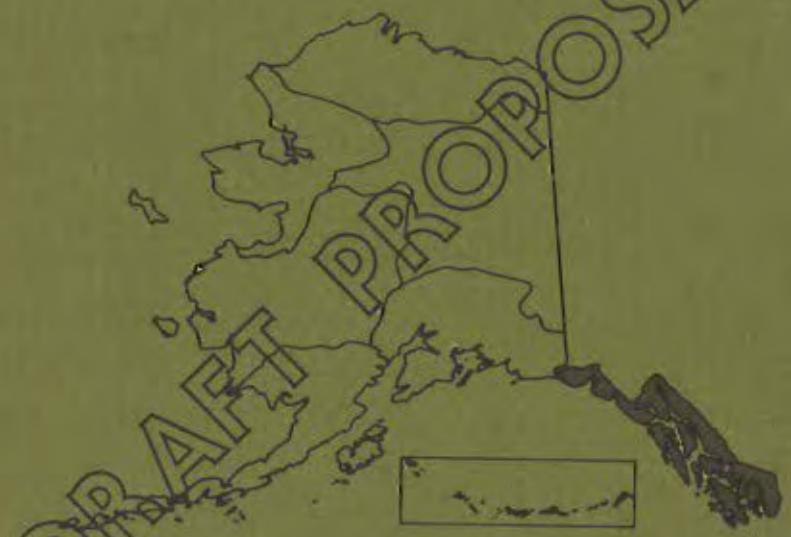
ALASKA WILDLIFE MANAGEMENT PLANS



DRAFT PROPOSAL

SOUTHEASTERN ALASKA

Alaska Dept. of Fish and Game

PART I:
WILDLIFE MANAGEMENT IN ALASKA

ALASKA WILDLIFE MANAGEMENT PLANS

A PUBLIC PROPOSAL FOR THE MANAGEMENT
OF ALASKA'S WILDLIFE

STATE OF ALASKA
Jay S. Hammond, Governor

Department of Fish and Game
James W. Brooks, Commissioner

Division of Game
Robert A. Rausch, Director

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FOREWORD

These Alaska Wildlife Management Plans are first and foremost proposals *for wildlife management developed by the Division of Game for consideration by the public. The many ideas contained in the plans are only a beginning - they form a basis upon which the public can comment and recommend. The plans are not inflexible, and even after they attain a more final form and are implemented, they will be subject to change as wildlife populations and public needs demand such changes.*

In addition to proposing management directions, the plans contain a wealth of information on the status and use of Alaska's wildlife populations. This valuable information was compiled from a number of widely scattered sources and much of it was not previously available in written form. These plans represent the most accurate assessment of wildlife status and use available to the Game Division at the time of writing in 1976. *However, wildlife populations are dynamic, and much of the information on population status will require reevaluation with time.*

Virtually the entire Game Division staff participated in the preparation of these proposals. Coming as it did amidst many other important tasks of the Division, this planning effort was most demanding. I am gratified by my staff's cooperation and support in this endeavor; their accomplishment reflects their professionalism and dedication.

Robert A. Rausch

Robert A. Rausch, Director
Division of Game

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WILDLIFE MANAGEMENT IN ALASKA

THE PLANS, THE DEPARTMENT OF FISH AND GAME AND THE PUBLIC

Alaska's Wildlife Management Plans are the result of a long-term planning effort which first resulted in the development of the Alaska Game Management Policies in 1973. These plans are another step toward developing a program for wise husbandry of Alaska's wildlife resources and, basically, are recommendations to the public by the Department of Fish and Game for the management of all wildlife in the state.

The information and recommendations contained in these plans represent a concerted effort by Department staff to compile and review existing information on the status, distribution, and uses of Alaskan wildlife populations. Current and projected land use patterns and natural resource potentials and developments are also considered. Synthesis of these plans began at the field level where local needs and conditions were best understood.

The need for planning in the management of wildlife, and particularly in the allocation of use of wildlife, has become pressing in recent years. Alaska is experiencing unprecedented growth in human population at the same time that immense land areas, conveyed to private ownership or federal single-purpose classification, may be lost to multipurpose public use. Development and mobilization of resources are impacting wildlife and its habitat and are bringing more people into contact with once-remote wildlife populations. In simplest terms, Alaska faces a rapidly growing demand for wildlife use which is in sharp contrast to the shrinking resource area available to support such use. Moreover, as pressures on wildlife populations increase, there are increasing possibilities that any given use will have detrimental effects. There is, therefore, need for greater precision in management.

The complexity of resource allocations requires the systematic approach provided by planning. In keeping with mandates of Alaska's constitution, the Department's planning efforts are intended to eventually achieve optimum, diversified use of Alaska's wildlife throughout the forseeable future.

Publication and distribution of these recommendations mark the beginning of the second phase in this planning process: the public's review of the staff's recommendations and its involvement and participation in shaping the initial proposal into a statement of direction for wildlife management in Alaska.

The responsibility of the Department is to manage Alaska's wildlife resources for the benefit of the people. Therefore, it is incumbent on the Department to determine what the public wants from its wildlife resources. It is clear also that the Department will not be able to maintain the continuity of long-term management programs without the support of Alaska's people.

Development and implementation of the wildlife plans will affect Alaskans in several ways. First, the public will participate in the initial formulation of the basic long-term management direction. Second, the plans as presented for review will inform the public about Alaska's wildlife populations and their current and potential uses. They will also give the public a clearer understanding of the role and responsibilities of the Department of Fish and Game. Third, if implemented, the plans will provide Alaskans and other interested persons with an array of alternative uses of wildlife which can be maintained through purposeful management.

All interested people are invited to contribute to the wildlife management planning effort. The Division of Game recommendations contained in this and other booklets and maps are being distributed to the public throughout the state. Included is a questionnaire soliciting opinions about the management the Division is proposing. In addition to printed circulation of the proposed plans, the Division will hold public meetings in many Alaskan communities to obtain comment and discussion.

All public response will be considered in evaluating and modifying the proposed plans. Allocation of wildlife values among competing users and between conflicting uses is a complex problem which will have to be resolved through careful consideration of expressed public desires and the biological capabilities of the wildlife populations in question. Minority as well as majority demands should be accomodated if we are to retain the values afforded by a spectrum of wildlife-oriented experiences.

The Division will work closely with the Alaska Board of Game and with the Board's local advisory committees during the entire public review process. As the principal forum for the public's voice in Alaska's wildlife management, the Alaska Board of Game will modify and make the final determination on proposed wildlife plans. The Division of Game will assist the Board by providing a full report of the public review process and the response it engenders.

After the public review process, and revision and adoption by the Board of Game, the plans will be published and distributed to the public. Needless to say, the plans are not intended to be inflexible. Conditions change with time, and the plans will need to be adaptable. Revision of plans may occur as the result of periodic reviews or when individual situations require modification. Revision of plans will be made with participation by the public.

Implementation of the plans will begin as soon as practical after final acceptance by the Board of Game. Those areas or species now receiving the greatest use or in danger of losing those attributes called for by the plans should receive the earliest attention. Implementation will involve development of operational plans, formulation of regulations, internal Department actions such as research and management activities, and interagency cooperative actions as required.

Development and implementation of these management plans will be strongly affected by conveyance of 40 million acres of land into private ownership and by inclusion of up to 80 million acres of classified federal withdrawals into "Four Systems" federal management under terms of the Alaska Native Claims Settlement Act. Development of staff recommendations has proceeded with the knowledge that many changes in the contents of the final plans are inevitable. Management of wildlife on lands under federal jurisdiction or under private ownership will necessarily be commensurate with the land-use policies of the respective landowners. Important land-use decisions are being made now and in the next few years that will affect wildlife and its future use in the state. By developing wildlife plans now, we can improve the rationale by which land-use policies will be formulated.

WHAT THE PLANS CONTAIN

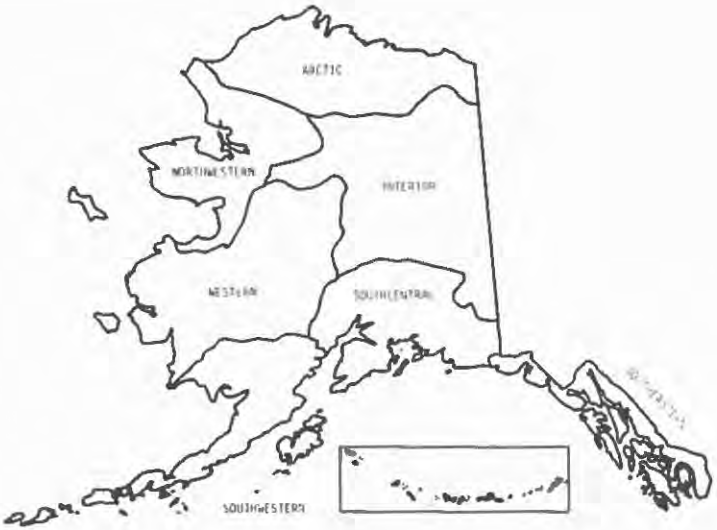
This regional booklet is only one portion of a comprehensive public proposal by the Division of Game, Department of Fish and Game, for the planned management of Alaska's wildlife resources. The proposal consists of: 1) seven regional booklets (of which this is one) containing recommendations for management of each species of wildlife, and 2) a set of eleven statewide maps outlining boundaries of individual species

management plan areas. The maps are intended to complement the material presented in the regional booklets. For complete understanding of the plans, the maps and appropriate regional booklets should be used together. These plans are for your review. Questionnaires have been included with the maps and booklets for your written comments. In addition, public meetings will be held throughout the state to explain plans and receive comment. You are invited to contact the Game Division staff to discuss these plans.

REGIONAL BOOKLETS

Each regional booklet is arranged in two parts. Part I contains an explanation of the planning effort and how the public will participate in the development of the plans. Included is an explanation of the management goals upon which the recommendations are structured. In addition, Part I presents a brief discussion of wildlife management in Alaska, reviewing the formal structure of management, the biological bases for wildlife use, and the problems encountered in managing wildlife. Part II contains the individual species/area management recommendations.

Each of the regional booklets corresponds to one of seven geographic regions of the state, depicted in the figure below.



All proposed management plans covering all or part of a region are included in the booklet for that region. The plans are arranged by species in Part II of each booklet, and each plan is titled and numbered to provide easy reference to the corresponding species map. Each individual plan includes:

1) A geographical description of the location of the area covered by the plan.

2) Goals - One primary goal and in some cases one or more secondary goals.

3) Examples of Management Guidelines - These are used to qualify or quantify in a more specific way the recommended management under a goal for any particular area.

   Management Guidelines are statements about:

   - the wildlife population: its size, sex and age structure and productivity.

   - use: season lengths and timing, bag limits, number or distribution of hunters or other users, access, transport, viewing, and aesthetic enjoyment.

   - habitat: alteration or protection.

4) A short summary of available information on the species and its use in the area to provide perspective for evaluation of the proposed management framework.

5) Statements of problems that may be encountered in managing for proposed goals. In general, problems deal with:

   - maintaining wildlife population levels: loss of animals or loss of habitat.

   - use of wildlife: exclusion of hunting, excessive access, noncompliance with regulations, state and federal legislation, and limitations on Department authority.

   - conflicts caused by wildlife: agricultural depredations, and safety of life and property.

6) A summary of the impacts of the proposed management in terms of its effects on the species in question, on characteristics of its use by man, on other species, and on other uses of the area.

MANAGEMENT GOALS

We have selected six management goals for these wildlife plan proposals. The goals are categories of use into which the various appropriate forms of human interactions with wildlife can be grouped. The goals provide direction for management with flexibility in mind. In most individual plans, multiple goals are assigned: a single primary goal and one or more secondary goals. Each goal emphasizes one general type of use opportunity. This does not necessarily mean that other uses will be excluded. Rather, it recognizes that if uses conflict, uses appropriate to the stated goals will receive preference. Furthermore, uses indicated by stated goals will be actively managed for. The overall content of each plan will further define goals for that specific area.

All proposed management goals are based on Alaska's constitutional mandate that its wildlife shall be reserved to the people for common use and shall be utilized and maintained on the sustained yield principle for the maximum benefit of the people. Use on a sustained yield basis for the maximum benefit of the people will take on different dimensions depending on individual situations. As an example, in rural Alaska the benefit of the people may, in large part, be concerned with the harvest of meat for domestic use, and yield would refer to pounds of meat or number of animals harvested. In another situation the greatest benefit to the people may accrue from only observing wildlife. Yield in this instance refers to the important but often intangible enjoyment derived from viewing or otherwise being aware of the presence of wildlife.

The choice of goals and their various combinations are intended to accommodate the variety of situations which exist in Alaska. The six wildlife management goals are:

1. TO PROVIDE AN OPPORTUNITY TO VIEW, PHOTOGRAPH AND ENJOY WILDLIFE.

2. TO PROVIDE FOR AN OPTIMUM HARVEST.

3. TO PROVIDE THE GREATEST OPPORTUNITY TO PARTICIPATE IN HUNTING.

4. TO PROVIDE AN OPPORTUNITY TO HUNT UNDER AESTHETICALLY PLEASING CONDITIONS.

5. TO PROVIDE AN OPPORTUNITY TO TAKE LARGE ANIMALS.

6. TO PROVIDE AN OPPORTUNITY FOR SCIENTIFIC AND EDUCATIONAL STUDY.

A thorough understanding of the goals is essential to understand and evaluate the plans. We urge you to study the following explanations of each goal.

1. TO PROVIDE AN OPPORTUNITY TO VIEW, PHOTOGRAPH AND ENJOY WILDLIFE.

This goal recognizes the great values of being able to see wildlife in a context not necessarily related to actual taking, and emphasizes yield in terms of aesthetic values. There are important areas where the combination of wildlife abundance, unique opportunity and human access result in this use accruing the maximum benefit to people. Emphasis is on viewing and photographing and may exclude all other uses. However, other uses including hunting may be allowed if compatible.

So-called "nonconsumptive" use of wildlife is popular in the state today. Viewing and photographing occur most frequently along the state's road and trail systems, areas which often receive heavy hunting use and which are most susceptible to human development. In some areas where unusual abundance, visibility, or accessibility of wildlife enable ready observation by the public without detrimental effects to wildlife, management for these purposes should be provided. Prompt identification, establishment and management of such areas is necessary to avoid losses to encroaching development and competing uses. Many of these areas have been previously identified.

Management which provides an opportunity to view, photograph, and enjoy a species is concerned with maintaining a sustained, observable population of that species. Human uses of wildlife or of the area supporting wildlife which significantly detract from the opportunity to observe the primary species may be regulated or restricted. Hunting for the primary species is generally excluded during the period when most observation takes place. Limitations on the number, distribution, or activities of viewers and photographers may be necessary where unlimited use would detract from the opportunity to observe wildlife or cause undue disturbance. Hunting may be allowed when year-round or area-wide observation does not occur. In some situations concurrent consumptive and "nonconsumptive" uses may be compatible.

Viewing and photographing are often compatible with other uses; this is reflected in the numerous plans where viewing and photography occur in combination with other goals. When applied as a secondary goal the emphasis on viewing and photographing is subdued, and uses addressed by primary goals may at times limit opportunities for observation. In some cases, however, management for other primary goals may enhance opportunities for observation of wildlife.

2. TO PROVIDE FOR AN OPTIMUM HARVEST.

This goal emphasizes yield of animals for human use. Within this goal are accommodated the needs for domestic utilization, especially by rural residents, but also by recreational hunters primarily interested in meat; commercial harvests; and situations involving maintenance of wildlife populations at specified levels. Aesthetic quality of experience and production of trophy animals may be compromised.

Direct domestic utilization of wildlife is important to many rural residents and is a valuable supplement to the larders of urban citizens. Emphasis of management will be to achieve an optimum harvest. This goal is also desirable in situations where excessive wildlife numbers develop and the welfare of wildlife populations or the safety of human life or property will require maintaining some lower optimum number of the species in question. Finally, management to provide for an optimum harvest is used where direct commercial utilization is warranted.

Optimum harvest can be defined as the amount or level of yield that is most favorable to some specified end result, whether it is productivity or density of a wildlife population, within the constraints of sustaining that population for future use. Such a harvest will differ from area to area, from species to species, and over time.

Management of populations under this goal will be intensive, involving manipulation of the numbers and/or sex and age structure of the population. Controls on methods and means of taking game, adjustments to lengths of

hunting seasons and bag limits and restrictions on the number of hunters are ways by which use will be regulated. In cases where production of food is important to local residents, the species may be managed to maximize sustained productivity, and use may be regulated to favor those people with the greatest dependency on the resource.

Management under this goal has wide latitude depending on the conditions and requirements of any particular area where it is employed. The goal is often compatible with the goal of providing the greatest opportunity to participate in hunting and with other goals by regulating the time and place of use. This goal may adversely affect aesthetic hunting considerations and the production of trophy class animals. "Nonconsumptive" uses may be available on an opportunistic basis.

This goal differs from the other five goals because it does not directly consider opportunity for use, but rather use itself. Perhaps the greatest similarity between this goal and other goals is with that of providing the greatest opportunity to participate in hunting. Under both goals the upper limit to consumptive use is the maximum harvest that a population can sustain. But whereas "greatest opportunity to participate in hunting" is dependent on the optimum harvest, attaining an "optimum harvest" is not dependent on providing the greatest opportunity to participate in hunting. Yield of the latter is participation. In the former, yield is in number of animals (biomass) that can be taken.

3. TO PROVIDE THE GREATEST OPPORTUNITY TO PARTICIPATE IN HUNTING.

This goal recognizes the recreational value of hunting and emphasizes the freedom of opportunity for all citizens to participate. In this case, the opportunity to participate is deemed more important than success or standards of quality of experience.

As Alaska moves away from the open frontier lifestyle, recreational hunting is an increasingly important use of wildlife in the state. Yet even as the demand for recreational hunting is growing, the area available for such use is decreasing. Extensive private land ownership and additional extensive parks, refuges and other lands designated for limited use will strongly affect recreational hunting opportunities in the state.

Providing the greatest opportunity to participate in hunting will not mean maximizing opportunity to kill. Management will consider participation more desirable than success. Opportunity must sometimes be limited to maintain harvests within the numbers that a wildlife population can sustain. Restricting harvest will usually involve altering methods and means of taking game, bag limits, and lengths and timing of seasons before limiting number of hunters. When participation must be limited, time allowed for a hunt will be limited before limiting number of hunters.

Management to provide the greatest opportunity to participate in hunting often will be similar to providing for an optimum harvest, because where demand to hunt is sufficient, full beneficial use of the resource will be allowed. Consequently these two goals are recommended in combination in many areas. Used as the only goal in an area, greatest opportunity to participate in hunting may compromise aesthetic considerations or reduce opportunity to take large (trophy) animals; "nonconsumptive" uses would be available on an opportunistic basis.

4. TO PROVIDE AN OPPORTUNITY TO HUNT UNDER AESTHETICALLY PLEASING CONDITIONS.

This goal emphasizes quality of hunting experience. To achieve it will often require limiting the number of people who may participate, as well as the means used to take game. Criteria for such areas include natural or wilderness character of the land, low hunter densities, and emphasis on hunting without the aid of mechanized vehicles.

Quality of experience is becoming increasingly important to a greater number of hunters, especially for those who value the aesthetics of the hunting experience as much or more than hunting success. For them the proliferation of off-road vehicles, riverboats, airplanes and the "hunter behind every bush" situation is distasteful. Under this goal, aesthetically pleasing conditions refers to a hunting experience which usually includes low hunter densities, controlled methods of transport, undisturbed wilderness character, and regulation of other conflicting uses, separately or in combination. Human activities which adversely affect the aesthetic quality of the hunting experience will be discouraged, limited, or prohibited. Opportunity as used here does not guarantee unlimited participation, and would normally imply limits on participation. Controls on hunter transport may reduce hunting success. This goal will not usually require large or dense populations of wildlife, nor will animals necessarily be of large (trophy) size. Harvests need not attain the highest levels that can be supported by the population.

The value of aesthetics is often considered when other goals are primary, and this goal is often used in combination with other goals to reflect the considerations of quality not explicitly stated in other goals. To the extent that other uses conflict with aesthetic values, timing and zoning of the area of use can be employed to obtain greater utilization of a wildlife population.

5. TO PROVIDE AN OPPORTUNITY TO TAKE LARGE ANIMALS.

This goal emphasizes the opportunity for hunters to take large animals. To accomplish this goal will usually mean that participation of hunters will be limited and the species population within the area may be manipulated to produce the maximum number of large animals.

Many recreational hunters are especially interested in taking a large animal. With development and increasing human pressures on wildlife resources, the opportunities for hunters to be selective for large animals are becoming fewer. Management under this goal may ensure that in some areas and for some species such opportunity will be retained. Areas recommended for management under this goal must have a reasonable number of large, old or trophy animals available or the potential to produce such animals. Opportunity as used here would not guarantee unlimited participation, but would provide a reasonable chance of success to those who do participate. Management will often be intensive, involving manipulation of the sex and age composition to produce large animals, and possible controls on number and distribution of hunters.

This goal and that of hunting under aesthetically pleasing conditions will often be compatible, and hunting both for large animals and under aesthetic conditions will be enjoyed simultaneously. Management for other goals is possible when the production of large animals is not affected. However, intensive management to produce large animals may

require taking other population segments by other users. For example, to produce large bull moose it may be necessary to harvest substantial numbers of female moose. This goal does not preclude "nonconsumptive" uses, and in fact may enhance "nonconsumptive" use experiences by providing improved opportunities to view large animals.

6. TO PROVIDE AN OPPORTUNITY FOR SCIENTIFIC AND EDUCATIONAL STUDY.

This goal recognizes the desirability and need to provide for scientific and educational use of wildlife to achieve a scientific basis for evaluating management options. Such management may require setting aside areas solely for this purpose, but in most cases, this use is compatible with other types of use.

The Alaskan wilderness, including its wildlife, is a unique natural laboratory for the scientific study of ecosystems and wildlife biology, and for the educational enrichment of the people. Scientific study and education have continually taken place in many areas of Alaska, reflecting the wide compatibility of such use with other uses of wildlife. Occasionally however, undisturbed or closely controlled conditions are necessary for study requirements and justify the designation of areas managed primarily for the scientific and educational study of wildlife. Study requirements would specify the extent to which other uses, both consumptive and nonconsumptive, would be allowed. In some cases, intensive population or habitat manipulation could be necessary to achieve study objectives. Participation could be limited.

This goal appears most often in combination with the goal of providing an opportunity to view, photograph and enjoy wildlife because they often have much in common. Educational studies are often enhanced by relatively undisturbed wildlife populations in areas established for viewing and photography. Providing for scientific and educational study is proposed as a primary goal in very few areas. Such limited direct application of this goal emphasizes the fact that opportunities for scientific and educational study exist throughout the state and special designation is unnecessary unless intensive population or environmental controls are required.

MANAGEMENT BACKGROUND

To properly evaluate the individual species plans presented in this volume, it is necessary to have some appreciation for the Alaska setting in which these plans are developed. There are, of course, biological or ecological characteristics of wildlife which affect its management. There are also a number of human institutions that affect management: constitutional and statutory authority, requirements, and constraints; policy; user requirements; and the demands of the "new Alaska." It is hoped that the following discussion touching on these considerations helps to place the plans in a more relevant perspective for public understanding.

THE LEGAL BASIS FOR WILDLIFE MANAGEMENT IN ALASKA

Wildlife management in Alaska was formally established in 1925 when Congress created the Alaska Game Commission "to protect game animals, land furbearing animals, and birds in Alaska, and for other purposes." Prior to 1925 protection of wildlife had been undertaken by the Departments of Treasury, Commerce, and Agriculture, and by the territorial governor.

The five-member Alaska Game Commission, appointed by the governor, represented each of four Judicial Divisions of the state and the U. S. Bureau of Biological Survey, later to become the U. S. Fish and Wildlife Service. This commission set hunting seasons and bag limits subject to approval by the Secretary of Interior. Emphasis of management was on establishment of wildlife refuges and on enforcement and predator control activities until the 1950's when research of game populations was increased.

With the attainment of statehood in 1959 a formal framework for State management of Alaska's wildlife resources was established. In addressing natural resources, Article VIII of the Constitution of the State of Alaska states:

> Section 1. Statement of Policy. It is the policy of the State to encourage the settlement of its land and the development of its resources by making them available for maximum use consistent with the public interest.
>
> Section 2. General Authority. The legislature shall provide for the utilization, development, and conservation of all natural resources belonging to the State, including land and waters, for the maximum benefit of its people.
>
> Section 3. Common Use. Wherever occurring in their natural state, fish, wildlife, and waters are reserved to the people for common use.
>
> Section 4. Sustained Yield. Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.

In accordance with these mandates, the Alaska Legislature established by statute a Department of Fish and Game, provided for a Commissioner as the principal executive officer of the Department, and created a Board of Fish and Game. The Division of Game was one of several divisions created to carry out the responsibilities of the Department.

Since statehood the role of the Legislature and the functions, structure, and interrelationships of the Board of Fish and Game, its advisory committees, and the Department have undergone changes in response to

public concerns over increased use of wildlife, increased conflicts between users, growing public involvement in government and increased public environmental concern.

Legislature

The Legislature, by virtue of its broad constitutional authority, has been a dominant force in establishing the character and direction of Alaska's management of wildlife. At statehood the Legislature enacted the Fish and Game Code of Alaska (Title 16) which established the Commissioner and Department of Fish and Game and a Board of Fish and Game, and defined the powers, duties and functions of each. In addition, this act, or amendments and additions to it, provided for: the authority to enforce laws and regulations; licensing of hunting and trapping, including specification of licenses and tags required and their fees; protection of fish and game from human activities; establishment of state game refuges and sanctuaries, and designation of critical habitat areas; suppression of and bounties for predatory animals; commercial use of fish and game; and the specification of unlawful acts, violations, and penalties therefor. Among the powers specifically reserved to the Legislature were those of regulatory and administrative legislative review, approval of areas set apart as fish and game reserves, refuges, and sanctuaries by the Board, the authority to change the amount of fees or licenses, and budgetary controls. This legislation, in essence, formed the basic framework for the entire scope of activities carried on by the Department and the Board.

Since statehood, the Legislature has variously added to, amended or repealed portions of the original State fish and game statutes, reflecting increased complexities of resource management, and increased demands on the Legislature by the people. In general, revisions of the statutes have served to clarify or expand legislative intent and to increase provisions for management, protection, regulation and use of wildlife. Although many of the revisions have affected the scope of activities of the Commissioner, the Department, and the Board, most have had little substantive effect on the interrelationships between these principals. Some recent state legislation however, has affected the traditional structure of Commissioner and Board authorities. The general effect of these recent legislative actions has been a diminution of Commissioner and Board authorities in favor of increased parochial advisory committee roles and increased public participation. Included in such acts are those relating to:

- Boards of Fisheries and Game. This 1975 act restructured the 12 member Board of Fish and Game into two, 7-member boards, one for fisheries and one for game; repealed the status of the Commissioner of Fish and Game as an ex-officio member of the Board; redefined the regulatory powers of the Boards; amended the provision establishing advisory committees to concurrently expand advisory committee authority to close seasons and limit the Commissioner's authority to overrule closures established by advisory committees.

- Taking of antlerless moose. This 1975 act expanded the authority of advisory committees and the Department while limiting the regulatory authority of the Board of Game by prohibiting the taking of antlerless moose except under regulations adopted by the Board after requisite recommendations for open seasons are made by the Department and by a majority of active local advisory committees for the game management unit or units affected.

Although it is important to recognize that the Legislature has delegated broad regulatory authority to the Board of Game, it is also important to

understand that the Legislature has the authority to affect that delegation at any time. For example, seasons and bag limits, normally set by the Board, could legally be established by the Legislature. However, the Legislature has generally restricted its activities to more general and enabling legislation.

Governor

The Governor, as chief executive of the State, is responsible for the conduct of the Department of Fish and Game in serving the people of Alaska. All actions of the Department are subject to review and concurrence by the Governor. In addition, the Governor may invoke independent executive actions. Under his strong constitutional authority, the Governor has brought about major reorganization of the Department in the past. In 1962 most of the functions and powers of the Department relative to the collection, accountability, and custody of fish and game revenues was transferred to the Department of Revenue by executive order. Similarly, the Division of Protection, with primary responsibility for enforcement of all fish and game laws and regulations for the Department, was transferred to the Department of Public Safety in 1972.

Commissioner of the Department of Fish and Game

The Commissioner is the principal executive officer of the Department of Fish and Game. He is appointed by the Governor for a term of 5 years, subject to confirmation by the Legislature, and serves at the pleasure of the Governor. The Commissioner functions to "manage, protect, maintain, improve, and extend the fish, game and aquatic plant resources of the state in the interest of the economy and general well-being of the state" (AS 16.05.020). To that end, he supervises and controls the Department, including appointments of personnel and assistants necessary for the general administration of the Department and he may delegate his authority to subordinate officers.

Among the powers and duties of the Commissioner are administrative, budgeting and fiscal powers; the collection, classification and dissemination of statistics, data and information; the emergency opening or closure of seasons or areas; and the capture, propagation, transport, purchase, sale, or exchange of fish or game or eggs for scientific or stocking purposes.

In addition to that authority specifically provided to the Commissioner by statute, the Board may delegate to the Commissioner authority to make regulations. However, such delegation in the past has been limited and specific in nature.

Division of Game

The Division of Game was established in 1959 under provisions of the act creating the Department of Fish and Game. As one of several divisions of the Department, the Division of Game functions in meeting the legislative charge to the Commissioner to "manage, protect, maintain, improve and extend the.....game.....resources of the state....." as well as in providing such assistance to the Board of Game as it requires in the performance of its functions. In each of these areas, the Division attempts to maintain a public posture by disseminating information and encouraging public involvement in the management of Alaska's wildlife.

The Division of Game conducts many activities to meet its responsibilities including:

* Assessment of game population status involving biological

research, surveys and inventories of game populations, and compilation and analysis of harvest statistics.

* Identification and protection of important wildlife habitats. The Division provides information and recommendations to federal, state and local agencies which plan for, manage, regulate, or otherwise affect lands in Alaska or their use, to minimize detrimental impacts of land and water uses upon wildlife habitat in Alaska.

* Preparation of reports on the status, management and use of Alaska's wildlife resources, for public information, scientific publication and use, and to provide the Board of Game with information it requires to promulgate regulations.

* Recommending appropriate regulations for consideration by the Board of Game.

* Enforcement of regulations. Although primary responsibility for enforcement of fish and game regulations falls to the Division of Wildlife Protection in the Department of Public Safety, Game Biologists are authorized as enforcement officers and maintain an active profile in the enforcement of regulations.

* Providing the public with information, assistance and other services. The Division disseminates reports of Division activities to the public, contributes to Departmental information and education activities including television and radio programs, a Fish and Game magazine and newspaper articles, distributes regulation pamphlets to the public, and provides personal assistance and explanation on an individual inquiry basis.

At present, the Division of Game is staffed with approximately 110 full-time positions. About 75 positions are filled by professional biologists, all of whom possess at least a Bachelor's degree in wildlife management or other biological sciences. Many possess Master's degrees or higher. The remainder comprise the support staff of clerical, technical, and statistical positions. In addition to the Division headquarters in Juneau, regional offices are maintained in Fairbanks, Anchorage and Juneau. A total of 21 area field offices are maintained in major communities throughout the state.

Activities of the Division of Game are largely funded by a federal-state matching funds arrangement, made possible through a "Fish and Game Fund" and the Federal Aid in Wildlife Restoration Act of 1937.

Under the Federal Aid in Wildlife Restoration Act and its amendments, funds from an excise tax on sporting arms and ammunition, including pistols, revolvers, bows and arrows, and parts and accessories are made available to the various states on a matching basis for use in wildlife restoration work, including land acquisition, research, development and management projects, and for use in hunter safety programs. Monies are made available on a maximum share basis of 3 federal to 1 state dollar basis. Provisions in the act require the various participating states to maintain funds obligated to fish and wildlife restoration work as defined by the act.

The Alaska Legislature established the Fish and Game Fund at the same time the Department was established. Most of the money comprising the Fish and Game Fund derives from the sale of state sport fishing and hunting licenses and special permits, although funds from other sources are possible. Funds gained from license sales or permit fees cannot be used for other than the protection, propagation, investigation and restoration of sport fish and game resources and the expenses of administering the Sport Fish and Game Divisions of the Department.

Board of Game

The Board of Game, as presently constituted, was established in 1975. Originally established in 1959 as an eight-member Board of Fish and Game, the Board was subsequently enlarged by statute to 10 and then 12 members before being divided into two Boards, one for fisheries and one for game. The Board of Game now has seven members, appointed by the Governor and subject to confirmation by the Legislature. The staggered term of office for members is four years. Members serve at the pleasure of the Governor.

The primary functions of the Board of Game in conserving and developing the game resources of the state are the promulgation of regulations affecting use of wildlife and the establishment and conduct of advisory committees.

The Board of Game is empowered to make regulations for:

(1) setting apart game reserve areas, refuges and sanctuaries in the waters or on the lands of the state over which it has jurisdiction, subject to the approval of the Legislature;

(2) establishment of open and closed seasons and areas for the taking of game;

(3) establishment of the means and methods employed in the pursuit, capture and transport of game;

(4) setting quotas and bag limits on the taking of game;

(5) classifying game as game birds, song birds, big game animals, furbearing animals, predators or other categories;

(6) investigating and determining the extent and effect of predation and competition among game in the state, exercising control measures considered necessary to the resources of the state and designating game management units or parts of game management units in which bounties for predatory animals shall be paid;

(7) engaging in biological research, watershed and habitat improvement, and game management, protection, propagation and stocking;

(8) entering into cooperative agreements with educational institutions and state, federal, or other agencies to promote game research, management, education, and information and to train men for game management;

(9) prohibiting the live capture, possession, transport, or release of native or exotic game or their eggs; and

(10) establishing the times and dates during which the issuance of game licenses, permits and registrations and the transfer of permits and registrations between registration areas and game management units or subunits is allowed. (AS 16.05.255)

In addition, the Board of Game may adopt regulations upon the recommendation of the Department, by the majority vote of affected local advisory committees, or by written petition by interested residents of an area as regards the establishment of subsistence hunting areas, the control of transportation methods and means within subsistence hunting areas, and the establishment of open and closed seasons and areas to protect subsistence hunting. (AS 16.05.257)

Promulgation of regulations by the Board must be in accordance with Alaska's Administrative Procedure Act (AS 44.62) which requires among

other things that:

1. Meetings of the Board be open to the public and that reasonable public notice be given for such meetings.

2. A procedure be used for adopting regulations which includes:

   a. prior public notification of proposed actions,

   b. opportunity for any interested person to present statements, arguments, or contentions in reference to a proposed action, and,

   c. opportunity for an interested person to petition the Board for the adoption, amendment, or repeal of a regulation.

3. Regulations be codified and published.

The Boards of Fisheries and Game are empowered to establish advisory committees in various parts of the state for the purpose of providing the Boards with recommendations on fish and game in their areas of jurisdiction. The Boards set the number and terms of the members of advisory committees, delegate one member of each committee as chairman and give him authority to hold public hearings on fish or game matters. Advisory committees have the authority to declare emergency closures during established seasons under procedures established by the Board. Furthermore, advisory committees must recommend openings of antlerless moose seasons in their respective areas, in conjunction with Department recommendations for open seasons, before the Board of Game may adopt regulations for the taking of antlerless moose.

The Board of Game meets at least once each year, but may meet more often as it considers necessary. Special Board meetings may be called at any time by the Commissioner or at the request of two Board members.

Public

Alaska's people are the ultimate managers of their wildlife resources. Through the electoral process and other mechanisms of government responsiveness, the public can and does effect the management of wildlife in Alaska.

Wildlife management in Alaska is an exceptionally public process. Aside from the economic interest in resource utilization, few other resources elicit public attention to the extent that fish and wildlife do because an intimate association with wildlife has been an important part of the Alaskan lifestyle. There is a traditional sense of personal ownership of wildlife that doesn't exist to the same degree with other natural resources. Other contributing factors are the increasing importance of outdoor recreational activities and the widespread public association with "ecological awareness."

Alaska's constitution reserves the state's wildlife to the people for common use consistent with the public interest. In order to assume an active and productive role in the management and use of wildlife, the public must be cognizant of the responsibilities demanded by such a role. The public has a responsibility to be informed about the status of wildlife resources and the options for their use. The public should also be informed about the governmental management framework - which agencies are involved, what their responsibilities are, how their functions and authority are interrelated, and what legal, budgetary, and administrative constraints limit their actions. Citizens should be aware of the opportunities to express their concerns as provided by statute, directive and policy: the legislative stage, the public forum provided by the Board of Game, public hearings and meetings, petitions,

and personal contact. The public should participate in the regulatory process and should actively support current regulations. Finally, all wildlife users should bear their share of costs of conservation. Although many people who do not hunt or fish derive substantial benefits from fish and wildlife, in Alaska almost all costs of wildlife management by the Department of Fish and Game are borne not by the general public, but by those individuals who purchase hunting and fishing licenses, guns and ammunition, and fishing tackle.

BIOLOGICAL CONSIDERATIONS

Wildlife Habitat

The dependency of wildlife on its habitat is of fundamental importance, yet many people are unaware of the relationships involved. Habitat is a combination of many interrelated factors which provide living space for a species. Food and cover are general terms for basic necessities that are often complicated and variable according to season and circumstance. Suitable and often different areas are needed for breeding, nesting, rearing young, resting, escaping and feeding. Not only must all these essential components be present in a habitat to make it "habitable" for a species, but they must be accessible to the animals. Some migratory birds satisfy their habitat needs by depending on habitat components over the breadth of two continents while some small mammals live their entire lives in the space of a backyard. But the "backyard" must have the necessary variety of areas to be good habitat. For many species, the more "edge effect" created by interspersion of vegetative types, the better the habitat. The suitability of a habitat is the first concern in any effort to establish, maintain, or enhance populations of a species.

There is a limit to the number of animals supported by a unit of habitat, and this limit varies from season to season and from year to year as the adequacy of the essential habitat factors vary. When expressed as an average density of animals that can be supported this limit is called the carrying capacity. When carrying capacity is exceeded by a population, habitat can be damaged, and the result is often a reduction in the carrying capacity followed by a decline in the wildlife population.

A species usually relies on more than one specific habitat area or factor for the essentials of life. The area or factor in shortest supply determines the maximum number of animals that a habitat can support. This is known as a limiting factor. If food is the limiting factor, and the supply is increased, the carrying capacity for that species will increase until it becomes limited by the shortage of another factor, such as a place to escape from predators. Specific habitat areas of great importance to a wildlife population are called critical areas or critical habitat. Such areas are critical because they are limiting, and their loss or reduction would result in elimination or reduction of the population.

Habitat changes are continuously occurring naturally. Vegetation associations succeed one another as each successional stage, through its occupancy, makes conditions more favorable for its successor until a climax vegetation stage is established. Climax communities remain in tenuous balance with the long-term forces of climate and geological change. There are reversals in the process as well, and these normally are sudden and drastic in comparison to the subtle progress of succession. Fire is perhaps the most spectacular, but there are many others, such as deposition of material by rivers and glaciers, effects of windstorms, insect infestations, and man-made clearings. Wildlife populations change in response to changes in habitat, as it becomes more or less

favorable for the species.

Manipulation of habitat (including protection when necessary) is therefore a prime tool in managing for desired populations of wildlife. With the proper techniques the successional stages most favorable to a species can be maintained on a long-term basis, variety of desired vegetation can be improved beyond natural occurrence, and special habitat necessities can sometimes be artificially provided. Response of wildlife to habitat improvements can be dramatic.

Some qualifications on the benefits of habitat improvement should be noted. Habitat improvement programs are directed at increasing or maintaining numbers of desired wildlife populations. Since a habitat favorable for some species may be less favorable for others, manipulation of habitat will mean reductions of some species populations as well as gains to others. Also, manipulation of habitat does not always result in increases of wildlife because the effectiveness of habitat improvements may be limited by the influence of uncontrolled factors such as climate and soil quality. There also are a number of species which are dependent upon climax vegetation associations. Because their populations cannot be benefitted through short-term vegetation changes management must be directed to other factors which are alterable.

Population dynamics

Maintenance of populations at carrying capacity, however useful as a management concept, is rarely achieved under natural, unmanaged conditions. How many individuals of a species there actually are in an area at any time is a result of the interplay of the population with the allowance of its living area. Wildlife is often "out of phase" with its habitat in a never-ending see-saw of adjustments to the excesses and shortages of its environment. The processes of adjustment by which a population's size is balanced with its habitat are termed population dynamics. Essentially, these are the opposing forces of reproduction and mortality.

Reproduction is the main way new individuals are recruited into a population (migration may add animals, too). The increase of a population, excluding the effects of movement or mortality, is limited by the reproductive potential of that species. The number of young each female can produce in a year, the minimum and maximum ages at which breeding may occur, the sex ratio of breeding adults, and longevity of individuals, all together determine the maximum rate of increase that a population may exhibit. Wildlife populations, however, rarely increase at their maximum rate. Mortality is the main reason, of course, but other factors may depress reproductive success. For example, not all females capable of breeding find males; or younger animals capable of breeding may be inhibited in attempting to breed because of dominance exerted by older individuals; and many species give birth to fewer young in times of adversity. Such depressants on reproduction are commonly self-regulating mechanisms, through which animals respond to conditions of overcrowding, food shortages, or poor nutrition.

Mortality operates against population growth by removing animals. Starvation, predation, hunting, inclement weather, diseases and parasites, accidents, and strife between animals all contribute to losses of wildlife. The relative importance of any one factor is generally dependent on two things: the effects of other mortality factors, and the density of the population. Animals injured by accident or strife may have difficulty obtaining food and may starve. Others, weakened by starvation or debilitated by disease, may fall easy prey to predators. In the absence of predation and hunting, populations can outgrow their food supply and starvation will be the major cause of mortality. Some factors, such as predation, starvation, and disease, increase in their importance as the density of the population rises and these are known as density-dependent mortality

factors. Success of predators increases as their prey becomes more abundant. Starvation is more common as competition for food increases. Transmission of disease is facilitated by crowding of animals. The reverse situation is also true. As a population is reduced, relatively fewer losses occur to these factors. Also, greater losses to one cause will result in reduced losses due to other factors. To some extent, change in one kind of loss is compensated for by change in another kind of loss.

These direct and indirect compensatory relationships between reproductive performance, various mortality factors, and population density make it possible to some extent for human use of wildlife to replace other kinds of mortality.

Losses to wildlife populations are replaced by reproduction. If everything is working right and habitat quality is reasonably good, animals characteristically produce more young than are needed for replacement. This creates a "surplus" of individuals, both young and old, that is trimmed off by the various mortality factors. The surplus may be small if the new individuals are accommodated by excellent habitat, or it may be large as the population exceeds the capacity of the habitat. Wildlife management seeks to take advantage of compensatory relationships to make some of the surplus available for human use.

Removal of animals lowers population density. Fewer animals are then lost to density-dependent mortality factors. Lowered density results in reduced competition for food, which in turn increases survival of young, for it is the young (and the very old) which suffer the greatest losses to starvation. Within limits, increasing the removal of adult animals continues to boost the survival of young. Furthermore, lower population density makes more food available, more animals breed successfully as a result of being in good physical condition, and more young are produced and raised by each female.

The productivity of a species in terms of its use by humans is called "yield." Normally, yield applies to consumptive use, but it can also include so-called "nonconsumptive" use as well. Management of wildlife is aimed at producing a sustained yield, that is, utilizing a wildlife population at such a level that the capability of the population to continue to provide such use is not impaired. Sustained yield is the central concept in the management of any renewable resource.

There is usually a range in intensity of use that wildlife populations will sustain, from no use to that which is the maximum allowable. Human use is another force acting on a population, affecting, and in turn being affected by, the compensatory relationships of the various natural reproductive and mortality factors. Consequently, a wildlife population will establish an equilibrium with the forces acting upon it, as long as the minimal species requirements are met.

PROBLEMS OF MANAGEMENT

Management of wildlife has its share of problems. Although many problems can be foreseen and avoided by giving careful thought to the future, dealing with wildlife and with people is full of surprises and the wildlife manager must be "ready for anything."

The difficulties faced by wild animals in their daily lives become part of the problems faced by wildlife managers. Many of the crucial problems faced by wildlife in obtaining enough good food, having a chance to reproduce, and avoiding an untimely death are known. Many remain nature's secrets. A large part of the wildlife manager's job consists of learning to recognize these crucial problems, and trying to either minimize or make allowance for them.

Perhaps a larger part of the manager's job involves regulating man's use of wildlife and its habitat. There are two broad problem areas involved. The most difficult is attempting to insure that use and development of resources other than wildlife cause the least difficulties for wildlife and its habitat. The second broad problem area involves developing a system of wildlife use that enriches the lives of the public in various ways without impairing the welfare of wildlife species, their habitat, or their relations with other species. The latter problem is the wildlifer's "first love," but more often than not he's "married" to the former!

Taken together, these two broad problem areas include a whole spectrum of potential difficulties for wildlife, wildlife managers, and the public who wishes to enjoy wildlife. Problems range in importance from critical to mere nuisances, depending on their nature, location, duration, season and magnitude. The most important problem affecting the well-being of wildlife in Alaska and indeed, in most parts of the world, is loss of suitable living space, or habitat. Alaska is fortunate in that the wildlife habitat that has been lost or significantly damaged is small at this time, but the trend toward increasing losses is clear.

Many other problems exist, and the following review may give readers a feeling for the variety and importance of problems encountered in wildlife management. For convenience, problems are grouped according to these circumstances: natural factors, land use, use of wildlife, and management limitations.

Natural Factors

Loss of habitat occurs through nature's processes, sometimes suddenly but more often slowly enough for animals to adjust. Given time, meadows may become brushlands, and brushlands become forests. For example, the great 1947 Kenai burn, a huge wildfire on the Kenai Peninsula, allowed thousands of acres of young willow, aspen and birch to replace mature forests with prime food, and stimulated a boom in moose numbers. But after 30 years the prime food plants have grown out of reach or have been eaten up; the prime moose habitat is gradually being lost, and the number of moose the area can support has declined. Similar situations have occurred throughout much of Southcentral and Interior Alaska, as modern, efficient fire suppression techniques have reduced the frequency and extent of burning. On the other hand, natural and man-caused fires have affected wildlife populations, such as caribou, red squirrels, and spruce grouse, that are dependent on long-established (climax) vegetation.

There are other examples: ponds or sloughs used by beavers may gradually fill in with silt and dead plant remains, and either become too shallow or develop a wide "beach" of sedges and grasses that makes food gathering a dangerous proposition, and the beavers quit using the ponds.

Sometimes the animals cause their own problem. The Nelchina caribou herd grew so large that it decreased its own food supply by eating and trampling more than the plants could produce. An important part of the caribou habitat was lost, and will not recover for many years. But, to repeat, these are all examples of relatively long-term changes, and while great changes may occur in numbers of the species affected, the change each year may be moderate.

In a few cases, change may be rapid and catastrophic. A much earlier fire on the Kenai Peninsula apparently destroyed the caribou habitat then available. Caribou disappeared from the Kenai, and did not return until transplanted by man 60 to 70 years later. The 1912 eruption of Katmai was a catastrophe that quickly eliminated much wildlife habitat on the Alaska Peninsula, and the 1964 earthquake caused the ocean floor to rise several feet in some areas of southcentral Alaska, dramatically

affecting all marine life, including marine mammals and waterfowl.

Another major, natural limiting factor, or problem, for wildlife is weather. Alaska's climate is often harsh and there are numerous examples of the limiting effects of weather on wildlife. In the winters of 1971, 1972 and 1974 unusually cold weather caused sea ice in the Bering Sea to extend hundreds of miles south of its usual limit; sea otters were trapped, unable to feed and float as they normally do, and many died. Winters of prolonged, unusually deep snow have caused major die-offs of moose at Yakutat, and in Southcentral and Interior Alaska. In some cases 50 percent or more of the moose may have died, mainly because it became too difficult to get around in search of food.

Hard snow crusts formed by unusual winter rain have caused grouse to die from freezing, because the birds were unable to burrow in the snow at night to sleep. Similar crusts caused by the bright spring sun have at times aided wolves in pursuit of moose. In some years, frozen or wind-blown snow crusts may prevent caribou from feeding on parts of their winter range; crusts or deep snow may affect sheep similarly.

Mid-winter flooding or unusually great depths of overflow ice have driven beavers from their houses, much to the benefit of passing wolves or wolverines which find beavers easy prey on land. Severe spring floods may drown beaver kits, calf moose, and other young-of-the-year. Of course, the effect of any of these events depends on their severity, how long they last, and whether or not they strike an especially vulnerable spot in the species' annual cycle of living.

There may be times when weather is so severe that animals (especially young ones) die outright from exposure, but usually, as in the examples above, bad weather makes it so hard for animals to use some critical part of their habitat that they die from starvation, with a little extra "push" from a combination of various lesser factors such as disease or parasites, predators, and accidents.

Food supply, or nutrition, is a crucial factor not only during hard winters, but at other times as well. Ample food of good quality is especially important to pregnant and nursing females, whose food needs are greatly increased. A lack of proper food may result in weak offspring which may be susceptible to disease, or be caught by a predator. Some young may not even be born, or may be born dead. In fact, if the female has been undernourished prior to breeding season, she may not conceive when she mates, or perhaps she will have fewer offspring than normal.

Moose, deer, and caribou depend on "fattening-up" during the summer in preparation for a rugged rutting season and a long winter. Males lose most of their fat during the rut, and are actually in only fair condition when winter comes. If winter weather is particularly severe, or winter food is scarce, males are more likely to die than females. Calves and very old animals are even more susceptible.

As more is learned about wildlife nutrition, it becomes evident that food quality is as important as quantity. Some species of food plants are more nutritious than others, some parts of plants are more nutritious than other parts, and in general younger plants are more nutritious than older plants. A bunch of brush is not necessarily a bunch of good wildlife food!

Predation. If the moose, caribou, sheep, grouse or other species have managed to survive all the other natural hazards of life so far discussed, there is no time to be smug, because there may be a bear, wolf, weasel, hawk or some other predator looking for its next meal! When prey species (those normally eaten by another species) are at low numbers, in poor condition, or have trouble escaping because of deep snow or lack of

suitable habitat, predators can eat enough prey to reduce or hold down numbers of their prey. The effects may be short-term, or they may extend over several decades, depending on the species involved and the circumstances. There usually is little doubt that prey numbers will eventually recover, but in the meantime few of the prey species may be available for the remaining predators, scavengers, or for various uses by people. For example, in recent years, severe winter weather has been an important cause of declining moose numbers in Interior Alaska. In the Tanana Flats, near Fairbanks, hunting and predation contributed to this decline. Hunting has been almost completely eliminated to encourage the recovery of the moose population, but so far no recovery is in sight. Wolves have been one of the major factors preventing moose numbers from rapidly recovering, and in the Tanana Flats, their depredations may accelerate and deepen the moose decline to very low numbers. The situation prompted wolf control programs in an effort to allow moose to recover more rapidly. Predators are rarely the sole reason for declines of wildlife populations, but under certain circumstances they can be a primary cause for depression of prey numbers.

There are additional natural hazards for wildlife. Accidents and disease sometimes kill wildlife, but often these hazards are either caused or promoted by other hazards. For example, a hard winter or late break-up may cause more accidents, because animals are in poor condition and more accident-prone.

In summary, a variety of natural mortality factors affect wildlife populations; these factors usually are interrelated, and their impact varies from negligible to considerable. Wildlife managers must know what these factors, or problems, are, and either devise ways of reducing them, or tailor management to allow for effects of these hazards.

Land Use

Land ownership was pretty simple before Alaska became a state. There were a few military reservations, and a large petroleum reserve. A handful of large National Parks, Monuments and extensive Wildlife Refuges existed, plus large National Forest holdings in Southeastern Alaska and smaller ones in Southcentral Alaska. Most of Alaska, though, was public domain, uncommitted to any special uses.

Times changed, the State of Alaska was given the right to select 104 million acres as part of its dowry from the federal government, and before long the question of Alaska Native Land Claims arose. In 1971 the Alaska Native Claims Settlement Act gave Alaskan Natives the right to select approximately 40 million acres of land in Alaska, and also provided for inclusion of up to 80 million acres in National Parks, Refuges, Forests and Wild and Scenic Rivers. Native selections were recently completed and are awaiting certification. Various proposals have been made for how the 80 million acres, called "d2" lands, should be assigned to the government agencies involved, and Congress has to make the final decisions by December 1978.

However those final decisions turn out, lands in Alaska will be in a crazy-quilt pattern of private, state, and (several) federal agency ownerships. The rights, regulations and rules of the various owners will make resource use of all kinds much more complex, and generally more restrictive than ever before. For wildlife management to contribute effectively to the well-being of wildlife species, and to provide for continued use of wildlife in various ways, some major problems must be addressed.

Perhaps the most basic problem is that even as demands for use of wildlife increase, the amount of land available for public use will decline, simply because the amount of land in private ownership will increase.

Land granted to native groups will be private land. Like any landowner, native groups will place their own interests first, and the lands granted to them are their main resource in becoming economically self-sufficient. Self-sufficiency may be based on resource development, subsistence use, or both, but whatever combination develops, public access to wildlife on those lands will no longer be a right, and opportunities to use wildlife will decrease.

Some state-owned lands may go into private control, too, through sale or lease. This would also decrease opportunity for public access to wildlife. By statute, one Alaskan has as much right to use wildlife as another, but, also by law, the landowner can regulate trespass on his own land as he sees fit.

The dilemma of increasing demand for wildlife use is only a little less complicated on public lands where constraints of private ownership are not in effect. In substantial portions of the 80 million acres of d2 lands under consideration by Congress, wildlife uses such as hunting, trapping, observing, or otherwise enjoying wildlife may be severely restricted or prohibited. Loss or severe restriction of these uses in large areas of federal domain is in itself a problem for those desiring to hunt and trap, or use wildlife in other ways, but the problem is compounded because the demand for these uses is not likely to go away. Rather, it will shift to other areas still available for these uses. Wildlife management programs then must cope with this concentrated demand and the stress it places on resources of a reduced land area.

With the many future owners of Alaska's lands and their diverse interests, a great challenge will be to achieve agreement on management that will benefit wildlife no matter whose land they're standing on. Many species will regularly cross property boundaries, and it will be very important that habitat preservation or manipulation and other management measures undertaken for the benefit of wildlife are a truly cooperative venture among landowners.

Development of Alaska's natural resources has spurred interest in Alaska ever since the first Russian ship groped its way through the storms and fog to find and claim "The Great Land." The history of development in Alaska is really more a chronicle of exploitation, crammed with a thousand shaky schemes to make men rich and sprinkled with a few that succeeded. Alaska survived, more by its vastness, remoteness, and by chance than by the enlightenment of men. Alaska is still vast but it is no longer remote, and its future condition as an unique environment for wildlife and for people depends upon the attitudes and actions of society much more than in the past.

Resource development, such has logging, mining, oil extraction, dam construction, and other activities are often viewed as the beginning of the end for wildlife. This is not always the case, but such resource uses do present potential problems to wildlife, wildlife habitat, and wildlife management because they often involve rapid and substantial habitat changes that persist for long periods of time. To most people, the change most immediately obvious when development occurs is a loss in aesthetic quality. Development involves change, and with few exceptions people view such change as an aesthetic loss. Although it is not mentioned in the following discussion, the degradation of aesthetic quality is a problem common to all forms of development.

Logging practices in Southeastern Alaska have been a source of concern to wildlife (and fisheries) biologists for years, and recently became national news when a court decision banned clear-cutting. Modern logging in Southeastern Alaska usually involves clear-cutting of mature forests because that is the most economical method in areas of even-aged trees where few or no roads exist, the country is rugged, and forests are a kind of jungle. "Clear-cutting" means cutting all timber on a selected

piece of ground. The ground cover vegetation is pretty well cleared also, by heavy equipment used in logging.

Although shrubs of various kinds grow up in clear-cuts, there is some question of how beneficial they may be to deer, particularly in large clear-cuts, where deer may be reluctant to go far from the edge of timber, or deep snow prevents them from doing so. Clear-cuts provide new deer browse (primarily in snow-free periods) for 15 to 20 years, but after that little food is available. Effects of clear-cuts on other species are even less well known. Where logging occurs next to salmon streams, siltation, stream blockage, and higher water temperatures may reduce or eliminate the stream's suitability for spawning or for young salmon and for other aquatic life, and may indirectly affect brown bears, black bears, and numerous furbearers that feed along these streams. Bald eagles nest in trees along the beaches, and they apparently require virgin timber for nesting. Even in very old clear-cuts that now have trees, eagles apparently do not nest.

Logs are usually stored in floating rafts which are held in sheltered bays, or estuaries, where freshwater streams mingle with the ocean. Estuaries are prime "nurseries" for many marine invertebrates and fishes, and pollution from logs and bark that is soaked or worn off can seriously affect the marine life of estuaries. Log rafts often scrape around the shallow bottom in response to tide or wind, and this too damages the habitat so important to young marine life. Thus, various birds and mammals that feed on the marine life of estuaries can be affected by what seem at first glance to be remote and unrelated events.

Logging in other parts of Alaska has not been extensive since the gold-rush days, but it is increasing in response to both domestic and foreign demand. Not much is known about effects of logging in these areas. Although logging was intensive in many places in the early days, no one paid much attention to its effects on wildlife. It may be that logging in Interior and Southcentral Alaska, can, with careful planning, benefit certain wildlife species without doing great harm to others.

Mining for many years has been synonymous with habitat destruction in parts of the U.S. where open-pit mines were developed. Alaska has had little of such methods, although scores of creek bottoms have been turned upside down by placer mining and dredging for gold. Now, 10 to 60 years after most gold mining shut down, it's hard to say what the impact has been or what it will amount to when another 50 years have passed. Much silt in numerous streams may have taken its toll on salmon and grayling, but impacts on wildlife are not well known. If extensive gold mining began once more, certainly habitat losses would result, but the importance of the losses is hard to predict.

In some cases roads or trails opened to reach mineral claims or mines have created erosion, thawing of permafrost and slumping, or other damage to habitat. Although some individual cases may do minimal damage, the accumulated damage may become significant, particularly if a great increase in mining should occur.

In the past, roads and trails built by and for miners provided access for commerce of the day. Some of these routes became roads which today allow thousands of wildlife users to reach new or different areas. The results have been both good and bad. Wildlife users were able to disperse to enjoy different areas and perhaps less crowding, but in certain areas the added hunting pressure was undesirable and proved detrimental to some big game species. Should new access be created by a future surge in mining, wildlife managers will have to be prepared to cope with the possibility of too much access by highly mobile hunters and other recreationists.

Impoundments, or lakes created by man-made dams are another form of

development that creates wildlife management problems. In general, the greatest problem caused by dams and their lakes is simply loss of the wildlife habitat to flooding. Few dams have been built in Alaska thus far, and relatively little habitat damage has occurred. Two proposed dams, however, illustrate the potential.

The Rampart Dam proposal was made in the early 1960's. With a dam near Rampart, on the Yukon River, the Yukon Flats would have been flooded, with the impoundment reaching nearly to the Canadian border. Ft. Yukon and several smaller villages would have been displaced along with several million acres of prime waterfowl, furbearer and big game habitat. Electric power was the purpose of the dam, and it was finally decided that the dam was not a good investment considering the returns it would bring. For wildlife resources of the state (and the nation), it was a fortunate decision. There is no way that production of wildlife in other areas could have been increased enough to make up for the losses that would have resulted from such a massive loss of prime habitat.

The "Devil's Canyon", or Susitna Dam, is a project currently being seriously considered. Its purpose is also the generation of electric power. A pair of dams would be built on the upper Susitna River where the river flows through a deep, relatively narrow valley. Habitat loss would be small compared to the Rampart Dam proposal, yet valuable wintering areas for moose and migration routes of caribou would be flooded, and increased human access would probably result. The effects of flood control on wildlife habitat below the dam are poorly understood, but it is known that periodic flooding is one of the main events that keeps river bottoms fertile and productive.

"Transportation corridor" is a currently-used phrase for a place to put roads, pipelines, electric lines or other systems for moving people, material or energy. Numerous transportation corridors for various anticipated uses have been proposed in Alaska. The best known such corridor in Alaska today is the Trans-Alaska Pipeline corridor, with its roads, camps, pipes and storage tanks.

For wildlife management, the problems of transportation corridors include habitat loss and disturbance of wildlife at critical times, but probably of more importance is how to regulate access and resource use next to the corridor, and how to insure that the pipeline, road or whatever may be built, interferes as little as possible with normal animal movements and behavior. While a single corridor through an area may have limited impact on wildlife, multiple corridors would very likely create much more serious problems by compounding the smaller influences of individual corridors.

Urbanization and related effects of an increasing human population, such as sprawling suburbs, private recreation property, roads, and fences, probably create more problems for wildlife and wildlife management than is commonly appreciated. Loss of wildlife habitat to urban expansion is often not very obvious, until comparisons are made with 5, 10 or 20 years past.

The amount of habitat lost in the Anchorage area over the last 10 years is startling, and can be appreciated only by comparing aerial photographs from 10 years ago and now. The same is true of the Fairbanks area, and to a lesser extent it is true of many smaller communities and roadside areas as well. In addition to habitat loss, disturbance by increased vehicle traffic, additional people, and more dogs and cats, places greater difficulties before wildlife as they attempt to find and use habitat once available to them but now gone or surrounded by "barriers." Conflicts between wild animals and people in urban and suburban areas often result in the elimination of the animals. Under such circumstances, wildlife numbers cannot help but decline.

A second impact of urban growth is the effect upon adjacent recreation areas. Urban dwellers characteristically look longingly to the country, and if possible they will buy recreation property somewhere near their homes. Again, the Anchorage area is a good example; many privately owned recreation lots have sprung up in the Matanuska Valley. Where formerly old homesteads and random fires created clearings that produced abundant winter food for moose, now private owners carefully guard their quota of maturing forest which they understandably treasure. The resulting reduction in winter range may have strong and long-term negative impact on the number of moose in the Matanuska Valley. Although it is a wildlife management problem, there may be no solution, at least within the choices presently available to the manager.

Pollution has only recently become a household word, even though it has long been a common problem. Alaskans are fortunate in having few serious pollution problems, but they do occur. Perhaps the most important source of pollution with respect to wildlife is oil development and transportation.

The effects of oil (or its by-products) may be direct, as when oil products spilled on lakes, rivers or oceans immobilize birds, ruin their waterproofing, or poison them. Oil spills are now infamous for the problems they have created for waterfowl and marine birds.

Indirect effects are more subtle, and in the long run they may be more important. Oil products can upset natural systems by killing or crippling small organisms upon which larger forms feed, or by similarly affecting young stages of larger forms. Either way, there's potential for impacts on game or food fishes, shellfish, waterfowl, sea birds and marine mammals. The indirect impacts of just a single spill are poorly understood, yet the potential for repeated spills exists and is probably increasing. Although more is being learned about the effects of oil spills, and more effort is now made to clean them up, the chief problem seems to be how to avoid them in the first place.

Use of Wildlife

Of all the problems of wildlife management, none are more perplexing to the wildlife manager, nor stir the emotions of the public like wildlife uses. People who would not blink an eye if Hoover Dam were plunked in the middle of Alaska, reservoir and all, are ready to fight if cow moose hunting is suggested! And how many years has it been since the "wolf controversy" didn't warm up the Alaskan winter and save a thousand souls from cabin fever? The list of wildlife issues that bring out the best, or the worst, in people seems endless. Alaskans have a personal and proprietary interest in wildlife, and as many views on wildlife uses as there are feathers on a falcon.

Is that a problem? No, and, yes. No - the public has the last word on how wildlife should be managed and their interest and input is essential if management is to turn out as they want it. But, yes - not everyone can be satisfied. Then, too, there are some people whose views are strictly self-serving, and who contribute more to the problems than to solutions.

Before a manager can think about how wildlife will be used and who will use it, he has to consider whether use can occur in the first place. For use to occur, wildlife populations must be maintained at levels where they can provide use; losses to natural factors must be considered and habitat must be maintained (land use).

To be used, wildlife must also be accessible. In many parts of Alaska little use occurs simply because people can't get to the animals. An increase in private land and some federal lands, discussed earlier, will

make wildlife even less available to the public. Everyone will feel more restricted as the human population and demands on wildlife grow, while wildlife populations and the lands where they can be used remain the same or shrink. What can be done?

There are a number of alternatives being used by other states where these kinds of problems are much more advanced than in Alaska: 1) increase access to remote areas; 2) make the public pay for access to private lands; 3) increase the number of animals in high use areas by means of habitat manipulation techniques; 4) accept more crowded conditions on public lands and at the same time reduce the success of the consumptive users; 5) limit the number of people who can use public lands to maintain satisfactory use experiences; and 6) rotate user groups on the same area (called "time and area zoning"). Most likely all of these alternatives eventually will be used in various combinations in Alaska. Increased restrictions on use seem inevitable.

The biggest problem of use is that of allocation or "who gets what." The public is made up of many interest groups who wish to use and enjoy wildlife in their own way; all have pretty much the same rights to do so, but there isn't enough wildlife to go around. There are many examples of user groups: the "locals" and the "outsiders," consumptive users and nonconsumptive users, recreational, "subsistence" and commercial users, residents and nonresidents, hunters and anti-hunters, majorities and minorities, and let's not forget the "haves" and the "have-nots."

One of the first questions to be settled is "who is which?" Is the man that kills a walrus and sells its ivory a subsistence user or a commercial user? Is a city dweller who hunts moose for meat a recreational hunter or a subsistence user? Is a hunter who photographs wildlife more a consumptive or nonconsumptive user?

If and when you can tell one user from another, the next point to consider is what each user's level of need is and how much use is adequate to satisfy it. Where should the priorities be? Physical need? Economic survival? Recreational enjoyment? There are few easy answers.

Although there are many instances of conflicting demands, one major problem which has befuddled nearly everyone is how to identify and fairly and adequately allocate resource uses between recreational and subsistence users. The State Constitution says that wildlife is "reserved to the people for common use," which means all Alaska residents have equal rights to use wildlife. However, many people living in the bush on low cash incomes depend more on wildlife (and other resources) for part of their livelihood than do urban-oriented people with regular jobs. The supply of wildlife is limited, so when the number of hunters increases, or when numbers of wildlife decline, somebody is going to return from the hunt empty-handed. The subsistence users are most severely affected, so it seems reasonable to give them some preference in use of wildlife. This has been done to some extent by adjusting seasons and bag limits to favor residents of a particular area, by a reduced fee (25¢) for hunting, fishing and trapping licenses for families with an income of less than $3,600, by regulating use of airplanes or vehicles, and various other techniques. Recently the Board of Game was given the power to establish subsistence use areas if it is shown that recreational hunting will prevent subsistence needs from being met. In such areas regulations specifically favoring subsistence users (but not legally barring others from use) could be adopted.

Economic conditions in the state are changing, and more rural residents are earning substantial incomes which enable them to purchase more of their needs. The distinction between a subsistence user and a recreational user is often very fuzzy and is becoming more so. There is actually a broad spectrum of what is called subsistence use, that ranges from

nearly total dependence on natural resources to very little use. Just where to draw the line establishing what combination of resource use and wage earning qualifies as subsistence use and what does not is difficult. Then, too, many Native groups as well as other Alaskan residents have expressed the view that subsistence is not simply an economic matter, but a lifestyle and cultural necessity also, even though they have willingly abandoned many traditional means (a cultural element) of obtaining such subsistence.

This has complicated the problem further in that while the subsistence user's dependency on the resource is still very real, the impact of his use on wildlife has changed markedly from what it once was. Instead of spears and bone fishhooks, he now uses high-powered rifles and gillnets, and he now travels by powerboat, snow machine and aircraft. In short, he now has much the same impact on wildlife populations that his "recreational" counterpart does, and in some cases, a much greater impact. The result has been harvests of some species in certain areas which have been in excess of people's needs, too large for the species to support on a continued basis, or both.

Conflicts between other user groups at times assume major proportions. Take the wolf controversy as an example. There are some who feel "the only good wolf is a dead wolf." Others blindly extoll the virtues of wolves under any circumstance while ignoring their "faults." Surely there is a balanced approach possible, a middle ground, but sometimes it seems it is a "no man's land" and the wildlife manager is square in the middle! The result: costly, time-consuming court suits at the expense of the resources involved and the public.

The general problem of hunters versus anti-hunters is not likely to be solved overnight. Because both groups share an enthusiasm for wildlife and a basic concern for its welfare, as well as similar rights to enjoy their preferred wildlife use, the wasted energies of unproductive confrontations could be far better used to benefit both interest groups and the wildlife resource. Certainly this is one more area to pursue "detente."

What does the future hold? Increased demands and more conflicts, certainly. It will be a challenge to avoid the unfortunate polarization of Alaskans that seems to accompany conflicting interests. As competition increases, parochialism will become even more obvious in the attempt to retain local jurisdiction. Overlaps in advisory committee, borough, village council and state and federal agency jurisdictions may create chaos unless some integrated workable system for allocation is developed.

From past experience, it is clear that whatever uses or combinations of uses are provided for, actions are necessary to ensure that overuse is avoided. There are many technical considerations. Should hunting of females be allowed, and if so, under what circumstances? Should predator control be used, and under what circumstances? What measures must be taken to avoid overhunting? Should vehicles be restricted? Should hunter numbers be limited? Seasons closed? How can illegal hunting best be detected and controlled?

Under some circumstances, illegal hunting or trapping can be an especially critical problem. In an area with intensive legal hunting, a large illegal kill can force curtailment of legal uses, and in situations where wildlife populations are at low levels, illegal kills can tip the balance and cause the populations to decline.

Enforcement of hunting, trapping, and fishing regulations is primarily the responsibility of the Division of Fish and Wildlife Protection, in the Department of Public Safety. However, most Fish and Game biologists are also deputized. Even so, the total number of enforcement officers is relatively small and consequently enforcement coverage of the state

is thin because of the state's size and because of the seasonal need to concentrate enforcement efforts on crucial problem areas.

Additional factors complicate the problem. Over such a large area it is extremely difficult to keep track of thinly scattered, highly mobile hunters. Also, many hunters are from out of state and are able to avoid prosecution by leaving Alaska before the violation is discovered or before a "hard" case can be put together. Contributing importantly to indifferent disregard for game regulations is the lack of meaningful penalties for convicted violators. The Alaska court records show a long history of suspended sentences and "slap on the wrist" penalties that have had little effect, except perhaps to encourage continued violations. Recently there has been some improvement in sentencing of violators and a continuation of this trend is most desirable.

Management Limitations

One final category of problems, here called management limitations, is perhaps the most important of all because it affects the capabilities of the Department of Fish and Game in solving all those other problems heretofore discussed, and hence its ability to meet its responsibilities to the resource and to the public. These limitations have to do with the Department's relationship to other agencies, the Legislature, and the public.

Both the state and federal governments have wildlife resource management responsibilities, but the objectives of each are not always in concert. Federal agencies such as the National Park Service, the Fish and Wildlife Service, the Forest Service and the Bureau of Land Management have been around for a long time. Their actions are sometimes ponderous, slowed by massive bureacracies, governed by long-standing policies and inflexible guidelines, administered by officials far removed from Alaska, and influenced by a national public with concerns which sometimes differ markedly from those of Alaskans.

To be sure, there are advantages to such a slow-but-steady system, the chief of which is perhaps that it is less subject to fickle or irresponsible management actions or local political influences. But there are as many instances where inaction is as damaging as the wrong action, and in Alaska, where changes are occurring at breakneck speed and where unique situations demand special considerations, innovative approaches to resource management are needed.

Alaska, as other states, has traditionally exercised jurisdiction over its resident wildlife species, including those on most federal lands within the state. Wildlife within national parks, however, is managed by the federal government in that national parks are traditionally closed to hunting and trapping. Federal wildlife refuges are generally open to hunting, but various regulations control use of airplanes, all-terrain vehicles and snow machines, and otherwise influence the distribution, numbers, and access of recreationists. Thus these regulations essentially become part of the State regulations affecting wildlife use. As more federal reserves are dedicated by Congress, additional rules and regulations will undoubtedly come into effect.

In addition, State jurisdiction over most species of birds, marine mammals and endangered species has been superseded by federal regulations made pursuant to national legislation and international treaties. Use of any species so affected is allowed only under the guidelines established by the federal government. Waterfowl hunting regulations must fit the general framework of federal regulations and be approved by the Secretary of the Interior. Management of marine mammals was withdrawn from the State by the Marine Mammals Protection Act of 1972, but under provisions of that act walrus management (subject to federal approval) was returned

to the State. Management of other marine mammals may follow the same costly and circuitous route. Federal laws protecting endangered species and some groups of birds also set some restrictions on State wildlife management.

Land use policies of federal and state agencies and of private landowners strongly affect management of wildlife. The Department of Fish and Game owns very little land. As a result, it is most often only advisory to other agencies on matters such as land use planning, habitat protection or manipulation, land disposal, and access regulation. In some cases this arrangement has been a stumbling block to various management efforts.

Funding largely determines what and how much the Division of Game can accomplish, not only by limiting the amount of work that can be conducted, but also by limiting the number of biologists on the staff (and therefore the time each man can devote to different tasks). Everyone knows a dollar doesn't go far in Alaska, and for the Game Division the mileage has been getting worse. Why? Because budgets have not kept pace with inflation or need. Each year more and more money goes to pay for "fixed costs" (salaries, rents, and equipment) and less and less is left for "operations" - (transportation, supplies, and contractual services).

One important problem arising from the small staff available is that not all parts of the state receive the attention they should. Although field offices are maintained in many of the state's larger communities, additional field staffing is required in various areas where the mushrooming need for more and better quality information on wildlife has become apparent.

In addition, unprecedented demands on the staff have resulted from the interaction between State and federal agencies on such matters as "d2" lands, marine mammal management, Outer Continental Shelf oil leasing, Coastal Zone Management, oil pipeline impacts and various other matters, all of tremendous importance to the future welfare of wildlife in Alaska.

Because there is so much to do, some things can be done well and others don't get done at all. One of the casualties of the "crunch" has been activities directed at keeping the public fully informed as to the status of wildlife, the reasons behind certain regulations, and, in general, what the Game Division is up to. The result? A serious credibility gap which has had far-reaching impacts on many Department programs.

Information and education activities aren't the only ones to suffer. Research activities needed to acquire badly needed information on wildlife have been cut back, and many survey and inventory programs are reduced to the "bare bones." Inadequate information is available about some species such as furbearers and unclassified wildlife because all the attention is focused on "problem" species such as caribou, moose, wolves and bears.

The cry for money is a chronic complaint among government agencies and it rarely catches a sympathetic ear. Nevertheless, the problems of funding are acute for the Game Division and they impose serious limitations on the Division's capability to meet its responsibilities.

Control of the Department's budget is only one of several ways the Legislature affects wildlife programs. Each year, legislation is passed which affects wildlife and its use either directly by governing use, or indirectly by influencing other land uses which in turn impact wildlife.

Because legislation is generally relatively inflexible and permanent (unlike fish and game regulations which are annually reviewed and revised, or policies which can be changed on short notice), legislation directly affecting wildlife is valuable and necessary to long-term direction and

continuity in wildlife programs if it is carefully considered, addresses matters of broad scope and provides a framework within which regulations may be promulgated and management can remain flexible. In contrast, detailed and specific legislation directed at regulation of individual programs removes the "elbow room" needed by managers to cope with dynamic wildlife situations. Once enacted, laws are infrequently repealed and by their very existence become traditional. Such "fixtures," if undesirable, reduce options and therefore the effectiveness of managers.

Legislation not directed at wildlife also can have significant secondary impacts on wildlife. Legislation affecting classification of lands for agriculture, private ownership, or state parks can be a detriment or sometimes may benefit wildlife through changes in, or protection of, habitat. Also, such measures, and others which influence settlement and transportation, affect utilization of wildlife by changing its accessibility.

The Division of Game operates within the general set of administrative operating rules and regulations, and legislative and fiscal schedules common to all State agencies. These assorted processes of State government all affect wildlife management programs to various degrees.

Finally, the public affects the things wildlife managers do by influencing actions of elected and appointed government officials including legislators, governors, commissioners, and members of the Board of Game. It is the actions of such officials which set the bounds on what professional managers can do.

Because wildlife managers act in the public interest as custodians of the public's resource, they welcome and encourage public interest and involvement in management decisions. There are times, however, when public sentiment can impede sound management, sometimes threatening the resource itself, but more often reducing or eliminating reasonable utilization. Popularity is not always synonymous with public interest.

We have already said something about the problem of identifying the various "publics." Everyone knows that with most issues there is a vocal minority and a silent majority, and the perceived public desire may not necessarily be the real broad-based public opinion. Yet it is the perceived public opinion that sways elected and appointed government officials, whose actions have the dual motivations of seeing to the public interest and of staying in office. Also, the public, or segments of it, are sometimes subject to emotionalism and rapid polarization over issues, and government officials sometimes react with corresponding brevity. The result: actions of the moment, in response to limited, special, and/or short-lived interests, having long-term consequences on the entire public body.

With wildlife management, as with politics, everyone seems to be an expert on the subject. However, while use and enjoyment of wildlife are common to all, the expertise required to manage wildlife is not. The problem comes in balancing scientific professionalism with public involvement. The public should understand that wildlife management must be based on biological and ecological principles and that it should be conducted with the highest standards of professional scientific expertise. Wildlife managers in turn should be responsive to changing public attitudes concerning wildlife and its use, and managers should be more cognizant of their custodial role. Essentially it is a problem of communication, in both directions. It is hoped that the information and proposals contained in these Alaska Wildlife Management Plans will be the basis of an improved mutual understanding and effective communication.

PART II:
INDIVIDUAL SPECIES MANAGEMENT PLANS

This section contains every individual species management plan located in the Southeastern Alaska Region. The plans are arranged by species alphabetically, and each species is introduced by a general description of that species in the region.

All individual plans are titled and numbered for easy reference to the maps provided with this booklet. Use of the maps will help in locating the areas described under "Location" in each individual plan.

Because wildlife in Alaska has long been managed according to administrative regulatory units called "Game Management Units", familiar to many Alaskans, most location descriptions indicate which Game Management Unit or Units the plans are located in or use some Game Management Unit boundaries as individual plan area boundaries. A Game Management Unit map has been included with the color-coded wildlife plans maps to help in understanding the precise location of proposed areas.

BLACK BEARS IN SOUTHEASTERN ALASKA

Black bears (*Ursus americanus*) are distributed throughout Southeastern Alaska on both the island and mainland areas with the exception of Admiralty, Baranof and Chichagof Islands and a few of the smaller offshore islands. They are abundant throughout their range in the region, and with the exception of deer, are the most commonly encountered big game animal in this area.

The areas in which black bears occur coincide closely with the distribution of forests but seasonal variations in habitat use are apparent within this vegetative zone. Black bears prefer open forests rather than dense stands of timber, and the highest densities of black bears generally occur in areas having interspersed vegetation types. Semi-open forested areas with understory composed of fruit-bearing shrubs and herbs, lush grasses and succulent forbs are particularly attractive to black bears. Extensive, open-canopy areas are generally avoided. Most of Southeastern Alaska's mature forest has a semi-open canopy, a good understory of food producing plants and is excellent black bear habitat. Black bear densities are probably higher on the islands than the mainland area because of the greater percentage of usable habitat on the islands. The mainland contains large amounts of ice and rock and the beaches tend to be steeper and rockier than on much of the island habitat. On the mainland competition with brown bears may also be a factor.

In spring, black bears are frequently found in moist lowland areas where early growing green vegetation is available. The sedge and grass areas of open beaches are particularly important. The first skunk cabbage, which is an important food, also appears in these beach fringe areas. Clearcuts less than 20 to 30 years of age that are at lower elevations also receive considerable use in spring.

Black bears spend the summer in transition from beach areas to berry-producing areas and along fish streams. Summer use of berries by black bears occurs from sea level to alpine areas. Some salmon become available in late July but fish are not present in large enough numbers to become an important food item until mid-August or later. By the end of September most salmon spawning is completed with the exception of some streams with late chum and coho runs and there large numbers of bears can be found into late October and even November. Black bears are capable of traveling long distances and have shown a remarkable homing ability in returning to their home ranges when transplanted to other locations. Some of the longer movements may be associated with travels to major fish streams in the fall.

Little information is available regarding natural controls on black bear populations and the degree of population fluctuations. Deep, long-lasting snows are thought to cause mortality of adults and cubs by slowing emergence of hibernating bears from dens and delaying availability of new green vegetation after emergence. Some bears are killed by other bears and by wolves, but the extent of such predation is unknown. Cubs are precocious; some orphans as young as five months of age have survived without maternal care. Parasites and diseases do not cause significant mortality. One parasite of concern to man, Trichinae, is present in some bears and is transmissable to man when raw or partially cooked bear meat is eaten.

Black bears in Southeastern Alaska are primarily used for recreational hunting for skins and meat. Despite traditionally liberal hunting seasons and bag limits, the harvest of this species in Southeastern has remained near 200 bears annually.

Black bear hunting is popular in spring when they, brown bears, and wolves are the only species of big game that can be legally taken. Hunters seek bears shortly after the bears emerge from hibernation when the hides are usually of excellent quality. Bears are also more concentrated and available to hunters along the beaches in spring; hunting from boats is both enjoyable and successful. Hide quality deteriorates as the winter hair is shed and rubbed spots appear, and most sport hunting ceases by mid-June. The harvest of males is greatest in spring because they leave the den before females and because females accompanied by cubs are protected by regulation.

Sport hunting of bears resumes in September when hides have improved in quality and continues until bears den for the winter. Many of the black bears harvested in the fall are taken incidental to hunts for other species, particularly deer and waterfowl.

Southeastern Alaska mainland black bears occur in three main color phases with the common black phase accounting for about 90 percent of the harvest over the past two years. The cinnamon phase provided about 9 percent of the harvest during this period and the blue color phase, found mainly around Yakutat, one percent. Nearly 100 percent of the bears taken on Southeastern Alaska islands are of the black color phase.

PROBLEMS

* Black bear habitat in southeastern Alaska is primarily climax forest which has been relatively stable for thousands of years. The advent of large scale clear cut logging has been the only human activity that has altered this climax habitat in significant quantities. Long range U.S. Forest Service plans call for clear cutting much of the commercially valuable timber in the region. It is unknown at this time what effect the change from a climax to a second growth forest will have on black bear populations. Studies of black bear-logging relationships should provide information useful in predicting the effects of timber removal on black bears.

* Black bears rapidly accustom themselves to the presence of humans and the ready souce of food that human habitations and activities provide. Open garbage dumps and the excesses or indulgences of humans at recreation sites and campgrounds quickly make nuisances of bears who become dependent on such sources of food. Many nuisance bears become a threat to human safety and property and must then be destroyed or otherwise removed. Proper garbage disposal and refraining from feeding "tame" bears are necessary to avoid eventual confrontations that endanger human life and lead to destruction of the bears.

* Populations of black bears in Southeastern Alaska in areas of high human population, or in areas of easy access are more susceptible to high harvests, particularly during the spring season. Bears foraging along beach areas after emerging from the dens are visible and readily accessible to hunters using boat transportation. An increasing number of hunters with decreasing opportunities to hunt the more popular game species could result in a significant increase in sport hunting of black bears. Hunting regulations will need to be modified to meet increased hunting pressure.

12. SOUTHEAST ALASKA BLACK BEAR MANAGEMENT PLAN

LOCATION

Game Management Units 2-5 and that portion of Game Management Unit 1 not included in the Behm Canal Black Bear Management Plan area or in Glacier Bay National Monument.

MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting black bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Encourage recreational hunting of black bears to achieve greater utilization of the black bear resource.

2. Regulate access and methods of transport, if necessary, to avoid conflicts with management objectives for other species.

3. Increase public awareness of black bear behavior to reduce adverse bear-human interactions.

THE SPECIES

Black bears are relatively abundant throughout Southeastern Alaska. Seasonal concentrations of bears occur on beaches and tidal areas during the spring and along salmon streams in fall. Black bear populations appear to have been stable for the past several years. Little is known of natural mortality factors. Three principal color phases of black bears occur on the mainland: black, cinnamon, and blue (glacier) bears. Almost all black bears on the islands are of the black color phase.

Prime black bear habitat in Southeastern Alaska consists of climax, semi-open, mature forest with a good food-producing understory. The only activity which has significantly altered this black bear habitat has been large-scale, clear-cut logging. Although clear cutting was used as early as the late 1800's, it did not reach significant proportions until the early 1950's. Clear-cut logging occurred at an annual rate of 16,300 acres during 1971, 1972 and 1973 and has since increased. Most logging has occurred in the southern portion of the area. Long-range U.S. Forest Service plans call for clear-cutting most commercially valuable timber; it is unknown at this time what effect the change from a climax to a second-growth forest will have on black bears, as the species appears to adapt to numerous habitats.

Most human use of black bears in Southeastern Alaska is recreational hunting for skins and meat. Photography and observation are significant uses but are usually incidental to other forms of activity. Hunter success for black bears has been generally high in the area. The number of bears harvested appears to be low compared to population size. The reported black bear harvest was 162 in 1974 and 191 in 1975. Males comprised about 80 percent of the harvest for both years. The black color phase accounted for about 90 percent of the harvest, the cinnamon phase 9 percent and the blue (glacier) phase 1 percent. The blue phase is found primarily near Yakutat. Hunters prefer the blue and cinnamon color phases, and this selectivity may increase representation of these color phases in the total harvest.

Over three-fourths of the annual harvest occurs in the spring, particularly during May. Black bears are most available to hunters in spring when they are concentrated on the grass flats of estuarine areas. Hunting effort is high at this season because black bears, brown bears, and wolves are the only species of big game that can be legally taken in the spring, because hides are of excellent quality early in the year, and because bears are readily

available to boat hunters. Black bears are also hunted in the fall but often incidental to hunts for other species, particularly deer, goat, and waterfowl.

Local residents primarily from Ketchikan and Juneau account for most of the black bear harvest. About 74 percent of the kill in 1974 was by residents; in 1975 the resident take was 63 percent. The decrease in kills by residents was due to an increase in the proportion of bears taken by unguided nonresidents, from 9 percent in 1974 to 20 percent in 1975. Guided nonresidents accounted for 17 percent of the kill in both years. The heaviest use by nonresidents occurs in Game Management Units 2 and 3. Guides are most active in Unit 3. In 1975, 62 percent of the Unit 3 harvest was taken by nonresidents.

Marine waterways provide almost unlimited access to black bear hunting areas in Southeastern Alaska for hunters using aircraft or boats. Most successful hunters utilize boats. Relatively few bears are taken along roads due to the limited road system and roadside hunting closures near communities.

Despite traditionally liberal hunting seasons and bag limits, hunting has not noticeably affected black bear populations. The harvest remains small except near larger communities where increases in hunting pressure have resulted from both an increased interest in hunting black bears and an increasing human population. Besides the sport harvest, at least eight bears were killed in the past two years in defense of life and property.

The liberal September 1 to June 30 season has remained unchanged since statehood. Restrictions prohibiting the taking of cubs and females accompanied by cubs have been in effect since 1963 for the blue (glacier) color phase, and since 1967 for all color phases. In 1971 the bag limit was reduced from three to two bears because of the increasing demand for black bears as big game trophies.

PROBLEMS

* Black bears rapidly accustom themselves to humans and the ready source of food human habitations and activities provide, and the excesses or indulgences of humans at recreation sites and campgrounds quickly make nuisances of bears who become dependent on such sources of food. Eventually, nuisance bears become a threat to human safety and property and must then be destroyed or otherwise removed. Attention to proper garbage disposal and refraining from feeding "tame" bears are necessary to avoid eventual confrontations that endanger human life and lead to destruction of the bears. Bear populations around urban areas should be held at minimum levels by hunting to minimize bear-human conflicts. Reduction or elimination of roadside closed areas that prohibit hunting would help control bear numbers and also provide increased hunting opportunity.

* Coastal populations of black bears in Southeast Alaska near human population centers or in areas of easy access are vulnerable to large harvests, particularly during spring seasons. Bears foraging along beach areas after emerging from dens are particularly vulnerable to boat-based hunters. A growing human population and reduced opportunities for hunting other species will result in increased hunting pressure on black bears. Management of vulnerable black bear populations may require adjustment of hunting seasons, bag limits and distribution of hunting effort to avoid overharvests.

IMPACTS

* No changes in black bear hunting seasons and bag limits are anticipated except where local overharvests may occur.

* The black bear populations in Southeastern Alaska should remain at about the same level in most areas. Average ages of black bears may decline and the sex ratios will probably be skewed in favor of females.

14. PETERSBURG CREEK BLACK BEAR MANAGEMENT PLAN

LOCATION

In Game Management Unit 3, the drainages of Petersburg Creek on Kupreanof Island.

MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy black bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain a year-long black bear hunting closure.
2. Encourage viewing and photography of black bears.
3. Regulate access and activities of viewers and photographers, if necessary, to prevent undesirable bear-human interactions.
4. Increase public awareness of black bear behavior to reduce adverse bear-human confrontations.
5. Discourage land use practices that will adversely affect black bear habitat or which will degrade the wild character of the area.

THE SPECIES

Although black bears are commonly observed within the Petersburg Creek drainage, there is little information available on population status. The lower four miles of the drainage is estuarine habitat. Grass flats parallel either side of the stream. Black bears are attracted by the vegetation during spring and summer months and by the availability of salmon in the upper streams during late summer and fall.

Petersburg Creek is an exceptional sport fishing stream, attracting both resident and nonresident fishermen. Access to the lower reaches of the stream is by boat (only a few minutes from Petersburg). The stream originates from Petersburg Lake which is accessible by either foot trail or aircraft. The entire Petersburg Creek system is a popular recreation site and the wild character of the area is very attractive. The opportunity to observe black bears increases the total experience by area users. In 1975, the drainage was closed to black bear hunting by public request. Prior to the closure, several black bears were taken each year by hunters. The easy access by skiff and the closeness to a population center made bears very vulnerable to hunters. The majority of the public supported the closure, considering it more valuable to observe than to hunt black bears, and there has been little opposition to the closure since 1975.

PROBLEMS

* The wilderness character of the Petersburg Creek drainage area is important to the aesthetic quality of the area for hunters. Clearcut logging in the area would significantly detract from the natural beauty and would reduce its appeal. The area lies within the Tongass National Forest. The Department must work together with the Forest Service to ensure protection of the area.

IMPACTS

* The hunting closure reduces the opportunity to take black bears on Kupreanof Island, but there are many other black bear hunting areas available nearby.

* The closure of the area to black bear hunting will have little impact on total bear populations in the region.

* Maintaining the wild character of the land would preclude industrial development within the area.

15. BLIND SLOUGH BLACK BEAR MANAGEMENT PLAN

LOCATION

In Game Management Unit 3, the Blind Slough - Blind River area on Mitkof Island between Wrangell Narrows and Sumner Strait, bounded on the northeast by the Mitkof Highway and on the southwest by a line lying 1/4 mile southwest and parallel to Blind Slough and Blind River.

MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy black bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain a year-long black bear hunting closure.

2. Encourage viewing and photography of black bears.

3. Regulate access and activities of viewers and photographers, if necessary, to prevent undesirable bear-human interactions.

4. Increase public awareness of black bear behavior to reduce adverse bear-human confrontations.

5. Discourage land use practices that will adversely affect black bear habitat or which will degrade the wild character of the area.

THE SPECIES

The Blind Slough area is a small portion of black bear habitat on Mitkof Island. It is about ten miles in length and averages less than one mile in width. Little data are available on actual population status; however, black bears are common on all of Mitkof Island. There are seasonal concentrations along Blind Slough providing a better opportunity to observe black bears than on most other areas of the island. In spring bears are attracted to vegetation on grass flats and in summer and fall by the presence of salmon in the numerous small streams which drain into Blind Slough. Usually the observer doesn't see large numbers of bears, normally less than five, but observations are enhanced by the aesthetically pleasing conditions of the area.

Blind Slough is a high use recreation area. Estuarine habitat is present at the northern and southern extremities and the entire slough is bounded by grass flats. The Mitkof Highway parallels the slough and much of the area used by black bears is visible from the highway. Blind Slough is an excellent sport fishing location. There are several public campgrounds along the slough and the area receives much recreational use by both local residents and tourists. The opportunity to view black bears contributes to the total experience. Less than five black bears are normally taken annually by hunters within the area.

PROBLEMS

* There is the possibility of timber harvests both within and adjacent to the area which would detract from the appearance of the area. Aesthetically pleasing conditions enhance the experience of viewing and photography. Public interests will best be insured by maintaining the natural character of the area. Human disturbances within the area should be discouraged.

* Some bear-human conflicts will occur as the concentration of fish near the hatchery attracts bears; hence it may be necessary to remove an occasional bear from the immediate vicinity of the hatchery. Improper garbage disposal also attracts bears and proper hauling and storage measures should be required and enforced both at the hatchery and at public campgrounds.

IMPACTS

* There will be a small reduction in the opportunity to take black bears but there are enough other good black bear hunting areas on Mitkof Island to compensate for this use change.

* Maintaining the wild character of the area will require restrictions on future industrial development and cooperative agreements and joint efforts between the U. S. Forest Service and the Department of Fish and Game.

16. ANAN CREEK BLACK BEAR MANAGEMENT PLAN

LOCATION

In Game Management Unit 1B, the drainage of Anan Creek on the Cleveland Peninsula.

MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy black bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain a year-long black bear hunting closure.
2. Encourage viewing and photograpy of black bears.
3. Regulate access and activities of viewers and photographers, if necessary, to prevent undesirable bear-human interactions.
4. Increase public awareness of black bear behavior to reduce adverse bear-human confrontations.
5. Discourage land use practices that will adversely affect black bear habitat or which will degrade the wild character of the area.

THE SPECIES

The lower portion of Anan Creek has historically been noted as a good location to view and photograph black bears. During summer and fall months, when salmon are spawning in the stream, black bears are abundant, at which time it is not uncommon to observe more than 20 black bears along the stream. Most of these bears are attracted from other areas on the mainland by the abundance of salmon. Few bears are observed in the area when salmon are not present in the stream.

Anan Creek is one of the most popular locations to view and photograph black bears in Southeast Alaska. Access to the area is by boat or aircraft. The entire drainage is within the Tongass National Forest and the Forest Service maintains two cabins and an observatory adjacent to the stream. In 1975 there were 600 man-days use of these cabins by 178 individuals, primarily observing and photographing black bears. The drainages of Anan Creek have been closed to the taking of black bears since prior to Statehood.

PROBLEMS

* Bear-human conflicts occasionally occur at Anan Creek, often caused by improper disposal of garbage. All garbage should be removed from the area and proper garbage holding and disposal regulations must be strictly enforced. Notices should be posted to advise users of possible confrontations with bears and to use reasonable precautions. It may be necessary to remove an occasional problem bear from the area.
* Use may become so intensive as to cause conflict among users and degrade the aesthetic values associated with viewing and photography. It may be necessary to limit use by registration.

IMPACTS

* Maintaining the wild character of the land will preclude incompatible industrial developments.

* Anan Creek has been closed to black bear hunting for many years. The implementation of this management plan should have no additional impact on bear or other wildlife populations.

* The significance given the management area through a specific plan may attract attention and result in higher human use.

* The Department may be requested to assist in providing and maintaining public facilities. Additional personnel may be necessary if use is monitored or registration is required.

17. BEHM CANAL BLACK BEAR MANAGEMENT PLAN

LOCATION

All of the mainland portion of Game Management Unit 1A except that part of the Cleveland Peninsula south of Spacious Bay.

MANAGEMENT GOAL

To provide an opportunity to hunt black bears under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control number and distribution of hunters, if necessary, to maintain aesthetic hunting conditions.

2. Discourage land use practices which will adversely affect the wild character of the area.

THE SPECIES

Black bears are abundant throughout the timbered and adjacent portions of the area. Seasonal concentrations occur along beaches and tideflat areas in the spring and along salmon creeks in late summer and fall. The population appears stable and natural mortality does not seem excessive. The population has few bears of trophy size. None of the skulls from bears taken in this area in 1974 and 1975 made the Boone and Crockett listing. The area contains cinnamon colored black bears that are not normally found on islands in Southeastern Alaska. The climax spruce, hemlock and cedar forest habitat is unlikely to change in the near future. The commercial quality of the timber is generally lower than on the islands in Southeastern Alaska; this area has been given a low priority for development by the U.S. Forest Service.

All forms of human use of black bears in the area are light in intensity. The predominant use is recreational hunting. The only change in black bear hunting regulations in the area since 1961 has been a reduction of the bag limit from three to two bears in 1971. The number of hunters has increased somewhat but the harvest remains low and hunter success is high. In 1974, 19 bears were taken during the spring and 6 in the fall; in 1975 the kill was 15 bears in the spring and one in the fall. Most bears are taken in the spring when no other big game hunting seasons are open. Bears killed in the fall are usually taken incidental to deer, goat and waterfowl hunting.

The current harvest has not noticeably affected the bear population although the sex ratio has probably been altered somewhat by the large percentage of males taken. Approximately 90 percent of the spring harvest and 68 percent of the fall harvest for the past two years has been males.

Local residents account for most of the bears harvested. No professional guides operate in the area. Hunting for hides is the primary use with few bears used for food. Considerable hunter effort is expended for bears of the cinnamon color phase. A total of ten cinnamon bears were reported taken in 1974 and 1975.

Transportation used for bear hunting in the area is primarily boat. Over the past two years 68 percent of the hunters used boats and the rest used air transportation to reach the hunting areas. Hunting usually occurs along beach and tideflat areas in the spring, particularly at the mouths of the bigger rivers, and along major salmon spawning streams in the fall. Hunters tend to concentrate in the more southern portions of the area. Of the 41 bears taken during 1974 and 1975, 24 came from Boca de Quadra and Smeaton Bay. The best hunting is a minimum of 50 water miles from Ketchikan and few people take boats this far. There are no fuel or repair facilities in the main hunting area.

Nonresidents are the primary nonconsumptive users of black bears in this area. Viewing and photography occur mainly in late summer months when bears are no longer on beaches and is of minor importance except on the Unuk and Chickamin Rivers. One of two resorts in this area conducts trout fishing trips on these two rivers; observation of bears on the salmon streams is an important part of those trips.

Almost all of the area is owned by the U.S. Forest Service. The few private holdings are small and there are no Native corporation lands in the area. There are private holdings at the mouths of the Chickamin and Unuk Rivers but they should not prevent access to the rivers. The only possible transportation corridor would be along the Unuk River and the feasibility of this is very low.

PROBLEMS

Development of a proposed molybdenum mine in Smeaton Bay or the development of other mineral claims may introduce large numbers of people to the area, resulting in a deterioration of aesthetic hunting opportunities as well as an increase in undesirable bear-human encounters. Permit or registration hunts may need to be implemented if crowded hunting conditions occur. Attention to proper garbage disposal will be necessary in any new communities to reduce bear-human confrontations.

IMPACTS

* Hunting effort and bear harvest will change little in the near future. Designation as an aesthetic hunting area may make it more attractive to the guiding industry, and nonresident hunting effort may increase somewhat in future years.

* Permit requirements and access restrictions may be imposed in the future if hunter distribution and hunting effort preclude the goal of maintaining aesthetic hunting conditions. Seasons and bag limits may also be adjusted.

* Viewing and photography of black bears will increase gradually.

* Nonresident use in this area has been low and is unlikely to increase significantly. The availability of professional guide services in Ketchikan could change the pattern of nonresident use, however, and designation of the area as aesthetic with a wilderness atmosphere could attract some guiding effort.

BROWN BEARS IN SOUTHEASTERN ALASKA

Brown bears (*Ursus arctos*) occur throughout Southeastern Alaska except on the islands south of Frederick Sound. Portions of this area support as dense a population of brown bears as may be found in the state. Although specific information on abundance is lacking, there is general understanding of the species status. Brown bears are probably as abundant in this area now as they have ever been. The ABC Islands (Admiralty, Baranof and Chichagof) support larger populations than mainland areas except for the possible exception of the Yakutat area. Brown bear and black bear co-exist on the mainland but not on the islands.

Brown bears were once classified into a large number of species and subspecies, but the brown bears of North America and Europe are now considered members of one species by most taxonomists. Bears over the greater part of North America fall under one subspecies, *U. a. horribilis*. Reproductively isolated populations may exist on the ABC Islands and Yakutat forelands; however, at this time there is no data to support subspecific designation.

All major habitat types are utilized by brown bears with seasonal differences in use governed by the availability of food. Emerging from dens beginning in late April, most brown bears move to the beach areas where they feed almost exclusively on sedges and kelp and on skunk cabbage, wild celery and parsley when available. Winter killed ungulates and marine mammal carcasses which wash ashore are also eaten. Herring and herring roe are utilized when available in mid-May. Spring bear predation on moose, deer, and goats may occur but is significant only in localized areas. Berries are utilized during summers in years when they are available. With the appearance of anadromous fish in the streams in July bears congregate along streams and remain there as long as spawning fish are present, usually until Ocotber. The quantity and quality of protein foods, especially salmon, and the longer period of the year in which food is available to bears in coastal areas are believed to be the major factors responsible for differences in size between coastal bears and bears from interior Alaskan areas.

Little information is available regarding natural controls on brown bear populations or the degree of population fluctuations. Except for dental and skeletal disorders, the diseases reported for brown bears are remarkably few. Brown bears apparently possess an unusual ability to withstand infections and to recover from fractures, many of which are caused by fighting and gunshot wounds. Cannibalism and other extraspecific strife may cause significant mortality. *Trichinella spirallis* is the known parasite infecting bears, because it is transmissible to man in raw or partially cooked bear meat; however it is of minor significance to infected bears.

In accessible and inhabited areas, human activities are doubtless the most significant source of bear mortality. Sport hunting is presently the most important mortality factor, but several nuisance bears are also killed near human habitations. Bears are killed in defense of life and property when they are attracted to garbage dumps and endanger human safety.

Recreational uses of brown bears predominate in Southeastern Alaska. Subsistence utilization is not known to occur. Sport hunting is the primary use with the ABC Islands being the most productive hunting areas. From the mid 1940's, trophy hunting of brown bears gained rapidly in popularity, with Admiralty Island becoming the favorite hunting area in Southeastern Alaska. At one time cannery workers and others connected with the commercial fishing industry destroyed bears indiscriminately. Until recently, hunting pressure has not appeared to be excessive. Low

harvests have allowed hunting regulations to remain liberal. In the spring, more males are taken because males emerge from dens before females and because females with cubs are protected. In the fall, more females are available for harvest due to natural separation of sows from grown cubs. Guided hunters have had the highest success rates, probably due to the efficiency of their hunting methods. Since the early 1960's, the annual kill from Southeastern Alaska has been from 10 to 13 percent of the statewide harvest. The ABC Islands have contributed about 9 percent of the statewide harvest and 70 percent of the Southeastern harvest. Since about 1968, there has been an upward trend in the kill from the ABC Islands. The overall quality of the hunting experience for bear hunters in the Southeastern Region has been extremely high, but with increasing hunter interactions quality has begun to deteriorate.

Nonconsumptive use of brown bears in Southeastern Alaska occurs throughout the region but primarily at Pack Creek on Admiralty Island, an area reserved for such use. The Thayer Mountain area, also on Admiralty Island, is similarly closed to the taking of brown bears. Visitors take advantage of opportunities for observation and photography when brown bears concentrate there during late summer salmon runs. Growing national interest in brown bears is certain to increase the demand for nonconsumptive use opportunities.

Problems:

* Well-intentioned concern by a national public may hamper effective management of the species and threatens future use by recreational hunters. One misconception is that because brown bears are threatened in one portion of their range, they are threatened in all areas. Also, some people believe that distinct, and therefore unique, subpopulations of brown bears exist which need abosulute protection. Management of bear populations and use of bears must continue to be based on scientific evidence. True taxonomic relationships and the fact that brown bear in most parts of Alaska are still relatively abundant provide sound support for continued beneficial uses, both consumptive and nonconsumptive.

* The eventual survival of the brown bear man not depend entirely on the designation of vast tracts of "unspoiled wilderness." Conflicts with bears in large national parks indicates that beyond merely providing space for bears, man must come to understand bears - their requirements, behavior and their place in ecosystems, and then apply this knowledge in land use decisions. The value of brown bears as a renewable resource should be acknowledged and considered in land use classification. Important brown bear habitats must be preserved by exclusion of incompatible development, and in areas where humans and bears co-exist, proper precautions should be observed to avoid confrontations. Proper disposal of garbage is of singular importance in this regard.

* Large acreages of spring, summer and fall bear habitat are being altered by clear-cut logging in Southeastern Alaska. Loss of bear habitat reduces bear populations. In addition, quality of bear hunting is reduced when hunters, displaced from areas which are or have been logged, crowd remaining areas with good bear populations. Timber removal and regeneration practices should be employed to minimize adverse impacts on important brown bear habitat. The effects of logging on brown bears need to be studied to develop recommendations for desirable logging practices.

* Under terms of the Alaska Native Claims Settlement Act more than 900,000 acres of land in Southeastern Alaska probably will be transferred from public to private ownership. Public hunting may be excluded from private land. In addition, private landowners may institute intensive logging on their lands with possible detrimental effects on brown bear populations.

37. SOUTHEASTERN MAINLAND BROWN BEAR MANAGEMENT PLAN

LOCATION

Game Management Units 1B, 1C, 1D, 5 and that portion of Unit 1A not included in the Behm Canal Brown Bear Management Plan area.

MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting brown bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Encourage greater utilization of the brown bear resource.

2. Increase public awareness of brown bear behavior to reduce adverse bear-human interactions.

THE SPECIES

The southeastern mainland brown bear populations appear to have remained fairly stable with only a decrease in numbers in those few areas where urbanization, such as in the Mendenhall Valley north of Juneau, have significantly changed or eliminated bear habitat. Probably the major factor affecting mainland bear numbers is the intraspecific strife resulting from territorialism and cannibalism, as the mainland brown bears are lightly hunted.

Hunting pressure on southeastern mainland brown bears is light in relation to areas such as the ABC islands. Harvest is usually less than 35 bears annually. Hunting seasons have been liberal since statehood and as such appear acceptable to the public and within the current replacement rate of the resource. Large bears (trophy size) are present in small numbers throughout this area but because of dense cover, nocturnal feeding habits and difficult hunter access, utilization of these large bears is believed to be below the capability of the population to produce large individuals.

PROBLEMS

* New road construction and more settlement and development by humans will increase conflicts between brown bears and people which usually result in destruction of the problem bears. Proposed road construction projects include the Yakutat Forest Highway beyond the Dangerous River, highways up either side of the Lynn Canal linking the Haines-Skagway-Juneau communities, and the Taku River and Stikine River Highways linking Canada to the Juneau and Wrangell communities. If the Yakutat Forest Highway is extended beyond the Dangerous River it should be located at mid point between the beach (summer feeding area) and the mountains (spring and fall feeding and winter denning areas). Effective control measures should be applied and enforced on garbage disposal, feeding of bears, harrassment of bears and other human associated activities wherever needed to assure desirable protection of the resource. Highway construction and logging camps should receive special attention.

IMPACTS

* Southeastern mainland brown bear populations and harvests will remain relatively low and stable as long as better opportunities are available on the ABC Islands.

38. BEHM CANAL BROWN BEAR MANAGEMENT PLAN

LOCATION

All of the mainland portion of Game Management Unit 1A except that part of the Cleveland Peninsula south of Spacious Bay.

MANAGEMENT GOAL

To provide an opportunity to hunt brown bears under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Discourage land use practices that adversely affect the wilderness character of the area.

THE SPECIES

Brown bears are common throughout this area and are particularly abundant on the Unuk and Chickamin Rivers during the salmon spawning season. Historical populations have probably been stable since the habitat has changed little and hunting pressure, except along the Unuk River, is extremely light. Brown bear habitat in this area is unlikely to change significantly for many years. Mining activity could impact small areas and logging is planned, but most of the timber is not of sufficient quality to support logging at this time. Declining salmon stocks could have an effect on bear populations.

Almost all hunting occurs along the Unuk River. The low density of brown bears over the rest of the area discourages extensive hunter effort. The brown bear kill from 1961 to 1974 averaged slightly more than 2 bears per year with 60 percent of the harvest coming from the Unuk River. Illegal kills occur which probably stem from a combination of general dislike of bears and their status as competitors for fish. Poaching for hides in this area is probably limited.

Season dates and bag limits have changed little since 1961 and transportation methods and access are unchanged. Access is by plane or boat, as there are no roads in the area. The majority of hunters hunt from skiffs. Most local residents hunt the Unuk River and use river skiffs for transport. Brown bears are hunted for trophies and recreation. Professional guides have not operated in the area since about 1965.

PROBLEMS

* Mineral development in Smeaton Bay and limited logging activity will increase undesirable bear-human encounters near communities or work camps. The Department should rigorously enforce regulations relating to proper garbage disposal, and feeding of "tame" bears should be discouraged.

* The Unuk River could be used as a transportation corridor and certain groups have proposed connecting Ketchikan with the Alaska Highway via a road along the Unuk River. While it apparently is only a remote possibility, such a road would probably eliminate the best brown bear habitat in the area. The Department should identify especially critical brown bear habitat in the area and recommend procedures that would minimize adverse effects of development.

* Substantial viewing and photography use is made of brown bears on the Unuk and Chickamin Rivers by visitors at one of the two private resorts in that area. There has been some support for closure of brown bear hunting along the Unuk River to provide more bears for the nonconsumptive users. This is not necessary with the existing harvest levels and the amount of current nonconsumptive use. Viewing and photography occurs almost entirely in the late summer when salmon are in the streams and hunting seasons are closed.

IMPACTS

* Brown bear populations in the area will continue to be largely unaffected by hunting.

* If hunting pressure increases significantly, permits may be utilized to distribute hunters and maintain uncrowded hunting conditions.

40. ABC ISLANDS BROWN BEAR MANAGEMENT PLAN

LOCATION

In Game Management Unit 4, Admiralty, Baranof and Chichagof Islands, except for the Pack Creek-Windfall Harbor Brown Bear Management Plan area.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to hunt brown bears under aesthetically pleasing conditions.

SECONDARY MANAGEMENT GOAL

To provide for an optimum harvest of brown bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters to maintain uncrowded hunting conditions.

2. Design brown bear hunting seasons, to maintain a large proportion of male bears in the harvest and the desired population size and structure.

3. Encourage land use practices that maintain the wild character of the area.

THE SPECIES

The density of brown bears on Admiralty, Baranof, and Chichagof Islands is perhaps as great as it is anywhere in Alaska. Recent studies by the Alaska Department of Fish and Game show that Hood Bay, a rather typical bay on southwest Admiralty Island, can have as many as 50 different bears using it during the course of a year. These findings are consistent with those of a joint study conducted in 1932 by the U. S. Forest Service and the Alaska Game Commission. These studies together suggest a population of about 1,000 bears on Admiralty Island and a somewhat lesser number on Baranof and Chichagof Islands. Studies at Hood Bay have shown that on the average, about 25 percent of the spring-time population consists of cubs under two years of age, suggesting high reproduction. Rates of natural mortality are not known, for it is seldom that a bear carcass, other than ones killed by hunters, is encountered. It is suspected that much of the natural mortality occurs during the period of winter dormancy. Aside from losses to starvation and old age, intraspecific strife and cannibalism are probably the most important natural mortality factors.

There has been considerable alteration of the climax forest ecosystem on the ABC islands. Foremost has been clear-cut logging which began with the long-term sales to encourage pulping operations in the 1950's. At this point in time, several of the major river systems have been clear-cut. Logging now consists of much smaller scale operations, but these are programmed to continue ad infinitum, based on a 100-year rotational cycle. Currently basic knowledge of the impact of logging on other forest resources, including bears is lacking, but studies are being designed to attempt to measure these impacts. Except for native lands and a few other small private holdings, brown bear habitat on the ABC islands is under management jurisdiction of the U. S. Forest Service.

Sport hunting has long been the dominant use of the brown bear resource of Southeast Alaska, and the ABC islands have been a favored brown bear hunting area. During the 11-year period from 1949 to 1959 an average of 40 bears per year were taken by guided sportsmen while harvests by unguided resident hunters went unrecorded. Large numbers of bears were also killed by fishermen, loggers, and cannery workers, but this loss has generally been reduced in more recent years. Since 1961, when the mandatory sealing program was instituted, the average annual kill has been 63 of which about 74 percent were males, 71 percent were taken during the spring season, and 52 percent were taken by nonresident hunters. While the hunting season has generally run from September 1 through June 10, the most productive hunting period has been from May 15 through June 10. Admiralty Island has generally contributed about 52 percent of the ABC island kill, Baranof about 15 percent, and Chichagof about 33 percent. In recent years there has been an upward trend of the harvest from Chichagof and a corresponding downward trend from Baranof. The southern half of Admiralty has contributed about 45 percent of the Admiralty kill and 35 percent of the total kill from the ABC islands. The most productive bays have been Hood, Chiak, Gambier, and Pybus. On a statewide basis, since 1961 the ABC islands have contributed 9 percent of the total brown bear harvest. Since 1969, this proportion has risen to about 11 percent of the statewide harvest. Measurements of harvested bears have remained remarkably consistent, suggesting that sport hunting has had little impact on the brown bear resource. Since 1961, the average male hide size (length plus width) has been 13.9 feet, the average male skull size since 1967 (length plus width) has been 22.3 inches, the average male age since 1968 has been 7.9 years, and the average female age since 1971 has been 7.7 years.

Records indicate that about half of the annual kill is taken by commercially guided hunters. About 12 registered guides operate the area each year. There has been a fairly rapid turnover in the guides who operate these hunts. Only three or four have consistently hunted this area since 1965. Residents, acting as guides for nonresident relatives account for only a small percentage of the annual kill. Up until about 1970, the mean annual recorded kill for the ABC islands was about 60 animals. The quality of the hunts was very high. Hunter interactions in the field were uncommon. Since that time there has been a gradual increase in hunter numbers and the total harvest. The 1975 recorded kill was 105 animals. Hunter interactions have become much more common.

Since the mid-1940's many hunters and guides have expressed much satisfaction with the high quality of hunting experienced while bear hunting on the ABC islands. This is particularly true during spring-time hunts. Hunters have been comfortably based on boats. During the spring, male blue grouse are "hooting", filling the bays with their pulsating calls; fishing and clam digging are productive, waterfowl and deer are abundant for viewing, herring are spawning, and the attendant predation by eagles, gulls, and other predators, including brown bears, that the large masses of herring attract, can be observed; and the weather is usually fairly good. Bears are plentiful enough that it is not uncommon for a guided or seasoned hunter to look at 50 or more different bears on a ten-day hunt.

PROBLEMS

* Increased use of resources in the form of logging and mining may reduce bear habitat and, therefore, populations of bears. Transfer of lands from public to private ownership under the terms of the Alaska Native Claims Settlement Act may reduce the area open to public hunting, thereby increasing hunting pressure on lands remaining open for public use. Increasing demands on a limited and possibly reduced resource base will require careful regulation in the future. The Department should try to maintain public hunting in as much

area as possible and should encourage measures to reduce adverse impacts of resource development on brown bears.

* Increased demand for bear trophies is beginning to express itself through unsatisfactory hunter interactions in the field. Hunter crowding should be prevented by a permit system that will limit the number of hunters in the field at any one time.

* Increased human settlements and more intensive land-use practices will continue to lead to increased bear-human encounters. Improper storage of food and disposal of garbage is probably the greatest cause of these conflicts. These non-hunting bear-human confrontations should be reduced through public education and effective enforcement of proper regulations associated with handling and disposal of human garbage.

* The Thayer Lake reserve on Admiralty Island, which was established in 1932 as a bear viewing area, does not fulfill that objective because it is difficult to visit and does not contain any areas in which bears can readily be observed. The hunting closure should be eliminated.

IMPACTS

* Aesthetic hunting conditions in the area will be maintained insofar as changes in habitat permit.

* With increases in hunting pressure, permit allocations may result in some loss of hunting opportunity. Permits might also result in loss of guiding opportunity including expansion into this area by guides not now hunting it.

41. PACK CREEK-WINDFALL HARBOR BROWN BEAR MANAGEMENT PLAN

LOCATION

On Admiralty Island in Game Management Unit 4, all drainages into Windfall Harbor including Pack Creek.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy brown bears.

SECONDARY MANAGEMENT GOAL

To provide an opportunity for the scientific and educational study of brown bears.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain a year-round closure on brown bear hunting.
2. Encourage public viewing and photography of brown bears.
3. Encourage the development of viewing facilities.
4. Encourage scientific and educational studies of brown bears that do not significantly detract from viewing experiences.
5. Regulate the number and activities of visitors, if necessary, to reduce disturbance and harassment of brown bears.
6. Discourage land use practices that adversely affect the wild character of the area.

THE SPECIES

Windfall Harbor, on north Admiralty Island at the north end of Seymour Canal, contains the necessary components to support a population of brown bears: high country for denning and summer foraging, grassy beaches for spring and summer foraging, and five streams which support runs of salmon upon which the bears feed in summer and fall. No current data are available on the number of bears which inhabit the area. Studies elsewhere on Admiralty Island suggest perhaps 30 animals inhabit the area.

Admiralty Island is under the management jurisdiction of the U.S. Forest Service. While the Wildfall Harbor area is not under any particular current timber sale contract commitment, logging is a possibility under future sale arrangements. There is one known human habitation, a floating residence near the mouth of Pack Creek.

Sport hunting has been relatively light with an average of about one bear per year taken from the area since 1963. The Pack Creek drainage was closed to bear hunting during the 1930's to furnish an undisturbed area for viewing; people may easily watch a concentration of brown bears fishing during the late summer-early fall months. Observation towers were constructed by the Civilian Conservation Corps (CCC) from which to observe bears. Fifty or more persons, mostly Juneau residents, visit the area annually to view and photograph the bears.

The area (Pack Creek drainage only) is recognized by the U. S. Forest Service as the Pack Creek Research Natural Area.

PROBLEMS

* The current Pack Creek reserve comprising only a portion of yearly bear range provides protection against sport hunting only during that season (late summer and fall) when bears are concentrated on the streams feeding on salmon. During other seasons bears which have become accustomed to humans are subject to hunting when they are on adjacent beach areas in spring and early summer. Expansion of the closure to include all drainages into Windfall Harbor would give a majority of those bears year-round protection from hunting.

IMPACTS

* Some loss of hunting opportunity will occur.

* Publicity of this area through implementation of this plan may increase visitors use.

WOLVES IN SOUTHEASTERN ALASKA

Wolves (*Canis lupus*) are present throughout Southeastern Alaska with the exception of Admiralty, Baranof and Chichagof Islands and some of the smaller islands where insufficient food is available to sustain wolves. Within historical time populations have varied considerably depending on food availability. Because of the dense forest cover and the elusive habits of the wolf, it is difficult to accurately determine population status. Even though they have a high reproductive potential, wolves are never abundant compared to most other game species.

Mainland populations south of Glacier Bay have remained relatively stable over the past 15 years with numbers in the southern half of the area holding at moderate to high levels. On the islands in Southeastern Alaska where wolves occur fluctuations in populations have been evident. Low population levels in the early 1960's increased to a peak between 1967 and 1970. Populations then began declining and are now again quite low. The trends have followed those of deer. Wolves have only recently inhabited the area north of Glacier Bay. The first wolf bountied there was in 1963-64. Wolf populations increased in the area since their establishment and were present at relatively high levels in 1976.

Wolves usually occur in packs which may consist of parents and pups of the year, young of the previous year, and often other adult animals. The social order in the pack is characterized by a dominance hierarchy with a separate rank order among females and males. Fighting is uncommon within packs except during periods of stress. Dominance order is maintained largely through ritualized behavior. In Southeastern Alaska pack sizes usually range from 3 to 5, although packs of 15 individuals have been seen. The range of a pack may include over 1,000 square miles, but their range is often restricted by the size of the island occupied. During early summer when pups remain at dens, most adults center their activities around dens. This reduces their mobility although adults may travel 20 miles or more from dens while hunting.

When available, moose, deer and mountain goat are the major food sources for wolves in Southeastern Alaska. During winter, these species constitute almost the entire diet of wolves. Beaver are also a preferred food, but are never available in sufficient quantity to be a major food source. During summer, and when big game species are not available, wolves will utilize almost any food source including small mammals, birds, fish and even many of the sea invertebrates found in the intertidal zone. When prey species are very scarce, wolves become scavengers, finding much of their food along the beach. Carrion, as well as anything edible, will be utilized.

Generalizations about wolf-prey interactions are difficult to make because of differences between areas and prey species. Evidence from various studies of wolf-prey relationships suggests that the effect of wolf predation is largely conditional upon the relative densities of predators and prey, and the size and reproductive potential of the prey species populations. The effect of wolf predation can range from one of minor significance in which wolves remove far less than the annual recruitment to the prey population, to one in which wolves can retard prey population growth or reduce a prey population by removing the annual recruitment or more.

Studies of wolf populations indicate the high reproductive potential of wolves is seldom realized. Several factors may regulate wolf population levels either through reduced productivity or direct mortality. These include reduced fertility, social inhibition of breeding, malnutrition and starvation (especially among pups), cannibalism and the other forms of intra-specific strife, disease, accidents and predation. The importance of these factors varies. Various studies of wolf ecology suggest that food supply is a primary determinant of wolf densities. When prey are abundant or easily taken wolves exhibit increased productivity giving birth to more, larger litters of pups, and more pups survive

their first year of life. Conversely, when food is scarce, fewer, smaller litters are produced, and mortality of pups because of starvation and cannibalism increases. Natural mortality is greatest during the first year of life. Fifty to sixty percent of the pups born each spring die within eight months.

Wolves may compensate for human utilization by increased production and survival of young. In some cases wolves can compensate for a harvest of 50 percent of the autumn population. Excessive human exploitation, however, can reduce wolf populations.

The treatment of wolves in Alaska has changed greatly during this century. In 1915, Alaska's first territorial legislature established a bounty on wolves, which has persisted in Southeastern Alaska. Prior to 1960 there were no restrictions on the taking of wolves. From 1948 until 1959 the federal government conducted intensive wolf control operations in many parts of Alaska using poisons, aerial shooting and trapping. In 1959 the State assumed management authority for wolves. In 1960 the use of poisons was discontinued. In 1963 the Board of Fish and Game classified wolves as both furbearers and big game animals. Regulations governing methods of harvest, seasons and bag limits were promulgated, thus providing additional protection for wolves. In 1968 the legislature authorized the Board of Fish and Game to abolish bounties and bounty payments were suspended in all but Game Management Units 1, 2 and 3 in Southeastern Alaska.

In Units 1, 2 and 3, the wolf has always been considered by most residents as a predator competing for game species, particularly deer. There has never been a closed season or a bag limit for wolves in these Units and they are normally taken when opportunity permits. In spite of no hunting restrictions, human use has had little impact on wolf populations. Presently, the area with the largest wolf population (Unit 1A) also supports the most intensive human use. Southeastern wolf pelts have never had a high commercial value, although, when added to the fifty dollar bounty, they are sufficient incentive for some trappers to actively attempt to take wolves when they are reasonably abundant. Today, most wolves are taken in the southern mainland area. At the present time most professional trappers do not consider it worth their time to trap on the islands.

PROBLEMS

* Increasing human demands on low or declining deer, moose and goat populations and the effect of wolf predation in retarding recoveries of such populations creates a serious dilemna in management of these species. The reduction of wolf numbers to encourage an increase in ungulate numbers is not easily accomplished given the controversial nature of the wolf and the practical obstacles to achieving significant reductions in wolf populations. The wolf evokes powerful sentiment from both those who see it as a destroyer of game animals which man covets and those for whom the wolf is a symbol of wilderness. Both opinions are powerfully expressed through political or legal channels and both influence the management of wolves in Alaska. Opposition to wolf control programs is widespread, especially on the national level, and promises to remain a serious obstacle to any wolf control program, especially involving aerial hunting, no matter how well the action is justified in terms of the future welfare of both ungulate and wolf populations. The role of wolves as predators and their effect on ungulate populations must be accurately conveyed to the public. Recent studies have shown many earlier assumptions regarding beneficial or at least inconsequential effects of wolf predation to be simplistic or limited in application. Responsible management of wolves must consider the complex interrelationships of predator and prey, the welfare of each, and the beneficial uses of both that can be derived by man. In some areas of Southeastern Alaska, use of wolves by humans will not always be sufficient to balance predator-prey ratios at an acceptable level when man also uses the prey species. It will sometimes be necessary for the Department to take additional wolves to maintain a reasonable balance.

1. ALASKA WOLF MANAGEMENT PLAN

LOCATION

Entire state except Game Management Units 7, 14C (see West Chugach Wolf Plan location description), 15, and national parks or other areas closed to all hunting and trapping.

PRIMARY MANAGEMENT GOAL

To provide for an optimum harvest of wolves.

SECONDARY MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting and trapping wolves.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain wolf trapping seasons and bag limits consistent with suitable wolf population levels during periods of pelt primeness.
2. Maintain wolf hunting seasons not necessarily limited to the period of pelt primeness, with restrictive bag limits.
3. Promote efficient and humane trapping methods.
4. Maintain wolf:ungulate ratios that will allow for ungulate reproduction adequate to sustain ungulate populations, wolf populations and human utilization of each.
5. Promote public understanding of the interrelationships of wolves with other wildlife species in the northern environment.
6. Encourage public viewing, listening, and photography of wolves in a wilderness setting.
7. Increase public awareness of wolf behavior to reduce adverse wolf-human interactions.

THE SPECIES

Wolves occur throughout mainland Alaska and on many islands in Southeastern Alaska. Although wolf abundance varies greatly between areas and from year to year, Department estimates indicate a statewide fall wolf population of 8,000 or more. Southeastern Alaska has historically supported the greatest wolf densities in the state. Wolves are common or abundant on the Southeastern mainland coast from Yakutat Bay south and moderate on islands south of Cape Fanshaw. Track sightings and wolf-killed deer on 1,168 square-mile Revillagigedo Island between 1970 and 1972 indicated about 125 wolves, approximately 1 wolf per 10 square miles. Wolf numbers there have since declined; winter aerial surveys between 1973 and 1975 indicated a winter population of between 30 and 40 animals. Wolves are rare on the mainland coast between Icy Cape and Yakutat Bay and absent from Admiralty, Baranof and Chichagof Islands. Wolves in Southeastern Alaska generally reach greater densities on islands, perhaps because deer are important wolf prey on islands and are more abundant and vulnerable than mountain goats, the primary mainland wolf prey.

South of the Alaska Range, historical accounts of wolf numbers in the Nelchina and Copper River Basins date from the early 1900's. Wolves were reported to be abundant around 1900 but declined to low numbers by 1907 and were uncommon until the late 1920's. Wolves were apparently numerous during the 1930's and 1940's until a federally-administered wolf control program reduced wolf numbers considerably. This program lasted from 1948 until 1953 in the Nelchina Basin and until 1955 in the Copper River Basin. An estimated 12 wolves remained in the Nelchina Basin in 1953. Wolf hunting and trapping were prohibited in the Nelchina Basin between 1957 and 1965-66. Wolves in the Nelchina had increased to approximately 450 animals by 1965, a density of 1 wolf per 55 square miles. Wolves were less numerous in the late 1960's but had again increased by 1972. In 1976, estimates of wolf density in the Nelchina Basin are approximately 1 wolf per 70 square miles, and densities in the Copper River Basin may be comparable. Wolves are much less numerous in the Copper River Delta, and a resident population did not become established there until about 1971. By 1975 an estimated 20 wolves occupied an area east of the Copper River. Wolf numbers in the Matanuska and lower Susitna River Valleys are unknown, although wolf pack sizes, which may be directly related to abundance, have increased from an average of 2.5 wolves per pack in 1972-73 to 4.4 in 1973-74 and 5.2 in 1974-75. Packs west of the lower Susitna River averaged 4.4 wolves in 1972-73, 2.0 in 1973-74 and 5.9 in 1974-75. The general increase in average pack size suggests an increasing number of wolves, but these data are inconclusive because few packs were counted in some years.

Wolves occur throughout lower Cook Inlet and the drainages of Bristol Bay, including Unimak in the Aleutian Islands. Wolf densities in Southwestern Alaska are unknown, but populations appear to be comparatively low on the Alaska Peninsula. Wolves are more numerous from the Lake Clark area west to the foothills of the Kilbuck Mountains. Wolves are most abundant where both caribou and moose occur, and in these areas appear to be increasing in numbers.

The broad expanse of Interior Alaska north of the Alaska Range to the Brooks Range is probably the most important wolf habitat in the state. Although there are few wolves in the Yukon-Kuskokwim Delta and on the Seward Peninsula, wolf densities in the rest of the region are the greatest in the state, except for Southeastern Alaska. Wolf densities from the middle Koyukuk River south to and including the drainages of the Kuskokwim River ranged between 1 wolf per 40 square miles to 1 per 80 square miles during 1971 through 1975. The Holitna River area and tributaries of the upper Kuskokwim support the greatest number of wolves in the southern part of the region. Wolves are also abundant in areas of the Nowitna and Innoko Rivers and along the middle Yukon. Although far less numerous on the Yukon-Kuskokwim Delta, wolves have been recorded within the city limits of Bethel in recent years. Wolf populations in the Koyukuk, Tanana and Upper Yukon drainages are in excellent condition, presumably because the region supports diverse ungulate populations. Within this broad interior region, wolves have increased since the late 1950's when control activities, including shooting from aircraft and poisoning, were discontinued. Intensive wolf surveys have been done only in a 7,000 square-mile area south of Fairbanks to the Alaska Range which corresponds to Game Management Subunit 20A, and there only since 1973. Surveys in the winter of 1975-76 indicated a wolf population in excess of 200 animals prior to removal of wolves from the area, a density of 1 wolf per 35 square miles. Whether wolf density estimates derived from Subunit 20A can be applied to the rest of the area is uncertain, although wolves south of Delta Junction have also been increasing in recent years and current densities probably equal those recorded for Subunit 20A. Wolves also appear numerous in the Tanana Hills and from the White Mountains north to the southern slopes of the Brooks Range, but densities have not been documented.

Northwestern Alaska and the North Slope also support wolves, but densities are generally lower than south of the Brooks Range. Wolves occur as far north as the Beaufort Sea, reaching greatest abundance in the foothills and mountains of the Brooks Range in the southern portion of the region. Wolves were scarce in the Arctic in the early 1900's, perhaps a reflection of low caribou numbers. By the 1930's, both caribou and wolves had substantially increased and continued to increase until the early 1950's. Federal wolf control efforts and public aerial hunting resulted in a sharp decline in the wolf population, and by the late 1960's wolves again became scarce in the Arctic. Wolves have subsequently increased following closure of the area to public aerial hunting in 1970. Wolf densities in 1975 varied from 1 wolf per 60 square miles to 1 wolf per 120 square miles for a total North Slope wolf population of approximately 600 animals. Populations in Northwestern Alaska are less well known, but are probably similar to North Slope densities. Wolves are most abundant in this region in the drainages of the Koyuk, Shaktoolik, Ungalik, and Unalakleet Rivers. They also appear to be increasing in number in this region.

Little is known of wolf natural mortality except in a general way and in localized areas where wolves have been studied intensively. Natural controls of wolf numbers seem to stem mainly from vagaries of prey abundance and availability. Low prey abundance leads to poor wolf pup survival and perhaps a decline in the proportion of breeding females. Natural mortality rates may be affected considerably by human exploitation. Canadian investigations of nonhunted wolves reported lower pup survival and a lower proportion of females producing pups in comparison to Alaska's wolves, indicating that increased mortality due to one factor may be compensated for by lower losses to other causes. Some wolves undoubtedly suffer injuries, perhaps occasionally death, while pursuing large ungulates. A substantial decline in wolf populations between 1907 and 1925 throughout Interior Alaska has been attributed to diseases such as mange, rabies and distemper, reportedly introduced by domestic sled dogs.

The status of wolf habitat can presently be viewed only in terms of the habitat of important wolf prey species. Hooved mammals are the major source of food for wolves over much of Alaska, although small mammals, such as voles, lemmings, ground squirrels, hares, and beavers are occasionally important dietary supplements in summer. Moose are the most important prey species in much of Interior Alaska although wolves also take caribou and Dall sheep. Wolves on the North Slope rely heavily on caribou, with moose and Dall sheep being less important. Deer and mountain goats are the most important prey species in Southeastern Alaska: deer on islands and mountain goats on the mainland. Moose have been declining in numbers over much of Alaska as a result of a decade of recurring harsh winters and decreasing quality and quantity of moose browse. Caribou, also important in wolf diets, have decreased in some areas from high population levels in the mid-1960's. These declines have occurred in some areas as a result of range overuse due to trampling and overgrazing. Improved techniques in fire suppression and prevention by state and federal agencies have probably been detrimental to moose but have probably aided caribou. In Southeastern Alaska, clearcut logging practices are altering much of the climax deer winter range and may result in fewer deer and ultimately fewer wolves. U.S. Forest Service plans call for logging almost all commercial grade timber in Southeastern Alaska, and the second-growth, closed-canopy vegetation that will follow will decrease the quality of wolf habitat. Wolf habitat has been little altered by human expansion in the remainder of Alaska, except in the vicinity of settlements. Much of the Interior is currently economically unsuitable for industrial or agricultural development. Despite the recent and perhaps continuing increase in the number of wolves over the much of the state in the last decade, the status of ungulate populations indicates that wolf numbers will decline somewhat over the next few years. Moose populations seem to be increasing along the lower reaches of the Yukon and Kuskokwim Rivers, and wolves there are likely to become more common.

The increases in wolves during the past decade are probably related to a substantial reduction in efforts at organized predator control, bans on poisons, and more restrictive regulations on wolf hunting, specifically on shooting wolves from the air with shotguns.

Wolf harvest data are derived from a combination of bounty records, aerial permit reports, and since 1971, a mandatory sealing requirement on all wolves taken. The harvest data are considered reasonably complete although some people have taken wolves without collecting bounties and others may not comply with sealing requirements. A gap in data exists from 1969 when bounties were largely discontinued to 1971 when the sealing requirement was initiated. The known wolf harvest by hunters and trappers in Alaska has averaged 921 wolves annually since 1959. The fewest wolves reported taken were 221 in 1959-60 and the most were 1711 in 1967-68. A reported 1,090 wolves were killed during the 1974-75 regulatory year. About 38 percent of the wolves harvested since statehood were taken in east-central Alaska. Southeastern Alaska from Icy Bay south, comprising about 6 percent of the state's land area, has produced more than 13 percent of the reported annual harvest. The wolf harvest has generally consisted of slightly more males than females. Pups comprise 40 to 50 percent of the kill each year.

Snow must be deep enough to allow tracking of wolves from the air and for aircraft landings if wolf harvests are to be significant. There is an unknown degree of noncompliance with the statewide wolf sealing requirement. In remote areas less than half of the wolves taken in some years may be reported, often because pelts are used locally. Illegal aerial hunting also occurs except in Southeastern Alaska where it is impractical due to the heavy forest cover. Since bounties are still paid on wolves from Icy Bay south, the unreported harvest there is probably small, although some bounty collectors may falsely state where the animals were taken.

The intensity of consumptive use of wolves varies considerably. Hunting and trapping pressure is comparatively light in the western portion of the state. Hunting pressure on wolves seems high in eastern and central Alaska, but it is doubtful whether the current kill is significantly impacting wolf numbers. Wolves in eastern Alaska have apparently increased since aerial hunting was prohibited in 1971 despite growing public interest in trophy wolf hunting and rising value of wolf pelts. Wolf numbers in the Nelchina and Copper River Basins appear to have fluctuated independently of harvests. Ground hunting and trapping are the only feasible methods of taking wolves in Southeastern Alaska. Harvests may, at times, have exceeded 50 percent of the population on Revillagigedo Island, but there is no evidence that the harvests have permanently reduced wolf numbers. On the North Slope, wolves were significantly suppressed by aerial hunting until the region was closed to aerial hunting in 1970. Wolf numbers north of the Brooks Range subsequently increased. It appears that continued aerial wolf hunting can reduce wolf numbers where open terrain affords the animals little escape cover. The number of wolves taken annually statewide is generally dependent on winter snow conditions.

Hunting and trapping seasons for wolves have remained liberal since statehood. Poisons were banned in 1960, and with their classification as big game animals in 1963, wolves received additional protection from regulations on seasons and bag limits. Aerial hunting permits were issued during the 1960's and early 1970's, but were suspended in 1972. Wolves in the Nelchina Basin were protected from 1957 through June, 1966. Current hunting regulations stipulate a limit of two wolves over most of the state with an August through April season; there is no closed season or limit on wolves in Southeastern Alaska. Trapping seasons generally extend from October or November through March or April with no limit on the number that can be taken. Since 1972 most wolves have been taken by ground shooting (44 percent) or by trapping (41 percent).

Trapping success by individuals is generally low since many are inexperienced trappers. The majority of wolves harvested are taken by comparatively few people. A combination of aerial spotting and shooting after landing is becoming increasingly common. A few wolves are killed by hunters incidentally to hunting for other big game species. Most are harvested between December and March, with March the most important month. Most people taking wolves are resident Alaskans. While nonresident guided hunts are becoming more popular, and nonresident trapping occurs extensively on military lands, the number of wolves taken by nonresidents is small. Wolves are sought primarily for the commercial value of the pelts in northern and western Alaska. Over the rest of the state a combination of recreation and commerce motivates wolf hunters and trappers. In Southeastern Alaska, trapping and hunting of wolves seems to occur primarily for recreational purposes, since wolf fur quality there is generally poor. Access to wolf hunting areas is primarily by airplane. Snowmachines, both for hunting and checking traplines, are important means of access in areas without roads and near remote villages. Most wolves in Southeastern Alaska are taken with traps set along beaches where the lines can be checked by boat or plane.

East-central Alaska, bordered on the north by the Brooks Range and on the south by the Alaska Range, produces the most desirable trophy wolves in the state. Wolves there are generally larger, and their pelts are often light gray, the color most preferred for trophies and by furriers. Wolves in Southeastern Alaska, though still sought for trophies, are generally smaller and darker and have shorter, more coarse and less dense fur than Interior wolves.

The number of people that enjoy seeing, hearing, or otherwise experiencing wolves in Alaska each year is unknown. Relatively few people see wolves except from aircraft. A growing number of people are frequenting remote areas during summer months, however, and incidental nonconsumptive use may be increasing. The northern Brooks Range, where the open terrain facilitates long-distance observation, may offer some of the best opportunities for the nonconsumptive use of wolves in Alaska.

PROBLEMS

* A substantial portion of wolf range in Alaska has been selected by local residents under terms of the Alaska Native Claims Settlement Act. Once title to public lands is conveyed to private ownership, public use on such lands may be restricted or prohibited. The Department should solicit the cooperation of private landowners to facilitate progressive management of wolves. Easements across private lands to public lands will be sought as provided for in the Alaska Native Claims Settlement Act.

* Substantial land areas will be placed in parks, monuments, wild and scenic rivers, and wildlife refuges, all under federal jurisdiction, under terms of the Alaska Native Claims Settlement Act. Extensive portions of these federally-administered areas may be closed to hunting and trapping or such use may be limited by access restrictions. The Department should seek cooperation from the appropriate federal agencies to allow hunting and trapping to continue within these areas.

* Adverse wolf-human interactions have occurred more frequently in recent years, particularly at pipeline construction camps and along the Trans-Alaska Pipeline Haul Road. Several people have been bitten by wolves that have grown accustomed to humans. Most of these animals have subsequently been destroyed, primarily to test for rabies. In most instances, private company regulations specifically prohibit feeding wild animals and these regulations should be strictly enforced. The Department may consider additional regulations to discourage adverse interactions.

* Wolf prey populations over much of the state are declining or are currently at low levels. Predation by wolves may conflict with human use of prey species in some areas. Wolf hunting and trapping should continue with liberal seasons and bag limits. If it is established that predation is causing declines or maintaining low densities of prey species, the Department may consider more liberal methods and means of harvesting wolves. Should public hunting efforts prove incapable of lowering the wolf population to relieve predation pressure on prey species, the Department should consider direct control by Department employees for a limited specified period and to meet specific objectives.

* The reduction of wolf numbers to encourage an increase in the number of ungulates is not easily accomplished given the controversial nature of wolves and the practical problems associated with achieving significant reductions in wolf populations. All wolf control efforts by the Department should be justified on the basis of substantial data and only after it has been shown public hunting and trapping harvests will not achieve the stated management goals. The role of wolves as predators and their effect on prey populations must be accurately conveyed to the public. Recent studies have shown many earlier assumptions regarding the beneficial or inconsequential impacts of wolf predation to be simplistic or limited in application. The Department must convey to the public all aspects of wolf biology in an objective manner; the public must understand that responsible wolf management will consider the complex relationships between predator and prey, the welfare of each and the beneficial uses of all resources that can be derived by humans.

* Domestic livestock may be established or reintroduced by private landowners in areas that currently support wolves. Demands for predator control will be forthcoming from the domestic livestock industry. Hunting and trapping harvest should be the primary means of suppressing problem wolves, and control actions, if necessary, will be directed at specific animals. The cost and responsibility of such control will be the responsibility of the industry and only as authorized under conditions of the state-issued permit. The Department should indicate to persons contemplating introduction of domestic livestock that some level of wolf predation must be accepted as a normal operating risk.

* Wolves in parts of Interior and Arctic Alaska are subject to illegal aerial hunting, and a proportion of people inhabiting rural areas are not complying with sealing regulations. Such activities make it difficult to accurately assess annual harvests and population parameters. An increased enforcement effort by the Division of Fish and Wildlife Protection and a more active enforcement role by the Department of Fish and Game, coupled with more severe penalties for offenders, could alleviate some of the problems.

* Recurring wildfires are generally beneficial to browse plants important to wolf prey species. Fire suppression and prevention efforts by state and federal agencies have improved to the point that habitat quality and quantity for moose are declining in some areas. The Department should identify critical habitat areas and make recommedations to the appropriate agencies regarding the possible beneficial aspects of fires in specified regions.

* Extensive logging activities in Southeastern Alaska may result in a decline in deer and mountain goat populations with a subsequent decline in wolves. The Department should make recommendations and seek agreements with appropriate management agencies to minimize adverse logging impacts on wildlife.

IMPACTS

* Wolves will not be eliminated from any region and will continue to be a viable part of Alaska's wildlife.

* The reduction of wolf populations in some areas of Alaska by limited permit aerial hunting by the public or by organized control efforts by the Department will allow a faster recovery of depressed ungulate populations.

* Selective reductions of wolf populations will decrease the opportunity for use of wolves by hunters, trappers and nonconsumptive users in some areas.

* Regulations governing harvest will be manipulated to maintain desired population levels of wolves. In general, liberal hunting and trapping regulations and seasons will continue, although restrictions on sport hunting may be imposed to make wolf hunting compatible with hunting regulations stipulated for other big game species.

MOOSE IN SOUTHEASTERN ALASKA

In Southeastern Alaska, moose (*Alces alces*) are presently found on the Malaspina forelands, Yakutat forelands, the river valleys between Haines and the Canadian border, Berners Bay and Taku Rivers near Juneau, the Stikine River valley and other drainages abutting larger Canadian herds. Throughout the region, moose habitat characteristics are fairly similar. Areas of alpine or riparian willows and river bars support the bulk of the population throughout the year. In low density willow areas, species such as cottonwood and ground forbs provide sustenance. Dense spruce stands and alder thickets provide cover but little food. During the summer months moose are found in areas of adequate browse from sea level to at least 2,000 feet. During the fall rut numerous individuals range to 3,500 feet or more. Winter snows force the moose back to lower elevations restricting them spatially to winter ranges. Calving takes place between mid-May and mid-June, frequently in dense spruce stands or on "islands" interspersed among sedge and grass marsh. Lowland river valleys are also commonly used parturition areas.

Moose were relatively scarce in Southeastern Alaska until expansion of moose populations in Canada resulted in emigrations of moose through access corridors such as the Alsek River, Chilkat River, Taku River and Stikine River valleys. By the 1950's moose were present on all major Southeastern ranges.

Typically, expanding moose populations exhibit a high reproductive rate. A larger percentage of young cows become pregnant and the frequency of twin calves is high. The incidence of twinning goes down as moose reach or exceed range carrying capacity. When winters are severe or browse is unavailable, cows debilitated by poor nutrition may fail to furnish adequate quantites of milk to newborn calves.

Many moose calves die during their first year of life. Calf mortality on some Southeastern moose ranges has reached 80 to 90 percent and generally averages above 50 percent for the area as a whole. Predation on calves, principally by wolves and bears, is perhaps greatest during the first six months. Loss to wolf predation continues through the winter. During severe winters food shortages cause mortality. Calves are the age segment most susceptible to winter starvation in moose populations. Calf mortality, coupled with natural and hunting mortality among adults has resulted in population reductions exhibited by several Southeastern moose populations.

Moose have long been one of the most important game species in Southeastern Alaska, initially providing for the domestic needs of early settlers and prospectors near the Stikine and Taku River valleys; and then for the past two decades supporting relatively intensive recreational utilization in those areas and in the Yakutat and Haines areas. Over 800 moose hunters went afield in the Southeastern area during the 1975 moose hunting season.

Moose populations in the Yakutat area have traditionally been heavily hunted for meat and trophies by both guided and unguided recreational hunters. Annual harvests over the past decade have fluctuated between 16 and 325 moose, with females constituting up to one-half of the kill of the larger harvests. In addition to hunting on foot from the road systems, aircraft, off-road vehicles and various types of boats have been widely used. Hunter access by airplane in the Yakutat area is accomplished on U.S. Forest Service landing strips, by landing on ocean beaches and river bars or on bodies of water with float planes.

Moose in the Haines area have experienced increasing hunting pressure in recent years, especially from Juneau-based hunters. The number of hunters has risen dramatically and use of air and jet boats in the Haines area has increased. Because of the inaccessibility of much of this country except by air boat, river boat or wheel-equipped aircraft, hunting in the area is still managable without regulating the number of hunters. From 28 to 120 moose are harvested annually, with one-third being females.

Other Southeastern moose populations consist of small herds in river valleys, managed either by permit drawing or bull only seasons, with limited cow seasons when moose populations are excessive to the available habitats.

PROBLEMS

* Some opposition to female moose hunting exists in Southeastern Alaska. Antlerless moose hunts by permit or during a special season have been conducted with varying degrees of acceptance and criticism. Unfortunately, recent declines in moose populations in some areas of Alaska strengthened opposition to antlerless hunts and culminated in passage of a bill preventing antlerless hunts unless otherwise authorized by the local advisory committee. Antlerless hunting is, however, a useful management tool, and efforts must be continued to explain the benefits of retaining this management option.

* Predation rates on some Southeastern moose populations are high, reflecting continued large populations of predators and low and decreasing populations of moose. The resulting extremely low survival rate of moose calves, exhibited now for several years, seriously reduces the reproductive performance of affected moose populations for many years to come because the breeding cohort passing out of the populations will not be fully replaced. Predator populations, particularly wolves, require management to maintain predation at levels not exceeding the capability of moose populations to support such predation. A balance in managed populations of wolves, other predators, and moose must be attained if the benefits of all of these species to man are to be realized.

59. YAKUTAT MOOSE MANAGEMENT PLAN

LOCATION

In Game Management Unit 5, all drainages into the Pacific Ocean between Icy Bay and Glacier Bay National Monument.

MANAGEMENT GOAL

To provide for an optimum harvest of moose.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain the moose population at the level of maximum productivity.
2. Maintain a post-hunting season moose population sex ratio of no less than 20 bulls per 100 cows.
3. Harvest antlerless moose, if necessary, to attain the desired moose population size and structure.
4. Control the number and distribution of hunters, if necessary, to distribute the harvest throughout the area.
5. Encourage land use practices that improve moose habitat.

THE SPECIES

Moose emigrated from Canada into the Yakutat area during the early 1930's. The population increased to 2000-2500 by 1968 and then declined to 300 animals by March 1976. The decline was due primarily to several severe winters, especially 1971-1972, and secondarily to wolf and brown bear predation and hunting. Since 1972, the population has declined despite mild winters in 1973 and 1974, and a moose hunting closure since 1974.

Winter ranges were somewhat overbrowsed in the late 1960's, but have recovered considerably due to the moose population decline. Receding glaciers, logging, and geological uplift and subsidence are favoring early successional plant communities, which are important habitat for moose.

The Yakutat moose herd was heavily sport hunted from 1959 to 1973. An either-sex 80 day season from 1959 to 1972 produced an average annual harvest of 230 moose. In 1973 the season was reduced to 50 days and 147 moose were taken. Since 1974, the Yakutat forelands have been closed to hunting, while a limited number of bulls have been taken from the Malaspina forelands.

The majority of the hunters utilizing the Yakutat area are from Juneau. Residents of Yakutat represent less than half of the total hunters, but future oil and timber industry developments will assuredly swell the local hunter population of Yakutat by the late 1970's. The harvest by nonresident hunters represents less than five percent of the yearly harvest. Characteristic of Canadian moose, Yakutat moose have generally smaller antlers than the Alaskan subspecies, although some mature bulls have antlers of 50 to 60-inch spreads.

Aircraft are the main transportation method for moose hunters in the Yakutat area. The U.S. Forest Service has built and maintains airstrips

throughout the Yakutat forelands in order to distribute moose hunters. The Yakutat road system also affords access to hunters out to the Dangerous River and in addition provides access to launching sites for boat hunters. Some larger boats utilize Yakutat Bay and Russell Fiord but inclement weather usually restricts their use for moose hunting. The area immediately surrounding the town of Yakutat and the airport area has historically been heavily hunted. At the present time moose numbers are low in this area.

PROBLEMS

* Apparently excessive predation has prevented an increase in the moose population in recent years. A reduction of the wolf population in this area is desirable to allow the moose population to recover.

* Brown bears which emerge from hibernation early in the season frequently prey on moose or displace wolves from their moose kills. The spring brown bear season in the area has been recently extended to run throughout the winter. Hunters should be encouraged to harvest some of these early-emerging brown bears.

* Outer Continental Shelf oil development in the Gulf of Alaska is expected to cause a significant increase in the human population of the Yakutat area. As the number of resource users increases, further restrictions may be necessary to protect against overharvest of an already limited moose population.

IMPACTS

* Restrictive hunting seasons will remain in effect until the moose population increases. Regulations will be liberalized as the moose population becomes capable of supporting larger harvests.

* The wolf population may be reduced to allow the moose population to increase.

61. UPPER LYNN CANAL MOOSE MANAGEMENT PLAN

LOCATION

In Game Management Unit 1, the drainages into Lynn Canal north of Lincoln Island.

MANAGEMENT GOAL

To provide for an optimum harvest of moose.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain the moose population at the level of maximum productivity.
2. Maintain a post-hunting season population sex ratio of no less than 20 bulls per 100 cows.
3. Harvest antlerless moose, if necessary, to attain the desired moose population size and structure.
4. Control the number and distribution of hunters, if necessary, to distribute the harvest through the area.
5. Encourage land use practices that improve moose habitat.

THE SPECIES

The Berners Bay herd found north of Juneau originated from transplants of 21 calves in 1958 and 1960. Aerial counts ranging from 50 to 90 animals have been common for this area since 1968. Such counts probably represent from 40 to 70 percent of the total moose herd. A noticeable herd reduction estimated at 40 percent was apparent in the fall of 1974. The hunting seasons for 1975 and 1976 were closed to allow for herd growth, and recent counts indicate this growth is occurring.

The Haines and Chilkat Range herd originated from migrations through river drainages from Canada in the 1930's. The herd numbers about 500 animals in an area extending from beyond Haines down Lynn Canal to Point Couverden (Chilkat Range). In the early and mid 1960's, the herd was estimated at 700 animals. At that time it was apparent that browse was being heavily utilized and range conditions were deteriorating. Between the late 1960's and 1976, moose numbers have remained at an estimated population of 500 animals.

The major natural mortality factors affecting these herds are severe winter weather and predation. Snow accumulations often reduce forage availability and certain snow densities increase the hunting success of wolves. Besides wolves, black and brown bears also prey on moose and such predation may be a significant limiting factor on these herds.

Good to excellent range conditions prevail throughout these areas. Except for severe winters in which snow accumulations are excessive, there is an adequate quantity of good quality browse.

The Berners Bay herd sustained bulls only hunting from 1963 to 1970. By 1970, it was apparent that too few bulls were present in relation to the number of cows to assure good reproduction. A limited either-sex harvest was allowed from 1971 to 1974. During 1975 and 1976, the hunting seasons were closed to allow the herd to increase after a 40 percent drop in herd size in 1974.

The Haines and Chilkat Range herd has sustained either-sex hunting seasons, but more bulls have been taken than cows. The number of hunters annually has averaged between 300 and 600 depending on the season and weather conditions. Most hunters are from the Haines and Juneau areas. An increased number of hunters in the early 1970's led to reduced seasons and bag limits. River boats (jet, prop and air-powered), overland and highway vehicles, float and wheel airplanes, and pack horses are used by hunters for transportation to the hunting areas.

PROBLEMS

* Brown bear and wolf predation may significantly affect moose population levels in the area. Seasons and bag limits on predators are liberal, but hunter interest is low. The Department should orient predator hunters and trappers to areas where excessive predation is depressing moose numbers.

* Highway moose kills on the Haines Highway are excessive. Road signs alerting travelers to moose on the highway should be posted. Reduced speed limits should be mandatory during the winter months when moose are concentrated in roadside areas.

IMPACTS

* The moose population should remain at its current size in the Haines-Chilkat Range area and should increase slowly in Berners Bay.

* Few hunter restrictions with respect to bull moose harvests are expected in the foreseeable future.

* Opportunity for hunters to take antlerless moose will be limited by permit if hunter numbers increase substantially.

62. MIDDLE SOUTHEASTERN MOOSE MANAGEMENT PLAN

LOCATION

Game Management Unit 1B and those portions of Game Management Units 1A and 1C not included in the Behm Canal and Upper Lynn Canal Moose Management Plan areas.

MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting moose.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Provide an early bulls-only moose hunting season.

2. Maintain a post-hunting season population sex ratio of no less than 10-15 bulls per 100 cows.

THE SPECIES

Small populations of moose are present in the Taku and Stikine River drainages and in the Thomas Bay area. The Taku and Stikine herds were established by emigrations of Canadian moose through the Coast Range to Alaska. Moose from the Stikine herd further extended their range to include Thomas Bay. Moose from these three populations occasionally inhabit other coastal areas and a few nearby islands.

The Taku herd has numbered from 40-100 animals since the early 1960's. The population was relatively stable until 1973 when the population began declining, probably as a result of poor calf production and survival, and increased hunting pressure. The Stikine herd was reportedly quite small in the early 1900's. Since the 1950's 100-300 moose have been present, and the population has remained relatively stable despite periods of low calf production. The recently established Thomas Bay herd inhabits an area of favorable habitat primarily consisting of post-logging vegetation. The herd probably numbers less than 50 animals and is expected to decline as a result of forest regrowth.

Moose numbers in the three herds are probably close to the carrying capacity of the habitat. Although summer ranges are in good condition, critical wintering ranges are limited in size and are in only fair condition. Predation and winter snow conditions are the major natural limiting factors affecting these populations. Wolves are the primary predator although brown bears also kill some moose. Deep snow reduces availability of browse and renders moose more vulnerable to predation.

The Taku moose herd has supported harvests of 30 or less bulls per year from 1959 to 1974. In 1974, the hunting season was reduced from one month to two weeks because of an apparent decline in herd size. Only five bulls were reported taken in 1974. Most Taku River moose hunters are Juneau residents. About 200 hunters participate annually.

Moose harvests from the Stikine herd ranged from 12 to 40 and averaged 27 bulls per year from 1952 to 1971. Low bull:cow ratios and poor calf production prompted a reduction in the hunting season from one month to two weeks during 1970 and 1971. A delayed season in 1971 appeared to favor calf production the following year. During 1972 and 1973 antlerless hunting was allowed by permit in conjunction with a late bull season. Although these either-sex hunts and late bull seasons continued to

improve calf:cow ratios, the public opposed the changes. Weather conditions in October are usually poor and the opportunity to hunt earlier appears more important to hunters than a higher hunter success. Since 1974 there has been a one month bulls-only hunting season. Most of the 125 to 200 hunters using the Stikine River area are Petersburg and Wrangell residents. Hunting for moose also occurs in the upper Stikine drainage, in Canada. Since 1973 a total of 48 moose of both sexes have been taken by Canadian guide operations.

The Thomas Bay herd has been hunted for bull moose since 1952. Most hunters are Petersburg residents who take from 6 to 10 bulls annually.

Heavy hunting pressure and bulls-only hunting seasons on all three herds have resulted in low proportions of bulls in the population and very few older bulls. Yearling bulls usually account for about 80 percent of the harvest.

Primary methods of transportation in all areas are boats (jet or propeller-driven) and float-equipped aircraft. Air boats, highway vehicles and wheel airplanes are also used.

PROBLEMS

* Predation by wolves and bears may contribute to herd reduction and retard recovery of populations at low levels. At such times predators may seriously compete with humans for harvestable animals. Liberal hunting seasons and bag limits should be maintained on predator populations which may impact Middle Southeastern moose populations. Trappers should be encouraged to take wolves in problem areas. Additional control measures may be warranted in situations where effects of predation become critical.

* Reforestation in the Thomas Bay area may cause a decline in moose numbers after logging has ceased if dense even-age regrowth occurs. Post-logging thinning of regrowth would be beneficial to the moose in this area.

IMPACTS

* Bull-only harvests will continue to satisfy local user demands although breeding capabilities of the moose populations will not be realized.

63. BEHM CANAL MOOSE MANAGEMENT PLAN

LOCATION

The mainland portion of Game Management Unit 1A excluding that part of the Cleveland Peninsula south of Spacious Bay.

MANAGEMENT GOAL

To provide an opportunity to hunt moose under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters to maintain aesthetic hunting conditions.

2. Maintain a minimum post-hunting season population sex ratio of 20 bulls per 100 cows.

3. Harvest antlerless moose, if necessary, to attain the desired moose population size and structure.

THE SPECIES

Moose are found in limited numbers along the Unuk and Chickamin River drainages and are rare throughout the rest of the management area. This pattern has probably held for many years and reflects the limited moose habitat in the area. Moose calves were transplanted to the Chickamin River drainage in 1963 and 1964 to bolster the few moose occasionally seen there. Moose populations at present are apparently little changed from those existing prior to the release. This area was closed to hunting from 1963 to 1972.

The habitat is climax forest. Little logging is likely to occur. Future mining operations in the river valleys could develop, and, if a road is build to Ketchikan, it will undoubtedly come down the Unuk River. Such developments could change a significant portion of the moose habitat in these river bottoms.

Intensity of use is light by consumptive users and almost non-existent by nonconsumptive users. Access is difficult, and chances of finding bull moose are poor. The kill has probably averaged between one and two bulls for many years and almost all have been taken from the Unuk River. Since statehood the hunting season on the Unuk River has been September 15- October 15, with a limit of one bull per hunter. The Chickamin River, closed from 1963 to 1972 because of the transplant attempt, has been hunted but only one bull has been killed since 1972. Most use has been by Ketchikan area residents for recreation. There have been no guiding activities in the area since about 1965.

Transportation means used by hunters in the area are boats and float planes. There are some places in the rivers and a few lakes in valleys where float planes can land. Skiffs equipped with jet motors are also used in the rivers.

PROBLEMS

* Access is limited along the Unuk and Chickamin Rivers. Air transportation usually leaves hunters without transportation along the river and greatly limits the area hunters can cover. Riverboats with jet units would be suitable transportation, but these are specialized equipment that would be used only on these two rivers in this area. In addition, riverboats would be difficult to transport to the rivers from Ketchikan.

IMPACTS

* Present hunting conditions and animal populations will continue.

* With future development and increased use of the area some limitations on hunter numbers by permit may be necessary, but such restrictions should not be required for many years.

* Bear hunting may be restricted in the area when it conflicts with moose hunting.

MOUNTAIN GOATS IN SOUTHEASTERN ALASKA

Mountain goat (*Oreamnos americanus*) populations in Southeastern Alaska are distributed along the coastal mountains from Dixon Entrance to Icy Bay and on Baranof Island where they were successfully introduced in 1923.

Population surveys conducted since 1959 indicated relatively stable populations until the early 1970's when severe winters caused area-wide declines. Overhunting, particularly on ranges abutting urban areas and access corridors, also probably contributed to some declines in goat numbers.

From early spring until fall mountain goats primarily utilize alpine and subalpine areas which are often extremely rugged and precipitous. Characterized by heavy snow accumulations in winter and short cool summers, these areas support grasses, sedges and forbs which comprise the bulk of the goat's diet. With the onset of winter snows goats move to rocky windblown ridges and ledges where forage remains available. As winter progresses, heavy snows tend to force goats to lower timbered elevations where forage such as shrubs, ferns and conifers are utilized. Mature coniferous forest reduces ground snowcover and is important to goats during winter. Goats also travel considerable distances through heavily forested areas since they are frequently observed on beaches.

Limited data suggest that mortality from winter weather conditions is the primary limiting factor on goat populations. In addition to limiting forage availability, precipitous terrain and excessive snow accumulations contribute to mortality through avalanches and accidental falls. Predation, particularly by wolves, may also be a major limiting factor on some goat populations, especially in combination with severe weather. Predation also retards population recovery.

Historical use of mountain goats by man included domestic utilization by coastal natives for meat, cosmetics and ornamental purposes, and by early-settlement whites for domestic use and for the market. Mountain goats are now hunted primarily for recreational values and meat. The species is increasing in popularity as a big game animal in Alaska, partly due to decreasing opportunities to hunt other species of big game throughout the state.

Differences in hunter accessibility to various goat ranges have resulted in two different patterns of use in Southeastern Alaska. Goat ranges near urban centers, alpine and subalpine lakes, and close to salt water receive considerable hunting pressure because of the ease of access. Since 1972, approximately 40 percent of the statewide harvest has occurred in the Southeastern Region, 87 percent of which has come from the inland coastal area between Haines and Ketchikan. Some goat populations have declined under heavy hunting pressure. Necessary reductions in season lengths and bag limits have accompanied increased utilization near urban centers. In contrast, relatively inaccessible goat populations have experienced only slight increases in hunting pressure. Seasons and bag limits remain liberal, however some reductions in season lengths may be necessary in the future.

Aesthetic values of mountain goats have in recent years received increased recognition. Opportunities for viewing and photographing goats are available at two established mountain goat observation areas: the Bullard Mountain goat observation area near Juneau and Adams Inlet in Glacier Bay. In addition, nonconsumptive use occurs throughout the goat's range in Southeastern Alaska.

PROBLEMS

* Knowledge of most facets of goat ecology in Alaska and of the influence of hunting and land use on goat populations is scanty. Research should be initiated to provide necessary management information. Until such information is obtained, a conservative harvest program should be maintained and goat habitats should not be altered.

* Clearcut logging adjacent to goat winter range is increasing annually. Many of the areas scheduled for logging have been identified as or are thought to be important wintering areas. Alteration of large portions of habitat used by goats for winter range may reduce availability of critical winter forage and cover. Forest areas used by goats for wintering or migration should be identified and logging activities should be controlled to minimize adverse impacts on goat populations.

* Hunting pressure has been concentrated in easily accessible areas. This has resulted in over-harvest in some localized areas while areas with difficult access remain, for the most part, unhunted. Because goats apparently remain on the same summer ranges and winter ranges annually, populations depleted in heavily hunted areas are not readily replenished by surrounding unhunted goat populations. Management will require restricted hunting in easily accessible areas, thereby encouraging hunting in more remote areas.

15. SOUTHEAST MAINLAND GOAT MANAGEMENT PLAN

LOCATION

Game Management Units 1 and 5, the southeast Alaska mainland coast except that area included in the Glacier Bay National Monument, Bullard Mountain, and Skagway Goat Management Plan areas.

MANAGEMENT GOAL

To provide an opportunity to hunt goats under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters, if necessary, to maintain aesthetic hunting conditions.

2. Limit harvests of mountain goats to facilitate a population increase to habitat carrying capacity levels.

3. Discourage land use practices that adversely affect mountain goat habitat or the wild character of the area.

THE SPECIES

Mountain goat populations on the southeastern Alaska mainland are found along the entire coast from Dixon Entrance to Icy Bay. Historical population trends and estimated goat numbers indicate that the population was relatively low and stable during the 1940's until at least the early 1950's, increased during the 1950's and 1960's until reaching a high during the mid-1960's, decreased dramatically in the early 1970's to roughly 1/3 the size of the peak population, and has remained relatively constant the past two years. Populations throughout the mainland are still sufficiently large to provide reasonable hunter success and adequate recreational opportunities.

The primary cause of the recent population decline was probably the severe winters in the early 1970's followed by excessive wolf predation in some areas. Hunting pressure in areas of good access may have affected local reductions. Clearcut logging is continuing to remove timber from steep slopes, some of which goats have utilized as winter range for many years. The possible impact of forest management on key goat habitat is presently under study in southeast Alaska.

Harvests of goats have been greatest in goat habitats abutting urban centers such as Juneau, Haines, Skagway, Petersburg, Wrangell, Sitka and Ketchikan. Highway corridors, improved trails and small boats have provided relatively easy access to goat populations for many local hunters. In addition, hunters using float planes have increased harvests on goat populations in remote areas surrounding alpine and subalpine lakes. Since 1972, approximately 35 percent of the statewide harvest has occurred in the coastal area between Haines and Ketchikan. With the decline in goat populations that have occurred in the 1970's reductions in season lengths and bag limits have been imposed on goat populations near urban centers. Relatively inaccessible goat populations have experienced only slight increases in hunting pressure, and seasons and bag limits in such areas remain liberal; however, some reductions in the future may be necessary.

PROBLEMS

* Clearcut logging of and adjacent to key goat winter range is increasing. Alteration of large portions of the habitat long used by goats for winter range may seriously jeopardize the future of local goat populations. Removal of timber and construction of roads may also pose physical barriers to migration between summer and winter ranges. Forest areas used by goats for seasonal movements should be identified and logging activities planned and executed so as to minimize adverse impacts on goat populations.

* Proposed highway expansion in southeast Alaska will have impacts on goat populations by providing increased access and in some cases by destruction of winter range. These projects include the Yakutat Forest Highway beyond the Dangerous River, highways up either side of Lynn Canal linking the Haines-Skagway-Juneau communities, and the Taku River and Stikine River highways linking Canada to Juneau and Wrangell. If the Yakutat Forest Highway is extended beyond the Dangerous River it should be located midway between the beach and the mountains to lessen impact on goat as well as black and brown bear populations.

* Predation by wolves on already reduced goat populations has apparently contributed to recent declines in many areas along the mainland coast. Continuing predation may be inhibiting recovery of goat populations in some areas. If goat populations decline below acceptable levels because of excessive predation, some predator control may need to be initiated in selected areas.

* Hunting pressure concentrated in easily accessible areas, particularly along roads, has resulted in overharvest in localized areas while areas with difficult access remain essentially unhunted. Efforts will be made to adjust this unequal pressure by maintaining more liberal hunting seasons in remote areas.

IMPACTS

* Goat population levels will continue to be affected primarily by winter weather.

* Restrictions on harvests in accessible areas will compell hunters to hunt in more remote locations.

* Nonconsumptive use in readily accessible areas near urban centers will be enhanced by restrictions on hunting.

17. SKAGWAY GOAT MANAGEMENT PLAN

LOCATION

In Game Management Unit 1D, the mainland area north of Skagway lying east of Taiya Inlet and River between the Chilkoot Trail and the White Pass and Yukon Railroad.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy mountain goats.

SECONDARY MANAGEMENT GOAL

To provide an opportunity to hunt mountain goats under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Encourage increased public participation in mountain goat viewing and photography.
2. Control access of viewers and photographers and use of off-road vehicles if necessary to minimize disturbance to goats.
3. Allow limited harvests of mountain goats when hunting does not conflict with viewing activity.
4. Control the number and distribution of hunters to maintain aesthetic hunting conditions.
5. Limit harvests of mountain goats to no more than 10 percent of the population.
6. Discourage land use practices that adversely affect mountain goat habitat.

THE SPECIES

The modest numbers of goats inhabiting the Skagway Mountains are in harmony with the available habitat of that area. Annual snowfall is extremely variable in this area with periods of high snow accumulations apparently coinciding with, or perhaps even causing a decline in goat populations. In addition to contributing to a shortage of winter food excessive snow accumulation further contributes to mortality through avalanches and accidental falls. Predation by wolves, coyotes and wolverines may also be a major factor affecting this goat population.

Some trophy-sized mountain goats are present in this population. After completion of the Skagway-Carcross Highway hunters or viewers will have an above average chance to take or view a large goat because of improved access.

This area has been closed to the taking of goats since 1975 in order to eliminate the possibility of excessive goat harvest during and after construction of the Skagway-Carcross Highway. Prior to 1975 mountain goat harvest levels were moderate (four to seven goats annually) according to hunter harvest report data. The majority of the goats harvested were taken by Skagway residents.

In addition to the new Skagway-Carcross Highway, the White Pass-Yukon Railroad and the historic Chilkoot and White Pass gold rush trails offer access into this area.

PROBLEMS

* Construction and utilization of the Skagway-Carcross Highway through goat habitat will probably facilitate human access to the readily accessible mountain goat habitat. The impact of motor vehicles and the off-highway viewer and hunter will interfere with normal goat movement patterns and may cause goats to abandon traditional range. This area should be zoned and users distributed to minimize disturbance to goats. The results of these disturbances should be understood before the Department encourages more intense use of the goats in this area.

IMPACTS

* The goat population may increase slowly under conditions of closely controlled use.

* Restrictions on off-road vehicles will limit access of all users to some extent.

* Goat hunting will be allowed after populations are enumerated and highway construction impacts understood.

* Controls on hunter distribution will limit the individual hunter's freedom to choose where and when he wishes to hunt.

18. BULLARD MOUNTAIN GOAT MANAGEMENT PLAN

LOCATION

In Game Management Unit 1C, Bullard Mountain, near Juneau.

MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy mountain goats.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain a year-round mountain goat hunting closure.
2. Encourage increased public participation in viewing and photography of mountain goats.
3. Control access of viewers and photographers, if necessary, to minimize disturbance to goats.

THE SPECIES

The limited Bullard Mountain goat habitat supports about a dozen animals. The major factor limiting population size appears to be winter weather. Snow accumulations probably reduce available winter food to a minimum. Wolf and coyote numbers are low and wolverine numbers are moderate in this area. It is doubtful if these predators, at current densities, exert significant pressure on this goat population.

The sole use of these goats is by viewers from the U. S. Forest Service Observatory site located immediately below the Mendenhall Glacier and Bullard Mountain. The observatory is open year around and viewers have free use of spotting scopes. Photographing goats is a minor activity in this area because of difficult foot access and U. S. Forest Service restrictions against trespass on the mountain to prevent persons from frightening the animals off their limited range.

PROBLEMS

* Disturbance of goats by hikers who may be interested in close-up viewing or photographing goats will move these animals from the face of Bullard Mountain which is the only portion of the area where goats can be observed by people using Forest Service facilities. The Department will encourage the Forest Service to continue to keep hikers from using the face of Bullard Mountain.

IMPACTS

* Continued closure of Bullard Mountain to hunting and control of disturbance by visitors will assure the presence of a small pod of animals available for viewing.

19. BARANOF ISLAND GOAT MANAGEMENT PLAN

LOCATION

In Game Management Unit 4, Baranof Island.

MANAGEMENT GOAL

To provide an opportunity to hunt mountain goats under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters to maintain aesthetic hunting conditions.

2. Limit harvests to no more than 10 percent of the mountain goat population.

3. Discourage land use practices that adversely affect mountain goat habitat or the wild character of the area.

THE SPECIES

Mountain goats were introduced to Baranof Island in 1923, using animals captured in Tracy Arm, southeast of Juneau. The Baranof transplant flourished, and by 1949 goats were sufficiently abundant to allow sport hunting. Goats now occupy most of the suitable habitat on Baranof Island though range extension to the south may still be in progress.

Aerial surveys of Baranof goats have been conducted sporadically since 1954. The number of goats observed has ranged from 116 in 1960 to 263 in 1954. In 1973, 253 goats were counted. Inclement weather frequently precludes comprehensive surveys. Based on the number of goats observed, the Baranof goat population is estimated to number about 300 animals. The herd has two centers of abundance which are separated by the ice field at the head of the Vodopad River.

Local observers and survey data indicate the population peaked several years ago and that it has since declined and stabilized. Reproductive rates, both actual and potential, are unknown. The limited survey data for Baranof Island have shown fall kid:adult ratios to average about 20 kids per 100 adults. These have varied from a low of 11:100 in 1970 to a high of 29:100 in 1960. Difficult flying conditions and the inability of some observers to differentiate kids from adults make these data suspect. A reproductive rate that results in 15-20 percent kids by fall is probably adequate to replace annual losses.

The influence of humans on Baranof mountain goat habitat has been substantial. Timber harvests have essentially removed all timber between the beaches and the heads of the canyons in some valleys. As a result, goat winter range on Baranof Island has been significantly reduced. The areas affected include the drainages into Katlian, Nakwasina, Fish and Rodman bays. Most logging activity occurred at about the same time as the reported peak in goat numbers. Few stands of marketable timber remain in goat winter ranges on Baranof.

Sport hunting has been the only significant use of the Baranof Island goat resource since its introduction. The annual sport kill has averaged between 10 and 30 animals since hunting first became legal in 1949.

Most of the kill is by Sitka residents in the area north of the Vodopad River. The harvest approximates 3 to 10 percent of the esimated population. There was a marked increase in hunting pressure in 1975 with a corresponding increase in the kill.

Access to alpine goat ranges during the early portion of the hunting season is difficult. Hunting may be almost precluded for an entire season because of inclement weather. Goats normally occupy alpine areas up to 4,000 feet elevation. There are no alpine landing areas and only a few alpine lakes suited to floatplane landing. Most goat hunts therefore originate at salt water by boat. Hunters must climb to perhaps 4,000 feet; as much as 2,000 feet of the climb may be through spruce forests and alder slides. Hunters may also traverse three to five or more horizontal miles. Many ridges occupied by goats are extremely steep and rugged.

Because of the difficulty of hunting goats on Baranof Island sport hunting is probably a minimal factor in regulating or controlling goat numbers, except possibly on the northern part of the island.

For those willing to expend the time and energies to pursue goats, a high-quality wilderness experience hunt is possible; indeed, is the rule. The exploitation rate of less than 10 percent, taken over a five-month season, has apparently exerted little overall control on the population while allowing almost unlimited hunting opportunity.

PROBLEMS

* Increasing hunter effort in the more accessible northern portion of the goat range may result in excessive kills in that area. Permit hunting was initiated in 1976 to limit the kill in that area to 25 goats. Further restrictions may be necessary. Access routes in the southern portion of the island should be developed to distribute some hunting effort away from the northern range.

IMPACTS

* Goat numbers should increase in the northern portion of the range.

* Some loss of hunting opportunity may result from restrictions of harvest in the northern portion of the range.

* The status of the mountain goat as game animals should improve.

DEER IN SOUTHEASTERN ALASKA

Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) are found in varying abundance throughout most of Southeastern Alaska from Dixon Entrance north to Yakutat Bay. They are indigenous to the mainland and islands of the Alexander Archipelago south of Lynn Canal and Icy Strait, and their range has been extended by transplants to Yakutat in 1934 and to upper Lynn Canal in 1951 and 1952. The transplant to Yakutat was reasonably successful and moderate deer densities are now present on the islands within Yakutat Bay; however few deer have ever been present on the mainland. The transplant to northern Lynn Canal was less successful. Deer did establish on Sullivan Island, but are rarely observed on the mainland in the vicinity of Haines and Skagway. An occasional deer is reported on the Chilkat Peninsula and within Glacier Bay National Monument.

Deer populations have historically fluctuated in Southeastern Alaska. The inner islands populations have had the greatest fluctuations while mainland populations have remained relatively static. Islands where winter conditions are most severe, and where wolves are present, have had the greatest extremes of deer abundance. Deer have been most abundant on the islands of the Alexander Archipelago and on the mainland south of Ernest Sound. Some deer are usually present along the entire mainland, north of Ernest Sound, but populations there have never been high. On the northern islands deer populations in 1975 were moderately high and increasing. On the central islands, deer numbers were the lowest in many years; however, a slight upward trend was recently observed. The southern islands and mainland had moderate populations, with an upward trend exhibited on the islands.

During different seasons of the year deer utilize most habitat types where food is available. Their home range is usually small, but they do make vertical migrations from the beach to alpine areas as a result of snow depths and availability of food. During much of the year, low-growing forbs are the most important plant species used. These are particularly abundant in alpine habitat during summer, and where alpine terrain is available, summer food is never a limiting factor. During winter, deer continue to utilize forbs when available under forest cover, but when about six inches of snow covers these species, deer begin using woody plants, with blueberry being most important. Most species of shrubs are used to some extent during critical winter months. Tips of cedar, spruce, and hemlock trees are also used, but these provide barely a maintenance diet. When snow depth under timber cover exceeds 18 to 24 inches, deer begin to concentrate on the open beaches, utilizing dead beach grass, sedges and some kelp. These species will not maintain basic metabolism and winter mortality begins.

Clearcut logging has had more impact on deer habitat in Southeastern Alaska than any other human factor. Until recently, many cuts exceeded 1,000 acres in size. These openings in the forest produce a great amount of deer food during initial successional stages, but in winter, snow covers the vegetation and it becomes unavailable to deer. Also, in 15 to 20 years following cutting, coniferous regrowth forms a closed canopy and most deer food species are shaded out. The forest floor becomes devoid of vegetation except for mosses and lichens, and many years must pass before sufficient vegetation is available in natural openings to support deer populations again. In the climax forest, small openings created by dying trees allow for growth of understory deer browse species. Recently there has been a trend toward smaller cuts which result in greater interspersion of vegetation types ("edge effect") and uneven-age forest stands. Such cuts may be beneficial to deer by creating habitat which remains favorable for long periods.

Although deer have been successfully transplanted to other coastal regions of Alaska, Southeastern Alaska is the natural northern limit of their distribution in North America. At the margins of any species range, populations are normally more susceptible to slight changes in habitat and climatic conditions. For deer in Alaska, the winter accumulation

of snow creates critical survival conditions in many years. Deep snows render much otherwise available food inaccessible. In severe winters deer populations may be greatly reduced by losses to starvation.

Wolf predation is a second important cause of mortality for some Southeastern deer populations. Predation has had its greatest impact on deer populations decimated by starvation, often further depressing deer numbers, and retarding recovery of reduced deer populations for prolonged periods. Since the last extreme winter of 1968-1969, deer populations on the central islands inhabited by wolves have remained at low densities while populations on the northern islands, which had similar or perhaps more severe winter conditions but no wolves, have made a rapid recovery to moderately high densities.

Observed losses of deer to other natural mortality factors have not been significant. Deer in Alaska are remarkably free of parasites and diseases.

Historically deer have been the most important big game species providing meat for the larder in Southeastern Alaska. Even today almost as many hunters take deer for meat as for sport. Although hunting license sales have increased during the past 15 years, the number of deer hunters afield has remained remarkably close to 6,000 from 1959 to 1974. Most hunters are residents of Southeastern Alaska. Hunter success in most areas has been good with usually more than half of the hunters taking at least one deer. The annual kill has fluctuated between 5,000 and 12,000 deer. Harvests, including either-sex hunts, have never been shown to significantly impact deer numbers in the region. Seasons and bag limits have at times been curtailed when deer populations in specific areas were low, but these low densities were caused by factors other than hunting. Given favorable weather conditions and reasonable levels of predation, deer populations increase in spite of hunting pressure. With protection of sufficient habitat and management of predation, deer populations should be more than adequate for public use in the foreseeable future.

PROBLEMS

* Wolves in Southeastern Alaska exert a strong depressant effect on some deer populations already reduced by severe winter conditions, retarding the recovery of deer populations from low levels of abundance. Management of wolf populations to reduce predation on depressed deer populations is very difficult because federal and state statutes and regulations limit allowable methods of control and the dense vegetative cover limits the effectiveness of permitted methods. In addition, efforts to manage wolf numbers are invariably controversial, sometimes resulting in a political climate under which any management action is difficult. Yet predator and prey populations alike require management if both are to benefit and the values of both are to be realized by man.

* Clearcut logging of large areas in Southeastern Alaska is detrimental to deer populations because it results in long-term losses of deer winter range. Smaller clear cut units or alternative cutting methods which produce favorable deer habitat should be employed. Recognition of wildlife values in land use management is necessary. Since most deer habitat in Southeastern Alaska is administered by the U.S. Forest Service, it is incumbent on that agency to pursue compatibility of resource values in its management of multiple uses of the public land. It is essential that the Department of Fish and Game and the U.S. Forest Service coordinate land use plans to assure maintenance or enhancement of wildlife habitats to ensure that future needs of the wildlife resource and of public use are met.

6. SOUTHEASTERN DEER MANAGEMENT PLAN

LOCATION

Game Management Units 1-5 except for the areas included in the Behm Canal, Missionary and Sherman Peaks, and the Virginia Peaks Deer Management Plans.

MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting deer.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain either-sex deer hunting seasons.

2. Encourage recreational utilization of deer.

3. Promote forest management practices that enhance deer habitat.

THE SPECIES

Deer are indigenous to all of Southeastern Alaska south of Glacier Bay National Monument. Transplants were made to Yakutat in 1934 and to Northern Lynn Canal (Taiya Valley and Sullivan Island) between 1951 and 1956. The Yakutat transplant was successful, deer being reasonably abundant on the islands of Yakutat Bay. Deer have never prospered in the upper Lynn Canal area. Deer are present on Sullivan Island, but are rarely observed on the mainland where winter weather conditions are apparently too severe for deer survival.

Indigenous deer populations in the remainder of Southeastern Alaska are relatively distinct. Deer have historically been cyclic in Southeastern Alaska. General lows in deer abundance have occurred around 1918, 1925, 1934, 1943, 1950, 1956 and 1971. Examination of climatic records shows a direct correlation between average winter temperature and deer abundance. Although winter weather conditions have been predominantly mild since 1973, there is presently a great deal of variation in deer population status in different parts of Southeastern.

The southern mainland and the outer islands normally have mild climatic conditions. Present deer status in this area is fair. On the mainland and the inner islands the climate becomes progressively more severe northward. On northern mainland deer ranges populations have always been relatively low, but appear to remain more stable than in other areas. On the central islands populations are currently very low. On the ABC Islands deer are abundant and appear to be increasing. The ABC Islands generally support more deer than any other area in Southeastern Alaska, but there have been times in the past when more southerly populations were higher.

Natural factors have historically determined deer status in Southeastern Alaska, with the primary factor being winter weather and the secondary factor being predation by wolves. Hunting has never been a significant factor. Winter mortality surveys, conducted since the early 1950's, indicate that when an average of more than one dead deer per mile of beach is observed, populations have begun to decline. Mortality, equal to or in excess of this, occurred from 1965 through 1971, with a few exceptions, when a widespread population decrease occurred. Since that time milder weather conditions have permitted populations to increase

rapidly on the ABC Islands and more slowly on Prince of Wales Island. Deer populations on the central islands and on the mainland have shown little change.

Wolves presently appear to be the limiting factor in areas where they are present. In areas where no wolves are present, deer are abundant. This is especially evident in Game Management Unit 3. Within Unit 3, small islands which do not support wolves have fair to good deer populations while those islands which have wolves have very few deer. It appears that when deer populations have been reduced by winter losses, predation can become a significant factor, slowing recovery or even further reducing populations.

Deer habitat in Southeastern Alaska is predominantly steep, mountainous terrain. In the climax situation there is almost complete forest cover below 2,500 feet elevation with alpine habitat above that level. On poorly drained sites, the forest is interspersed with muskegs creating natural openings. When snow is not a factor, adequate food is available to support high deer populations. During most winters, however, snow forces deer to use areas below the 750-foot level. Habitat condition ranges from poor to good in this critical zone depending on deer abundance. It is presently poor on the ABC Islands and fair to good in the remainder of Southeastern. Even on good habitat, snow depths in excess of 24 inches restrict deer movements and makes the majority of food species unavailable. Quality of habitat may be as important as quantity. Ironically, the ABC Islands normally exhibit the poorest range conditions, yet support the most deer.

Deer have historically been the most important big game species for the resident hunter in Southeastern Alaska. Even today they supply a substantial portion of meat utilized by many families. Very few nonresident hunters come to Alaska specifically to hunt deer. The number of hunters in the field has remained very close to 6,000 for the past 15 years. More hunting licenses are sold each year, but a smaller proportion of license holders actually hunt.

Hunter success is determined by deer population levels and availability of the animals to hunters. If deer are abundant and concentrated at low elevations, the average hunter takes two or more deer. The annual kill has fluctuated between 5,000 to 12,000 deer. There is no evidence that hunting, with perhaps a few exceptions, has significantly influenced deer populations. Natural factors have much more impact on deer abundance than hunting.

Hunting seasons and bag limits are normally liberal. When deer are plentiful the season is usually open from August 1 through December 31 with a limit of four deer of either sex. Over 70 percent of the kill occurs in November and December when snow forces deer to lower elevations.

In Southeastern, boats and aircraft are the primary means of access used by deer hunters. There are some roads available around each major town but most hunters prefer to get "out of town". Most hunters use skiffs and small boats less than 30 feet in length. Hunting is concentrated within the one-day range of these boats. The majority of deer are therefore taken within a 25 mile radius of towns.

PROBLEMS

* In areas where wolves are present, they sometimes reduce deer numbers below the levels acceptable for human use. In these areas wolf populations should be managed to maintain a predator-prey balance which will provide adequate deer for human use. Human use

of wolves will be advocated. When this is not sufficient, Departmental hunting and trapping may be initiated.

* Clearcut logging can be detrimental to deer habitat, particularly deer winter range, by the removal of forest cover. When large amounts of timber are removed from low elevations, the area is unavailable for deer use during periods of deep snow, even during average winters. The Department is now recommending that the majority of beach fringe be retained in its natural state. In some timber types, small cuts may not be detrimental, and in fact may improve deer habitat by creating more edge effect. In these cases, cuts of less than 40 acres are recommeded. The Department will identify critical winter habitat and develop criteria for timber harvest practices. The Department will work closely with land managing agencies or private land owners to ensure protection of adequate deer habitat.

IMPACTS

* Deer populations will continue to fluctuate under influence of weather.

* Wolf populations may be reduced when necessary to maintain a balance with deer. This will be expensive and invoke criticism from many segments of society.

* Maintaining adequate deer habitat will result in more restrictions to developmental activities.

8. MISSIONARY AND SHERMAN PEAKS DEER MANAGEMENT PLAN

LOCATION

In Game Management Unit 3, that portion of Kupreanof Island which drains into Frederick Sound between Todahl Creek on the north and Fivemile Creek on the south.

MANAGEMENT GOAL

To provide an opportunity to hunt deer under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters, if necessary, to maintain aesthetic hunting conditions.

2. Provide either-sex deer hunting seasons.

3. Discourage land use practices that adversely affect the wild character of the area.

THE SPECIES

The Missionary and Sherman Peaks area on Kupreanof Island has historically been a favorite location for high country deer hunts, primarily by residents of Petersburg. Deer populations in this area have fluctuated greatly in the past, similar to the remainder of Kupreanof Island. The last peak in deer abundance was in the early 1960's. Beginning in 1965, deer populations began declining and they are presently still low. When deer are reasonably plentiful, it is not unusual to observe over 50 in a single day in alpine habitat. Mature bucks utilize this high range more than does and yearling males, providing an above average opportunity of obtaining a trophy animal.

Buck seasons normally open August 1 and weather controls the period of deer availability. With the first frosts in September, deer begin moving down into the high timber. Hunters usually take only one deer per trip. The majority of hunts are completed in a single day. Use is extremely light; less than 5 percent of the annual deer kill is taken by high country hunters.

PROBLEMS

* The undisturbed character of the Missionary and Sherman Peaks area is important to the aesthetic quality of the area for hunters. Clearcut logging in the area would significantly detract from the natural beauty and would reduce its appeal. The area lies within the Tongass National Forest. The Department must work together with the Forest Service to ensure protection of the area.

IMPACTS

* Maintaining the natural character of the land will preclude conflicting developmental activities.

* The significance given the management area may result in increased use. Use will be restricted if necessary to ensure uncrowded conditions.

9. VIRGINIA PEAKS DEER MANAGEMENT PLAN

LOCATION

In Game Management Unit 3, that portion of Etolin Island which drains into Zimovia Strait, between Kunk Creek on the north and Anita Bay on the south.

MANAGEMENT GOAL

To provide an opportunity to hunt deer under aesthetically pleasing conditions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters, if necessary, to maintain aesthetic hunting conditions.

2. Provide either-sex deer hunting seasons.

3. Discourage land use practices that adversely affect the wild character of the area.

THE SPECIES

The Virginia Peaks area on northern Etolin Island has historically been a favorite location for high country deer hunts, primarily by residents of Wrangell. Deer populations in this area have fluctuated greatly in the past, similar to the remainder of Etolin Island. The last peak in deer abundance was in the early 1960's. Beginning in 1965, deer populations began declining and are presently still low. When deer are reasonably plentiful, it is not unusual to observe over 50 in a single day in alpine habitat. Mature bucks utilize this high range more than does and yearling males, providing an above average opportunity of obtain a trophy animal.

Buck seasons normally open August 1 and weather controls the period of deer availability. With the first frosts in September, deer begin moving down into the high timber. Hunters usually take only one deer per trip. The majority of hunts are completed in a single day. Use is extremely light; less than 5 percent of the annual deer kill is taken by high country hunters.

PROBLEMS

* The undisturbed character of the Virginia Peaks area is important to the aesthetic quality of the area for hunters. Clearcut logging in the area would significantly detract from the natural beauty and would reduce its appeal. The area lies within the Tongass National Forest. The Department must work together with the Forest Service to ensure protection of the area.

IMPACTS

* Maintaining the natural character of the land will preclude conflicting developmental activities.

* No significant impact on deer populations is anticipated from high country hunting.

10. BEHM CANAL DEER MANAGEMENT PLAN

LOCATION

All of the mainland portion of Game Management Subunit 1A excluding that part of the Cleveland Peninsula south of Spacious Bay.

MANAGEMENT GOAL

To provide an opportunity to hunt deer under aesthetically pleasing conditions

EXAMPLES OF MANAGEMENT GUIDELINES

1. Control the number and distribution of hunters, if necessary, to maintain uncrowded hunting conditions.

2. Maintain either-sex deer hunting seasons.

3. Discourage land use practices that adversely affect the wilderness character of the area.

THE SPECIES

Currently, in the Behm Canal area, deer abundance is variable. Deer are common on some localized, good quality ranges but are scarce in the remainder of the area. During population highs such as occurred in the mid-1960's, deer were abundant over much of the area.

Natural mortality is apparently quite high, particularly during severe winters such as 1968-69 when heavy die-offs occurred. Wolves are present throughout the area and probably exert significant pressure on the reduced deer population.

The general condition of the habitat should not change significantly for many years. Logging would be the main cause of habitat change, and this area generally supports timber of lesser grade than the islands. The U.S. Forest Service has classed much of the area for low development which discourages clearcutting.

Very little use is currently made of the deer in this area. Deer populations are larger on islands which are closer to Ketchikan. Hunters usually don't travel the greater distances to the mainland. During years of high deer populations, considerably more hunter effort was expended in this area for deer, often in conjunction with other activities such as trapping, fishing or hunting for other species. Most hunters of the area are local residents. Deer are taken for recreation and domestic use. Nonconsumptive use is light and is incidental to other activities as people do not travel to this area specifically to observe deer.

Boats and aircraft are the means of transport to the area and skiffs are the best method of transportation once in the area. In summer and early fall the deer are at higher elevations and air transportation to the alpine lakes is preferred. Boats and beach hunting are generally used late in the season, particularly after snowfall.

PROBLEMS

* Localized mining activities may lower the aesthetic appeal of the area for some hunters.

IMPACTS

* Hunting conditions of low hunter density will be maintained.

* Deer populations will continue to fluctuate under the influence of winter weather conditions.

* Restrictions on hunter density are not likely in the near future.

FURBEARERS IN SOUTHEASTERN ALASKA

Almost all species of furbearers* common to Alaska occur in Southeastern Alaska. The region is comprised mostly of the Alaska Archipelago and the distribution of several species is discontinuous throughout the area. Mink, otter and marten are the prominent species with wolverine, lynx and other species occurring either sporadically or at low densities in a few areas. White fox are not present. The coastal and estuarine habitats, influenced by the warmth of the Japanese current, contain an abundant food supply which provides for relatively high numbers of those furbearer species which utilize the marine environment. Otter are as abundant throughout their range in Southeastern Alaska as anywhere in their world-wide range. Furbearers have been transplanted to several locations in Southeastern Alaska and some transplants have been very successful, particularly the marten transplants to Prince of Wales, Baranof and Chicagof Islands. Red squirrel transplants have also been successful in the region.

Population levels and trends of carnivorous furbearers are often closely tied to relatively few prey species or even a single prey species. The abundance of snowshoe hare and small rodents are often reflected in the abundance of lynx, coyote, marten, weasels and red foxes. Although mink, marten and weasel populations fluctuate greatly, otter populations are generally stable. The herbivorous furbearers do not appear capable of seriously damaging their food supply. Although beavers are capable of overutilizing their immediate food supply, they are not widely distributed or abundant in Southeastern Alaska, therefore they have no important influence on the environment. Beaver, muskrat, squirrels and marmots are all subject to significant levels of predation by other furbearers.

The most important influence on Southeastern furbearer habitats has been logging. The activities associated with logging, such as log storage and handling facilities, mills etc. almost always occur along the tidal zones which are important mink, otter, and weasel habitat.

Human consumptive use of furbearer populations throughout Southeastern Alaska is highly variable and almost always depends on recent fur market values. Southeastern otters command the highest prices of Alaskan otters, whereas mink and marten, although very abundant, have a much lower value relative to other Alaskan areas, and the trapping effort which is expended on these species is much more dependent upon annual market conditions. In the past mink have been heavily trapped to the point where it was necessary to have alternate-year openings and closings in many areas. Present market conditions and the resulting trapping efforts do not require alternate-year season openings.

Long established traditions, market conditions, and trapping regulations have limited the use of furbearers to the season from October to May when pelts are prime. Consumptive use of red squirrels occurs at other seasons because this species is used for food.

The seasonal nature of employment in Southeastern Alaska has not changed significantly over the years. Unlike other areas which have seen changes in the traditional patterns of use of furbearers, Southeastern has remained relatively stable, although some shift from commercial to recreational trapping has occurred. The trend in the intensity of use, however, has been towards a slowly decreasing utilization. Trapping pressures are relatively low now and will probably not decrease further. Recent increases in fur prices may stimulate some increase in trapping pressures. Compared with other areas of Alaska there is little nonconsumptive use of furbearers in Southeastern. The furbearers which predominate are generally those which are nocturnal or secretive in nature and provide limited viewing opportunities.

* A list of furbearer species considered in these plans follows this regional account.

PROBLEMS

* Pressure to ban leg-hold traps has come about as a result of public awareness of the inhumane potential of these devices when improperly set and infrequently checked. Prohibitive legislation may result in the loss of important commercial and recreational utilization of the furbearer resource. The Department should promote efficient and humane trapping methods to ensure the opportunity to participate in trapping.

* Underharvested furbearer populations are a significant economic loss to the area. Efforts to properly utilize all furbearer populations could provide substantial economic benefits.

* Development activities may occur at a rapid rate in Southeastern Alaska. It is impossible to predict long term trends in furbearer populations or their utilization by humans. Development activities should be monitored to prevent unnecessary destruction or loss of furbearer habitat.

* Overharvest can occur, particularly on mink. The fur market conditions and the general trapping pressure should be monitored annually to prevent overharvest situations from developing.

LIST OF FURBEARERS IN SOUTHEASTERN ALASKA

	Common Name	Scientific Name
Canids	Coyote	*Canis latrans*
	Red Fox	*Vulpes vulpes*
Felids	Lynx	*Lynx canadensis*
Mustelids	Mink	*Mustela vison*
	Sea Otter	*Enhydra lutris*
	Land Otter	*Lutra canadensis*
	Marten	*Martes americana*
	Wolverine	*Gulo gulo*
	Weasel	*Mustela rixosa*
		Mustela ermina
Rodentia	Beaver	*Castor canadensis*
	Muskrat	*Ondatra zibethicus*
	Snowshoe Hare	*Lepus americanus*
	Marmot	*Marmota caligata*
	Red Squirrel	*Tamiasciurus hudsonicus*
	Ground Squirrel	*Citellus parryii*
	Flying Squirrel	*Glaucomys volans*

1. GREATER ALASKA FURBEARER MANAGEMENT PLAN

LOCATION

Entire state except Game Management Units 7, 14 and 15 and national parks or other areas closed to all hunting and trapping.

PRIMARY MANAGEMENT GOAL

To provide for an optimum harvest of furbearers.

SECONDARY MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting and trapping furbearers.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Promote efficient and humane trapping methods.
2. Maintain trapping seasons and bag limits during periods of pelt primeness, consistent with population levels.
3. Maintain hunting seasons on selected furbearer species, with seasons not necessarily limited to the period of pelt primeness and with restrictive bag limits.
4. Maintain restrictive trapping seasons and bag limits on beaver based upon current beaver population levels.
5. Encourage proper preparation and handling of furbearer pelts to maximize fur values.
6. Close areas well suited for viewing and photography of furbearers to hunting and trapping or otherwise restrict use, if necessary.
7. Discourage land use practices that adversely affect furbearer habitat.

THE SPECIES

The species of furbearers addressed in this plan include wolverine, marten, mink, beaver, muskrat, lynx, land otter, coyote, red and arctic foxes, short-tailed and least weasels, arctic ground squirrel, red squirrel, marmot and raccoon. The wolf has been treated separately.

Many of these species have wide distribution in the state; consequently most are represented to some extent any given area. The arctic slope, the Aleutian Islands, and many islands in the Bering Sea, the northern Gulf of Alaska, and Southeastern Alaska have relatively few species present although large numbers of any one species may occur. On a number of islands furbearers are present as a result of past introductions from fur farming or from efforts to establish harvestable populations. Each individual species may vary in abundance according to habitat preferences and availability of food. There is little information available on numbers, distribution, or utilization of the various species. Much of what is known is acquired from fur export reports, some field observations and reports from trappers.

Furbearer population levels and trends depend primarily on the abundance of food. Most species such as wolverine, otter and beaver rely on a

variety of prey species or on a relatively stable vegetative food source are less subject to fluctuations than those furbearers such as lynx and arctic fox are dependent on a single or only a few prey species. At times diseases cause significant reductions in furbearer populations. Rabies, mange, and distemper affect fox populations, beavers are subject to endemic hemorrhagic disease, and in Southeastern Alaska, nutritional steatitis affects those mustelids that feed on rancid fish fat. Those species which occupy aquatic or riparian habitats, particularly beaver, muskrat, and mink are subject to flooding or "glaciering" conditions. A number of the smaller furbearers including weasels, muskrats, squirrels, and marmots are prey to larger furbearers or other mammalian and avian predators.

Commercial and domestic utilization are the most important uses of furbearers in much of Alaska. Some recreational trapping and nonconsumptive use occurs near urban centers, but viewing and photography are limited to relatively few species whose habits provide opportunities for observation. Most furs are sold but some are retained for domestic use in parkas, mukluks, or as trim for garments. Wolverine, muskrat, and beaver are the species most used in the domestic manufacture of garments, but almost all species are utilized to some extent, particularly when the furs are not in prime marketable condition. Beaver, muskrat, ground squirrels, and to a limited extent lynx and red squirrels are also used as human or dog food.

Furbearer trapping seasons and bag limits have remained relatively unchanged since statehood. Seasons have generally been timed to coincide with periods of pelt primeness. Liberal seasons and bag limits have had little effect on populations of most species of furbearers except for small localized areas of overharvest associated with ease of access. The vulnerability of beavers to intensive trapping and that of wolverines in tundra regions to tracking by snowmachine has resulted in depressed populations of these species in some areas. In most areas of the state and for most species harvests are regulated primarily by abundance and availability of furbearers, and by market values. At low levels of abundance or in inaccessible areas, trapping effort usually ceases when it becomes unprofitable; then the high reproductive potential of most species rapidly restores populations to carrying capacity. Trapping is done primarily to supplement income derived from other sources. Few full-time professional trappers operate in the state.

Snowmachines are the most commonly used mode of transport for trapping or hunting furbearers, although aircraft are also used extensively. Snowmachines are the standard means of transport at all bush communities and provide rapid and efficient coverage of large areas surrounding settlements. Aircraft are useful for trapping in areas far from human habitation and are also used as an aid in locating and shooting foxes and wolverines from the ground. In Southeastern Alaska, boats are the primary transport means for trappers because most trapping activity occurs along the beach fringe.

Wolverine occur throughout mainland Alaska and on some islands in Southeastern Alaska. Population densities are variable depending on suitable habitat and, in some western and northern areas, on the degree of harvest. Wolverines are most abundant in interior Alaska and least abundant in southcoastal areas. Sparse populations exist over most of Southeastern Alaska, with moderate numbers in the Stikine, Taku, Chilkat, Yakutat and gulf coast areas. Wolverines are generally abundant over the remainder of the state, particularly in forested and alpine habitats. Densities are relatively low on portions of the arctic slope, northwestern coastal tundra areas, and on the Yukon-Kuskokwim Delta.

In comparison to other furbearers, wolverine never attain high densities, due in part to their large territorial requirements and apparently low

reproductive rate. Wolverine have catholic food habits; much of their food is scavenged and a dependable source of carrion may be important in maintaining populations.

More than 800 wolverine are harvested each year by hunters and trappers. Southcentral Alaska and the Yukon River drainage yield the largest harvests with about 250 and 200 wolverine, respectively, taken there. Although sealing (marking) of wolverine skins is required, some skins are used domestically for parkas, ruffs and garment trim and are not reported; consequently, reported harvests are minimum numbers. Trapping is the most common method of taking wolverines in forested areas, such as in Interior and Southcentral Alaska while in the open country of Western and Arctic Alaska or in alpine areas ground-shooting from snowmachines or with the aid of aircraft predominates.

Use of wolverine varies between areas. In Western and Arctic Alaska, most wolverine are in high demand for domestic use in garments and few are sold commercially. Most skins never leave the villages. Coastal villagers acquire pelts by bartering with Interior residents or purchasing from commercial furriers. In Interior and Southcentral Alaska most skins are sold commercially with a few kept for domestic use.

Regulations and remote wilderness areas provide some measure of protection for wolverine populations. Where lack of cover renders the animals vulnerable to tracking with mechanized vehicles, local extirpation may occur, especially near settlements. High prices for pelts and the demand for local use of skins for garments provides continuous incentive to trappers and hunters. In forested areas with relatively low wolverine densities the species is not actively sought and many that are taken are caught in wolf sets.

Marten occur throughout most of the state but are absent north of the Brooks Range, on the Yukon-Kuskokwim Delta, and the Alaska Peninsula. Marten were introduced to Prince of Wales and Baranof Islands in 1934 and to Chichagof and Afognak Islands in the early 1950's; they are abundant on Admiralty Island, but are otherwise absent from most of the islands in Southeastern Alaska, Prince William Sound, and the Kodiak Archipelago. Marten distribution coincides with that of climax spruce forests. Their dependence on mature spruce habitat makes this species particularly susceptible to forest fires and clearcut logging practices. In northern Interior Alaska extensive burns have resulted in reduced populations of marten over large areas. Much good habitat is still present in Interior Alaska, however, and marten are abundant over the area as a whole. Marten populations are lower south and west of Interior Alaska; marten in Western and Southeastern Alaska are less abundant than in past years.

In good marten habitat, population densities may be as high as four animals per square mile. Although males occupy a larger home range than females, neither generally range over an area greater than one square mile, except during the breeding season or in mountainous terrain where marten may undertake seasonal altitudinal movements due to changing food availability. Microtine rodents constitute the main source of food for marten although a variety of prey is utilized, depending on availablity. The red squirrel is a minor item in their diet. Berries may be an important food in late summer and fall.

Past marten harvests have fluctuated widely, but in the period from 1962 to 1972 averaged about 8000 per year. In 1973 the harvest increased to about 18,000. The price of marten fur, a primary determinant of trapping effort on the species, increased from $30 to $40 per pelt in 1973. Current prices of $40-50 are incentive for continuing intensive trapping effort. Harvests in Interior Alaska have been relatively low (2000-3000 per year) despite high marten densities; here low trapping effort is

probably a result of the availability of other employment in the area. Currently, Southeastern and Western Alaska have the largest harvests, with each area exporting 4000 or more pelts per year in recent years. Most marten trapped are sold commercially. A few are kept in Western Alaska for domestic use as garment trim and on slippers.

Mink are common throughout the state except for the Kodiak Archipelago, the Aleutian Islands, the off-shore islands of the Bering Sea, and most of the Arctic Slope. Mink are usually associated with riparian habitats - streams, ponds, marshes, and salt water beaches and their diet reflects the variety of food species available there; small mammals, birds, fish, and insects and other invertebrates are eaten. Southeastern Alaska and the northern Gulf of Alaska Coast-Prince William Sound area have relatively stable, high density mink populations, distributed primarily along the coastal fringe where their food supply including a variety of small mammals, marine invertebrates and fish, is diverse and abundant. Mink populations in interior Alaska areas are characterized by lower densities and greater fluctuations than southcoastal populations as a result of seasonal or unstable food sources, and lower productivity of freshwater habitats. Microtine rodent populations typically fluctuate drastically and are a primary factor affecting mink abundance. An abundance of mice or hares in upland areas will sometimes prompt mink populations to expand inland in search of prey.

In 1976, mink population levels were variable over most of Alaska excluding Southeastern. Mink in northern Interior areas and in Northwestern Alaska were relatively abundant and increasing. Over most of the remainder of the state, mink were moderately abundant, having declined somewhat from high levels in the mid-1960's. Populations were low in some parts of the central Interior such as the Tanana River drainage.

Factors controlling mink population levels are not well known. Food availability is probably the major factor. In some areas spring flooding may reduce populations by drowning young mink in dens. In southcoastal areas nutritional steatitis may be important; it was a significant mortality factor to mink raised commercially in past years.

Traditionally mink have been one of the most important commercially trapped species of furbearers in the state. Reduced pelt prices, increased levels of employment, and availability of welfare, have resulted in reduced trapping effort in many areas in the past decade, and mink are currently underharvested over much of the state. Western Alaska, particularly the Yukon-Kuskokwim Delta, has always been an important mink producer. Delta mink are not only much larger than in other parts of Alaska but they are more uniform in color which, in combination, contribute to consistently higher prices. Large harvests also occur in Southeastern Alaska where climatic conditions are less of a deterrent to trapping than to the north. Elsewhere in the state harvests are variable, depending as much on the abundance of mink as on current market values. In some locations such as near Fairbanks and along the Copper River Highway near Cordova interest in recreational trapping is high despite price or abundance considerations. The majority of trapping effort, however, continues to be commercial in nature. Most mink trapped are sold to outside buyers. A few are retained for use as garment trim on slippers, gloves, hats and parkas.

Beaver are presently distributed over most of mainland Alaska from the Brooks Range south to the middle of the Alaska Peninsula and into Southeastern Alaska. Beaver are rare in much of Prince William Sound, and in Southeastern Alaska are now abundant only in the Yakutat forelands and some of the major mainland river drainages. They are present in low numbers on many Southeastern Alaska islands. In Southwestern Alaska there has been a general decline in the beaver population north of the Kvichak watershed, particularly near settlements. Beaver are abundant in remote areas and are increasing there because of reduced wilderness trapping. Populations are also high and increasing on the Alaska Peninsula and southwest of

the Kvichak watershed. Beaver were introduced to islands in the Kodiak area in the 1920's and are now well established in suitable habitat on Kodiak, Afognak, Raspberry and several other islands. Beaver populations in Interior and Western Alaska are moderate to high and generally increasing except in the lower Yukon-Kuskokwim area where overtrapping has occurred. Very few beavers were present in Northwestern Alaska prior to the 1930's, but since the 1950's populations there have been increasing and expanding into the Selawik and lower Kobuk drainages.

Distribution and abundance is a reflection of habitat availability except in areas where overtrapping has occurred. The most productive beaver habitat is characterized by a dependable water supply with little fluctuation in stream flow and by willow, aspen, cottonwood, or birch vegetation. Beavers are found from sea level to elevations of 4000 feet; they are absent on treeless tundra bordering the Arctic Ocean and the Bering Sea, and on the Aleutian Islands. Populations fluctuate naturally in response to availability of food in localized areas. In some years high water levels force beavers out of lodges where they become vulnerable to predation. Endemic hemorrhagic disease can reduce populations when they attain high densities.

Beavers are unique in the degree to which their presence modifies riparian habitats. Beaver dams stabilize watersheds, reducing flooding and silting. Raising of water tables and impoundment of water alters vegetative cover and provides aquatic and riparian habitat for many species of wildlife. Although some species of fish benefit by increased production of fish food, dams often create serious barriers to spawning anadromous fish.

Beginning with the 18th century Russian fur trade, beavers have been one of Alaska's most important furbearers. Heavy utilization of beaver in early territorial days led to a period of scarcity in the early 1900's, but populations have recovered and are now at moderate to high levels in many areas. Although prices of beaver pelts have not risen as dramatically as other furs, beavers remain an important furbearer in Alaska.

Trapping pressure varies between areas. The largest harvests come from the lower Yukon-Kuskokwim River drainages where about 3500 beavers are taken annually. Trapping is also heavy in the Bristol Bay drainages where more than 1600 beavers are taken each year. A declining salmon industry in that area has resulted in increased trapping effort. Harvests in Interior and Southcentral Alaska are relatively small; poor prices, low limits on take and relatively high employment rates contribute to low trapping effort. Trappers on Kodiak Island annually take about 200 beavers, but the traditional low prices offered for coastal beaver pelts discourages effort there. Southeastern Alaska trappers also take about 200 beavers per year, mostly from the mainland; harvests tend to fluctuate widely between years.

Most beaver trapping occurs near human settlements by local inhabitants. Because beaver are easily overtrapped, concentrated trapping near villages and along road systems results in overharvests and depletion of local populations. This is especially evident in Southwestern Alaska where beaver are five times as abundant in remote locations as compared to areas near villages. The percentage of beavers less than one year old (kits) in the harvest is also indicative of harvest pressure. Up to 30 percent of the harvest near some Southwestern and Western Alaska villages are kits, as contrasted to 10 percent kits or less on the average in more remote areas.

Beavers are trapped mainly for commercial use, but in some areas such as Western and northern Interior Alaska they are also used for human and dog food. Pelts, particularly those from kits, may be used domestically for garment trim on hats, mittens and slippers. Beaver castors are used as a perfume base and are valuable to trappers as a component of scent lures.

Beavers are one of the few furbearer species that provide for nonconsumptive use. Much viewing and photography take place not only near the larger human settlements, but also in "bush" areas.

Muskrats occur throughout all of the Alaska mainland south of the Brooks Range except the Alaska Peninsula west of the Ugashik Lakes. The species was introduced to Kodiak Island in 1929 and later to Afognak and Raspberry Islands, but is absent from most other Alaskan islands. The densest muskrat populations are found in five areas: the Yukon Flats surrounding Fort Yukon, Minto Flats, Tetlin Lakes, the Yukon-Kuskokwim Delta and the Selawik-Kobuk-Noatak area. Four fifths of the annual muskrat harvest comes from these areas. Muskrat abundance elsewhere in the state varies depending on localized wetland habitat conditions. In Southeastern Alaska, muskrats have never been abundant and are currently present in fair numbers only near Haines, Juneau, and the Stikine River. Muskrats were once very abundant on the Copper River Delta but are now relatively scarce throughout the northern Gulf of Alaska coast. Populations over most of the remainder of the state are generally at moderate levels, down from higher densities of past years.

Muskrats are vulnerable to unfavorable weather conditions affecting their wetland habitat. Populations are reduced by winter kill when the ice becomes too thick and animals are forced into limited forage areas or emigrate. In years of heavy snow, muskrats are flooded out in the spring. Losses to predation and starvation increase under such situations. Reduced muskrat populations in many areas of Alaska can be attributed to adverse winter and spring conditions of recent years.

Hunting and trapping have relatively little effect on muskrat populations. The species is highly productive (about 15 young produced annually per adult female) and capable of repopulating depleted habitats rapidly. Heavy harvests can be sustained if habitat conditions remain good. A relatively small proportion of the total good muskrat habitat is hunted or trapped, usually only areas of high density populations within three or four miles of major streams and lakes. Unhunted areas act as reservoirs of breeding stock.

Although the open season for harvesting muskrats extends from November into June, most are taken in the last six weeks of the season. Eighty percent or more of the muskrat harvest is taken by shooting with small caliber rifles; trapping is usually considered too time consuming.

In the 1950's, muskrats ranked first in numbers of furbearers harvested in Alaska, and was among the first four in total value. Low prices combined with increased employment and availability of welfare are responsible for current greatly reduced harvest efforts, although recent pelt price increases may increase harvests. Most muskrats are taken for commercial sale of fur, but some are utilized domestically for food and for parkas and trim on boots and slippers. In Western and Northwestern Alaska domestic use exceeds commercial use. In northern Interior Alaska muskrats are an important food in the spring. Muskrats also provide some nonconsumptive use, particularly near human population centers to which they readily adapt, but observation of muskrats is much less than that of the more conspicuous beavers.

Lynx occur throughout Alaska except on the Aleutian Islands, the islands Lynx are relatively uncommon along the northern Gulf Coast and in Southeastern of the Bering Sea and some of the islands of Prince William Sound and Southeastern Alaska. The lynx is primarily an inhabitant of the northern boreal forest where it feeds largely on snowshoe hares. It occassionally occurs on the tundra beyond treeline, and in starvation years it ventures

far out onto the tundra in search of arctic hares, lemmings, and ptarmigan. Lynx are relatively uncommon along the northern Gulf Coast and in Southeastern Alaska, being present on the larger river systems where they have emigrated from interior populations.

Population estimates are not available but lynx were very abundant over much of their range in Alaska from about 1971 to 1974. Currently lynx are present in low numbers and are still declining. Like snowshoe hares, lynx populations fluctuate greatly with a 10-year periodicity in abundance. The amplitude of lynx population fluctuations is very great as indicated by records of exported pelts. Population highs are not synchronous throughout Alaska and broad two to four year peaks of catch probably reflect consecutive population peaks in different areas. In increasing lynx populations the females breed in the first year of life and almost 100 percent of the females conceive. Large litters and high survival of kits is common. After snowshoe hare populations decline, female lynx may not breed during their first year, the number of kits produced is reduced, and those kits that are born have low survival rates.

Lynx fur has again become popular for parkas, coat trim, jackets, hats and muffs after a long period of unpopularity. High prices in recent years have resulted in intensive trapping effort. Harvests during the recent period of peak abundance were about 2000 to 2500 annually, half of which came from Interior Alaska. Trapping effort is centered around villages and along road systems and the majority of the harvest is by local residents. Most pelts are sold but some are kept for domestic use. The meat is edible and is occasionally used for human and dog food.

Land otters are most abundant in the Southeastern Alaska and Prince William Sound coastal regions, and in the Yukon-Kuskokwim Delta, although they are found throughout the state except on the Aleutian Islands, islands of the Bering Sea, and the arctic coastal plain east of Point Lay. Land otter populations are relatively stable, especially in coastal areas where marine food is always abundant. Shellfish, crustaceans, insects, fish, frogs, birds, small mammals and vegetable matter are all eaten. Parasites and disease are not normally important mortality factors. Flooding in the spring sometimes drowns young otters in dens.

Land otters are probably utilized more in the Southeastern and Southcentral coastal areas than in Interior Alaska. Overtrapping is usually not a factor affecting populations, but temporary reductions in local populations can be effected by an efficient trapper. From 1000 to 2000 land otters are taken annually, most near villages or communities in Southeastern Alaska, Prince William Sound and the Yukon-Kuskokwim Delta. Land otters are an important furbearer on the Kodiak Archipelago where 200-250 are taken and sold locally. Pelt prices affect trapping effort because otters are difficult to catch and to skin. Most otter hides are sold commercially, but in the Northwestern area they are often used domestically for trim on garments and slippers. Otter hides that are used domestically are usually those which are taken late in the season and are less than prime. Land otters often provide excellent viewing opportunities, especially around coastal towns where they are often seen in the harbors.

Coyotes apparently first arrived in Alaska about 1915. A rapid population expansion occurred, with the center of abundance first in the Tanana Valley around 1930 and later in Southcentral Alaska. At the present time coyotes occur as far west as the Alaska Peninsula and the north side of Bristol Bay, and are rare north of the Brooks Range. While not especially abundant, coyotes are common in many areas, particularly in the drainages of the Tanana, Copper, Matanuska and Susitna Rivers, and on the Kenai Peninsula. Populations may become locally abundant periodically.

Although snowshoe hares may be important prey in some areas and at certain times, coyotes are catholic in their food habits. The diversity of their foods and their adaptability to a variety of habitats including those affected by man are probably factors which have allowed them to compete successfully against indigenous wolf populations.

Relatively few coyotes are trapped and those which are taken are usually caught incidental to trapping for fox, lynx, and wolf. A few coyotes are taken by sport hunters. Most coyotes are sold commercially. Some are used for parka ruffs and mittens. Prior to 1969 there was a statewide bounty of $30 for coyotes. No bounties have been paid since 1969.

Red foxes occur over the entire state except for some of the islands of Southeastern Alaska and Prince William Sound. The species is native to Kodiak Island but on many of the other islands where it occurs it was introduced by fox farming operations in the early 1900's. Red foxes are most abundant south of the arctic tundra although they are present in Arctic and Northwestern coastal tundra regions where their distribution overlaps that of arctic foxes. The best red fox habitat appears to be in Interior Alaska and on the coastal areas south of Norton Sound, including the Alaska Peninsula. Red fox populations along the northern Gulf of Alaska coast and in Southeastern Alaska are sparse, with most foxes occurring in the major mainland drainages which connect to interior areas.

Red fox populations fluctuate in response to availability of food. Fluctuations of snowshoe hare and rodent populations will cause the fox populations to fluctuate also. Fox populations in Interior areas of the state are currently declining due to low hare numbers. In coastal areas such as Kodiak Island and the Alaska Peninsula, red foxes feed on carrion on the beaches and are not so dependent on small mammal populations; populations in these areas are therefore more stable. Fox populations are affected by diseases such as rabies, mange and distemper.

Red foxes are one of the more important furbearers in the state. In the last two to three years the value of their pelts has increased greatly, which may result in increased trapping pressure; however, foxes are probably not overtrapped anywhere in the state. The estimated red fox harvest in 1973-74 was 14,580.

Silver and cross foxes, color variations of the red fox, are in high demand for wall mounts. Most red foxes taken are sold commercially, but some are used domestically for garments including parkas, ruffs, hats, and trim. In some areas such as McKinley National Park, the North Slope Haul Road and other roads and trails, red foxes provide substantial enjoyment to viewers and photographers. The species readily becomes accustomed to the presence of humans and once so conditioned can be observed at close range.

Arctic or white foxes are found in Alaska along the coast from the Aleutian Islands north. On the mainland (except the lower Alaska Peninsula) and St. Lawrence and Nunivak Island the white color phase predominates while on the Pribilofs and most of the Aleutians west of Unalaska, the blue phase predominates. Blue foxes were transplanted to the Pribilofs, Aleutians and many other islands.

Arctic foxes are noted for their extreme fluctuations in population levels. Periodic peaks in arctic fox populations occur approximately every four years in Alaska, Canada and Greenland and are tied to cyclic fluctuations in small rodent abundance. Arctic foxes have a high reproductive potential, breeding at one year of age and averaging four to eight pups

per litter. Apparently there is a reduced production of pups during periods of food scarcity. Studies in Canada show that mean litter size varied directly with lemming numbers. Although microtine rodents are the primary prey, arctic foxes are highly efficient predators on the eggs and young of waterfowl, and are an important factor governing the nest locations of seabirds.

Considerable variation exists in the yearly harvest of Alaskan arctic foxes. Since pelt prices have remained relatively stable the size of the annual harvest has been most affected by cyclical abundance of foxes. The average annual harvest between 1912 and 1963, (derived from the number of furs exported) was 4,072 white fox pelts. Between 1968 and 1974 the annual harvest averaged 2,369 pelts. Arctic foxes are the most important furbearer north of the Brooks Range because they are the only furbearer that occurs in large numbers. Approximately 40 percent of the arctic fox harvest comes from the arctic slope. The highest catch per unit of area, however, comes from the Bering Sea islands where about 30 percent of the harvest is taken. Most Alaskan white fox furs are sold and utilized outside of Alaska.

Short-tailed weasels, also known as ermine, are present throughout Alaska except for the Aleutian Islands west of Unimak Island and the offshore islands of the Bering Sea. Least weasels, have a similar range except that they are not found in Southeastern Alaska south of Glacier Bay, the mountains in the southeastern corner of Southcentral Alaska, nor on Kodiak Island. The ermine favors wooded or brushy terrain with some topographic relief whereas least weasels prefer damp, marshy habitat with its high microtine populations. Ermine are seldom numerous anywhere within their range. The smaller least weasel is sparsely distributed throughout its range except in some years of peak rodent populations.

Weasels are voracious predators that take a variety of rodents, young snowshoe hares, young birds, eggs, fish and earthworms. When live prey is scarce weasels utilize carrion and berries or other vegetable matter. Weasels are not selective among prey species but take them in direct proportion to their abundance and availability. Weasels in turn fall prey to raptors and other carnivorous furbearers.

Most weasels are now taken incidental to trapping for other species. Weasel pelts are sold although their value is low. Some skins are used for trim on parkas and slippers and in the manufacture of tourist items.

Arctic ground squirrels are found in well drained tundra areas throughout Alaska from sea level to the uplands. They are most abundant in mountainous terrain. Ground squirrels live in colonies where there are loose soils on well-drained slopes, vantage points from which the surrounding terrain can be observed, and bare soils surrounded by vegetation in early stages of succession. Colonies in high areas or well drained slopes are least affected in the spring by water from melting snow. Hibernation protects ground squirrels from the low temperatures of winter, and lasts as long as seven or eight months. Ground squirrels feed on a variety of food including seeds, roots and bulbs, plant stems and leaves, mushrooms, insects, carrion and bird eggs. Quantities of seeds and vegetation are stored in underground chambers. Ground squirrels are an important food source for raptors, weasels, foxes, wolverines and grizzly bears.

Residents of the Arctic Slope, northern Interior Alaska, and Northwestern Alaska trap, snare and shoot ground squirrels and use them for food and parkas. Ground squirrels are an important food supplement for these people in the spring soon after the squirrels emerge from hibernation. Local residents extract fat and oil from squirrels by boiling and eat the fat along with the lean meat of other animals. Elsewhere in the

state, utilization of the arctic ground squirrel fur is much less than other furbearers. Nonconsumptive use of ground squirrels occurs in alpine areas but except for park areas and upland campgrounds, observation of ground squirrels is usually incidental to other outdoor activities.

Red squirrels are found over most of Alaska where white spruce are present. These squirrels are abundant in the Interior, especially along river bottoms with abundant stands of white spruce. They are highly dependent on white spruce seeds as a food source; squirrel populations fluctuate in response to spruce cone abundance, with sharp declines when spruce cone failures come in consecutive years. Squirrels will utilize spruce buds in winters when there are no cones, but there may be severe attrition in the squirrel population. Red squirrels may have some effect on the scattering of spruce seeds, aiding reforestation.

Red squirrels are prey for a variety of predators including marten, fox, lynx, and many raptors. They are also hunted and trapped by man, mostly for recreation, with some utilization for food, fur, and trap bait. Some are taken in traps set for other species. The hides are worth about 50¢ to $1.50 each and the fur harvest is insignificant. Many red squirrels are shot as nuisances around human dwellings as they can be destructive to insulation if they gain access to a building. Red squirrels are one of the most commonly observed small mammals in Alaska. Viewing and photography are significant uses in campgrounds, waysides and other recreation sites.

Northern flying squirrels are a relatively little-known species which inhabits the boreal forest in Interior, Southcentral, and Southeastern Alaska. The species is rarely seen due to its nocturnal habits. Flying squirrels eat a variety of seeds, fruits, and other vegetable material and scavenge on carrion. This proclivity for meat results in flying squirrels often being caught in traps set for other species. The fur is of no commercial value.

Hoary marmots are present throughout most of the mountainous regions of Alaska, but are generally absent from the lower regions such as the Seward Peninsula, the Yukon-Kuskokwim Delta, the North Slope, and the lower Alaska Peninsula. None are present on the Kodiak Island group or the outer islands in the Southeastern Alaska group. Hoary marmots prefer the precipitous sides of canyons and valleys where boulders are large and have accumulated to a depth sufficient to give subsurface protection.

Marmots are sometimes trapped and the fur used for parkas. If the pelts are taken in the fall while they are prime and softly furred they make a fine garment. There is not much commercial use of marmot fur, however, and little information is available on the harvest. Marmots may be seen in some of the national parks, notably Mt. McKinley National Park, and provide opportunities for interesting viewing and photography.

A closely related species, the woodchuck is present in eastern Interior Alaska, in a small area lying between the Yukon and Tanana Rivers east of Fairbanks to the Alaska-Yukon border. Woodchucks prefer open woodlands and thickets, near fields and clearings on dry soil. They have a very spotty distribution in Alaska.

Raccoons have been released by private individuals in Southeastern Alaska in the past, and a small population has become established. Only occassional sightings are reported.

PROBLEMS

* Pressure to ban leg-hold traps has come about as a result of public awareness of the inhuman potential of these devices when improperly set and infrequently checked. Prohibitive legislation may result in the loss of important commercial and recreational utilization of the furbearer resource. The Department should promote efficient and humane trapping methods to ensure the opportunity to participate in trapping.

* Loss of habitat is potentially a serious problem for furbearers. Presently the most significant loss is that occurring through successional changes in vegetation resulting from fire suppression activities. Normally wild fires benefit furbearers by creating favorable habitat for prey species such as snowshoe hare and microtine rodents. Establishment of hardwood species along waterways after coniferous vegetation is burned is also a significant benefit to beavers. The control of wildfire should be discouraged except when resources with a superior value will be destroyed by the wildfire or where domiciles or property damage are the major consideration. Close liaison should be maintained with the various fire control agencies to assure that public energies are not expended unnecessarily in the control of wildfire.

  Oil pollution has not affected habitat on a significant scale but it has the potential of serious and extensive damage to aquatic, riparian, and marine coastal furbearer habitats. Outer Continental Shelf oil extraction and transport will almost certainly result in some detrimental pollution of coastline habitats, and accidental onshore spills will impact riparian habitats. Stringent precautions must be observed in oil development activities to minimize adverse impacts. Oil spill containment and cleanup capabilities must be improved.

  Other resource and human development activities also result in loss of furbearer habitat. Large scale water impoundments and clearcut logging affect large areas and important habitats for some species. Placer mining and dredging, gravel removal, urbanization and construction of transportation and utility corridors all have localized impacts which when taken together add up to significant long-term habitat alteration. Important furbearer habitats should be identified in conjunction with proposed developmental activities so that possible may be considered which minimize detrimental effects to furbearers.

* The generally underharvested fur populations in the northern portion of Alaska are a significant economic loss to the state. Many furbearer populations are capable of much larger harvests than they are now sustaining. Some species of furbearers are not harvested because there is no traditional use of a particular species. The formation of marketing associations would tend to provide a higher and more stable market for all furs and offset the unstable marketing conditions which now result in substantial economic loss. Development of an extension training program directed to the proper care and handling of pelts would also tend to increase the value of the harvest and increase utilization of furbearer populations. The Department probably would not initiate fur marketing associations or furbearer extension programs, but would cooperate with educational and other agencies to enhance the value of furbearers.

* Overharvesting of the furbearer resource occurs primarily on beaver and wolverine. There is a potential for overharvest of other species (possibly otter, mink and marten), but the high market conditions which would stimulate an overharvest are not likely to occur. Beaver are easily overharvested because they establish fixed colonies which are accessible and susceptible to repeated

trapping. Overtrapping of beaver is a recurring problem in some areas, particularly the lower Yukon-Kuskokwim River drainages and the northern Bristol Bay drainages. Wolverine are particularly vulnerable in the Northwestern and Arctic regions in the winter when they are easily tracked and pursued on snowmachines. High pelt prices and a strong domestic demand provide incentive for heavy trapping and hunting pressure on wolverine. Restrictive regulations where required to protect the resource should be implemented. Season closures in some areas may be the only viable solution to the overharvest of wolverine. Successful implementation of harvest restrictions will depend on the cooperation of resource users and on increased enforcement of regulations.

* Significant loss of public trapping opportunity may occur from the exclusion or prohibition of public trapping on extensive land areas conveyed to private ownership or federal limited use status under terms of the Alaska Native Claims Settlement Act. The Department should advocate strong consideration of continued consumptive use of furbearers on all categories of federal lands and should solicit the cooperation of private landowners to facilitate progressive management of furbearers. Easements across private lands to public lands will be sought as provided for in the Alaska Native Claims Settlement Act.

* As land available for public trapping diminishes, competition for available areas will increase, resulting in increased conflicts between trappers as well as heavy pressure on furbearer resources. Some restrictions on harvest may be necessary to protect the resource. Some trapper conflicts may be alleviated through better communication and agreements among trappers, and through trapper education efforts. Theft of traps and trapped animals may be curbed to some extent by enforcement activities, but trappers themselves must aid in the policing of their own activities.

* High market values for several species of furbearers will stimulate increased trapping effort. Existing information on distribution, population trends and habitat requirements for many furbearers is inadequate for management at higher intensities of trapping pressure or for assessment of the consequences of habitat alteration. The Department should seek adequate funding and attempt to develop needed inventory techniques.

* Accidental trapping of dogs near populated areas results in posting of private land against trespass and increases public anti-trapping sentiment. Increased awareness of the problem by trappers should be encouraged as well as increased community controls on free-roaming dogs.

* Some furbearers, particularly foxes, are known to carry diseases which are harmful or lethal to other wildlife and humans. Rabies is the most common disease which reaches epidemic proportions. *Echinococcus multilocularis* is carried by the foxes on St. Lawrence Island and Trichinosis is also carried by several species of furbearers. Trapping and hunting of both red and white fox should be encouraged in areas which have a potential to produce high fox populations which are prone to rabies outbreaks. Hygenic techniques should be encouraged to prevent the transmission of parasites and diseases from furbearers to humans, particularly in areas where these problems are known to exist. To prevent Trichinosis proper handling and cooking of all furbearer meat to be consumed by humans and domestic animals should be encouraged.

* Beaver chronically cause problems by blocking road culverts with dams and by flooding or cutting down trees on private property. Blockage of streams by beaver dams also prevents movements of

spawning anadromous fish. The Department should encourage public trapping of beaver in areas where damage to public and private property is chronic, and where important salmon spawning streams are blocked. Public utilization of beaver in problem areas is preferable to Departmental control efforts. The Department should also encourage appropriate design and construction considerations in public and private road building projects.

* Red squirrels cause more damage to human property than any other furbearer by destroying insulation, damaging human food caches and general destruction of many different items such as mattresses, sleeping bags, etc. Information on controlling squirrel damage should be consolidated into a publication which would be made available to anyone needing assistance.

IMPACTS

* Furbearer population levels will continue to fluctuate, primarily in response to prey availability and quality of habitat.

* Abundant trapping opportunities for local residents will continue to be available. Some trapper congestion and competition may occur in easily accessible areas.

* Increased harvests of available furbearer populations, improved handling, and improved marketing in the Interior and northern areas of the state could increase the economic value of the fur harvest 50 percent above the present economic value, or about $500,000.

* It may be necessary to close the beaver trapping season entirely in areas of overharvest or effectively enforce a very restricted season. This would eliminate or reduce the present harvest level by 50 percent depending upon the degree of restriction imposed. Within three to five years the harvest could be increased, compensating for the loss of harvest in years of severe restriction or total closure.

* A total closure on wolverine may be initiated in large areas of Northwestern and Arctic Alaska until populations increase to the point where they can sustain larger harvests. Future harvests would be conducted under conditions which are more rigidly controlled than at present.

* Sealing requirements for beaver and wolverine will continue and harvest reports or sealing requirements for additional species will probably be implemented.

* Loss of trapping opportunity in areas established exclusively for nonconsumptive use will be insignificant.

* Dissemination of information to prevent beaver and squirrel damage could result in a considerable savings to the public.

* Beaver populations in urban areas will be reduced below the carrying capacity of the habitat to prevent property damage.

* Knowledge of furbearer population status, habitat requirements, and utilization will increase.

* Coordination of development activity with various conservation agencies would minimize the adverse impacts of development on furbearer habitat.

* No loss of nonconsumptive use opportunity will occur, nor will proposed management adversely affect existing habitat, other species in the area or other recreational uses of the land.

SMALL GAME IN SOUTHEASTERN ALASKA

GROUSE AND PTARMIGAN

Blue, spruce and ruffed grouse and willow, rock and white-tailed ptarmigan, all members of the family Tetraonidae, are gallinaceous birds inhabiting various parts of Southeastern Alaska.

Blue grouse (*Dendragapus obscurus*) are the most widely distributed and hunted small game species in Southeastern. They occur primarily in spruce-hemlock forests from Yakutat south throughout the rest of the panhandle except for Prince of Wales Island. Franklin's grouse, a subspecies of spruce grouse (*Canachites canadensis*), occurs in limited numbers in spruce-hemlock forests on the mainland south of Unuk River and on Revillagigedo and Prince of Wales Islands. Ruffed grouse (*Bonasa umbellus*) are found in very low numbers in cottonwood forests and riparian willow stands on mainland river drainages from the Unuk River north to Haines.

Willow ptarmigan (*Lagopus lagopus*) are the most abundant ptarmigan species and occur on the mainland and all larger islands except Prince of Wales and Kiui Islands. White-tailed ptarmigan (*L. leucurus*) are found throughout Southeastern Alaska except for Prince of Wales Island. Rock ptarmigan (*L. mutus*) occur in low numbers along the entire mainland coast and on Revillagigedo Island.

Ptarmigan move downwards in October to their winter ranges. Among rock and willow ptarmigan the sexes segregate during this seasonal habitat shift. Male rock and willow ptarmigan remain near the breeding grounds throughout winter, while the females undergo movements of several miles to brushy subalpine or timbered winter range. The birds are funneled through river valleys and low mountain passes during this fall movement and again when returning to their breeding grounds in March. The degree of sexual segregation among white-tailed ptarmigan is not known.

The tetraonids have evolved so that each major vegetation type in Alaska provides habitat for one or more species at some period of the year. Therefore, disturbances such as burning, timber removal and agriculture produce vegetative changes that decrease the range quality for some species while favoring otherspecies. Spruce and blue grouse and the three species of ptarmigan tend to occupy mature or climax habitats. Conversely, disturbed communities provide ruffed grouse habitat.

Although populations of grouse and ptarmigan fluctuate in Southeastern Alaska the extreme cyclic fluctuations evident over large northern Alaska areas have not been observed in the region. Due to lack of knowledge regarding the factors governing population fluctuations, management programs aimed at stabilizing tetraonid densities from year to year are not feasible at present. Although populations can probably withstand repeated harvest amounting to 40 percent of the fall population, hunting pressure and harvest will probably continue to fluctuate with tetraonid abundance. Habitat management has not been attempted in Alaska, but ruffed grouse populations would probably respond to habitat manipulation. Higher densities of this species could probably be attained in some years through intensive habitat manipulation although it is doubtful if "cyclic" lows could be prevented.

Gallinaceous birds are important prey for avian and mammalian predators. The number of grouse and ptarmigan taken by predators not only varies according to their abundance, but also with predator densities and availability of buffer species such as snowshoe hares. Even in years when grouse and ptarmigan sustain relatively heavy losses to predators, their long-term population trends are not significantly altered.

Therefore, the use of these species as prey is compatible with the various human uses.

Grouse and ptarmigan have received only light to moderate harvest by sport hunters in Southeastern. Most hunters are residents, and the distribution of hunting pressure is primarily restricted to access routes and areas in close proximity to human population centers. Most grouse hunting occurs in the spring when the male blue grouse are "hooting." Ptarmigan and some grouse are also taken in the fall in conjunction with deer or goat hunting.

Although some individuals may hunt specifically for grouse and ptarmigan, a significant amount of the harvest results incidental to big game hunting. Interest in grouse and ptarmigan hunting is expected to increase along with human population growth. This increased hunting pressure will probably continue to be exerted in relatively localized, traditional hunting areas. Like hunting, nonconsumptive uses such as observation and photography have been light in the past, but an increase should also be expected. For the most part consumptive and nonconsumptive uses can be provided concurrently on all small game ranges in Southeastern Alaska.

HARES

The snowshoe hare (*Lepus americanus*) is the only hare occurring in Southeastern Alaska. It is found mainly in the major river deltas of the mainland, and is very sparse elsewhere. There are no hares on the islands.

Hares are never as abundant in the Southeastern Region as they are in more northern parts of the state but their densities are still influenced to some extent by cyclic fluctuations in population levels. These fluctuations average 10 years between peaks, but never reach the magnitude that occurs in interior Alaska areas. No estimates are available for hare densities in the Southeast.

Snowshoe hares occupy a variety of habitats, although certain types seem to be preferred, or will support a higher density. Hares prefer the more open aspen and birch communities with brushy understories of willow, alder, blueberry, etc. and streamside areas with willows seem to be optimum habitat for hares. In Southeastern Alaska suitable habitat occurs mainly along the major river bottoms. Dense spruce-hemlock forests support few hares.

Habitat disturbances such as wildfire and clearing of timber usually benefit the snowshoe hare, since regrowth of herbaceous and woody species provides cover and food. Increased logging operations in the region may possibly benefit the hare. Climax communities of dense spruce do not provide suitable brushy understories for snowshoe hares.

The snowshoe hare is an extremely important prey species for several predators. Lynx depend almost entirely on snowshoe hares for food, and populations of lynx fluctuate with hare populations, with high and low points in lynx populations following those of hares by about one year. In years of low hare numbers, few if any lynx kittens are raised. Both red foxes and wolves also depend to a great extent on hares. Raptors such as the great horned owl and the goshawk utilize hares as a major part of their diet, and their numbers are influenced by the snowshoe hare populations.

The cyclic nature of snowshoe hare populations precludes management programs designed to stabilize hare populations. In Southeastern Alaska especially, it is the availability of suitable habitat which controls the hare populations. Hunting pressure on hares increases as populations increase and hares become more available, but as hare populations decline and become harder to find, there is correspondingly less interest in

hunting them, and hunting then has little effect on the natural population cycle. Snowshoe hares are not considered an important small game animal in Southeastern Alaska as their populations are so scattered. Most hare hunting in the region is probably incidental to hunting for other species. Local populations of hares, such as those in the Mendenhall flats area near Juneau, may receive significant hunting pressure as the human population in the area increases.

PROBLEMS

* Hunting pressure upon the upland game bird resource in Southeastern is expected to increase. The most critical aspect of increased pressure is that exerted in the spring on blue grouse and ptarmigan populations. Areas of concern are those where roads or trails permit easy access during the spring to breeding habitat near the larger towns. Local spring harvests have little impact on populations over major geographical areas, and due to mobility of birds in the fall, probably have little influence on hunter success the following autumn in these areas. Marked increases in spring hunting pressure in these areas could, however, greatly reduce local populations the subsequent summer, and, if repeated annually, could virtually eliminate nonconsumptive use of the resource at these localities. Therefore, programs to identify areas of high hunter use will be needed in the future. Once identified, hunting pressure and success, particularly in the case of spring blue grouse and ptarmigan hunting, should be closely monitored in these areas.

* The effects of large scale timber harvests on small game populations in Southeastern Alaska are unknown but may be significant for some species. Impacts of logging on small game need to be determined in order that adverse effects of timber removal on small game can be minimized.

1. ALASKA SMALL GAME MANAGEMENT PLAN

LOCATION

Entire state except national parks or other areas which are closed to all hunting.

PRIMARY MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting small game.

SECONDARY MANAGEMENT GOALS

To provide for an optimum harvest of small game.

To provide an opportunity to view, photograph and enjoy small game.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Achieve greater utilization of the small game resource by encouraging wider distribution of hunting pressure and identifying species that are lightly utilized.

2. Encourage public viewing and photography of small game.

3. Regulate or eliminate hunting seasons to minimize disturbance in areas especially suited for viewing or photographing small game.

4. Discourage land use practices that adversely affect small game habitat.

THE SPECIES

Small game species addressed in this management plan are blue, spruce, ruffed and sharp-tailed grouse; willow, rock and white-tailed ptarmigan; and snowshoe, arctic and European hares. Small game populations fluctuate considerably in successive years, and little is known of annual population status except in relatively small, localized areas. A feature common to most Alaskan small game populations is a recurrent cycle of abundance and scarcity. In most instances, a complete cycle lasts 8 to 12 years. Populations of the various species appear to fluctuate in phase over most of Alaska, although local pockets of animals may remain at high numbers while populations are declining elsewhere. Coastal populations seem to exhibit less drastic oscillations than populations in the interior. Blue grouse, found only in Southeastern Alaska spruce-hemlock forests, occur in relatively stable numbers. The three species of ptarmigan in coastal parts of their range exhibit erratic, rather than cyclic, population fluctuations. Grouse and ptarmigan populations in interior and parts of Southcentral Alaska were high during 1960 to 1962-63 and again in 1968 to 1970. Hare populations followed a similar pattern, including less drastic, more erratic fluctuations in numbers in coastal areas.

Factors causing the oscillations in small game numbers are not well understood, although weather, food, predation and diseases probably all play a role, with different factors varying in significance during different stages of the cycle. The general synchrony of small game population fluctuations suggests that some major extrinsic factor, perhaps weather, is the cause for population cycles. Natural mortality

rates for all small game species are very high, perhaps reaching 80 percent in some years. Severe winters and wet, cold springs which adversely impact nesting success and chick survival may be the main sources of grouse and ptarmigan mortality. Snowshoe hare abundance may be related to available food supplies as well as weather.

Small game habitat has been little affected by human activity over most of the state, although some habitat has been lost or altered by urbanization and agriculture near Anchorage and in the Matanuska-Susitna Valley and by extensive logging in Southeastern Alaska. Logging activities and fires may enhance habitat for hares and ruffed and sharp-tailed grouse, while reducing suitable habitat for spruce and blue grouse and willow ptarmigan. Rock and especially white-tailed ptarmigan breed at higher elevations than willow ptarmigan, and their habitat has probably been little altered by human activity.

Recreational hunting by Alaskan residents is the primary use of small game with most harvested animals retained for domestic consumption. Most small game hunting occurs along established road systems close to human population centers, although some hunters employ snowmachines in winter and boats in summer and fall to reach more distant areas. A few hunting parties travel by plane to remote regions specifically to hunt small game. Most small game hunting in remote areas, however, is incidental to quests for big game and serves mainly to supplement camp rations. Nonresident hunters contribute little to the small game harvest. Hunter effort and harvest levels of small game depend mainly on small game abundance and accessibility. The high natural mortality and fecundity rates of small game populations preclude hunting as a significant limiting factor. Small game hunting seasons and bag limits have changed little since statehood. The only significant change was a shortening of seasons and summer closures to small game hunting in Chugach State Park near Anchorage.

Nonconsumptive uses of small game vary significantly between areas. Most viewing and photography occurs adjacent to major human population centers, such as in Chugach State Park near Anchorage, along the roads, trails and footpaths in Chugach National Forest and the National Moose Range on the Kenai Peninsula, and the Twelvemile and Eagle Summits on the Steese Highway. Besides being an important hobby of many urban-area residents, viewing and photography of small game occur incidental to other outdoor pursuits, such as berrypicking, skiing, snowshoeing, hiking, and mountain climbing. Although most nonconsumptive users are Alaska residents, nonresidents also enjoy small game, particularly in Interior Alaska along roads leading to and near Mt. McKinley National Park.

Ptarmigan are the most common and popular gamebirds in Alaska. Willow and rock ptarmigan are distributed throughout the state. White-tailed ptarmigan are restricted to the Alaska Range and mountainous areas to the south including the Cook Inlet area, the Kenai Peninsula, the coast of Prince William Sound and the Gulf of Alaska, and Southeastern Alaska. Rock and willow ptarmigan make extensive altitudinal migrations in spring and fall, while white-tailed ptarmigan generally remain at higher elevations throughout the year. Willow ptarmigan occur in willow-grown flats and foothills near timberline during summer and fall and move to lower riparian areas in winter. Rock ptarmigan breed above timberline to about 3500 feet, and white-tailed ptarmigan occur as high as 5000 feet. Comparatively little ptarmigan habitat has been altered or destroyed in Alaska, although greater efficiency in fire suppression may be having an impact on willow and rock ptarmigan wintering areas.

Willow ptarmigan are the most frequently encountered gamebird because they are most abundant and they winter at lower elevations. The magnitude of harvest is unknown, but hunting effort varies considerably from year to year depending on bird abundance. Some of the most popular recreational

ptarmigan hunting areas include the Copper River Delta, lands adjacent to the headwaters of the Little Susitna River, the Isabel Pass area, Eagle and Twelvemile Summits on the Steese Highway, Mt. Fairplay and, on Kodiak Island, the Upper Station Lakes and Tugidak Island. In Southeastern Alaska, the most used ptarmigan hunting areas are near Haines, Juneau, Ketchikan, and along beach and river systems from Yakutat to the Alsek River. Ptarmigan hunting is most intensive in late winter after snow depths at high elevations have forced birds to move down. Ptarmigan are an important year-round source of food for rural residents in much of northern, western and interior Alaska and are taken whenever available. The extent of domestic utilization by local residents is dependent on cyclical ptarmigan abundance; when birds are scarce relatively little effort is expended to procure them. Observation and photography of ptarmigan occurs year-round and are popular whenever and wherever the birds are accessible. Many people also view ptarmigan incidentally to other outdoor activities.

Grouse are less abundant and less conspicuous than ptarmigan, although spruce grouse are widespread and at times locally abundant. Blue grouse are common in spruce-hemlock forests of Southeastern Alaska but their range extends only as far north as the Dangerous River. Sharp-tailed and ruffed grouse are distributed through Interior Alaska in a broad band that approximates the drainage of the Yukon River, although these species also occur in areas south of the Alaska Range. Ruffed grouse are present in Southeastern Alaska. Ruffed grouse have an affinity for hardwood trees and replace spruce grouse where aspen and birch stands occur in the predominantly spruce forests. The sharp-tailed grouse prefers transitional habitats between forests and tundra or grasslands. Spruce grouse are the most widespread and numerous of Alaskan grouse, present in spruce-birch and spruce-hemlock forests over most of the state. Little information is available on abundance, except on a comparative basis. Whereas ruffed and sharp-tailed grouse probably benefited from widespread wildfires that occurred earlier in the century, spruce grouse have probably benefited from forest fire prevention now provided by federal and state agencies.

Most grouse hunting is by Alaska residents for recreation and domestic use. The magnitude of harvest is unknown. Hunting effort declines substantially when grouse populations decline. Grouse are typically hunted along road systems in fall and early spring when the birds are gathering grit. Spruce grouse have been relatively common along the Steese Highway between Mile 120 and 148, near Manley.Hot Springs, between Ester and Nenana on the Nenana Road near Fairbanks, along the Alaska and Taylor Highways near Fortymile, near Glennallen, and on many secondary roads on the Kenai Peninsula.

In Southeastern Alaska spruce and ruffed grouse occur in such low numbers that they are usually taken by hunters only incidental to quests for other species, usually big game. Blue grouse, however, are subject to intensive local hunting from mid-April to mid-May when "hooters" (territorial males) are conspicuous; most of the blue grouse harvest consists of males. Most grouse hunting occurs adjacent to major road systems.

Grouse viewing and photography are primarily by Alaska local residents, although an increasing number of nonresidents, usually summer tourists, are important nonconsumptive users in state and national parks and along major road systems. Comparatively few people seek grouse specifically for viewing and photography, but they are clearly important adjuncts to some outdoor activities such as hiking, camping, fishing etc.

Hares are probably the most important small game in Alaska. Three species occur in the state. Snowshoe hares and arctic hares are indigenous species. European hares are introduced. Native hare populations are extremely cyclic in inland areas of the state; hare numbers may vary by

factors of 100 or more between years. Snowshoe hares reach their greatest density about every 10 years, with catastrophic population declines during intervening periods. Coastal populations of arctic and snowshoe hares seem less cyclic and exhibit erratic population oscillations. Hare population fluctuations have been documented since the late 1800's in Alaska. Hares were abundant in Interior Alaska in 1885, probably during the mid-1890's, in 1905, from 1913 to 1915, in 1924, in 1935, from 1946 to 1947, in 1954, in 1963, and finally around 1970. Hare numbers were again at low levels by the mid-1970's. Less is known of arctic hares, but their numbers seem to show a similar pattern. European hares have been established by the release of domestic hares on a number of islands including Umnak and Hog in the Aleutians, and Middleton Island in Prince William Sound. The Middleton Island transplant of three females and one male in 1954 increased to at least 6000 by 1960 and the population is currently at about that level, although drastic fluctuations in numbers have occurred over the last 15 years. The Alaska Game Commission authorized a transplant of snowshoe hares to Kodiak and Afognak Islands in 1934. The transplant was successful, and snowshoes were subsequently released on Woody and Long Islands and later on Popof Island in the Shumagin group. Most hare habitat has probably been little altered by human activity, although improved efficiency in fire suppression and prevention by state and federal agencies may have reduced some hare habitat. Habitat requirements of hares appear flexible but most often consist of streamside willows, dwarf birches, and brush thickets. Hares are widespread during population highs. Urban sprawl and livestock grazing are probably having adverse local impacts on hare numbers in some areas.

Snowshoe hares are probably the most popular small game species in Alaska. Most use is recreational hunting for food. Most hares are harvested by local residents although nonresidents take hares incidentally to quests for big game. Areas adjacent to roads and waterways are most heavily hunted. Access to hunting areas is often by walking, but more hunters are employing boats, all-terrain vehicles and snowmachines to reach distant areas. A few hunting parties travel by plane to remote regions exclusively to hunt hares. Hunting effort varies with population fluctuations, being intense when hares are abundant and limited when they are scarce. Snowshoe hares are less common in Southeastern Alaska and provide a limited amount of recreational hunting near Juneau, Haines, and Skagway. Villagers in remote areas make extensive domestic use of hares. Most hare hunting occurs in fall and winter. Hares are also popular with nonconsumptive users, particularly near urban areas. Although many people wishing to view hares often blame hunting for low numbers during years of hare scarcity, the high reproductive and natural mortality rates make the impact of losses due to hunting insignificant.

PROBLEMS

* Much of the small game habitat bordering the state's highway system has been selected by Alaskan natives under terms of the Alaska Natives Claims Settlement Act. Once title to public lands is conveyed to private ownership, public use of such lands may be prohibited. The Department should solicit the cooperation of private landowners to facilitate progressive management of small game. Easements across private lands to public lands will be sought as provided for in the Alaska Native Claims Settlement Act. The Department should also maintain close liaison with native corporations and make recommendations on land use practices which benefit wildlife.

* The proposed inclusion of land, about 80 million acres, into Federally-administered parks, wildlife refuges, wild and scenic rivers, and national forests under the terms of the Alaska Native Claims Settlement Act will affect public use and state management of small game in

these areas. Hunting may be prohibited, limited or otherwise these areas. Hunting may be prohibited, limited or otherwise affected. If these areas are established by Congress, the Department should solicit cooperation of the respective land management agencies to allow public use of the lands for hunting. Seasons and bag limits and methods and means of hunting may require adjustment to conform with federal regulations.

* Alteration or loss of small game habitat due to logging, expansion of residential areas, industrial and mineral development and fire suppression will affect numbers of small game in some accessible areas that receive heavy hunter use. The Department should identify important small game habitat and make recommendations on land use practices. The Department will also propose and encourage habitat improvement by the various land management agencies.

* Many areas of the state receive little or no use due to problems of access. The Department may consider encouraging wider distribution of use by providing information to the public regarding small game populations that are not being utilized. In some cases, the Department may recommend providing additional routes of access.

* Due to manpower and funding restrictions, data on population status and harvest levels of small game are not gathered. In some cases, no methodology exists for the routine censusing of small game. The Department should seek adequate funding to develop needed inventory techniques.

* Hunting adjacent to roads and near urban centers may pose public safety hazards, and local opposition to hunting may develop and result in restrictions such as closed areas. The Department should anticipate such conflicts and, where appropriate, limit hunting by time and space zoning. The Department will generally oppose efforts to effect closures except where a clear need exists.

* As small game hunting near urban centers increases, conflicts with nonconsumptive users will occur in a few accessible locations where small game are traditionally observed. Intensive local harvests of ptarmigan in the spring can reduce the summer population of birds available for observation. Three areas of potential conflicts are the Eagle and Twelvemile summits on the Steese Highway north of Fairbanks, the Mt. Fairplay area on the Taylor Highway, and the Donelly Dome - Paxson area along the Richardson Highway. Restrictions on hunting in these areas may be necessary, especially in the spring, if hunting significantly reduces the birds available for nonconsumptive use during the summer.

* Although small game populations generally increase or decrease independently of hunting, many people believe that population lows are caused by overharvest. The Department should inaugurate an active educational program on small game population cycles and dynamics.

* Many small game hunters regularly dress and clean the animals they have bagged along highways and leave the offal and skin or feathers on the road right-of-way. Other people often find such practices offensive. The Department should discourage such practices by an active and vigorous educational program or, if appropriate, consider regulations that would prohibit careless and thoughtless disposal of animal remains.

IMPACTS

* Small game populations will continue to fluctuate with or without hunting.

* Some hunter congestion and competition may occur in easily accessible areas.

* Restrictions on hunters may be imposed in areas of high nonconsumptive use of small game.

* Distribution of hunting pressure and harvest may be improved.

* No loss of nonconsumptive use will occur, nor will proposed management adversely affect existing habitat, other species in the area, or other recreational uses of the land.

WATERFOWL IN SOUTHEASTERN ALASKA

Southeastern Alaska annually supports millions of waterfowl* enroute to and from northern Alaska and Canadian breeding grounds. Because waterfowl are scattered over thousands of small coastal tideflats and stream deltas there are only a few major concentration areas: deltas of the Situk, Ahrnklin and Dangerous Rivers; the Alsek River delta and Dry Bay; Mendenhall Wetlands; Stikine River delta; Rocky Pass; and tideflat areas in Duncan Canal. Breeding populations of waterfowl are not large but the number of wintering birds probably exceeds two million.

Breeding habitat in Southeastern Alaska is limited by the mountainous character of much of the region. There are no major production areas but thousands of small sedge flats at the heads of bays and deltas of small streams collectively support a substantial number of birds. Numerous ponds, generally below 1500' elevation, also support some birds. Definitive breeding duck surveys have not been conducted in the Southeastern Region but an estimated 100,000 "dabbling" ducks and 10,000 "divers" nest here. A substantial population of nongame ducks (mergansers and harlequin) also breed here.

During the summer several hundred thousand immature nonbreeding scoters remain in Southeastern waters. In addition adult males, after mating in northern areas, return to Southeastern Alaska for their summer molt.

Nearly the entire world's population of Vancouver Canada geese breed and remain here year-round. The estimated annual fall population is 60,000 geese. Although most geese are permanent residents a small percentage of the population migrate as far south as Oregon during the winter. A few Canada geese are known to nest and summer-molt in the Yakutat area but their subspecific classification is unknown.

Trumpeter swans nest primarily in the Yakutat area although nests have been recorded in the Haines and Ketchikan area. The total average fall flight from this region is perhaps 100-150 swans. Some trumpeters also overwinter in the southern part of the region; their numbers vary with the severity of the winter.

Because most salt water in the region remains ice-free during winter months, large numbers of birds overwinter. Besides Vancouver Canada geese, mallards, scoters, mergansers, harlequin, old squaw, goldeneyes, bufflehead and other dabblers and divers are abundant. The total wintering waterfowl population probably exceeds two million birds annually. Mallard populations vary according to the winter's severity, but possibly average over 150,000 each year.

Waterfowl habitat conditions are generally good throughout the region. Change is occurring in some areas from "glacial rebound" and silt deposit, most noticeably on the Stikine River Delta and Gustavus tidelands. On these areas the uplands have risen markedly and vegetation changes are occurring. A loss of upland ponds and a decrease in waterfowl use has occurred.

In Southeastern Alaska waterfowl are utilized primarily for recreational hunting. Unlike most areas in Alaska hunters here can make use of the full 107 day season. However, inclement weather after early November precludes much waterfowl hunting except when waterfowl and big game hunts are combined. Many more ducks and geese are produced in Southeastern Alaska than hunters succeed in shooting.

Less than 20 percent of all waterfowl sport hunters in Alaska live in Southeastern Alaska. Nearly 25 percent of the state's total hunter days, about 20 percent of the duck harvest and over 10 percent of the

* A list of waterfowl species considered in these plans follows this regional account.

total goose harvest occurs in the region. Over 90 percent of the ducks harvested are mallard, pintail, American widgeon, and green-winged teal. Canada geese comprise about 90 percent of the total goose harvest with Vancouvers the predominant subspecies. The locations of major hunting activity and waterfowl harvest are: Mendenhall Wetlands, Stikine River Delta, Yakutat area (east from Yakutat through Dry Bay), Duncan Canal, Blind Slough, Rocky Pass, St. James Bay, Farragut Bay and the Chilkat River. The Stikine River Delta and Yakutat area are the most popular hunting areas for Southeastern waterfowl hunters.

Most of the hunting effort occurs in areas accessible only by aircraft or boat. However, in the Juneau, Petersburg, Yakutat and Haines vicinities hunting opportunities are available from road systems. Less than 2 percent of all waterfowl hunters travel out of the Southeastern region to take most of their waterfowl.

Nonconsumptive use of waterfowl is low to moderate in the region but high in a few areas where road systems permit easy access. The greatest use occurs near Juneau where a highway parallels the Mendenhall Wetlands for several miles. Other areas of moderate to high nonconsumptive use include: Yakutat, Petersburg, Haines, Ketchikan and in the immediate vicinity of the numerous small towns and villages along the coast. Travelers on the state ferry and commercial cruise ships have fair bird viewing, primarily of pelagic species.

Both hunting pressure and nonconsumptive use are expected to increase in proportion to the increase in human population. The average annual number of hunter use days during the past four seasons have been 13,000. By 1980 an anticipated 15,000 days spent hunting will occur yearly in the Southeastern region. A significant increase in nonconsumptive use in the Juneau area is anticipated. If the capitol is moved from Juneau a significant decrease in all uses will occur.

PROBLEMS

* Pollution of coastal tidelands and estuaries by oil or oil industry-related contaminants poses a serious threat to waterfowl in the Yakutat area and along the outer coast of the Alaska panhandle. Massive Outer Continental Shelf (OCS) oil development, onshore support facilities near Yakutat and tanker traffic along the coast could devastate coastal waterfowl habitats. Baseline data on habitat and bird numbers are needed to provide rational recommendations for O.C.S. lease areas, future oil spill cleanup facilities and to document the effect of habitat contamination for mitigation purposes. Ongoing federally funded state and federal O.C.S. bird studies are designed to identify and quantify effects of these potential problems.

* Timber cutting adjacent to sedge-tideland habitats and log storage near these areas may adversely affect waterfowl and waterfowl habitat. An apparent decrease in waterfowl food production occurs from bark decomposition in log storage areas. Waterfowl losses have also occurred from pulp mill effluents. Baseline quantitative and qualitative data on coastal bird habitats, bird numbers and relationships between these two entities are needed to provide rational recommendations to the Forest Service and logging companies to insure minimum habitat damage.

* Local encroachment on waterfowl habitat is probable by road construction and urban and industrial development. Key waterfowl and human use areas must be given adequate protection through land use regulations, safeguards in development, or mitigation measures.

LIST OF WATERFOWL SPECIES IN ALASKA

	Common Name	Scientific Name
Dabbling Ducks	Aleutian Common Teal	*Anas crecca nimia*
	American Widgeon	*Mareca americana*
	Baikal Teal	*Anas formosa*
	Black Duck	*Anas rubripes*
	Blue-Winged Teal	*Anas discors*
	Chinese Spot Bill	*Anas poecilorhyncha zonorhyncha*
	Cinnamon Teal	*Anas cyanoptera*
	European Widgeon	*Mareca penelope*
	European Common Teal	*Anas crecca crecca*
	Falcated Teal	*Anas falcata*
	Gadwall	*Anas strepera*
	Garganey	*Anas querquedula*
	GreenWinged Teal	*Anas crecca carolinensis*
	Mallard	*Anas platyrhynchos*
	Pintail	*Anas acuta*
	Wood Duck	*Aix sponsa*
Diving Ducks	American Goldeneye	*Bucephala clangula americana*
	Barrow's Goldeneye	*Bucephala islandica*
	Bufflehead	*Bucephala albeola*
	Canvasback	*Aythya valisineria*
	Common Pochard	*Aythya ferina*
	Greater Scaup	*Aythya marila*
	Lesser Scaup	*Aythya affinis*
	Redhead	*Aythya americana*
	Ringneck	*Aythya collaris*
	Ruddy Duck	*Oxyura jamaicensis*
	Tufted Duck	*Aythya fuligula*
Sea Ducks and Mergansers	American Common Merganser	*Mergus merganser*
	American Common Scoter	*Oidemia nigra*
	Harlequin	*Histrionicus histrionicus*
	Hooded Merganser	*Lophodytes cucullatus*
	King Eider	*Somateria spectabilis*
	Old Squaw	*Clangula hyemalis*
	Pacific Common Eider	*Somateria mollissima*
	Red-Breasted Merganser	*Mergus serrator*
	Smew	*Mergus albellus*
	Spectacled Eider	*Lampronetta fischeri*
	Steller's Eider	*Polysticta stelleri*
	Surf Scoter	*Melanitta perspicillata*
	Western White-Winged Scoter	*Melanitta deglandi*
Geese	Aleutian Canada	*Branta canadensis leucopareia*
	Cackling Canada	*Branta canadensis minima*
	Dusky Canada	*Branta canadensis occidentalis*
	Lesser Canada	*Branta canadensis parvipes*
	Vancouver Canada	*Branta canadensis fulva*
	Bean	*Anser fabalis*
	American Brant	*Branta bernicla*
	Black Brant	*Branta nigricans*
	Emperor	*Philacte canagica*
	Ross's	*Chen rossi*
	Lesser Snow	*Chen hyperborea*
	White-Fronted	*Anser albifrons*
Swans	Trumpeter	*Olor buccinator*
	Whistling	*Olor columbianus*
	Whooper	*Olor cygnus*

2. SOUTHERN ALASKA WATERFOWL MANAGEMENT PLAN

LOCATION

Game Management Units 1-17, 19 and 20 except the areas included in the Izembek, Port Moller, Port Heiden, Cinder River, Pilot Point, Egegik, Naknek River, Minchumina, Fairbanks, Potter Point, Jim-Swan Lakes, Chickaloon Flats, Kenai and Kasilof Flats, Fox River Flats, Controller Bay, Copper River Delta, and Mendenhall Wetlands Waterfowl Management Plan areas.

MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting waterfowl.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Maintain waterfowl hunting seasons and bag limits that reflect climatic conditions.

2. Control waterfowl hunting seasons and bag limits, methods and means of taking, and methods of hunter transport, if necessary, to distribute hunting pressure.

3. Control hunter access and methods of transport, if necessary, to minimize disturbance or harassment of waterfowl.

4. Obtain, maintain and improve hunter access to waterfowl hunting areas.

5. Encourage viewing and photography of waterfowl.

6. Discourage human activities that disturb or harass waterfowl during critical nesting or migration periods.

7. Enhance waterfowl habitat in high use areas to increase utilization of habitat by waterfowl, and discourage land use practices that are detrimental to waterfowl habitat.

THE SPECIES

Southern Alaska annually provides resting and feeding habitat for millions of waterfowl enroute to or from Northern Alaskan, Canadian or Russian breeding grounds. Spectacular concentrations of migrating ducks, geese and swans occur in areas such as southern Bristol Bay, Cook Inlet, and Prince William Sound. Although breeding populations in the Southern Alaska area are not nearly as large as those to the north, over one-fourth of the fall duck flight and over 10 percent of the fall goose flight from Alaska originates from the area. About 900,000 ducks, 90,000 geese, 11,000 whistling swans, and 2000 trumpeter swans nest in such areas as lower Bristol Bay, Yukon Flats, Minto Flats, the Tanana and Kuskokwim Rivers, the Susitna and Nelchina basins, and the Copper River Delta. Southeastern Alaska has no large areas suitable for nesting waterfowl; however, approximately 60,000 Vancouver Canada geese are year-round residents and about 110,000 ducks nest there in the many tideflat and stream delta areas. Essentially all of Alaska's wintering waterfowl occur in Southern Alaska. Coastal areas from the south side of the Alaska Peninsula south to Southeastern Alaska are used by wintering birds with Kachemak Bay, Prince William Sound and the many bays and inlets of Southeastern Alaska being particularly important as wintering areas. Southeastern Alaska alone supports an estimated 2,000,000 wintering waterfowl.

Recreational waterfowl hunting is the dominant use over most of the area. Although freeze-up limits the time waterfowl are available in interior areas, hunters in some coastal areas are able to hunt for a major portion of the season. Hunters in Southeastern Alaska, Kodiak and Aleutian Islands make use of the full 107 day hunting season. Over 93 percent of Alaska's recreational duck harvest, 88 percent of the goose harvest, and about 95 percent of the total sport hunter days occur in the Southern Alaska area.

The following list of areas are specific locations within the Southern Alaska area where use by waterfowl and/or use of waterfowl is important. These areas are not discussed in other management plans, but are places where control of human use or habitat protection is desirable. For each area the applicability of management guidelines is indicated.

AREA	Management Guideline No.						
	1	2	3	4	5	6	7
Southeastern Alaska							
Behm Canal	X			X		X	X
Berner's Bay	X			X		X	X
Brown's Cove	X			X		X	X
Chickamin R. Flats	X			X		X	X
Chilkat River	X			X	X	X	X
Marten R. Flats	X			X		X	X
Smeaton Bay	X			X		X	X
Sandborn Canal	X			X		X	X
Traitor's Cove	X			X		X	X
Unuk R. Flats	X			X		X	X
Walker Cove	X			X		X	X
Wilson R. Flats	X			X		X	X
Farragut Bay	X			X		X	X
Big Salt Lake	X			X		X	X
Calder Bay	X			X		X	X
Exchange Cove	X			X		X	X
Fish Egg Island Area	X					X	X
McFarland Island Area	X					X	X
Mud Bay	X			X		X	X
Portage Bay	X			X		X	X
Portillo Channel	X			X		X	X
Port Real Marina	X			X		X	X
Port Refugio	X			X		X	X
Red Bay	X			X		X	X
Salmon Bay	X			X		X	X
Sarkar Lakes	X			X	X	X	X
Sea Otter Sound	X			X		X	X
Shinaku Inlet	X			X		X	X
Staney Creek	X			X		X	X
Suemez Island Area	X			X		X	X
Sweet Briar Lake	X			X	X	X	X
Trocadero Bay	X			X		X	X
Bay of Pillars	X			X		X	X
Blind Slough	X			X		X	X
Colorado Creek	X			X		X	X
Kadake Bay	X			X		X	X
Petersburg Creek	X				X	X	X
Port Camden	X			X			
Rowan Bay	X			X		X	X
Saginaw Bay	X			X		X	X
Tebenkof Bay	X			X		X	X
Security Bay	X			X		X	X
Three Mile Arm	X			X		X	X
Totem Bay	X			X		X	X
Wrangell Narrows	X			X	X	X	X

AREA	Management Guideline No.						
	1	2	3	4	5	6	7
Zimovia Strait	X			X		X	X
Chaik Bay	X			X		X	X
Gambier Bay	X			X		X	X
Hood Bay	X			X		X	X
Favorite Bay	X			X		X	X
Fish Bay	X			X		X	X
Hoohah Sound	X			X		X	X
Kadashan Bay	X			X		X	X
Mitchell Bay	X			X	X	X	X
Neka Sound	X			X		X	X
Pybus Bay	X			X		X	X
Youngs Bay	X			X		X	X
Eagle R. Flats	X			X	X	X	X
Stikine River Delta	X	X	X	X		X	X
Rocky Pass	X			X	X	X	X
Duncan Canal	X			X		X	X
Gustavus Flats	X			X		X	X
St. James Bay	X			X		X	X
Arrons Creek	X			X		X	X
Bradfield River Flats	X			X		X	X
Northern Gulf Coast							
Yakutat SE thru Dry Bay	X			X		X	X
Prince William Sound	X			X		X	X
Portage Flats	X		X	X	X	X	X
Pt. Campbell-Woronzof Flats	X			X	X	X	X
Palmer-Hay Flats Refuge	X	X	X	X	X	X	X
Matanuska Valley	X		X	X	X	X	X
Goose Bay Refuge	X		X	X		X	X
Susitna Flats	X		X	X		X	X
Trading Bay	X		X	X		X	X
Redoubt Bay	X		X	X		X	X
Kodiak-Afognak Islands	X		X	X	X	X	X
Interior							
Nelchina Basin	X			X		X	X
Copper River Valley	X				X	X	X
Delta Management Area	X	X	X	X	X	X	X
Tetlin-Northway				X	X	X	X
Minto Flats	X			X		X	X

Some of the areas listed have exceptionally large concentrations of waterfowl during some or all periods of the year and are considered especially sensitive and important from the standpoint of maintaining undisturbed habitat. These areas include the Stikine River Delta, Rocky Pass, Duncan Canal, Yakutat southeast through Dry Bay, Prince William Sound, Palmer Hay Flats Refuge, Susitna Flats, Trading Bay, Redoubt Bay, Kodiak-Afognak Island, and Minto Flats.

The majority of areas listed receive relatively light use by hunters at present, primarily because of their inaccessibility to population centers. Heaviest hunter use occurs in areas near population centers where a short flight or boat trip or access via the road system puts hunting locations within the physical and financial reach of many urban hunters. The Stikine River Delta, Portage Flats, Palmer Hay Flats, Susitna Flats, Minto, and the Delta Management area all receive high hunter use which may in some cases require more intensive management to better distribute and regulate hunter use.

Most of the nonconsumptive use of waterfowl in Alaska occurs in Southern Alaska at relatively few locations which lend themselves to public viewing due to their proximity to human populations or their good access. These are the Chilkat River, Wrangell Narrows, Gastineau Channel, Eagle River Flats (Juneau), Portage Flats, Palmer-Hay Flats Refuge, and the Matanuska Valley.

Limited domestic utilization by local residents occurs primarily around villages in the lower Bristol Bay area and in some interior areas such as Tetlin and Minto.

PROBLEMS

* Pollution of coastal tidelands and estuaries and other pelagic areas by oil or oil industry-related contaminants poses a serious threat to waterfowl and waterfowl habitat in all coastal areas of Southern Alaska. Spills from massive Outer Continental Shelf (OCS) oil development, onshore support facilities, and tanker traffic along the coast could devastate coastal waterfowl habitats and result in the loss of hundreds of thousands of waterfowl if all possible precations are not taken. Baseline quantitative and qualitative data on coastal bird habitats are needed before oil impacts occur to provide rational recommendations for future OCS lease areas, recommendations for future oil spill cleanup facilities and to document the effect of estuary contamination for mitigation measures. Ongoing federally funded OCS bird projects by the Department and the U.S. Fish and Wildlife Service are designed to identify and quantify the effects of these potential problems.

* Construction of dams could eliminate important waterfowl habitat in interior Alaska. For example, a dam at Rampart would eliminate habitat for over 2 million ducks and geese. Dams on other streams would be less devastating but could result in significant losses, depending on the area. The Department must work closely with the U.S. Fish and Wildlife Service and other resource management agencies to insure that waterfowl resources are adequately considered in review of dam proposals and that all feasible mitigation measures are assured if dams are constructed. In some cases, such as Rampart Dam, the Department should oppose construction on the basis of wildlife damage.

* Timber cutting adjacent to sedge-tideland habitats and log storage near these areas may adversely affect waterfowl and waterfowl habitat. An apparent decrease in waterfowl food production results from bark decomposition in log storage areas. Waterfowl losses have also occurred from pulp mill effluents. Baseline quantitative and qualitative data on coastal bird habitats and bird numbers, and relationships between them are needed to provide rational recommendations to the U.S. Forest Service and logging companies to insure minimum habitat damage.

* Local encroachment on waterfowl habitat is probable through highway and airport construction, industrial and urban development, upland oil and gas exploration and subsequent development. Key waterfowl and human use areas must be given adequate protection through land use regulations, safeguards in development, or mitigation measures.

* The black brant population has been declining for about 15 years. A substantial increase in the harvest of brant is not desirable in the forseeable future. As hunting pressure increases in Southwestern Alaska, restrictions on brant harvests may be necessary.

* New native landowners and other private landowners will probably impose varying degrees of trespass restrictions on hunters. The

Minto Flats, Delta area, Yukon Flats, and Tetlin area will be the most affected. The Department should solicit the cooperation of private landowners to facilitate progressive management of waterfowl. Easements across private lands to public lands will be sought as provided for in the Alaska Native Claims Settlement Act. The State should secure ownership of as much of the best waterfowl land and access to it to insure good waterfowl hunting opportunities in the future.

* Use of waterfowl by hunters and nonconsumptive users will continue to increase, especially near urban centers. To prevent corresponding increases in user conflicts, crowding and reduced success, measures must be initiated to enhance habitat, increase access and control user numbers.

* Except for hunting areas in Southeastern Alaska and some lightly hunted coastal areas in Prince William Sound and Kachemak Bay, freezeup limits hunters to 50 days or less of hunting out of a possible 107 day season. Liberalized duck bag limits should be allowed to partially offset reductions in hunting opportunity imposed by climate.

* Ingestion of lead shot by waterfowl in a few areas may be causing substantial loss of birds from lead poisoning. Efforts must continue to identify these areas, measure the impact, and take corrective action if necessary.

IMPACTS

* Appropriate waterfowl seasons and bag limits will be maintained on all areas.

* All listed areas are recognized as important waterfowl use and/or human use areas; future development resulting in habitat alteration may be curtailed in recognition of the waterfowl values.

* Control of use will generally be greater in high use areas rather than low use areas. However, in all cases the minimum controls possible will be applied to achieve the desired balance between the resource and different user groups.

23. MENDENHALL WETLANDS WATERFOWL MANAGEMENT PLAN

LOCATION

In Game Management Unit 1C, the state-owned lands in Gastineau Channel south of the Glacier Highway, north of the north Douglas Road, east of Mendenhall Peninsula and west of Salmon Creek.

PRIMARY MANAGEMENT GOAL

To provide the greatest opportunity to participate in hunting waterfowl.

SECONDARY MANAGEMENT GOAL

To provide an opportunity to view and photograph waterfowl.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Obtain, maintain and improve public access to waterfowl areas.
2. Control waterfowl hunting seasons and bag limits, methods and means of taking, and methods of hunter transport, if necessary, to distribute hunting pressure or to minimize disturbance or harassment of waterfowl.
3. Encourage public viewing and photography of waterfowl and enhance viewing facilities.
4. Discourage human activities that disturb or harass waterfowl during critical nesting or migration periods.
5. Enhance waterfowl habitat in high use areas to increase utilization of habitat by waterfowl, and encourage land use practices that are beneficial to waterfowl habitat.
6. Encourage scientific and educational studies of waterfowl.

THE SPECIES

There are no extensive quantitative waterfowl use data for the Mendenhall area, but because the wetlands are one of the largest tideland areas in southeast Alaska, waterfowl use is substantial. Over 3,000 ducks have been counted in late August on the area. Lesser concentrations occur during the hunting season primarily because of shooting pressure. Canada geese numbering usually over 200 birds are present in late summer and smaller numbers occur during the hunting season. After the season closes 200-300 Canada geese return to the flats to overwinter. Over 1,000 ducks also overwinter including about 400 mallards. Swans also migrate through the area in substantial numbers from September thru mid-November. Most migrant waterfowl depart by November 15. Spring use by waterfowl on the area is heavy but occurs during a shorter time period than in the fall. The estimated total numbers of birds using Mendenhall wetlands during spring and fall are: ducks - 30,000 in the spring, 50,000 in the fall; geese - 3,000 in the spring, 5,000 in the fall; swans - 1,000 in the spring, 500 in the fall.

Duck and Vancouver Canada goose production occurs on the area. Total production of ducklings is probably less than 250 while probably less than 5 broods of geese are reared. Goose nesting is known to have decreased, probably because of increased human activity on and near the wetlands. Waterfowl use during spring and fall has also generally decreased in the past 10 years for the same reason.

During the past four years duck and goose harvests on the area have annually averaged 3,325 and 250 birds, respectively. Over 3,865 days of hunter activity occur annually by hunters over 16 years of age. However, field checks show 25-30 percent of all hunters are juveniles, so actual days spent on the area exceeds 5,000 each year. Almost all hunters are from the Juneau-Douglas area. Hunters are very crowded on the area opening day and for the first few weekends. Hunter success is generally good opening day but declines significantly thereafter. Light, but constant, hunting pressure throughout the season keeps waterfowl concentrations from occurring. Ducks concentrate near tideline and thus partially remain unavailable to hunters. However, high tides move birds and excellent hunting is available on such days.

The major access route to the wetlands is through airport property. However, with the completion of the new Glacier Highway additional public access is available, but vehicle parking is a problem. Other access routes are available, but most are through private land. On the south side of the wetlands the Fish Creek area affords good access but some of this land is privately owned. The Mendenhall River offers good boat access but tides complicate boat hunting.

Exceptional viewing, photography and other nonconsumptive use opportunities are available and utilized on the wetlands. During winter and spring especially, large numbers of birds congregate close to roads and other readily accessible viewpoints. Berms along ponds adjacent to the airport are excellent places of concealment for photographers. Little user conflict (hunter vs. nonconsumptive) has occurred to date for several reasons. People seem more interested in viewing birds in the spring after a long winter than in the fall, and the birds are much more colorful during spring. Also, the Auke Lake closed area near the Mendenhall wetlands offers some viewing opportunity in the fall.

PROBLEMS

* Habitat destruction since the mid-1960's by highway construction, dredging, land fill and commercial building has eliminated some habitat and reduced bird use. State owned lands are now classified as a refuge with management authority shared by the State and the Borough. Key private lands should be purchased or leased and close cooperation between landowners and the Department should be established.

* Public access routes to the wetlands are limited. There is one pull-off on the new highway, but at least one more should be constructed between the airport and Sunny Point. Other access corridors through private lands should be obtained by lease-easement, purchase or mutual agreement.

* Hunter success, except on opening day, is poor and is probably the result of crowded conditions and decreased habitat. Closed periods during the week could be established to allow more birds to concentrate on the area and thus improve hunter success. Habitat improvement would also attract more birds to the area. However, additional birds on the final approaches to the airport are not desirable because of the bird hazard to planes. Because of the number of juvenile hunters using the wetlands (about 30 percent of total hunters) a "kids only day" once each week could be tested.

IMPACTS

* Public access should be improved and guaranteed in the future. Relations between airport authorities and hunters should improve.

* Hunter success should improve, but crowded conditions will still exist on some days.

MARINE MAMMALS IN SOUTHEASTERN ALASKA

Southeastern Alaska coastal waters provide habitat for a number of marine mammal species* including harbor and elephant seals, sea lions, sea otters, whales, dolphins and porpoises. Although there are some specific habitat preferences, the several species are generally widely distributed and abundant, reflecting the high productivity of the Alaska coastal marine environment. Several species affect and are affected by man's utilization of marine fishery resources. Some species have at times supported substantial commercial or domestic human utilization. In the case of sea otters, populations eliminated by excessive exploitation have been reestablished through a transplant program. On the other hand, use of harbor seals and sea lions had relatively minor impacts on stock status; populations of these species are near or have reached the carrying capacity of the habitat. Since 1972, consumptive use of all marine mammals has been limited to Alaskan natives under a moratorium on use established by the Marine Mammal Protection Act. Little use of marine mammals now occurs in Southeastern Alaska.

Harbor Seals

Harbor seals are abundant in nearshore waters usually less than 30 fathoms in depth. Unlike other species, harbor seals are at home in turbid water as well as in clear water. At times they may move up rivers for considerable distances.

Harbor seals are primarily fish eaters, although marine invertebrate species are also taken. They compete with fishermen for certain species of sport and commercially valuable fish. Depredation on gill-netted salmon has occurred in the Stikine and Taku areas; however, this is less a problem in Southeastern Alaska than in other regions.

Population size is controlled primarily by availability of food. Predation by killer whales and sharks accounts for some losses. Abandonment of pups is relatively common, particularly when seals in pupping areas are disturbed by man. Loss of pups also occurs due to malnutrition or drowning. The presence of pesticide and mercury accumulations in harbor seals has been demonstrated but the effects of these contaminants are unknown.

Coastal residents have used harbor seals for food and clothing. During the early to mid-1960's, temporary high prices for seal skins effected a dramatic increase in commercial harvests which subsequently tapered off as the value of pelts declined. There was relatively little increase in hunter effort when prices again rose to moderately high levels. Only limited use of harbor seals by coastal natives has occurred since passage of the Marine Mammal Protection Act in 1972.

Sea Lions

Sea lions are abundant along the Southeastern coast with at least 10,000 animals known to be associated with about 20 different rookeries and hauling-out sites. The largest rookeries are located on Lowrie Island and and nearby rocks where about 4,000 sea lions can be found during the breeding season. Movements and interchange of sea lions between areas occurs during the fall when many animals leave the exposed breeding areas and move to more protected waters, and again in the spring when they return to the breeding rookeries. No changes in sea lion population size have been detected in recent years and populations in Southeastern Alaska are probably near the carrying capacity of their habitat.

* A list of marine mammal species considered in these plans follows this regional account.

Sea lion habitat can be found nearly anywhere along the coastline although only traditional haul-out areas are used regularly. The best habitat appears to be remote islands with extensive shallow water and rocky bottoms productive of sea life. Clear waters are preferred with most feeding occurring at depths less than 50 fathoms. Since they are primarily fish eaters, sea lions often concentrate in areas where fish are abundant, such as large herring and pollock schooling areas and spawning grounds, and salmon staging areas. Sea lions probably travel long distances to follow and feed on their prey.

Little change has occurred to sea lion habitat that has not been associated with man. The most significant impact has been on man's utilization of food species vital to sea lions. Several of the species important to sea lions have become commercially valuable and are fished extensively both by United States and foreign fishing fleets. Some alteration of habitat has resulted from the development of coastal communities. Continued development and pollution associated with exploration, extraction, and transportation of oil resources have the potential for serious adverse impacts on sea lions.

Sea lion populations are limited by a variety of factors including availability of food, losses of pups due to adverse weather during pupping and to abandonment, malnutrition, drowning, and losses to predation by killer whales and sharks.

Historically, sea lions were harvested by aboriginal natives for a variety of uses including meat, skin covering for boats, and garments. Prior to passage of the Marine Mammal Act in 1972, commercial harvests of sea lions were directed toward control of fisheries depredations and use of pup skins for the foreign garment trade.

Sea Otter

The sea otter population in Southeastern Alaska was completely exterminated by commercial hunting in the 1800's. A total of 412 sea otters were transplanted to several sites between Yakutat Bay and Dixon Entrance between 1965 and 1969. Several small but well established and rapidly growing populations now occur along the outside coasts. Some sea otters may have immigrated to the outside coast near Icy Bay and Yakutat from Prince William Sound. Southeastern Alaska now supports 600 to 800 sea otters and this number should increase rapidly.

Sea otters, limited to waters shallower than 30 to 40 fathoms in their foraging activities, exert a profound effect on many littoral species of invertebrates and possibly on certain species of bottom fish. Sea urchins and mollusks are preferred food and population size and structure of these and other food species may be significantly altered by sea otter feeding pressure. In some Southwestern Alaska sea otter populations, numbers of otters have reached or exceeded carrying capacity and many hundreds of otters have died from starvation. In other areas, starvation may be the primary natural mortality factor, particularly on subadults in late winter. Southeastern populations are far below carrying capacity and starvation does not appear to be a significant factor at this time. Predation may account for some losses of sea otters. Although otters harbor several species of parasites found in other marine mammals, mortality due to parasites is not thought to be significant.

Whales, Dolphins and Porpoises

More than a dozen species of whales can be found in waters off Alaska, varying in abundance from common to rare. Some species such as the blue and Sei whales extend only into the north Pacific, others including the gray, minke, fin, bowhead, humpback, and killer whales occur in the

Chukchi and Bering Seas as well as in the Gulf of Alaska. Most species move far south in winter and occur off Alaska only in summer, while others remain in Arctic waters year-round. The Belukha whale occurs only in small numbers south of the Bering Sea. Similarly, the bowhead whale is found primarily in Chukchi and Bering Sea waters, and the Narwhal is an Arctic Ocean resident.

A number of the larger whales now under complete protection were over-exploited by whalers during the 19th and early 20th centuries. The black right whale has shown slight increases since it was driven almost to extinction. The bowhead, gray, blue and humpback whales have remained stable or shown slight increases in populations since they were afforded complete protection. Commercial utilization continues on several species with no apparent detrimental effects. Among these, the sperm whale is the most important industry species. Sei and fin whales are valuable baleen whales. Some domestic use of whales occurs along Alaska's coast. Alaskan natives annually take from 1 to 37 bowheads, and in some years may take from 1 to 3 gray whales. Belukha whales are an important source of muktuk, oil, and meat for residents of the Bering Sea and Arctic Ocean coasts. Only a few Belukhas are harvested in Bristol Bay.

Because most species of whales feed on plankton, krill or ocean fishes not currently of interest to man, few conflicts with man occur. Beluga whales feed on several species of fish utilized by man and their predation on salmon smolt in particular may impact significantly on depressed salmon populations in some areas such as in Bristol Bay. Killer whales are known to take salmon and herring and thus compete directly with fishermen. In addition killer whales damage fishing gear and interfere with long line fisheries.

Pacific whitesided dolphins and Dall and harbor porpoises occur in Alaskan waters; these species are abundant in inshore waters during winter. These mammals feed on several species of commercially valuable fish such as herring, cod, flounder, and sardines. Porpoises are sometimes caught accidentally in fishermen's nets. Approximately 20,000 Dall porpoises are lost each year to the Japanese high seas salmon gillnet fishery.

Whales, dolphins and porpoises in Alaska are protected by one or more federal laws and by international treaties and laws. These include the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, the International Whaling Convention signed in 1946, and the International Convention of Trade in Endangered Species of Wild Fauna and Flora.

Other Pinnipeds

Elephant seals and California sea lions have been expanding their ranges northward in recent years. Sightings of elephant seals are reported each summer in the southern areas of the Alexander Archipelago. California sea lions now occur in British Columbia and a few stray animals may reach Alaska. Fur seals inhabit offshore waters of the region seasonally and small numbers of subadult animals often stray into coastal waters. No human use of these species occurs in this region.

PROBLEMS

* The problem of environmental contaminants and their adverse impacts on the marine ecosystem is a major one for all species of marine mammals and is certain to grow more critical as resource development progresses in the north. Of most immediate concern is the threat posed by pollution resulting from the exploitation, extraction and transportation of oil and natural gas. Marine mammal populations may be seriously impacted by reduction of primary

productivity of marine food webs, by direct losses of invertebrate and vertebrate food species, by direct ingestion of toxic chemicals and by loss of insulative quality of fur. Other contaminants have entered the northern marine ecosystem primarily from sources outside of Alaska. Significant accumulations of several pesticide residues and of mercury have been detected in several species of marine mammals, although the effects of these contaminants on marine mammals or on humans who consume them are unknown. All resource development and utilization with the potential for contamination of the marine ecosystem must be carefully regulated to minimize introduction of pollutants and consequent effects on marine food systems. Use of pesticides and industrial waste processing in Alaska similarly must be closely controlled.

* Several species of marine mammals compete with man for fisheries resources. To date, such competition has taken the form of depredations on netted fish or has resulted in the destruction of some fishing gear. Conflicts between fishermen and marine mammals are likely to increase as human utilization of fisheries intensifies. Reduction of fish stocks is certain to impact populations of marine mammals which are approaching or have achieved carrying capacity levels. Development of new or expanded fisheries will affect some species not now impacted. The reverse is also true. Levels of human utilization of fisheries may be limited by intensive use of fish stocks by marine mammals. Since affected species of marine mammals are limited to shallow waters in their foraging activities, much potential conflict may be eliminated by zoning certain commercial fishing activities to deeper waters. In some situations, conflicts may necessitate reduction of some marine mammal populations in specified areas.

* Human activity including movement of people, operation of equipment or harassment by low-flying aircraft can result in desertion of traditional haul-out areas. Of particular importance is disturbance during critical pupping periods which can result in abandonment of pups. Areas of importance to marine mammals for hauling out or pupping need to be identified by regulations which will minimize disturbance by humans.

* The Marine Mammal Protection Act of 1972 established a moratorium on all consumptive use of marine mammals except for traditional uses by Alaskan Natives. It also removed management authority for marine mammals from the State of Alaska. The Act in effect eliminated some rational, beneficial human uses of marine mammals. Marine mammals have the capability to support significant, beneficial, sustained use. All species utilized by United States Nationals and managed by the State of Alaska prior to 1972 existed as healthy, productive stocks. In April of 1976 walrus management was returned to the State. This sets an important precedent for the return of other marine mammals to State management. The State should continue to press for return of management authority for those species which it has the capability to manage.

LIST OF MARINE MAMMAL SPECIES IN SOUTHEASTERN ALASKA

	Common Name	Scientific Name
Seals	Elephant Seal	*Mirounga leonina*
	Harbor Seal	*Phoca vitulina*
	Northern Fur Seal	*Callorhinus ursinus*
Whales	Blue Whale	*Balaenoptera musculus*
	Bowhead Whale	*Balaena mysticetus*
	Finback Whale	*Balaenoptera physalus*
	Gray Whale	*Eschrichtius gibbosus*
	Humpback Whale	*Megaptera novaeangliae*
	Killer Whale	*Orcinus orca*
	Minke Whale	*Balaenoptera acutorostrata*
	North Pacific Right Whale	*Eubalaena glacialis*
	Pacific Blackfish (Pacific Pilot Whale)	*Globicephala melaena*
	Sei Whale	*Balaenoptera borealis*
	Sperm Whale	*Physeter catodon*
Porpoises	Dall Porpoise	*Phocoenoides dalli*
	Harbor Porpoise	*Phocoena phocoena*
	Pacific Whitesided Dolphin	*Lagenorhynchus obliquidens*
Other Marine Mammals	Sea Otter	*Enhydra lutris*
	Steller Sea Lion	*Eumetopias jubata*

6A. SOUTHERN ALASKA SEA OTTER MANAGEMENT PLAN

LOCATION

Alaska coastal waters in Game Management Units 1, 2, 3, 4, 5, 6, 7, 14, 15 and 16.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy sea otters.

SECONDARY MANAGEMENT GOAL

To provide an opportunity for the scientific and educational study of sea otters.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Allow and assist the population to repopulate most of its former range.

2. Encourage increased participation in viewing, photographing and enjoying sea otters.

3. Encourage scientific and educational studies of sea otters and their role in marine communities.

4. Protect sea otter populations from adverse effects of resource development activity.

THE SPECIES

Sea otters were once abundant throughout Southeastern Alaska, Prince William Sound, along the outer Kenai Peninsula coast and in lower Cook Inlet. It is not likely that significant numbers occurred in upper Cook Inlet. By 1911 commercial hunting had eliminated sea otters from much of this range. One or more small populations persisted around the outer islands of Prince William Sound. These populations have grown steadily since 1911 and have expanded their range northward along the islands and mainland of both sides of Prince William Sound, eastward toward Yakutat and westward along the Kenai Peninsula. In the mid-1960's a group perhaps from the Barren Islands migrated to the southwestern tip of the Kenai Peninsula and merged with animals migrating from Prince William Sound.

While there were occasional unconfirmed reports of individual animals, no established population occurred in Southeastern Alaska until 1965. Between 1965 and 1969, a total of 402 sea otters were transplanted to several locations between Cape Spencer and Dixon Entrance and ten were released in Yakutat Bay. Sea otters now occupy most areas of former sea otter habitat in the region, but expansion into northern Prince William Sound, along the Gulf of Alaska coast toward Yakutat and into lower Cook Inlet is still occurring. Populations around the outer islands of Price William Sound are probably near carrying capacity; here, there was a marked increase in the incidence of beach-dead juveniles accompanied by

rapid range expansion into adjacent unpopulated habitat in the 1960's. This usually is an indication that food availability has become a limiting factor. Other recently repopulated areas such as Sheep and Gravina Bays may support densities well above carrying capacity even though nutritionally related mortality appears to remain low. Sea otter numbers east of the Copper River, in parts of northern Prince William Sound and in lower Cook Inlet remain below carrying capacity. The populations should reach aboriginal levels in all areas of Prince William Sound and around the outer Kenai Peninsula in the next few years. Repopulation of the area east of Kayak Island and lower Cook Inlet will take somewhat longer and this population should continue to expand eastward into Game Management Unit 5 and perhaps to the Alaska Peninsula. Present estimates of sea otter numbers are 4,000 to 6,000 in Prince William Sound and 1,500 to 2,000 along the Kenai Peninsula.

At the present time, an estimated 600 to 800 sea otters inhabit the Alexander Archipelago. Established and rapidly growing populations exist at Yakobi Island, Khaz Bay, Coronation Island and the Maurelle Islands. Smaller concentrations of uncertain status have been located in the Necker and Barrier Islands. Scattered individuals are reported from other areas. Little is known about the status of sea otters in Game Management Unit 5 but small numbers are occasionally seen at several locations between Icy Bay and Dry Bay.

Present sea otter populations in Southeastern appear far below carrying capacity and the observed pup-adult ratios and rates of population increase indicate that high productivity and low mortality. Barring any unexpected mortality factors or habitat alteration, the existing population nuclei should increase rapidly and expand their range into most areas of former sea otter habitat.

After 1911 federal laws prohibited the taking of sea otters except by Eskimos, Indians and Aleuts using aboriginal methods and means. In 1959 management authority passed to the State and all public harvest was prohibited. The Marine Mammal Protection Act of 1972 returned management authority to the federal government and removed all restrictions on the taking of marine mammals by natives. Throughout this period the only recorded take of sea otters has been 184 removed from the vicinity of Hinchinbrook and Montague Islands during transplants. A few were taken for scientific purposes and some were shot illegally. Legal native take, accidental entanglement in fishing gear, and oil pollution may have removed small numbers from the population. Recently some Alaska Native organizations have discussed the possibility of starting a sea otter hunting industry, but few or none have been taken to date.

By the early 1960's sea otter numbers in Southcentral Alaska had increased to a level where public viewing and photography became a regular use. Opportunities for observation have been steadily increasing as sea otters expand their range and recreational boating increases. Since 1970 Resurrection Bay has provided more opportunity for the general public to view sea otters than any other part of Alaska even though that area contains relatively poor sea otter habitat and supports only modest densities. Kachemak Bay should provide excellent viewing opportunities in a few years and increasing numbers of recreational boaters are traveling to areas of high sea otter densities throughout Prince William Sound and portions of the Kenai Peninsula. While many people travel to this area for other purposes, the opportunity to see sea otters often becomes a significant part of their experience.

The opportunity to view and photograph sea otters in Southeastern has existed since August 1965, but relatively few individuals were able to locate them. By 1970 several populations had grown to the point where it was always possible to find moderate numbers. The Department began publicizing the locations of concentrations and requested sightings

from the public. In recent years, public interest has increased and a few people now travel by boat to the area specifically to view and photograph sea otters. This use should steadily increase as the populations expand their range into more accessible areas.

Limited scientific studies on the impact of sea otter predation on invertebrate populations have been conducted. The precise knowledge of the history of sea otter populations creates an ideal opportunity to monitor changes in the marine community as sea otters enter the system.

PROBLEMS

* Activities associated with oil and gas exploration, extraction, transportation, refinement and other industrial activities may result in direct mortality of sea otters or alter sea otter habitat. Many of these activities will be concentrated in areas of greatest public access to sea otter habitat while others will occur near areas supporting the highest sea otter densities. Nucleus populations in Southeastern Alaska are particularly vulnerable. The Department should identify areas of critical sea otter habitat and areas of high recreational opportunity and should encourage studies of the habitat requirements of sea otters and elements in their food chain. The Department should encourage regulation of industrial activities to minimize impacts on sea otters and on sea otter viewing opportunities.

* Public access to sea otter concentrations is limited. Most viewing activities will be concentrated in areas of low sea otter density near communities. The Department should promote public awareness of sea otter viewing opportunities in more remote areas.

* The Marine Mammal Protection Act of 1972 permits Eskimos, Indians and Aleuts to harvest marine mammals without restriction on numbers or season of take. Native corporations have considered starting a sea otter hunting industry. The Act does not permit the federal government to restrict Native take but would permit the Alaska Board of Game to pass such restrictions if management authority were returned to the State of Alaska. The Department should continue to press for return of sea otter management authority and reinstate regulations controlling the take of sea otters by all individuals.

* Sea otters are capable of altering the abundance and age structure of certain commercially valuable invertebrates. This may lead to competition with man for a limited resource. If such conflicts occur, the Department should encourage studies of the total impact of sea otters and should present several management options and the consequences of each option to the public.

IMPACTS

* The population should continue to expand until all areas of former sea otter habitat support aboriginal densities. Juvenile mortality will increase and some animals will emigrate to other regions as food becomes limiting.

* Viewing and photography opportunities should increase as areas nearer population centers are repopulated.

* Predation by sea otters should alter the numbers and age structure of some species of invertebrates, particularly sea urchins and mollusks. There may be an increase in size of kelp beds as invertebrate grazers are removed.

7A. SOUTHERN ALASKA HARBOR SEAL MANAGEMENT PLAN

LOCATION

Alaska coastal waters in Game Management Units 1-10 and 14-17 except Glacier Bay and Katmai National Monuments, and the Juneau, Resurrection Bay, Kachemak Bay and Iliamna Lake Harbor Seal Management Plan areas.

PRIMARY MANAGEMENT GOAL

To provide for an optimum harvest of harbor seals.

SECONDARY MANAGEMENT GOALS

To provide the greatest opportunity to participate in hunting harbor seals.

To provide an opportunity to view, photograph and enjoy harbor seals.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Allow harvesting for recreational and commercial purposes.
2. Commercial hunting may be regulated through time and space zoning to minimize conflicts with other uses.
3. Maintain the harbor seal population at an optimum level.
4. Encourage public participation in viewing and photographing harbor seals.
5. Protect harbor seals from adverse effects of resource development, except where severe conflicts with fisheries warrant manipulation of seal numbers in local areas.

THE SPECIES

Land breeding harbor seals are common along the entire coast from Dixon Entrance to the southern Bering Sea. During periods when seasonal pack ice occurs in the southern Bering Sea they intermingle with ice breeding harbor seals but are genetically isolated by differences in breeding season.

Along rocky coasts seals tend to be scattered, although up to 300 might be seen hauled out in certain prime areas. Larger concentrations frequently occur in glacial fjords, estuaries or near extensive shallow areas where thousands may haul out on glacial ice or sandy beaches at one time. Examples of such haul-out areas are Icy Bay, Glacier Bay, the Copper River, Tugidak Island, Port Moller and Port Heiden. Seals frequently ascend major rivers where seasonal concentrations of food species occur.

It is difficult to accurately assess seal numbers since an unknown and highly variable percentage of the population is in the water at any given time. A conservative estimate based on aerial surveys and harvest records is 270,000 in Alaskan waters. The population as a whole appears to have been near carrying capacity for many years, and no major population changes have been documented. However, densities have been reduced by man in a few areas. An extensive predator control program greatly

reduced seal numbers in the Copper River in the 1950's. Commercial harvesting in the mid 1960's reduced densities in portions of Southeastern and Southcentral Alaska, Kodiak Island and Bristol Bay. When hunting pressure diminished in the late 1960's seal numbers increased and are again near carrying capacity in most areas.

There is no documented evidence that human activities are influencing seal numbers at the present time, although limited effects may occur near towns or areas of concentrated industrial activity. Increasing fishing pressure on bottom fish, projected Outer Continental Shelf oil and gas development and other industrial activities increase the potential for significant impacts on seal numbers in the future.

Seals have always been used by coastal residents for domestic purposes including clothing and food. Some were taken in conjunction with fisheries conflicts and a bounty was paid for seal scalps for many years. Small numbers were used for commercial garments and souvenirs and for trap bait. In 1963 Alaskan seal skins entered the European fur market. High prices were paid for raw seal skins, stimulating a great deal of interest in harvesting the animals. The estimated yearly harvest in Alaskan waters climbed from about 6,000 to 10,000 harbor seals prior to 1963, to over 50,000 seals in 1965. The market price of seal hides then dropped, resulting in a significant decline in hunting pressure. The seal harvest in 1966 dropped to 25,000-30,000 and continued to decline each year thereafter. By the late 1960's the annual harvest in the area was 8,000 to 12,000 seals. Pelt prices again rose to a relatively high level in the early 1970's, but this failed to stimulate a significant increase in harvest. This may have been due to the fact that many potential commercial seal hunters had learned that successful commercial seal hunting requires skill, effort and in some cases a significant cash outlay.

After 1966 hunting pressure was considerably below what the population could support. No significant harvest occurred over vast areas of southern Alaska. Heavy hunting pressure, primarily directed at pups, was limited to a few areas of high seal density. The harvest was controlled by manipulating seasons and, when necessary, closing areas by field announcement.

The Marine Mammal Protection Act of 1972 (MMPA) effectively terminated commercial hunting. While Eskimos, Indians and Aleuts were allowed to harvest seals without restriction on numbers or season, they could not sell them to fur dealers. Nonnatives were prohibited from taking seals for any purpose. The initial effect of the MMPA was to reduce the harvest of seals to a very low level. Several native groups have discussed organizing a seal harvesting industry. This creates the potential for a greatly increased harvest and perhaps overharvest in some areas.

Viewing and photography of seals has increased in recent years. Seal behavior is such that few individuals deliberately seek this species for observation relative to some other marine mammals; however, the presence of undisturbed seals contributes significantly to the enjoyment of many individuals engaged in other pursuits. Seals have become accustomed to humans in Glacier Bay National Monument and are readily observed and photographed there.

PROBLEMS

* Activities associated with oil and gas exploration, extraction, transportation, refinement and other industrial activities may result in direct mortality of seals or alter seal habitat. Refined and crude petroleum, heavy metal and pesticide pollution may kill seals directly, particularly pups. Additionally it may cause reproductive failure or affect seals indirectly through the food chain. Excessive disturbance can cause abandonment of hauling

areas. Several scheduled Outer Continental Shelf oil and gas lease areas are situated near major seal hauling and feeding areas. The Department should identify areas of critical seal habitat and areas of high recreational opportunity and should encourage studies of the habitat requirements of seals and elements in their food chain. The Department should request regulation of industrial activities to minimize impacts on seals.

* Foreign fishing fleets may compete with seals for certain fish stocks. Excessive fishing may lower seal carrying capacity. The Department should encourage population studies of major seal food species and request that those stocks be managed to maintain the seal population.

* Seals are vulnerable to overharvest in localized areas. Harvesting activities can disrupt certain seal activities causing higher mortality or interfering with viewing and photography opportunities. The Department should regulate harvesting activities through time and space zoning to minimize adverse impacts on seals and on viewing and photography opportunities.

* Public access to seal concentrations is limited. Most viewing activities will be concentrated in areas of low seal density near towns connected to the road systems. The Department should promote public awareness of seal viewing opportunities in more remote areas.

* The Marine Mammal Protection Act of 1972 permits Eskimos, Indians and Aleuts to harvest marine mammals without restriction on numbers or season or take. The Act does not permit the federal government to restrict native take but would permit the Alaska Board of Game to pass such restrictions if management authority were returned to the State of Alaska. The Act also restricts commercial uses by all individuals, which results in loss of revenue and inefficient use of harvested animals. The Act has made it impossible to effectively resolve fisheries conflicts. The Department should continue to press for return of seal management authority and reinstate regulations controlling the take of seals by all individuals.

* Conflicts with domestic fishing activities may develop in localized areas when seals damage fishing gear or fish caught in the gear. The Department may allow intensive harvesting of seals in specific areas where significant conflicts have been clearly demonstrated.

IMPACTS

* An industry associated with the harvest of seals, processing of hides, and manufacture and sale of seal skin products would be reestablished, providing income to a substantial number of individuals. Waste of commercially valuable parts of seals would be reduced.

* Portions of the seal population could be reduced to a level somewhat below carrying capacity. This could result in increased productivity and survival of young.

* Individuals of all races would be able to harvest seals for recreation and personal use.

* Localized conflicts with fisheries could be minimized without wasting a valuable resource or endangering the population.

* The potential for excessive unregulated harvest would be removed.

* Viewing and photographic opportunities would be preserved.

7B. ALASKA SEA LION MANAGEMENT PLAN

LOCATION

Alaska coastal waters in Game Management Units 1-10, 15, 18, and 22 except Glacier Bay and Katmai National Monuments, and the Juneau, Resurrection Bay, and Chiniak Bay Sea Lion Management Plan areas.

PRIMARY MANAGEMENT GOAL

To provide for an optimum harvest of sea lions.

SECONDARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy sea lions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Allow a harvest of sea lions for commercial and domestic purposes.
2. Maintain the sea lion population at an optimum level.
3. Higher harvest may be allowed in localized areas in response to specific conflicts with fisheries.
4. Commercial harvest may be regulated through time and space zoning to minimize conflicts with viewing and photography.
5. Protect sea lions from adverse effects of resource development activity.

THE SPECIES

The Alaska population of Steller or northern sea lions is estimated to exceed 200,000. Approximately 10,000 occur in the Southeastern Region, 19,000 in the Southcentral Region, and 185,000 in the Southwestern Region. An unknown number range into the seasonal pack ice of the Bering Sea. These estimates are based primarily on counts of animals on hauling grounds and rookeries. A large part of the sea lion population is hauled out at any given time although many may be at sea. Reproductively active animals concentrate at rookeries in summer for pupping and breeding. These rookeries are usually large, often containing over 10,000 animals, and tend to be on remote islands exposed to the open sea. Limited pupping and breeding activity occurs at some hauling areas. Hauling areas are primarily used by reproductively inactive animals in summer and by all animals in winter.

Use of rookeries and hauling areas varies seasonally. Some, particularly those in more protected waters, may be used only in winter, others are used all year, although the numbers of sea lions hauling out may vary seasonally. Some areas may be used only rarely, perhaps only when food species concentrate in the vicinity. Significant shifts in concentrations of animals in the water also occur. These movements are poorly understood but probably are related to the distribution of food species. Movement between areas appears common.

Shifts between areas may give the appearance of overall population changes, however surveys over the last 20 years indicate no major change in population size or in distribution of sea lions other than an increase in numbers on the high seas associated with foreign fishing fleets. The population appears to be near carrying capacity in all parts of its range. Natural mortality, particularly of pups and subadults, appears to be the main population regulatory mechanism although lowered productivity

has been suggested. Harvest of pups may have exerted a slight influence on sea lion numbers in localized areas of the Kodiak Archipelago between 1963 and 1972, but no change has been observed.

No known habitat changes significant to sea lions have occurred. The present population probably exceeds the level at the time white man arrived, since historical evidence indicated that aboriginal hunting maintained the sea lion population at a reduced level.

At present the influence of human activites is probably minor. However, projected increases in activities related to the oil, logging and other industries, projected growth of coastal communities, and the current high levels of foreigh fishing for sea lion food species increase the chances that sea lions will be affected in the future.

Sea lion populations in Alaska have been subjected to hunting pressure of varying intensities for many centuries. Remains of sea lions in middens indicate the coastal dwelling natives utilized the resource to a high degree. Historical records indicate that hunting pressure prior to the early 1900's was so intensive that the sea lion populations in much of Alaska were reduced to low levels. Hunting pressure apparently declined sometime after the turn of the 19th century, because natives were no longer dependent upon them for subsistence and white man turned to more economically attractive materials. As a result sea lions greatly increased in numbers.

In more recent times sea lions have been hunted for a variety of reasons. Prior to passage of the Marine Mammal Protection Act of 1972 (MMPA) fishermen annually killed an unknown but relatively small number of sea lions in the course of domestic commercial fishing operations. A small number (probably less than 100) were taken for crab or shrimp bait. In 1959 a total of 630 were taken from several areas of Game Management Units 8 and 9 in a study of potential commercial uses of sea lions. Between 1963 and 1972 harvests of pups for pelts were conducted at several rookeries in Game Management Units 8, 9 and 10. The total harvest included 14,180 from Marmot Island; 16,753 from Sugarloaf Island; 8,632 from Akutan Island; 638 from Atkins Island; 574 from Round Island; 3,773 from Ugamak Island and 628 from Jude Island.

The MMPA removed all restrictions on harvest of marine mammals by Eskimos, Indians and Aleuts but prohibited all others from taking them. This effectively stopped the commercial harvest, however, an undetermined number have been taken either legally or illegally in the course of domestic fishing operations. Incidental harvest in conjunction with foreign fishing fleets appears to have increased in recent years. Some estimates place the annual take at over 10,000. Permits were issued for the taking of a few hundred sea lions for scientific purposes.

Viewing and photography of sea lions has increased in recent years. Recreational boaters and fishermen often visit hauling areas near coastal communities and a small number of tourists and professional photographers travel to more remote rookeries each year. A few individuals derive a portion of their annual income guiding and transporting photographers seeking sea lion.

Experience prior to 1972 demonstrated that commercial harvest and viewing of sea lions can be compatible if properly regulated.

PROBLEMS

* Activities associated with oil and gas exploration, extraction, transportation, refinement and other industrial activities may alter sea lion habitat or result in direct mortality of sea lions, especially small pups. Refined and crude petroleum, heavy metal and pesticide pollution may kill sea lions directly, particularly pups. Additionally it may cause reproductive failure or affect sea lions indirectly through the food chain. Excessive disturbance can

cause abandonment of rookeries and hauling areas. Several scheduled Outer Continental Shelf oil and gas lease areas are situated near major rookeries and hauling areas. The Department should identify areas of critical sea lion habitat, and should encourage studies of the habitat requirements of sea lions and elements in their food chain. The Department should request regulation of industrial activities to minimize impacts on sea lions.

* Foreign fishing fleets may compete with sea lions for certain fish stocks. Excessive fishing may lower sea lion carrying capacity. The Department should encourage population studies of major sea lion food species and request that these stocks be managed to maintain the sea lion population.

* Sea lions are vulnerable to overharvest in localized areas. Harvesting activities can disrupt certain sea lion activities causing higher mortality or interfering with viewing and photography opportunities. The Department should regulate harvesting activities through time and space zoning to minimize adverse impacts on sea lions and on viewing and photography opportunities.

* Public access to sea lion concentrations is limited. Most viewing activities will be concentrated in areas of lower sea lion density near towns connected to the road system. The Department should promote public awareness of sea lion viewing opportunities in more remote areas.

* The Marine Mammal Protection Act of 1972 permits Eskimos, Indians and Aleuts to harvest marine mammals without restriction on numbers or season of take. The Act does not permit the federal government to restrict native take but would permit the Alaska Board of Game to pass such restrictions if management authority were returned to the State of Alaska. The Act also restricts commercial uses by all individuals, which results in loss of revenue and inefficient use of harvested animals. It has made it impossible to effectively resolve fisheries conflicts. The Department should continue to press for return of sea lion management authority and reinstate regulations controlling the take of sea lions by all individuals.

* Conflicts with domestic fishing activities may develop in localized areas when sea lions damage fishing gear or fish caught in the gear. The Department may allow liberal harvesting of sea lions in specific areas where significant conflicts have been clearly demonstrated.

* Disturbance can cause abandonment of hauling areas by sea lions. This could be particularly important around rookeries during the pupping and breeding seasons. Human visitation or activities on or near rookeries should be controlled to minimize disturbance during critical periods.

IMPACTS

* If sufficient interest in commercial harvest of sea lions develops, portions of the sea lion population could be reduced to a level somewhat below carrying capacity. This could result in increased productivity and survival of young.

* Establishment of a sea lion harvesting industry will create economic opportunities for coastal residents.

* Localized conflicts with fisheries can be minimized without wasting a valuable resource or endangering the sea lion population.

* Sea lion viewing opportunities will be preserved.

12A. JUNEAU HARBOR SEAL MANAGEMENT PLAN

LOCATION

In Game Management Unit 1C, that area bounded by a line starting at Point Bridget and then extending southeasterly along the mainland shore to Point Salisbury, thence to Point Tantallon on Douglas Island, thence along the Gastineau Channel and Fritz Cove shores of Douglas Island to Outer Point, thence to the southeast Shelter Island light, thence along the east shore of Shelter Island to its northernmost point, thence to the point of beginning at Point Bridget.

MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy seals.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Prohibit hunting for seals in the Juneau Area.

2. Encourage consideration of the food requirements of seals in fisheries management in the Juneau Area.

3. Discourage human activity that might cause the abandonment of seal hauling and feeding areas within the Juneau Area.

THE SPECIES

No quantitative data are available on seal use of the Juneau area. However, seals are common throughout much of the area and regularly haul out in several locations including islets and rocks frequented by recreational boaters. Information from nearby areas indicates that seal densities were reduced in the mid 1960's by hunting but have since recovered and stablized near carrying capacity. While no data are available to indicate that human activities are influencing seals in the Juneau area it is likely that human activities have reduced carrying capacity of at least part of the area.

No harvest data specific to the Juneau area are available. The close proximity to a major population center suggests that a fairly heavy harvest for sport, hides, food, and in response to fisheries conflicts occurred prior to passage of the Marine Mammal Protection Act of 1972. It is unlikely that any concentrated commercial hunting effort occurred within the area although the statewide harbor seal population was subjected to intensive commercial hunting in the mid 1960's. The most intensive use of seals in the area has probably been viewing, particularly around Auke Bay and Douglas Island.

PROBLEMS

* Foreign and domestic fishing fleets may compete with seals for certain fish stocks. Excessive fishing may lower seal carrying capacity. The Department should encourage population studies of major seal food species and request that these stocks be managed to maintain the seal population.

* The Marine Mammal Protection Act of 1972 permits Eskimos, Indians and Aleuts to harvest marine mammals without restriction on numbers or season of take. The Act does not permit the federal government to restrict native take but would permit the Alaska Board of Game

to pass such restrictions if management authority were returned to the State of Alaska. The Department should continue to press for return of seal management authority and reinstate regulations controlling the take of seals by all individuals.

IMPACTS

* The proposed management would have no significant impact on the seal population or on the allowable harvest of seals outside of the Juneau area.

* Viewing and photographic opportunities should remain similar to those in the past, unless disturbance or habitat changes beyond the Department's control take place.

12B. JUNEAU SEA LION MANAGEMENT PLAN

LOCATION

In Game Management Unit 1C that area bounded by a line starting at Point Bridget and then extending southeasterly along the mainland shore to Point Salisbury, thence to Point Tantallon on Douglas Island, thence along the Gastineau Channel and Fritz Cove shores of Douglas Island to Outer Point, thence to the southeast Shelter Island light, thence along the east shore of Shelter Island to its northernmost point, thence to the point of beginning at Point Bridget.

MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy sea lions.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Prohibit hunting for sea lions in the Juneau area.

2. Encourage consideration of the food requirements of sea lion in fisheries management in the Juneau area.

3. Discourage human activity that might cause abandonment of the Benjamin Island hauling area.

THE SPECIES

Several hundred sea lions occur in the waters of this area seasonally and use Benjamin Island as a haulout. Few data are available on the numbers in the area at different seasons or on the reasons for changes in abundance. Food availability, particularly the occurance of large schools of herring may be a governing factor.

No data are available on population changes or condition of the habitat within the closed area. High human densities create the potential of adverse impacts through disturbance or reduction of food species. Such influence could reduce sea lion use of the area without any significant effect on the sea lion population as a whole. Conversely impacts on the population in other areas could influence sea lion use of the Juneau area.

No information is available on harvest of sea lions from this area. A few may have been taken for domestic purposes, for bait or animal food, or shot because of real or imagined conflicts with fisheries. No commercial harvest has ever been conducted in the area.

The Juneau area has one of the largest fleets of recreational boats in Alaska. Good access provides greater opportunities for viewing and photographing sea lions than in many areas of much higher sea lion densities. Viewing and photographing sea lions, seals and whales has become a popular recreational activity in the area and the opportunity to see these species contributes to the enjoyment of many people engaged in other activities such as boating and fishing.

PROBLEMS

* Activities associated with logging and wood products or processing manufacturing and other industrial activities may alter sea lion

habitat or result in direct mortality of sea lions, especially small pups. Excessive disturbance can cause abandonment of rookeries and hauling areas. The Department should identify areas of critical sea lion habitat and areas of high recreational opportunity and should encourage studies of the habitat requirements of sea lions and elements in their food chain. The Department should recommend procedures that will minimize the impact of industrial activities on sea lions and on sea lion viewing opportunities.

* The Marine Mammal Protection Act of 1972 permits Eskimos, Indians and Aleuts to harvest marine mammals without restriction on numbers or season of take. The Act does not permit the federal government to restrict native take but would permit the Alaska Board of Game to pass such restrictions if management authority were returned to the State of Alaska. The Department should continue to press for return of sea lion management authority and reinstate regulations controlling the take of sea lions by all individuals.

* Disturbance can cause abandonment of hauling areas by sea lions. This could be particularly important around rookeries during the pupping and breeding seasons. Human visitation or activities on or near rookeries should be controlled to minimize disturbance during critical periods.

IMPACTS

* The proposed management would have no significant impact on the sea lion population as a whole or on the allowable harvest of sea lions outside the area.

* Viewing and photographic opportunities should remain similar to those in the past, unless disturbance or habitat changes beyond the Department's control take place.

LAND AND SHORE BIRDS

Alaska, despite its large size, has a comparitively limited variety of birds as a result of the rather uniform character of the habitats occurring in the state. Only 325 species have been recognized as occurring in Alaska. About half of the total are waterbirds, a relatively high proportion in comparison to most other states and indicative of the extent and importance of marine and freshwater habitats. About 170 species are landbirds, roughly divisible into groups inhabiting tundra, interior forest and coastal forest habitats. Less than one-fourth of the species occurring in Alaska are permanent residents of the state. The majority of species are new-world forms which migrate to Alaska to breed. In addition a few old-world species breed in Alaska and about a dozen species migrate to or through, but do not breed in, the state.

Birdlife in Southeastern Alaska is diverse due to a variety of habitats available in the spruce-hemlock and alpine forests of the northern Pacific coast. Habitat variety is enhanced by the proximity of inshore and offshore waters and by the presence of a major mountain system. Upland passerine species common to the spruce-hemlock and associated shrub habitat include corvids, robins and thrushes, kinglets, warblers, siskins, juncos and sparrows. Typical alpine tundra breeders are savannah sparrows, lapland longspurs and water pipits. Coastal tidelands, bogs and marshes and numerous lakes and streams support herons, grebes, loons, kingfishers and swallows. Plovers, sandpipers, phalaropes and a variety of other shorebirds occupy the freshwater marshes, marine beaches and tidal flats. Though most species migrate south in fall, tens of thousands of shorebirds persist through the winter frequenting the rocky shores of the tidal areas. Several species of passerines frequent upland areas in winter, but some, most notably pine siskins, crossbills and redpolls, vary greatly in abundance from year to year. Permanent year-round residents include ravens, gray and Stellar's jays, crossbills, chickadees, juncos, gray-crowned rosy finches, pine grosbeaks, dippers and woodpeckers.

Besides those species which breed or reside there, Southeastern Alaska is visited annually by great numbers of migrants. The northward spring migration is most striking, resulting in the concentration of millions of birds along the north Pacific coast. Concentrations are enhanced because the migration period is telescoped in northern latitudes, with most birds passing through in five weeks or less. Many thousands of waterbirds frequent the Southeastern coastal waters as an extension of the Pacific Coast Flyway enroute to or returning from coastal or Arctic breeding grounds.

The major human uses of nongame birds are nonconsumptive. Birdwatching is a popular recreational activity enjoyed by thousands of Alaskans. Observation and photography of birds occurs primarily along roads and trails and near major communities. Travelers on the marine highway system or on sea tours cruising the Southeastern Alaska coast have excellent opportunities to view many of the species associated with the coastal environment. In addition to direct use, many outdoor activities are enriched by the sight and song of birds. Scientific study of birds has provided much fascinating and valuable information on animal migrations, ecological relationships and evolutionary mechanisms.

SEABIRDS

Documented information on seabirds in Southeastern Alaska is scarce. Nesting colonies have been identified on Willoughby, Marble, Drake, St.

Lazaria, Hazy, and Forrester Islands. Forrester Island has a nesting population of 350,000 birds including petrels, cormorants, murres, murrelets, guillemots, auklets, puffins, and gulls. Other known rookeries range in size from less than 1000 to 20,000 birds and each contains several of the above species. Additional seabird colonies on the western side of the Alexander Archipelago and up the coast to Icy Cape have not been surveyed. Leach's petrels are the most common known breeders, followed by horned puffins, common murres, ancient murrelets and rhinocerous auklets.

Some alcids, cormorants and many gulls winter in sheltered inside waters and on Continental Shelf waters. Birds that winter on off-shore waters include fulmars, petrels, murres, guillemots, puffins, murrelets, and auklets. Winter pelagic bird numbers are considerably lower than summer. Seabird numbers traditionally fluctuate. No data is available to indicate population trends of most seabirds in Southeastern Alaska; however, gull numbers appear to be increasing. During spring and fall migrations, millions of seabirds pass by Southeastern Alaska. Chief migrants are short-tailed and sooty shearwaters whose summer populations in the subarctic north Pacific approximate 50 million birds.

Nesting habits and habitat vary with species. Common murres and cormorants nest in colonies on steep rocky cliffs. Auklets, puffins, and storm petrels make nesting burrows in steep banks or hillsides. Guillemots and murrelets lay eggs in crevices and crannys among loose boulders, or in relatively open rocky situations close to shore. Gulls utilize a variety of nest sites including steep cliffs, and flat, open areas.

Most seabirds rely on the ocean for sustenance. In some instances seabirds compete directly with man for the fisheries resource. Some, such as scavenging gulls and fulmars, benefit from fisheries waste products. Seabirds are a dynamic part of marine food systems. Hundreds of thousands of tons of biological material are cycled through seabirds each year. Some of the smaller seabird species such as auklets or murrelets are important prey for the peregrine falcon which is often associated with seabird colonies. Many species fall prey to land based predators such as foxes and mustelids. Gulls are scavengers as well as predators on eggs and young of other marine birds, and are found in conjunction with most seabird colonies. Cassin's auklets consume a soupy mixture of macroplanktonic euphasids and fish larvae. Pigeon guillemots prefer large blennies. Murres, murrelets, puffins and rhinocerous auklets all feed on small fish such as anchovy, sandlance, smelt, sea-bass, etc. Pigeon guillemots and marbled murrelets fish within a few hundred meters of shore, followed seaward by common murres, tufted puffins, rhinocerous auklets, and Cassin's auklet. Birds that feed farthest out at sea tend to be burrow nesters that return to their nest at twilight or after dark. Storm petrels are burrow nesters and nocturnal feeders on plankton, crustaceans and small fish.

Human consumptive use of seabirds has been minimal in Southeastern Alaska. Nonconsumptive use in the form of viewing and photography is increasing. Some of the known pelagic bird colonies in the region are administered as refuges by the U.S. Fish and Wildlife Service. Visitor access to refuges is not limited, but the areas must be maintained in an undisturbed state.

Access to as yet uncatalogued colonies on the Gulf of Alaska side of the Alexander Archipelago is restricted by weather and hazardous sea conditions. Use of these colonies will probably remain minimal. Ultimately seabirds may provide valuable data as biological indicators of marine habitat degradation.

RAPTORS

Raptors* which occur in Southeastern Alaska include bald and golden eagles, osprey, red-tailed, and rough-legged hawks, marsh hawk, goshawk, and sharp-shinned hawk, peregrine falcon, merlin, and kestrel, and the great-horned, great-grey, snowy, hawk, boreal, pygmy, saw-whet, screech, long-eared and short-eared owls. With the exception of eagles and goshawks the diurnal birds of prey are only summer residents of the region. With two exceptions, owls are Southeastern residents throughout the year. The snowy owl infrequently winters in the region, while the short-eared owl is a summer resident. The long-eared owl only occurs as a rare visitor to this region. Migration times vary among species and seasonal weather patterns, but summer residents generally arrive in early April and leave during September or October.

Resident raptor populations appear to be at moderate densities, although marked fluctuations in abundance occur over time. These variations are thought to occur in response to changes in prey abundance. Although comparative data from earlier periods are not available, general observations suggest that, except for the peregrine falcon, migratory species occurring in Southeastern Alaska are currently at moderate levels of abundance.

Breeding populations of bald eagles and ospreys, endangered or threatened in eastern and southern North America, do not appear reduced in Southeastern Alaska at this time. The abundance of two subspecies of peregrine falcon has declined in much of its Alaska range over the last 20 years. This decline has coincided with the documented declines of peregrine falcons throughout the world and is thought to be primarily the result of chemical contamination. Because of marked declines in other portions of the continent, any habitat supporting a breeding population is critical.

All habitat types in the region are utilized by raptors during the breeding season. Raptors range widely in hunting activity, using a combination of vegetation types as foraging habitat during the nesting season. Nevertheless, the various species display marked preferences for particular types of nest sites. Ospreys and bald eagles select lowland old growth forests along rivers or lakes and along coastal waters as nesting habitat. Golden eagles, and rough-legged hawks prefer to nest on cliffs. The other buteos, the accipiters, merlins, kestrels and owls (with the exception of the short-eared owl), are principally tree-nesters, and are found throughout Southeastern forests. The peregrine falcon nests on cliffs typically in the vicinity of seabird colonies. The marsh hawk and short-eared owl are the only consistent ground-nesters in the Southeastern Region. Both of these species select open areas for nesting. Resident raptors range widely over all major habitat types during the winter in search of food.

The habitat changes that have occured to date in Southeastern Alaska apparently have not significantly influenced raptor abundance. Raptors do not have high reproductive potentials and, like other predators, exist at relatively low densities. Given adequate nesting conditions, raptor abundance depends primarily on the abundance and condition of the prey populations. The diet of raptors as a group in Southeastern Alaska varies seasonally and encompasses a wide array of species including birds, mammals, fish and insects. Not only are the abundance and distribution of these prey species important, but diseases or harmful residues carried by these species are of prime concern. Many of the common diseases carried by domestic fowl and by wild gallinaceous birds are known to be transmittable to raptors. Residues from pesticides have been cited as the primary factor responsible for declines in peregrine falcon numbers, not only in Alaska, but throughout the world. Because little work has

* A list of raptor species considered in these plans follows this regional account.

population growth in Alaska these uses will increase. Use of raptors f
falconry has not been a common practice in Alaska, although a few indi
do practice the sport. Alaskan peregrine falcons and gyrfalcons have
been taken for use by falconers in other parts of the world; however,
with protection under the Endangered Species Act and the Migratory Bird
Treaty Act, protection or closely controlled utilization of raptors in
Alaska was effected. Currently, use of goshawks is allowed under the
terms of a permit. At least one species of raptor, the snowy owl, is
utilized for domestic consumption by residents of Northwestern and
Arctic Alaska.

PROBLEMS

* Disturbances at nest sites during critical stages of the nesting season such as egg laying, incubation and early brooding stages, have probably been the major cause of direct, human induced reprodu failure. In view of increased human activity throughout the sta te. critical habitat, particularly that associated with nesting raptors, must be preserved if raptor populations are to be maintained in the future. Identification of important raptor habitats and quantita tiv population information are required for meaningful management decisions. Multi-agency collaboration would be the most effective approach.

* Of special concern is the accumulation of pesticide residues in raptors and their prey. Although pesticides are used to a very limited extent in Alaska, raptors are subjected to contamination from contaminated prey that migrates into Alaska and from contamina te prey consumed in southern wintering areas. Over a period of time these residues concentrate within raptor tissues and eventually reach levels sufficient to reduce reproductive success. Decrease in eggshell thickness, a symptom of such contamination, has been documented for peregrine falcons nesting in Arctic Alaska. National and international efforts to reduce environmental burdens of implica te chemical contaminants must be encouraged.

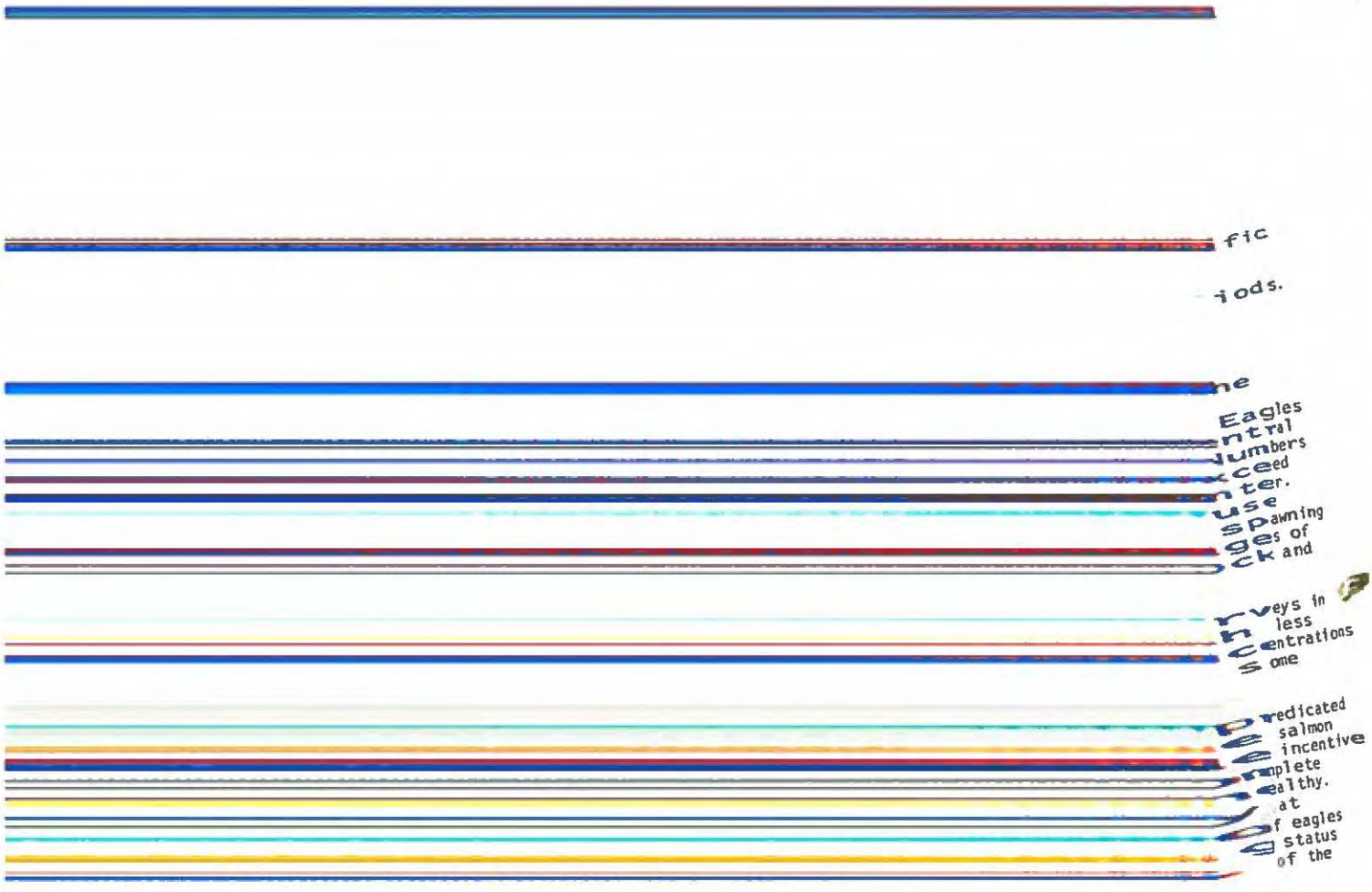
* Indiscriminate shooting of raptors occurs near human population centers. Public attitudes toward raptors must be improved by increasing public awareness of the value of raptors.

IMPACTS

* Increased interest in raptors by nonconsumptive users may necessitate strict controls governing the season, duration and types of activities during periods of use. This may be especially true when photography or viewing of nesting raptors is involved.

* Falconry will continue to be allowed on selected species under provisions of a closely controlled permit program. The delineation or management of critical habitat for raptors may alter managment of other wildlife species and restrict or inhibit resource development in selected areas.

* Critical nesting habitat will be protected through specific land classification procedures.



population growth in Alaska these uses will increase. Use of raptors for falconry has not been a common practice in Alaska, although a few individuals do practice the sport. Alaskan peregrine falcons and gyrfalcons have been taken for use by falconers in other parts of the world; however, with protection under the Endangered Species Act and the Migratory Bird Treaty Act, protection or closely controlled utilization of raptors in Alaska was effected. Currently, use of goshawks is allowed under the terms of a permit. At least one species of raptor, the snowy owl, is utilized for domestic consumption by residents of Northwestern and Arctic Alaska.

PROBLEMS

* Disturbances at nest sites during critical stages of the nesting season such as egg laying, incubation and early brooding stages, have probably been the major cause of direct, human induced reproductive failure. In view of increased human activity throughout the state, critical habitat, particularly that associated with nesting raptors, must be preserved if raptor populations are to be maintained in the future. Identification of important raptor habitats and quantitative population information are required for meaningful management decisions. Multi-agency collaboration would be the most effective approach.

* Of special concern is the accumulation of pesticide residues in raptors and their prey. Although pesticides are used to a very limited extent in Alaska, raptors are subjected to contamination from contaminated prey that migrates into Alaska and from contaminated prey consumed in southern wintering areas. Over a period of time these residues concentrate within raptor tissues and eventually reach levels sufficient to reduce reproductive success. Decrease in eggshell thickness, a symptom of such contamination, has been documented for peregrine falcons nesting in Arctic Alaska. National and international efforts to reduce environmental burdens of implicated chemical contaminants must be encouraged.

* Indiscriminate shooting of raptors occurs near human population centers. Public attitudes toward raptors must be improved by increasing public awareness of the value of raptors.

IMPACTS

* Increased interest in raptors by nonconsumptive users may necessitate strict controls governing the season, duration and types of activities during periods of use. This may be especially true when photography or viewing of nesting raptors is involved.

* Falconry will continue to be allowed on selected species under provisions of a closely controlled permit program. The delineation or management of critical habitat for raptors may alter managment of other wildlife species and restrict or inhibit resource development in selected areas.

* Critical nesting habitat will be protected through specific land classification procedures.

1B. ALASKA BALD EAGLE MANAGEMENT PLAN

LOCATION

Entire state of Alaska.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy bald eagles.

SECONDARY MANAGEMENT GOAL

To provide an opportunity for scientific and educational study of bald eagles.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Encourage public awareness of bald eagle ecology.
2. Discourage resource utilization that may adversely impact bald eagle nesting, roosting and feeding areas.
3. Protect bald eagles from unnatural disturbance and harassment.
4. Identify areas best suited for viewing, photography and scientific study of eagles and encourage their wise use.
5. Discourage viewing and photography during critical nesting periods.

THE SPECIES

The highly productive coastal zone areas of Southeastern Alaska, the Gulf of Alaska, and the southwestern coast to the Aleutian Islands support the largest populations of bald eagles in North America. Eagles are also found along major inland drainages of Western and Southcentral Alaska, although not in the densities present in coastal areas. Numbers of eagles within the state vary seasonally. Summer populations exceed 50,000 birds, but migrations reduce the total substantially by winter. Spawning cycles of several fish, primarily salmon and herring, cause spectacular concentrations of eagles in some coastal streams and spawning grounds. Noteworthy concentration areas include the lower drainages of the Chilkat and Stikine rivers, and coastal shorelines near Klawock and Craig.

Nesting pairs are distributed throughout the species' range. Surveys in Southeastern Alaska have revealed at least 1,709 eagle nests with less than 50 percent of the habitat surveyed. Additional nesting concentrations occur in Prince William Sound, the Kodiak Archipelago and along some Aleutian Island sea cliff habitat.

In the past, persecution of eagles by commercial fishermen was predicated on the belief that eagles had significant adverse impacts on the salmon fishery. At one time bounties on eagles were offered to provide incentive for their reduction. Since 1953 the bald eagle has received complete protection under law, and populations in Alaska have remained healthy. Nonconsumptive uses include viewing and photography, especially at feeding concentration sites. In addition, scientific studies of eagles in Alaska provide ecological bases of comparison for evaluating status and trends of endangered bald eagle populations in other parts of the country.

PROBLEMS

* With increasing recreational viewing and photography of eagles, greater disturbance and harassment can be expected. Nonconsumptive use that is not detrimental to bald eagles should be encouraged, but at the same time measures should be taken to limit numbers and activities of users during critical nesting periods.

* Pollution of coastal tidelands and estuaries by oil or oil industry-related contaminants poses a critical threat to bald eagles and their habitat. Massive Outer Continental Shelf oil development and tanker traffic in Prince William Sound, Bristol Bay and the Aleutian Islands could devastate coastal habitat in the state if all possible precautions are not taken. Baseline quantitative and qualitative data on coastal bird habitats are needed before oil impacts are made in order to provide rational recommendations for future oil spill cleanup procedures and to document the effects of estuary contamination for mitigation measures. Continued efforts by the State, U.S. Forest Service and U.S. Fish and Wildlife Service will identify and quantify the effects of these potential problems.

* Although bald eagles are protected by law, many are killed by ignorant or misinformed people. The Department should encourage greater public understanding and appreciation of the values of eagles. Strict enforcement of existing protective laws by federal and state agencies should be maintained.

* Logging of forests on private lands, not subject to Forest Service requirements protecting eagle nest trees in national forests, may result in the loss of nesting habitat in some areas. Private logging interests should be encouraged to safeguard eagle nest trees on private lands. The Department should cooperate with federal agencies in identifying existing eagle nest sites.

* Alaskan bald eagles, like other raptors, are susceptible to chemical contamination of the environment. Those eagles which migrate south for the winter are subject to greater contamination than birds resident within Alaska. Although present levels of contaminants are probably low in Alaskan birds, increased use of pesticides or herbicides in the state could have serious detrimental effects on eagles. Future use of such chemicals in Alaska should be closely controlled.

IMPACTS

* Delineation and management of critical eagle habitat areas may restrict resource development activities within such areas.

* Controls on numbers and activities of nonconsumptive users will become necessary to protect eagles in some areas as user numbers increase.

16. ALASKA SEABIRDS MANAGEMENT PLAN

LOCATION

Entire state of Alaska

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy seabirds.

SECONDARY MANAGEMENT GOAL

To provide an opportunity for scientific and educational study of seabirds.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Encourage public viewing and photography of seabirds.
2. Encourage scientific and educational studies of seabird ecology.
3. Discourage resource utilization practices and human activities that adversely impact seabird nesting, roosting and feeding habitat.
4. Develop public awareness of seabird ecology.
5. Protect seabirds from unnatural disturbance and harassment, particularly at colonies during critical nesting periods.
6. Allow utilization of seabirds for traditional domestic use.

THE SPECIES

Over 40 species of seabirds migrate through, breed on, or visit Alaska's coastline and adjacent waters. Approximately 24 species are known to breed in Alaska, usually in colonies ranging from a few hundred to a million or more birds. Most of the large colonies are located on islands in the Bering Sea or in the Aleutian Islands, but sizeable colonies are located wherever precipitous sea cliffs occur along the mainland coast from Cape Lisburne to Southeastern Alaska. The most abundant nesting species are murres, murrelets, gulls, kittiwakes, fulmars, and petrels. Several species of auklets, puffins, and cormorants, though not as numerous as some other species, are widely distributed. Seabird populations in Southwestern and Southcentral Alaska exhibit greater species diversity than those found in the remainder of Alaska because of greater diversity of favorable habitats.

In addition to millions of nesting seabirds, many millions more utilize pelagic waters off Alaska as summer feeding grounds. Of these, slender-billed and sooty shearwaters are the most numerous.

Seabirds migrate south as winter approaches and populations in Alaskan waters become much reduced from those of summer. Many birds, however, overwinter in ice-free waters, and substantial numbers are found in and south of the Aleutian Islands.

Historically, seabirds have provided food and clothing to coastal native people in the state. Traditional use of seabird eggs and adult birds, principally auklets, puffins and murres, has been greatest along the Northwestern and Western Alaska coast. Limited domestic use of seabirds

occurred in Southeastern and Southcentral Alaska. Consumptive utilization has decreased in the past 10 to 20 years as coastal residents have adopted a cash economy.

Nonconsumptive use is now becoming the dominant use of seabirds. As the potential impact of energy resource development on these species has become apparent, scientific surveys of Alaskan seabirds are being conducted throughout the state. Studies of seabird distribution, population sizes, and habitat requirements should increase knowledge about these species. Seabirds may eventually serve as biological indicators of the health of marine environments.

Viewing and photography are becoming major activities at seabird nesting colonies in the more accessible waters of the state. The more conspicuous colonial nesters such as gulls, murres, and kittiwakes support the most use, but less numerous or more secretive species such as puffins, cormorants, auklets, and murrelets are receiving increased attention. Fortunately, many seabird colonies are protected from habitat alteration or undue disturbance by their inclusion in the National Wildlife Refuge System. These areas receive additional protection under the state's refuge and sanctuary system.

PROBLEMS

* Pollution by petroleum related contaminants poses a serious threat to seabirds using Alaska's coastline and marine waters for nesting, feeding or resting. Outer Continental Shelf (OCS) oil development and tanker traffic could result in large oil spills or chronic pollution which would devastate seabird habitat and kill millions of seabirds. Baseline quantitative and qualitative data on coastal seabird habitats and colony location, size and composition are needed to properly interpret population fluctuations and impacts of oil development. These data are necessary to provide rational recommendations for future OCS lease areas, recommendations for future oil spill cleanup facilities and to document the effect of estuary contamination. Stringent controls on oil development and associated human activities will be necessary to minimize environmental hazards.

* Commercial fishing is an unknown factor with potentially adverse consequences for seabirds. Some seabirds prey on commercially-valuable fishery stocks, and conflict and competition between seabirds and commercial fishermen may become intense. Excessive exploitation by foreign fishing fleets may have reduced the range of at least one species (ancient murrelet). Japanese gillnet fisheries have directly caused seabird losses as high as 10,000 birds per day from birds being entangled in nets. Local seabird populations may be unable to sustain such losses indefinitely. The 200-mile foreign fishery limit recently passed by Congress should substantially reduce seabird loss, especially during the breeding season.

* Seabirds are susceptible to disturbances that lead to nest abandonment and nestling or egg loss. Nonconsumptive use of seabirds will continue to increase with a corresponding increase in disturbance. Reduced reproductive success and a decline in colony sizes, especially near urban centers, may result unless measures are taken to protect habitat and to control numbers and activities of human visitors.

* Introduction of furbearers and rats on Alaska islands has resulted in the elimination or serious reduction of seabirds nesting on those islands. Future proposals for introductions of any exotic animals to any islands must be carefully evaluated for possible consequences to indigenous wildlife.

* In some areas, ocean floor mining, coastal dredging, or gravel removal may alter coastline habitat or alter productivity of near shore waters through siltation, adversely affecting seabirds and other marine life. Mining and dredging or gravel removal activities should be regulated to minimize adverse impacts on the marine ecosystem.

IMPACTS

* Some limitations on access, periods of use, and activities of visitors to seabird colonies will be required to reduce disturbance to colonies subject to frequent human visitation.

* Traditional consumptive domestic use will continue but is expected to decrease as lifestyles change.

* Expansion of biological knowledge of seabird species will provide an additional monitoring tool for interpreting man's impact upon the marine environment. Such capabilities may dictate changes in the patterns of use of other resources.

* Increased demands for nonconsumptive use may foster development of interpretive and user transport services.

GLACIER BAY NATIONAL MONUMENT WILDLIFE MANAGEMENT PLAN

LOCATION

Glacier Bay National Monument is located approximately 55 miles northwest of Juneau. The Monument occupies portions of Game Management Units 1C, 1D, and 5.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy wildlife.

SECONDARY MANAGEMENT GOAL

To provide an opportunity for scientific and educational study of wildlife.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Cooperate with the National Park Service in its management of Glacier Bay National Monument according to established National Park Service management objectives including but not limited to:

    * Preserving the wilderness integrity of the Monument by accepting the premise that the waters of Glacier Bay will be its roadways of access and that vehicular roads are destructive and unnecessary in this environment.

    * Phasing out prospecting and mining activity in order to protect important scientific and scenic values.

    * Managing the natural resources of the Monument to ensure the perpetuation of the Monument's wildlife.

    * Educating the visitor regarding the natural and human history of the area including the present spectacular recession of glaciation, total environmental impact, and the comparison of this untampered environment with those altered by man.

    * Promoting day use of the Monument's resources during the months of April through September.

    * Encouraging the utilization of the park resources by schools for environmental teaching areas.

THE SPECIES

Wildlife in the area include brown bears, black bears, (including the "glacier" or blue color phase of the black bear), lynx, wolves, coyotes, wolverines, mountain goats, Sitka deer, moose, hair seals, sea lions, killer and humpback whales and porpoises. The amount of habitat for big game species is limited. Eighty-five percent of the monument now consists of either glaciers or geological features which were left by retreating glaciers.

Large numbers of waterfowl frequent the inlets and islands including geese, cormorants, loons, gulls and terns, murrelets, guillemots, puffins and many ducks. Large flocks of sandhill cranes migrate through the monument in late spring. Shorelands are inhabited by a multitude of birds. Bald eagles, ptarmigan, grouse, crows and ravens are common residents.

Glacier Bay National Monument was established in 1925 by Presidential Proclamation to reserve its scientific and scenic values. Of special interest are accessible tidewater glaciers in a setting of lofty peaks, a variety of ecological stages showing vegetation development related to glacial retreat and opportunities for study of paleoecology and history. Visitors come to Glacier Bay National Monument between May and September. Half of them belong to tour groups sightseeing in Southeastern Alaska; a third are commercial fishermen, prospectors, and researchers; and the rest are local residents and yacht travelers from the "Lower 48." In 1966, there were 4900 visitors. In 1970, 37,000. These numbers will probably grow by at least 10 percent per year in the future.

PROBLEMS

None

IMPACTS

* Management of wildlife within Glacier Bay National Monument is under the jurisdiction of the National Park Service. This plan only recognizes those uses compatible with National Park Service management and suggests no changes from established uses.

been done with migratory raptor species in Alaska other than Peregrines, it is not certain whether toxic chemical residues have affected populations of these species. Findings presently available indicate that residues are not significantly affecting resident populations.

Observation, photography and enrichment of wilderness experiences are recognized by the Department as the primary uses of raptors. However, the taking of a limited number of goshawks and kestrels under a tightly regulated falconry permit system is compatible with nonconsumptive uses. The number of persons interested in raptors for falconry purposes has been low in the past and has included Alaska residents, nonresidents and aliens. There has been a slight increase in interest during the last five years. The number of permits issued in 1974 was less than 30, but the demand for birds to be used for falconry is expected to increase in the future.

SMALL MAMMALS

Small mammal*** populations are found throughout Southeastern Alaska; however, distribution of certain species is disjunct, reflecting the insular nature of much of this region. About 20 species are found including the introduced house mouse and rat, both associated with human habitation. Of the indigenous species, common and dusky shrews, deer mouse, and long-tailed vole are distributed most widely in the region. Four additional species of vole occur in the region but are limited primarily to the mainland. One species, the Coronation Island vole, is found only on several small islands in this area.

The masked, vagrant, water, and Glacier Bay water shrews inhabit portions of the Southeastern Region in varied patterns of distribution. Other small mammals include six species of bats, pikas, and the meadow jumping mouse. Bats and deer mice are found over most of the region while pikas and meadow jumping mice are found only in the northern mainland portions of the region. The northern bog lemming is the only lemming occuring in Southeastern Alaska. Its range includes Admiralty Island and the mainland south of Juneau.

Habitat requirements are as varied as the number of species found in this group. Species such as the pika, which require higher altitude rock and talus slopes, or the northern bog lemming, which is limited to wet tundra and sphagnum bogs, are rather narrow in their habitat requirements. Others such as the common shrew or meadow jumping mouse are adapted to a variety of habitats such as marshy, grassy, or forested areas.

Due to the high reproductive capacity of many of these species, the main factor limiting numbers is the availability of food. The voles and in particular are noted for the rhythmic fluctuations in numbers, generally with 3 to 4 years between peaks.

Small mammals are an extremely important source of food for many terrestrial and avian predators. Most carnivorous furbearers and many raptors utilize rodents as food and when populations of these small mammals are high they form a significiant part of the summer diet of wolves and bears.

PROBLEMS

* Many migratory bird species are exposed to contamination by chemical pollutants, especially insecticides and herbicides. Such compounds may seriously affect populations, either by causing direct mortality

*** A list of small mammal species considered in these plans follows this regional account.

or by lowering reproductive success. Decreased populations of peregrine falcons resulting from chemical residues found outside Alaska are well documented. While other Alaskan raptors, seabirds and other nongame bird species do not currently appear to be seriously affected by chemical residues, migrant species may experience similar declines in the future. Use of pesticides and other potentially harmful compounds is limited in Alaska at this time. Strict measures should be taken to control the future use of such chemicals within the state.

* Catastrophic or chronic pollution by oil industry related contaminants threatens welfare of marine birds in Southeastern Alaska. Danger will be greatest when chicks are fledging in July and August. In particular, oil transport by single hulled tankers from central Alaska to the "south 48" may endanger coastal colonies. Historically, problem pollution from oil in transport has been much greater than pollution from oil platforms or shore based facilities. Baseline data on colonies should be gathered, and surveys of dead or affected birds on beaches should be conducted to provide comparative data for the future assessment of oil impacts.

* Critical nesting habitat must be preserved if raptor populations are to be maintained in the future. Disturbances at nest sites during critical stages of the nesting seasons such as the egg laying, incubation and early brooding phases, have probably been the major cause of direct, human-induced reproductive failure. Therefore, protection of nesting raptor habitat must include the following: 1) physical preservation of the nest sites; 2) preservation of the general nesting areas including feeding habitat; and 3) protection of the nesting areas from excessive human disturbance.

* The extremely high value placed on the endangered peregrine falcon by falconers and collectors around the world creates an incentive for illegal traffic in this bird. Laws and regulations must be stringently enforced to minimize illegal use of raptors. Falconry is a legitimate and sporting method of hunting, and its practice poses no threat to the raptor resource when decisions regarding the number of raptors to be used annually for this prupose are based on the sustained yield principle.

LIST OF RAPTOR SPECIES IN SOUTHEASTERN ALASKA

	Common Name	Scientific Name
Eagles	Bald Eagle	*Haliaeetus leucocephalus*
	Golden Eagle	*Aquila chrysaetos*
	Osprey	*Pandion haliaetus*
Hawks	Goshawk	*Accipiter gentilis*
	Sharpshinned Hawk	*Accipiter striatus*
	Redtailed Hawk	*Buteo jamaicensus*
	Harlan's Hawk	*Buteo harlani*
	Roughlegged Hawk	*Buteo lagopus*
	Marsh Hawk	*Circus cyaneus*
Falcons	Gyrfalcon	*Falco rusticolus*
	Peregrine Falcon	*Falco peregrinus*

	Merlin (Pigeon Hawk)	*Falco columbarius*
	Kestrel (Sparrow Hawk)	*Falco sparverius*
Owls	Screech Owl	*Otus asio*
	Great Horned Owl	*Bubo virginianus*
	Snowy Owl	*Nyctea scandiaca*
	Hawk Owl	*Surnia ulula*
	Pygmy Owl	*Glaucidium gnoma*
	Great Gray Owl	*Strix nebulosa*
	Short-eared Owl	*Asio flammeus*
	Boreal Owl	*Aegolius funereus*
	Saw-whet Owl	*Aegolius acadica*

LIST OF SMALL MAMMALS IN SOUTHEASTERN ALASKA

	Common Name	Scientific Name
Shrews	Common Shrew	*Sorex cinereus*
	Dusky Shrew	*Sorex obscurus*
	Northern Water Shrew	*Sorex palustris*
	Pygmy Shrew	*Microsorex hoyi*
Bats	Keen's Bat	*Myotis keeni*
	Big Brown Bat	*Eptesicus fuscus*
Pikas	Pika	*Ochotona collaris*
Rodents	Deer Mouse	*Peromyscus maniculatus*
	Bog Lemming	*Synaptomys borealis*
	Brown Lemming	*Lemmus trimucronatus*
	Red-backed Vole	*Clethrionomys rutilis*
	Meadow Vole	*Microtus pennsylvanicus*
	Long-tailed Vole	*Microtus longicaudis*
	Tundra Vole	*Microtus oeconomus*
	House Mouse	*Mus musculus*
	Meadow Jumping Mouse	*Zapus hudsonius*
	Rat	*Rattus norvegicus*
	Porcupine	*Erethizon dorsatum*

1a. ALASKA RAPTOR MANAGEMENT PLAN

LOCATION

The entire state of Alaska.

PRIMARY MANAGEMENT GOAL

To provide an opportunity to view, photograph and enjoy raptors.

SECONDARY MANAGEMENT GOAL

To provide an opportunity for scientific and educational study of raptors.

EXAMPLES OF MANAGEMENT GUIDELINES

1. Protect raptor populations from unnatural disturbance and harassment.
2. Discourage resource utilization that may adversely impact raptor nesting, roosting and feeding areas.
3. Develop public appreciation of raptor importance in the ecosystem.
4. Encourage viewing and photography of raptors.
5. Promote scientific studies of raptors.
6. Provide for limited utilization of selected raptor species for falconry.

THE SPECIES

About 22 species of hawks, falcons, eagles and owls occur regularly within the state. Detailed population data for raptors are lacking. Accurate censuses of raptors are difficult because of the secretive behavior of many species, and the wide distribution but low density of most species.

International concern has resulted from the worldwide decline of the endangered peregrine falcon. Alaska and northern Canada provide the last extensive nesting populations of peregrines in North America. Population estimates for Alaska range from 115 to more than 300 nesting pairs. However, much of the potential nesting habitat has not been surveyed and the population may be even larger.

Kestrels, marsh hawks and short-eared owls are seasonally among the most abundant raptors. Conspicuous species such as rough-legged and Swainson's hawks, and great-horned owls are probably most commonly observed. Southcentral Alaska supports the greatest variety of species due to the diversity of habitats present in the region.

While raptor habitat throughout Alaska has remained relatively stable, populations have fluctuated annually, largely in response to other environmental factors. Local habitat changes have occurred in areas of urban development, agriculture, or transportation corridors and have, in addition to disturbance associated with human activity in such areas, reduced local raptor populations, particularly nesting populations.

Viewing, photography and enrichment of wilderness experience are significant, but unmeasurable uses of the raptor resource. With increased human