which will recognize fish and wildlife protection as a definite objective.

7. SPECIFIC PROBLEMS IDENTIFIED

In relation to the complexity of the pollution problem, staffing is not adequate. One person is assigned to pollution matters in the Water Projects Section at Sacramento. The 1958-59 Budget provided one pollution analyst position for each of two regions. The time-consuming task of detecting sources of pollution, ascertaining the composition and magnitude of fish stocks affected and the determination of dilution or treatment standards sufficient to protect such stocks is a complex technical problem which calls for a much larger staff. The only recourse is to detail regional fishery personnel, similar to the practice prevailing in connection with water impoundments, diversions and appropriations. Some analytical work may be performed by other state agencies having related functions or by private firms, and some bioassay has been performed by the California Academy of Sciences. There is no assurance that such services will be available when needed. Regional staffs are ordinarily not pollution specialists with the training and experience required to work out the chemical and biological problems inherent in antipollution activities. In any case, the interference with regular duties involving the normal programs of the department, which occurs when emergency pollution assignments are made, is destructive to the other activities. Tentative plans have been drawn up by the department for providing additional staff and facilities to meet the challenge of new and greater waste discharges.

In addition, reference has already been made to the fact that the basic state antipollution law (the Dickey Act) is not an effective and forceful law with which to protect fish and wildlife. A more effective state law is required if the department is to have the tools necessary to accomplish its constitutional objectives of wildlife conservation and protection.

8. RECOMMENDATIONS ON POLLUTION

(1) *Increase the Water Pollution Staff*

Pending a change in the basic pollution control laws of the State, the department should prepare a budget estimate which will provide a staff of chemists and biologists adequate to meet the workload of pollution cases in each region, in those coastal areas in which Marine Resources Operations exercise major functions and at headquarters. The present staff can outline the form and extent of added staff organization to conform to any specific budgetary level.

A pollution research and control laboratory is necessary if a pollution staff is to operate with maximum proficiency. Budgeting for such a unit, set up as a centralized staff function to be supervised by the chief of the Water Projects Section, should be a part of the general plan of pollution control. Such a laboratory can provide uniform technical standards and specialized services and studies for application within and by the regions. Here, also, the judgment as to location, design, equipment and facilities can be drawn from the experience of the present staff. The Legislature has approved a modest start toward alleviating a menace to all living aquatic resources, but halfway measures are not enough. The department is aware of the seriousness of the threat but lacks the resources to cope with it.

* Sections 481; 481.5—Fish and Game Code, 1955-57.

(2) *A Stronger, More Workable Pollution Control Law Should Be Enacted*

The present antipollution law should be strengthened so as to provide the department the necessary legal authority to enforce antipollution action on a continuing basis.

In this connection, it is important to recognize that pollution control for fish and wildlife is not always closely related to sanitation and public health. Silt or low oxygen content in a stream may not be of importance to public health but may make aquatic life difficult or impossible. On the other hand, conditions unacceptable from a public health standpoint might not be inimical to fish. Co-operation between state agencies is desirable and liaison on pollution matters with the sanitation and public health bodies should be maintained. However, the objectives of the two groups are different; and if fish and wildlife are to be adequately protected, the Department of Fish and Game will have to maintain an active part in the pollution picture. Any other agency could not be expected to have the interest in or knowledge of the needs of fish and wildlife.

SALMON-STEELHEAD MANAGEMENT

It is necessary to devote a separate section of this survey report to consideration of the special problems inherent in the management of the anadromous salmon and steelhead populations. It is a problem which confronts the States of Oregon and Washington as well as California.

The basic difficulty is the fact that a marine fishery (for salmon) is involved and is vitally affected by management practices applied to inland fresh water areas. Both stocks are intermingled in spawning areas and depend upon the protection of watersheds and the conservation of water for their survival. In California the management of the two populations is vested primarily in two administrative units: the Inland Fisheries Branch, operating through the regions, and the Marine Resources Branch. Basically, the former concerns itself most deeply with steelhead while Marine Resources is considered the "salmon" organization. The biology of the species creates inevitable overlapping, complicated by the added fact that the related hatchery functions are performed under the regional regime. The department has sought to reconcile these crossed lines by setting up an informal, interbranch salmon-steelhead technical committee. By this means, generalized plans are developed and branch and regional responsibilities are defined.

9. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

Within recent months the king salmon stocks have exhibited signs of an apparent decline so drastic that widespread alarm has been generated. This situation has accented a growing conviction that the management of the salmon-steelhead stocks, whether in the ocean or in fresh water, is a unified biological problem and cannot be successfully overcome by approaching it through diversified administrative channels. In popular terms, it has to be "packaged." This writer knows of no individuals engaged in research or management of the salmonoids who disagree with the basic concept that the biological unity of the reproductive and growth phases demands similar unity in the organization of management and research.

10. SPECIFIC PROBLEMS IDENTIFIED

Revision of the department's plan of operating responsibility in connection with salmon-steelhead has become urgent. Such revision must take the form of withdrawing some functions from their present assigned location and adding them to some other existing or new unit. The problem is to select the most appropriate administrative entity in which to place the combined functions.

11. RECOMMMENDATIONS ON SALMON-STEELHEAD MANAGEMENT

(1) *There Should Be Established a New Section of Anadromous Fish (Salmon-Steelhead Section Would Be Equally Descriptive)*

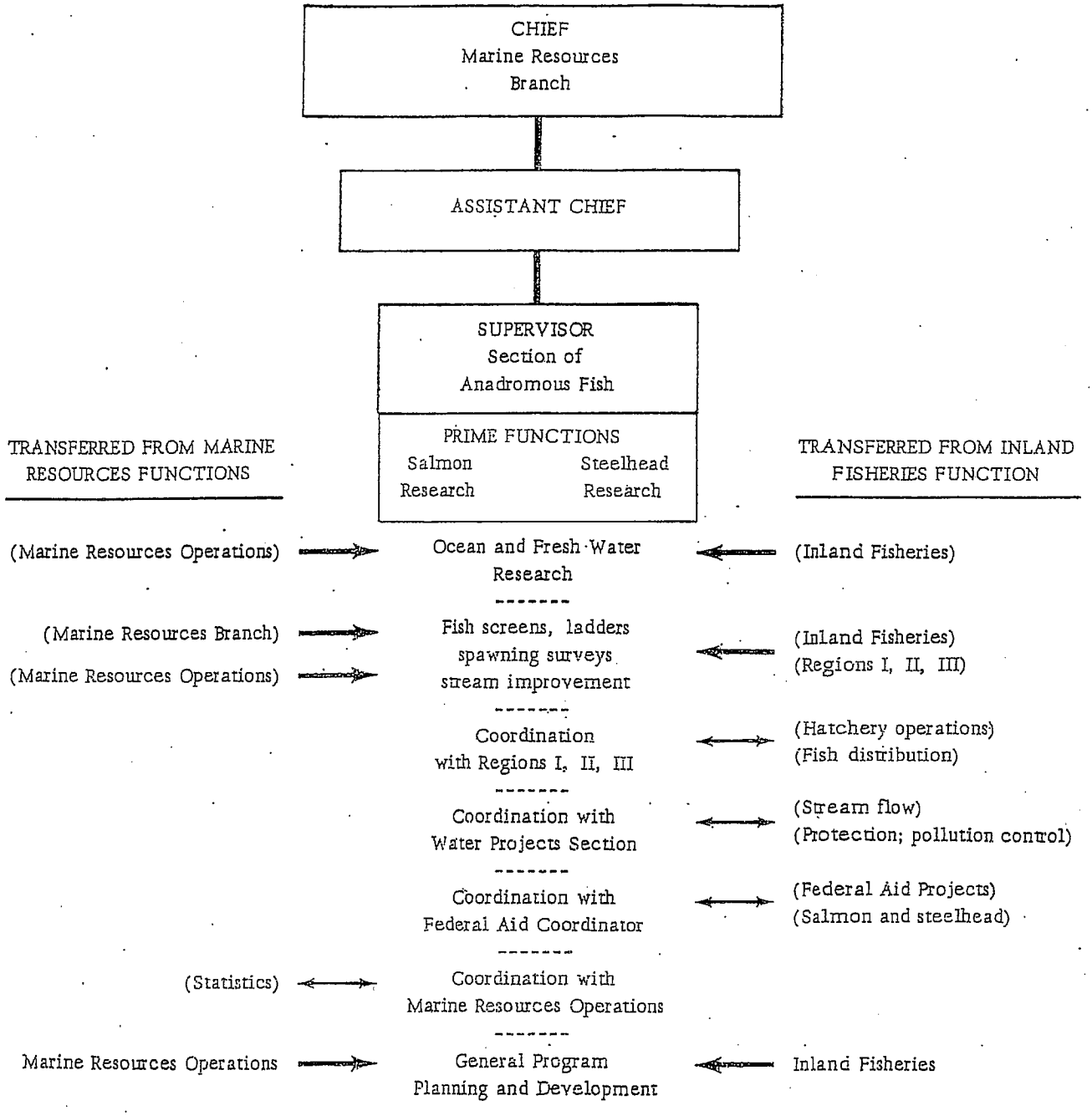
The subject matter (salmon and steelhead research and management) is not biologically divisible into unrelated segments. Any separation of individual operations, geographical or otherwise, is entirely artificial. A related series of operations, tied together by biological sequences, can best be administered by a single unit of organization.

(2) *Existing Functions of Salmon-Steelhead Research and Management Should Be Assigned to Section of Anadromous Fish*

The functions to be transferred to the new section of anadromous fish should include fish ladder and screening co-ordination; spawning ground and escapement counts and analysis; sampling activities (ocean and fresh water); functional planning and design for facilities (ladders, hatcheries, experimental devices, such as artificial spawning reeds). Exhibit XXVII, following this page, graphically illustrates the proposed transfer of functions. Federal aid studies concerned with salmon-steelhead should retain their identity as Dingell-Johnson projects but be co-ordinated through the new section. Hatchery operation, maintenance, and fish distribution should remain as a function of the regions, with broad planning affecting the development of new facilities, and the disposal of hatchery production being a joint determination of the new section and the appropriate region. According to information from the department there are 11 persons engaged in full-time duties on salmon and steelhead.

EXHIBIT XXVII
State of California
Department of Fish and Game

RECOMMENDED TRANSFER OF RESPONSIBILITIES TO SECTION OF ANADROMOUS FISH



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The Inland Fisheries Branch is principally involved with steelhead but conducts some activities with king salmon (marking, etc.). The Marine Resources Branch does not concern itself with steelhead and focuses its salmon research largely on the ocean phase of the life cycle. However, it does participate directly in those fresh-water phases which involve spawning escapement, hatching and survival of young and has assigned to it (by action effective April 1, 1958) a fisheries manager II position with the assigned responsibility of co-ordinating fish screen and ladder programs and spawning ground surveys. Both Inland Fisheries and Marine Resources have staff duties in identical areas involving identical species and species which coexist.

This situation is superimposed upon regional responsibilities for the collection of eggs, and hatching and distribution of the salmonoid species. Regional personnel (supervisors and fishery managers) participate in varying degrees in the above-mentioned activities, by arrangement. Four regions have actual or potential responsibilities in this context.

It should be unnecessary to itemize in greater detail the extent to which the salmon-steelhead program leaps across the present boundaries of unit responsibility. It should be evident that the program is basically homogeneous, and that homogeneity in administration is only to be won by consolidation of the key functions, wherever they may be located.

(3) *The Section of Anadromous Fish Should Be Assigned As a Headquarters (Sacramento) Unit With Direct and Immediate Supervisory Responsibility Vested in the Chief and Assistant Chief of the Marine Resources Branch*

It is recommended that the proposed new section be placed at the central headquarters, under an employee at the level of staff adviser to the director, because interbranch and interregional co-ordination will be necessary. Exhibit XXVIII, which follows illustrates the organizational placement of the proposed new section. The central headquarters is the place where such co-ordination can best be accomplished. The hatcheries, under regional supervision, can make their contribution to a planned program only through the deputy director as the key point of contact with regional managers. The federal aid coordinator is likewise a headquarters position. The water projects section, also headquarters, is constantly reaching policy decisions which virtually mean life or death to segments of the salmon-steelhead runs. It seems probable that, despite the consolidation of functions recommended above, there will be additional residual functions of the Inland Fisheries and Marine Resources branches which will require co-ordination. All this adds up to a series of actions which will come about more smoothly under the guidance of a headquarters staff officer than through any field operating unit.

The placement of the proposed new section under the chief of the Marine Resources Branch calls for more of an arbitrary decision. The alternative would be to assign the supervisory role to the chief of the Inland Fisheries Branch.

Some of the arguments in favor of the recommendation are as follows:

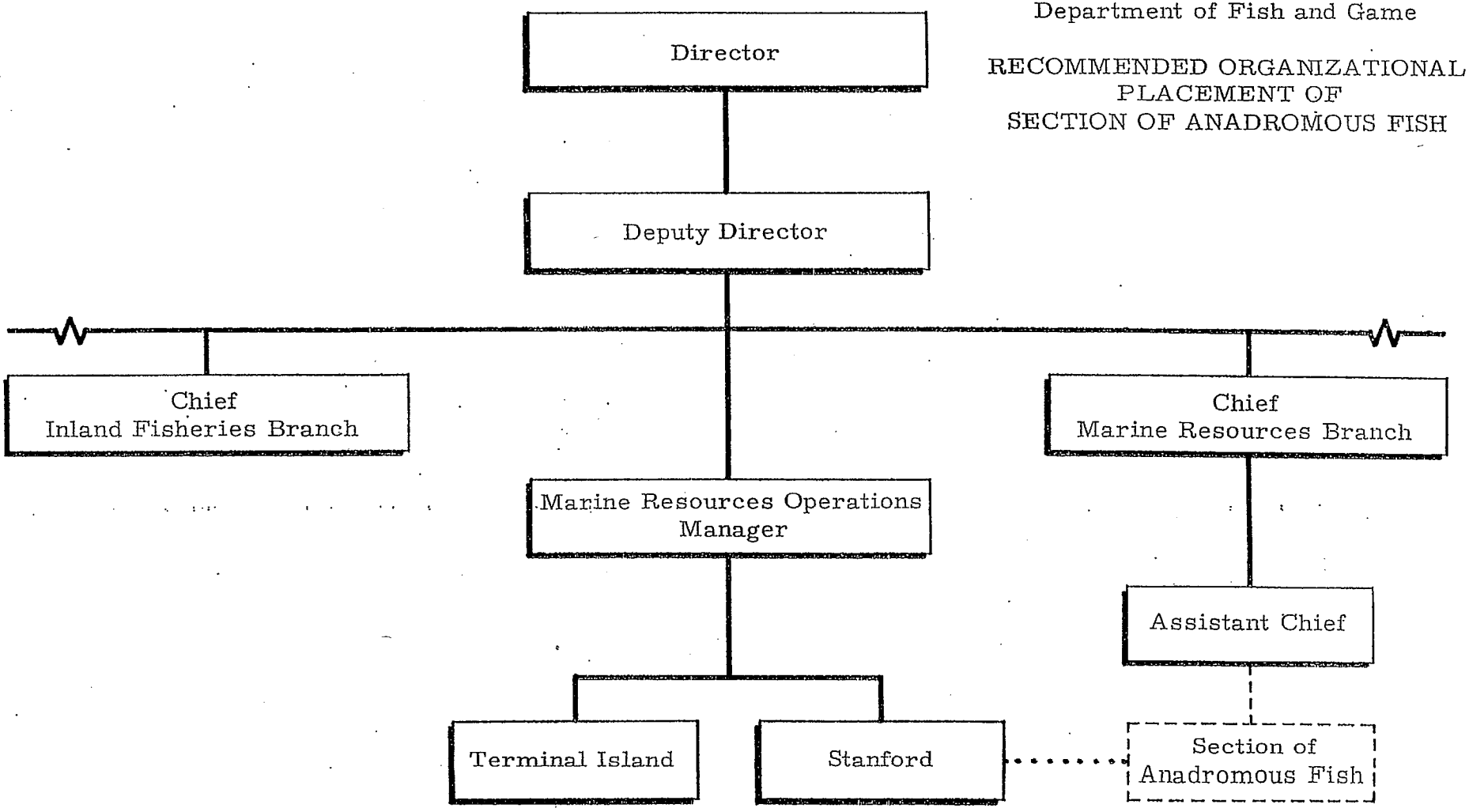
1. The salmon problem is most critical; there is no dramatic steelhead "crisis." Marine Resources has a long background of research upon salmon and is presently staffed with specialist personnel at the Stanford laboratory.
2. Marine Resources is performing all of the marine research conducted by the department, which is a significant proportion of the overall aquatic research program, and it can absorb any added research responsibilities as a normal expansion. Transfer of some personnel to Sacramento as a central core staff for the headquarters section is visualized as a necessary step for activating the proposed unit.

   However, operating logistics for ocean investigations, an essential part of salmon studies, or for certain other field activities, can be facilitated by use of the vessel and coastal field office facilities of Marine Resources operations. This indicates the desirability of continuing to use the Stanford laboratory of Marine Resources as a point for stationing personnel who will be performing active duty in the coastal waters, the San Francisco Bay area, the coastal rivers and the lower Central Valley. The selection and placement of individuals for specific assignments in headquarters or field is most likely to be realistic if left to the administrative judgment of the department.
3. The chief of the Marine Resources Branch has long represented the department before interstate and international organizations where the conservation of salmon has been considered. The background in this facet is well established. Although there is room for debate, it appears that Marine Resources provides the best vehicle for administering a new consolidated section of anadromous fish.

Adequate water supplies of acceptable quality are required if anadromous and inland fishes are to prosper, or even survive. The many water projects in process or in the planning stage, and the extent of water pollution problems present a growing need to increase the departmental staff devoted to overcoming these threats to inland fisheries conservation. There is also a pressing need to integrate responsibility for anadromous fish management into one organizational unit.

EXHIBIT XXVIII
State of California
Department of Fish and Game

RECOMMENDED ORGANIZATIONAL PLACEMENT OF SECTION OF ANADROMOUS FISH



Legend

Existing ——

Proposed — — —

Field Liaison .....

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CHAPTER VIII

WILDLIFE PROTECTION

ERNEST SWIFT

Enforcement of fish and game regulations is a part of the management of wildlife resources and one of the department's most important responsibilities. Maintenance of a protection force is recognition of this responsibility.

Law enforcement officers also can play an important part in the field of wildlife management, public relations and general conservation education.

Game laws are almost as old as the original colonies, and the conservation programs of most states originally centered around law enforcement activities. Abuse of resources first became apparent with the disappearance of wildlife as the Nation moved west; and many who became alarmed at the slaughter of game were blind to the fact that forests, land and water could be abused to the point where they too must ultimately come under regulations.

Enactment of restrictive laws was at first thought to be the entire answer to conserving wildlife. As time went on, it became apparent that land and water use were vital factors and that the laws of the Nation could not save fish and game if their environment was not preserved.

Today a well-balanced conservation program requires considerable reliance on the police powers of the state for protection of wildlife resources.

In California, it is necessary that both the personnel of the department and the public have a profound appreciation of the relative importance of the various activities which make possible a well-rounded conservation program.

Restrictive laws and regulations and their enforcement will always be necessary to protect the fish and game resources. Regulations are nothing more than a form or system of rationing, so that everyone wishing to hunt or fish has a reasonable opportunity to help harvest the surplus and at the same time give protection to the basic seed stock.

1. SCOPE OF THE SURVEY

Although Senate Concurrent Resolution No. 126 does not specifically include an evaluation of the wildlife protection function, such an evaluation is pertinent to the overall intent of the survey. Survey scope has, therefore, included full review of the organization, functions and administrative activities in this important area.

2. CONDUCT OF THE SURVEY

That portion of the survey which involved evaluation of wildlife protection included these steps:

(1) Examination of procedures at headquarters and at regional offices.
(2) Field trips to supervisors, captains and field wardens.
(3) Contacts with other department personnel and the public.

Our evaluation has been based on the analysis of facts gathered in the above steps.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

The wildlife protection force consists of one chief at headquarters; six supervisors; 26 patrol captains in five regions and headquarters; and 220 wardens.

Law enforcement is administered on a regional level primarily, with the chief at headquarters in a staff capacity. In each region, a supervisor, responsible to the regional manager, is in direct charge of law enforcement. Under the supervisor, the several patrol captains in the region direct the wardens assigned to their areas for law enforcement.

In California, enforcement of the fish and game code and regulations is good. The wildlife protection service is composed of conscientious, hard-working and experienced men who are well liked and respected by local residents and the public at large.

Wardens carry out their law enforcement duties in every section of the state. Since they spend a major portion of their time in public contact and since they are often the only department employee in their area, wardens act as department field representatives. In this role they can be one of the chief means of conveying and interpreting department policies and programs to state residents.

Unfortunately, not all wardens act in the department's best interest—some have actively opposed department policies and programs upon occasion. The cause for this lack of co-operation and apparently unloyal attitude is complex.

Basically, the department has not given adequate attention to developing warden understanding of the needs for and logic of its policies and programs nor to gaining warden acceptance before announcing them to the public.

Even when the department has tried to educate the wardens properly, however, there has been some resistance by some wardens. The apparent explanation of this attitude involves several factors. As local residents in their areas wardens have difficulty in explaining broad department programs in terms their

neighbors will understand, especially since the wardens themselves have not been given adequate explanations of the program. Some wardens with long experience in following certain policies and programs find it difficult to accept new policies and programs at odds with the old. Since the wildlife protection service is older than fish and game management, some wardens may resent the new policies formulated by what they may consider to be less experienced men. Wardens have also resented the fact that the department has published policies and programs without prior notification to the wardens. This has placed the wardens in the position of being asked specific questions by the public about programs of which the wardens have no knowledge.

Thus, the course of warden opposition to department policies and programs is complicated and will be only overcome by a carefully planned and well-executed program. Basic recommendations to correct this situation are found in Chapter IX, Conservation Education, and in Chapter XII, Departmental Organization.

In the next section we have listed some specific problem areas in wildlife protection which require attention.

4. SPECIFIC PROBLEMS IDENTIFIED

Survey work in the wildlife protection service has isolated several specific problem areas which are listed below:

(1) Relationships between the branch chief, the regional managers and regional supervisors.
(2) Standardization of law interpretation, procedures and equipment among the regions.
(3) Interchange of personnel between law enforcement and other functions.
(4) Wording of fish and game regulations.
(5) Relationship of wildlife protection to:
— Marine Resources
— Department of Fish and Game

Each of these problem areas is discussed in detail in the next section.

5. ANALYSIS OF PROBLEMS AND DEVELOPMENT OF RECOMMENDATIONS

In the following discussion, each problem area is defined and analyzed. Specific recommendations for overcoming the problems are presented to complete the discussion.

(1) *Relationships Between the Branch Chief, the Regional Managers and Regional Supervisors*

Lack of clearly understood relationships between these three management levels prevents fully effective results from their individual efforts.

Analysis of the present organization structure indicates that the wildlife protection branch chief is a staff officer under the deputy director. The department manual states that the branch chief's duties are:

> "Under the direction of the deputy director * * * to make studies of needs and facilities; to plan wildlife protection activities; to inspect field operations to assure compliance with policies and procedures; to evaluate procedures, and ascertain means of improving operations; to present recommendations on programs, policies, regulations, and legislation to the deputy director; to assist in formulating in-service training programs; to maintain liaison with governmental and other agencies within scope of responsibilities; to inspect and co-ordinate activities of patrol boats assigned to regions; to review applications for permits to take or possess certain wild animals."

In actual practice the branch chief has not exerted the full force of his position to co-ordinate the wildlife protection function throughout the State. His superiors have restricted his inspection and performance evaluation activities in the regions on the premise that regional supervisors would construe these activities as line rather than staff direction. Also, since the staff nature of the branch chief position is relatively new in the department, there is little precedent for the incumbent to follow regarding how to perform his duties.

Regional managers are the administrators of all functions of their regions and give varying degrees of attention to enforcement. None of the regional managers has had any extensive amount of enforcement experience; and enforcement, by the very nature of its scope, requires more uniformity and concerted action than any other function.

Thus, regional managers should be constantly referring their law enforcement problems to the branch chief in order to get sound and department-wide solutions to the problems. This has not been the case.

Wildlife protection supervisors were told at the time of the department reorganization that they reported to their regional manager for direction. Since the supervisors have not had clear-cut understandings on their relationships with the branch chief, they have taken their law enforcement problems to the regional manager or have made their own decisions. As a result, each region has its own law interpretations and solutions to law enforcement problems.

The relationships between the responsibilities of the branch chief, the regional manager and the regional supervisor need clarification.

RECOMMENDATION

1. Define the Relationship Between the Branch Chief, the Regional Manager and the Regional Supervisor by Listing the Specific

Areas in Which They Should Work With Each Other and the Expected Results in Each Case

Some but not all of these areas are mentioned in the succeeding discussion.

(2) *Standardization of Law Interpretation, Procedures and Equipment Among the Regions*

Fish and game laws are not uniformly interpreted nor are law enforcement procedures and equipment standard throughout the State. The tendency is for each region to develop its own wildlife protection service. Apparently this situation was true to some degree under the old organization prior to 1953, but it should not continue and can be corrected.

The regions are becoming independent law enforcement units with different emphasis on certain regulations and different interpretations. There seems to be substance to the complaint that misunderstanding and jealousies have arisen regarding the wardens of one region working over the boundary of a neighboring region. This type of situation can be very damaging to morale and effective enforcement.

One common complaint from the wildlife protection activity is that too little attention is paid to their recommendations for equipment. There seems to be a great need for better unification and processing of equipment purchasing.

Current arrest files should be set up in each region (some regions have them) so that this information is available within the region. More important is a master file at headquarters which is current and up to date, so that field men calling can immediately obtain information regarding the previous arrests of any individual. This responsibility should center in the office of the chief of enforcement.

Three regions dispatch their radio messages by a full-time warden, two have clerks. All radio dispatching should be done by a full-time enforcement officer, and during peak loads in some regions an 18-hour service would increase efficiency. At present some wardens cannot call into their regional office by radio. Increasing the booster system would probably overcome this problem.

Uniformity of law enforcement, procedures and equipment are the responsibility of the branch chief. He should continually inspect regional operations to identify lack of uniformity and law enforcement problems which need statewide co-ordination in resolution. Regional managers and supervisors have responsibility for bringing their problems to the attention of the branch chief.

Promulgation of uniform law interpretations, procedures and equipment should be initiated by the branch chief through the regional manager to the supervisors, but this formality should not extend to the identification and resolution of law enforcement problems. There is a need for the direct interchange of ideas and information between the branch chief and regions. In addition to frequent visits of the branch chief to the regions, occasional group meetings of the regional managers and supervisors would be desirable.

RECOMMENDATIONS

1. **Review All Law Enforcement Activities in Each Region to Determine Where Lack of Statewide Uniformity Exists and to Identify Problems**

   While the branch chief should be held responsible for this review, he should be given adequate and experienced assistance in the form of temporary assignments of experienced law enforcement personnel.

2. **Hold Meetings of Regional Managers and Law Enforcement Supervisors to Discuss Lack of Uniformity Between Regions and Other Law Enforcement Problems**
3. **Develop Standard Law Enforcement Interpretations, Procedures and Equipment**
4. **Issue Performance Standards as Directives From the Deputy Director**

(3) *Interchange of Personnel Between Law Enforcement and Other Functions*

Better understanding is needed regarding the interchange of personnel between enforcement and other functions and between regions. The department has potential manpower for seasonal peak work loads, but little seems to be done to co-ordinate this manpower. During certain game seasons such as duck, pheasant and deer, personnel of other divisions should be used in law enforcement.

Specific recommendations to accomplish this program are contained in Chapter XII, Departmental Organization.

There should be greater stress placed on this aspect of administration. It is a common-sense approach to the better utilization of manpower.

RECOMMENDATIONS

1. **Develop and Implement Plans to Interchange Personnel Between Functions in Each Region**

   This should be a regional manager responsibility.

2. **Develop and Implement Plans to Interchange Personnel Between Regions**

   This should be a deputy director function in conjunction with branch chiefs and regional managers.

(4) *Wording of Fish and Game Regulations*

At the present time, law enforcement personnel in the regions have little or no part in writing fish and

game regulations. Since wildlife protection personnel have the difficult task of interpreting and enforcing the regulations, they should participate in establishing the wording of the regulations.

An important responsibility of the commission is setting of seasons and bag limits for hunting and fishing; and one of the most important functions of the Department of Fish and Game is the development of these regulations for consideration by the commission. When authorized by the commission, their enforcement becomes an important function of the department.

All such regulations have an impact on the public, and sound fish and game management cannot be promulgated or made effective unless the regulations are written so that the average person can understand them. There also must be sound reasoning as to why they are necessary. The public has a right to expect easily interpreted regulations. This cannot be accomplished unless regulations are written and reviewed by people who are schooled in developing and enforcing regulations as well as having the ability to write with brevity and clarity.

Codification of regulations so they are as brief as possible yet complete and explicit must be developed through teamwork over a period of years. After experience, trial and error, certain basic language needs little or no change and should not be changed unless amply justified. Codification of regulations is not a one-man job but a job that must have leadership and collective effort. Even legal training is not sufficient; people trained in the biological fields and in conservation law enforcement must be a part of the team.

Game and fish regulations passed by the commission should begin as recommendations of:

— The game management branch in co-operation with the regions.

— The inland fisheries management branch in co-operation with the regions.

Marine regulations presented to the Legislature should be recommended by the Marine Resources Branch.

Responsibility of writing and codifying the regulations for the department should center in the wildlife protection branch chief. Steps necessary to finalize the regulations should be timed in conjunction with the statutory dates for their consideration set by the Legislature for the commission to consider; nevertheless, these steps can be standardized. The pattern of operation should be as follows:

1. All recommendations for regulations should be forwarded by the respective branches to the wildlife protection branch chief for tentative development into proper terminology.
2. Prior to their presentation to the director and the commission, the tentative draft should be sent to regional law enforcement personnel for study.
3. After a review period, all regional wildlife protection supervisors should meet at headquarters to discuss further the proposed regulations.
   — Purpose of this meeting should be to recommend terminology and the mechanics to make the recommendations enforceable and not to change the intent of the regulation.
   — The deputy director should be chairman of the meeting.
   — The Attorney General's Office should be represented.
   — The branch chiefs of Fish and Game should be represented.
4. As a result of the meeting, the regulations should be rewritten to support intelligent management and to give the public as much latitude as is consistent with good game and fish management. Above all, they should be clear in meaning and as concise as possible; and should not be unduly harsh.
5. After final wording is agreed upon, the regulations should be submitted to the director and then to the commission. The commission should then amend wording of the annual regulations only in special cases.

RECOMMENDATION

1. **Provide Direct Participation of Regional Law Enforcement Personnel in Developing the Wording of Fish and Game Regulations**

(5) *Relationship of Wildlife Protection to Marine Resources*

Some questions have been raised concerning the advisability of placing the marine patrols (now under wildlife protection) under Marine Resources Operations.

There is one wildlife protection supervisor in each of the regions except Region V, where there are two wildlife protection supervisors—one for land patrol and one for marine patrol. The wildlife protection supervisors are responsible for the law enforcement in their regions and report directly to the regional managers.

In all regions except Region V, the wardens who are stationed along the coast generally do some land and some marine patrol. In Region V, where the law enforcement personnel are divided into land and marine patrol, there is some duplication and quite a lot of confusion on the part of the public as to which group should be called for law enforcement in the overlapping areas. This duplication and confusion is not apparent in the regions where there is not this division of land and marine patrol.

Region V is a large region and now has a heavy law enforcement work load. Recommendations in Chapter XII, Departmental Organization, however, lessen this work load by reducing the size of Region V. This move will allow wildlife protection for this region in the future to be co-ordinated by one wildlife protection supervisor.

It would only add to the confusion and duplication if the marine patrol in Region V were to be put into the Marine Resources Operations at Terminal Island. If a few wardens in these three regions which have some coastal area were reporting to the manager of Marine Resources at Terminal Island, it could and no doubt would cause duplication and confusion and would generally not be satisfactory. As an example, the warden at Crescent City, Del Norte County, who does some land patrol and some marine patrol, would be reporting to two supervisors.

It would appear that the Marine Resources Operations and Branch should mainly devote their efforts to research for which they are set up and which they have been doing all these years.

RECOMMENDATIONS

1. **Keep Marine Patrol Within the Wildlife Protection Function**
2. **Direct the Wildlife Protection Branch Chief to Devote Sufficient Time to Evaluating Interrelationships Between Inland and Oceanic Patrols to Insure Intelligent Co-ordination and Operation**

(6) *Relationship of Wildlife Protection to the Department of Fish and Game*

Some opinions have been expressed that wildlife protection should be a separate agency from the department.

Separation of the function from the department would lead to the situation where a large group of personnel would be pursuing the wildlife protection function with little or no co-ordination with the department.

Instead of rigidly fixing the duties of warden to enforcement, those duties should be broadened to include participation in fish and game surveys, in development of regulations and in being leaders in the department's educational program.

Any person officially engaged in any phase of resource management should be a dedicated conservationist first and a specialist second. Conservation still has all the elements of a crusade and will have for a long time.

Recommendations contained in Chapter XII, Departmental Organization, have developed a definite plan for broadening the responsibilities of the present warden to enable him to be more effective as the department field representative.

RECOMMENDATION

1. **Retain the Wildlife Protection Function in the Department of Fish and Game**

Enforcement of the Fish and Game Code and regulations is good. In addition to their law enforcement responsibilities, wardens have the responsibility to carry the department's programs to the people. Wardens are in constant contact with the public and therefore are the department's representatives to the public.

Unfortunately, not all wardens act in the department's best interest. By their actions, an element of departmental disunity is sowed in the minds of the public. Causes of this lack of teamwork are several, but the principal cause is the failure of the department to win warden understanding of the needs for and logic of its policies and programs.

Greater understanding of department programs is the key to gaining greater warden acceptance of department programs and to developing the necessary spirit of departmental teamwork.

CHAPTER IX

CONSERVATION EDUCATION

ERNEST SWIFT

Interest in wildlife management has increased many-fold in the past several decades. At the same time, the fund of knowledge relating to wildlife management has been rapidly increasing. As a result, there has developed a need to bring knowledge of these new developments both to those engaged in wildlife management and to the sportsmen and interested general public.

Those responsible for managing wildlife resources have developed an appreciation for the fact that they are working with natural elements, that there are limitations to the manipulation of those elements, and that there are many factors and so-called whims of nature which must be intelligently recognized and with which they must live. Much is known about these various factors, but much is yet to be learned. Because of this, research is a prerequisite to sound wildlife management. As a result, many programs must be pursued over an extended period of time, with continuity and patience and, of course, with manpower and money.

State conservation departments have found it necessary to devise ways and means of informing all concerned as to the meaning of the new knowledge gained and as to its effect upon wildlife conservation policies, programs and practices.

Since conservation departments are public agencies, the people are entitled to an honest evaluation of the problems inherent in conservation. A wildlife program is generally considered essential to the recreational and aesthetic well-being of the American citizen, and a wildlife program is based on good land and water management—the elements that support human life. Strange as it may seem, many people have come to recognize the importance of land husbandry for human existence through lessons learned through the management of wildlife. Therefore, regardless of the scope of limitations of responsibility resting in a conservation department, the need for educating the public in this basic philosophy is sound.

1. SCOPE OF THE SURVEY

Senate Concurrent Resolution No. 126 specifically directs an evaluation of the conservation education program in the Department of Fish and Game. All functions of conservation education, including the publications and printing of the department have been subjected to review and analysis.

One handicap of sound programing in conservation education in general is the lack of clear-cut objectives by the departments themselves. Objectives must be sound and lucid before conservation education can translate them for public consumption.

It is with these factors in mind regarding the national pattern that an examination is made of the educational program of the California Department of Fish and Game.

2. CONDUCT OF THE SURVEY

Material and data necessary for proper evaluation of the department conservation education program was gathered through:

(1) Discussion with personnel of the department at all levels.
(2) Information from other members of the survey team.
(3) Information from other public agencies.
(4) Examination of the literature and material produced and distributed by the department.
(5) From recent legislative reports and the report of the legislative analyst.

These data were analyzed to produce the conclusions and recommendations set forth in the following section.

3. GENERAL APPRAISAL OF POLICIES AND PROGRAMS

Functions of the Conservation Education Division are (quoting from the department manual of 1955):

> "The conservation education section is charged with, and responsible for, the preparation, use and distribution of all departmental public information and material, including news releases, special informational articles, publications, photographs, maps, motion pictures, etc.: for the participation by the department in sportsmen's shows, fairs, conferences on conservation, special courses on wildlife in colleges and universities in California; in-service training of departmental personnel; and the hunter safety training program.
>
> "The goal of the section is to provide uniform availability of all informational and educational resources to the public, and to provide reasonable insurance against circulation of information not in accord with commission and department policies."

5—87325

The Conservation Education Director is responsible to the Director of the Fish and Game Department in carrying out the functions of the division. Under his direction are two public information officers, an editorial assistant, a hunter training officer and clerical personnel.

Mechanically, the functions of the division are adequately performed. The goal of conservation education, however, is inadequate for the good of the department. Even at that, one phase of the present goal is not being achieved.

Under the present goal, the division has the passive objective of providing "* * * uniform availability of all informational and educational resources to the public. * * *" The department has the massive responsibility of conserving the state wildlife resources. This responsibility can hardly be met unless the public is aggressively advised of the issues and facts which must be considered in conserving state wildlife resources.

For example, the public must be told that poor logging practices have destroyed large portions of state salmon spawning grounds and that, as a result, the salmon resource is decreasing. The issue here of correcting the improper logging practices must be carried to the public in an aggressive manner until the public has decided that it wants to correct the logging practices or that it will allow them to continue knowing full well that salmon runs will be greatly reduced.

The department needs to reset its goals and better identify the issues which the conservation education section takes to the public.

As was pointed out in Chapter VIII, Wildlife Protection, some wardens have on occasion actively opposed department policies and programs. This is adequate proof that the conservation education division has not satisfied another part of its goal which states, "* * * provide reasonable insurance against circulation of information not in accord with commission and department policies."

In addition to these broad appraisals of conservation education, a number of specific problems have been considered.

4. SPECIFIC PROBLEMS IDENTIFIED

Following is a list of specific problem areas identified during evaluation of the conservation education functions.

(1) Conservation education objectives.
(2) Talent needs in the division.
(3) Publications.
(4) Publications required by law.
(5) Other printed material.
(6) Press releases.
(7) Exhibits.
(8) Motion pictures.
(9) Education.
(10) Participation of department personnel in conservation education.
(11) Hunter safety training program.
(12) School and youth education.
(13) In-service training.
(14) Regional conservation education officer.

In the following, these problems are identified and discussed in detail.

5. ANALYSIS OF PROBLEMS AND DEVELOPMENT OF RECOMMENDATIONS

Discussion and recommendations for each problem follow the caption headings.

(1) *Conservation Education Objectives*

Objectives of the Conservation Education Division, as set forth in the department manual, simply state the duties of the division and, to a degree, the mechanics to be followed.

The directive should be broadened with an explanation of why a conservation education program is essential to developing a proper public attitude. It should emphasize the department as a guardian of resources and a leader in their management. It should point out that conservation is much more than shooting game and catching fish. Recognition should be given to those who enjoy the aesthetic elements of nature, and this segment of the public should be assured their interests are being given due consideration.

The directive could well emphasize the need for youth education in the field of conservation and the use of resources. It should set forth more specifically what the department policy is in handling public information and should aim at uniformity in carrying these policies out. All personnel should be informed of and familiar with the department's educational policies so there is a united front in presenting them to the public.

RECOMMENDATION

1. Rewrite Conservation Education Objectives to Broaden Coverage and to Promote Intradepartmental Understanding

(2) *Talent Needs in the Division*

In view of the fact that education and public relations is such a vital part of the conservation movement, the conservation education director should be in close liaison with both the director and deputy director of the Department of Fish and Game and should be in position to guide the regions so as to insure conformity with department policy.

Consideration should be given to the composition of the educational staff. Personnel of this division should have varied backgrounds. A Conservation Education Division should have some rare combinations

of talent, and all personnel should be well-grounded in the fundamentals of resource management such as forestry, range management, water and pollution problems, erosion, as well as wildlife.

The personnel should have the ability to present facts to the public with the greatest simplicity. They should be able to sense controversial problems before they become issues. They should have the authority as well as the imagination and leadership to develop the department personnel into a team which contributes to the overall educational effort.

At least one member should have some formal teaching background as an entry to the State School System and youth groups. Extension service type of talent is much needed in all the educational efforts of a conservation department. The U. S. Department of Agriculture has been notably successful in training people for leadership along these lines.

All personnel of a conservation education division should have better than average ability to write and to absorb technical findings, interpreting them for public consumption.

RECOMMENDATION

1. **Determine Specific Talent Needs and Staff Division With the Proper Personnel**

   An evaluation of the present talent of the conservation education division to determine the diversification and potential of the present personnel will serve as the basis for carrying out this recommendation.

(3) *Publications*

The *California Fish and Game Quarterly* has been published for 44 years. Traditionally it has been considered a technical publication, but prior to department reorganization it contained items of general interest.

The quarterly has been and is now edited by members of the technical staff from game, fish and marine resources. Editorship is rotated and that duty takes about one-half of the editor's time from his regular work. This direction on a part-time basis by research personnel is not as effective as using professional publications talents.

Throughout the Nation, the quarterly is considered a very high-class technical publication and is responsible for giving California considerable prestige in the conservation field.

At present, 5,000 copies are issued quarterly at a cost of $10,000, according to the budget.

Outdoor California is issued on a monthly basis, with a circulation of 15,000. The department developed this publication after the reorganization. It is a newspaper type of publication dealing to a large extent with a variety of current department problems. Much of it extols the efforts of the department and, by inference, recommends where to hunt and fish.

There is a diversity of thought concerning the contents of this type of publication by a conservation department. Some questions arise:

- — Should it incorporate fundamentals relating to game and fish management in relation to land and water, which also produce a livelihood for mankind?
- — Should it constantly editorialize the ecological conscience and a philosophy of land ethics?
- — Should it emphasize aesthetic values?
- — Should it simply cater to the license buyer who demands bigger bag limits and wants the department to tell him where he can get them?
- — Should it attempt to lift the public by its own bootstraps on matters of human behavior and hunting and fishing ethics when seeking their favorite recreation?
- — Should it be in such terminology that it can be used in schools?

A well-balanced conservation publication should bear on all such issues as part of its editorial burden.

Outdoor California should give greater space and stress to proper land use as a basis for game habitat. This should be on an editorial basis. The public should be constantly made aware of any detrimental logging, agricultural or other practices which damage the land or the water supplies of the State. They should be made aware that detrimental land use affects the state economy as well as the recreational potential; and they should be made aware that there must be careful husbandry of the land for both human beings and for wildlife.

There should be a more editorial-type presentation regarding the pollution problem. There should be more information on how other states are attacking the problem and the administrative organizations which other states have created to cope with the problem. There should be more fundamental facts on what pollution of water does to human welfare as well as fish and game.

Before the commission changes any regulations of major importance, the issues should be set forth impartially giving the public time to debate them before any changes are made. These should be on an editorial level, giving both sides of the issues. There should be less extolling of department virtues and more information on the problems to be overcome. The so-called newspaper presentation should be changed to longer and more detailed articles. The need for a more enlightened attitude toward the use of resources should be stressed. There should be less about big fish catches and trophy heads, and more about the habitat to perpetuate wildlife. There should be more progress reports on research written for public understanding.

The number of pages of *Outdoor California* should be increased and effort should be made to develop a

greater interest in the publication. Strong effort should be made to increase the number of paid subscribers among sportsmen to a minimum of 75,000.

RECOMMENDATIONS

1. **Place Quarterly Publication Under the Conservation Education Division**
2. **Re-examine the Publication Costs of the Quarterly in an Effort to Reduce Costs**
3. **Modify Editorial Policies of Outdoor California to Stress Conservation Fundamentals, Contemplated Changes in Regulations, and Progress Reports on Research**

   Give less emphasis to department virtues, big fish catches and trophy heads.
4. **Increase the Number of Pages in Outdoor California**
5. **Make a Strong Effort to Develop Reader Interest in Outdoor California**

   Increase paid circulation of *Outdoor California* to a minimum of 75,000.

(4) *Publications Required by Law*

By law, the department is required to publish laws essential to enforcement passed by the Legislature and rules and regulations promulgated by the commission. Publication of the Hunter Safety Instructor's Handbook is required by Chapter 1662, Statutes 1953. Publication of a biennial report is required by Government Code, Section 11091.

It should be noted that the Senate Interim Report of 1957 takes issue with the department for publishing a condensed digest of the game laws and regulations and further states that business firms would be eager and willing to do this job free of charge.

In all fairness, a license holder is entitled to all information regarding regulations when he goes into the field to hunt or fish; and this obligation increases with the multiplicity of regulations, many of a local character. Every state in the Union makes a condensed version of its hunting and fishing laws available to licensees.

The State of California has an obligation when selling a hunting or fishing license to give the licensee this essential information. Otherwise, even the noblest of sportsmen could easily find themselves disobeying the law unintentionally. To turn such an important obligation over to private industry would indeed be a grave injustice to the millions of California citizens attempting to keep within the already too-confusing regulations laid down by the commission and the Legislature.

Although a digest issued by the department may not have the force of law, it would be at least factual and not condensed by amateurs who could very possibly have some rare flights of fancy in interpreting the laws. A digest of the fish and game regulations is too serious a business to be left to private enterprise. It is a job strictly for the department.

RECOMMENDATION

1. **Retain Responsibility for Preparing Fish and Game Regulation Digests Within the Department**

(5) *Other Printed Material*

Expansion of department distribution of printed material, such as signs for licensed game clubs and the distribution of angling guides and maps, apparently has brought protests from private industry. On pages 27, 28 and 29 of the Senate Interim Report of 1957, the committee has commented on the department's furnishing signs for licensed game clubs at cost, and purportedly competing with private industry. The subject of signs is closely related to the whole subject of licensed game clubs, which is discussed in Chapter IV, Small Game Management.

The distribution of angling guides and maps becomes a judgment factor in relation to their use as a management tool. If they are a benefit to the hunting and fishing public, their distribution would come within the realm of department responsibility. If they fall within the category of tourist bureau media and strictly commercializing wildlife, their distribution is not a responsibility of the department.

The department could better spend its license money on educating the public on the needs of wildlife management than taking on the role of a tourist bureau. However, the contention that such literature is competing with private industry is a fallacious one. This contention points up the fact that private industry wishes to capitalize on public resources to which they contribute little or nothing to preserve or hold in perpetuity for the public.

RECOMMENDATIONS

1. **Designate the Sign Used for Licensed Game Clubs**
2. **Sell Signs at Cost Only If Determined That This Is a Department Responsibility**
3. **Print and Distribute Angling Guides and Maps as a Management Tool and as a Service to the Hunting and Fishing Public but Avoid Taking on the Role of a Tourist Bureau**

(6) *Press Releases*

Current, thought-provoking and forthright releases to the press on conservation problems and their solution, plus some human interest stories, have been accepted and generally encouraged by the public.

News releases will be accepted by the press if they have reader interest. It is the responsibility of the department to make them interesting.

A department with a high standard of authentic information going to the press has a tremendous opportunity to explain its program and the problems connected with its achievement.

Press releases can be a front line for a sound educational program. It is entirely possible to make all facets of conservation interesting to the newspaper reader. According to department statistics, there has been a noticeable increase of acceptance by the press of departmental news releases in recent years.

RECOMMENDATIONS

1. Continue Present News Release Service
2. Improve News Release Quality to Obtain More Interest by Newspapers

   This action will require meetings with editors to discuss the type of news that newspapers are interested in printing.

(7) *Exhibits*

Exhibits are a medium of public education which should be carefully measured in relation to their value to the cause of conservation. Exhibits of wild animals and birds, although having a certain attractiveness, leave no lasting impression so far as basic conservation precepts are concerned.

Dioramas, movies and slides showing land use carry a message which needs to be impressed on the public. If exhibits are to be a part of the educational program, the personnel should be trained to participate and the exhibits rotated so that the responsibility does not fall on one division; participation should not be a matter of personal like or dislike of individuals.

A modest but well-planned type of exhibit, with great care given to location of displays, should be the aim of the department. The department should not dissipate its money and manpower at sports shows that are simply money-making schemes for some group or for an individual, unless the proceeds go back into the conservation movement.

The planning should be done at the headquarters office so that common standards and objectives are uniform. The use of exhibits should not be left to the judgment of regional managers. The effort should be well distributed over the State and headquarters should decide where exhibits will be shown.

RECOMMENDATION

1. Plan and Implement a Conservative Program of Exhibits for Use at Shows Important to the Conservation Movement

(8) *Motion Pictures*

In 1953, the department made a major departure from previous practices regarding the development of motion pictures. Old pictures were re-edited with new script, cut to 12½ minutes for television and keyed to specific wildlife conservation problems which were of wide interest. The result was an audience increase from approximately 100,000 to over 1,000,000 viewers.

Problems cited by the department are:

— Deletion of proposed funds by Legislature.

— Competitive bidding by Department of Finance regulations.

— Lack of departmental personnel qualified to make motion pictures.

— Total absence of equipment and facilities.

Many public agencies have gone through the cycle of producing motion pictures. This is especially true with state and federal conservation agencies.

Years ago departments produced films which were crude and amateur in nature, and their purpose was solely for entertainment. The quality of these films is no longer acceptable today.

The professional type of motion picture becomes increasingly expensive to the point where costs must be balanced against their life expectancy in terms of value. Many agencies, both public and private, have reduced their motion picture efforts and turned to the use of slides. Slides are not as entertaining, but they are much cheaper to produce and they present conservation problems as well or better than films.

As the slides are shown, the machine operator should carry on a lecture to amplify the story told by the slides. Here again is an opportunity to inject the field personnel into the educational program, as the lecture does not necessarily have to be given by conservation education personnel. Slides presented along with a lecture by a local biologist, game or fish manager or warden develops public relations on a community basis. People will ask more questions of a person lecturing on slides than the operator of a movie machine.

The cost of obtaining pictures for slides and the slide projector are far cheaper than attempting to produce movies, either by the department personnel or by contract.

It should be noted that the movies of the department have improved in subject matter, and making them available for television has brought them to a much greater audience.

If films are to be produced, they should be limited in number and subject matter relating to examples of good and poor land use, to showing areas of public domain which lack public access, to areas which should be made available to public access, to fish and game habitat improvement and to a comprehensive portrayal of the pollution problem and the justification of research.

However, it is recommended that the department give serious consideration to using slides as a medium of public education before embarking on a program of hiring motion picture professionals or buying ex-

pensive movie equipment. The above-suggested subjects for movies could be presented by the use of slides much more cheaply and also would bring the field personnel into participation more than at present.

RECOMMENDATIONS

1. **Limit Use of Motion Pictures to More Important Conservation Matters Where Budgets Can Be Justified on Results Obtainable**
2. **Develop Slides to Carry Larger Portion of Conservation Education Presentation Workload**

(9) *Education*

Considerable criticism has been leveled at efforts of the department to conduct a program of educating the public in the facts and issues of wildlife management.

In its 1957 report to the Legislature, the Senate Interim Committee on Fish and Game stated:

> "We have stated our case at some length in the 1954 and 1955 reports and suffice to say that we reaffirm our position that this branch is only of the least importance in California's over-all fish and game picture and why the administration of this agency has allowed—and, in fact, encouraged—greater spending for these services in the face of a mounting deficit is something of a puzzle to us. Observations over the past two years have led us to decrease further our already low estimation of the worth of this branch."

It is not clear whether the committee recommendation is based on its examination of the quality of work and effort of the Conservation Education Division of the Department of Fish and Game or whether this philosophy resulted from an appraisal of the educational effort in conservation throughout the nation.

It should be pointed out that past research and knowledge of wildlife management has been so meager, and recent developments in this field have moved so fast, that diligent educational effort is required in order to keep the public informed. Modern management can no longer be based on the antiquated notions we once held about wildlife.

In carrying out its responsibility of conserving and protecting wildlife resources, the department must employ modern wildlife management techniques. But, if all department personnel and the public do not understand the new techniques, then it is imperative that an educational progam insure that the new management techniques are properly applied and are successful.

Someone must plan and implement the educational program. Apparently the department is best prepared to perform the task since the program must be closely co-ordinated with department research and operational activities.

A constant appraisal of the broad fundamental conservation concepts needs to be presented to both the personnel and the public—reasons why resources are vital to mankind's existence.

Statistics alone do not supply the necessary material to stimulate understanding of conservation problems. It is necessary to convey concepts and principles, as well as statistics, in order to gain understanding and acceptance of programs by the public.

Approximately 2 percent of the department budget is allocated for conservation education and general information. This is considerably less than the percentage expended by some other states as shown in Exhibit XXIX, which follows.

In 1958 the combined budgets of 49 state conservation agencies were approximately $60,000,000, with about $5,000,000, or 8.3 percent, allocated to conservation education work. The National Association for Conservation Information has recommended that between 5 percent to 7 percent of a departmental budget be allocated to conservation education work.

It would be entirely justified on the basis of the above comparisons and data to double the Department of Fish and Game conservation education and information budget. However, before there is any expansion in this field the present effort should be carefully analyzed and future developments should have well-conceived objectives.

EXHIBIT XXIX

State of California, Department of Fish and Game

TABLE OF SELECTED STATE EXPENDITURES FOR CONSERVATION EDUCATION

State	*Budget year*	*Budgeted amount*	*Percent of total budget*	*Remarks*
New York	1958	$496,035	4.0	Department has jurisdiction over fish, game, land and forests. Activities include: —4 boys' camps run on a fee basis. —hunter safety program. —Literature, films, film strips. —$140,000 for conservation magazine with 70,000 subscribers at $2 per subscription.
Michigan	1957	$320,435	2.4	Department has jurisdiction over fish, game, state parks, forestry and forest fire fighting with an overall budget exceeding $15,000,000.
Colorado	1957	$145,000	3.35	Figure does not include $60,000 for 4 regional educators.

After a realignment of objectives, the next concern is how they will be reached. One means is to integrate all personnel into the educational program within the capacity of their position and talents.

Here is an opportunity for inservice training to become an action program instead of one dealing in theories. The lack of unity and understanding within the department as to what constitutes a conservation education program is glaringly apparent.

Improvements in program, techniques and proper mental attitude can only be brought about by top administration. What is planned must be followed through and adhered to. The committee or group approach will produce little in the way of results.

After this is done and with some rather profound internal soul-searching, there is justification for expansion.

The personnel of the educational division are very serious about their job, and have advanced very good ideas for general improvement.

After all, education in this field means nothing more than creating an understanding of reasons, philosophies and the need for resource management. It means developing a proper attitude toward resources in the public mind.

Sound programs in conservation education have already proven that democracy is safest in the hands of a people who love and conserve their out-of-doors.

RECOMMENDATIONS

1. **Improve Educational Efforts by Constant Review of the Broad Conservation Concepts**
2. **Develop Better Ways of Presenting Conservation Concepts**
3. **Consider Expanding the Budget Allotted to Conservation Education as Effectiveness of This Activity Is Improved**

(10) *Participation of Department Personnel in Educational Program*

No educational program will succeed unless it is obligatory that all department personnel are given definite responsibilities in participation. Scattered individual interest is not sufficient, however sincere. Success will only be achieved by long-range planning wherein the various personnel are fitted into the overall scheme of the program.

Educational planning must commence at the top level of administration where all objectives can be visualized and given priorities. This takes imagination and a thorough knowledge of the State's problems as well as a knowledge of educational processes.

Integration of the personnel into the educational program can be achieved through in-service training. This is discussed in a later part of this chapter. Some personnel, especially in the technical field, although others are equally guilty, feel they have no direct responsibility and that any diversion of interest is detrimental to their specialty. They hold that they have no responsibility to help inform the public of their work or findings. They have the quaint notion that it is the job of the conservation education division to follow the technicians around to glean facts and then "sell" the public on what is being accomplished.

Here again they must be impressed with the fact that they are working for the public and must be conservationists first and specialists second; that the entire effort will fail unless they have a healthy interest in every department's activity and are willing to discuss it when the occasion arises. All personnel must properly and intelligently represent the department to the public.

There are two ways that the work of the specialists, whatever field they work in, can be brought before the public: one, by having the conservation education personnel frequently contact them and insist that time be spent on explanation of their work and findings so that the conservation education division can report on it; or, two, by the specialists themselves writing and submitting articles for public consumption.

There should be more positive planning whereby all divisions and regions contribute written material to be made available to the public. Naturally such material has to be edited and given priority. Such a system of teamwork should be developed before conservation education personnel are increased.

A biologist on the conservation education staff should be unnecessary with proper planning and proper teamwork.

RECOMMENDATIONS

1. **Implement a Policy of Department-wide Participation in Conservation Education With Definition of the Part Each Group Must Play to Obtain Maximum Results**
2. **Initiate Programs Whereby Each Division and Region Contributes Material for Conservation Education Use**

(11) *Hunter Safety Training Program*

This program has been initiated in many states by the American Rifle Association and is a very laudable enterprise. Most states today, through some form or other, stress hunting and boating safety. In the department, the safety training officer for hunter safety training is a patrol captain who was transferred from the protection division to education. There is some feeling within the department that the training officer should be responsible to the protection division.

The department has been able to enlist the assistance of some 3,500 volunteer instructors. This spirit of public service by these volunteers should be recognized and applauded. The Associated Sportsmen of

California have endorsed the program by recommending that at least one wildlife protection officer be assigned per region on the hunter safety program.

Utilization of department organization to make the public more safety-conscious should not preclude recognition of the department's primary responsibility of protecting and managing wildlife. It can be debated which is more important: to educate the young people to the necessity of land husbandry so that wildlife and humans can live, or how to properly handle a gun and operate a boat. The latter stresses the immediate matter of survival, the former the long-range view. Both are important. Certainly, the hunter safety training program can include material on fundamentals of conservation and codes of ethics towards wildlife, hunting and fishing as well as safety.

At the present time, wildlife protection personnel carry the main burden in the program. Other department personnel can and should participate to extend the program further and to make the program more effective.

RECOMMENDATIONS

1. **Continue the Hunter Safety Training Program Under the Conservation Education Section**
2. **Increase the Amount of Conservation Fundamentals and Wildlife, Hunting and Fishing Ethics Taught in the Program**
3. **Increase the Participation of Department Personnel Other Than Wildlife Protection**

(12) *School and Youth Education*

It is noted that the department claims to be working directly with some 150 to 200 high schools which participate in hunter safety training. Comments regarding the type of program recommended for hunter safety have been previously made. The department cooperates with a variety of conservation workshops and is a member of the interdepartmental committee on conservation education, chairmaned by Dr. J. Connor of the Department of Education.

It is also noted that the department wants more money for classroom material and for personnel in connection with the school and youth education program. It is not entirely clear just what type of material has been developed for the schools or what is contemplated. However, reference has been made to the booklets, *Waterfowl, Upland Birds,* and *Trout of California,* as being used to a limited extent, and consolidation of these pamphlets into a school wildlife leaflet is being considered. These booklets should be informative and interesting to grade school classes, but high school pupils should have something more adult. The booklet, *Waterfowl,* gives the most background on history and management; the other two booklets give nothing on what is required to preserve the various species.

Enumeration of species and color plates do not constitute an educational program, although it develops interest which will lead to more profound understanding of conservation.

Present staff assigned to conservation education does not include a person skilled in preparing material for school use.

It is evident that the overall present efforts to inculcate conservation fundamentals to the youths of the State through the schools is less than sophisticated. In addition to providing better material for school use, the department might well consider other educational techniques such as use of department teams composed of representatives of the several divisions that could visit schools to put on conservation presentations.

RECOMMENDATIONS

1. **Add a Person to the Conservation Education Staff Qualified to Work With State School Systems**
2. **Improve Conservation Education Programs for Schools**

Hunter safety training can be used as a basic vehicle for school education but cannot carry the full load.

(13) *In-Service Training Program*

Present training efforts were started after the department was reorganized. The first training effort was centralized at headquarters to train the trainers, or supervisory personnel.

A training committee was appointed and still functions. This committee is composed of the staff division chiefs at headquarters, the regional managers and the training officer. The committee develops all training standards, guides and policies. They meet twice a year.

The training officer (a full-time job) is an intermediary between the training committee and the regions, where most of the training is carried on at the present time. He informs the regions of the training policies decided on by the committee.

Each region has a training officer appointed by the regional manager. He is one of the regional supervisors. The regional manager is supposed to tell the regional training officer how to carry out his duties.

The department training officer at headquarters has no control or jurisdiction over the regional training officer. His only function is to advise. Up to the present time, regional training programs have been developed by the regional supervisors for their respective divisions. They may exchange ideas with other supervisors or with the regional manager, but each supervisor makes up his own training agenda. Each division has one training session a month, or at least 10 a year.

A copy of the agenda or monthly training program of the region is sent to the training officer at headquarters, who in turn distribute copies to each member of the training committee.

At present, the training emphasis is at the regional level. Training at the regional level has been on a functional basis, with too little emphasis on immediate problems.

Changing the divisional functional training to cross-functional training is now being discussed. Under cross-functional training, for example, the patrol force would be given training in game and fish management programs. However, there are few plans to bring all functional groups together for mutual discussions at training sessions. Two regions are now making some attempt at cross-functional training.

Supposedly, the emphasis in the future will be toward solving actual problems and less on theory. So far, regions have attempted to cover the waterfront on subject matter and have not gone very deep into any subject; and training programs have not been a tool to point up solutions for vital department problems on a co-ordinated statewide basis.

The department training officer seldom attends regional training sessions, and if he does, he refrains from participating. He files no reports of his own evaluation other than bringing problems to the training committee when they meet, which is twice a year. He states that attending meetings to observe personnel and report on them would be snooping.

He is very much against being responsible for passing judgment on the value or standards of the regional training sessions. He is opposed to being an inspector of training meetings. He exerts no leadership of any kind other than by suggestions occasionally to supervisors as to their agendas. He meets occasionally with the regional training officers.

If a regional training officer is not fulfilling his obligations, the training officer does not report it to the deputy director or the regional manager but waits until the committee meets to bring up the matter. Poor training techniques in a region can go wrong for nearly a year before being corrected.

A training committee is probably justified as an advisory group, but the training officer should initiate the programs and the committee should advise or supplement. It appears that the objections raised by the training officer are the very functions he should be performing. With so large a committee, it would seem that they should meet only in conjunction with deliberating on other affairs in order to avoid unnecessary travel.

It should be the duty of the training officer to develop a carefully balanced program. Certain fundamentals of resource management, together with the administrative plans for carrying out departmental objectives, should become a part of the training program.

Training should include evaluation and duties of other state and national agencies operating in California, lectures by personnel from state and federal agencies, presentations on how other states are handling wildlife problems and the explanation of federal aids.

All statewide programs and policies of the department should be evaluated uniformly for the edification of the group. Personnel should be informed of any new or contemplated programs which may have a public impact; for example, liberalization of or restrictions on seasons on important fish and game species. These contemplated changes should be well documented by the training officer, or he should be in a position to have a qualified person there to discuss the changes. The personnel must be sold on new programs or changes in old ones and, in turn, sell them to the public before they are put into effect. A conscious effort should be made to indoctrinate department personnel on the need to gain public acceptance of sound conservation programs.

Cross-functional training within a single functional group will not be effective in co-ordinating departmental efforts. Cross-functional training should be carried out in groups composed of law enforcement, game management and fish management people. These combined training meetings could be broken down into functional groups to discuss specialized problems at the close of the general meeting.

There should be fewer meetings, two or three a year. The programs should be better prepared; the three divisions should participate in common meeting before discussing specialties, as referred to above.

The training officer should assume leadership of meetings, but part of the training should be such that personnel act as chairmen and floor leaders to give them experience in handling meetings.

The techniques employed by the U. S. Extension Service should be developed and taught to the personnel. It is recommended that representatives of the State and U. S. Departments of Agriculture be requested to lecture at the inservice training meeting on the methods and techniques they employ to carry their programs to the public.

At the present time the training officer reports to the personnel officer under the administrative officer. Inasmuch as the development of an adequate inservice training program is an integral part of conservation education, the training officer should report to the conservation education director. Chapter XII, Departmental Organization, also recommends that the primary responsibility for conservation education planning be assigned to the conservation education director.

RECOMMENDATIONS

1. Improve the In-service Training Program
2. Use New and Improved Training Techniques

3. **Place the Training Officer Under the Direct Authority of the Conservation Education Officer**

(14) *Regional Conservation Education Officer*

In order to bring the department's educational program closer to the regions and the people, a regional conservation education officer should be assigned to each region.

He should be responsible to the regional manager, but he should carry out educational programs in conformity with programs and standards of performance established by the conservation education director in Sacramento.

RECOMMENDATION

1. **A Regional Conservation Education Director Be Assigned to Each Region**

This chapter appraises and evaluates the present way in which the conservation education division is carrying out its responsibilities. From the broader viewpoint, the department has the urgent need to better inform the public on the issues confronting wildlife conservation management. The department should make a more aggressive effort to bring to the public all facts bearing on wildlife management problems.

Conservation education objectives should be broadened and more effective information programs should be developed. The department's overall responsibility of conserving the State's wildlife resources automatically carries with it the responsibility to lead public opinion along the road of sound wildlife management.

The basic problem of informing the public and of winning public acceptance of sound wildlife management programs underlies the recommendations developed in Chapters X through XIV dealing with departmental administration, organization, planning, teamwork and management controls.

CHAPTER X

EVALUATION OF DEPARTMENTAL ADMINISTRATION

In earlier chapters, the wildlife consultants reviewed and evaluated the various functional activities of the department. Almost uniformly, they have emphasized two basic and interlocked problems which underlie all areas of the department's operations:

—Need to achieve better teamwork within the department.

—Need to gain greater public understanding and support of wildlife management programs.

These two key problems have been given much study throughout the survey. Departmental administration has been appraised and evaluated in the light of these fundamental questions. Ways have been sought to accomplish the dual objectives of increasing internal department teamwork and winning greater public understanding and support of wildlife management programs. Much attention has also been given to developing ways to reduce administrative costs.

1. SCOPE OF THE SURVEY

Senate Concurrent Resolution No. 126 specified that a review be made of the "methods and procedures of administration of the department both on the headquarters and regional levels to determine if general business functions are operating with all possible efficiency and to ascertain if there is a possibility of effecting any consolidation of regional administrative operations."

This official recognition of the importance of administration to the accomplishment of wildlife conservation objectives reflects an awareness on the part of the legislature and the interested public that good administration is essential to the effective carrying out of sound conservation principles.

What is the meaning of departmental administration as it relates to the Department of Fish and Game? In the broad sense, administration means *planning, organizing, directing, co-ordinating* and *controlling* the combined efforts of over 1,000 men and women who comprise the Department of Fish and Game. These people have been brought together to accomplish wildlife conservation objectives. Administration is the total process of bringing to bear all of the resources of the department to achieve the overall objectives of the department. Teamwork, among department personnel and with the public, is the heart of good administration in the Department of Fish and Game.

Responsibility for effective management of the dedicated department people rests with the director. The director must operate through managers on his headquarters staff and in the regions. Activities of these managers are both technical and nontechnical in nature. For the purposes of this survey, the technical activities relating to wildlife management have been reviewed and evaluated by recognized wildlife experts in separate chapters preceding this one.

These wildlife consultants have also identified and commented on key administrative problems as they related to specific functional areas. This and subsequent chapters present the analysis, evaluation and development of recommendations on the administrative aspects of wildlife management.

2. CONDUCT OF THE SURVEY

The survey of departmental administration was conducted to give a broad perspective to the administrative aspects of wildlife management. Review and analysis of departmental administration were carried out over an extended period of time so that complete study and appraisal of administrative practices could be made.

Initially, Booz, Allen & Hamilton staff made a preliminary review of the organization of the department, the budget and the accounting records. Knowledge of the extent of information available in these areas provided the basis for developing plans for the conduct of the administrative portion of the survey.

In conducting the survey of departmental administration, extensive reviews were made of administrative policies, plans and procedures at the Sacramento headquarters and at all regional headquarters. Present methods and procedures were carefully reviewed. Those deemed to merit further analysis and study were identified, and additional effort was devoted to them. Moreover, the comments and observations of all the wildlife consultants served as aids in identifying areas of departmental administration for further, more intensive study. Mr. Ernest Swift contributed significantly to the analysis and development of recommendations on administration. His long and extensive experience in conservation department administration has given assurance that the recommendations are workable ideas and expressed in practical terms.

During the course of the administrative survey, all of the top-level administrators were interviewed, as well as a large number of field managers and other field personnel. Department personnel directly concerned with specific administrative procedures analyzed during the survey were also interviewed.

After evaluations of administrative practices were completed, tentative hypotheses for the improvement

of administrative practices were developed and tested. Final recommendations selected for improving departmental administration are included in subsequent chapters.

3. GENERAL APPRAISAL OF DEPARTMENTAL ADMINISTRATION

The final test of the adequacy of administration is whether or not the department is accomplishing its wildlife conservation objectives. The wildlife consultants who surveyed and evaluated the department's functional areas of game, inland fisheries, marine fisheries, wildlife protection and conservation education management have reported in earlier chapters. Throughout their evaluations, two basic conclusions emerge:

—The department needs greater unity of purpose, unity of effort and unity of action—the ingredients of great teamwork—if it is to accomplish its goals.

—The department needs to do a better job of informing the public on all factors bearing on conservation problems, so as to better earn the public's support.

Review and analysis of departmental administration revealed that these same two basic needs underlie administrative management of the department.

A comprehensive evaluation of departmental administration must be expressed in terms of its basic parts. As indicated previously, administration is composed of planning, organizing, directing, co-ordinating and controlling the efforts of the department. Administration is a continuous, never-ending process; yet each of the basic elements must be performed in proper sequence if the department is to be most effective.

First in the cycle of administration is planning—the careful drawing up of plans of action, after considering all factors bearing on the objectives to be accomplished. Planning should be both for the long-range future and for the near term of the next one or two years. It is clear that department planning of conservation programs has not been adequate. Detailed, integrated plans by which a united department could carry out effective wildlife management have not been provided. The reasons for this lack of detailed, integrated planning stem from several causes, some of which are part of the "growing pains" caused by the 1953 regional decentralization. Lack of adequate plans have contributed to disunity within the department and to varying public understanding and support of wildlife management problems.

The second aspect of overall administration is organizing—dividing the total work to be done among all the people available to work. It is desirable to assign responsibility for work in such a way that the total departmental effort is most effective. In evaluating the present organizational form of the department, it became clear that the present organization structure has been built upon sound principles.

Nevertheless, full benefit of the decentralized regional organization has not been realized. This is true because duties and responsibilities of headquarters staff and regional management have not been clearly defined and understood. This failure to fully implement the 1953 reorganization plan has led to uncoordinated efforts in the field and to the lack of detailed, co-ordinated department planning. In some respects each of the five regions became a separate Department of Fish and Game.

Moreover, the division of field personnel into specialized activities of law enforcement, game management and inland fisheries management has discouraged departmental teamwork. It is thus clear that organizational weaknesses have contributed in large measure to disunity of effort within the department and to omission of co-ordinated planning, both of which sowed the seeds of misunderstanding and caused lukewarm support from the public.

Directing and co-ordinating—these are other aspects of departmental administration. These two responsibilities of management are concerned with the winning of teamwork and co-operation from all the people working together to gain a common set of objectives. It has already been stated that this is one of the fundamental weaknesses in the department, both internally and externally. Much can be done to gain the support of all through proper planning and organizing, and also through motivating all department people to work together toward mutually agreed upon plans and programs. Teamwork within the department should do much to win greater understanding and support from the interested public.

Control is the fifth important part of administration. Control is the setting up of planned benchmarks against which to measure progress. In this way the prudent traveler checks his progress toward where he wants to go. Similarly, the department should have pre-established guideposts against which to check the department's progress toward mutually agreed upon plans. Evaluation of this aspect of administration reveals that overall control of the department's activities requires strengthening. Information on the amount of total departmental effort being given to each major wildlife program is inadequate. This lack of information has in turn hindered a factual appraisal of these programs by the Legislature, the commission and the public.

It is clear that each of these individual aspects of administration is, in fact, closely interwoven. All of them are directly related to the basic problems of building more teamwork within the department and of winning more public understanding and support of sound wildlife management programs.

These findings and conclusions should be accepted as opportunities for improvement. The department took an important step in 1953 in adopting the plan of regional decentralization. Such a basic change would have been difficult for most organizations, and it has been difficult for the department. The five years since 1953 have been marked by "growing pains." Today, however, the department is ready to make further progress. Today the future is more important than the past.

4. IDENTIFICATION OF SPECIFIC PROBLEM AREAS AND DEVELOPMENT OF RECOMMENDATIONS

Ways of improving departmental administration have been carefully studied. The recommendations developed are sound and realistic. They offer the means of greater public understanding and support.

Due to the importance of improving departmental administrative effectiveness, each of the important aspects of administration has been treated in separate chapters as follows:

Chapter XI. Planning.

Chapter XII. Departmental Organization.

Chapter XIII. Teamwork Among Department Personnel.

Chapter XIV. Management Controls.

In the next chapter, department planning is discussed and recommendations for improved department planning presented.

CHAPTER XI

PLANNING

If a person does not know where he is going, it is very hard for him to get there. If several people do not know where they are going, they are very likely to wind up in different places. On the other hand, if a group of people know where they want to go and have a plan to get there, it is easy for the group to get where they want to go. Thus, planning is both the deciding of where to go, and of setting a plan to get there. After deciding where to go and how to get there, it is wise to check periodically to make sure that the selected road is being followed. If a wrong turn has been made along the way, it is much better to know that and to get back on the right road.

This process of deciding where to go, of setting a plan to get there, and of checking periodically on the progress being made is equally necessary in managing the Department of Fish and Game. In fact, this process of planning and checking on progress is more necessary in a complex enterprise such as the Department of Fish and Game, because there are so many people involved and problems are more difficult. It is also necessary to determine who will do the necessary work to carry out the plans and to develop as much teamwork among the people as possible.

An organization such as the Department of Fish and Game needs two sets of plans: long range and short range. The long-range plan should be for as long a period ahead as conditions can be forecast with usable accuracy: 5, 10, 20 years. Long-range planning is concerned with developing a picture of the desirable future size and characteristics of the activities of the organization over the long term. Its existence gives a more consistent direction to short-range planning.

The short-range plan is usually for not longer than the next fiscal year. It is the immediate operating plan for accomplishing specific objectives. It should fit into the overall pattern of the long-range plan.

Long-range planning is not a one-time thing. Each year the immediate future comes into better focus. The long-range plan should be revised periodically so as to reflect facts which have become more definite.

It is true that the activities of the Department of Fish and Game are affected by many uncontrollable factors such as weather, public pressures and natural disasters. Therefore, a long-range plan must deal with a span of possibilities. The essence of good planning is the recognition of these posibilities and the development of alternative courses of action in the event of their occurrence.

Plans are of little value unless the people involved are fully familiar with them. At any one time, everyone involved should have the same understanding of them. Only thus can everyone act consistently in his own area of responsibility.

Plans are also of little value if the actions taken do not fulfill the plans decided upon. Thus, the mere existence of plans is not enough. Guidelines and check points should be set up so that at frequent intervals actual progress and position can be checked against the plan. This is similar to what a person does in driving over strange roads to a particular destination. He checks periodically to make sure that he is on the right road. If he finds he is not, he corrects his mistake and gets back on the right road.

Certainly if there is no plan, it is difficult to control intelligently. How can people, facilities and funds be allocated effectively if not for planned purposes? Thus, the number one requirement for achieving desired objectives is the existence of a plan by which to operate, and against which to control.

This chapter is devoted to the management responsibility of determining where the department should be going and how to get there. The equally important management responsibilities of determining how the work should be divided among the department people, of bringing about the best posible teamwork among all the people working together, and of checking periodically on actual progress being made are discussed in Chapter XII, Departmental Organization, Chapter XIII, Teamwork Among Department Personnel, and Chapter XIV, Management Controls, respectively.

1. DEPARTMENT LACKS A FORMAL, ORGANIZED, INTEGRATED LONG-RANGE PLAN

Review and analysis of the department's planning reveals that little effective long-range planning has been developed. Some effort has been devoted to developing a 10-year plan for the 1955-1965 decade, and also to projecting in 1957 the consequences of a continuing budget deficit. This indicates that some thought has been given to the future programs of the department. But the department does not have a formal, organized, integrated long-range plan.

Analysis of the reasons for this lack of long-range planning reveals several important factors:

—Basic departmental objectives and policies are not clearly and concisely stated.

—Responsibility for developing plans is not clearly placed.

These factors are very significant to an understanding of the lack of integrated long-range planning in the Department of Fish and Game.

(1) *Basic Departmental Objectives Are Not Clearly and Concisely Stated*

What are objectives? What is the need for them? In the very simplest terms, objectives are the goals which you want to attain. Generally, you have one all-inclusive objective. But it is desirable to determine a set of more specific objectives in order to convey the full meaning of the all-inclusive objective.

For example, the ardent sportsman may have a general, overall objective of having as much enjoyment as possible in hunting and fishing activities in the coming year, within the limits of good sportsmanship. This is the sportsman's overall objective. But in order to translate this primary objective into reality, it is necessary for him to determine a number of more specific objectives, each one of which is one part of the total objective. For the ardent sportsman, these specific objectives may include fishing for trout in a particular mountain lake, hunting for deer in a remote section of the state, being a leader in his sportsman's association, and helping to further the cause of sound wildlife conservation. These specific objectives, if accomplished, would cause this particular sportsman to accomplish his basic objective.

By defining these specific objectives, it is possible for the sportsman to draw up plans for each. This makes the job of doing them easier.

There is a similar need to set clear and concise basic objectives for the Department of Fish and Game. In fact, it is more necessary than in the example of the sportsman, for in the department many hundreds of people must work together to accomplish the objectives. The objective must be clearly stated and agreed upon, so that all can work toward a common goal.

The California State Constitution states that all money collected under the provisions of the Fish and Game Code "shall be used and expended exclusively for the protection, conservation, propagation and preservation of fish, game, mollusks or crustaceans and for the administration and enforcement of laws relating thereto." This is in the nature of a general, overall objective for the department. The Wildlife Conservation Law of 1947 contains a similar statement of the general objective of wildlife conservation.

In order to convert the general objective into accomplished facts, it is necessary first to translate the general, overall objective into a number of specific objectives. The total of the specific, individual objectives should equal the one overall objective.

In recent months the department has made an attempt to prepare a short, clear statement of basic departmental objectives, but the commission has not yet approved these objectives or modified them in preparation for approval. Approval of a set of specific objectives would greatly aid the department in clarifying the individual thinking which prevails among personnel in all areas and levels in the department. A set of approved objectives would do much to orient the department and the general public toward a common goal which is at present indistinct.

While it is true that some detailed objectives can be drawn from the various policies which the commission has adopted from time to time, there is no clear-cut statement of objectives to which the people within and without the department can give their full, united support. As pointed out in Chapter XVI, the Fish and Game Commission can assist the department by reviewing and reissuing its general policies for the department in more usable form.

(2) *Department Policies Are Not Clearly and Concisely Stated*

In the example of the sportsman in the preceding section, the sportsman found it helpful to determine his specific objectives. The next step would be to decide how to go about accomplishing his objectives. The sportsman might decide to limit his hunting and fishing to his regular vacation, to attend sportsmen's meetings as often as he could, and to keep in touch with the fish and game editor of the local newspaper. These would be the rules, or policies, by which he carried out his fish and game activities. The individual sportsman might make these rules, or policies, without consciously recognizing them as policies. But in effect they would be policies, for they would be the guide lines which would govern how he carried out his fish and game activities.

Setting of policies, or rules, or guide lines becomes more important as more people work together. In the Department of Fish and Game, where more than 1,000 people are working together, it is very important that the policy guide lines be set down in writing for the guidance of all department personnel and for the information of the interested public.

The department does not have a comprehensive set of clearly defined and stated departmental policies. Some policies do exist and are generally recognized by department personnel. Examples of this are the policies to maintain the present levels of the catchable trout and "put-and-take" pheasant programs. There is, however, no comprehensive, clearly written collection of department policies which could be effective in building department teamwork. In the absence of full statements of department policy, many key personnel are unable or reluctant to make decisions. Vagueness and lack of clear-cut decisions have tended to result. Definite plans and programs needed for department action have not been developed.

(3) *Responsibility for Developing Plans Is Not Clearly Placed*

Plans can be effectively made only when objectives and the guidelines for accomplishing the objectives have been determined. After this has been done, it is

possible to draw up specific plans by which to accomplish the objectives.

In a large organization such as the department, it is necessary that responsibility for drawing up the plans be assigned to specific people. In the example of the sportsman cited earlier in the chapter, only the sportsman himself can draw up plans for the fishing or hunting trip. In an organization as large and complex as the Department of Fish and Game, it is extremely important that responsibility for developing both long-range and short-range plans be clearly placed.

When the present form of organization was adopted in 1953, the duties and responsibilities of the branch chiefs in headquarters and of the new regional managers were not clearly defined. Responsibility for departmental planning was not clearly placed. During the years following 1953, the regional managers were given wide authority to develop and carry out wildlife programs in their regions. At the same time, planning, guidance and control from headquarters was slight. The period from 1953 to the present has been a period of development, a period of growing pains for a department which was learning how to operate on a decentralized basis.

In the first few years after 1953, some attempts were made at planning. Little co-ordinated integrated planning resulted. Branch chiefs were largely prevented from making field contacts, which resulted in their isolation from what was happening in the field. This fact, together with the lack of any clear-cut responsibilities to develop plans, prevented the branch chiefs from any effective planning. The regional managers in the field were so occupied learning their jobs and in carrying out day-to-day responsibilities that they did not have time for any long-range planning. Moreover, the regional manager knew only his own problems, and therefore co-ordinated department planning of programs was almost impossible.

Chapter XII, Departmental Organization, treats of this subject in more detail. It is sufficient here to record that in this period of transition from a centralized to a decentralized department, several of the fundamental responsibilities of management were allowed to drift. Planning was one of these responsibilities.

At the present time, the department planning function and responsibility have been assigned to a planning committee composed of the branch chiefs and the regional managers, chaired by the director. The department's experience in utilizing a committee in such fashion has not been satisfactory, as planning progress has been slow and time consuming. The use of a committee to develop plans has the effect of assigning the responsibility to everybody, which leads to a somewhat natural result of no one taking responsibility for creative work.

The net result has been that a formal, integrated long-range plan has not been evolved by the department.

2. EFFECTIVENESS OF THE DEPARTMENT SUFFERS AS A RESULT OF THE LACK OF ADEQUATE PLANNING

Lack of adequate department planning has harmed the ability of the department in several important respects.

(1) *Complete and Timely Plans Are Needed*

In 1954 the department prepared and released a broad plan to meet the growing wildlife management needs of California in the decade from 1955 to 1965. This plan forecast that by 1965 the number of anglers would increase to over 2,000,000 from 1,263,000 in 1954, and the number of hunters would increase to 936,000 from 639,000 in 1954.

The 10-year program presented an ambitious array of projects which are summarized as follows:

Programs	*Estimated cost of recommended projects*	*Estimated annual operation and maintenance costs*
Marine fisheries	$7,100,000	$65,000
Inland fisheries	11,500,000	795,000
Salmon and steelhead	3,950,000	
Fisheries improvement	$22,550,000	
Hunting opportunities	20,000,000	2,700,000
Economic survey	15,000	
Totals	$42,565,000	$3,560,000

Viewed in relation to the then current annual budget of approximately $8,000,000, this 10-year program was very sizable, although only a general suggestion was made that tideland oil funds might be used as a source of revenues to support it.

The plan did not indicate whether accomplishment of the 10-year program would allow the department to meet the expected increases in hunting and fishing pressures. Priorities were not given to individual programs, and it appeared to be a list of all programs which might be entered into, if funds were somehow made available.

In effect, the 1954 plan seemed to be an "all-or-nothing" plan which lacked the realism of practical financing and selective programing. Time has proven this to be the case since the department has done little to implement the plan since its announcement.

The department published another form of overall planning in January, 1957. By this time the condition of the Fish and Game Preservation Fund was becoming critical due to deficit budgets. In this plan the department presented an outline of severe program cutbacks which would be carried out if license fees were not increased. An alternative expanded program was also presented in the event license fees were raised sufficiently, calling for estimated one-time expendi-

tures of $3,500,000 to $4,000,000, and increased annual operational costs of $2,600,000 to $3,300,000.

The 1957 plan was more realistic in terms of known facts bearing on the problem, but the wisdom of the recommended cutbacks was subject to considerable question because administrative organizations were left practically untouched while major pruning of wildlife programs was recommended.

More importantly, this plan of 1957 was perhaps two years or more too late, as operating deficits had been occurring since 1951. Earlier and more effective planning could have averted the public clamor which immediately followed the January, 1957, plan.

(2) *Department Fails to Be an Effective Leader in Molding Public Opinion*

The lack of action on the 1954 10-year plan, and the reserved reception given to the 1957 plan by many sportsmen, point to the department's failure to be an effective molder of public opinion on wildlife management matters. Other examples can be cited. The system of unit deer management and of county supervisor veto was legislated over the department's objections. The need for increased revenues was precipitated by the department, but it would be difficult to say that public opinion was led by the department.

In these instances, the lack of adequate planning to meet the problems contributed to the inability to communicate all of the pertinent facts to the public. As indicated in previous chapters, appropriate and timely informing of the public on all the facts bearing on conservative problems has been a principal weakness of the department.

(3) *The Department's Activities Are Largely "Fire Fighting" on Controversial Matters*

Analysis of the activities of the department indicates that much of its efforts are devoted to attempting to overcome emergencies which develop due to lack of foresight and adequate detailed planning. Certainly, the controversy over either-sex deer hunting reflects a lack of analysis of probable reactions and of detailed planning to avoid the problems and misunderstandings. This is illustrative of the fact that planning involves much more than determining the end objective. It requires painstaking analysis of the factors bearing on the end objective and of developing detailed plans for accomplishing it.

Too much of the time the efforts of department branch chiefs and others are spent on emergencies which should have been prevented by foresight and preventive planning.

3. FUTURE SPORTSMEN OF CALIFORNIA WILL SUFFER AS A RESULT OF THE LACK OF EFFECTIVE PLANNING

Authors of the various chapters on wildlife management repeatedly pointed out the problems of increasing human populations, of resulting increases in hunting and fishing pressure, and of reduced accessibility to public land. The department's 1954 plan for the 1955-1965 decade similarly emphasized these same factors. It becomes quite apparent, therefore, that ineffective planning today will have lasting unfavorable effects upon future sportsmen in California.

(1) *Physical Factors Affecting Wildlife Are Continuing to Reduce Suitable Habitat*

As the State's human population continues to increase, more demands are being made on the natural resources of the State. More withdrawals of public land for private use are occurring each year. More farm lands are being urbanized, or converted to more intensive farming. More private lands are being posted against trespass, thereby further reducing the lands accessible to the general public for hunting purposes.

Physical factors are also affecting inland fishing. Water supplies are becoming increasingly important to the economy of the State and also to fish management. Water diversion projects and water pollution problems have a far-reaching impact upon the future of inland fishing and upon some marine fishing as well. Inadequate provision for continuing supplies of water to support inland fisheries and failure to correct harmful pollution will reduce the inland fisheries resources.

(2) *The Department of Fish and Game Has the Primary Responsibility to Plan for Future Wildlife Conservation Needs*

Responsibility for future planning rests mainly upon the department. This responsibility must be effectively carried out if the future sportsmen of California are to be provided their proper opportunities and if wildlife are to be preserved and conserved, so as to maximize the harvest without endangering future supplies of wildlife.

4. PLANNING RESPONSIBILITY DOES NOT REST SOLELY WITH THE DEPARTMENT OF FISH AND GAME

One factor which tends to weaken the department's planning effectiveness is that other governmental bodies share, to a degree, the responsibility and authority for planning wildlife management activities. This condition tends to make the integrated, long-range planning more difficult.

(1) *Wildlife Conservation Board and Marine Research Committee Carry Certain Important Planning Responsibilities*

As is indicated in Chapter I, Introduction, the Wildlife Conservation Board has been delegated responsibility and authority by the Legislature to allocate funds made available from the parimutuel fund

for capital improvements for wildlife preservation, protection and propagation. In years past, some $13,000,000 has been so allocated by the Wildlife Conservation Board. At the present time, such earmarked funds total $750,000 per year.

In all cases, the capital outlays so acquired have a decided influence upon the department's programs, and in some cases the capital outlays create a continuing need for annual operating expenses.

It should be pointed out that both the president of the Fish and Game Commission and the director of the department are members of the Wildlife Conservation Board and that co-ordination between the department and the Wildlife Conservation Board has been good. Nevertheless, the Wildlife Conservation Board is a separate entity which receives direct guidance from the legislators who work with the board and which receives advice from its own planning group which performs planning similar but not identical to that of the department.

To a lesser degree, the Marine Research Committee shares planning responsibility for marine research with the department. The Marine Research Committee determines the way in which the special taxes on certain commercial fish are spent on research projects. It becomes necessary, therefore, for the department to co-ordinate its marine research activities with the Marine Research Committee. Thus, the planning responsibility is split.

(2) *The Planning Responsibility of the Fish and Game Commission Is Not Clearly Defined Nor Fully Understood*

A factor which further tends to complicate the planning function is that the responsibility of the commission on planning matters is not clearly defined. Previously mentioned reluctance of the commission to issue a comprehensive statement of wildlife management objectives is indicative of this condition. The commission's responsibilities can be viewed in the narrow concept of setting fishing and hunting regulations. Another viewpoint is that the commission's responsibilities cover the broad fields of policy determination, and review and approval of planning and programs.

(3) *These Divided Responsibilities for Planning Tend to Create Confusion and to Dissipate the Will to Plan*

It becomes evident that the division of planning responsibility among the department, the commission, the Wildlife Conservation Board and the Marine Research Committee hinders the development of wildlife management plans. Thus, it becomes clear that factors outside the department, as well as inside the department, affect the way in which plans are developed.

5. RECOMMENDATIONS TO ACCOMPLISH EFFECTIVE PLANNING

The preceding sections of this chapter have stressed the importance of planning to the accomplishment of wildlife management objectives, and the reasons underlying the present deficiencies in departmental planning. Recommendations designed to strengthen the planning process are presented in the concluding pages of this chapter.

(1) *Set Specific Objectives for the Department*

Clearly defined objectives or goals are needed to provide the focal point for all planning and, indeed, all activities of the department. The establishment of agreed-upon objectives lessens the chances of divergent planning and thereby increases the teamwork and unity of action within the department.

We recommend that the department work closely with the commission in developing a set of general objectives which the commission should approve. Further, the department should refine these approved general objectives into more specific objectives.

(2) *Establish Clearly Defined General and Operating Department Policies*

Clearly defined policies, or guide lines, are needed to assist the translation of objectives into detailed plans. It is the responsibility of the commission to set general policies for the department, but the department should set the more definitive policies required in day-to-day decision-making at the planning and operating levels. The general and operating policies should be published in written form for use in guiding all department personnel in performing their duties. Chapter XIV, Management Controls, stresses the need for such written policy manuals.

(3) *Assign the Planning Responsibility to Definite Positions in the Department Organizational Structure*

Assignment of the planning responsibility to specific individuals and organizational units is another fundamental step to effective planning. In this way, divided and uncertain responsibilities are eliminated and co-ordinated planning can be achieved. Chapter XII, Departmental Organization, sets forth the detailed recommendations to implement this recommendation.

(4) *Consolidate Planning Responsibility in the Department*

Consolidation of wildlife planning responsibility in the department would increase the effectiveness of the planning function. Chapter XVI, Fish and Game

Commission, presents specific recommendations to accomplish this.

(5) *Give Adequate Attention to Developing Both Long-Range and Short-Range Planning*

It is extremely important for the department to develop a comprehensive, realistic long-range plan. It is also equally important that adequate short-range planning be developed for the near-term future. Both types of planning should be related to the department's objectives. They should also be related to projected human population increases and other changing factors.

Constructive long-range planning projected over the time span of 10 years should be in sufficient detail so as to set the broad outlines for the more detailed short-range plans. These short-range plans should extend over a one- or two-year period, so as to go beyond the planning related to the budget. Department resources of money, time and facilities are limited. Each year only a few new programs can be handled within the limited resources. Long- and short-range plans keep all objectives in focus but direct department attention to accomplishing each objective in sequence according to its importance to the overall purpose of the department.

(6) *Develop Realistic Plans Through Co-ordination With People in the Field*

Making of good plans requires close co-ordination between the branch chiefs in headquarters who carry the primary responsibilities for planning, and the operational managers in the field who know the actual field conditions and problems.

In a very real sense, planning should go through a "planning cycle." First, the branch chiefs should develop the broad outline of the plan to meet approved department objectives. Then the broad plan should be transmitted to the operational managers and their assistants in the field. The field people should relate the broad plan to their particular conditions and problems, and they should develop the more specific planning. Field comments and suggestions on the overall plan should be presented to department headquarters, together with the more specific planning.

In this way, planning is not made in a vacuum, or "ivory tower," but instead is realistic. The flowing back of comments and specific plans from the field to department headquarters should be an integral part of the "planning cycle."

The field information should then be integrated into the master planning and the resultant plan "recycled" back to the field managers for their review. Thus, planning should be a closely co-ordinated, continuing process between headquarters staff and operating managers in the field.

(7) *Secure Approval of the Planning From the Proper Approving Authority*

As elaborated upon in Chapter XVI, the Fish and Game Commission, it is important for the plans developed within the department to be reviewed and approved by the Fish and Game Commission. In this way, the commission can be informed on the planned future course of department programs and can insure that commission policies are being carried out. Chapter XVI recommends that the commission assume considerably greater responsibility in reviewing department objectives, plans and programs. Closer contact between the commission and the department is needed as one step in improving the caliber of department policies and programs. The Legislature retains final approval of plans through its power to appropriate money.

(8) *Use Approved Plans as Standards Against Which to Evaluate Operational Performance*

As stated in the introductory section of this chapter, plans are of little value if the actions taken do not fulfill the plans. It is important, therefore, that the approved plans be used as standards against which to evaluate the action taken in the field. This is a key concept of total management responsibility. As is outlined in greater detail in Chapter XIV, Management Controls, the branch chiefs should make periodic inspections of field activities to evaluate actual progress against approved plans.

In addition, the approved plans should be forwarded to the chief accounting and control officer in order that he can periodically report to the director on actual results as compared to planned results. This constitutes another important aspect of management control. Chapter XIV emphasizes this important concept.

(9) *Carry the Planning to the Public*

Planning approved by the Fish and Game Commission should be continually presented and explained in full to the public. Certainly one of the most fundamental conclusions of this survey, which is repeated throughout the report, is that improved public understanding of the various wildlife programs would result in a greater acceptance of them. It is important that a full, impartial presentation of plans be made to the public, setting forth all sides of the issues. In this way public confidence and support will be increased. Legislative support will follow the public support.

(10) *Provide for Flexibility to Meet Natural Emergencies*

Recognition was given early in this chapter to the fact that the activities of the department are affected by many uncontrollable factors. Natural disasters

and severe weather conditions can have serious effect upon California's wildlife. Because of the suddenness of such emergencies, immediate and decisive action is often necessary if wildlife populations are to be protected and conserved. The botulism epidemic on Tulare Lake in the summer of 1958 is a recent example of the need for immediate action on the part of the department.

Some greater elasticity should be provided in the department's budgets so as to permit the director to act quickly in the face of natural disasters of this type. It is recommended that there be provided in the department's annual budget a contingency fund of perhaps $50,000 or $100,000, to be used at the discretion of the director for such purposes.

In order to provide a degree of control over such action by the director, it is recommended that he be required to justify any expenditures of funds under such authority to the Fish and Game Commission.

The Legislature would, of course, exercise an effective "after-the-fact" control. The annual department budget requires legislative approval, at which time the request for a contingency fund would be supported in terms of the use to which the prior year's contingency fund was put. The unexpended portion of the prior year's contingency fund would, of course, revert to the Fish and Game Conservation Fund.

* * * * *

In summary, the most effective future action of the department will be based upon sound, realistic planning designed to accomplish accepted objectives. Planning should be the co-ordinated effort of both headquarters and field personnel. Approved long-range planning in turn provides the broad blueprint to be filled in by detailed short-range plans. Planning also provides the basis for evaluating actual progress against planned progress. Full disclosure of such planning to the public would provide the foundation for greater public acceptance and legislative support.

Recommendations for departmental organization are developed and presented in the following chapter.

CHAPTER XII

DEPARTMENTAL ORGANIZATION

Whenever two or more people work together, it is necessary to determine what work each person shall do. The way in which the work is divided between the various people working together is important because poor division of the work results in a poor job being done and a waste of money. It is also important that each person clearly understands what his job is and what is expected of him so that he can work at the job to be done.

The Department of Fish and Game is made up of over 1,000 people working together. Their activities are many, and they work in all parts of the State. Because California is such a large state, and because these 1,000 people are spread very thinly over the State, the determination of how best to divide the total amount of work to be done is difficult.

This survey has given much study to the important problem of deciding how best to organize the work of the department. Our primary objective has been to find the most effective way in which the department can organize its work so as to best achieve its wildlife conservation purposes. Reduction of costs has been an additional objective.

1. DEPARTMENT IS NOW GEOGRAPHICALLY DECENTRALIZED ON A LINE AND STAFF BASIS

Although the present organization of the department was described in Chapter I, Introduction, a brief summary of it is presented here. A clear understanding of the present form of organization is important to understanding the recommendations developed in this chapter. Exhibit I, following page 5, illustrates the present form of organization.

The department is organized under a plan whereby the director is the head of the department. He has three assistants: a deputy director directing the wildlife activities; an administrative officer in charge of accounting and administrative matters; and a conservation education officer responsible for providing wildlife conservation information to the public.

The deputy director is assisted by four branch chiefs, a marine research manager and a water projects co-ordinator, who are specialists in game management, inland fisheries management, law enforcement, marine research and water projects. These branch chiefs are the chief advisers to the deputy director and to the director on wildlife management policies, plans and programs. The branch chiefs also direct research activities, except that the manager of Marine Research Operations reports directly to the deputy director. Inasmuch as they are advisers to the deputy director and to the director, the branch chiefs and the water projects co-ordinator are the "headquarters staff." These branch chiefs do not direct or supervise the field activities of the department.

The field operations of the department are directed by five regional managers, each of whom is responsible to the deputy director for department activities in his region. Exhibit II, following page 5, shows the boundaries of each of these regions. The regional manager directs the field activities through three supervisors, one for each of the basic field functions: law enforcement, game management and inland fisheries management. These supervisors in turn direct the fieldmen actually carrying out law enforcement, game management and fisheries management work. There is also a business service officer for each region, responsible for license administration and other administrative work.

Because the regional managers have direct supervisory control over supervisors, who in turn have direct supervisory control over fieldmen, these people are known as "line" people. "Line" people have responsibility for carrying out the department's program, whereas "staff" people advise on how programs should be developed and carried out.

Each regional manager has the responsibility to carry out the department's policies and programs in his region. Each of the five regional managers makes decisions on how to carry out the programs. He makes these decisions in the light of the conditions and problems in his region. Thus, much decision-making takes place at the regional headquarters. To the degree this happens, there is a transfer of decision-making away from the departmental headquarters in Sacramento, to the five regional headquarters. This geographical decentralization was accomplished in the department reorganization which took place in 1953, when the present "line and staff" organization was established.

2. PRESENT DEPARTMENTAL ORGANIZATIONAL FORM IS BASED ON SOUND PRINCIPLES WHICH CAN BE FURTHER APPLIED TO PRODUCE ADDITIONAL IMPROVEMENT

In 1953 the department adopted its present form of regionally decentralized line and staff organization. Prior to 1953, the department was a centralized line organization in which branch chiefs of game management, inland fisheries management and law enforcement directed from department headquarters all of the field activities. Under this arrangement, the branch

chiefs both advised the director on plans and programs, and also had direct responsibility for carrying them out. However, as programs became more complex, it was more difficult to adapt them to varying conditions throughout the State. It also became more difficult to get the game people, the fisheries people and the wardens to work together to help one another, because the person with the authority to have them work together was hundreds of miles away in department headquarters.

(1) *Present Organization Plan Is Based on Sound Principles . . but .*

The 1953 reorganization plan, which established the present departmental organization, clearly recognized that authority and responsibility for field operations should be divided up into several parts on a geographical basis. This principle of geographical decentralization is sound, for in this way decision-making was brought closer to the place at which field operations were being carried out. Decisions could thereby be made more quickly, and action taken. Assignments of personnel to meet temporary peak workloads could thereby be made more readily. Unity of effort could be more nearly achieved. In summary, the creation of regional managers made possible more unified, prompt action, more decisions in line with regional problems, and more effective use of manpower. Geographical decentralization is a sound principle for the department's needs.

A second sound principle upon which the present department organization plan is based is the concept of a headquarters staff to advise the director. The 1953 reorganization plan recognized that the director would require a group of qualified people in the areas of game management, fisheries management and law enforcement to advise him on the policies, plans and programs which should be carried out by the five regional managers. It would be necessary for the director to have this headquarters staff because the director simply could not do all the necessary work himself. It was clear that a headquarters staff was necessary if geographical decentralization was to be accomplished. This concept is sound.

(2) *The "Staff" Aspect of the "Line and Staff" Concept Has Failed to Function to Fullest Advantage*

Although the line and staff concept is sound, the headquarters staff has not functioned to fullest advantage in actual practice. As a result, the substantial benefits of the line and staff form of organization have not been fully realized.

It became quite clear during the course of the survey that the various branch chiefs in department headquarters have not performed all of the necessary functions as staff advisers and planners. It is understandable that difficulties would be encountered in converting a functional line organization into a line and staff organization. The men who had been in direct charge of game management, fisheries management and law enforcement functions throughout the State suddenly became advisers, rather than doers. At the same time, new men assumed responsibilities as regional managers and thereby became responsible for carrying out wildlife management in their regions.

Much of the difficulty is directly traceable to the fact that duties and responsibilities of the branch chiefs have never been adequately defined or fully understood. It is only natural that under such circumstances the duties should be poorly performed. It also should be recognized that, in the desire to give the newly appointed regional managers authority in their regions, the department restrained branch chiefs from maintaining full contact with field operations.

The move to regional decentralization was consequently difficult to make. Men needed time to grow into their new responsibilities, and to develop management know-how.

It is clear, however, that during this transition period the full benefits of regional decentralization have not been realized. Chapter XI has discussed the shortcomings in departmental planning. To a large degree, each region has had to develop on its own strengths without a great amount of guidance and control from headquarters. This has been difficult and time-consuming, with each region trying to learn the same lessons. It has also resulted in differences between regions in law enforcement, game management and fisheries management. In some respects there have been five separate departments of fish and game.

(3) *Some Benefits Have Been Achieved in Interchanging Field Personnel Between Functions*

One of the benefits of the regional form of organization has been the interchange of people between jobs to meet peak work loads. The regional manager has authority over all of the people in his region and consequently is able to use men to help out in another function. Examples of this are the assignments of men to help run pheasant co-operative areas and deer checking stations. There has also been interchange of personnel between regions to meet peak work loads, especially in law enforcement activities.

Based upon estimates prepared by the regional functional supervisors, the following table illustrates the extent to which interchange of personnel between functions occurred in 1957-58:

	Percent of Time Spent on Principal Functions			
Organizational Unit	*Law Enforcement*	*Game and Fish Management*	*Conservation Education*	*Total*
Wildlife Protection	79%	14%	7%	100%
Game Management	4%	92%	4%	100%
Inland Fisheries	1%	93%	6%	100%

These figures are simply estimates, and undue accuracy should not be attributed to them; but they do indicate that some interchange of personnel between functions does take place. These figures are the average for all five regions, although generally each region follows this same pattern. It is notable that wildlife protection personnel contribute significantly more manpower to meeting peak workloads in other functions than do either game management or inland fisheries personnel.

This flexibility between functions in meeting peak workloads is desirable. This is one of the benefits which has resulted from regional decentralization.

3. DEPARTMENT IS NOW READY TO COMPLETE ITS ORGANIZATIONAL DEVELOPMENT

In 1953, the department took the important step of changing from a centralized functional organization to a regionally decentralized organization with a headquarters staff. Such a basic change would be difficult in any organization, and it was difficult for the department. Some of these growing pains are still being felt.

It is the future, however, which is important, not the past. The department, interested sportsmen and conservationists should be looking ahead to see what further steps should be taken.

The progress made since the 1953 reorganization makes clear the fact that the department is now ready to complete the transition to a fully decentralized department. The remainder of this chapter is devoted to the analysis of the facts and to the setting forth of the recommended form of organization.

4. CHARACTERISTICS OF FISH AND GAME CONSERVATION WORK ARE IMPORTANT TO DETERMINATION OF BEST ORGANIZATIONAL STRUCTURE

An understanding of the basic characteristics of wildlife conservation work in California is essential to the determination and development of the best department organization structure. Following are significant characteristics upon which recommendations presented later in this chapter are based.

(1) *Wildlife Conservation Work Is Largely Fieldwork*

The major portion of department wildlife conservation and management work is conducted in the field. This basic fact, of course, should surprise no one, but there is evidence that it has tended to be overlooked. There are numerous examples of nonessential levels of supervisors. Various headquarters are necessary to administer a geographically decentralized organization such as the department, but concentrations of department personnel in headquarters offices should be reduced to a minimum.

(2) *Wildlife Conservation Fieldwork Can Be Broken Down Into Basic Categories of Work*

Reducing wildlife conservation and management fieldwork to its simplest terms, it is composed of the following basic elements:

—Gathering *facts* on the various wildlife species as to how they live and what factors affect their survival.

—Enforcing the *rules and regulations* which are designed to prevent undue human pressures on the survival of the species.

—Taking positive action to *improve the habitat* in which the species live.

—Operating *artificial propagation* facilities so as to increase the wildlife populations over what the habitat can provide.

—*Educating* the public in the growing body of wildlife management knowledge so that the most benefit can be realized without harming the future supply of wildlife.

It is possible, and desirable, to relate these elements to the field activities which are performed by department personnel, and to the basic educational and technical requirements for successfully carrying them out. The following summarizes the essential facts:

Category of field work	*Basic educational and technical requirements*
1. Data collecting, such as condition of range or stream, population counts, etc.	High school graduate and basic wildlife knowledge
2. Law enforcement of fish and game regulations.	High school graduate, law enforcement knowledge and basic wildlife knowledge.
3. Wildlife management activities, such as range improvement, rough fish control, stream flow maintenance work.	High school graduate, basic wildlife knowledge and some specialized knowledge.
4. Installation management, such as fish hatchery or game farm.	High school graduate, basic wildlife knowledge and some specialized knowledge.
5. Wildlife research, including evaluation of data obtained.	College training or equivalent, with specialization in biological studies.
6. Conservation education.	High school graduate and knowledge and proficiency in one or more categories of wildlife management.

(3) *Most Fieldwork Has Same Basic Requirements*

Analysis of these basic categories of fieldwork leads to the conclusion that, with the exception of true research, educational and technical requirements of all fieldwork are essentially the same.

(4) *Knowledge and Proficiency in One Category Assists in Carrying Out Another Category of Work*

Moreover, knowledge and proficiency in each of the categories unquestionably aids in carrying out the duties and responsibilities in other categories of wildlife management work. This is especially true with regard to conservation education, which is an underlying key factor to effectiveness in wildlife management. Without public understanding and support, progress is slow and difficult. Recent experience of the department is tangible proof of this fact.

(5) *Fieldwork Is Characterized By the Necessity to Travel*

Basically, because of California's size, it is necessary for much traveling to be done by field personnel. Indeed, a review of the department's operating budget readily discloses this fact. The significance of this is that travel can be unproductive, which focuses attention on the desirability of accomplishing as much as possible when traveling in the field. A wise goal in establishing field organization is to provide, where practicable, a reduction in field travel through elimination of the need for several people to cover the same area.

(6) *Generally There Are No Large Concentrations of People in the Field*

With the exception of Marine Resources operations at Terminal Island, there are no large concentrations of personnel in the field. Land wildlife protection personnel generally work as individuals; game management and inland fisheries personnel work as individuals or in small teams, except at an installation such as a hatchery or a waterfowl management area, in which case perhaps six or eight work as a team. In general, however, fish and game work can be characterized as individual effort, with a minimum of close supervision.

(7) *There Are Requirements Both for Technically Trained Specialists in Biological Research and for Less Technically Trained Field Personnel*

One other characteristic of wildlife conservation work must be recognized; both technically trained biologists and generally trained field personnel are needed to carry on effective wildlife conservation activities. The scientist is needed to support the field management work, for there is ample evidence that much factual knowledge on wildlife management remains to be discovered and developed for practical application. All of the wildlife consultants who participated in this survey have repeatedly emphasized this point. This fact, however, does not discredit the work of the management people who apply the knowledge developed by the biologists. Efforts of both groups should be teamed together, with each contributing an integral part of the wildlife conservation program.

5. ORGANIZATION STRUCTURE CAN MATERIALLY FACILITATE THE ACCOMPLISHMENT OF DEPARTMENT OBJECTIVES

Good organization structure can improve the effectiveness of the department. Discussion thus far has been devoted to evaluation of the present organization and to understanding the characteristics of fish and game work in California. It is now appropriate to determine the specific improvements which should be sought through modification of departmental organization.

(1) *Greater Public Acceptance of Wildlife Programs Can Be Achieved Through Greater Unity of Effort*

Throughout the wildlife chapters of this report, the lack of departmental teamwork and its unfortunate effect upon public acceptance of fish and game programs has been emphasized. Underlying this lack of teamwork has been a lack of common understanding and acceptance of new wildlife management facts and techniques by all field personnel.

The present functional separation of the field personnel into wardens, game managers and fisheries managers tends to perpetuate the problem of disunity. The separating of field people into wardens, game personnel or fisheries personnel naturally causes those people to think and act as wardens, game personnel or fisheries personnel. This leads to a concentration on their specialties and a lack of time and interest in work outside their own specialities. But this also leads to a lack of understanding of new advances made in wildlife management outside their own specialties. The lack of understanding of a wildlife program leads to lack of acceptance of that program, and sometimes leads to active resistance to it. Sportsmen and others in the general public notice this disunity within the department and are naturally confused. Public acceptance of new wildlife programs is therefore poor, and sound programs are held back.

It therefore becomes apparent that one primary objective of organization planning should be the unifying of field personnel at the field operating level as well as at the regional management level. Greater unity of effort can be built upon commonly understood and accepted wildlife programs. This greater unity of effort would, in turn, create better understanding and gain more support from sportsmen and the general public.

(2) *Improved Program Planning and Improved Program Execution Can Be Achieved Through More Logical Assignment of Planning Responsibilities*

Chapter XI, Planning, stresses the importance to the department of improved long-range and short-range planning. Attention was directed to the fact that planning responsibility was not clearly understood within the department. The end result has been planning which has lacked realism and reason and which has not received public support and approval. This is another example of the lack of unity of effort. As has been stressed before, common understanding of programs can greatly increase the unity of effort.

Thus, another objective of organization planning is to determine the most logical assignment of the planning responsibility and to staff it adequately so that this important function can be effectively performed. It is equally important that all department personnel should fully understand where this responsibility rests, so that all can pull together in the same direction.

(3) *Program Execution Can Be Improved Through Reduction of Number of Supervisory Levels*

Under the present organization structure there are four basic levels of supervision for field personnel, and in some cases six supervisory levels. For example, the following table illustrates the typical number of supervisory levels in the wildlife protection and game management functions:

Wildlife protection	*Supervisory level*	*Game management*
Department director or deputy director	First	Department director or deputy director
Regional manager	Second	Regional manager
Wildlife protection supervisor	Third	Game management supervisor
Patrol captain	Fourth	Game manager III
	Fifth	Game manager II supervising several game units
	Sixth	Game manager I supervising one game unit

Thus, a warden has four supervisory levels above him. A fish and game assistant working in a game management area has six supervisory levels above him. Excessive supervisory levels create loss of efficiency. It is a case of "too many chiefs and too few Indians." There is a need for more workers on the firing line and fewer supervisors to tell the others what to do.

Excessive supervisory levels multiply communications problems. It has been demonstrated many times that the fewer the number of people through whom instructions are passed, the better the original message will go through. The actual intent of department policies and programs would be more nearly carried out if there were fewer supervisory levels to interpret them and pass them on the next lower supervisor.

Clearly, therefore, the reducing of the number of supervisory levels within the department should be one of the improvements to be sought in organization planning. The recommendations developed later in this chapter achieve a significant reduction in the number of supervisory levels.

(4) *Employee Utilization and Unity of Effort Can Be Maximized by Placing the Decision-Making Authority Closer to the Point of Action*

The functional separation of field personnel has had the definite effect of retarding the interchange of personnel between functions. This has slowed down the common understanding of problems and programs. It has also tended to result in reduced efficiency of field personnel. Although some progress has been made in the direction of improved utilization of personnel to meet peak workloads and to reduce nonproductive travel time, the basic fact remains that a functional specialist is interested primarily in his own specialty and consequently has a natural resistance to performing work in other functional areas. This situation tends to preserve the division of the department, with unfavorable effects upon knowledge and acceptance of new programs, and with large amounts of unproductive time spent traveling in the field.

Placing management responsibility and authority at the lowest practical level in the organization structure thus seems desirable. Greater flexibility in assigning field personnel would be achieved, and in turn more effective employee utilization and unity of effort would result.

(5) *Greater Economies in Administrative and Clerical Functions Can Be Achieved Through Streamlining of the Administrative Organization*

Like most enterprises in both government and industry, the Department of Fish and Game finds itself faced with an ever-growing volume of paper work. A very legitimate objective of organization planning is streamlining the administrative and clerical duties and responsibilities down to a level where essential administration and control is effected at minimum cost. Opportunities for greater economies in administrative and clerical functions should be capitalized upon whenever organization planning permits.

Every effort should be made to reduce the administrative and clerical costs of the department in order that the greatest possible amount of the license buyer's dollar can be devoted to actual fish and game conservation work. Reduction of the number of people

processing and handling paper work, and the elimination of unnecessary administrative levels at which this takes place, should be an objective of organization planning.

6. BASIC CONCEPTS IN THE RECOMMENDED FORM OF ORGANIZATION ARE IMPORTANT

Preceding paragraphs list the very tangible and significant objectives which can be achieved by organization planning. These objectives offer sufficient potential benefits to warrant the development of a new or modified form of departmental organization. Before presenting the specific recommendation for departmental organization, the fundamental concepts underlying the recommendations are discussed below.

(1) *Wildlife Management Operations Should Be Further Decentralized and Supporting Services Should Be Centralized*

The predominant field nature of fish and game conservation work has been previously stated. The desire to make fieldwork more effective, and to give greater emphasis to field problems of fish and game management, are sound reasons why actual field operations should be decentralized still further.

Another strong reason to decentralize field operations further is the need to build greater unity of effort within the department. At the present time, the regional manager is the lowest management level at which all the field operations are brought together. Beneath the regional manager the operations are carried out by functional specialists. That this organizational arrangement retards common understanding of wildlife management policies and programs has been made clear in earlier paragraphs. Creation of field managers at a level lower than the regional manager, with full responsibility for carrying out all field programs, will do much to solve the problems of disunity of effort.

Centralizing supporting services at department headquarters offers an excellent opportunity to reduce administrative costs without harming the necessary service to operating people. Under the present form of organization, each regional headquarters contains a business service unit composed of a number of people whose primary function is that of processing accounting and personnel records and of handling license administration.

Since most field personnel are located at widely scattered locations, there is little actual service rendered to them by the regional business service office which cannot be rendered more economically from a centralized location. Today most economies in clerical operations are to be found in centralization and mechanization. Most business services and fiscal management must be accomplished by written communication rather than by personal contact. It makes no significant difference, therefore, whether the fiscal and accounting operations are 50 or 300 miles from the point at which day-to-day field operations take place.

License administration falls into this same category. The splitting of license administration into five regional offices prevents maximum use of machine accounting and most effective use of personnel. Centralization of business services offers a significant opportunity for reduced costs without impairing necessary service to license agents.

The further decentralization of field management, together with centralization of supporting services, is a key concept of the proposed plan.

(2) *The Basic Unit of Fish and Game Management Should Be a District, Supervised by a District Manager*

Further decentralization of fish and game field operations should be accomplished by creating districts within a region. Each district should be supervised by a district manager who would have responsibility and authority for basic field activities within his district.

Distinction must be made between basic field functions, which should be assigned to the district, and specialized field functions, which should be assigned to the region or to department headquarters. The following categories of field work are the basic ones which should be assigned to the district:

- *Law Enforcement,* which should continue to be the principal field activity in terms of effort devoted to it.
- *Fact Gathering,* such as condition of range or stream; population counts, bag and catch counts, etc.
- *Basic Wildlife Management Activities,* such as range improvement, rough fish control, stream flow maintenance, etc., as can be accomplished within the resources of the district.
- *Conservation Education,* with special emphasis on developing community relationships, assisted by published material developed at regional and headquarters levels.

This results in the assignment of four of the six basic elements of wildlife management to the district. Wildlife research and installation management are the two other basic parts of fish and game management. Because these require specialized knowledge and full-time specialization of effort, they are not assigned to the district. There is another compelling reason why installation management should be assigned to the region headquarters rather than to the district. Installations such as fish hatcheries and game farms produce fish and game for distribution to many

districts and to other regions. There exist problems of co-ordination among installations and release areas which would become even greater problems if such facilities were placed under district managers.

Those activities which can be best and most effectively carried out by the district should be the responsibilities of the district. Those activities which can be best carried out in some higher level of the organization should be assigned to the appropriate level.

In summary, the district should be assigned those field activities which are continually being performed throughout all sections of the State: law enforcement, data gathering, basic wildlife management, and conservation education. The establishment of a district manager to supervise these activities provides the basis for greater unity of effort and greater common understanding of problems and programs.

(3) *Personnel Assigned to Work Under a District Manager Should Be Essentially Generalists, Capable of Carrying Out All of the Basic Field Activities*

The fundamental problem of how to secure the greatest unity of effort in field operations has been repeatedly emphasized. Creation of the district is part of the solution to this problem. Also fundamental to the solution of this problem is the creation of generalists, rather than functional specialists, to carry out the basic field tasks in the district. These generalists should be known by some common title such as "conservation officer," to emphasize both their law enforcement and conservation management responsibilities.

The generalist concept is based on the fundamental idea that the Department of Fish and Game fieldman should be capable and qualified in all basic fish and game management activities which are to be carried out in his area. No longer would he be a warden or a unit game manager. Instead, he would be a "conservation officer," with qualifications in and responsibility for carrying on an effective conservation education program for all law enforcement and for all basic game management and fisheries management work in his assigned area.

It is contemplated that the district would be divided into subdistricts, each with a "conservation officer" assigned. The "conservation officer" would be "Mr. Fish and Game" in his subdistrict.

As will be discussed later in this section, there should be a number of "conservation assistants" to assist "conservation officers" in handling special or peak workloads.

It should be made clear that flexibility in job assignments should be practiced by the district manager whenever workload makes it desirable, just as at present wardens, unit game managers and others are given temporary assignments to meet peak workloads. The district manager should have the authority and the responsibility to reassign "conservation officers" under his supervision as needed. Similarly, the regional manager should have the authority and the responsibility to call upon his district managers for temporary assistance to meet peak workloads. Indeed, interchange between regions should also be made when desirable. Underlying the entire organizational plan is the concept that all department personnel have one basic objective—to accomplish sound wildlife conservation in California.

Additional concepts relating to the generalist concept are important. Under the proposed organization structure each district would be divided into a number of subdistricts, averaging perhaps 12 per district. The subdistrict could be somewhat smaller geographically than the present warden district, but the duties and responsibilities of the "conservation officer" in charge of a subdistrict would include conservation education, law enforcement, basic game management and basic fisheries management responsibilities.

It is recognized that the "conservation officer" position thus may become larger in scope of responsibility than the present warden, unit game manager or area fisheries manager. Consequently, the position of "conservation officer" possibly should be evaluated for salary purposes at a higher level than any one of the functional positions being eliminated. As mentioned previously, geographical area would be reduced so as to balance total workload. Chapter XIII covers this subject in greater detail.

A second additional concept of importance is that recognition should be given to the fact that not all "conservation officers" will have acquired the same level of knowledge and experience at the same time. It should also be noted that not all subdistricts throughout the State would have equal requirements for capabilities in all phases of conservation management. It is therefore evident that two grades of "conservation officer" should be established, with corresponding difference in salary level. The fully qualified generalist would be a "conservation officer II," with level I for a less qualified individual.

Closely allied to this concept is the concept that there would still be a need for field personnel with qualifications less than that of "conservation officer I." As is true now with the position of fish and game assistant, there should be a classification of "conservation assistant," with qualifications to perform some of the basic activities in game or fisheries fieldwork. It is contemplated that the "conservation assistant" would be in the nature of a general utility employee, to be assigned by the district manager as varying workloads require.

The fact that some progress has been made in interchange of personnel between functions is evidence that the responsibilities to be assigned to the district

are within a practical range for field personnel. It should also be noted that in Chapter III, Big Game Management, recommendations were made which would have the effect of significantly reducing the amount of field deer management work over the next five years.

As will be further evident in subsequent recommendations, realignment of existing wildlife management responsibilities is a basic requirement of the district generalist concept. When viewed as a whole, the organizational plans involve the reassignment of duties among the existing department personnel. Certain field positions would be enlarged in scope, but in most cases the geographical territory would be reduced, thereby equalizing the workloads.

Benefits to the wildlife management programs would be sizable. Conservation officers would be qualified in all areas of basic field managment and, as such, would have the responsibility to carry out all phases of basic fieldwork. This participation in all basic wildlife management problems and programs would increase common understanding of programs, which in turn would improve unity of effort. Employee utilization would be significantly increased, as it would no longer be necessary for different specialists to go into the same geographical area on separate functional assignments.

Moreover, the conservation officer would be capable of carrying on an effective conservation education program in his contacts with local citizens. This would be a most significant advantage. Under this organizational concept, departmental unity would be made effective since every fieldman would have responsibility for and interest in the full department programs and not for only a functional part of the programs.

(4) *The Next Level Above the District Should Be the Region, Supervised by a Regional Manager*

The region should be the next organizational level above the district. The region should be managed by a regional manager responsible for carrying out the approved plans and programs within the region. The regional manager should be provided sufficient qualified personnel to assist him to carry out all fish and game activities in the region.

Throughout all of this organizational planning is the key point that responsibilities should be assigned to the level at which they can be most effectively carried out. The recommended assignment of responsibilities to the district was based upon the concept that all basic categories of fieldwork be assigned to the district. However, those activities requiring a higher level of educational or technical training and those activities which are highly specialized and which require extensive co-ordination between regions and districts were purposely not assigned to the district. Instead, these activities should be assigned to the region.

At this point, the necessity for a regional headquarters should be made clear. If California were a much smaller state, it would be possible for the districts to be supervised directly from a department headquarters. However, there are four basic reasons why in California an intermediate headquarters is necessary between the district and the department headquarters.

- — California is such a large state geographically. The long distances between Sacramento and the outer portions of the State prevent effective management of field activities from Sacramento.
- — Creation of districts in the manner recommended would result in over 20 districts. Such a large number of district managers would be more than could be supervised effectively by one manager. It is therefore necessary to provide for a manager to supervise a considerably smaller number of district managers.
- — The variations in climate and terrain throughout California are great. This, of course, is a corollary of California's large size. These variations affect the wildlife management problems. Consequently, such variation in climate and terrain makes it necessary to have actual management responsibility located in several points in the State rather than at one central point.
- — Creation of districts staffed with generalists does not fill the need for a group of specialists to do the regional planning and to operate the specialized installations such as hatcheries and game farms. These specialists must have qualifications not found in the generalists.

These factors all support the conclusion that the regional form of organization is sound. Care has been taken to see that the responsibilities of the district are not duplicated in the regional headquarters. Instead, the regional headquarters is intended to provide help and assistance to the district managers.

In order for the regional manager to carry out his responsibilities, it is necessary to provide him with specialists in each of the functional areas. These specialists should be essentially staff advisers to the regional manager in law enforcement, game management, inland fisheries management and conservation education.

One of the key problems of the department is the bringing to the public all of the significant information bearing on wildlife management problems. Chapter IX, Conservation Education, discusses this basic problem at length. In order to aid in solving this basic problem, each regional manager should be assisted by a regional information officer responsible for developing ways of informing the public on conservation problems.

These advisers, who could be called "regional branch chiefs," would do the regional planning in their functional areas for approval by the regional manager. They would also evaluate fieldwork being done in their functional areas by the districts.

In addition, the respective "regional branch chiefs" would direct the operation of the fish hatcheries, game farms and waterfowl management areas. In this capacity the regional branch chief would have direct line authority over these installations. There are two basic reasons for this. First, these are specialized operations, and the duties of the district manager are broad enough without requiring him to be qualified as a specialist in installation management. Secondly, these installations do require co-ordination with similar installations in other regions and with the districts in which the fish or game are to be released. It is more convenient, therefore, to retain the supervisory responsibility over them at regional headquarters.

One other type of function should be assigned to the region rather than to the district. Specialized work on certain problem areas should be directly under the supervision of the appropriate regional branch chief. Examples of such specialized work would be studies of major water diversion projects or studies of certain large bodies of water. These activities require specialized training which would not be available in the district. One other category of work should be assigned to a regional headquarters rather than to a district. If the extent of specialized work (such as habitat improvement or fish screen installation) makes it more economical for one crew to perform this service throughout a region, then this activity should be under the supervision of the appropriate regional branch chief. If there is such a large amount of this work that one crew would be working almost exclusively within a single district, then this activity should be under the supervision of the district manager. There should be no hard and fast organization structure forced on all regions merely for the sake of uniformity. The test should be: where can this responsibility be best performed?

These concepts form a sound basis for the separation of duties and responsibilities between the region and the district. In summary, the regional manager's total responsibility remains the same as they are now constituted.

However, the concepts presented here make very significant reassignments of the responsibilities of those working within the region. District managers would become responsible for basic field operations, assisted by generalists qualified in law enforcement, game management, inland fish management and conservation education. The regional manager would be assisted by staff specialists who would provide all necessary technical knowledge in planning, operating and controlling specialized activities throughout the region.

Shifting of supervisory responsibility for basic game and fisheries field management from the present functional supervisors to the district managers reduces the amount of supervisory responsibility carried by these supervisors in their new positions as regional branch chiefs. The regional game branch chiefs would not have supervisory responsibility for game units. Similarly, the regional fisheries branch chiefs would not have supervisory responsibility for basic fisheries field work. This reduction of supervisory responsibility on the part of regional game and fisheries branch chiefs would permit a significant reduction in the need for intermediate supervisory positions which now exist. Moreover, this reduction in supervisory responsibilities would permit the regional branch chiefs to assume regional planning responsibilities now carried to an extent by intermediate supervisors in game and fisheries management. It is estimated that approximately 23 game and fisheries manager II and III positions could be eliminated by reason of the shift of supervisory and planning responsibilities to district managers.

(5) *Department Headquarters Should Be the Top-Level Part of the Departmental Organization*

Building up from the bottom, the organizational level above the region should be the department headquarters. This, of course, is consistent with the present organization. One basic organization principle is to keep the number of management levels in an organization at a minimum to improve the channels of communication between the field man and top management. The concepts presented in these pages are built upon three management levels in the department: the department headquarters, the region and the district. As was indicated earlier in the chapter, there are at present four to six management levels.

Assignments of responsibilities within the departmental headquarters should be on the line and staff pattern, such as now exists. However, it is extremely important that the responsibilities be grouped in such a way as to make "doable" jobs—jobs which can be done. Duties and responsibilities of the present deputy director are far too broad for effective performance. As now constituted, the deputy director has 11 people reporting to him: four branch chiefs, five regional managers, the manager of the Marine Research Operations, and the water projects coordinator. In addition, the deputy director is active in liaison contacts with the Legislature.

Essentially, the director's responsibilities fall into four broad categories:

— *Operations,* to carry out wildlife management programs.

— *Planning* of wildlife management programs, including research for facts upon which to base programs.

— *Control* of operations, including fiscal control and administrative services.

— *Information* and education, including the important responsibility of keeping the public effectively informed on all wildlife conservation problems.

Accordingly, the director should be provided with four principal assistants, one in each of these broad fields:

— Deputy director—operations.
— Associate director—plans.
— Associate director—control.
— Assistant director—information.

The deputy director—operations should be responsible for carrying out the department's programs. Beneath the deputy director—operations should be the regional managers in the field who carry out the wildlife conservation activites. These are the operating people who translate plans into action.

The associate director—plans should be responsible for developing the overall plans by which the department accomplishes its objectives. Beneath the associate director—plans should be the top level functional specialists in game management, inland fisheries management, marine fisheries management, law enforcement and water projects. Each of these top-level branch chiefs would be the chief planning adviser to the associate director—plans in his specialty, as well as directing technical research activities. They would be responsible for program planning, program evaluation and research management. The marine fisheries branch chief should have direct control over the Marine Resources Operations at Terminal Island.

The associate director—control should be responsible for reporting on the department's performance compared to predetermined goals or standards. He should also direct all fiscal and accounting activities of the department, as well as being the chief adviser to the director on all fiscal matters.

Due to its current importance, a fourth position of assistant director—information should report to the director. The assistant director—information should be responsible for developing the ways by which the department can best keep all interested people informed on wildlife management problems. Particular emphasis should be given to improving the department's effectiveness in communicating to the public if the department is to be effective in improving wildlife conservation in the future. Chapter IX, Conservation Education, has discussed this subject in considerable detail.

(6) *Fiscal and Accounting Activities Should Be Centralized at Department Headquarters*

In the preceding subsection, the concept was presented that all financial and accounting activities of the department should be directed by the associate director—control in department headquarters. Coupled with this is the concept that all fiscal and accounting activities should be centralized at department headquarters, rather than partially decentralized as now.

A part of the fiscal and accounting activities of the department is centralized in department headquarters at the present time. The encumbrance ledger and general accounting records are maintained in department headquarters. Some document processing is performed there, too. However, there are sizable fiscal and accounting functions still performed in regional headquarters.

Analysis of the accounting and administrative services performed by the regional business service function reveals that most of these services are such that they can be performed more economically from a central headquarters without reducing necessary service. The regional business service function can be broken down into the following basic parts:

LICENSE ADMINISTRATION

— Issue and account for fish and game licenses distributed to license agents in the region.

PERSONNEL ADMINISTRATION

— Maintain personnel records on personnel in the region.

ACCOUNTING ADMINISTRATION

— Code and partially process purchase orders and purchase requests prior to forwarding to department headquarters.

ADMINISTRATIVE SERVICES

— Provide stenographic and clerical services to other sections of regional headquarters.
— Act as administrative assistant to regional manager in handling housekeeping problems.
— Supervise small supplies warehouse operation.

ADVISORY FUNCTION TO REGIONAL MANAGEMENT

— Assist regional manager in preparing annual budget request for region.
— Advise regional manager and functional supervisors on interpretations of department administrative policies and procedures.
— Advise and assist regional manager and functional supervisors on specific business management problems.

The license, personnel and accounting administration functions are essentially clerical in nature. These are activities in which economies can be obtained

through centralization. License administration is an outstanding example of the opportunity to mechanize an accounting operation, thereby eliminating costly manual methods. At the present time license administration is split into five regional offices, which prevents maximum use of machine accounting and most effective use of personnel.

There are approximately 20 persons, located at five regional offices, engaged in issuing licenses to selling agents and in maintaining agents' accountability ledgers. Centralization of license administration would permit full use of machine accounting and improved employee utilization. It is estimated that a net reduction of five clerical positions would result.

The proposed centralized organization of business services offers a significant opportunity for reduced costs without impairing necessary service to license agents.

Accounting and personnel administration at the regional level offer excellent opportunity to eliminate duplication in recordkeeping and to eliminate duplicate handling of documents. The accounting function is already partially centralized in department headquarters, but there exists unnecessary processing and handling of routine accounting papers at regional headquarters. It is only natural that each headquarters level check and approve all papers passing through it. This produces duplicate handling of routine documents which flow in large volumes, all of which requires clerical personnel. Personnel records at regional headquarters tend to duplicate information maintained at department headquarters.

It is estimated that a net reduction of three clerical positions could be achieved through centralization of the accounting and personnel clerical functions in department headquarters.

The proposed organizational plan eliminates the administrative "middle man" and the middle man's costs. It is significant that most regional personnel are located at widely scattered locations throughout the region. Consequently, the regional business service function is essentially a processing station separated physically from the majority of field personnel.

The regional business service function plays no significant part in the approvals of requests for expenditures. Authority for most expenditures under $25 each rests with the field man. He has made an actual expenditure before the business service office is aware of it. Requests for expenditures in excess of $25 each usually require preliminary approval of the field man's supervisor and final approval of the accounting officer or administrative officer in Sacramento. Actual purchase of these items is made by the purchasing division of the Department of Finance.

Expenditures for items of capital equipment follow procedures closely controlled by the centralized accounting office in department headquarters. Automotive repairs involving more than $100 must be approved by the automotive inspector of the Department of Finance.

It is clear, therefore, that to a very large degree the business service function exercises no actual control over expenditures. The monthly report of funds encumbered, compared to authorized budget, is prepared by the centralized accounting section of department headquarters.

Stenographic and clerical services are, of course, necessary to the regional manager and to his staff. These services should remain at regional headquarters. The secretary to the regional manager should be able to assume the supervisory responsibilities involved in addition to her regular duties.

The regional manager and his staff should also have available to them a business management advisory service. This is particularly needed in connection with budget request preparation. It is also necessary from time to time in specific instances for the regional manager or others in regional management to have qualified business management advice and counsel. The frequency of such needs, however, is not high. Budget preparation occurs at a set time each year. The other requirements for qualified business management counsel can generally be anticipated, particularly if adequate planning of programs is developed. It is evident, therefore, that qualified fiscal and business management should be provided when needed. The proposed organization plan makes adequate provision for such assistance by establishing two business service positions in department headquarters, who would periodically visit regional offices. The plan also recognizes the need for a business service function at Marine Resources Operations at Terminal Island because of the large concentration of personnel. However, the proposed organization plan offers the opportunity to make a net reduction of three business service officer positions, while still providing adequate business management counsel to field management. It is recommended that each of the two business service officer positions at departmental headquarters be assigned specific responsibility to counsel two regions. In this way a personal and continuing type of business counsel can be offered.

One other important point should be made in reference to decentralizing field management and centralizing administrative services. Complete written manuals clearly setting forth organization; job responsibilities; department objectives, policies, plans and programs; operating and administrative procedures; and standards of performance are essential to effective operation of a decentralized operations-centralized services form of organization. In this way, the necessary unity of understanding and effort can be best achieved. Chapter XIV, Management Controls, discusses this important concept in greater detail.

7. ADOPT ORGANIZATION STRUCTURE BASED ON FOREGOING CONCEPTS

The six basic concepts presented in the preceding section form the key points upon which the ultimate form of organization has been designed.

(1) *Adopt Recommended Top Level Assignments of Responsibility at the Department Level*

Exhibit XXX, Recommended Ultimate Top Level Organization Structure, which follows, illustrates the recommended reporting relationships. The following statements of principal duties and responsibilities of each key position are based upon the organizational concepts developed in earlier sections of this chapter.

DIRECTOR

The director should be responsible for planning, organizing, directing and controlling all wildlife management activities within the State so as to achieve the department's objectives in accordance with the overall policies, plans, programs and budgets approved by the Fish and Game Commission in conformity with the budget appropriations of the Legislature.

DEPUTY DIRECTOR—OPERATIONS

The deputy director—operations should be responsible to the director for organizing, directing and controlling all wildlife management activities in the field so as to achieve the department's objectives in accordance with the overall policies, plans, programs and budgets established by the Fish and Game Commission and the director; for providing to the director and associate director—plans, all pertinent field data relating to plans and programs in process in order that future planning and programing may best accomplish the department's objectives; and for providing to the associate director—control statements on organization, policy and procedures relating to field operations for inclusion in approved department manuals. In addition, the deputy director—operations should be empowered to act for the director in his absence.

ASSOCIATE DIRECTOR—PLANS

The associate director—plans should be responsible to the director for developing and recommending the objectives, policies, plans and programs of wildlife management and research which will best accomplish the sound preservation, conservation and propagation of wildlife in California; for directing all research conducted by the department; for developing, in conjunction with the deputy director—operations, and recommending to the director and the associate director—control the standards of performance for field activities of the department; for developing and recommending to the director standards of performance for research activities of the department; for conducting periodic inspections of field activities to evaluate compliance with predetermined standards; for providing to the associate director—control statements on organization, policy and procedures relating to the planning and research function for inclusion in approved department manuals; and for maintaining continuous liaison with the deputy director—operations so as to be aware of all pertinent field data relating to plans and programs in progress in order that future planning and programing may best accomplish the department's objectives.

ASSOCIATE DIRECTOR—CONTROL

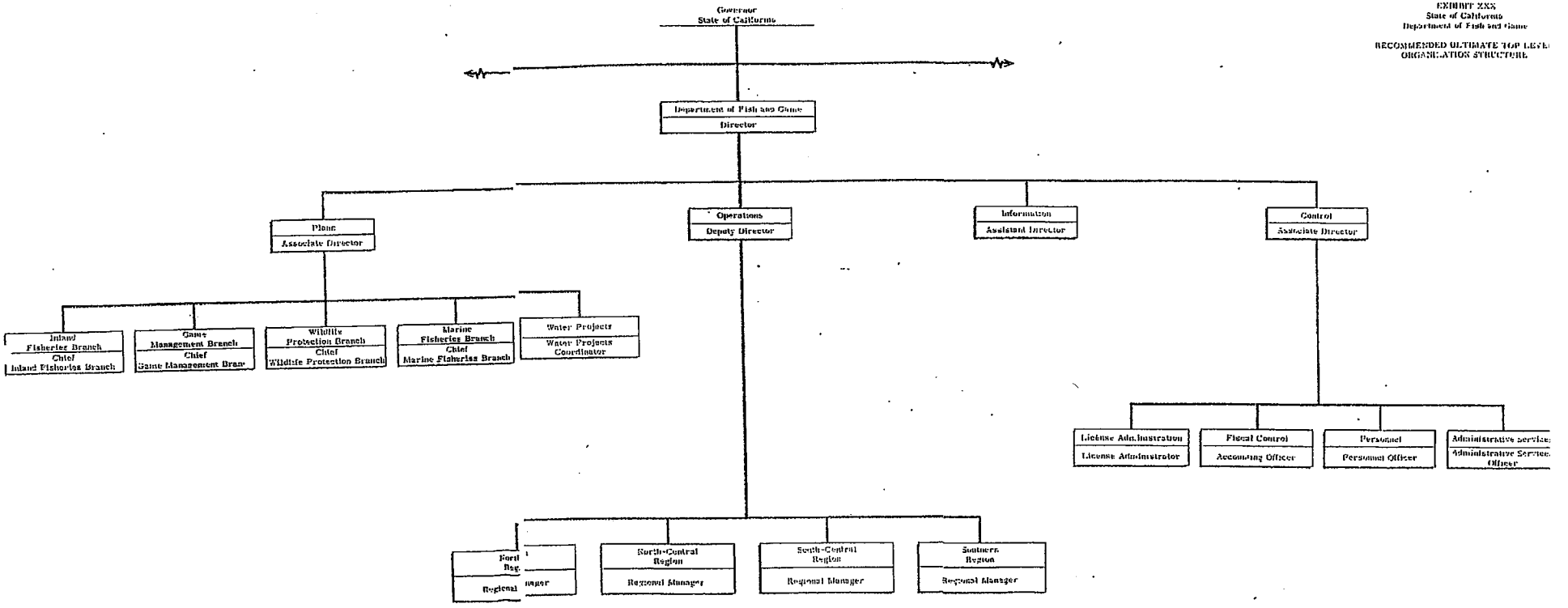
The associate director—control should be responsible to the director for evaluating and recommending the standards of performance for field and research activities against which actual performance should be compared; for reporting on actual performance in comparison to predetermined standards of performance; for publishing approved organization, policy and procedures manuals; and for planning, organizing, directing and controlling the accounting, fiscal, license, personnel and administrative services activities of the department in accordance with policies and programs approved by the director and in conformity with statewide administrative practices.

ASSISTANT DIRECTOR—INFORMATION

The assistant director—information should be responsible to the director for developing and recommending the objectives, policies, plans and programs of conservation education, both within and without the department, which will best facilitate the sound preservation, conservation and propagation of wildlife in California; for directing the preparation, publication and release of conservation education material from headquarters; for developing and recommending to the associate director—plans the standards of performance for field activities in conservation education; for providing to the associate director—control statements on organization, policy and procedures relating to the information and education function for inclusion in approved department manuals; for conducting periodic inspections of conservation education activities in the field to evaluate compliance to predetermined standards of performance; and for maintaining continuous liaison with conservation education activities in the field so as to be aware of all pertinent conservation education data relating to plans and programs in progress in order that future planning and programing may best accomplish the department's objectives.

EXHIBIT XXX
State of California
Department of Fish and Game

RECOMMENDED ULTIMATE TOP LEVEL
ORGANIZATION STRUCTURE



CHIEF, GAME MANAGEMENT BRANCH

The chief, game management branch, should be responsible to the associate director—plans for developing and recommending the objectives, policies, plans and programs of game management and research which will best accomplish the sound preservation, conservation and propagation of game in California; for directing all research in game management; for developing and recommending to the associate director—plans the standards of performance for field activities and research activities in game management; for conducting periodic inspections of field game management activities to evaluate compliance with predetermined standards; and for maintaining continuous liaison with game management activities in the field so as to be aware of all pertinent game field data relating to plans and programs in progress in order that future planning and programming may best accomplish the department's objectives.

CHIEF, INLAND FISHERIES BRANCH

The chief, inland fisheries branch, should be responsible to the associate director—plans for developing and recommending the objectives, policies, plans and programs of inland fisheries management and research which will best accomplish the sound preservation, conservation and propagation of inland fish in California; for directing all research in inland fisheries management; for developing and recommending to the associate director—plans the standards of performance for field activities and research activities in inland fisheries management; for conducting periodic inspections of field inland fisheries activities to evaluate compliance with predetermined standards; and for maintaining continuous liaison with inland fisheries management activities in the field so as to be aware of all pertinent inland fisheries field data relating to plans and programs in progress in order that future planning and programing may best accomplish the department's objectives.

CHIEF, MARINE FISHERIES BRANCH

The chief, marine fisheries branch, should be responsible to the associate director—plans for developing and recommending the objectives, policies, plans and programs of marine research which will best accomplish the sound preservation, conservation and propagation of marine fish species in Pacific waters, and in California waters with respect to anadromous fish; for directing all marine and anadromous fish research; and for developing and recommending to the associate director—plans the standards of performance for marine and anadromous fish research activities.

CHIEF, WILDLIFE PROTECTION BRANCH

The chief, wildlife protection branch, should be responsible to the associate director—plans for developing and recommending the objectives, policies, plans and programs of law enforcement which will best accomplish the sound preservation, conservation and propagation of wildlife in California; for developing and recommending to the associate director—plans the standards of performance for field law enforcement activities; for conducting periodic inspections of field wildlife protection activities to evaluate compliance with predetermined standards; and for maintaining continuous liaison with law enforcement activities in the field so as to be aware of all pertinent field data relating to law enforcement plans and programs in progress in order that future planning and programing may best accomplish the department's objectives.

WATER PROJECTS CO-ORDINATOR

The water projects co-ordinator should be responsible to the associate director—plans for developing and recommending the objectives, policies, plans and programs of water conservation and control which will best accomplish the sound preservation, conservation and propagation of wildlife in California; for developing and recommending to the associate director—plans the standards of performance for field activities in water projects work; for providing technical advice and co-ordination on major water projects; for conducting periodic inspections of field water projects activities to evaluate compliance with predetermined standards; and for maintaining continuous liaison with water projects activities in the field so as to be aware of all pertinent water projects data relating to plans and programs in progress in order that future planning and programing may best accomplish the department's objectives.

(2) *Adopt Recommended Assignments of Responsibility Within the Region and District*

Exhibit XXXI, Recommended Ultimate Regional Organization Structure, which follows, illustrates the recommended reporting relationships within the northern region. The same principles would apply to the other regions. The following statements of principal duties and responsibilities of each key position are based upon the organizational concepts developed in earlier sections of this chapter.

REGIONAL MANAGER

The regional manager should be responsible to the deputy director—operations for planning, organizing, directing and controlling all wildlife management activities within the region so as to

achieve the department's objectives in accordance with the overall policies, plans and programs established by the director, and the budget appropriations of the Legislature.

REGIONAL GAME MANAGEMENT CHIEF

The regional game management chief should be responsible for planning game management activities in the region for the approval of the regional manager; for directing the operations of waterfowl management areas and game farms in the region; for rendering technical advice and assistance to district managers when requested; for conducting periodic inspections of game management activities in the districts to evaluate compliance to predetermined standards of performance; and for directing regional game management investigations so as to achieve the department's objectives in accordance with overall game management policies and programs.

REGIONAL FISHERIES MANAGEMENT CHIEF

The regional fisheries management chief should be responsible for planning fisheries management activities in the region for the approval of the regional manager; for directing the operations of hatcheries in the region; for rendering technical advice and assistance to district managers when requested; for conducting periodic inspections of fisheries management activities in the districts to evaluate compliance to predetermined standards of performance; and for directing regional fisheries management investigations so as to achieve the department's objectives in accordance with overall fisheries management policies and programs.

REGIONAL WILDLIFE PROTECTION CHIEF

The regional wildlife protection chief should be responsible for planning law enforcement activities in the region for the approval of the regional managers; for rendering technical advice and assistance to district managers when requested; for conducting periodic inspections of law enforcement activities in the districts to evaluate compliance to predetermined standards of performance; for supervising the radio communications system in the region; and for maintaining continuous liaison with law enforcement activities in the districts and with the chief, wildlife protection branch so as to be able to advise the regional manager and district managers of the conformity to predetermined standards of performance.

REGIONAL INFORMATION OFFICER

The regional information officer should be responsible to the regional manager for planning conservation education activities, both within and without the department, which will best facilitate the sound preservation, conservation and propagation of wildlife in the region; for preparing press releases of conservation education material pertaining to the region; for rendering technical advice and assistance to district managers when requested; and for conducting periodic inspections of conservation education activities in the districts to evaluate compliance to predetermined standards of performance, so as to achieve the department's objectives in accordance with overall wildlife management policies and programs.

DISTRICT MANAGER

The district manager should be responsible to the regional manager for planning, organizing, supervising and controlling the law enforcement, conservation education, and game and fisheries basic field activities within the district, so as to achieve the department's objectives in accordance with the policies and programs established by the regional manager.

CONSERVATION OFFICER

The conservation officer should be responsible to the district manager for carrying out the law enforcement, conservation education, and game and fisheries basic field activities within his assigned area, so as to achieve the department's objectives in accordance with the plans and programs established by the district manager.

GAME BIOLOGIST

The game biologist should be responsible to the regional game management chief for rendering technical advice and assistance to district managers when requested; for carrying out game management investigations within the region and for assisting the regional game management chief in evaluating basic game management carried out by the district managers, so as to achieve the department's objectives in accordance with plans and programs established by the regional game management chief.

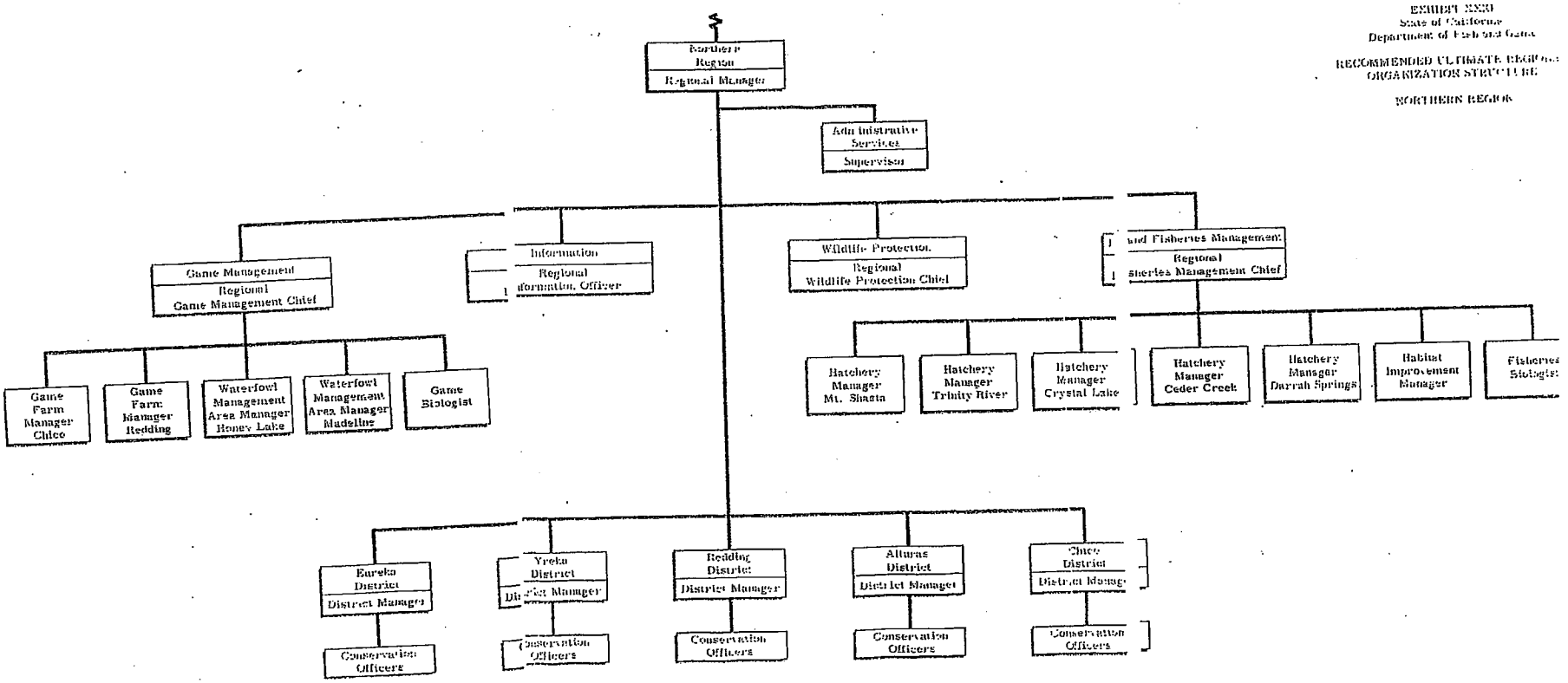
FISHERIES BIOLOGIST

The fisheries biologist should be responsible to the regional fisheries management chief for rendering technical advice and assistance to district managers when requested; for carrying out fisheries management investigations within the region; and for assisting the regional fisheries management chief in evaluating basic fisheries management carried out by the district managers, so as to achieve the department's objectives in accordance with plans and programs established by the regional fisheries management chief.

EXHIBIT XXXI
State of California
Department of Fish and Game

RECOMMENDED ULTIMATE REGIONAL
ORGANIZATION STRUCTURE

NORTHERN REGION



HABITAT IMPROVEMENT MANAGER

The habitat improvement manager should be responsible to the regional game or fisheries management chief for planning and carrying out approved habitat improvement work within the region in co-operation with managers of the districts involved, so as to achieve the department's objectives in accordance with plans and programs established by the regional game or fisheries management chief.

SUPERVISOR OF ADMINISTRATIVE SERVICES

The supervisor of administrative services should be responsible to the regional manager for supervising the stenographic and clerical activities in the region which are required to support the regional headquarters, in accordance with procedures contained in the department procedures manual.

Hatchery, game farm and waterfowl management area managers should continue to carry the same duties and responsibilities as they do at present.

As was stated in section (2), Exhibit XXXI presents the recommended ultimate organization structure for the northern region. The same basic structure should be applied to the other three regions. Any basic field activity regularly carried out by permanent personnel within a single district should be a responsibility of the district manager. For example, in the northern region, fish screen work is carried out by personnel working within the Siskiyou and Redding districts. The respective district managers should have supervision over these activities, in addition to other field activities. If such activities are carried out over an entire region by personnel working out of regional headquarters, such activities should be directly supervised by the appropriate regional management chief.

8. PROPOSED BOUNDARIES OF REGIONS AND DISTRICTS HAVE BEEN DEVELOPED

The concepts and structure of the recommended ultimate form of organization have been presented in the preceding sections of this chapter. Study has also been given to the determination of logical boundaries of districts and regions under the concepts developed. Exhibit XXXII, which follows, sets forth tentative regional and district boundaries. The nature of this survey was such that it was not possible to discuss our findings and conclusions with department personnel during the course of the survey. As will be evident in a latter part of this section, many factors should determine the setting of district and regional boundaries. Careful and detailed study of all factors by department personnel would be desirable before exact boundaries are set. Inasmuch as this has not taken place, the boundaries presented in Exhibit XXXII should be considered as tentative.

(1) *Four Regions Are Recommended*

One major difference between the present regional plan and the proposed plan is that only four regions are proposed. Exhibit XXXII graphically portrays the recommended division of the State into the following four tentative fish and game regions:

Northern region	Comprising all of the present Region I, plus Glenn, Plumas and Butte Counties.
North-Central region	Comprising all of the present Region II, except Glenn, Plumas and Butte Counties, plus the northern half of the present Region III, including the San Francisco Bay area counties.
South-Central region	Comprising all of the present Region IV, plus the southern half of the present Region III, and Inyo and Mono Counties.
Southern region	Comprising all of the present Region V, except Inyo and Mono Counties.

The reduction in the number of regions from five to four would be made possible by the further decentralization of field management responsibilities from the region to the district. The district manager, with responsibility for all basic fieldwork in the district, would carry supervisory responsibilities now carried by the functional supervisors. As a result, the regional headquarters would be able to assume planning and overall management responsibility over a larger geographical area.

It is, of course, true that considerable savings will result from the elimination of one regional headquarters. A regional headquarters cost approximately $125,000 a year for salaries of headquarters personnel and related expenses. It is therefore possible to save $125,000 per year by eliminating a regional headquarters under the concepts developed. However, this cost reduction is a result of the district generalist concept, rather than a primary reason for recommending a reduction in the number of regions.

(2) *All Regions Should Have Sea Coast As Well As Inland Areas*

This concept was developed both on the basis of the desirability of providing a wide variety of wildlife management activities within a region and on the basis that greater utilization of manpower could be achieved because of fluctuations of work peaks between seacoast and mountains.

(3) *Criteria for Establishing Regional Boundaries Have Been Established*

The following criteria were applied in determining the tentative regional boundaries:

1. The region should consist of the largest number of districts capable of being supervised and

served adequately by the regional manager and his staff.

2. The number of land districts within a region should normally not exceed seven in order not to exceed the ability of the regional manager to give effective, direct supervision.
3. The region should be geographically small enough so that the regional manager could travel by automobile to any district office and conduct business in the same working day.
   The region should have a satisfactory road network.
   The time required to travel from the regional office to any district office usually should not exceed five hours (or 200 miles).
4. Districts should be contiguous within a region.
5. The number of districts should be equalized among regions as much as possible.
6. The regions should be so constituted as to present the most practical opportunities for flexibility in meeting peak work loads.
7. Each region should encompass as wide a range of wildlife management problems as practical to facilitate in-service training of personnel.

Mention should be made of the Inyo-Mono area. By reasons of its location and its terrain, it is considerably isolated from the remainder of California. This creates a difficult problem in trying to determine how best to include it in the regional planning. From the point of view of accessibility, it is almost equally accessible from either the south-central region or the southern region. Because of the desire to more nearly equalize regions, it was decided to include Inyo and Mono counties in the south-central region.

Economic and field management considerations should be given to building a headquarters for the southern region on the Los Serranos game farm; and to establishing the headquarters of the north-central region at the present regional office in Sacramento.

(4) *District Boundaries Necessarily Must Be a Compromise Between Ecologic and Administrative Considerations*

Because of the fact that the conservation officer in the field would be a generalist, he would be performing activities in law enforcement, conservation education and game and fish management. From a law enforcement point of view, county boundaries would be desirable because of administrative reasons. On the other hand, from a game management point of view, the natural ecologic limits of deer herds in particular, and other game species as well, would be most logical. Similarly, from an inland fisheries management point of view, natural ecologic limits would be most logical, and they may vary from natural ecologic limits for game.

It becomes evident, therefore, that some compromise is necessary. Fortunately, many of the county boundaries do follow crests of mountain ranges, or crests of mountainous areas, thereby delineating watersheds. It is also to be noted that accessibility has been a factor in county boundaries, which is helpful in the matter of setting district lines.

(5) *Twenty-two Land Districts and Three Marine Districts Are Tentatively Proposed*

Consistent with the administrative and ecologic considerations discussed above, the tentative districts were designed as the largest geographical units capable of being adequately supervised by the first-level supervisor, the district manager. Detailed statements of the criteria used in setting the tentative district boundaries are presented below. The number of proposed districts per region varies between five in the northern and south-central regions, seven in the north-central region and five land and three marine districts in the southern region. Exhibit XXXII, illustrates the tentative twenty-two land districts. The boundaries of the three marine districts would be the same as now constituted.

Activities within land districts comprise the basic field responsibilities of law enforcement, conservation education and game and fish field management. Activities within marine districts consist principally of marine law enforcement, together with supplemental marine research activities as assistance to marine resources.

(6) *Criteria for Establishing District Boundaries Have Been Established*

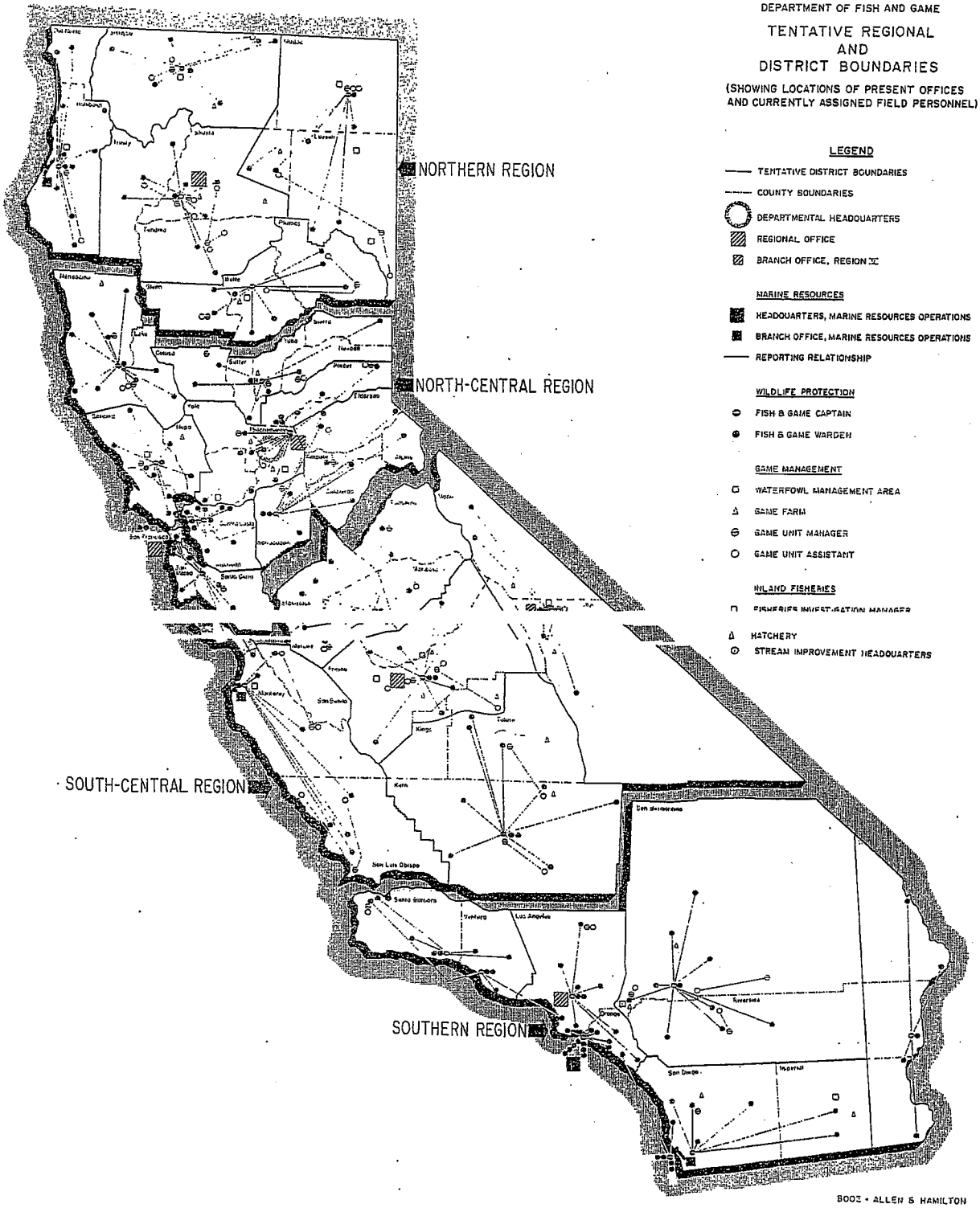
The following criteria were applied in determining the tentative district boundaries:

1. The district should be the largest geographical unit capable of being adequately supervised directly by the district manager.
2. The number of conservation officers reporting to a district manager should usually not exceed 12 in order not to exceed the ability of the district manager to give effective, direct supervision.
3. The district should be geographically small enough so that the district manager could easily travel by automobile to any point in the district and conduct business in the same working day.
   The district should have an adequate road network.
   The time required to travel from the district office to any point in the district usually should not exceed three hours (or 100 miles).
4. The boundaries of the district should be the best possible compromise between ecologic and administrative boundaries.

EXHIBIT XXXII
STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME

TENTATIVE REGIONAL AND DISTRICT BOUNDARIES

(SHOWING LOCATIONS OF PRESENT OFFICES AND CURRENTLY ASSIGNED FIELD PERSONNEL)



BOOZ • ALLEN & HAMILTON
MANAGEMENT CONSULTANTS

5. The area of the district should be in inverse ratio to the intensity of hunting and fishing effort in the area.

The tentative boundaries of the proposed 22 land districts are indicated on Exhibit XXXII. It should be re-emphasized that these district boundaries are tentative suggestions only. It is evident that the setting of exact district boundaries will require careful study by the department over a considerable period of time. Decisions will be necessary to compromise the various ecologic and administrative considerations. To illustrate the need to adjust district boundaries by reason of the particular circumstances, the tentative western boundary of the Bishop district was set somewhat west of the Inyo-Mono county line (and the crest of the Sierras) because of easier accessibility from the Bishop area. Similarly, the southwest boundary of the Alturas district was extended into neighboring counties because of ecologic and administrative considerations.

9. BENEFITS OF THE PROPOSED ULTIMATE ORGANIZATION PLAN ARE SIGNIFICANT.

It is appropriate at this juncture to summarize the important benefits which the recommended organization plan affords. Admittedly, the proposed plan is one which cannot be achieved quickly or without considerable effort on the part of all concerned. To make such a plan worthwhile, therefore, there should be sizable and significant advantages.

(1) *More Public Understanding and Support of Wildlife Management Programs Should Be Achieved*

This is a key benefit, one which is vitally needed. The increase in public acceptance and support would arise from three basic factors:

— Field personnel would be qualified in and would be carrying out all basic field functions rather than being functional specialists. This would be the building block for greater unity of action and teamwork.

— Program planning would be significantly strengthened and improved, thereby providing a second important base for gaining greater public acceptance of department programs.

— Program execution would be improved by reason of better planning, improved utilization of personnel and greater teamwork.

Increased public understanding and support of wildlife management programs should be achieved as a result of the improved teamwork, planning and program execution.

(2) *Conservation Objectives Would Thereby Be Better Attained*

Increased public acceptance and support of wildlife programs, improved planning and improved program execution should result in more perfect attainment of the department's objectives. This will be reflected in increased harvest to the sportsmen and commercial fishing industry, while improving the wildlife potential for the future.

More public understanding and support of wildlife management programs, which in turn would better achieve conservation objectives, are the chief benefits which would be realized from adoption of the proposed organization plan.

(3) *Significant Operating Economies Would Probably Result*

In addition, there are certain net operating economies which have been referred to in the preceding sections of this chapter. An attempt has been made to summarize these probable net savings in the following paragraphs. However, due to the nature of this survey, it has not been possible to review our findings and conclusions with department personnel. Although effort has been made to evaluate the net savings, it is possible that not all of these economies will be realized.

It is our firm conviction that apart from any economies realized, the very important benefits of increased public understanding and support and consequent better achieved conservation objectives would more than justify the adoption of the organization recommendations.

The following is a tabulation of the net operating economies which probably would result from adoption of the recommended organization plans.

	Estimated annual savings
— *Elimination of one regional headquarters*_____ This estimate includes all costs associated with a regional headquarters, including the positions of functional supervisors in game and fisheries management and wildlife protection.	$125,000
— *Centralization of the majority of business service functions at department headquarters*_____ As discussed earlier, it is anticipated that a net reduction of three business service officer positions and eight clerical positions could be achieved through centralization of license administration, accounting and personnel activities.	55,000
— *Adoption of the district-generalist concept* As discussed earlier, the creation of district managers results in a definite transfer of responsibility away from the functional supervisors at regional headquarters. This reduces the need for intermediate level supervisors such as supervisors of game managers, supervisors of game farm and hatchery managers. The recommended plan also would eliminate the need for one of the two wildlife protection supervisors in Region V, inasmuch as direct supervision of land law enforcement would be transferred to	

	Estimated annual savings
district managers. Direct supervision of marine patrol captains would be retained by the regional wildlife protection chief in the southern region.	
Positions eliminated:	
14 Game managers II and III	$93,000
9 Fisheries managers II and III	59,000
1 Wildlife protection supervisor	9,000
	$161,000
Under the district-generalist concept the functional specialists of patrol captain, warden, unit game managers and area fisheries managers would be replaced by generalists qualified in all basic fieldwork. Recognition should be given to this fact and the possible basis for higher salary levels. This study has not attempted to make a position evaluation study of the old and new positions. However, recognition should be given to the fact that approximately 280 positions may be so affected.	
Provision for possible increased salaries due to position re-evaluation	($100,000)
The district manager should be provided an office in order that one point in the district would be recognized as the district headquarters for fish and game. Existing facilities should be utilized to the extent possible.	
Provision for rent of district offices	($15,000)
Net expected savings—adoption of district-generalist concept	$46,000
— New positions added:	
Provision for addition of an associate director—plans and three regional information officers, including one at Marine Resources Operations recommended in Chapter VI	($40,000)
Net annual estimated savings resulting from proposed ultimate form of organization	$186,000

Some economies may also result in reduced traveling and automotive expenses under the new district organization plan.

* * * * *

Careful preparatory steps would be required before the recommended form of organization could be adopted in its entirety. However, the recommendations are sound, the benefits significant, and results are feasible. Chapter XVIII, Plan of Action, presents the steps which should be taken to place these and other recommendations into effect.

The following chapter discusses the important management responsibility of building the teamwork among department personnel.

CHAPTER XIII

TEAMWORK AMONG DEPARTMENT PERSONNEL

Two important aspects of management responsibility—planning and organizing—have been discussed in the two preceding chapters. Another important element of management is achievement of teamwork. Unless department personnel can operate as a well-co-ordinated team, the department cannot hope to achieve fully its objectives. Motivating personnel as individuals and in groups is one of the most intangible and most difficult of management's responsibilities. This problem is particularly difficult to handle in the Department of Fish and Game, because its field activities are so widespread; actions of individuals are more important, yet are subject to less control.

Survey findings definitely point up the fact that teamwork of the department has not been as effective as it should be. There has been a tendency for each region to interpret departmental policy in different ways. Similarly, functional groups have had a tendency to make their own judgments on department programs and policies and to take their own actions without regard to the effect on others. There has been a divergence of effort, which has created friction within the department and which has reflected itself in divided public acceptance of the department's wildlife programs.

This problem pervades the entire department and is sufficiently important for separate discussion and development of specific recommendations which, together with other recommendations for planning and organization, should provide a sound program for obtaining personnel teamwork in the department.

Some of the key considerations and recommendations for operating the department under its new organization plan so as to obtain teamwork between department personnel are covered in the following sections.

1. DEPARTMENT OF FISH AND GAME PERSONNEL ARE DEDICATED TO WILDLIFE CONSERVATION

Generally, department personnel are sincere, dedicated conservation workers. According to their own interpretations, they are all working toward preservation and conservation of wildlife in California, although not all of their interpretations of the soundness and importance of specific programs and policies are the same. Generally, department personnel are capable in wildlife fields but they lack understanding and skill in administration.

The fact that department personnel are conscientious, sincere and capable people is the foundation upon which co-ordinated, unified teamwork can be built and maximum department effectiveness can be achieved.

2. PERSONAL DESIRES AND DRIVES MUST BE CONSIDERED IN DEVELOPING A SOUND DEPARTMENT PERSONNEL PROGRAM

Department personnel have personal objectives with respect to their jobs. Most of these objectives are sufficiently similar as to form a common base upon which greater unity of effort can be built. Some of the most common objectives are the desires for accomplishment of worthwhile jobs; for recognition and status by associates and by the public; for the sense of belonging to a respected organization; for opportunity to advance; and for job security.

These several fundamental underlying characteristics which are common to most department personnel should be recognized in planning, organizing and operating department programs. The individual will make a greater contribution to the department team if his personal objectives are being met.

3. THE PROPOSED PLAN OF ORGANIZATION OFFERS A GOOD OPPORTUNITY TO IMPROVE THE CAREER PROGRAMS FOR DEPARTMENT PERSONNEL

The preceding chapter developed a recommended plan of organization for the department which was based on two fundamental concepts—the further decentralization of basic field activity to a district, and the assignment of all basic field responsibilities to a generalist in a subdistrict. By its very nature, the recommended organization offers greater career opportunity to department personnel.

(1) *The Generalist Concept Widens the Job Responsibilities of Most Field Personnel*

Fundamental to the generalistic concept is the fact that under the proposed organization structure, each district would be divided into a number of subdistricts, averaging perhaps 12 per district. Each such subdistrict could be somewhat smaller geographically than the present warden district, but the duties and responsibilities of each such man in charge of a subdistrict would include law enforcement, basic game management and basic fisheries management responsibilities. It is recognized that the individual is thus given a considerably larger scope of responsibility and, consequently, a greater opportunity to accomplish his basic personal objectives.

Under such a concept, the generalist becomes in effect Mr. Fish and Game in his area. He becomes a key individual in the department, both to the department and to the general public.

The present warden force will provide the great majority of generalists under the proposed organization. Law enforcement will remain the major part of the duties and responsibilities of the conservation officer, and there is no intention of de-emphasizing the importance of law enforcement.

The conservation officer will be assigned responsibilities which will afford greater opportunity for recognition from both fellow department personnel and from the public, for greater accomplishment and for greater compensation. Concurrent with this is the reduction of geographical area to be covered, so that time will be available for performance of these additional responsibilities.

These same opportunities for increased job responsibility and recognition are not limited to the present warden force. It is contemplated that the number of conservation officers will exceed the present number of wardens, and there will be opportunity for a number of qualified game managers and fisheries managers to become conservation officers. Thus, this is an opportunity to broaden their job responsibility, with resultant increases in recognition, status, accomplishment and compensation.

At the supervisory level, the position of district manager offers greater opportunity and challenge than that of present field managers such as patrol captains, fisheries managers III and game managers III. Patrol captains are already responsible for a district and many of the duties which would be handled by district managers. District managers, however, would have significantly greater job responsibility, recognition and accomplishment. The mainstream of field activities will flow up through the conservation officer and district manager. Just as experience as a conservation officer will in the future be the logical training ground for the district managership, so will the position of district manager be the logical training ground for the regional managership.

(2) *Opportunity for Advancement Through Two Principal Channels Would Be Open to All Department Personnel*

Under the recommended form of organization, two separate avenues for advancement within the department would be provided.

One channel is that of the generalist, progressing up through the various field activities of conservation assistant, conservation officer I and II, district manager and regional manager.

In another basic channel of advancement, the specialist or biologist would progress up through the various technical and research activities of biologist trainee, biologist I, II, III and IV, regional branch chief, and departmental branch chief.

One other concept is important, and that is that advancement of properly qualified personnel would be possible by bridging from the technical channel to the generalist channel, or vice versa. These two channels should be flexible so that opportunity for advancement will not be restricted. Care should be taken, however, that the fundamental importance of the generalist will not be weakened; for, in the last analysis, fish and game activities are essentially field activities.

(3) *Field Personnel Would Be Qualified and Expected to Carry the Fish and Game Management Programs to the People*

Another important attribute of the generalist concept is the fact that a conservation officer, by virtue of his training and experience in all phases of basic field activities, would be qualified and expected to explain and carry the fish and game management programs to the people in his area.

This very significant responsibility would do much to fulfill several of the basic personal objectives of field personnel. Such responsibility would place the conservation officer in the mainstream of the department's work. He would be active and qualified in all basic field activities, and thus he would be a very important part of fish and game activities. His sense of accomplishment would be greater, his position more important, his opportunity for advancement greater and recognition of his contribution higher.

(4) *The Present Tendency for Functional Division of the Department Would Be Greatly Reduced*

The survey has revealed that some rather sharp functional divisions do exist within the department. This tendency for conflict is most evident between wildlife protection and game management functions, although it is not limited to these functional areas. It should be recognized that such divisions of opinion and action are natural results stemming from a functional form of organization, a widely spread group and differing backgrounds.

Such a divergence of opinion has been reflected in sharply divided public opinion, with unfortunate results. The proposed organizational plan will do much to eliminate the causes for such divisions within the department. At the same time, the individual objectives of department personnel will be better attained, for the sense of their belonging to one unified department will be immeasurably increased. Not only will personal satisfaction be improved but total effectiveness of the department will be significantly improved.

4. RESPONSIBILITY FOR UNITY OF EFFORT AND TEAMWORK OF PERSONNEL RESTS WITH EACH SUPERVISOR

In such a widespread organization as the Department of Fish and Game, field men work with much less direct supervision than if the department's activities were concentrated at a few locations. This results in the need for self-starting, resourceful men.

Consequently, there is a large responsibility for each supervisor to stimulate the men under his supervision to reach the highest level of his potential. Each of the department's supervisors has the responsibility of motivating people under his supervision to work toward the total objectives of the department. These departmental objectives should be clearly stated and easily understood. The supervisor is the person who embodies and conveys these objectives as they relate to the specific work being done.

The proposed form of organization places heavy reliance upon each supervisor to motivate his people to work toward common objectives. The district manager would be a key supervisor in this respect, for the people under his direct supervision would be doing a major part of fish and game work in the field.

Although the district manager would be the key supervisor in this respect, each management level, from the director down, should fully recognize the responsibility to encourage and stimulate the people under his supervision to reach their top potential. The carrying out of this responsibility can make a large difference in the effectiveness of the department. This is particularly significant in view of the job security aspects of civil service.

5. UNITY OF EFFORT THROUGH TEAMWORK CAN BE INCREASED

Unified action and teamwork by department personnel can be improved by removing some of the circumstances which now produce friction between functional groups and reduce morale.

(1) *Understanding of the Department's Objectives, Policies, Plans and Programs Is Required*

Communication is an indispensible tool in building unity and teamwork among department personnel. All during the survey it was abundantly clear that communication, both from top to bottom and from bottom to top, had failed in too many instances. Field personnel in many cases were ignorant of the reasons and factors which were important to an understanding of policies and programs. The department's deer management program is perhaps the outstanding example of this.

This lack of full understanding of policies and programs, and the corresponding failure to seek fuller participation by all who could contribute, has been one of the fundamental reasons for the division of the department.

While some effort has been directed toward building a better understanding of department policies and programs among field personnel, the fact is that the understanding achieved has not been as full or widespread as it should be.

(2) *Assurance That All Qualified Department Personnel Will Be Given Full Consideration for Positions Created by the Proposed Plan of Organization Should Be Made Clear*

It is vitally important that all department personnel should understand that the proposed plan of organization contemplates that all qualified department personnel will be given every opportunity to become qualified for the positions to be created, and that it is the intention that such positions be filled with department personnel who become qualified.

Since the positions of conservation officer and district manager will encompass law enforcement, basic game management and basic fisheries management responsibilities, department personnel now performing in these specialties should be given every encouragement and opportunity to qualify themselves for the broader positions.

As has been stated previously in this report, there is no intention or desire to downgrade the law enforcement function. This function is and will continue to be very important, and qualification in law enforcement work will undoubtedly be the most important single qualification for conservation officers and district managers.

6. BETTER USE OF AVAILABLE CHANNELS OF COMMUNICATION WILL IMPROVE TEAMWORK

There is a common misunderstanding among department personnel that all communication among regions and between regions and headquarters must pass through the regional managers. Net effect of this policy is that a letter from one field man in a region to another field man in an adjacent region on a routine matter must travel many extra miles through several layers of supervisors and two regional managers. By the time such a letter is received, it is often too late for effective action to be taken. Red tape of this nature discourages proper action and teamwork. It can be eliminated.

Department personnel are not going to work happily if the organization plan is a rigid, restraining formality. It need not be and usually is not. There should be well-recognized channels of communication which department personnel can use in performing their duties.

These channels do not appear on the organization chart. If they did they would obliterate it. They are

a web woven of common sense and good judgment in doing the things that need to be done. For instance:

(1) An individual will often need facts from others in order to make an intelligent decision. There should be no hesitation to get needed information directly from anybody who can supply it.

(2) Someone in a supervisory position will want advice frequently on some action that he is planning to take. He should certainly feel free to confer with those who can give sound advice. However, this fact should be remembered: getting advice on a decision in no way relieves him of the responsibility for making the right decision. He is accountable for results in his sphere of responsibility.

(3) Co-ordination of activities requires frequent and continuing contacts. Each person in a responsible position should set up and maintain channels of communication with those who are concerned with activities related to his, wherever they are in the organization. However, when problems arise that are beyond his responsibility or that of his contact, the decision must be referred to higher levels of management, as provided for in the organization plan.

(4) Requests for service also involve direct contacts across organizational lines. Department procedures should authorize direct requests for services of other functional or staff sections. Major or unusual requests will often require referral to higher management for approval.

All of these contacts within the organization are subject to an important qualification. Anyone's superior must be kept informed on significant matters that arise out of his contacts with others. The superior has overall responsibility for all operations under him, so his subordinates should be especially careful to inform him on these points:

(1) Any matters where significant disagreement has arisen or is likely to arise within the organization.

(2) Matters involving significant deviations from established policies or plans.

(3) Significant conclusions reached in any conversations he may have with his superiors, before he takes action.

In summary, then, an individual is responsible for maintaining the communication he needs to do his job well. The lines of authority and responsibility come into focus through the communication web when someone runs into something beyond his authority and for something on which the responsible person should be informed. The organization chart shows who is responsible and who has the authority.

7. PLAN AND CARRY OUT A TRAINING AND INDOCTRINATION PROGRAM WITHIN THE DEPARTMENT

This report has repeatedly emphasized the importance of winning the full, united support of all members of the department in carrying out a balanced fish and game conservation program. The responsibility for developing this motivation lies with each supervisor. At the same time, it is the responsibility of each member of the department to work toward gaining a good, sound understanding of the department's objectives, policies, and programs.

(1) *Plan a Training and Indoctrination Program Within the Framework of the In-Service Training Program*

The first step should be to plan a detailed, specific training program by which the present specialists will be given full opportunity to develop as generalists capable of fulfilling the responsibilities of the new form of organization.

This training program should be organized on a basis whereby all functions should attend training meetings together, rather than separately. This in itself will help to build the co-operative spirit and understanding which is so necessary.

The department's objectives, policies, plans and programs should be covered in such a way that all of the significant reasons and considerations leading to the development of the plans and programs are presented in understandable form. Discussions should be encouraged in order to secure the participation of all.

(2) *Plan a Management Development Program for Potential and Actual Supervisors and Managers*

Equally important is the planning of a program to develop potential and actual supervisors and managers. The recommended position of district manager will carry with it heavier and broader management responsibilities than the candidates for these positions will likely have carried. It is important that those selected to be district managers should be well qualified, as this is a key position in the organization structure.

Such a development program should also emphasize the duties and responsibilities of staff positions, both at the departmental and regional levels. As has been noted elsewhere, the staff-line relationships have not been clearly understood, resulting in confusion and lack of effectiveness. The proposed form of organization presents the opportunity for greater utilization of the staff concept, for which training should be developed.

(3) *Include Material on Organizational Channels of Communication in the Training Program*

As discussed in Section 7, the red tape of unnecessary steps in communication between organizational groups should be eliminated.

(4) *Carry Out Such Training Programs on a Timetable Co-ordinated to Meet the Needs of the Proposed Form of Organization*

The planning of these development programs should include the establishment of a timetable which is geared to the desired pace of transition to the new organization structure. The programs should then be carried out in accordance with such a schedule.

(5) *Continue to Emphasize the Importance of Two-Way Communications Within the Department*

It should be continually stressed that motivation is a continuing need. It is essential that the channels of communication be kept open, both downward and upward. Proper motivation is built upon sound understanding of the department's programs and policies. Care should be taken that the initial momentum built up should not be allowed to dissipate itself.

(6) *Continue to Emphasize the Full Range of Responsibilities Placed Upon All Department Personnel*

Coupled with the need to maintain adequate communication is the need to emphasize the broad responsibilities of all department personnel to carry out fish and game policies and programs. To a very large degree, the general public's acceptance of department programs is dependent upon the ability of individual department personnel to explain and carry out these programs. Each member of the department should recognize his responsibilities in the public information and education program.

8. UTILIZE STAFF MEETINGS TO DEVELOP BETTER TEAMWORK

Staff meetings are for the purpose of giving direction and co-ordination to the department's business. Staff meetings can be very useful to solve current operational problems; to aid in setting standards for the conduct of the work; to aid in planning future programs and budgets; to re-examine expenditures; and to determine seasonal workloads and to shift manpower accordingly. Staff meetings at headquarters and on a regional level are one facet of good administration.

(1) *Adopt a Standard Policy Requiring Regular Staff Meetings*

There is no evidence of a directive for the holding of staff meetings, although the headquarters office holds staff meetings with fair consistency. In some regions they are nonexistent, and where held at all are infrequent with little thought given to their desirability and usefulness.

As one means of overcoming an increasing confusion and lack of unanimity of policies and procedures and of correcting an increasing tendency to create five little conservation departments, it is highly essential that a standard policy for both headquarters and regional staff meetings be established. Staff meetings should be required at least twice a month.

The fact that after five years no such policy has been established points up a flaw in administration; and the fact that regional managers within their own jurisdiction have not made staff meetings their own policy indicates the need for greater administrative guidance at the regional level.

(2) *Include in Staff Meetings All People Who Can Contribute to Subjects Under Discussion*

All headquarters staff meetings should include the director and the deputy director when possible, all heads of divisions and branch chiefs, and such other personnel as can contribute to subjects under discussion. The director or deputy director should act as chairman.

At the regional level, staff meetings should include the regional manager as chairman, his supervisors, and such personnel as can contribute to the discussion.

At headquarters and in the regions, bringing in others below the staff and supervisory level is educational to all concerned. Such a procedure keeps both the headquarters and regional offices in closer touch with the field and its functions and educates the fieldman in staff work and in how problems are debated and solved. It prepares them for promotion.

If the staff work is of high caliber, fieldmen attending will spread the information that field problems receive serious consideration. Staff meetings should deal with vital problems and not theory, and this in itself is highly valuable inservice training.

(3) *Make Adequate Preparation for Staff Meetings*

Staff meetings properly organized should have an agenda as an effective working tool. The agenda should be composed of the collective suggestions of the group. An agenda helps bring together the different philosophies, ideas and methods of approach to solve problems and to plan.

People participating in staff meetings should be apprised of the subjects for discussion and the issues and should come to the meeting prepared to discuss them concisely and with clarity. This prepares the personnel to appear before the commission and the public. It is a form of inservice and cross-functional training far more realistic than the present training program. Cross-functional training in the regions is

essential to break down the old line function traditions which defeat any attempts at departmental unity. The place to begin cross-functional training is with the supervisors through the staff meeting procedure.

(4) *Conduct Staff Meetings in an Effective Manner*

The chairman of a staff meeting should sit in a judicial capacity, listening to all evidence and being certain that all evidence is presented, however controversial, on any subject under discussion. The chairman should then make the decisions, not leaving it to majority vote.

Current programs and problems should be discussed and, whenever possible, decisions made immediately and lines of procedures developed.

Time should be spent on planning for the future, such as budgets, peak workloads, utilization of manpower, and functions that affect each division or operation. All present at staff meetings should be encouraged to take an interest in and enter into discussion of all subjects.

After each staff meeting, written directives should be issued as to the decisions so that no misunderstandings can arise. Not only should decisions be made clear, but a directive should be issued as to who will carry them out.

A concise report of regional staff meetings—the subjects discussed, the decisions reached, the directives issued—should go to the deputy director and then to the director.

Arguments have been raised that staff meetings are time-consuming; however, staff meetings following this formula are far more profitable than the many and numerous committee meetings now held where few decisions are reached and no directives issued. Also, a brief report of problems solved and action taken would do away with many of the present long-winded reports.

9. ISSUE DEPARTMENT DIRECTIVES IN CLEAR, WELL-ORGANIZED MANNER

One other important tool by which to build teamwork and unity of effort within the department is the issuing of written department directives in a clear, well-organized form. This will best insure that all department personnel, the commission and other interested people will have the same statement of objectives, policies, plans, and programs from which to take action.

Objectives, policies, and permanent procedures should be incorporated into a well-organized department manual for the information and guidance of all concerned. The department manual also is a very necessary form of management control, in that it sets forth the standards of performance to be expected from all department personnel. The department manual is, therefore, both an important tool of communication and of control. The end objective is the creating of greater teamwork within the department. Chapter XIV, Management Controls, further discusses department manuals.

There is also a need for the department to issue instructions which are intended to cover one-time situations, or problems of a localized nature. It is desirable to have a system of organized written communication for such purposes which would not require distribution to all holders of department manuals. This system of administrative directives should be organized with a comprehensive file number system and with a regular format. As is true of department manuals, administrative directives are a valuable tool of creating unity of action and teamwork.

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In the final analysis, the effectiveness of the Department of Fish and Game is largely determined by the combined effectiveness of the individual members of the department. The importance of stimulating and motivating each individual to work in teamwork with the other members of the department and to realize his fullest potential is self-evident.

The proposed form of organization provides the best possible structure through which each individual can most effectively contribute to the accomplishment of the department's objectives.

The maximum effectiveness of all members of the department can be achieved through the knowledge that all department personnel have basic common objectives. Full realization of his potential rests with each individual and with his supervisor. Motivation of his people remains one of the basic responsibilities of each supervisor in the Department of Fish and Game.

CHAPTER XIV

MANAGEMENT CONTROLS

Preceding chapters in this report have discussed the planning, organizing and motivating aspects of the total managerial responsibility of the Director of the Department of Fish and Game. Another responsibility of the director is to control department operations to insure that department policies and programs are being carried out in the manner intended. Since personnel are widely dispersed throughout the State, management control becomes, therefore, more a matter of management technique and less a matter of personal control through immediate supervision.

This chapter presents an analysis of present management controls and develops significant improvements in management controls whereby the director may better insure that department operations are carrying out, on a uniform basis throughout the State, the approved policies, plans and programs.

1. PRESENT MANAGEMENT CONTROLS ARE LARGELY IN AREA OF BUDGETARY CONTROL

One of the primary objectives of the survey of the administration of the department was to ascertain the nature and extent of management controls being utilized by the department. During the course of the survey it became clearly evident that the primary means of control was the annual budget. Other forms of control are much less highly developed.

(1) *Department of Fish and Game Follows Prescribed State Procedures of Fiscal Control*

The accounting system employed by the Department of Fish and Game is primarily a budgetary control system. Accounts are maintained in terms of the organizational units which expend the funds and in terms of the types of expenditures made. In this way, it is readily known, for example, that the game management function has expended "X" dollars in Region I, and that of this total, certain amounts were spent on salaries, on traveling, utilities, communications, tractor operations, and other specific classes of expenses.

The process of obtaining an approved budget is based upon statewide procedure whereby budget requests originate in the individual organizational units in the field. Any increases in positions or classification upgrading are closely controlled. Any proposed increase in operating expenses and all requests for equipment must be fully supported and justified.

Approved budget requests become the basis for the department's portion of the Governor's Budget presentation to the legislature. In this way increases in authorized budget are carefully controlled. Actual encumbrances are charged against the budget. Consequently, budgetary accounting is a very important management tool for controlling actual expenditures and encumbrances of funds. The Department of Fish and Game has made effective use of budgetary accounting.

(2) *Control of Wildlife Programs and of Subprograms Within the Major Wildlife Programs Exists on an Irregular Pattern*

There is little in the way of effective, co-ordinated control of wildlife programs by the director, except as control is exerted through budgetary control. However, as has been stated above, budgetary control is in terms of functions and classes of expense, rather than in terms of functions and classes of expense, rather than in terms of specific wildlife programs and subprograms. For example, there are no current reports showing the total amount of department effort being spent on the deer management program, or on the "put-and-take" pheasant program, to cite two examples. Within the limitations of the budget, it is possible to vary the amount of emphasis on wildlife programs and subprograms, region by region. There are no effective measurements of effort by program and, thus, no effective means by which the director can insure that the proper degrees of emphasis are being given.

Closely related to this absence of control reporting is the absence of effective control through personal inspection by headquarters staff in the field. Since the setting up of the regional managers in 1953, there has been no systematic and effective inspection of field activities by headquarters staff personnel. By the closing months of this survey, the department had taken the initial steps to inaugurate a system of field inspections. However, little in the way of standards of performance has been reduced to manualized form. As a result, much remains to be done to make this form of control effective.

(3) *Net Result Is That Each Region Has Found It Necessary to Proceed on Its Own Largely Without Benefit of Overall Control From Headquarters*

Chapter XII, Departmental Organization, pointed out the fact that many uncertainties have clouded the responsibilities of the branch chiefs at headquarters and the regional managers, and the working relationships between them. This condition, coupled with

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the lack of a formal system of management controls, created the vacuum in which the regional managers found themselves at the setting up of the regions.

The net result is that each regional manager proceeded to develop his own policies and programs, without too much regard to the policies and programs being evolved in the other regions. Certainly, broad adherence was given to known department policies and programs. However, the situation has been that, to a considerable extent, each region has operated in its own way, as a separate Department of Fish and Game.

The director has consequently lacked the full set of management control tools which would enable him to exercise the necessary control over the department. The highly developed budgetary control has been effective in its own way, but this has provided only one aspect of a comprehensive set of management controls.

2. IN ORDER BOTH TO GAIN AN INSIGHT INTO PRESENT WILDLIFE PROGRAMS AND TO EVALUATE FEASIBILITY OF MANAGEMENT COST CONTROLS, DEPARTMENT COSTS AND REVENUES WERE ANALYZED

Early in the survey it was recognized that a well-rounded system of management controls did not exist. Although the department had made an analysis of the 1954-55 expenditures in an attempt to report the amount of effort going into the various wildlife programs, such information was incomplete and also dated.

Consequently, it was determined to be essential to make an analysis of the department's 1957-58 revenues and expenditures, both to provide a basis for evaluation of department programs and to test the feasibility of developing a system of management controls.

(1) *The Analyses of 1957-58 Expenditures and Revenues Were Made on the Basis of Supplemental Information Supplied by the Department Rather Than From Existing Accounting and Control Data*

An examination of existing accounting data revealed that it was necessary to secure information which was not available in the accounting records. Expenditures were recorded mainly in terms of budgetary items, and consequently costs were not readily identifiable to wildlife programs or to subfunctions within a major function.

It was determined, therefore, that supplemental data would be necessary. The manner of obtaining this information is described in later sections of this chapter.

(2) *The Supplemental Data Were Necessarily Obtained as Estimates Rather Than as Exact Statements of Fact*

Because of the need to examine expenditures of time and money relating to the Fiscal Year 1957-58, it was necessary to obtain data on an estimated, rather than on an actual basis. The fiscal year was largely past, and actual records were not available. However, a trial run was made on obtaining the desired information on an estimated basis. This pilot run proved to be a useful and feasible plan which was applied to all expenditures and revenues.

In this connection, it is important to recognize that because the basic data are based on a system of estimated allocations, it is not possible to assign an unwarranted exactness to the results which were obtained. Nevertheless, the general conclusions which were drawn are valid and useful to a very considerable degree.

(3) *An Analysis of Expenditures and Revenues in Terms of Major Wildlife Programs Permits Several Important Conclusions to Be Drawn*

Before entering into a detailed presentation of the analysis of the 1957-58 expenditures and revenues, it is helpful to recognize the several benefits which are possible:

1. It would provide the basis for a clearer understanding in the minds of the Legislature, the wildlife sportsmen, the commercial fishing interests and the general public of the programs and activities of the department.
2. It would provide quantitative measurement of the various fish and game programs and activities to the end that those responsible for formulating and administering the department's programs would be better able to evaluate results in comparison to expenditures, and so to evaluate the proper emphasis to be given to the various wildlife programs and activities.
3. It would provide a basis for comparing major program costs with corresponding revenues, and thereby increase the factual knowledge upon which to decide the proper levels of license fees and expenditures with respect to major programs.

This survey carefully reviewed and appraised these benefits in detail. Early in the conduct of the work it was determined that a broad analysis of the department's 1957-58 expenditures and revenues would be highly desirable both from the viewpoint of testing the feasibility of improving management controls, and from the viewpoint of gaining an overall knowledge of the relative degrees of emphasis being currently given to major wildlife programs. The manner of conducting this analysis and the conclusions drawn

therefrom are discussed in detail in the following section of this chapter.

3. ANALYSIS OF 1957-58 EXPENDITURES PROVIDES MEANINGFUL MANAGEMENT CONTROL INFORMATION

The need to gain an overall grasp and understanding of the size and scope of the department's 1957-58 programs led to the conclusion that an analysis of the total budget in terms of wildlife programs would be highly desirable. How much of the department's effort was going into the big game program? How much was being spent on preserving and increasing the salmon resource? These and related questions could only be answered by an accounting analysis which identified the efforts of the department with respect to the major species of wildlife.

(1) *The Analysis Was Made in Terms of Major Wildlife Programs and Also in Terms of the Primary Functions of the Department*

In determining a workable basis by which to obtain this information, it was observed that the department had made a functional analysis of the 1954-55 expenditures along somewhat similar lines. However, the 1954-55 analysis was directed primarily at determining the effort going into functions, rather than the effort going into end-product programs. This 1954-55 analysis was a significant step in the direction of cost accounting and did provide management information not theretofore known.

From the broad management point of view, however, an analysis in terms of major wildlife programs would be more meaningful. Our analysis of 1957-58 expenditures proceeded, therefore, to identify the total department costs in terms of the following programs:

GAME MANAGEMENT PROGRAMS

1. Big game
2. Waterfowl
3. Wild pheasant
4. Raised pheasant
5. Other upland game

INLAND FISH PROGRAMS

1. Wild trout (including fingerling plants)
2. Raised trout
3. Warm-water fish
4. Steelhead
5. Salmon, in inland waters
6. Striped bass

MARINE FISH PROGRAMS

1. Salmon, in ocean waters
2. Tuna
3. Bottom fish
4. Shellfish
5. Pelagic fish
6. Other sports fish

The selection of these wildlife programs was made so as to result in programs easily identified in the minds of the sporting public, as well as being meaningful ones in terms of the department's activities.

It was also determined that some insight into the functional composition of the department's 1957-58 expenditures would be informative. Although a more detailed analysis would have been desirable, it was felt that practical considerations should limit this portion of the analysis to the following broad categories:

1. Management and operations—all activities not specifically included in the other categories.
2. Research—both department and federal aid projects, at 100 percent of cost, which are research in nature.
3. Law enforcement—direct law enforcement activities only.
4. Conservation education—all general public information activities, including attendance at sportsmen's meetings and time devoted to hunter safety program.
5. Administration—headquarters and regional administration.
6. Miscellaneous—principally capital outlay expenditures, as well as nonrecurring special items.

(2) *Manner of Proceeding With the Analysis Was Largely Determined by the Nature of the Expenditures*

The manner of proceeding with the analysis was largely determined by the fact that costs as recorded by the department's budgetary accounting system were generally not identified to wildlife programs. A review of expenditures revealed that salaries and wages accounted for approximately 60 percent of the regular support budget, and that a major portion of the operating expenses were those types of expenses which generally are closely related to personnel, such as automobile operations and travel. Perhaps one-third of the operating expenses were, by their nature, identifiable to a specific program or programs. Other significant items of total expenditure, such as federal aid projects and major capital outlay, were also identifiable to particular programs.

These facts concerning the nature and relationships of expenditures provided the following bases for making the analysis of the department's 1957-58 expenditures:

1. Salaries and wages of the game management, inland fisheries, and wildlife protection personnel were distributed to the various wildlife programs on the basis of estimated time allocations obtained from the various functional supervisors

throughout the departmental headquarters and the regions.

2. General and administrative salaries of departmental headquarters and regional headquarters personnel were allocated to the various wildlife programs on the basis of wage and salary allocations resulting from step 1 above, which were appropriate to the areas of activity involved.
3. Specific operating expenses and other expenditures and reimbursements were identified to particular wildlife programs to the extent possible, on the basis of analysis.
4. General operating expenses not identifiable to specific wildlife programs were allocated to programs on the basis of the relative distribution of salaries and wages of the particular organizational unit involved determined by steps 1 and 2.
5. Allocations of regional expenditures by primary functions were made on the basis of estimates provided by the functional supervisors in each of the regions.
6. All departmental headquarters expenditures were distributed to primary functions on the basis of the nature of such expenditures.

(3) *Results Obtained by These Methods Should Necessarily Be Viewed in Their Proper Perspective*

The accuracy of the resulting analysis is not absolute. However, the results are generally reliable and provide a considerable insight into the overall direction of the department's operations. The experience and knowledge gained from this analysis also permit certain specific conclusions and recommendations concerning the feasibility and implementation of a continuing cost accounting program for the department.

The methods of allocation used in this analysis were somewhat similar to the methods employed by the department in its analysis of 1954-55 expenditures. As previously stated, however, the 1954-55 analysis was not directed toward the same end objectives. It is also pertinent to point out that estimates of time allocations were obtained directly from the various functional supervisors throughout the department, so as to obtain objective, independent estimates.

(4) *The Results of the Analysis of 1957-58 Expenditures Are Shown in Exhibit XXXIII*

Exhibit XXXIII, which follows, presents the results of the analysis of 1957-58 expenditures. As is indicated by the caption, this exhibit reflects the 1957-58 expenditures by wildlife program, primary function and organizational unit. It should be noted that this analysis was conducted and completed before the actual, final figures were known for the year. However, total actual expenditures (all funds) for 1957-58 totaled $10,565,588, as compared to an estimated $10,632,893. The difference of $67,305 is not significant to the conclusions reached.

(5) *Significant Conclusions Can Be Drawn From the Analysis*

The following significant conclusions can be drawn from the analysis of 1957-58 expenditures:

FROM THE STANDPOINT OF WILDLIFE PROGRAMS

- — Game and inland fish programs each account for approximately 40 percent of the total expenditures of the department.
- — Marine fish programs approximate 20 percent of the total expenditures.

FROM THE VIEWPOINT OF TYPES OF DEPARTMENT FUNCTIONS

- — Management and operations consume approximately 43 percent of the total budget.
- — Law enforcement consumes approximately 19 percent, and administration and research each utilize approximately 14 percent of the budget.
- — Conservation education utilizes approximately five percent of all expenditures, and miscellaneous expenditures (largely major capital outlays) also utilize approximately five percent of the total expenditures.

These facts permit an understanding of the direction of departmental emphasis, which is not possible without such an analysis. As will be indicated in later sections of this chapter, this analysis is not considered to be a completely developed tool of management control. However, this analysis does contribute materially to the accomplishment of the objectives outlined in the aforementioned Section 2. (3).

4. ANALYSIS OF 1957-58 REVENUES PROVIDES ADDITIONAL MEANINGFUL MANAGEMENT CONTROL INFORMATION

Analysis of revenues provides another source of significant management control information. Such an analysis provides greater insight into the source of the department's income. Also, such an analysis, made in terms of the same major wildlife programs as were used in the analysis of expenditures, provides the basis for a comparison between revenues and expenditures, by wildlife program.

(1) *Analysis of 1957-58 Revenues Was Made in Terms of Same Wildlife Programs*

Accordingly, 1957-58 revenues were distributed to the same major wildlife programs as were used in the analysis of expenditures.

(2) *It Was Necessary to Find Reasonable Bases for Allocating Revenues*

Because basic fishing and hunting licenses are required for pursuit of all respective fish and game, it was necessary to develop reasonable and practical methods to allocate such basic revenues to specific fish and game programs.

As was true with respect to expenditures, available data were limited. However, estimated revenues were allocated to major wildlife programs on the basis of available data and certain reasonable assumptions. The following constitute the general basis upon which the allocations were made:

1. Those license revenues and taxes which are identifiable to specific wildlife programs were so allocated. Examples of this category of revenues are deer and bear tag revenues, pheasant tags, salmon tax and privilege taxes on pelagic fish.
2. License revenues relating to broad classes of programs were allocated on the most accurate basis available. The bulk of the license revenues fall into general categories such as angling and hunting licenses fees. The most logical basis for allocating such revenues was determined to be on the basis of sportsman effort devoted to the various species. The only available measurement of relative sportsman effort was time data obtained from the department's questionnaire surveys of hunters and anglers. On this basis, allocations were made to the various major wildlife programs.
3. The divisions between revenue attributable to "put-and-take" and natural harvesting of trout and pheasant were made on the relative quantities of the catch or bag.
4. Certain other revenues related to a large number of programs and were allocated on a basis proportionate to the revenues allocated to the various programs. Such revenues included confiscated fish and property, court fines and interest on investments.

The notes accompanying Exhibit XXXIV, itemize in detail the specific basis of allocation of each item of 1957-58 revenue.

(3) *Undue Exactness Should Not Be Attributed to the Analysis of 1957-58 Revenues*

Because of the scarcity of current data regarding hunting and fishing effort, and because of the resultant necessity for some assumptions, undue accuracy should not be attributed to the analysis of 1957-58 revenues. The results obtained should be interpreted in terms at least as general as those used in evaluating the analysis of 1957-58 expenditures. However, the results obtained do have broad value and validity in evaluating programs and their related revenues. Such an analysis also has genuine merit in illustrating this type of approach to management controls.

(4) *The Results of the Analysis of 1957-58 Revenues Are Shown in Exhibit XXXIV the Analysis*

Exhibit XXXIV presents the results of the analysis of 1957-58 revenues. As indicated by the caption, this exhibit reflects the 1957-58 revenues by source of revenue to the major wildlife programs. It should be noted that this analysis was conducted and completed before the actual final figures were known for the year. However, total actual revenues for 1957-58 totalled $9,839,840, as compared to an estimated $9,861,228. The difference of $21,388 is not significant to the conclusions reached.

(5) *Significant Conclusions Can Be Drawn From the Analysis*

The following significant conclusions can be drawn from the analysis of 1957-58 revenues:

FROM THE STANDPOINT OF GENERAL WILDLIFE PROGRAMS

— Game management and inland fish activities each contributed approximately 40 percent of total revenues, and marine fish activities contributed approximately 20 percent in 1957-58.

FROM THE VIEWPOINT OF SPECIFIC WILDLIFE PROGRAMS

— The combined wild and raised trout programs contributed almost 25 percent of the department's total revenues in 1957-58, of which 17 percent was contributed by the wild trout program and eight percent by the raised trout program.

— The big game program contributed approximately 16 percent of the department's total revenues in 1957-58.

— The waterfoul program contributed approximately eight percent of the department's 1957-58 revenues.

— All other programs contributed approximately 51 percent of the department's 1957-58 revenues.

This analysis provides a new and significant approach to another aspect of management control. By such a study, greater understanding can be gained as to the sources of financial support for the department's programs. Through this greater knowledge, it is possible for management to make more informed decisions as to future wildlife programs.

5. COMPARISON OF EXPENDITURES AND REVENUES BY MAJOR WILDLIFE PROGRAMS PROVIDES ADDITIONAL MEANINGFUL MANAGEMENT CONTROL INFORMATION

(1) *These Analyses Provide an Excellent Basis for Comparing Expenditures to Revenues*

The comparison of 1957-58 expenditures and revenues by major wildlife programs provides an excellent basis for developing further meaningful management control information. Certainly the relationship of expenditures to revenue with respect to specific wildlife programs provides a more informative basis for evaluation of programs.

Another use of such a comparison is the evaluation of license fee levels in relation to the programs being maintained. It is logical that the extent each program is self-supporting should be one of the important factors in evaluating the proper license levels.

(2) *Comparison of Expenditures and Revenues Is Presented in Exhibit XXXV*

Exhibit XXXV, which follows, presents the comparison of estimated expenditures and revenues for 1957-58. The qualifications presented earlier apply, of course, to this comparison.

(3) *Significant Conclusions Can Be Drawn From This Comparison*

Before enumerating the significant conclusions, it is important to call attention to the fact that these analyses relate to 1957-58 actual conditions. It should be remembered that certain license fees were in process of being raised and that the full effect of such an increase was not reflected in 1957-58 revenue.

Angling stamps were effective January 1, 1958, contributing $1,081,668 in the second half of the fiscal year. Increases in the basic hunting license and deer tag fees were approved but not effective until July 1, 1958, thereby not being reflected in Fiscal 1957-58. These facts should be kept in mind when evaluating the conclusions.

With this in mind, the following general conclusions are valid and significant.

1. In general each of the three broad classes of wildlife programs are self-supporting. Although game program expenditures exceeded related revenues by $365,000 in 1957-58, it is expected that the increased hunting fees effective July 1, 1958, will more than offset this amount.

   Inland fish revenues exceeded costs of inland fish programs by approximately $200,000, which would have been greater had the angling stamp revenue been in effect for the full fiscal year.

   Marine fish revenues lagged approximately $600,000 behind related program costs. However, it is to be pointed out that approximately $297,000 in major capital outlays were allocated to marine fish programs in the 1957-58 expenditures. These represented the purchase of a replacement for the patrol boat "Albacore" and a pro rata share of a new department airplane. Although major capital outlays do reoccur from time to time, the marine fish programs experienced unusually large expenditures for capital outlays in 1957-58.

2. In general, the two programs in which both wild and artificially propagated wildlife are involved are self-supporting in total.

   Approximately $875,000 was expended on the combined pheasant program in 1957-58, and related revenues approximated $710,000. However, the increased basic hunting license fees should be expected to offset perhaps half of this differential.

   The combined trout revenues contributed approximately $2,400,000 as compared to combined program costs of approximately $2,600,000. The full effect of angling stamps may be expected to offset this differential.

3. It is clearly evident that although the trout and pheasant programs are each substantially self-supporting in total, in both cases the artificial programs are being very significantly supported by the wild species programs.

   The "put-and-take" pheasant program contributes only approximately $100,000 in revenues, whereas the program costs approach $600,000.

   The catchable trout program contributes approximately $725,000 in revenues, whereas the program costs are almost $2,000,000.

4. Certain wildlife species generate revenues considerably in excess of their related expenditures because the species are popular but require relatively little in the way of management at this time. Striped bass, warm water fish and bottom fish are in this category.

5. On the other hand, other species are presently generating less revenue than the costs of programs in 1957-58. Steelhead, salmon, shellfish, and pelagic fish are in this category.

(4) *Time Spans of Several Years May Be Appropriate When Evaluating Program Costs Against Program Revenues*

Great care should be taken not to base evaluations of programs revenues and costs on the basis of a single year's experience. It should be continually kept in mind that very considerable efforts may be required to determine the causes of declines in natural resources and that such effort is not necessarily related to current revenues attributed to that resource. This

EXHIBIT XXXIII

State of California, Department of Fish and Game

ANALYSIS OF ESTIMATED 1957-58 EXPENDITURES BY WILDLIFE PROGRAM, PRIMARY FUNCTION, AND ORGANIZATIONAL UNIT

Primary function / Organizational unit	Game programs: Deer	Waterfowl	Wild pheasant	Upland game	Other upland game	Total	Inland fish programs: Wild trout	Planted trout	Warm water fish	Steelhead	Salmon	Striped bass	Total	Marine fish programs: Salmon	Tuna	Baitboat fish	Shellfish	Pelagic	Other sports fish	Total	All programs total
Management and Operations																					
Region I	103,070	$25,075	$13,912	$17,579	$35,325	$194,959	$34,996	$372,116	$1,411	$72,205	$89,777	$14	$572,519	$2,752	$42	$127	$894	$13	$99	$3,957	$771,128
Region II	77,585	105,694	51,101	23,642	30,460	288,482	40,181	52,254	61,899	44,561	(121)	10,289	211,063	744	1,270	196	294	294	98	2,896	572,441
Region III	69,098	10,995	16,429	87,962	18,462	197,186	19,964	46,511	37,726	45,877	15,883	36,039	182,000	176	---	176	266	---	267	885	380,315
Region IV	91,239	54,395	20,342	37,842	44,747	231,675	73,586	327,490	20,213	1,248	15,774	1,126	439,437	70	---	70	70	---	---	210	671,262
Region V	63,550	61,209	9,052	104,799	40,625	200,235	129,030	344,547	45,846	1,453	1,256	16	732,190	124	5,557	6,899	30,683	12,005	4,387	40,146	1,013,171
In co-operation with Federal Government	214,860	600,300	14,000	9,200	123,800	962,400	45,000	27,500	24,300	31,800	14,700	5,400	148,500	4,000	---	---	---	..	35,000	40,500	1,151,400
Total	592,702	$860,171	$119,496	$281,018	$292,417	$2,225,744	$342,757	$1,200,458	$195,395	$196,944	$137,271	$52,894	$2,205,709	$8,466	$6,869	$7,452	$32,207	$12,342	$41,251	$58,594	$4,500,047
Law Enforcement																					
Region I	101,382	$21,977	$14,281	$2,698	$16,075	$166,913	$24,393	$26,896	$11,964	$34,196	$35,764	$514	$133,057	$6,755	$402	$2,526	$11,016	$941	$2,199	$23,089	$327,979
Region II	55,430	46,265	31,567	22,599	9,944	169,663	21,151	14,100	10,685	25,068	7,050	32,570	119,464	14,000	536	51,295	80,442	14,603	9,259	201,774	490,841
Region III	76,003	15,026	6,060	2,030	38,946	175,441	10,168	27,792	26,269	---	7,444	8,209	79,911	496	---	496	496	---	---	1,488	256,840
Region IV	65,855	37,768	15,057	17,216	74,461	226,152	13,661	64,056	54,899	1,969	665	107	135,357	826	37,018	45,929	71,221	80,037	32,552	267,645	629,154
Region V	82,923	35,108	6,436	28,177	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total	382,693	$170,148	$74,048	$68,319	$161,338	$857,646	$381,127	$131,422	$154,670	$73,708	$62,561	$65,366	$811,946	$57,560	$42,229	$101,716	$164,330	$96,436	$44,225	$506,586	$1,976,578
Conservation Education																					
Region I	$13,160	$3,741	$1,806	$1,126	$3,076	$22,909	$2,009	$9,243	$1,005	$3,970	$4,507	$25	$21,358	$813	$74	$223	$898	$74	$173	$2,255	$46,522
Region II	6,179	6,241	3,781	4,117	2,253	22,791	6,477	7,233	9,673	6,133	486	2,410	32,412	131	318	48	72	72	24	665	55,868
Region III	12,310	2,838	1,116	2,383	1,613	8,060	1,880	7,563	1,329	25	563	224	11,584	18	---	18	18	---	54	19,698	71,127
Region IV	2,824	1,790	717	1,116	9,458	36,046	12,954	59,397	9,134	312	181	11	81,989	93	3,766	4,593	7,122	6,001	3,253	26,760	144,801
Region V	11,026	6,911	1,094	7,567	10,366	62,557	10,543	29,346	9,665	7,356	8,435	2,987	68,532	4,569	6,253	5,500	11,071	12,476	3,866	44,035	175,724
Headquarters	23,371	11,949	5,623	11,246	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total	68,870	$32,970	$14,087	$28,045	$26,556	$172,323	$37,633	$116,148	$34,273	$22,979	$15,731	$10,887	$237,671	$12,050	$11,027	$18,106	$30,687	$22,713	$8,658	$109,241	$513,740
Administration																					
Region I	113,896	$5,028	$2,691	$1,473	$4,454	$32,852	$3,581	$22,887	$1,473	$10,403	$12,743	---	$50,887	$3,214	$87	$260	$1,127	$87	$174	$2,949	$86,688
Region II	11,494	10,721	7,462	9,263	4,329	43,329	7,205	6,691	9,521	6,004	8,294	3,260	40,975	214	426	86	129	129	42	1,028	85,772
Region III	21,975	3,690	2,306	11,071	4,124	42,656	4,450	5,970	5,427	5,466	2,822	7,598	34,733	7,164	109	6,513	18,784	2,062	1,520	31,152	108,541
Region IV	13,918	9,778	3,694	6,214	5,677	41,341	8,203	23,697	5,396	166	2,735	746	40,943	---	---	---	83	---	---	83	82,367
Region V	17,407	12,117	2,219	13,141	15,186	60,072	14,506	45,905	12,456	311	171	---	73,352	---	5,120	6,485	9,899	11,264	4,438	37,206	170,660
Headquarters	122,071	61,147	31,793	59,935	57,156	332,102	69,872	171,098	51,975	41,902	49,172	17,909	408,022	26,681	39,391	33,173	61,695	73,659	22,149	257,788	999,112
Commission	5,506	2,561	1,306	2,636	2,485	14,979	2,524	7,027	2,314	1,509	2,029	715	16,109	3,094	1,641	1,988	2,650	2,988	926	10,687	42,075
Total	310,657	$105,312	$51,811	$103,733	$97,411	$568,631	$110,141	$286,276	$90,554	$71,001	$77,897	$30,232	$666,181	$36,367	$46,776	$47,905	$89,367	$90,189	$30,299	$340,893	$1,575,705
Marine function																					
Research																					
Marine Resources—Terminal Island														$77,209	$172,632	$85,015	$159,222	$267,534	$80,058	$861,669	$861,669
Headquarters																					
In co-operation with Federal Government	99,500	$65,500	$27,700	$13,700	$55,200	$261,400	$15,500	$28,700	$19,019	$43,100	$11,500	$16,300	$134,019	1,200					41,200	42,400	19,019
Marine Research Committee									3,000				119,000					123,250		123,250	284,650
Pacific Marine Fisheries Commission														1,593	3,562	1,754	3,047	6,050	1,594	17,500	123,250
Kelp Bed Investigation																		10,000	40,000	50,000	17,500
Total	99,500	$65,500	$27,700	$13,700	$55,200	$261,400	$15,500	$28,700	$22,019	$43,100	$11,500	$16,300	$134,019	$80,001	$176,194	$86,769	$162,269	$436,834	$162,852	$1,105,219	50,000
Miscellaneous																					$1,507,665
Capital Outlay	11,972	$29,264	$1,463	$1,545	$2,170	$51,151	$33,324	$45,077	$9,292	$2,474	$1,715	$1,462	$91,347	$1,219	$92,567	$1,529	$1,536	$197,398	$9,285	$305,774	$448,275
Legislature—Joint Services	1,731	1,397	458	1,315	1,272	6,173	1,283	3,492	1,130	434	966	319	7,824	294	80	473	1,295	1,459	152	5,219	20,217
Claims—State Board of Control	700	300	---	---	---	930	---	---	---	---	---	---	---	---	---	---	---	---	100	100	1,031
Total	14,403	$31,961	$1,921	$2,860	$3,442	$58,186	$34,557	$48,569	$10,422	$2,777	$2,681	$1,781	$99,767	$1,513	$92,808	$2,507	$4,831	$198,857	$10,135	$311,394	$469,523
Grand Total	$1,468,825	$1,267,662	$529,203	$587,772	$629,724	$4,483,186	$951,713	$1,992,133	$502,233	$511,509	$310,661	$177,473	$4,045,217	$196,157	$376,903	$264,462	$483,991	$457,371	$297,513	$2,155,927	$10,682,330

EXHIBIT XXXIV

State of California, Department of Fish and Game

ALLOCATION OF ESTIMATED 1957-1958 REVENUES TO MAJOR WILDLIFE PROGRAMS

	Game management programs					*Inland fish programs*						*Marine fish programs*							
	Big game	*Waterfowl*	*Wild pheasant*	*Raised pheasant*	*Other upland game*	*Wild trout*	*Catchable trout*	*Warm water fish*	*Steelhead*	*Salmon*	*Striped bass*	*Salmon*	*Tuna*	*Bottom fish*	*Shellfish*	*Pelagic fish*	*Sports fish*	*Total*	*Remarks*
Licenses, permits, and tags																			
Angling	...	...	...	...	...	$1,029,150	$441,085	$795,508	$114,906	$142,521	$433,112	$40,103	$22,916	$716,120	$17,187	...	$349,461	$4,092,116	See accompanying Note A.
Angling stamps	...		...	...	...	594,126	254,620	125,523	18,131	20,921	68,341		...	...	...			1,081,662	See accompanying Note B.
Fish tags and permits	...	...	...	...	...	25,903	...	...	...	...	...	...	...	...	...	...	...	25,903	Principally trout for restaurants.
Colorado River permits	...		...	...	...	...	...	13,220	...	...		...	...		...	...	...	13,220	Principally warm water fish.
Fish breeder and importer	...	...	...	...	...	5,050	...	...	...	...	...		...	...	...	...	...	5,050	Principally trout.
Commercial fisherman / Fish dealers and processors / Boat registrations and permits	...	...	...	...	...		...	...	...	...		10,219	141,396	2,606	6,775	$12,661	...	173,707	See accompanying Note C.
Hunting	$649,108	$213,671	$187,286	$20,810	$587,130	...		...	...	...	...	...	...	...	...	...	...	1,658,005	See accompanying Note D.
Deer and bear tags	445,127	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	445,127	
Pheasant tags	...	...	382,315	42,479	...	...	...	...	...	...	...	...	...	...	...	...	...	424,794	10 percent raised; 90 percent wild.
Special big game hunts	28,230	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	28,230	
Controlled hunt area permits	...	106,505	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	106,505	Primarily waterfowl.
Deer meat permits	10,506	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10,506	
Commercial hunt clubs	...	...	29,943	3,327	...	...	...	...	...	...	...	...	...	...	...	...	...	33,270	Primarily pheasant, 10 percent raised; 90 percent wild.
Guide and trapper licenses / Miscellaneous	1,630	392	734	82	719	1,920	807	1,090	150	179	565	59	200	342	29	16	410	9,550	See accompanying Note E.
Less commissions	(53,955)	(12,970)	(24,289)	(2,706)	(23,300)	(63,342)	(26,701)	(26,123)	(5,151)	(5,931)	(19,368)	(7,956)	(6,618)	(27,875)	(945)	(522)	(13,562)	(326,021)	See accompanying Note E.
General taxes																			
Fish tax	...	...	...	...	...	...	...	...	...	...	...	...	164,366	13,368	9,502	109,020	...	297,056	See accompanying Note F.
Salmon tax	...	...	...	...	...	...	...	...	...	...	...	25,779	...	...	...	...	...	25,779	
Kelp harvester and shellfish	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5,491	...	...	5,491	
Privilege taxes	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	85,773	...	85,773	
Miscellaneous																			
Leases of kelp and oyster beds / Inspection fees / Confiscated fish and property / Miscellaneous	...	...	...	...	...	...	...	...	...	...	...	2,538	18,132	1,471	1,681	21,425	...	45,517	See accompanying Note G.
Court fines	25,356	8,093	11,404	1,265	11,177	29,350	12,540	16,089	2,417	2,790	9,101	1,492	8,732	13,384	779	4,526	6,359	162,224	See accompanying Note H.
Interest on investments	11,650	2,795	5,239	531	5,135	14,714	5,761	7,796	1,110	1,282	4,189	656	3,093	6,149	358	2,079	2,921	71,529	See accompanying Note H.
Subtotals	$1,317,652	$316,470	$592,632	$65,838	$550,361	$1,436,170	$638,098	$923,983	$131,569	$151,822	$495,952	$79,250	$350,717	$726,065	$41,157	$235,003	$345,589	$8,178,328	
Federal funds	235,397	501,550	17,744	31,938	133,668	42,584	14,950	21,292	55,596	20,109	16,561	3,549	...	...	...	...	57,962	1,182,800	See accompanying Note I.
Totals	$1,553,049	$818,020	$610,376	$97,776	$714,029	$1,478,754	$653,048	$945,275	$187,165	$171,931	$512,513	$82,799	$350,717	$726,065	$41,157	$235,003	$403,551	$9,361,228	

NOTES

SPECIFIC BASES OF ALLOCATION FOR VARIOUS ITEMS OF REVENUE

NOTE A

1. The revenue from sale of angling licenses was distributed to the various fish programs on the basis of sports fishing effort as revealed by the most current data available.
2. The total angling license revenue was split 28 percent to marine fishing and 72 percent to inland fishing on the basis of man-days spent by angling license buyers on each of these categories in 1956, as revealed by the department's questionnaire to a representative group of such anglers.
3. Within these two major groupings the revenue was allocated to wildlife programs as follows:

Inland Fish Programs—On the basis of the department's 1955 questionnaire, it was determined that man-days were spent by fresh water anglers in the following ratio.

	Percent
Trout	69.3
Steelhead	3.3
Salmon	1.5
Striped bass	14.7
Warm water fish	27.0
	100.0

The amount of trout fishing revenue was further split between the catchable trout program and the wild trout program on the ratio of estimated catch in 1955:

(1) Total 1955 trout catch, as computed from 1955 questionnaire—35,780,000.

(2) On the basis of departmental opinion that the angler catch estimates were approximately 100 percent overstated, the adjusted total catch was estimated to be 18,350,000.

(3) Of the total catch, it was estimated that two-thirds of the 7,700,000 catchables planted were harvested, or 5,150,000. This constituted 28.6 percent of the total adjusted catch, which was rounded off to 28 percent for the purposes of this analysis.

Marine Fish Programs—On the basis of the department's 1956 statistics on numbers of fish caught by anglers fishing from licensed party boats, the following distribution by major programs was calculated.

	Percent
Salmon	1.1
Tuna	2.4
Bottom fish	42.2
Shellfish	1.1
Other sports fish	30.1
	60.4

These statistics do not reflect surf-angling effort. However, no such data were available and consequently the above derived data was used as the best available.

NOTE B

1. It was estimated that 371,000 of the 11 angling stamps would be purchased by anglers for the purpose of trout fishing. The remaining licenses were distributed to the various fresh water fish programs on the ratio of man-days spent on the various inland fish programs in 1955, as indicated in paragraph 3 of Note A.
2. The split between catchable trout and wild trout was made in the same basis as indicated in paragraph 3 of Note A.

NOTE C

1. These three categories of revenue were allocated to the various major programs on the ratio of the value of commercial fish landings in California for 1956.

	Percent
Salmon	5.3
Tuna	81.1
Bottom fish	1.5
Shellfish	3.9
Pelagic fish	7.2
	100.0

2. This basis of allocation is not completely accurate on two counts. First, boat registration permits are required for party boat operators as well as commercial fishing boats. Second, the relative values of commercial fish landings can vary considerably from year to year, depending upon the abundance of various species. Nevertheless, the basis of allocation adopted was the most reasonable one available.

NOTE D

1. The revenue from sale of hunting licenses was distributed to the various game management programs on the basis of hunting effort as revealed by the most current data available.
2. The total hunting license revenue was allocated to the following programs on the basis of man-days spent by hunting license buyers on each of these categories in 1957 as revealed by the department's questionnaire to a representative group of such hunters.

	Percent
Big game	45.1
Waterfowl	11.5
Other upland game	31.5
Pheasant	11.2
	100.0

3. The amount of pheasant hunting effort was further divided between pheasant raised to maturity on state farms and all other pheasant in the ratio of 10 percent and 90 percent, respectively. This ratio was based upon the department's estimate of the bag of the two classes of pheasant in 1954.

NOTE E

1. Guide and trapping licenses, and miscellaneous license, permit and tag revenues were allocated to major programs on the ratio of all other license, permit and tag income.

	Percent
Big game	18.33
Waterfowl	3.38
Pheasant—raised	.43
Pheasant—wild	7.16
Other upland game	7.30
Trout—catchable	8.12
Trout—wild	19.12
Warm water fish	11.08
Steelhead	1.58
Salmon	1.42
Striped bass	5.51
Salmon	.60
Tuna	2.03
Bottom fish	4.55
Shellfish	.35
Pelagic fish	.16
Other sports fish	4.14
	100.00

2. Commissions paid to license agents were also distributed to programs on these same ratios.

NOTE F

Inasmuch as fish taxes are levied on a weight basis, the general fish tax revenue was allocated to the various major marine fish programs exclusive of salmon on the basis of the poundage of the 1956 commercial fish landings in California.

	Percent
Tuna	55.2
Pelagic fish	36.7
Bottom fish	4.5
Shellfish	3.3
	100.0

NOTE G

Miscellaneous marine fish revenues were allocated on the ratio of the estimated 1957-58 commercial revenues as determined below.

	Percent
Salmon	5.12
Tuna	39.41
Bottom fish	3.23
Shellfish	3.69
Pelagic fish	17.41
	100.00

NOTE H

Court fines and interest on investments were allocated to the various major programs on the ratio of the total estimated 1957-58 revenue as distributed in this schedule.

	Percent
Big game	15.63
Waterfowl	1.77
Pheasant—raised	.78
Pheasant—wild	7.13
Other upland game	4.45
Trout—catchable	7.73
Trout—wild	18.10
Warm water fish	10.15
Steelhead	1.19
Salmon	1.72
Striped bass	5.41
Salmon	.82
Tuna	4.15
Bottom fish	8.25
Shellfish	.48
Pelagic fish	2.79
Other sports fish	3.92
	100.00

NOTE I

Federal funds made available under the provisions of the Dingell-Johnson and Pittman-Robertson Acts were allocated to the various programs on the ratio of the total expenditures of such projects during 1957-58:

	Percent
Big game	[illegible]
Waterfowl	[illegible]
Pheasant—wild	[illegible]
Pheasant—raised	[illegible]
Other upland game	[illegible]
Trout—wild	[illegible]
Trout—catchable	[illegible]
Warm water fish	[illegible]
Steelhead	[illegible]
Salmon	[illegible]
Striped bass	[illegible]
Salmon	[illegible]
Other sports fish	[illegible]
	[illegible]

EXHIBIT XXXV

State of California, Department of Fish and Game

COMPARISON OF ESTIMATED EXPENDITURES AND REVENUES BY PROGRAM AND MAJOR FUNCTION
FISH AND GAME PRESERVATION FUND 1957-1958

	Estimated expenditures								*Percent*	
Program	*Management and operations*	*Law enforcement*	*Conservation education*	*Administration*	*Research*	*Miscellaneous*	*Total expenditures*	*Estimated revenues*	*Expenditures*	*Revenues*
Game Programs										
Big game	$592,702	$382,693	$68,870	$210,657	$99,800	$18,046	$1,373,668	$1,553,049	12.9	15.7
Waterfowl	860,171	170,148	32,970	105,342	68,000	31,051	1,267,682	818,020	12.0	8.3
Wildlife pheasant	119,436	74,048	14,087	51,811	27,700	2,121	289,203	610,376	2.7	6.2
Raised pheasant	371,018	68,319	28,045	103,790	13,700	2,900	587,772	97,776	5.5	1.0
Other upland game	292,417	161,838	28,856	97,031	55,200	4,382	639,724	714,029	6.0	7.3
Total	$2,235,744	$857,046	$172,828	$568,631	$264,400	$59,400	$4,158,049	$3,793,250	39.1	38.5
Inland Fish Programs										
Wild trout	$332,757	$104,127	$37,633	$110,141	$15,500	$34,557	$634,715	$1,678,754	6.0	17.0
Raised trout	1,360,458	151,422	116,168	286,276	28,700	49,109	1,992,133	733,048	18.7	7.5
Warm water fish	185,395	154,670	34,273	90,554	22,949	4,422	492,263	945,275	4.6	9.6
Steelhead	196,944	73,798	22,979	71,091	43,100	3,757	411,669	187,165	3.9	1.9
Salmon	137,271	62,561	15,731	77,897	11,500	5,704	310,664	171,931	2.9	1.7
Striped bass	52,884	65,368	10,887	30,222	16,300	1,812	177,473	512,513	1.7	5.2
Total	$2,265,709	$611,946	$237,671	$666,181	$138,049	$99,361	$4,018,917	$4,228,686	37.8	42.9
Marine Fish Programs										
Salmon	$8,466	$57,550	$12,050	$36,367	$80,001	$1,753	$196,187	$82,799	1.8	0.8
Tuna	6,869	42,229	11,027	46,776	176,194	93,308	376,403	350,717	3.5	3.6
Bottom fish	7,459	101,716	18,106	47,905	86,769	2,507	264,462	726,065	2.5	7.3
Shellfish	12,207	164,330	30,687	89,367	162,569	4,831	463,991	41,157	4.4	0.4
Pelagic	12,342	96,436	22,713	90,189	436,834	198,857	857,371	235,003	8.1	2.4
Other sports fish	41,251	44,325	8,658	30,289	162,852	10,138	297,513	403,551	2.8	4.1
Total	$88,594	$506,586	$103,241	$340,893	$1,105,219	$311,394	$2,455,927	$1,839,292	23.1	18.6
Grand total	$4,590,047	$1,975,578	$513,740	$1,575,705	$1,507,668	$470,155	$10,632,893	$9,861,228	100.0	100.0
Percent	43.2%	18.6%	4.8%	14.8%	14.2%	4.4%	100.0%			

is particularly true with respect to solving the unknowns of marine fisheries.

The development of cost and revenue analyses of this type provides an additional factual base upon which to determine policy and program decisions and to provide management with data by which to control the department's efforts.

6. INSTALL AND MAINTAIN REVENUE AND COST CONTROLS ON A CONTINUING BASIS

Better control of department programs can be obtained if revenue and cost controls are installed and maintained on a continuing basis. The expenditures and revenue analyses for the 1957-58 Fiscal Year were made in the light of available information and data. The degree of accuracy and depth of penetration were necessarily limited by the availability of data. However, the desirability and feasibility of a continuing program of expanded management control embodying revenue and expenditures analyses were made apparent. It is clear that revenue and cost control produces four significant benefits:

- — Provides additional facts upon which to base policy and program decisions.
- — Presents management control information upon which to judge and evaluate departmental performance against approved policies and programs.
- — Furnishes added factual data which would facilitate a clearer understanding in the minds of the Legislature, the sportsmen and the general public.
- — Offers factual data upon which to evaluate the proper levels of license fees, particularly with respect to artificial programs.

(1) *Some Conclusions on Revenue and Cost Analyses Should Be Based on Several Years' Experience*

It is important to stress the point made earlier in this chapter that considerable care should be taken in drawing hard and fast conclusions based on an analysis of a single year's revenue and cost experience. In several respects, the analyses of the 1957-58 Fiscal Year should be considered experimental in nature. Estimates of time allocations were a keystone of the expenditure allocations. Estimates of sportsmen interest in relation to various species were the primary basis for allocating large amounts of revenue. It should be clearly recognized that refinements to the methods of allocation can likely be made as further thought and effort is applied to this problem.

It is also equally important to recognize that wildlife research and management programs may cover several or more years, and consequently a single year's expenditures may not be typical of the need in that area. Natural resources are not indestructible nor fully controllable. It is necessary to take steps at times not dictated by revenues but by needs. Hopefully, it will be increasingly possible to forecast needs more precisely, but as yet this has not been perfected.

All of these considerations indicate the need to base some of the conclusions drawn from expenditure and revenues analyses on several years', rather than a single year's, expenditures.

(2) *Develop More Detailed and Refined Revenue and Cost Control*

Based upon knowledge acquired in developing the 1957-58 analysis, it is evident that a more detailed and refined system of revenue and cost control should be instituted on a continuing basis.

1. Use the Cost Accounting System to Supplement Budgetary Accounting

The experience gained from the analysis of 1957-58 costs and revenues indicates that a workable cost reporting system can be designed which would supplement the present budgetary accounting system. As is revealed below, additional data should be obtained, particularly with regard to the distribution of salaries and wages. Data to permit distribution of salaries and wages, however, can most expeditiously be processed separately from the present budgetary accounting system. Details of the cost accounting system would be fully developed in the process of implementing the decision to adopt cost accounting.

2. Identify Costs Both as to Major Wildlife Programs and as to Significant Subfunctions Within a Major Wildlife Function

Knowledge as to the expenditures of effort going into the various wildlife programs is essential to the effective management of the department. The 17 programs into which 1957-58 costs were identified were appropriate for this survey. However, it should be noted that other wildlife programs may become important in the future. Consequently, this listing should not be considered as fixed but should be modified as department effort changes.

Costs should also be identified as to significant subfunctions within a major wildlife function. This concept was utilized to a limited extent in the 1957-58 analysis. However, the full cost accounting program on a continuing basis should develop this concept much more fully. Exhibit XXXVI, illustrates the extent to which the subfunctional breakdown should be achieved. Where significant, identification of costs to installations within a subfunction should be

made, such as to individual hatcheries, game farms and game management areas.

The identification of costs to subfunction as well as to wildlife program will provide the needed management information which will greatly assist in the determination of degrees of effort, and the means by which control over such effort can be exercised.

3. Identify Revenues to the Same Wildlife Programs Used for Cost Breakdowns

It is highly desirable that the department's revenues be identified to the same wildlife programs to which costs are allocated. The methods employed to accomplish this with respect to the 1957-58 revenues illustrate the general approach that should be used. Very likely refinements to those techniques can be developed, including an updating of the statistics used. However, in general, revenues common to several programs should be allocated to individual programs on the basis of sportsmen interest. Additional study on the problem of allocations of revenues will undoubtedly result in more definitive data.

4. Require Daily Time Reporting of All Department Personnel Except Those Whose Activities Fall Into a General or Administrative Category

The analysis of the 1957-58 costs was based upon the general fact that salaries, wages and retirement fund payments accounted for 63 percent of the total support budget. In addition, a significant part of the remaining 37 percent was comprised of expenses which vary almost directly with personnel, such as automobile operation, travel expenses and boat operation. It becomes quite clear, therefore, that accurate allocation of salaries and wages is of paramount importance to the cost reporting system.

It is strongly recommended that a daily personnel time reporting system should be a key part of the cost reporting program. By requiring a daily recording of effort in terms of both wildlife program and subfunction, there will be established a factual basis for the entire cost accounting program. It is to be noted that the department has been contemplating a step of this sort. This type of reporting is practiced in some state agencies and would be easily carried out after a period of indoctrination. The present attendance report could be modified to serve this purpose.

Certain administrative and general supervisory personnel should be excluded from a detailed time reporting plan because of the nature of their work. Such salaries should be allocated to wildlife programs on a equitable basis.

5. Classify Other Costs Into Those Which Are Generally Related to Personnel Activity and Those Which Are Identifiable to Programs and Functions

It is very desirable that the cost accounting system be as simple as possible, consistent with the objective of yielding the desired management information to a reasonable degree of accuracy. The nature of the department's operations is such that control of personnel and of certain key programs provides the basis for achieving this objective.

The following are examples of expenses which, by their nature, closely follow personnel or are

EXHIBIT XXXVI

State of California, Department of Fish and Game

EXAMPLE OF INLAND FISHERIES SUBFUNCTIONS

- Fish Planting
  - Boulder Creek Fish Planting Base
  - Chino Fisheries Base
  - Each hatchery
  - El Sur Fish Planting Base
  - Fish Planting Base, Alpine County
  - Fish Planting Base, Bear River
  - Fish Planting Base, Fiddle Creek
  - Fish Planting Base, Greenhorn Creek
  - Fish Planting Base, South Fork, American River
  - Yountville Planting Base
- Fish Rescue
- Habitat Improvement
- Hatchery Production
  - Benbow Dam Experimental Station
  - Cedar Creek
  - Central Valleys
  - Crystal Lake
  - Darrah Springs
  - Fillmore
  - Fish Springs
  - General
  - Heenan Lake Egg Collection Station
  - Hot Creek
  - Kern River
  - Moccasin Creek
  - Mojave River
  - Moorehouse Springs
  - Mt. Shasta
  - Mt. Whitney
  - Pudding Creek Egg Collection Station
  - San Joaquin
  - Sequoia
  - Snow Mountain Egg Collection Station
  - Tahoe
  - Trinity River
- In-service Training
- Inspection—Commercial Fish
- Management
- Permit Administration
- Research
- Rough Fish Control
- Stream Improvement
- Water Pollution Surveys
- Water Project Surveys

of such general nature that identification to a particular program and subfunction is not practical except on an allocation basis:

—Accident and death claims.
—Communications expense.
—General expense.
—Traveling expense.

These expenses should be allocated within the particular region on the basis of salaries and wages. Consequently, it will not be necessary to identify these expenses except to the regular budgetary account.

Other operating expenses are, by their nature, identifiable to particular wildlife programs and subfunctions. These will require identification by code number to the appropriate program and subfunction by the person initiating the purchase estimate or subpurchase order. Examples of this type of operating expense include the following:

—County in lieu taxes.
—Fish food and storage.
—Game food.
—Maintenance charges which relate to installations such as hatcheries, waterfowl areas, game farms, etc.
—Rent charges which relate to installations.
—Utilities which relate to installations.

Thus, under this concept, each class of operating expense would be analyzed to determine whether it should be treated as a general expense and therefore be allocated, or whether it be one in which each charge should be coded as to program and subfunction. The thinking applied to this determination should be flexible, in that an expense such as utilities would fall into both categories. In one region, utilities may be of such general application that it will be determined to be allocable. In another region, utilities may be a major expense, identifiable to particular programs and subfunctions.

6. Develop Quantitative Measures of Performance in Order to Facilitate Evaluation of Programs and Results

One of the main reasons that budgetary accounting proves to be such a useful management tool in controlling expenditures is that there is provided a quantitative basis for comparison between actual expenditures and budget. The Department of Fish and Game has made progress in developing a basis for comparing production costs in hatcheries and, to a lesser degree, in game farms. There remains, however, opportunity for further developing of cost accounting techniques in hatchery and game farm operations, as well as in other areas of wildlife management.

These quantitative measurements should be developed in two important respects. First, there is much to be gained by relating costs to units of production, or accomplishment. Average cost per pheasant raised (or preferably per pound of pheasant raised) is a clear example. Other less obvious quantitative measurements might include the following:

—Cost per mile of stream improvement.
—Cost per acre-feet of rough fish control.
—Cost per sportsman of law enforcement.
—Cost per hour of marine law enforcement patrol.

These may not be the most desirable measurements of specific activities, but they illustrate the concept. Second, comparisons of unit costs so developed should be made between various similar activities throughout the State for the current and prior years.

These unit costs can in turn become an effective and useful basis for planning future programs. The historical unit cost data can be projected to reflect anticipated costs of new activities, and thereby would be a factual basis for decision making. These same quantitative measurements would be an important aid to management in evaluating results of programs in progress.

The establishment of quantitative measurements of performance represents a significant opportunity for improving the management tools of the department. Their development in an orderly and practical way should be an important objective, as a means of furthering the effective management of wild life conservation. Such data would also be very helpful in communicating the department's aims and accomplishments to those interested in it.

7. Prepare Cost Accounting Reports on a Monthly, Quarterly and Annual Basis

Control reports, to be of maximum effectiveness, should be rendered on a current basis. They should present the facts while there is still time for remedial action to have effect, if such action is required. To do otherwise is to lose a chief benefit.

It is therefore important that a timely report on salaries and wages by wildlife program and subfunction be rendered by the accounting department. As such, this class of expenditure should be reported on monthly in order that the direction and control of effort can be most effective.

At this point, it is also pertinent to consider the cost of reporting salaries and wages in the manner described. Benefits obtained should always be related to the costs of obtaining them. With respect to summarizing salaries and wages by program and function, it is anticipated that the equivalent cost of one clerk would be required

to perform this work. Further study would be required to determine the most economic procedures. Perhaps the use of punch card equipment, on a contract basis with another state agency or an independent service bureau, would be the most economical means. However, these data should be processed monthly, in which case a monthly report by the tenth of the following month would be quite feasible.

Complete cost accounting reports showing costs by wildlife program and subfunction should be prepared each quarter. This frequency is such that the total departmental effort can be reviewed at least three times during the year, so that changes in emphasis would be possible. Frequency of less than one report a quarter would greatly reduce the usefulness of the cost reports.

Certain other supplemental cost reports should be rendered on a yearly basis. These would be the comparative cost reports on hatcheries, game farms and other specialized activities such as stream improvement, and waterfowl and hunting areas management. These activities normally have a yearly cycle, so that reports on less than a full year's operations would be of limited usefulness.

8. All, Control Reports Should Be Prepared by the Centralized Accounting Department

One other important point is that all accounting control reports should be the responsibility of and be issued by the centralized accounting department. It is this department which is best qualified to render such reports efficiently and economically. Moreover, the accounting department should be the service unit supplying all accounting management data and control reports to management.

This concept of the centralized accounting department serving both headquarters and field management is an extension of the decentralized operations-centralized services concept introduced in Chapter XII, Departmental Organization. The recommended centralization of the major part of the regional business service function is also a part of the decentralized operations-centralized services concept. The objectives are to relieve field operations of the burden of paper work and report preparation; and to provide field management with useful information promptly and economically compiled at central headquarters. Source data for these reports should go direct to the centralized accounting department; prompt reports should be returned to the field showing actual performance against predetermined criteria on a statewide, uniform basis.

In summary, the Department of Fish and Game has an excellent opportunity to improve its management control information and to improve the factual basis for communication with the various organizations and individuals who are interested in its activities. A comprehensive program of cost and revenue control will provide an important means of accomplishing these goals at a modest cost. It is estimated that the incremental cost of maintaining the recommended cost accounting system would approximate $12,000 to $15,000 per year. The many important benefits greatly exceed this estimated cost. In our opinion, the department should proceed with full effort in the recommended cost accounting program.

7. ADOPT OTHER SIGNIFICANT MANAGEMENT CONTROLS

In addition to the management controls afforded by cost and revenue accounting, there are three other significant management controls which should be instituted or further improved.

One very significant tool of management control is the compilation of detailed written manuals covering commission and department policies, organization and operational procedures. The importance to the department of fully developed manuals cannot be overemphasized. The survey has repeatedly revealed the lack of an organized set of manuals covering all phases of the department's operations, with the result that each region to a large degree pioneers its own way over similar problems. This results in inefficiency and lack of uniformity.

Closely related to the need for manualization is the need for periodic inspections of headquarters, regional and field activities by qualified personnel acting in behalf of the director, applying predetermined standards of performance contained in department manuals. Only in this way can the director be kept informed on operations, and thus be in a position to control the way in which commission and department policy is being carried out.

A third area of management control lies in the establishment of a system of meaningful regular reports flowing from the field to headquarters whereby significant action is reported. This should provide a basis for comparison of actual performance against predetermined programs, in order that continued evaluation of progress is possible.

8. PLACE THE PREPARATION OF DETAILED WRITTEN MANUALS COVERING COMMISSION AND DEPARTMENT POLICIES, ORGANIZATION AND OPERATIONAL PROCEDURES ON A HIGH PRIORITY BASIS

It is very apparent that a comprehensive and complete manualization of policies, organizational responsibilities and operational procedures can contribute greatly to the effectiveness of the department.

(1) *Some Progress Has Been Made in Building a Department Operational Manual*

The department has made some effort to develop operational manuals. However, few areas of operations have been covered in any detail. The deer management and pheasant co-op management manuals are examples of the types of manuals which are extremely useful and which can establish uniform, effective procedures for carrying out operations throughout the State.

In some areas, sections of the state administrative manual have been adapted to department requirements. The operation and maintenance of automotive vehicles is another area which has been covered in detail.

It is clear, however, that much remains to be done to obtain a full, comprehensive set of manuals which clearly sets forth all department policies, organizational responsibilities and operational procedures.

(2) *Decentralized Operation Creates a Strong Need for Manuals*

The proposed form of organization contained in Chapter XII recommends further decentralization of the department's operations. Fundamental to the success of such an organization plan is the building of a comprehensive, detailed set of policy, organization and procedural manuals.

This requirement is of extreme importance, for greatest effectiveness and efficiency. Manuals will provide the best method for dissemination of information and instructions for the guidance and control of regional and district activities. Properly compiled manuals reflect the best thinking of the department, thereby eliminating the duplication of effort now necessary to pioneer many of the plans and procedures in each of the separate regions. Moreover, uniformity of operations throughout the State will be much better achieved.

Most significant of all the factors indicating the need for full manualization is the fact that comprehensive manuals will provide information and guidance to district managers and regional managers at all times. Properly prepared manuals are the best tools that can be devised to assist field managers in carrying out the intent of department policies and programs.

(3) *Much of the Most Efficient and Effective Departmental Results Have Been in Areas Which Are Relatively Well Manualized*

It is significant that much of the most efficient and effective areas of departmental operations are aided by relatively well-prepared manuals of operations. Law enforcement has a warden's manual. Vehicle maintenance follows a well-prescribed procedure. In water projects work, the more effective work has been in subjects in which procedures of conducting the work have been reduced to organized procedures in written form. Similarly, hatchery operations generally follow uniform methods which are contained in written manuals.

(4) *Define Responsibility for Developing Manuals*

Responsibility for preparation of the manuals on policy, organization and operational procedures should rest with the director. Final review and approval of broad policies should rest with the commission. Review and approval of organization and operational procedures should rest in the director, subject to commission policy and other controls of the Legislature and other state agencies.

In order to assist the director in his responsibility of preparing the manuals, the developing of policy, organization and procedures for the approval of the director should be delegated by the director as follows:

- — The deputy director—operations should develop policies, organization and procedures on field operations.
- — The associate director—plans should develop policies, organization and procedures with respect to staff operations.
- — The associate director—control should develop policies, organization and procedures with respect to administrative matters.
- — The assistant director—information should develop policies and procedure material on public contacts and conservation education.

The associate director—control should also be assigned responsibility for co-ordinating and publishing the approved manuals, with editorial assistance from the assistant director—information when requested.

(5) *Make Adequate Provision for Continual Updating of the Manuals*

Manuals are not intended to freeze the concepts and thinking on the subjects covered. It is important that the department's manuals should be revised when improvements are possible, and that the manuals be kept on a current basis.

9. INSTITUTE PERIODIC INSPECTIONS OF DEPARTMENT ACTIVITIES

Just as comprehensive manualization is a fundamental requirement of decentralization, so is a system of periodic inspections. This is important for two very basic reasons. First, periodic inspections permit the director to know of the degree of accomplishment and compliance with department policies, plans and programs.

Second, inspections result in improving the communications between headquarters staff and field personnel. Headquarters staff have too much of a tendency to remain in headquarters. Field inspections force more visits to the field and thus better equip them to perform their own staff functions.

(1) *Policy, Organization and Procedures Manuals Provide the Standards Against Which Inspections Should Be Made*

This point has been made before, but it bears repeating. Inspections, to be most productive, should be made against known standards. In this way, progress in meeting department objectives can be objectively evaluated.

(2) *Inspections Should Be Carried Out for the Director by Both Staff and Operational People*

It is important that these inspections be made for the director by persons whom he designates. Essentially, the director's headquarters staff should be the source of the bulk of those making the periodic inspection visits. However, the inspection teams should not be limited to headquarters staff. It would be very beneficial to draw upon regional managers, functional supervisors and others for participation in such visits, in order to broaden coverage and viewpoints.

It would, of course, be important for the director to participate personally in periodic inspection visits to the field.

(3) *Formal Reports Should Be Rendered on Inspection Findings*

In order to increase the objectivity of inspections, and to make them most productive, formal reports of findings should be prepared. Copies of such findings should, of course, be furnished to the activity being inspected as well as to the higher responsible managers, including the director in each instance.

(4) *Headquarters Activities Should Be Subject to Inspections as Well as Field Activities*

The benefits of inspections should be extended to headquarters activities as well as to the field. Appropriate selections of personnel could be made which would make such a plan workable.

Underlying the concept of inspections is the concept that the department can best achieve its objectives operating as a unified whole. Inspections against established yardsticks provide an excellent basis for achieving efficient, unified operations.

10. CONDUCT A CRITICAL REVIEW OF THE PRESENT SYSTEM OF REGULAR REPORTS

The system of regular reports constitutes a fourth aspect of management controls which should be considered in the discussion of the department's control of operations.

The present reports required of regional and field personnel are very numerous. As is true of many organizations, the present reports have grown over the past years without recent critical review. As a consequence, reports are enlarged and new reports are added, but rarely are reports simplified or reduced. This, in turn, results in an excessive absorption of time and effort in preparing reports, particularly at the field level.

(1) *Department Should Expedite a Critical Review of All Regular Reports*

All present regular reports should be subjected to a critical examination as to their need and usefulness. Overlapping and duplication of information should be carefully reviewed. The test of usefulness should be applied to each. For example, the desirability of weekly and monthly reports by wardens should be examined. Perhaps an adequate weekly report would fill all requirements, without the need for either daily diary entries or monthly summary reports. Such a critical review should prove to be very beneficial in reducing present reporting requirements.

(2) *Continuous Control of Future Reports Should Be Maintained*

The recommended review of present reports should be applied on a continuing basis to future reports. In this way it should be possible to prevent the building again of excessive reporting from the field.

* * * * *

In as complex and geographically dispersed organization as the Department of Fish and Game, an adequate system of management controls is essential. The director cannot adequately discharge his responsibilities if he is not provided the necessary information by which informed judgments can be made as to the manner in which operations are carried out. Moreover, information provided by management control reports furnishes factual data upon which future planning and programing can be built. This is particularly true of the recommended cost and revenue accounting controls whereby revenues and costs would be analyzed in terms of major wildlife programs and significant subfunctions.

CHAPTER XV

COST REDUCTION OPPORTUNITIES

Several recommendations advanced in previous chapters offer the means of reducing department operating costs now and of saving increased expenditures in the future. The recommendations involved are these:

—Consolidate pheasant production and rearing at the Yountville and Los Serranos Game Farms. (Chapter IV, Small Game Management.)

—Reduce fish hatcheries operating costs by consolidating production at fewer hatcheries and increasing use of dry feed. (Chapter V, Inland Fisheries Management.)

—Increase natural fish production in California reservoirs and lakes. (Chapter V, Inland Fisheries Management.)

—Centralize license administration at department headquarters under the associate director—control. (Chapter XII, Departmental Organization.)

In this chapter, greater detail is presented regarding the manner in which the recommendations can be placed in effect. Also, estimated benefits in reduced operating costs or future savings are computed. None of these cost reduction opportunities can be realized without the expenditure of money for capital outlay or other one-time expenditures. Figures for each of the four cost reduction plans are discussed separately below.

CONSOLIDATION OF GAME FARMS

Chapter IV, Small Game Management, presented an analysis of the pheasant management program. Primary emphasis was devoted to presentation of all significant factors bearing on the basic policy question: Should the "put-and-take" pheasant program be continued in California? As stressed in Chapter IV, this policy question should be answered by the sportsmen of California. If the answer is "yes," attention should be given to cost reduction opportunities through consolidation of game farms.

Consolidation of game farms is not a new idea to the department, but consolidation of all pheasant production at Yountville and Los Serranos is beyond the aim of present department plans. Recently the Los Banos, Porterville and Bakersfield installations were closed. Their respective pheasant production was consolidated at Fresno with attendant savings estimated at $10,000 per year. Previously, the department has closed other game farms throughout the State.

It has not been practical to determine the full costs and benefits to be produced if all present pheasant production is consolidated at Yountville and Los Serranos since present Fresno game farm costs can only be estimated. The department has been able to supply estimated capital outlay, costs and operating costs savings if:

(1) Redding, Chico, Marysville and Sacramento pheasant production are consolidated at Yountville.

(2) Imperial and Valley Center pheasant production are consolidated at Los Serranos.

Department plans have already been completed to carry out the Los Serranos consolidation move and to have the California Institution for Men rear the pheasants in holding pens at the nearby prison farm at Chino.

In estimating consolidation savings, the game management branch has stated:

—Feed costs can be reduced up to 5 percent.

—Supplies and services costs can be reduced up to 20 percent.

—Equipment costs can be reduced up to 25 percent.

—Labor cost at Yountville can be reduced up to 25 percent and at Los Serranos can be up to 63 percent.

These estimates have been utilized in computing consolidation savings.

1. CONSOLIDATE FIVE GAME FARMS IN REGIONS I, II, AND III

Exhibit XXXVII, which follows, shows a computation of estimated operating savings if game farms in Regions I, II and III are consolidated at Yountville. Potential savings amount to $33,000 per year. Capital outlay to enlarge Yountville for this purpose would amount to $79,000, which would be offset by the savings in 2½ years.

If state property and facilities at the game farms to be closed are sold, the sales prices can be applied to reducing the capital outlay at Yountville.

Consolidation at Yountville has been planned so as to produce the same number of pheasants each year as now produced for all five game farms. Increased costs for transporting the adult birds to areas for releasing were included before the department estimated savings percentages.

2. CONSOLIDATE REGION V GAME FARMS AT LOS SERRANOS

Estimated operating cost savings for consolidating Region V game farms at Los Serranos are shown in

Exhibit XXXVIII. Potential savings amount to $47,000, due mainly to replacement of department manpower with prison farm manpower in rearing pheasants in the holding pens. Hatching work and management would continue under the department.

Capital outlay to establish adequate facilities at Los Serranos and at the prison farm have been estimated at $120,038 if contracted and $77,700 if prison farm personnel perform the work. Annual savings would offset these capital charges in from 1⅔ to 2½ years.

Facilities at Valley Center would be sold at auction or given to the county. The county owns the land on which this game farm stands.

Facilities at the Imperial game farm would be transferred to the waterfowl management area.

EXHIBIT XXXVII

State of California, Department of Fish and Game

ESTIMATE OF OPERATING COST SAVINGS IF REGION I, II AND III GAME FARM PRODUCTION IS CONSOLIDATED AT YOUNTVILLE

Regions I, and II game farms	*Birds raised* [1]	*Estimated 1957-1958 Costs*				
		Labor cost	*Feed cost*	*Services and supply*	*Equipment*	*Total*
Redding	2,309	$9,492	$2,298	$5,732	$684	$18,206
Chico	4,150	42,819	10,285	9,389	1,432	63,925
Marysville	3,040					
Sacramento	3,840					
Yountville	10,980	51,539	12,985	10,481	575	75,580
Totals	24,319	$103,850	$25,568	$25,602	$2,691	$157,711
Comparative costs if all production is consolidated at Yountville	25,000	$77,910	$24,298	$20,482	$2,021	$124,711
Potential savings	--	$25,940	$1,270	$5,120	$670	$33,000

Estimated capital outlay required to enlarge the Yountville game farm:

60 additional rearing pens at $750/pen	$45,000
Additional brooder house—2,000 sq. ft. at $17/sq. ft.	34,000
	$79,000

$$\text{Payoff period} = \frac{\text{capital outlay}}{\text{savings/year}} = \frac{\$79,000}{\$33,000/\text{year}} = 2\tfrac{1}{2} \text{ years}$$

[1] Figure does not include pheasants raised by sportsmen which are hatched at Yountville.

EXHIBIT XXXVIII

State of California, Department of Fish and Game

ESTIMATE OF OPERATING COST SAVINGS IF REGION V GAME FARMS ARE CONSOLIDATED AT LOS SERRANOS AND CHINO PRISON

Region V Game Farms	*Birds raised* [1]	*Estimated 1957-1958 costs*				
		Labor cost	*Feed cost*	*Services and supply*	*Equipment*	*Total*
Los Serranos Imperial Valley Center	20,000	$64,000	$15,250	$17,900	$3,300	$100,450
Comparative costs if all production is consolidated at Los Serranos and Chino California Institute for Men	20,000	$24,000	$14,250	$12,900	$2,300	$53,450
Potential savings		$40,000	$1,000	$5,000	$1,000	$47,000

Capital outlay required to place rearing pens at the California Institute for Men would amount to $120,038 if performed by contractor and $77,700 if performed by C. I. M. labor.

$$\text{Payoff period} = \frac{\text{capital outlay}}{\text{savings/year}}$$

$$\text{For contractor} = \frac{\$120,038}{\$47,000/\text{year}} = 2\tfrac{1}{2} \text{ years}$$

$$\text{For C. I. M.} = \frac{\$77,700}{\$47,000/\text{year}} = 1\tfrac{2}{3} \text{ years}$$

[1] Figure does not include pheasants raised by sportsmen which are hatched at Los Serranos.

Game management personnel in the department recognize the cost reduction opportunities available through consolidation of game farms. They are anxious to realize these cost saving benefits.

Completion of the two game farm consolidations recommended on the foregoing page would produce annual savings in pheasant production cost of $80,000 without affecting the amount of pheasants raised nor the present program for releasing them. This sound opportunity for reducing costs should be realized.

Eventual closing down of Fresno game farm and division of its pheasant production between Yountville and Los Serranos has been recommended in Chapter IV, Small Game Management. Further economies should result from such a move although department figures were not available for computation of the resultant savings.

COST REDUCTION OPPORTUNITIES IN FISH HATCHERIES OPERATIONS

During the past year, the brood stock committee in the Department of Fish and Game has conducted an analysis of the expansion potential in each of the fish hatcheries which the department operates throughout the State. The brood stock committee is responsible for determining the kinds of fish produced and production schedules for all fish hatchery operations. Careful study of the reports generated by this committee, in conjunction with the summary of fish hatchery operating costs for Fiscal Year 1957-58, discloses real opportunity to reduce overall hatcheries operating costs. As a result, the scope of this analysis was enlarged over the original recommendations in Chapter V.

As identified in Chapter V, cost reduction opportunities in fish hatcheries are of two types: closing down of high-cost hatcheries and increasing production at low-cost hatcheries; using more economical food in certain hatcheries which have not yet modernized their fish-feeding operations.

In Exhibit XXXIX, which follows, the cost per pound of fish produced at all trout hatcheries is presented for comparative purposes. High-cost hatcheries are identified.

For example, the $0.99 per pound cost of fish produced at Crystal Lake in Region I is twice as high as the $0.49 per pound cost at Darrah Springs in the same region. Crystal Lake is one of the hatcheries which can be closed. High cost in operations is due to a number of different factors such as low volume, older facilities and expensive water pumping operations.

Although the department has closed many high-cost hatcheries in the past, such action is generally opposed by local residents near the hatchery in question. Any action to close existing hatcheries must anticipate this reaction, and the public should be given the facts and logic leading to the decision to close the hatchery.

In consolidating trout production at fewer hatcheries, careful attention should be given to disease control, and to adequate provisions for brood stock and taking of eggs.

In the following discussion, the specific recommendations for closing hatcheries and increasing the use of dry feed are presented and discussed.

1. CLOSE TWO HATCHERIES IN REGION I

In Region I, both the Crystal Lake and Mt. Shasta hatcheries are high cost as indicated in Exhibit XXXIX, and should be closed. These two hatcheries now produce 180,544 pounds of fish annually. It is not practical to expand facilities at Darrah Springs to take on this additional production. Since Region I sends a high proportion of fish to Region II for planting, it is practical to consider hatcheries in other regions as substitutes for the hatcheries to be closed.

The Moccasin Creek hatchery in Region IV can replace the production lost from closing the two hatcheries in the north by staggering production and expanding its facilities. Transportation costs of fish planted in the north-central region would not be materially increased by using Moccasin Creek as a source. Potential savings to be realized by closing down the Crystal Lake and Mt. Shasta hatcheries

EXHIBIT XXXIX

State of California, Department of Fish and Game
Cost per pound of fish produced at hatcheries

Region	Hatchery	*Total operating cost (adjusted for interhatchery charges)*	*Pounds of fish produced*	*Cost per pounds of fish produced*
I	Cedar Creek	$30,638	20,729	$1.48 [1]
	Crystal Lake	80,447	81,560	.99 [2]
	Darrah Springs	209,442	427,903	.49
	Mt. Shasta	116,105	98,984	1.17 [2]
	Total for region	$436,632	629,176	$0.69
IV	Kern River	$62,445	77,713	$.80 [2]
	Moccasin Creek	128,997	269,353	.48
	Moorehouse Springs	20,113	24,512	.82 [2]
	San Joaquin	127,336	222,910	.57
	Sequoia	29,738	29,629	1.00 [2]
	Total for region	$368,629	624,117	$0.59
V	Fillmore	$93,987	74,571	$1.26 [2]
	Fish Springs	96,888	173,199	.56
	Hot Creek	149,146	130,826	1.14 [2]
	Mojave River	164,385	228,516	.72
	Mt. Whitney-Black Rock	117,791	136,706	.86 [3]
	Total for region	$622,197	743,818	$0.84
	Total for regions I, IV and V	$1,427,458	1,997,111	$0.71

[1] Cedar Creek is an experimental hatchery which can be closed after experimentation is completed unless operating costs can be brought down to an acceptable level.

[2] These hatcheries are comparatively high-cost operations which can be closed. Remaining hatcheries can produce the total pounds of fish required at considerable less cost after some expansion.

[3] Mt. Whitney-Black Rock cost per pound can be reduced by increasing Black Rock rearing pond capacity.

amount to $91,837 per year as shown in Exhibit XL, on this page. Capital outlays for improvements to expand Moccasin Creek are estimated to cost $153,000 and would be offset by the net savings in less than two years' time. Estimates of capital outlays used throughout this section were prepared by the department.

EXHIBIT XL

State of California, Department of Fish and Game

POTENTIAL SAVINGS IN OPERATING COSTS IF CRYSTAL LAKE AND MT. SHASTA HATCHERIES ARE CLOSED

Close hatcheries at:	*Cost per pound*	*Pounds produced*	*Total operating costs*
Crystal Lake	$0.99	81,560	$80,447
Mt. Shasta	1.17	98,984	116,105
	$1.09	180,544	$196,552
Expand hatchery at:			
Moccasin Creek	$0.58	180,544	$104,715
Net savings per year			$91,837
Capital outlay required to expand Moccasin Creek			$153,000*

$$\text{Payoff period} = \frac{\text{capital outlay}}{\text{savings/year}} = \frac{\$153,000}{\$91,837/\text{year}} = 1\tfrac{2}{3} \text{ years}$$

* This capital outlay can be reduced by the sales price of the Crystal Lake and Mt. Shasta hatcheries if these properties are declared surplus and are sold.

2. CLOSE THREE HATCHERIES IN REGION IV

Kern River, Moorehouse Springs and Sequoia are high-cost hatcheries in Region IV, as shown in Exhibit XXXIX. These hatcheries can be closed by transferring their annual production volumes of 131,852 pounds of fish to the San Joaquin hatchery. Greater use of present capacity and expansion at San Joaquin will meet the additional production requirements. Expansion needs consist of trough extensions in the hatchery and the addition of 12 more ponds.

Since San Joaquin is to the north of the Kern River, Moorehouse Springs and Sequoia hatcheries, some additional transportation costs can be expected in planting fish in Region V from San Joaquin. Potential savings to be realized by closing three hatcheries in Region IV amount to $37,140 per year as shown in Exhibit XLI, which follows. Estimated capital outlay for improvements to expand San Joaquin amount to $102,000, which would be offset by annual savings in less than three years' time.

3. CLOSE TWO HATCHERIES IN REGION V

As shown in Exhibit XXXIX, the Fillmore and Hot Creek hatcheries in Region V are high cost and can be closed by dividing their annual production of 205,397 pounds of fish among the remaining three hatcheries in that region.

Present facilities at Fish Springs and Mojave River hatcheries are not used to capacity and will allow

EXHIBIT XLI

State of California, Department of Fish and Game

POTENTIAL SAVINGS IN OPERATING COSTS IF KERN RIVER, MOOREHOUSE SPRINGS AND SEQUOIA HATCHERIES ARE CLOSED

Close hatcheries at:	*Cost per pound*	*Pounds produced*	*Total operating costs*
Kern River	$0.80	77,713	$62,445
Moorehouse Springs	0.82	24,512	20,113
Sequoia	1.00	29,627	29,738
	$0.85	131,852	$112,296
Expand hatchery at:			
San Joaquin	$0.57 (Includes increased transportation costs)	131,852	$75,156
Net savings per year			$37,140
Capital outlay required to expand San Joaquin			$102,000*

$$\text{Payoff period} = \frac{\text{capital outlay}}{\text{savings/year}} = \frac{\$102,000}{\$37,140/\text{year}} = 2\tfrac{3}{4} \text{ years}$$

* This capital outlay can be reduced by the sales price of the Kern River, Moorehouse Springs and Sequoia hatcheries if these properties are declared surplus and are sold.

production of 60,000 and 65,000 more pounds of fish respectively without additional improvement. Production capacity at Mt. Whitney-Black Rock hatchery can be increased and its operating cost reduced to $0.73 per pound by providing three new rearing ponds at Black Rock. Fish would be produced in these ponds at $0.50 per pound.

Potential savings which can be realized by closing Fillmore and Hot Creek hatcheries amount to $122,533 per year as shown in Exhibit XLII, which follows. Capital outlay to enlarge the Black Rock rearing ponds would amount to $77,500, which would be offset by net annual savings in less than a year.

4. INCREASE USE OF DRY FEED

Each year, the department analyzes the cost for each pound of fish produced at the various hatcheries in Regions I, IV and V. Selected figures resulting from this analysis for the Fiscal Year 1957-1958 are shown in Exhibit XLIII.

Differentials in the cost of food and labor per pound of fish produced between the two northern Regions I and IV, and Region V are significant.

Region V food and labor costs per pound are higher than those of the two other regions. This significant differential in favor of Regions I and IV is due to high use of dry feed at the hatcheries in these regions.

Dry feed is pelletized trout food which is purchased in sack or bulk and can be fed directly to the fish with a minimum of loss in food value. Wet feed, such as ocean fish and liver, is used preponderantly in Region V. Wet feed is purchased in sack or in bulk, and must be kept frozen until fed to the trout. Due to a

high moisture content, wet food does not give trout as high nutriment per pound as dry food.

Analysis of the difference in food costs per pound of fish produced between the two northern regions and Region V indicates that wet food costs about $0.08 per pound more than dry food or the difference between $0.30 and $0.22 per pound. Although labor costs are also less for dry feed, it is difficult to identify an exact amount.

It is recommended, however, that the Region V hatcheries switch to dry feed since this move will save $0.08 per pound for 740,000 pounds of fish produced, or $59,200 per year in food costs alone. This cost reduction figure alone is conservative since there should also be savings in labor and a reduction in labor cost. Department estimates place the full savings potential at $100,000 per year.

EXHIBIT XLII

State of California, Department of Fish and Game

POTENTIAL SAVINGS IN OPERATING COSTS IF FILLMORE AND HOT CREEK HATCHERIES ARE CLOSED

Close hatcheries at:	*Cost per pound*	*Pounds produced*	*Operating costs*	*Total operating costs*
Fillmore	$1.26	74,571	$93,987	
Hot Creek	1.14	130,826	149,146	
	$1.18	205,397	--	$243,133
Use extra capacity at:				
Fish Springs	$0.56	60,000	$33,600	
Mojave River	.72	65,000	46,800	
Expand hatchery at:				
Mt. Whitney-Black Rock	$0.50	80,397	$40,200	
	$0.59	205,397	--	$120,600
Net savings per year				$122,533
Capital outlay required to expand Mt. Whitney-Black Rock				* $77,500

$$\text{Payoff period} = \frac{\text{capital outlay}}{\text{savings/year}} = \frac{\$77,500}{\$122,533/\text{year}} = \frac{3}{5} \text{ year}$$

* This capital outlay can be reduced by the sale price of the Fillmore and Hot Creek Hatcheries if these properties are declared surplus and are sold.

EXHIBIT XLIII

State of California, Department of Fish and Game

ANALYSIS OF COSTS FOR EACH POUND OF FISH PRODUCED, 1957-1958 FISCAL YEAR

Dry food used	*Food*	*Labor*	*Equipment*	*Miscellaneous*	*Total*
Region I					
Darrah Springs	$0.22	$0.16	$0.01	$0.10	$0.49
Region IV					
Moccasin Creek	.21	.18	.01	.08	.48
San Joaquin	.22	.25	.01	.09	.57
Wet food used					
Region V					
Fish Springs	$0.30	$0.19	$0.01	$0.06	$0.56
Mojave River	.34	.20	.01	.17	.72
Mt. Whitney-Black Rock	.29	.39	.03	.02	*.73

* Adjusted for anticipated cost reduction to result from increasing production at Black Rock rearing ponds.

5. REALIZE ALL POTENTIAL SAVINGS IN FISH HATCHERIES OPERATIONS

Potential savings in fish hatcheries operations are summarized in the following table.

Cost reduction opportunity	*Capital charge*	*Annual cost reduction*
Close 2 hatcheries in Region I	$153,000	$ 91,837
Close 3 hatcheries in Region IV	102,000	37,140
Close 2 hatcheries in Region V	77,500	122,533
Increase use of dry feed		59,200
Totals	$332,500	$310,710

Thus, annual cost reduction to be realized from these opportunities would offset capital charges in just more than a year.

If any or all of the closed hatcheries are sold, capital charges can be reduced by the sales prices obtained. It, of course, may be desirable to retain certain of the hatcheries to be closed for use in salmon and steelhead programs or in other department programs.

INCREASING NATURAL PRODUCTION OF FISH IN CALIFORNIA RESERVOIRS AND LAKES

Recommendations advanced in Chapter V, Inland Fisheries Management, advocate that the department concentrate on increasing the annual yield of game fish in California's reservoirs and lakes. Basically, the department needs more know-how in establishing warm water game fish in suitable reservoirs and in utilizing natural habitat to produce catchable trout from fingerling plants in cold water reservoirs and lakes. Chemical control of rough fish has a definite place in making certain bodies of water more suitable for game fish.

This overall plan to increase natural production of fish in California reservoirs and lakes does offer some immediate cost reduction benefits. Essentially, however, the plan is a more economical alternative than increasing fish hatchery production of catchable trout to produce satisfactory angling in the future.

Present department estimates are that fishing pressure will double in the next 10 years. By 1968, more than 3,000,000 anglers are expected to be trying their luck and skill in California waters. Doubling fish hatchery production of about 1,800,000 pounds of catchable trout at $0.50 per pound would cost an additional $900,000 per year. Capital outlays to provide the additional capacity would amount to over one million dollars. Both of these figures are optimistic estimates based on best conditions in present hatchery operations.

Increasing the natural yield of fish in existing and proposed bodies of water in California could produce more pounds of fish annually than doubling fish hatchery production and at considerably less operating costs. Two potential plans for increasing natural fish production are presented in the next sections.

1. CONDUCT A FIVE-YEAR PROGRAM TO INCREASE NATURAL FISH PRODUCTION IN LARGE RESERVOIRS AND LAKES

Recently, the inland fisheries branch assembled for the survey team some facts and estimates on a program to increase fish yield in large reservoirs and lakes. In spite of attendant problems, the potential increase was set at five pounds of fish per surface acre each year.

Exhibit XLIV, which follows, shows that existing bodies of water could produce more than 1,800,000 additional pounds of game fish each year on this basis. This amount is about equal to the weight of catchable trout produced during the 1957-1958 Fiscal Year. The exhibit further shows that proposed reservoirs to be completed during the next 20 years could be expected to produce a minimum of 900,000 pounds of additional game fish annually.

These estimates have not included the many hundreds of smaller reservoirs and lakes in California which have similar potential.

(1) *Realizing the Potential Will Take Time and Money*

Immediate tapping of the natural fish-producing potential described in Exhibit XLIV is not practical. Many technical problems must be solved in devising the proper techniques to achieve the desired increase in natural fish production.

Basically, many California reservoirs and lakes do not now possess natural food in sufficient quantities to support large yields of game fish. Increasing the yield may require supplying the links in food chain.

EXHIBIT XLIV

State of California, Department of Fish and Game

POTENTIAL OF INCREASED NATURAL PRODUCTION OF FISH IN LARGE RESERVOIRS AND LAKES*

Types of existing reservoirs and lakes	*Number*	*Total surface area (acres)*	*Potential additional pounds of fish each year†*
Warm water fluctuating	39	156,638	783,190
Cold water fluctuating	29	40,076	200,380
Very large cold water	3	159,800	799,000
Intermediate	8	17,758	88,790
Cold water regulating	3	2,150	10,750
Totals for existing reservoirs and lakes	82	376,422	1,882,110
Types of proposed reservoirs			
Warm water fluctuating	31	123,420	617,100
Cold water fluctuating	18	25,861	129,305
Intermediate	14	31,473	157,365
Totals for proposed reservoirs	63	180,754	903,770
Totals for existing and proposed reservoirs and lakes	145	557,176	2,785,880

* Based on department figures.

† Computed at the rate of five pounds per surface acre.

An example might be a chain composed of unicellular algae, zooplankton that feed on the algae, a small forage fish or minnow that feeds on the zooplankton, and the game fish that feeds on the forage fish.

Even though adequate food may be present, large bodies of water may not possess natural spawning habitat for game fish. In this case, fingerling plants may offer the means of utilizing the fish-producing capacity of the water.

In some reservoirs, fish already exist in quantity but they may be stunted due to lack of food or they may be the wrong species—a rough fish such as carp or some types of minnows. Establishing game fish in such bodies of water may require chemical treatment to destroy trash fish and then restocking with game fish. Large bodies of water cannot be treated chemically; so other methods, such as introducing game fish that eat the trash fish, must be tried.

Each body of water requires some study to determine the existing conditions. Next, one or more solutions must be tried to determine the approach that will produce the desired increase of five pounds of game fish per surface acre each year. Introduction of the wrong solution can create a new problem of eliminating undesirable fish—requiring additional serious study.

Teams of skilled fish management personnel are needed to do the job. Recommendations and suggested rates of effort for such teams are presented in the next section.

(2) *Assign Teams to Develop Reservoir and Lake Fish-Producing Potentials*

Department estimates of the manpower and cost needs to develop the fishing capacities of existing large reservoirs and lakes is shown in the following table:

Type of reservoir and lake	*Number of men*	*Amount of time*	*Annual cost*	*Cost of program*
Warm water fluctuating	9	5 years	$85,000	$425,000
Cold water fluctuating	5	5 years	50,000	250,000
Very large cold water	4	5 years	70,000*	350,000
Intermediate	4	5 years	30,000	150,000
Totals	22		$235,000	$1,175,000

* Includes cost of fingerling plants.

The program is estimated to require 22 men at an annual cost of $235,000 for five years, or total expenditures of $1,175,000.

Expectations are that most of the potential in the several types of water would be realized at the end of the five-year period. The plan would involve teams for each type of water.

One team would work on warm water fluctuating reservoirs such as Cachuma, Berryessa and Shasta; another on cold water fluctuating reservoirs such as Big Sage, Boca and Pillsbury. Other teams would work at Lake Tahoe, Eagle Lake and Clear Lake (Modoc

County). Another team would work on intermediate reservoirs such as Britton, Conn and Isabella.

Work at cold water regulating reservoirs such as Nimbus is considered marginal since an expenditure for one man at $10,000 per year, or $50,000 for five years would result in an estimated increase of only 10,000 pounds of fish per year.

Department estimates of development costs might be somewhat higher. Careful planning of project methods, procedures and action schedules with continual review of progress and results should reduce the amount of manpower needed on these teams. Elapsed time of five years will be needed due to the time which must pass before test programs can be evaluated.

One method of appraising the worth of spending $1,175,000 in five years on increasing the natural yield of fish in the bodies of water is to compare the estimated costs with artificial production costs. The following table shows the comparison for a 10-year period:

Type of production	*Pounds of fish produced*	*Estimated capital outlay*	*Estimated annual cost*	*Total estimated cost for 10 years*
Natural	1,800,000	$1,175,000*	$100,000†	$2,175,000
Artificial	1,800,000	$1,000,000	$900,000	$10,000,000

* Cost of development work spread over previous five years.
† Estimated annual sustaining cost after development work is completed.

Natural fish production would thus cost only about 22 percent of the artificial production costs in a 10-year period.

2. INCREASE NATURAL FISH PRODUCTION IN EXISTING SMALLER BODIES OF WATER THROUGH CHEMICAL TREATMENT

Natural game fish production in many existing bodies of water in California is low due to the presence of trash fish. Trash fish are either stunted game fish or undesirable rough fish. At the request of the survey team, the department has identified existing bodies of water which require chemical treatment to eliminate undesirable fish before game fish can be produced in quantity.

In the following table, estimated costs for chemical treatment are shown:

Region	*Number of reservoirs*	*Surface areas*	*Estimated cost of chemicals*
I	11	1,020	$8,540
II	25	5,547	35,274
V	11	23,980	36,580
	47	30,547	$80,394

Fish-producing capacity of the 47 reservoirs after treatment would be at least 150,000 pounds per year (five pounds per surface acre) for from 5 to 10 years.

It is estimated that it would cost four times as much to plant 150,000 pounds of catchable trout in these waters each year for five years, as shown below:

Type of production	*Pounds of fish produced*	*Estimated chemical cost*	*Estimated annual planting cost*	*Total estimated cost for five years*
Natural	150,000	$80,395	$1,500*	$87,894
Artificial	150,000	------	$75,000	$375,000

* Cost of fingerling plants to produce trout since reservoirs do not allow natural spawning.

On these bases, the chemical treatment of these 47 reservoirs would be more economical than planting catchable trout.

LICENSE ADMINISTRATION

Two million fish and game licenses are sold annually by approximately 3,900 independent license agents in most cities and towns of California. The Department of Fish and Game also sells licenses at both the Sacramento headquarters and at its regional offices. The sale of licenses yields approximately $8,000,000 in revenue annually, which is approximately 80 percent of the department's total income.

1. THE REVIEW OF LICENSE ADMINISTRATION INDICATED SEVERAL PRINCIPAL CHARACTERISTICS OF IMPORTANCE TO THIS SURVEY

License issue and accounting is administered by the department on a decentralized, regional basis. Approximately 20 persons, located at the various regional offices, issue licenses to selling agents and maintain accounting records. The license officer in departmental headquarters maintains overall functional supervision of the license activity but has no direct line authority. In the regional offices the business service officer, who reports to the regional manager, has authority over and responsibility for license administration. Generally, the accounting records are maintained manually.

Bulk licenses are issued to authorized license agents on a consignment basis. License agents account to the regional offices for licenses sold on a monthly basis. In general, a commission of 5 percent of the basic license fee is allowed to the license agents in compensation for clerical and administrative work in connection with license issue. No commission is permitted on the increased fees adopted in 1957. The total of such commissions paid to license agents approximates $350,000 per year.

All license agents are voluntary. Practically all license agents are engaged in retail-type businesses which depend upon people coming into their places of business, or are engaged in businesses closely allied to recreation activities. Consequently, license agents derive an indirect benefit from the fact that actual or potential customers come to them to buy hunting and fishing licenses.

License procedure requires the license agent or his representative to complete the informational portion

of the issued license. The license applicant is required to supply the desired information, and to sign the completed license.

Generally, any businessman desiring to be a license agent is acceptable to the department provided he is bondable by the bonding company utilized by the department. Such bonding costs are borne by the department, amounting to approximately $6,500 per year.

There are approximately 65 various types of hunting and fishing licenses, permits and tags, although most agents issue only the more popular forms of hunting and fishing licenses.

Excellent service is rendered to the license buying public by means of the widespread coverage afforded by some 3,900 license agents. It is noteworthy that sportsmen are able to secure their licenses in almost any locality, at almost any time of the day.

2. SALE AND ACCOUNTING FOR FISH AND GAME LICENSES INVOLVES A LARGE AMOUNT OF ADMINISTRATIVE EFFORT

The sale and accounting for fish and game licenses is consequently a very considerable administrative effort for both the department and the license agents. The opportunities for sizable cost reductions through work simplification and centralization of administration became apparent during the course of the study.

Detailed analysis and development of recommendations are presented in the following paragraphs of this chapter. It is estimated that the total potential savings resulting from these recommendations can be in excess of $175,000 per year.

3. CLERICAL WORK LOAD FOR LICENSE AGENTS CAN BE MATERIALLY REDUCED

At the present time, license agents are required to initiate and complete each license individually and to report by serial number on each license sold. The calculation of commissions is a somewhat difficult procedure, complicated by the fact that commissions are not allowed on license stamps. As a result, the license agent is required to devote a considerable amount of time to license issuing and accounting.

Four significant opportunities for simplification of the license procedure for agents are identified.

(1) *Adopt a "Self-Issued" License Application Form*

The placing of responsibility on the applicant for correct completion of the license application as to the identifying data (name, address, age, height, weight, sex, color of eyes and hair) would relieve the license agent of much time-absorbing clerical work. In effect, the applicant should be required to complete the application, to present it to the license agent for validation, and to complete the validation process.

The mechanics of validation would be accomplished by the purchase of a serially numbered stamp from the license agent. This stamp would be similar to the present trout stamp, except that the serial number should appear on the face. The license application form would not become a license until properly validated. The validation process would consist of the following:

—Writing of issue date on face of stamp and on application by license agent.

—Affixing of proper stamp to license application by applicant.

—Signing face of stamp by applicant.

Such a "self-issued" procedure should reduce the agent's time to issue a license by at least 50 percent. Control would not be reduced, as the validated license would be identified to the buyer by reason of the validating signature. Service to sportsmen would be improved through faster issuing of licenses, especially at times of peak demand for licenses such as occur just prior to opening of a season.

(2) *Adopt an "Application-Stub" Type of License*

The "self-issued" license application would permit the use of a less expensive form of license. At the present time, a three-part, snapout form, with one-time carbon inserts, is used for fishing and hunting licenses. Such a form is relatively expensive. In 1958 the printing cost exceeds $24,500 for fishing and hunting licenses.

The carbon-insert form had been adopted in order to eliminate the dual work of recording certain data on the license copy remaining with the agent. If the applicant were required to duplicate his name and address on the license application stub, the expensive three-part form could be eliminated. Printing savings estimated at approximately $10,000 per year could be achieved, after allowing for some additional cost in printing a larger quantity of validating stamps.

It would be possible for the application and the stub to be marked by an identifying serial control number. The stub could remain in the possession of the agent during the license year, for use by the agent and by law enforcement personnel. The agent could be required to mail the stubs to fish and game headquarters at the end of the year for survey purposes. Such stubs would be less bulky than the present license copies now mailed to regional offices by license agents.

(3) *Design an "All-purpose" Angling Application and an "All-Purpose" Hunting Application*

In order to reduce the number of different kinds of license applications, there should be an "all-purpose" angling application and an "all-purpose" hunting

application. These forms would replace the present six types of fishing licenses and five types of hunting licenses. The basic information on all these various licenses is the same. Under the concept of the "self-issued" license, it would be the responsibility of the license agent to determine which license was appropriate, to check the appropriate box on the application and on the stub, and to issue the proper stamp to the license buyer. Exhibit XLV, which follows, presents a suggested "self-issued," "all-purpose" "application-stub" form.

The use of a gummed stamp, such as the present angling stamp, to validate any type of angling license application would simplify the license inventory problem for license agents. Instead of maintaining as many as five types of fishing licenses as well as trout stamps, it would only be necessary for an agent to maintain a supply of "all-purpose" application blanks (which would have no value) and a supply of $1, $3 and $10 validating stamps. Thus, some greater flexibility in maintaining an inventory would be achieved.

(4) *Simplify the Deer and Bear Tags*

In 1958, the department simplified the pheasant tag by requiring that only the name of the tag buyer and the number of his hunting license be entered on the pheasant tag and that the pheasant tag number be entered on the hunting license. The hunting license number was also required to be on the pheasant tag stub. Such a procedure simplified the work of issuing a pheasant tag, for detailed identifying data were no longer required. License agents thruoghout the State have commented favorably on this simplification.

Inasmuch as the tag and the hunting license are identified to each other, the necessary control is provided. This simplified procedure should also be applied to the deer and bear tags.

(5) *Simplify the Accounting by License Agents*

The present monthly license report required of license agents can be significantly simplified in two important respects. First, the computation of commission can be greatly simplified by the use of a lower, uniform commission rate applicable to all license revenues. The present law which specifies certain commissions on some licenses and none on others places an administrative hardship both on the agent and on the Department of Fish and Game. An equivalent lower rate applied to all licenses would be of help in reducing clerical workload.

Secondly, the accounting for license stamps should be in terms of serial numbers assigned to books, rather than to individual stamps. In this concept, a book of 50 angling stamps would bear a base control number, such as A 5901. Each stamp in the particular book would bear the number A 5901 plus a subnumber of -01 through -50. However, the agent should be required only to list the base control number of the book being accounted for, plus the base and subnumber of any stamps returned voided or unissued. Such a system would reduce the clerical work required of the agent and also of the fish and game license audit function inasmuch as voided stamps would be rare and blocks of 50 stamps could be reported by a single base control number. Exhibit XLVI, which follows, presents a suggested "license report form."

It is gratifying to report that both of these ideas for simplifying the accounting by license agents originated within the Department of Fish and Game.

In summary, it is recommended that the workload on the license agent be reduced by (1) adopting a "self-issued," "all-purpose," "application-stub" license form and by (2) simplifying the accounting procedure for agents. It is estimated that these procedural changes would result in a 50 percent to 60 percent reduction in clerical effort required of the average license agent.

4. BASED ON THESE SIGNIFICANT REDUCTIONS IN LICENSE AGENT WORKLOAD, THE RATE OF COMMISSION PAID TO LICENSE AGENTS SHOULD BE ESTABLISHED AT 2 PERCENT ON ALL LICENSES

License agents as a group have been reimbursed a total of approximately $350,000 in Fiscal 1958 for their services as license agents. This is a considerable sum of money, the cost of which is borne by the department out of moneys paid by license buyers.

A very basic question is raised by the fact that payments are made to agents for their services in this function. Historically, it has been the practice for the State of California to reimburse license agents for their services. However, this practice is not consistent with the general policy of the State of California not to reimburse private businesses for revenue-collecting services performed for the State. It is sufficient to note that approximately 275,000 retailers throughout the State are required to collect and account for sales tax moneys, without any reimbursement. Similarly, perhaps 250,000 employers act in a like capacity for unemployment insurance and disability insurance moneys, without any reimbursement.

It can be logically argued that a consistent state policy should be applied. It can also be pointed out that license agents are acting on a voluntary basis, and have the remedy of resigning their license agency if they deem the agency not to be desirable. However, most, if not all, the 3,900 agents probably recognize the business-building advantages of being a license agent.

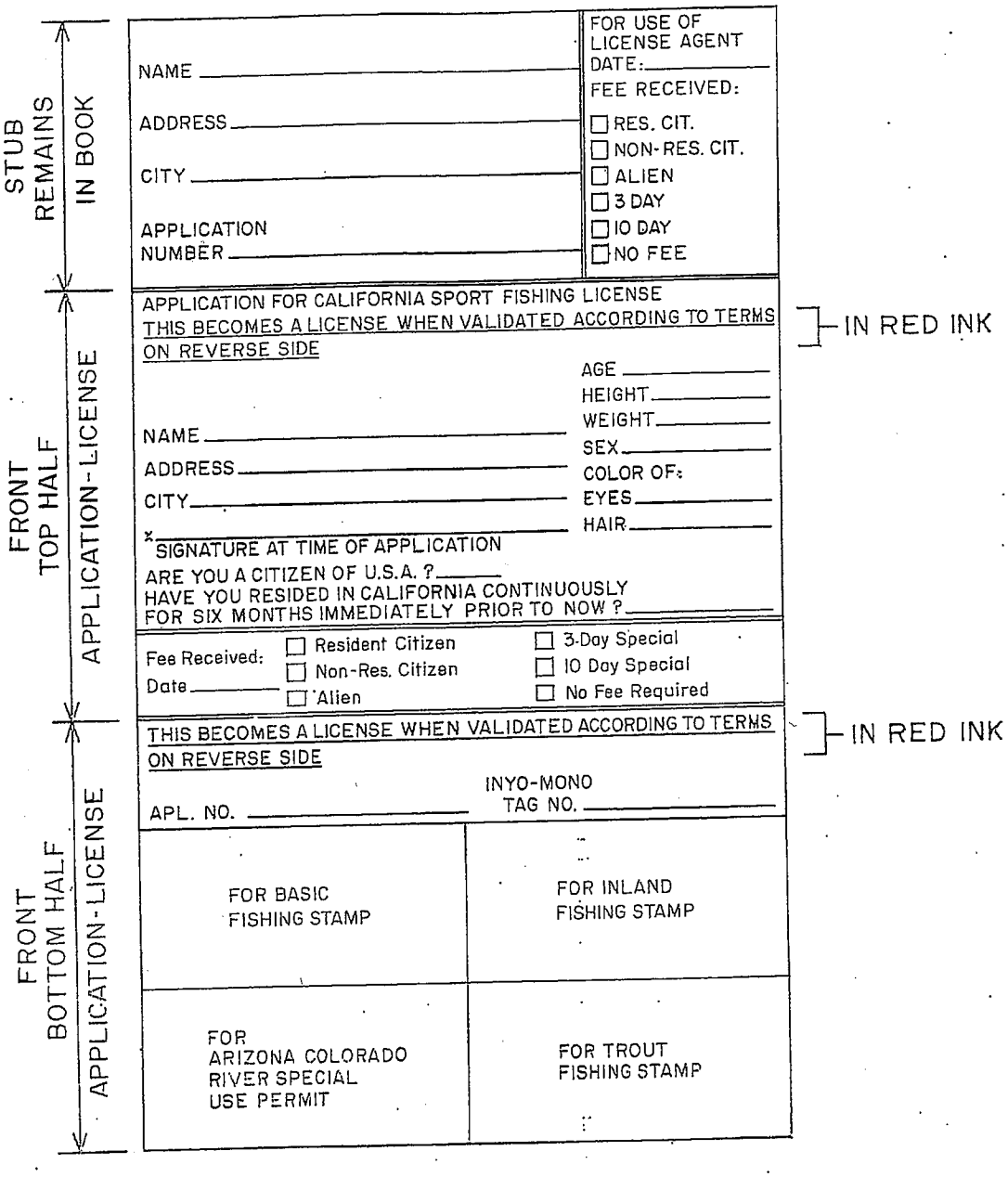
A strong case can be made, therefore, for discontinuing all commission payments to license agents. However, there is merit to the counter-position that

EXHIBIT XLV

State of California
Department of Fish and Game

TENTATIVE FORM OF ALL-PURPOSE COMBINED APPLICATION AND LICENSE FOR SPORT FISHING

FRONT SIDE



REVERSE SIDE

THIS APPLICATION BECOMES A VALID LICENSE UPON PAYMENT OF PROPER FEES.
ALL VALIDATING STAMPS MUST BE FIRMLY AFFIXED TO FRONT SIDE AND SIGNED IN INK ACROSS FACE OF EACH.

1. OCEAN FISHING - BASIC STAMP REQUIRED

RESIDENT CITIZEN	$ 3.00	FOR CALENDAR YEAR
NON-RESIDENT CITIZEN	$10.00	
ALIEN	$10.00	
10 DAY SPECIAL	$ 3.00	
3 DAY SPECIAL	$ 1.00	
CERTAIN AGED PEOPLE - NO FEE		

2. INLAND FISHING (EXCEPT FOR TROUT)

BASIC STAMP IS REQUIRED. IN ADDITION, ONE $1 SPECIAL STAMP IS REQUIRED.

3. TROUT FISHING

BASIC STAMP IS REQUIRED. IN ADDITION, TWO $1 SPECIAL STAMPS ARE REQUIRED.

4. COLORADO RIVER FISHING (WHERE COLORADO RIVER FORMS MUTUAL BOUNDARY BETWEEN CALIFORNIA AND ARIZONA.

IN ADDITION TO OTHER STAMPS REQUIRED, ARIZONA COLORADO RIVER SPECIAL STAMP IS REQUIRED.

EXHIBIT XLVI

State of California
Department of Fish and Game

TENTATIVE FORM OF LICENSE REPORT FORM

Agent's name _____

Address _____

Date _____

License Year	Name of License Stamp	Stamps Sold		
		Quantity	Unit Value	Amount

Stamps Returned		
Quantity	Unit Value	Total Value

Total _____

Total Less: Comm. _____

Remittance _____

Serial Numbers of Stamp Books Accounted for		Serial Numbers of Individual Stamps Returned	

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MANAGEMENT CONSULTANTS

inasmuch as the entire fish and game program is self-supporting, the cost of issuing licenses should be borne by the revenues from fish and game licenses.

The survey has approached this issue on the basis that, at the very minimum, commissions to agents should be reduced to the same proportion that the license agents' workload may be reduced. Inasmuch as it is accepted practice that license agents be reimbursed for issuing and accounting for licenses, it is logical that if workload is reduced 50 percent, commissions should also be reduced 50 percent. Based on the simplifications developed in the preceding section, a commission rate of 2 percent on all licenses sold should be allowed license agents. The 2 percent rate would result in a total commission of approximately $160,000, as compared to the present $350,000. Such a concept, if adopted, would result in a savings of approximately $175,000 each year to the Fish and Game Preservation Fund.

If the State should elect to eliminate all commissions to license agents, approximately $350,000 would be saved each year.

5. DEPARTMENTAL COST OF LICENSE ADMINISTRATION CAN BE REDUCED

The survey has also critically reviewed the departmental costs of license administration. License accounting and administration is currently on a decentralized basis. As previously stated in Chapter XII, Departmental Organization, the license officer in department headquarters at Sacramento has responsibility for establishing the systems and procedures by which license accounting and administration will be conducted. The license officer, reporting to the administrative officer, does not have supervisory control over the license activities in the regions. The business service officer in each regional headquarters is responsible for administering the issuing and accounting for licenses.

The internal aspects of license administration were carefully reviewed. Various practices of license administration were examined in considerable detail. Four significant improvement or cost reduction opportunities were identified. These recommendations are as follows.

(1) *Centralize All License Administration in Sacramento Headquarters*

This recommendation has been discussed in detail in Chapter XII, Departmental Organization. Centralization offers an opportunity to achieve significant economies through mechanization of accounting procedures and improved utilization of personnel. The estimate of possible cost savings are included in Chapter XII. Centralization of license administration can be accomplished without impairing necessary service to license agents. It is very important that all requests by agents for additional licenses be handled promptly in the central office. This can be done. It is also important that personal contact be maintained with license agents throughout the State. It is recommended that the conservation officers make periodic visits to license agents in their subdistricts in order to maintain contact with agents. If correspondence from the central office should fail to solve problems with license agents, the conservation officer should be called upon to visit the particular license agent. These minor administrative problems should not prove to be any bar to centralization of license administration.

(2) *Simplify the Auditing Procedure*

It has been previously recommended that a simplified reporting procedure be adopted for the license agents whereby (1) book numbers, rather than stamp numbers, be accounted for, and (2) commissions be computed on total license sales. Such a procedure would also reduce the auditing time required, thereby aiding in reducing clerical requirements in license administration.

(3) *Administratively Reduce the Number of License Agents*

Both from the viewpoint of administrative cost and of service to sportsmen, the State of California has more agents than it needs. Fewer agents would reduce license administration costs at department headquarters without impairing service to sportsmen. It therefore is recommended that the following administrative action be instituted to establish and maintain license standards for license agents:

— Raise the minimum annual requirements for license sales from $300 to $600, except where geographical distribution will be lost. It is estimated that this would reduce the number of agents by between 5 percent and 10 percent.

— Adopt and strictly enforce departmental rules on prompt reporting of license sales and on credit standards. Such action will ease the administrative work load of the license officer by reason of reducing the amount of correspondence.

(4) *Review the Number of Types of Licenses Required*

Currently there are approximately 65 different types of fish and game licenses. Any reduction in this number would be of some assistance in reducing the administrative work load. A review of estimated 1958-59 license revenues revealed the following:

	Estimated revenue in 1958-59
Bass tags	$20
Kelp harvesters	30
Pheasant and coot permits	50
Bird net tags	5
Bird net permits	50

It is recommended that a review of these and other low-volume licenses, tags and permits be made with the view of reducing the number of types of such licenses.

The various recommendations relating to license administration are designed to streamline paper work without sacrifice of desired service, coverage and control. Simplification of license administration offers the potential annual savings of $175,000 in commissions paid to agents, and of approximately $10,000 in operating expenses. The savings in clerical positions to be derived from centralization of license administration in department headquarters have been included in the estimated cost reductions reported in Chapter XII, Departmental Organization.

CHAPTER XVI

THE FISH AND GAME COMMISSION

In 1940, the present Fish and Game Commission was created by constitutional amendment. From the standpoint of the department, the commission is the most important of the several bodies that influence the department's courses of action. By statute, the commission is responsible for setting general policies for the department, and the director is responsible to the commission for administering the department in accordance with these general policies.

As provided in the 1940 amendment, the commission consists of five members, appointed by the Governor and approved by the senate, who serve six-year terms that are staggered to prevent more than one regular appointment per year. The commission is required by law to hold public meetings in January and February to consider and set fishing regulations and in April and May to consider and set hunting regulations.

While the commission is not limited to the number and locations of additional meetings nor to the amount of time individual commissioners devote to their responsibilities, each commissioner is paid $10 a day for a limit of five days a month. In addition, commissioners are reimbursed for actual and necessary expenses incurred in the performance of their duties.

Under present statutes, the commission occupies a complex position in California fish and game conservation. There are real opportunities to simplify the commission's position and to improve its effectiveness in guiding state wildlife conservation programs. Recommended actions for realizing these opportunities are developed in this chapter.

1. DISSOLUTION OF THE WILDLIFE CONSERVATION BOARD WOULD SERVE TO CLARIFY THE COMMISSION'S POSITION AND ELIMINATE DUPLICATION OF EFFORT

In 1947, the commission was a relatively young and inexperienced body, and the legislature was reluctant to give the commission added responsibility for controlling expenditure of several million dollars from pari-mutuel funds for wildlife purposes. As a result, the Wildlife Conservation Board was created to evaluate proposed capital improvements and acquisitions and to allocate expenditures from the Wildlife Restoration Fund for worthy projects.

Board membership consists of the President of the Fish and Game Commission, the Director of the Department of Finance and the director of the Department of Fish and Game. In addition, three senators and three assemblymen representing the legislature act in concert with the board members on an advisory basis.

Board expenditures have on the whole favored facility improvements such as overhauling the fish hatchery system rather than habitat improvement. Although greater emphasis to the latter area is now needed, the board expenditures have been well planned and worthwhile.

Currently, and since 1955, $750,000 has been appropriated annually to the board, and there is an accumulated surplus of more than 1.5 million dollars.

Capital improvements and acquisitions made by the Wildlife Conservation Board become operating responsibilities of the department with attendant operating, maintenance and repair costs which must be paid out of department funds. Since it has no responsibility for department programs and budgets, the board is under no obligation to act in the interest of departmental efficiency and economy. Consequently, some board improvements and acquisitions commit the department to annual operating maintenance costs which are high or could have been avoided if greater consideration had been given to department plans and problems.

In addition to its members, the board employs a separate staff consisting of a project co-ordinator, an assistant, a consultant and three clericals. Total support for the board, its staff and facilities amounts to over $80,000 a year, slightly more than 10 percent of the $750,000 annually appropriated for the board.

Part of the field work for board projects is now performed by department personnel at the expense of the Preservation Fund. All field work could be done by the department as part of its regular field work. Project co-ordination could be handled by the branch chiefs under the proposed associate director—plans. The associate director—control could assume responsibility for accounting and clerical duties. Most of these functions would be performed by the department at no extra cost to the Preservation Fund since the department already gives wildlife conservation projects careful sudy and attention.

Need no longer exists for the Wildlife Conservation Board as a separate body to control annual expenditures of $750,000 in capital improvements and acquisitions. The Fish and Game Commission is now a mature group that can and should assume this responsibility and, in addition, co-ordinate wildlife conservation projects with department plans and programs. At the same time, the department can perform wildlife conservation project co-ordination and field work at a distinct savings in cost. It is estimated that

annual savings amounting to a 50 percent reduction in salaries and expense for board staff, or $40,000 can be realized.

RECOMMENDATIONS

1. Dissolve the Present Wildlife Conservation Board and Its Staff
2. Place Responsibility for Evaluating and Approving Wildlife Conservation Projects Under the Fish and Game Commission
3. Eliminate Duplication of Effort and Expense in Project Co-ordination and Field Work by Having the Department Perform All of This Work

2. CO-ORDINATION OF MARINE RESEARCH COMMITTEE AND FISH AND GAME COMMISSION IS POSSIBLE

In 1955, the Legislature reconstituted the Marine Research Committee to include five members who represent commercial fish processors and four other citizen members, of which at least one each shall represent organized labor and organized sportsmen's groups. All members are appointed by the Governor for two-year terms.

Primary function of the committee is to aid research as it affects commercial fishing. Funds for this purpose derive from a special privilege tax on licensed fish packers and processors. Although empowered to employ technical and clerical assistance, the committee contracts its research through the Department of Fish and Game, U. S. Fish and Wildlife Service, University of California, Scripps Institute of Oceanography, Stanford University and California Academy of Sciences.

To some degree, the committee through its research program influences the department marine resources research programs and consequently the expenditure of Dingell-Johnson Federal Aid funds and the Preservation Funds.

Since the committee exists in the interest of commercial fish processors and its support is a self-imposed tax on this group, dissolution of the committee or its placement under the Fish and Game Commission is not warranted. Furthermore, the committee influence on the department in a relatively narrow field.

There is definite need, however, for the committee research program to be co-ordinated with that of marine resources in the department. Thus, committee and department funds would be better spent due to elimination of overlapping between research projects.

RECOMMENDATION

1. Arrange for a Joint Meeting of the Commission and the Committee Every Two Years and More Often as Necessary, to Co-ordinate the Research Programs of the Department and the Committee

3. APPOINTMENT OF THE DIRECTOR OF THE DEPARTMENT OF FISH AND GAME IS AN IMPORTANT CONCERN OF THE COMMISSION

California, in its executive departments, follows the philosophy that members of the Governor's official staff should serve at his pleasure to provide an administration that reflects the will of the public. Consequently, the director is appointed by the Governor although he is responsible to the commission for department administration according to commission general policies. Some other states provide for appointment of directors by fish and game commissions.

Under the present plan in California, the director serves as long as the Governor feels that the department is providing proper services to the public. If the commission appoints the director, the advantage is that the director can provide desirable continuity to long-range fish and game plans, programs and operations.

It is apparent that the leveling factor between both approaches is in selecting the right director to fulfill the requirements of the job. The right director will provide proper fish and game services for the public. He will accomplish this by planning and executing the programs which will best protect, perserve and increase California wildlife resources. He will insure that Californians are provided the information and facts necessary to understand current and anticipated problems that affect state wildlife and that the programs are being followed to overcome the problems and to improve hunting, fishing and other wildlife recreation in the State. If the director should administer the department in a manner satisfactory to the public and to the Governor, he should serve long enough to give continuity to department programs.

To do this, however, the director will of necessity work closely with the commission in carrying out commission policies and in keeping the commission advised of department conditions and problems so that the commission may consider and set new policies required in proper administration of the department.

In California, it seems proper to have the Governor appoint the director of the Department of Fish and Game. Since the commission also must work through the director, it is right that the commission have some say in the appointment. A logical method is to have the commission nominate the list of prospective directors from which the Governor makes his selection.

RECOMMENDATION

1. Provide for the Governor to Appoint the Director of the Department of Fish and Game From a List of Eligibles Nominated by the Fish and Game Commission

4. RESPONSIBILITIES OF THE FISH AND GAME COMMISSION SHOULD BE CLARIFIED AND STRENGTHENED

At the present time the responsibilities of the commission are not so stated that uniform agreement can be reached as to their scope. It is important that these responsibilities be clearly and fully stated.

Responsibilities of the Fish and Game Commission should be clarified and strengthened so that it would be the recognized and accepted wildlife conservation policy-making body in California. As such, it would be a "board of directors," as in an industrial or commercial enterprise.

RECOMMENDATION

1. **Enact Legislation to Clarify and Strengthen the Responsibilities of the Commission. Such Wording as the Following Is Suggested:**

"It shall be the responsibility of the Fish and Game Commission, a constitutional body, to provide leadership through its delegated policy-making authority for the preservation and management of the wildlife resources of the State.

"It is further their responsibility to institute broad policies of conduct for the department; and to direct the department through the director to submit for consideration such plans, programs, wildlife regulations and all other information which will adequately and intelligently carry out the constitutional and legislative intent of the department's functions.

"It is not a function of the commission to exercise any administrative authority over the Department of Fish and Game."

5. FISH AND GAME COMMISSION EFFECTIVENESS CAN BE IMPROVED

Recommendations presented in previous paragraphs improve commission effectiveness by clarifying commission responsibility in the fields of wildlife conservation and marine resources research and by giving the commission some voice in the selection of the director. These recommendations require legislative approval and action. The commission itself can take several steps which would improve its effectiveness in setting fish and game regulations, in setting general policies for the department and in determining how well the department is following commission policies.

(1) *Greater Knowledge of the Department Is Needed by the Commission*

If it is to set regulations and policies appropriate for use by the department, the commission must have a more intimate knowledge of conditions and problems that the department faces and must be able to review and comment on department plans, programs and budgets before public announcement. This cannot be done in open hearings one or two days a month.

Although Section 105 of the Fish and Game Code states that "all records of the commission shall be open to inspection by the public during regular office hours . . ." the code does not require that all commission meetings be official and a part of the official record. Therefore, the commission can and should hold periodic informal and closed sessions with department personnel to gain the necessary background for evaluating department activities and determining proper general policies to govern department administration. The commission could hold closed sessions with other parties as well, although the need is less evident.

One of the most important ways in which the commission should acquire greater knowledge of department problems and activities is provided in the form of the department's long-range and short-range planning. Chapter XI presents the various aspects of the planning concept. Certainly, one of the important uses of department planning should be to inform the commission of the future plans of the department and to obtain its approval of the planning. As has been discussed in Chapter XI, department planning should be the common denominator by which the entire unity of fish and game management is achieved. Mutually-agreed-to and understood plans can build unity of action between the Legislature, the commission, the public and the department.

Another means by which the commission can be better informed on department plans and operations would be provided by the complete manualization of department policies, organization and procedures. Chapter XIV, Management Controls, stresses the importance of developing a full set of department manuals for the guidance and control of department operations. These manuals would be a multi-purpose tool, one through which the commission could have greater knowledge of department operations.

Additional understanding of the department can be gained by commissioners if they will take more trips to the field to inspect installations and activities.

Commission action should, of course, continue to be taken in open session after adequate hearings of interested parties.

(2) *Present Assistant to the Commission Can Be Eliminated*

Under present arrangements, the assistant to the commission has these responsibilities:

"Safeguards observance of the provisions of all sections of the Fish and Game Code which require specific performance in connection with commission action, and counsels the commission and the department accordingly. Acts as the commission's

representative before legislative committees, sportsmen's groups, with members of the Legislature and with department administrators. Counsels and advises department administrators as to commission procedures. Makes decisions on operation of the commission office. Makes decisions as to what shall appear on the agenda of the commission's meetings, and advises commission concerning such items. Analyzes effect of Legislative bills affecting the Fish and Game Code, from the commission's standpoint."

Essentially, most of these responsibilities are duties that the director and his staff should handle. The fact that an intermediary now performs this work prevents a close relationship of the director with the commission and is costly.

Elimination of the assistant to the commission and one clerk would reduce the current commission support budget by $15,000 in salary and expense from over $43,000 a year down to $28,000. Those duties of the present assistant which the director would not perform and which concern the commission office could be handled by the secretary to the commission.

(3) *Commission Policies and Regulations Can Be Used More Effectively If Issued in Revised Format*

General policies which the commission has established are not organized in a manner for easy reference by the department and other interested parties. Department field personnel also indicate that the present form of commission regulations governing the taking of fish and game is difficult for use by the public, district attorneys, judges and justices.

The commision can request the department to prepare new formats for issuing commission general policies for the department and for issuing commission regulations on the taking of fish and game.

At the same time, the commission can consider the recent set of general policies submitted for approval by the department to determine the suitability of these policies with or without revision for inclusion in the new statement of commission policies. Wide distribution of the policies within the State would be desirable since these are the policies which will determine the course of department action.

RECOMMENDATIONS

1. Increase Commission Knowledge and Understanding of the Department Through Informal Meetings With Department Personnel to Discuss Long-range and Short-range Planning, and Through Increased Inspection in the Field
2. Improve and Strengthen the Relationship of the Director to the Commission by Elimination of the Assistant to the Commission
3. Revise the Format of Commission Regulations for Easier Use
4. Revise the Format of Commission General Policies for the Department and Give the New Publication Wide Distribution

6. COMMISSION RESPONSIBILITIES WOULD BE INCREASED

Recommendations presented above will increase the time and attention that commissioners will devote to fish and game matters.

Present commissioners are businessmen who give their time to commission matters at the expense of their regular positions. If time demands for commission work increase, present commissioners may not find it practical to continue in their positions although it is desirable to have them stay on the job.

Nevertheless, it does not seem necessary that salaries be paid to attract men possessing the necessary experience and judgment to accept appointment to the commission. In a state as large as California there are enough qualified, public-spirited men to fill the commission even though it may require considerable time each month. Present limitations of $10 per day for five days a month, however, should be increased to $10 per day for 10 days a month to encourage additional participation by commissioners through recognition that their time demands are not limited to five days a month. It is not expected that each commissioner will devote 10 days a month to fish and game matters, but that he will devote up to that amount as the need for commission action arises.

RECOMMENDATION

1. Increase Commissioner Payments at the Rate of $10 per Day From a Limit of Five, or $50 a Month, Up to a Limit of 10, or $100 a Month

7. LEGISLATIVE ACTION IS REQUIRED TO ASSIST THE COMMISSION IN ITS POLICY DETERMINATIONS

During this survey, it has become evident that Californians need to make certain basic decisions regarding future courses of action for state wildlife conservation programs if the commission is to set proper policies for the department to follow. The points can be best presented by posing these questions:

(1) To what degree should the department attempt to provide future hunting and fishing opportunities for future state population and license buyers?

(2) Should artificial propagation of fish and game be increased in the future to assist in meeting the anticipated increases in hunting and fishing pressures as the state population increases?

(3) Should those hunters and fishermen who benefit by artificial propagation programs pay for the actual costs of the programs?

(4) Should commercial enterprises be encouraged under appropriate control, to enter the field of artificial propagation and accompanying fishing and hunting programs?

The Legislature, representing the public, should answer these basic questions. The commission and the department should provide the Legislature and the public pertinent facts to aid in the final judgment. The department and the commission can and should determine the facts upon which the decisions can be made. The long-range planning of the department should develop the alternative ways which could be followed, together with the implications resulting from each alternative course of action. Such alternative plans are some of the facts which should be furnished to the Legislature and the public.

But facts alone will not determine the final answer. The public, through the legislature, must evaluate the facts and reach a decision. Once the basic policy decision is reached, the commission and the department can make the plans to carry out the public mandate.

Questions (3) and (4) are raised because revenues from the "put-and-take" pheasant and catchable trout programs do not cover the high costs of these programs. Chapter XIV, Management Controls, amply bears out this statement. If the Legislature decides that hunters and fishermen taking artificial fish and game should pay fully for the privilege, commercial groups may fill appropriate niches in the resulting programs.

Now is the proper time to answer questions (1) and (2) above since preparations of natural habitat and facilities for artificial propagation to provide hunting and fishing that will meet the demands of future populations at a rate proportional to that enjoyed today will take many years and will be costly.

Before the Legislature considers these questions, it is appropriate that the department prepare estimates of the extent of the hunting and fishing pressures and of the costs associated with providing hunting and fishing at various levels. This is a part of long-range planning. After review by the commission, these alternative plans should be submitted to the Legislature and to the public so that the size and cost of attendant programs can be considered at the same time that the desirability of the policy is discussed.

Depending upon the Legislature's answers to these questions, the commission may need to set new policies for the department to follow in planning and executing its programs for protecting, preserving, and increasing California wildlife and in providing adequate recreation for the public.

* * * * *

In this and preceding chapters, individual subjects studied during the survey have been analyzed and specified recommendations have been presented. In the next chapter, the full survey results and recommendations have been summarized and presented for consideration.

CHAPTER XVII

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Senate Concurrent Resolution No. 126 stated that this survey should include but not be limited to studies of five defined subjects as follows:

(1) Determination of relative levels of department effort for artificial propagation and improvement of natural habitat.
(2) Appraisal of departmental administration.
(3) Evaluation of department conservation education programs.
(4) Consideration of the effectiveness of Federal Aid expenditures.
(5) Survey of predatory animal control.

The second subject, that of departmental administration, inevitably led to a general survey of the department's activities and of the Fish and Game commission as any appraisal of administration is improved by an evaluation of the needs of the activities being administered. Hence, the chapters of this report have been organized largely around the functions performed by the department.

Material pertinent to the five defined subjects may, therefore, appear in several chapters. Here the conclusions and recommendations are regrouped under the five subject headings.

The necessary evaluation of activities other than those specifically listed produced several other sets of conclusions and recommendations. Here these are summarized under the following headings: Wildlife Protection, Marine Fisheries Management and Deer Management.

Action paragraph headings in the sections below present the summary recommendations in the major areas studied during the survey. Key recommendations are included under the headings. Some, more detailed recommendations, do not appear in this summary but are presented in the chapters. Chapter numbers in parenthesis at the end of paragraphs indicate the location of the detailed analysis and discussion behind the summary statements.

ARTIFICIAL PROPAGATION VERSUS IMPROVEMENT OF NATURAL HABITAT

Senate Concurrent Resolution No. 126 specified that the survey include:

> "(1) An evaluation of the artificial propagation programs of the Department and of Fish and Game with the aim of establishing levels of emphasis and expenditure for these programs in relation to the emphasis and expenditure that should be accorded improvement of habitat and natural conditions."

Careful study devoted to this phase of the survey produced the following key points:

1. INCREASE THE EMPHASIS AND ATTENTION GIVEN TO IMPROVEMENT OF HABITAT AND NATURAL CONDITIONS BUT HOLD ARTIFICIAL PROPAGATION PROGRAMS AT PRESENT LEVELS

Over all, the conclusion reached is that California should concentrate on improving its natural habitat for wildlife. Many specific recommendations proposed that the development enlarge the wildlife-supporting capacity of the State.

At the same time, strong recommendations are presented to hold the artificial propagation programs at their current production level and not to expand production. The "put-and-take" pheasant program is questionable from a game management point of view. If it is decided to continue this program, it should be on a "pay its own way" basis. Furthermore, specific plans were advanced to reduce the cost of these programs. (Chapters III, IV, V and VII)

2. IMPROVE THE HABITAT OF PRESENT LAND AVAILABLE AND ACQUIRE MORE LAND FOR HUNTING

Present department programs to increase hunting land are regarded as initial steps which must be enlarged and refined to achieve proper results. Full-scale concerted efforts are proposed to improve and add to the land now available for hunting.

More public lands should be set aside for recreational purposes and additional land should be acquired for pheasant and waterfowl. Increased opportunities for the unattached hunter to hunt should be given emphasis.

Land improvement programs are encouraged with continued emphasis on wise use of controlled brush burning, brush reseeding and on construction of access roads to areas now unaccessible. (Chapters III and IV)

3. TAKE STEPS TO ENLARGE THE FISH-PRODUCING CAPACITY OF RESERVOIRS, LAKES AND STREAMS

Expansion of fish-producing capacity of California's present and proposed bodies of water is recommended to take precedence over increased hatchery production of catchable trout. As discussed in Chap-

ter XV, Cost Reduction Opportunities, the potential for this approach is larger than the present catchable trout program. But action is needed to realize the potential since projects to develop the proper fishery for each body of water must be completed before the benefits can be received.

In addition, it is proposed that the department stream improvement and water development program should be strengthened and accelerated. A comprehensive program to place fish screens at water diversion outlets is suggested to keep fish out of irrigation canals. Increased use of fish management tools such as water impoundment, flow maintenance dams, chemical elimination of trash fish and stream improvement devices is recommended. (Chapter V.)

4. IMPROVE ABILITY TO HANDLE WATER PROJECTS AND POLLUTION

Applications to use California water for industrial and agricultural purposes must be processed by the department if wildlife needs for the water as natural habitat are to be recognized and protected. More applications are being received than the present staff can effectively handle. More staff is recommended to process water projects. Investigation of possibilities that the cost of department water projects work be shared by the agency constructing the water project is suggested. (Chapter VII.)

Water pollution problems require time-consuming work to detect sources of pollution, the kinds and amounts of fish affected, and the corrective action needed. Pollution control now is not effective due to the lack of manpower. More staff is proposed to handle the problem of pollution control. Present pollution laws do not allow the department to correct all known pollution violations. Enactment of more workable pollution laws is recommended. (Chapter VII.)

5. REDUCE ARTIFICIAL PROPAGATION PROGRAM COSTS

Present pheasant and catchable trout production at game farms and fish hatcheries can be maintained, but operating costs can be reduced by consolidating a number of high-cost operations at more efficient installations and by improving operating methods. Recommendations are to:

- Consolidate all pheasant production at Yountville and Los Serranos.
- Reduce the number of hatcheries producing trout from 14 down to seven.
- Increase use of dry feed at fish hatcheries.

Plans for partially consolidating game farms in accordance with the recommendation would reduce operating costs for present production by $80,000 a year after capital outlays costing $200,000. This rate of annual savings would pay back the capital outlay in two and one-half years. Plans for consolidating fish hatcheries and using more dry feed allow reductions in operating costs of $310,000 each year after capital outlays of $333,000. This rate of annual savings would pay back the capital outlay in 13 months. Note also, that after the pay-back periods, the annual savings accrue each year as a continuing economy. (Chapters IV, V and XV.)

These savings could be used to support habitat improvement programs recommended in previous paragraphs.

6. IMPROVE SALMON AND STEELHEAD PROGRAMS

Critical reductions observed recently in salmon and steelhead runs require intensive department attention. A new salmon-steelhead research and management section is recommended. Suggestions are made that stream clearance and barrier removal programs for salmon and steelhead be accelerated.

In view of the emergency, it is also suggested that raising salmon and steelhead at inland fish hatcheries and in water impoundments be considered. (Chapters V, VI and VII.)

* * * * *

Many department personnel recognize the worth of the recommendations discussed above. But factors both inside and outside the department have prevented concerted action. Recently the department has moved to create the salmon-steelhead section as recommended in preceding paragraphs. This action is commendable.

DEPARTMENTAL ADMINISTRATION

Survey study specifications included:

> "(2) A review of the methods and procedures of administration of the department both on the headquarters and regional levels to determine if general business functions are operating with all possible efficiency and to ascertain if there is a possibility of effecting any consolidation of regional administrative operations."

During the survey much attention has been directed to departmental administration. Recommended action for simplifying the relationship of the department with the Fish and Game Commission are found in Chapter XVI. Each of the wildlife consultants has included recommendations for improving department administration in his chapters. In addition, Chapters X, Evaluation of Departmental Administration; XI, Planning; XII, Departmental Organization: XIII, Teamwork Among Department Personnel; XIV, Management Controls; and XV, Cost Reduction Opportunities, analyze administrative conditions and

develop recommendations for improvement. Summaries are found in the following sections.

1. CLARIFY THE FISH AND GAME COMMISSION ROLE AS A POLICY-FORMULATING BODY FOR THE DEPARTMENT

Under present statutes, the commission occupies a complex position in California fish and game conservation. There are real opportunities to simplify the commission's position and to improve its effectiveness in guiding state wildlife conservation programs.

Need no longer exists for the Wildlife Conservation Board. as a separate body, to control annual expenditures of $750,000 in capital improvements and acquisitions. It is recommended that the present board be dissolved and that the commission assume present board responsibilities. Also it is strongly urged that the department assume the responsibilities of the present board's staff group to eliminate duplication of effort and expense. Annual savings of $40,000 are possible.

There is definite need for the Marine Research Committee research program to be co-ordinated with that of the Marine Resources division in the department. It is recommended that the commission and the committee provide this co-ordination by arranging joint meetings every two years and more often as necessary to discuss all marine research projects.

Responsibilities of the commission should be clarified and strengthened so that it would be the recognized and accepted wildlife conservation policy making body in California. As such it would be a "board of directors" as in an industrial or commercial enterprise. Suggested wording of several sentences accomplishing this purpose is set forth in Chapter XVI.

Action on above recommendations for improving the position of the commission is important. The commission itself needs greater knowledge about the department. It is recommended that the commission hold more informal meetings with department personnel and that its members make more inspection trips to department field operations.

Further, a recommendation is made that the relationship between the director and the commission be strengthened by eliminating the assistant to the commission. The director and his department staff would assume the assistant's responsibilities. Savings due to elimination of the assistant and services rendered for him would amount to $15,000 per year.

Finally, it is believed that the commission should have a voice in the selection of the director. The position is one best occupied by a dedicated professional conservationist. The department will profit by continuity of professional administration. However, this administration assuredly must be sensitive to the needs and feelings of the sporting public.

Previous recommendations should assist in giving the commission greater insight into the problems and proficiencies of the administration of the department. Presumably members of the commission will have an acquaintanceship among leading figures in conservation circles nationally. Therefore they will know both the needs of the department and people qualified to be director.

The commission is appointive, however, and on a staggered basis. The Governor is the elected head of the State and presumably reflects the will of the public. We therefore recommend that the director continue to be appointed by the Governor, but from a list of candidates submitted by the commission, and with the advice and counsel of the commission.

Chapter XVI presents a number of questions on the future of hunting and fishing opportunities in California, on the future status of artificial propagation programs, on who should pay for artificial propagation programs and on the part commercial enterprise should play in these programs. It is recommended that the Legislature act on these questions after the department and commision have presented the facts on the questions for legislative consideration. The Legislature, representing the public, can best answer these basic questions.

2. IMPROVE DEPARTMENT PLANNING ACTIVITIES

Planning in a large organization is the first step toward success. It provides the vehicle for focusing department resources of money, manpower and facilities toward accomplishment of definite goals. It furnishes the detailed assignments for various groups of department personnel to carry out. It allows co-ordination of the various groups through time schedules. It establishes standards or yardsticks of performance against which results can be measured and poor performance corrected.

Short-range planning may extend over one or two years and be in considerable detail. Long-range planning may extend over 10 or 20 years and lack the detail which can only be supplied as the immediate future comes into better focus.

Lack of a formal, organized and integrated long-range plan has hindered the department in accomplishing its goals. In many instances, department goals or objectives are not stated in written form and prevent adequate planning. Responsibilities for developing plans are not clearly placed on individuals in the organization.

Due to the lack of complete and timely plans, the department has failed to be an effective leader in molding public opinion. Many department activities are emergency actions on controversial matters. Better planning could have avoided the controversies and emergencies.

Conversion of public and private land to agricultural and industrial use is reducing the natural habitat for wildlife. Greater need for department planning to provide for required future wildlife conservation programs is apparent. The Fish and Game Commission has a strong role in conservation planning.

Recommendations for improved department planning are:

(1) Set specific objectives for the department.
(2) Establish clearly defined general and operating department policies.
(3) Consolidate planning responsibilities in the department.
(4) Give adequate attention to developing both long- and short-range planning.
(5) Develop realistic plans through co-ordination with people in the field.
(6) Secure approval of objectives, policies and plans from the Fish and Game Commission.
(7) Use approved plans as standards against which to evaluate operational performance.
(8) Carry department planning to the public.
(9) Provide for budget flexibility to meet natural emergencies.

Discussion of planning is contained in Chapter XI. Organization changes to implement planning recommendations are contained in Chapter XII.

3. REVISE DEPARTMENTAL ORGANIZATION FOR FURTHER IMPROVEMENTS

Since 1953, the departmental organization has been geographically decentralized on a line and staff basis. The present departmental organization form is based on sound principles which can be further applied to produce additional improvement.

Under the present plan, headquarters staff personnel have not been allowed to perform their jobs of advising the deputy director on the control of their functions in the field. This difficulty can be corrected.

The present responsibility of the deputy director for handling both headquarters planning and regional operations is too big a task for one man. Establishment of a new associate director—plans is recommended to allow the deputy director to concentrate on operations. All of the branch chiefs and the water projects co-ordinator will report to the new associate director. The newly recommended top organization reporting to the director will consist of the deputy director—operations, associate directors—plans and control, and the assistant director—information.

The associate director—control replaces the present administrative officer, and the assistant director—information replaces the present conservation education officer.

Within the regions, further decentralization of operations is recommended. Wildlife conservation is largely field work. Field personnel must have essentially the same basic qualifications whether performing law enforcement, game management or fisheries management duties. Knowledge and proficiency in the one category assists in carrying out another category of work.

Generally, the department has no large concentrations of people in the field, and consequently considerable travel is involved at present by the various functional personnel who must each cover the same areas.

Recommendations are made in Chapter XII that the regions be divided into districts and that most field personnel be assigned to work under district managers as generalists. The generalists would be composed of present law enforcement, game management and fisheries management personnel reclassified after adequate training to be conservation officers. Each would be qualified to perform all functions in the field.

By dividing the State into 22 districts and eliminating one or more layers of functional supervisors, it is possible to reduce the number of regions needed to manage field activities from five down to four. Functional supervision is retained at each regional headquarters to manage the game farms, waterfowl management areas and fish hatcheries, and to provide functional guidance for the regional and district managers.

Greater public acceptance of wildlife programs can be achieved through the unity of effort possible under the district plan. Placement of decision-making authority closer to the point of action in the field eliminates delays and improves the decisions. The district plan reduces the number of supervisory levels over the field man from four to six, under the present organization structure, down to three and vastly improves communications between the director and field personnel.

Modern organization planning utilizes to advantage the principle of decentralizing operations and centralizing services. Centralizing regional business services at headquarters under the associate director—control can reduce the number of people processing and handling paper work.

Primary regional business service functions consist of processing accounting and personnel records and of handling license administration. Most field personnel and license agents are widely scattered and mail papers and forms to the regional offices for processing. This material can be mailed to Sacramento as easily as to a regional office. Material originating in the regional offices need only be assembled and sent to headquarters. Processing of the various reports and records can be handled more economically at a central location with extensive use of mechanical equipment. Summary reports can be prepared quickly and sent back to regional management for action.

Centralized business services have been recommended. Business service officers are then no longer needed in the regions since clerical services remaining in the region can be supervised by the secretary to the regional manager. The regional manager would look to specified positions in the control division at Sacramento for necessary advice on accounting and fiscal matters.

Reduction in the number of regions and creation of the new districts will require concentrated attention by the deputy director in establishing workable boundaries for each. Recommendations for criteria to use in establishing the proposed boundaries are contained in Chapter XII.

The four new regions have been named the northern region, the north-central region, the south-central region and the southern region. All four of the new regions run from the coast across to the eastern state lines. This arrangement permits flexibility for interchanging personnel to meet workload fluctuations.

Region III under the present regional plan has been eliminated and Region V reduced in size.

In addition to all other benefits, the revised organization plan permits cost reductions which may be as great as $186,000 per year. Since the survey has been made for the Legislature, these conclusions and recommendations were not discussed with department personnel.

4. IMPROVE TEAMWORK AMONG DEPARTMENT PERSONNEL

Department personnel are sincere, capable people dedicated to conservation, but there has been a lack of uniformity among the regions and of teamwork among functional groups in the field. Differences in policy and program interpretation have resulted in diverging effort and action. Friction within the department has been reflected in divided public reaction to the department's wildlife programs.

Under the proposed organization plan of dividing the regions into districts and of establishing generalists in each district, the career program for department personnel will improve. The generalist concept widens the job responsibilities of most field personnel and provides a new promotion channel from conservation officer I to conservation officer II to district manager to regional manager.

In addition to responsibilities for law enforcement, the generalist will be qualified and expected to carry the fish and game programs to the people. The present tendency for functional division of the department would be greatly reduced.

Unity of effort through teamwork can be improved by indoctrination, training and supervisory practices designed to promote better understanding of department policies and programs. Recommendations are:

—Plan an indoctrination and training program within the framework of the in-service training program to assist field personnel to develop into generalists.

—Plan a management development program for potential and actual supervisors and managers.

—Carry out such training programs on a timetable co-ordinated to meet the needs of the proposed form of organization.

—Continue to emphasize the importance of two communication channels—up and down the organization—within the department.

—Continue to emphasize the full range of responsibilities placed upon all department personnel.

—Improve the use of staff meetings within the department.

—Complete the department operating manual.

These recommendations are contained in Chapter XIII and are planned to improve the teamwork of department personnel. But these ideas can only serve as tools in the hands of department supervisors and managers who must develop the team.

5. ESTABLISH BETTER MANAGEMENT CONTROLS

Present management controls in the department are largely in the area of budgetary control. Prescribed state procedures of fiscal control are used.

No current reports show the cost of the various wildlife programs such as deer management or "put-and-take" pheasants. Headquarters staff personnel have not conducted systematic inspections of field operations. There are few standards of performance in written form which inspectors could use to evaluate field performance.

As a result, each region has proceeded on its own without benefit of over-all control from headquarters.

During the survey, department revenues and costs were analyzed by wildlife program to compare revenue against costs for the several programs and to study the feasibility of making a wildlife program analysis report a regular part of department management controls. Some conclusions of the analysis are:

(1) By program, game and inland fisheries programs each account for 40 percent of the total budget, and marine fisheries for the remaining 20 percent.

(2) By function, management and operations consume 43 percent of the total budget, law enforcement 19 percent, administration 14 percent, research 14 percent, conservation education 5 percent and miscellaneous expenditures 5 percent.

(3) Game and inland fisheries revenue exceeded expenditures for these programs while marine fisheries revenues were less than program expenditures.

(4) In general, each of the two programs in which both wild and artificially propagated wildlife are involved are self-supporting in total, however.

— While the "put-and-take" pheasant program costs almost $600,000, revenues for this program only amount to about $100,000. Thus, wild pheasant hunters are contributing about $500,000 to its support.

— Program costs for catchable trout are almost $2,000,000 but the revenues for catchable trout are only about $725,000. Thus wild trout fishermen are contributing about $1,275,000 to its support.

These conclusions must not be taken too literally since the analysis was based on a number of assumptions and approximations, but the trends indicate the desirability of having such information available when deciding on license fees and levels of emphasis for expenditures in the future.

Installation and maintenance of revenue and cost controls on a continuing basis is strongly urged. The proposed cost accounting system would supplement budgetary accounting. Daily time reporting would be required of all department personnel except those whose activities fall into general or administrative categories.

Further recommendations are:

— Develop quantitative measures of performance in order to evaluate programs and results.

— Prepare cost accounting reports on a monthly, quarterly and annual basis.

— Have all control reports prepared by the centralized accounting department.

The department is urged to adopt other significant management controls including:

— Compilation of detailed written material covering commission and department policies, organization and operational procedures.

— Periodic inspections of headquarters, regional and field activities to insure compliance with department policies, methods and procedures.

— Critical review, elimination and/or revision of all regular reports made throughout the department.

It is important that the director rely heavily on the use of management controls in directing the progress of his widely dispersed department organization.

* * * * *

Recommendations for improving departmental administration are extensive. The department faces a substantial task in acting to place all recommendations in effect. But the resulting benefits are essential to the success of the department in meeting its obligations of protecting, preserving and improving wildlife.

6. TAKE ADVANTAGE OF COST REDUCTION OPPORTUNITIES

During the survey, several cost reduction opportunities were developed. Some occur as part of the organization changes recommended for the commission, the board and the department. Others result purely from the desire to introduce more economical operations in the department.

A summary of the dollar savings which can be realized and the chapter containing the details of the plan are as follows:

Chapter	*Source of savings*	*Approximate amount*
XII	Reduction from 5 to 4 regions and installation of district and generalist plans could mean as much as	$186,000
XIV	Consolidation of game farms at Los Serranos and Yountville	80,000
XV	Reduction in operating costs of fish hatcheries	310,000
XV	Adoption of a new licensing procedure	10,000
XVI	Dissolution of the Wildlife Conservation Board	40,000
XVI	Assignment to the department of the responsibilities of assistant to the commission	15,000
		$641,000

There is the possibility that the adoption of the new licensing procedure can increase department revenues through reduction of license agents commissions. The workload of license agents is reduced and, consequently, a reduction in their commissions can be considered.

Another type of cost savings is developed in Chapter XV—the future savings possible through increasing the natural fish production of California lakes and reservoirs as a much more economical alternative to increasing artificial fish production at hatcheries.

CONSERVATION EDUCATION

Contained in the Senate Concurrent Resolution was the directive for:

> "(3) A survey of the conservation education activities of the department with the aim of evaluating the function of this branch and the publications and printing of the department."

In conducting this survey, it has seemed appropriate to enlarge its scope. The study has included the total task of placing department plans and programs before department personnel and the public and of gaining the acceptance of these two groups.

Every state conservation department has found it necessary to devise ways and means of informing all

concerned as to the new knowledge consistently being gained about wildlife management and its effect upon wildlife conservation policies, programs and practices. The people are entitled to an honest evaluation of the problems inherent in conservation.

The task of giving proper information to the public is tied directly into providing the same information for all personnel within the department. It is notable that the department has not been able to sell its programs to its own personnel, much less the general public. There is a real need for the department to improve the material which is given to the department personnel and to the public for their consideration and acceptance. Survey comments and recommendations are classified under the following points:

1. IMPROVE DEPARTMENTAL IN-SERVICE TRAINING

Until department personnel accept department programs, it certainly is not wise to present these programs to the public. Department personnel in the field constitute one of the major channels of communicating department programs to the public, and each of these field personnel should be convinced of the soundness of department programs. Divided opinions among department personnel are quickly noticed by the interested public with the result that department programs are not completely accepted.

It will be necessary that greater time and attention be given to preparing announcements of department programs to all department personnel before such programs are released to the general public. (Chapters III, IV, VI and IX.)

2. ENLARGE THE INFORMATION STAFF WITHIN THE DEPARTMENT

Recommendations contained in Chapter XII, Departmental Organization, place a public information officer at each region headquarters and at Terminal Island. This constitutes an increase of three of these positions since two regions already have information officers. Salaries for these positions were allowed in Chapter XII before the potential net cost reduction was computed. Increasing the information staff is in recognition of the tremendous job of giving information to the public which the department must undertake if it is to gain better acceptance of its programs.

No increase in the headquarters staff of the assistant director for information is contemplated. There is a recommendation, however, that the talent needs of the headquarters information staff be reviewed and that the proper talent for the staff be obtained. A specific suggestion is that a staff member possessing experience and knowledge in working with state school systems be added to the staff. (Chapter IX.)

3. STRENGTHEN THE CONSERVATION EDUCATION PROGRAM

Chapter XII, Departmental Organization, recommends that the conservation education activities be placed under a new position, the assistant director—information, reporting to the director. This move is a part of an overall plan to improve the conservation education program.

Specific recommendations in Chapter IX for strengthening this program are:

(1) Rewrite conservation education objectives to:
- — Emphasize the department as a guardian of wildlife resources and a leader in their management.
- — Recognize the interests of hunters and fishermen.
- — Recognize the interest of that segment of the public who enjoy the aesthetic elements of nature.
- — Provide for youth education in conservation and use of wildlife resources.
- — Set forth department policies on all department personnel giving uniform information to the public.

(2) Place quarterly publication under the assistant director—information.

(3) Re-examine the publication costs of the quarterly in an effort to reduce costs if possible.

(4) Modify editorial policies of *Outdoor California* to stress conservation fundamentals, contemplated changes in regulations, and more progress reports on research. Give less emphasis to department virtues, big fish catches and trophy heads.

(5) Increase the number of pages in *Outdoor California.*

(6) Make a strong effort to develop reader interest in *Outdoor California* and increase paid circulation to a minimum of 75,000 copies.

(7) Retain responsibility for preparing fish and game regulation digests within the department.

(8) Designate the sign used for licensed game clubs.

(9) Sell licensed game club signs at cost only if determined that this is a department responsibility.

(10) Print and distribute angling guides and maps as a management tool and as a service to the hunting and fishing public, but avoid taking on the role of a tourist bureau.

(11) Continue present news release service.

(12) Improve news release quality to obtain more interest by newspapers.

(13) Plan and implement a conservative program of exhibits for use at shows important to the conservation movement.
(14) Limit use of motion pictures to more important conservation matters where budgets can be justified on results obtainable.
(15) Develop slides to carry larger portion of conservation education presentation work load.
(16) Improve educational efforts by constant review of broad conservation concepts.
(17) Develop better ways of presenting conservation concepts.
(18) Consider expanding the budget allotted to conservation education as effectiveness of this activity is improved.
(19) Implement a policy of department-wide participation in conservation education.
(20) Initiate programs whereby each division and region contributes material for conservation education use.
(21) Continue the hunter safety training program.
(22) Increase the amount of conservation fundamentals and wildlife hunting and fishing ethics taught in the program.
(23) Improve conservation education programs for schools.

While the assistant director—information will bear major responsibility for placing the above recommendations in effect, the new regional and district organization plans will provide a sound structure for improving the acceptance of wildlife programs by department personnel and the public.

4. INCREASE THE INFORMATION PROGRAM ON THE OPPORTUNITIES FOR HUNTING AND FISHING GIVEN TO THE PUBLIC

Some upland game is not being fully harvested. There is a need to develop more public interest in the opportunities to hunt doves, pigeons, chukar, quail, rabbits and squirrels. Similarly a need is to advise the public of the opportunities to catch warmwater fish. Good game and fish management requires that the surplus of these various wildlife resources be harvested each year. (Chapters IV and V.)

CONTROL OF FEDERAL AID RESEARCH AND DEVELOPMENT PROJECTS

One specification of the study was:

> "(4) Consideration of the effectiveness of the department's use of funds received under the Pittman-Robertson Federal Aid in Wildlife Restoration Act and the Dingell-Johnson Federal Aid in Sport Fish Restoration Act to determine if the best possible utilization is being made of these funds."

A major conclusion is that federal aid for wildlife and sport fish restoration has been utilized properly in building the fund of knowledge for game and fish management. (Chapters III, IV, V and VI.)

Recommendations have been made, however, that control of federal aid projects be improved through establishment of completion dates for each project, through more frequent termination and rewriting of the objectives of the projects and through better evaluation of projects to see that they are achieving their objectives. (Chapters III, IV, V and VI.)

Suggestions are made that some disease laboratory work be farmed out to outside agencies; that some larger research and development projects be programed to supply needed information; and that some projects should be redesignated as development rather than research to avoid false impressions of the nature of the work. (Chapters IV, V and VI.)

Other specific recommendations are that more warmwater fish research and more research on the planting of fingerlings be made in the inland fisheries management group research under the Dingell-Johnson Act. (Chapter V.)

PREDATORY ANIMAL CONTROL

The last specific directive of the Senate concurrent resolution was that "(5) A survey of predatory animal control, particularly existing duplicating activities" be made. The survey results have shown that predatory animal control is more important to state agriculture than to game. Recommendations advanced in Chapter III, which discussed predation as a part of the big game program, state:

(1) Use predator control only when and where studies show that game is being damaged severely.
(2) Contribute financially to the U. S. Fish and Wildlife Service coyote control program.
(3) Abolish remaining lion hunter positions.
(4) Simplify cougar bounty administration by reducing female bounty to $50.

When needed, field personnel can carry out predatory animal control through trapping and other devices as necessary. Special positions to carry out this work are not necessary.

* * * * *

Subsequent summaries of conclusions and recommendations cover subjects which were outside the specifications of the Senate concurrent resolution but which were made a part of the survey in order to better evaluate the overall department programs and policies.

WILDLIFE PROTECTION

Enforcement of fish and game regulations is one of the department's most important and its most vital

responsibility. Wardens carry out their law enforcement duties in every section of the State. Under the newly conceived generalist plan, law enforcement will constitute a major task of the conservation officer.

At the present time, wardens are one of the chief means of conveying and interpreting department policies and programs to state residents. Since the department has not presented its programs in a convincing manner, some wardens have not always acted in the best interest of the department.

Recommendations to overcome some of the wildlife protection problems are these:

(1) Define the relationships between the wildlife protection branch chief, the regional manager and the regional supervisor by listing the specific areas in which they should work with each other and the expected results in each case.
(2) Review all law enforcement activities in each region to determine where lack of statewide uniformity exists and to identify problems.
(3) Hold meetings of regional managers and law enforcement supervisors to discuss lack of uniformity between regions and other law enforcement problems.
(4) Develop standard law enforcement interpretations, procedures and equipment.
(5) Issue performance standards as directives from the deputy director.
(6) Develop and implement plans to interchange personnel between areas in each region.
(7) Develop and implement plans to interchange personnel between regions.
(8) Provide direct participation of regional law enforcement personnel in developing the wording of fish and game regulations.
(9) Keep marine patrol within the regions.
(10) Direct the Wildlife Protection Branch chief to devote sufficient time to co-ordination and evaluating interrelationships between inland and marine patrol to insure intelligent co-ordination and operation.
(11) Retain the wildlife protection function in the Department of Fish and Game.

Chapter VIII contains the discussion and analyses from which these recommendations were developed.

MARINE FISHERIES MANAGEMENT

There is no evidence that the effectiveness of Marine Resources Operations can be improved by splitting it into existing regions, designating it as a new region, segregating it as a department branch of research or removing it from the department. Recommendations are, therefore, that the basic organization structure be retained and that the present Marine Resources Operation manager report to the Marine Resourches Branch Chief.

Since the biostatistical section of Marine Resources Operations can refine and improve reliability of all research, it is recommended that its services be made available to the entire department.

Marine patrol is effective as a separate unit from Marine Resources Operations. Recommendations are made, however, that marine patrol act in acquiring and dissemination of information on behalf of Marine Resources.

With regard to research and development projects both being under federal aid and preservation fund fiscal support, these recommendations are made:

(1) Project planning should be given greater emphasis.
(2) No all-out policy for contracting research should be adopted.
(3) Continue to develop research orientation programs.
(4) Give greater emphasis to co-operation with out-of-state agencies.

Internal administration recommendations for Marine Resources are:

(1) The basic pattern of the present marine resources organization should be disturbed as little as possible.
(2) Consolidate marine research activities at the project level into two groups:
   —One group should be located at Terminal Island.
   —The other group should be located at Stanford.
   —Project assignments to each group should follow definite policies.
(3) Improve the facilities at Stanford University.

Chapter VI contains the analysis and discussion from which these recommendations have been developed.

DEER MANAGEMENT

From the standpoint of California wildlife, no other subject is more controversial than the department's deer management program. Acceptance of this program both by department personnel and the public has been spotty. The program itself can be improved by simplifying the manner in which the need for harvesting does is computed and the way in which the need for the doe harvest is presented to department personnel and the public.

It is recommended that the annual surplus of does continue to be harvested on a controlled basis. Further, it is recommended that after public confidence in the ability of the commission and the department is restored with regard to deer management that the full regulatory power be returned to the commission.

Specific recommendations regarding deer depredation involve the continued use of special seasons to reduce deer herds in problem areas, the encouragement of county zoning to keep agriculture out of forest game areas, and the recognition that increased deer harvesting by hunters will reduce, but not solve, the depredation problem.

It is also recommended that the State continue participation in the various interstate deer herd committees and that recommendation of these committees be followed by the commission.

Chapter III, Big Game Management, presents a full-scale discussion and development of recommendations concerning the deer management program.

* * * * *

In the next and last chapter, suggested steps are presented for the department to take in implementing the recommendations contained in this report.

CHAPTER XVIII

PLAN OF ACTION

Implementation of the recommendations in this report will take a lot of time and effort. Approvals from outside the department will be necessary in many instances. An orderly approach to installing the recommendations will allow their accomplishment in an effective manner in the least amount of time. A suggested program follows.

First, the report will require study by key department personnel. The director should then assign responsibility for action on each item. Action assignments are more effective if the assignment includes completion dates. Individuals should be held responsible for planning the necessary action, organizing to take the action, placing the plan into effect and then following through to see that the desired results are obtained.

Another action for the director is the selection and appointment of an individual to fill the new position of associate director—plans. All the branch chiefs and the water projects co-ordinator will report to the associate director—plans under the proposed top-level reorganization plan for the department.

During the period in which the majority of recommendations are being implemented, the director should hold meetings at least monthly with his key assistants to discus progres and to control results. After several months, the progress sessions can become part of regular staff meetings since remaining action will by then have become part of regular department programs.

Each of the four assistants reporting to the director —responsible for plans, operations, control and information—will have definite parts to play in putting the many recommendations into effect and in obtaining desired results. In general:

- The plans division will determine what and how things are to be done and who will do them.
- The operations division will do the things according to the plans and in accordance with operating manual policies and procedures.
- The control division will summarize progress and results in control reports.
- The information division will determine the manner in which the information on programs planned and in effect is given to department personnel and the interested public.

1. ASSIGNMENT FOR THE ASSOCIATE DIRECTOR—PLANS

Key report recommendations which the director should assign to the associate director—plans for action are these:

(1) *Preparation of Department Objectives and Policies*

- Final draft should reflect the thinking of the plans, operations, control and information divisions.
- After approval by the director, the draft should be submitted to the commission for approval.

(2) *Preparation of a 10-Year Long-Range Plan*

Major attention in this plan must be devoted to improving natural habitat. The 1954 10-year program prepared by the department identified types of improvement and suggested rates of expenditures. The proposed plan, however, should list individual projects with cost estimates and expected benefits for each program. Specific programs must be developed for the plan in the areas of:

- Improving the habitat land available and acquiring more land for hunting.
- Taking steps to enlarge the fish-producing capacity of reservoirs, lakes and streams.
- Improving ability to handle water projects and pollution.
- Reducing artificial propagation program costs.
- Improving salmon and steelhead programs.

A program to demonstrate the benefits of installing the deer management program should be included. These and other appropriate plans will, of course, be the basis for insuring consistent action by the department in years to come. An understanding and appreciation of them by all department personnel will be extremely useful in developing unity and teamwork. An understanding and appreciation of them by sportsmen's groups will aid greatly in developing public support. Therefore, it is essential that any semblance of "ivory tower" planning be avoided.

Obviously, the broad outlines of the plans must be established at headquarters. Successive refinements should take place through review at regional and district levels to the end that the planning be realistic, practical, understood and accepted throughout the field. As this condition develops, it will be much easier

to enlist the assistance and support of the sporting public.

It is evident that initial development of a long-range plan will take many months. Successive annual refinements will be less time consuming.

The finally developed plans should be thoroughly integrated at headquarters and informally reviewed with the commission before formal action is taken by that body.

(3) *Preparation of a One- or Two-Year Short-Range Plan*

In preparing the short-range plans for the department, the associate director should utilize the recommended steps for planning presented in Chapter XI, Planning.

Each program included in the short-range plan will need to be detailed in terms of definite assignments, standards of performance, schedules for action, financial arrangements, announcements to department personnel and the public and control measurements. Examples of programs that will be in the short-range plan are those for reducing the numbers of game farms and fish hatcheries.

Much of the detailed planning for programs to be included in the short-range plan will take place in the field where action is to be taken. The planning division will assemble the details from the field into workable programs.

As in the case of the long-range plan, after final approval by the director, the short-range plan should be reviewed informally by the commission before this body undertakes formal approval of the plan.

(4) *Preparation of Material for the Operating Manual*

Although the associate director—control will physically issue and control the department operating manual, the plans division will have the major role in determining the need for and in preparing the material required to complete the present manual. Each organizational group in the department should be encouraged by the plans division to list the subjects and problems to be covered in the manual. Functional policies, methods, systems and procedures, whether written by field or staff personnel, should be reviewed by the functional branch chiefs and the water projects co-ordinator and then the associate director—plans. All material prepared for the manual should be reviewed by field personnel in the operations division.

The director and his key assistants should approve all drafts of material for the operating manual before the material is finally given to the associate director—control for print and distribution.

(5) *Initiation of a Permanent Compliance Inspection Program*

Compliance inspection by functional branch chiefs and the water projects co-ordinator have already been started. The associate director—plans should arrange for a permanent program for headquarters staff to inspect all department activities on a regular basis.

Inspectors should look for compliance with department-written policies and methods and for uniform and consistent practices among the regions and districts. Regular inspection reports should be prepared. Irregularities observed should be included in the reports and given to the director for corrective action. Inspectors should also look for problems and potential problems and trends that should be treated in the operating manual.

2. ASSIGNMENT FOR THE DEPUTY DIRECTOR—OPERATIONS

Under the new organization plan, the deputy director—operations can concentrate on administering the department's field operations throughout the State. The director should assign action to the deputy director on these recommendations.

- — Eliminate lack of uniformity among the regions as rapidly as uniform policies and procedures are approved and issued.
- — Revise the regional organization structure.
- — Consolidate all game farms at Yountville and Los Serranos.
- — Reduce the number of fish hatcheries.

Steps necessary to action on these recommendations are as follows:

The deputy director can establish more uniform practices in the regions through these steps:

(1) Request that the regional managers list all known points of nonuniform practices between the regions.
   - — This list should cover all functional areas and all types of field activities.
   - — Functional supervisors in the regions should be asked to check the various field groups and operations under their control to identify their problems in making the practices uniform.

(2) Review at staff meetings the points of difference between the regions.

(3) Request the associate director—plans to prepare uniform practices for each point of difference for issue in the operating manual.

(4) Emphasize new uniform practices at staff meetings at the time they are issued as part of the operating manual.

(5) Review inspection reports prepared by members of the plans division in their compliance inspection work.

(6) Instruct regional managers to correct nonstandard practices observed during compliance inspection trips by members of the plans division.

(7) Request the associate director—plans to revise the wording of the operating manual as necessary to insure easier and more standard interpretation of its contents.

This action is expected to be of a continuing nature, but the first round should be completed in three or four months.

Revision of the regional organization structure is a major task that will take some time to accomplish. As detailed in Chapter XII, the plan calls for the creation of 22 districts under four regions. One of the present five regions is eliminated. Each district is to be headed by a district manager with a field staff of 10 to 15 conservation officers and assistants. In addition, the business service activities in the regions are to be reduced to the level of clerical services. License administration and processing of accounting and personnel records are to be centralized at Sacramento headquarters under the associate director—control.

The deputy director can initiate immediately arrangements for centralizing licensing, accounting and personnel record services. Arrangements should be such that this part of the new regional organization plan is put into effect one region at a time. Remaining clerical services in the regions can then be placed under a clerical supervisor and the business service officer positions eliminated.

At this point, the deputy director could start installation of the district plan. The program to establish uniform practices through the operating manual in all of the regions will be under way and will be setting a good foundation for conversion of present field personnel to the generalist classifications. Careful steps should be taken in installing the new organization plan.

(1) Establish finally the boundaries of the four regions and the 22 districts. Chapter XII contains criteria for setting these boundaries. Tentative boundary lines are shown on Exhibit XXXII, following page 148. The deputy director may want to use a committee for advice on establishing the proper boundaries.

(2) Hold a meeting of the regional managers to act upon these points.
- — Selection of one district in each of the planned four regions for initial application of the district organization plan.
- — Selection of an acting district manager for each of the four districts.

Careful selections are important. The acting district managers must be qualified in all field functions and must understand and support the generalist concept. The district selected in combination with the acting district manager must represent a sympathetic environment in which the new organization plan can operate.

(3) Hold a meeting of the regional managers and the four acting district managers selected. At this meeting, decisions should be reached concerning these points:
- — The number of generalist positions needed to staff each region.
- — The selection of fish and game wardens, managers and assistants to fill each position.
- — The methods and procedures for operating the districts.
- — The determination of indoctrination and training necessary before the selected field training of the field personnel.
- — The arrangement for indoctrination and personnel can assume the positions.

(4) Prepare and present the indoctrination and training material to the selected field personnel. It is expected that the main task will be in training the game and fisheries personnel selected to be competent in law enforcement.
- — The plans division will prepare the material to be presented.
- — The information division will determine the manner and techniques used in presentation.
- — The operations division will present the material.
- — Manuals of operating instructions should be prepared and issued to each man.

(5) Assign all personnel to the four districts and operate according to the prescribed instructions.
- — Acting district managers should identify operating problem experienced.
- — Frequent meetings of the regional managers and the acting district managers should be held to resolve operating problems on a uniform basis and to discuss progress.

(6) Prepare for conversion of all districts to the new organization concurrently with operation of the four initial districts.
- — Request assistance of the Personnel Board in establishing new classifications for district managers, conservation officers and conservation assistants. The control division will be responsible for contacting and working with the Personnel Board.

— Determine the training and development needs necessary to assist eligible department personnel to qualify for the new district manager and generalist classifications. Use of job descriptions and examination requirements prepared by the Personnel Board will constitute a major source of data for making this determination.

— Develop and present training courses which will assist in qualifying eligible fish and game wardens, managers and assistants as conservation officers and assistants.

— Develop and present management courses which will assist eligible department personnel in qualifying for district manager positions.

— Arrange for the Personnel Board to give necessary written and oral examinations to the department personnel desiring to complete for the district manager and generalist positions. The Personnel Board will establish lists from which the department can select properly qualified personnel to staff all remaining districts.

During this preparation period, the four initial districts will be gaining valuable experience in operating under the generalist plan.

(7) Convert one region at a time to the new district plan. These moves should be made after several months of experience in operating under the generalist plan and after sufficient personnel have been qualified to fill the new district manager and conservation officers and assistants classifications.

(8) Eliminate Region III gradually as the other regions are being converted to the district plan.

It is expected that the time necessary to complete these actions may run well over a year.

During this same period, the deputy director should be working on the cost reduction moves for the game farms and fish hatcheries. These steps are needed:

(1) Plans of action should be prepared for the deputy director by the associate director—plans.

— Schedules should be prepared to permit uninterrupted production of pheasants and trout as installations are closed and their production assumed by the remaining farms and hatcheries.

— Capital outlays for required expansion of the permanent farms and hatcheries should be approved by the commission or, if necessary, by the board.

— Reassignments or layoffs of personnel should be planned.

— Reassignment or disposal of equipment and facilities should be planned.

(2) Deputy director should assign action to appropriate regional managers on each installation to be expanded and each to be closed.

(3) Deputy director should hold progress sessions with each regional manager to be certain that planned action is completed in a satisfactory manner according to the approved time schedule.

It is expected that all consolidation moves can be completed within a two-year period.

3. ASSIGNMENT FOR THE ASSOCIATE DIRECTOR—CONTROL

These assignments should be made by the director to the associate director—control.

(1) Create the new control reporting of revenue and expenditures by fish and game program.

— Detail for this report must come from the field where new time reports will be required.

— Arrangements for the new time report should be completed for application at the start of the next fiscal year.

(2) Assume responsibility for issuing and maintaining the operating manual in up-to-date order.

— Requests that material be included in the manual can originate in any division in the department.

— Preparation of the material to be placed in the manual rests with the plans division.

— Before inclusion in the manual, all material should be edited by the information division.

(3) Centralize, as recommended, business service functions now performed in the regions.

— These moves should be scheduled to handle conversion of one region at a time.

— Taking on these new responsibilities a region at a time should allow for ready absorption on a centralized basis.

— In accomplishing this action, the associate director—control will need to work closely with the plans and operations divisions.

(4) Set up controls on the various cost reduction programs including the reduction in numbers of regions and regional reorganization by districts to realize all of the planned savings.

— Control reports on progress in realizing the savings should be given to the director and deputy director.

(5) Initiate a program to simplify the systems and procedures for preparing and using department records and reports.

— Special attention should be given to reducing paperwork in the field.

— First review should be directed to eliminating all records and reports which are not now serving a useful purpose.

— Next, remaining records and forms should be combined and simplified.

— This program should be continued to maintain control of forms and records.

4. ASSIGNMENT FOR THE ASSISTANT DIRECTOR—INFORMATION

The director should give these assignments to the assistant director—information for action:

(1) Strengthen present objectives of the conservation education program.

(2) Implement recommendations for improving the education program.

— Chapter IX lists each recommended action.

(3) Participate in planning all programs to be announced to department personnel.

— Plans should be laid to let department personnel know all department moves in advance of the public. The assistant director should participate in all such planning, although he and his staff should not necessarily participate in the meetings and announcements of department action to department people.

(4) Prepare announcements of department plans and actions for the public.

— Include facts and alternatives considered in making decisions.

(5) Advise the public of underharvested fish and game.

— Includes warm water fish, quail, chukar, rabbit and squirrel.

A program for action has been presented in this chapter. The program calls for organized and coordinated action carefully controlled to produce desired results. With capable, determined leadership and the support of the sportsmen of California, it can be done.

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