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Buckley - Wildlife and the Constitution

WILDLIFE AND THE CONSTITUTION

Prepared for consideration of the

COMMITTEE ON NATURAL RESOURCES

of the

ALASKA CONSTITUTIONAL CONVENTION

December, 1955

By

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WILDLIFE CONSERVATION AND THE CONSTITUTION

Natural resources may be divided into two groups, often called renewable and non-renewable. The term conservation, as applied to the two groups, has quite different conotations. Conservation of non-renewable resources implies only that we make optimum use of what we have--once used up, we will have no more. In the case of renewable resources, accepted usage implies the continued existence of the resource through wise use. In other words, with renewable resources we can eat our cake and have it too! You will have heard from others concerning the non-renewable resources, and various of the other renewable resources. I will confine my comments to the wildlife and sport fishery resource, and will discuss other resources only as they impinge on wildlife.

Our wildlife resource differs from most other resources in that its principal contribution to human welfare is through the opportunities it affords for recreational and esthetic outlets, and not through material gain to our economy as measured in terms of dollars and cents (although, as we will see later, the pursuit of these recreational and esthetic values engenders considerable and steadily increasing expenditures that do bolster our economy). As such it is not the concern of any one group, but rather of all of us who live in Alaska.

In the case of most resources, the user of the resource is its best defender. Thus, the miner depends for his livelihood directly on the minerals he is mining; the logger on the timber he is cutting; and the commercial fisherman on the fish he is catching. In each case the dependence is immediate and complete; and any mismanagement, through legislative ineptness or otherwise, will soon be reflected in the income of the man depending on the resource. Since the most sensitive nerve in the human body is the one connected to the

pocketbook, we can rest assured that the reaction of the miner, logger or commercial fisherman to resource exploitation and mismanagement will be violent and effective! The foregoing statements are made with the full knowledge that fisheries, forests, and minerals have all been mismanaged from time to time in the past, and that certain elements of the exploiting groups have sanctioned or even encouraged the destruction of the resource for personal, short-term gains. But in spite of this shortcoming, personal interest is best served in the long run by the best possible management of the individual resource concerned.

On the other hand, there is no group that depends entirely on wildife for its subsistence, with the exception of trappers and others in remote areas, mostly of aboriginal stock, who as a group tend to be somewhat inarticulate. For this reason, wildlife conservation often has been treated somewhat lightly with mismanagement or no management resulting; it has not been granted the prompt corrective measures that would have been accorded most other resources. In some instances conservation groups have finally become sufficiently aroused to see to it that better management measures were instituted. Sometimes the time lapse has been too great--witness the extinction of the Labrador duck, the heath hen, the Carolina paroquet, and several others. In other cases, protective measures have been initiated that have prevented further decrease in threatened species, or have even permitted the populations of some to return to sizable levels. The management of wildlife, like the management of other resources, is today a highly complex job, and with the rapid increase in population that we can forsee for Alaska, will become even more so. But because the science of wildlife technology is so young, there is a large segment of the public that does not realize its existence. As a result, too often in the States, the game and fish department apparently has seemed a good place for

the governor or the legislature to pay political debts,--perhaps with political gain, but almost invariably with wildlife loss! It was pointed out on the TV appearance of this Committee that the legislature can always rectify its mistakes at the next session; may I add that it can just as easily undo the good it has done, if it so desires! It is to forestall political interference and to maintain continuity that I believe provision for wildlife should be at the constitutional rather than the legislative level.

* * * * * * *

You may well ask "Is wildlife important enough to be considered by the Constitutional Convention?" I believe that it is, and I hope to satisfy you that it is.

Attached to this paper is a publication that I prepared earlier this year in which I discuss in some detail the value of wildlife in Alaska. In addition, you have already been provided with a paper prepared for this Convention by George Rogers, in which tangible wildlife values have been compared to other natural resources. At this time I would like to pick out the highlights of these publications.

Wildlife has several values that are intangible, and others that can be measured in monetary terms. The intangible values far exceed the tangible in importance, but are less easily explained. In this category are the social, esthetic, biological, and certain portions of the recreational value.

The social value is best illustrated by the fact that fully one-third of Alaska, supporting a population of 30,000 people, is presently habitable only because of the presence of wildlife as a source of food.

The esthetic value we may consider as the attraction of wild animals by virtue of their beauty or interest. I can tie no price-tag on this value, but

I think we all agree this world would be a poorer place in which to live without the presence of wild things for us to admire and draw inspiration from. How many of you would want to live here without any wild living thing of any sort? (I noted that 52 per cent of the people in "Alaska -who's here -what's doing -who's doing it 1955" listed hunting, fishing, nature study, or photography among their hobbies, and that many of the remaining 48 per cent listed no hobbies.)

The biological value is also difficult of demonstration. Examples of this value are the pollination of plants by insects, without which very few kinds of plants could exist; the development of moose habitat by beaver, such as is so evident in the Innoko River valley; and the conversion of products of no direct use to man into a form that he can use, such as the conversion by lemmings of tundra vegetation into food for foxes which in turn provide us with furs. Many other examples could be cited, but these should suffice to make clear the point.

Some measure of the intangible aspects of the recreational value is given by the time and money spent by residents on recreational hunting and fishing. These expenditures are set forth in the following table:

EXPENDITURES OF TIME AND MONEY BY ALASKANS IN FISCAL YEARS

	1952	1953	1954	1955
No. of licenses	29,826	36,121	41,321	44,633
No. of days spent	518,800	619,600	743,300	774,900
No. of dollars spent	$8,786,000	$10,502,500	$12,075,500	$13,208,000

You may note that there has been an increase in expenditures during the last four years of 50.3 per cent, an average of 12.6 per cent per year. Still

another measure has been computed by the U. S. National Park Service, which points out that leisure time is more valuable to the individual than working time (that is, men work only for "time and a half" or "double time" on weekends and holidays). The Park Service assumes that the average Alaskan wage is $3.00 per hour, using an eight-hour day, at the average wage, we can compute a desire for hunting and fishing of 774,900 man days at $24 per day equal to $18,597,600. If we consider that this is leisure time and thus twice as valuable, our value becomes $37,195,200. Adding this to the actual expenditures, we have a total of over $50,000,000 for fiscal year 1955, a sizable figure, I think you will admit.

Turning now to the tangible values, you will find them well illustrated in Dr. Rogers' paper in the table following page 7. You will note that "Furs" and "Other tangible wildlife values" (the latter are made up of nonresident hunting and fishing expenditures, subsistence value of meat harvested in remote areas, and the value of reindeer and ivory) make up $12,725,000 which represents 6.3 per cent of the basic economic structure of Alaska.

Considering the expenditure mentioned above of over $13,000,000 on recreational pursuit of fish and game by Alaskans, the $37,000,000 worth of the time spent hunting and fishing, the $12,725,000 of tangible values, and the fact that many of the most significant wildlife values cannot be expressed in dollars, I trust that you will agree that wildlife is deserving of your consideration.

* * * * * * *

Lastly, I would like to point out some items that I feel must be borne in mind when considering wildlife and sport fish.

1. Wildlife is a product of the land, and as such any change in the

land will inevitably affect wildlife. Few areas are ever managed exclusively for wildlife--for the most part it is a by-product on areas managed for other purposes. Sometimes minor changes in land use practices, without detriment to the primary user, can greatly increase wildlife. Thus, management of other resources must consider wildlife, if wildlife is to continue to exist.

2. Wildlife is living and dynamic; its management must also be dynamic. Most small game animals have a life expectancy of less than one year, and even big game animals have an average length of life of less than four years. Reproductive rates of wild animals are such that immense changes in population levels can take place within a short period of time. Immediate action can result in saving for human use many animals that would otherwise be lost to natural causes; conversely, prompt action can also prevent overharvest. Therefore, regulations relating to wild animals must be made by an organization capable of rapid action. Legislative action is too slow; only a commission with adequate authority can act quickly enough. For obvious reasons, such a commission should be non-political in make-up and action.

3. Certain forms of wildlife, such as the Alaska moose, the brown bear, muskoxen, and caribou occur under the American flag only in Alaska. Hence our obligation is not only to the people of Alaska, but also to all citizens of the United States, and indeed, other countries as well.

4. Wildlife and fish are accepted to be the property of the State so long as they remain in the wild and within State boundaries. Ownership of land does not carry with it ownership of the wild animals on the land, but only custody. We probably should make a declaration to this effect in our constitution.

5. Wildlife and fish may occur in or on either public or private lands and waters. We need a provision to guarantee access by the public to all waters of the State for fishing.

WILDLIFE IN THE ECONOMY OF ALASKA

BIOLOGICAL PAPERS OF THE UNIVERSITY OF ALASKA

NUMBER 1

FEBRUARY, 1955

COMPARISON OF FOUR BASIC INDUSTRIES IN ALASKA

WILDLIFE IN THE ECONOMY OF ALASKA

by

JOHN L. BUCKLEY, Leader

Alaska Cooperative Wildlife Research Unit

Illustrated by
Sigurd T. Olson, U. S. Fish and Wildlife Service

A contribution of

The Alaska Cooperative Wildlife Research Unit

The Alaska Game Commission, University of Alaska, U. S. Fish and Wildlife Service, Wildlife Management Institute cooperating.

BIOLOGICAL PAPERS OF THE UNIVERSITY OF ALASKA

NUMBER 1 FEBRUARY, 1955

Biological Papers of the University of Alaska will be issued at irregular intervals. Original papers on any phase of Arctic or sub-Arctic biology may be accepted. Photographs and drawings should be kept to a minimum; excessive illustrations will be charged to the author.

Editor
FREDERICK C. DEAN
Head, Department of Wildlife Management

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A REPORT TO THE STOCKHOLDERS

We believe that the policies for the administration of our natural resources should be determined by an informed public, and that the programs pursued by the various agencies of management must be based on these policies. One of the primary considerations in establishing a policy for use of our natural resources is the relative importance of each resource in relation to the others. Information on the amount of use made of each segment of the resource is required by the administrator for determining the distribution of allotted funds.

In this pamphlet we have attempted to describe for you, the citizens of Alaska, the value of your wildlife* resource. The question that we have asked is "What part does wildlife play in the economy of Alaska?", judged by the criteria of money, recreational use of time, employment, and social welfare. The figures are for the period July 1, 1951, to June 30, 1952, except as noted in the text; they can be considered representative of other years only to the extent that the stated period is typical. In the case of recreational expenditures, the value has increased. On the other hand, some of the other values may have decreased. Despite these shortcomings, the final estimate presents a rather comprehensive view of the importance of wildlife to Alaska.

It is a pleasure to acknowledge the assistance of the many people who contributed to this study: the many sportsmen who answered questionnaires, and without

* Wildlife, as it is used here, includes all of the wild vertebrates, whether they be fish, bird, or mammal.

whose assistance the study could not have been done; George W. Rogers, formerly Chairman of the Alaska Field Committee of the U. S. Department of the Interior, for assistance in planning the study; the staff of the Regional office of the U. S. Fish and Wildlife Service for supplying much necessary information; the staff of the Alaska Cooperative Wildlife Research Unit, especially Miss Anna Mueller and Mrs. Louella Hawes DeLeonardis, and Mrs. Bertha Brooks for assistance in mailing and analyzing questionnaires; Dr. Brina Kessel, F. C. Dean, and C. J. Keim of the University of Alaska for many valuable suggestions; and W. L. Libby and Sigurd T. Olson, biologists of the U. S. Fish and Wildlife Service, respectively for the drafting and cartooning of illustrations; I am indebted also to Robert F. Wallace, Associate Professor of Economics at the State College of Washington, for ideas drawn from his excellent publication "Economic Aspects of Wildlife Resources of the State of Washington."

I am solely responsible for decisions as to handling of data, method of presentation, conclusions drawn and opinions expressed, despite the help of all of the above individuals.

SUMMARY

1952 DOLLAR VALUE OF WILDLIFE IN ALASKA

Item	Total value	Value to Alaska
Commercial Value		
Commercial fisheries (wholesale)	$ 95,839,201	$ 95,839,201
Raw land fur	1,942,291	1,942,291
Raw fur seal	2,702,959	200,000
Food value in remote areas	3,250,000	3,250,000
Manufactured ivory	150,000	150,000
Reindeer	115,000	115,000
Fur farming	40,000	40,000
Total	104,039,451	101,536,492
Recreational Value		
Expenditures by nonresidents	3,335,500	3,335,500
Expenditures by residents	8,786,000	8,786,000
Licenses and military special services	272,500	272,500
Total	12,394,000	12,394,000
Scientific Value	50,000	50,000
Esthetic Value	1,600,000	1,600,000
GRAND TOTAL	118,083,451	115,580,492

INTRODUCTION

The history of Alaska has been closely related to, indeed often dependent upon, its fur, fish, and game. From the time of Alaska's discovery by Bering in 1741 until after its purchase by the United States in 1867, fur-trading was its sole industry; commercial fishing began in 1868 and, since 1891, when it surpassed furs in annual value, has been our principal industry; and lastly, development of mineral resources would not have been possible in much of the Territory without the presence of game as a source of food. Since the purchase of Alaska by the United States, the value of fish shipped from Alaska has repaid the original purchase price of $7,200,000 more than 300 fold, and the value of fur has repaid the purchase price nearly 30 times over.

Today there are many changes. With modern transportation making commercial foods more readily available, a decreasing segment of our population is directly dependent upon game and fish for food. But this same transportation brings visitors to harvest or otherwise enjoy our wildlife. The population of Alaska is growing rapidly, and with this growth the demand for recreation is increasing. Fur prices have declined in recent years. Commercial fishing is still the most important industry in the Territory. What, then, is the place of wildlife in the economy of Alaska today? We will try to assess this by totaling the tangible recreational and commercial values, less the costs of management, and describing the intangible social, esthetic, and biological values.

RECREATIONAL VALUE

The recreational value of wildlife may be considered as the amount of time and money spent in pursuit of wildlife in connection with sports and hobbies. To obtain an estimate of such expenditures for Alaska, a questionnaire was sent to 4,119 individuals who held hunting and/or fishing licenses during the period July 1, 1951, to June 30, 1952.* A discussion of the methods used is included in the Appendix for those who are statistically inclined.

The details of recreational expenditures for hunting and fishing are shown in Table 1 (p.18). A total of $12,121,500 was spent on the recreational pursuit of fish and game in Alaska during the survey period. To this must be added $272,500 spent by the 43,421 sportsmen for their Alaska Game Commission Licenses, their Migratory Bird Hunting Stamps, and their Territorial Sport Fishing Licenses, and by military special serces for recreational hunting and fishing by servicemen. This grand total of nearly twelve and a half million dollars is understandable when we consider that nearly one of each five men, women, and children in Alaska bought a license, and that an additional 13,595 licenses were purchased by nonresidents. Even this total figure of 43,421 license buyers is not the total number of hunters and fishermen, for people of half or more Indian or Eskimo blood are not required to have licenses. Coupled with the high percentage of license buyers is a high average expenditure. (Appendix Table A compares the data from Alaska with those from certain States where similar studies have been made.)

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* Referred to hereafter as fiscal 1952.

The recreational value of wildlife has increased in each of the two years since the study period, judging from the increase in the number of licenses sold from 43,421 in the study year to 55,159 the next year, and to 58,844 the following year. The amount of increase in expenditures can be estimated by assuming that the average expenditure per license buyer, as determined by the survey, has remained constant and multiplying by the number of licenses bought in each of the subsequent years. The total estimated expenditures of time and money by each license type are shown in Table 2. The totals are $15,039,500 and 900,400 man-days in fiscal 1953 and $16,157,000 and 993,300 man-days in fiscal 1954.

It is particularly interesting to note that $3,335,500 was spent by nonresidents during fiscal 1952, and can for the most part be considered as an actual addition to our economy from "Outside." In fiscal year 1953, the contribution by nonresidents was $4,537,000 and in fiscal year 1954 it was $4,048,500.

Figure 1 indicates graphically the distribution of expenditures for all license buyers. (In Appendix Table B is listed the distribution of expenditures for all license buyers, and for each type of license.) The disparity between expenditures by the various types of license holders is to be expected, because several of the license types permit only certain kinds of sport. For example, fishermen spend nothing on hunting equipment, nonresident big game hunters are required by law to have guides, etc. The total distribution of expenditures is not greatly different from expenditures in the State of Washington.[1] The greatest divergence from the Washington figures is the 10 per cent that is spent by Alaskans for cameras and camera supplies. This percentage is twice that spent in Washington, and probably indicates the extremely great interest in and appreciation for wildlife that is typical of Alaskans. The diversity of wildlife in Alaska and the magnificent country in which the animals live are probably contributory factors to this expenditure.

TABLE 2. COMPARISON OF EXPENDITURES IN THOUSANDS OF DOLLARS AND THOUSANDS OF MAN-DAYS FOR FISCAL YEARS 1952, 1953, AND 1954.

License type	Fiscal 1952		Fiscal 1953		Fiscal 1954	
	Dollars	Man-days	Dollars	Man-days	Dollars	Man-days
Nonresident General	419.0	7.4	441.0	7.8	454.5	8.0
Small Game	456.5	31.8	635.0	44.2	634.0	44.2
Fishing	2,460.0	162.6	3,461.0	228.8	2,993.0	197.8
Total	3,335.5	201.8	4,537.0	280.8	4,081.5	250.0
Resident Trapping	1,674.0	109.7	1,709.0	112.0	1,559.5	102.2
Hunting	6,513.5	367.2	7,925.0	446.8	9,558.0	538.9
Fishing	598.5	41.9	868.5	60.8	958.0	67.0
Total	8,786.0	518.8	10,502.5	619.6	12,075.5	743.3
GRAND TOTAL	12,121.5	720.6	15,039.5	900.4	16,157.0	993.3

FIGURE 1

DISTRIBUTION OF EACH ONE HUNDRED DOLLARS SPENT IN PURSUIT OF WILDLIFE BY LICENSE BUYERS

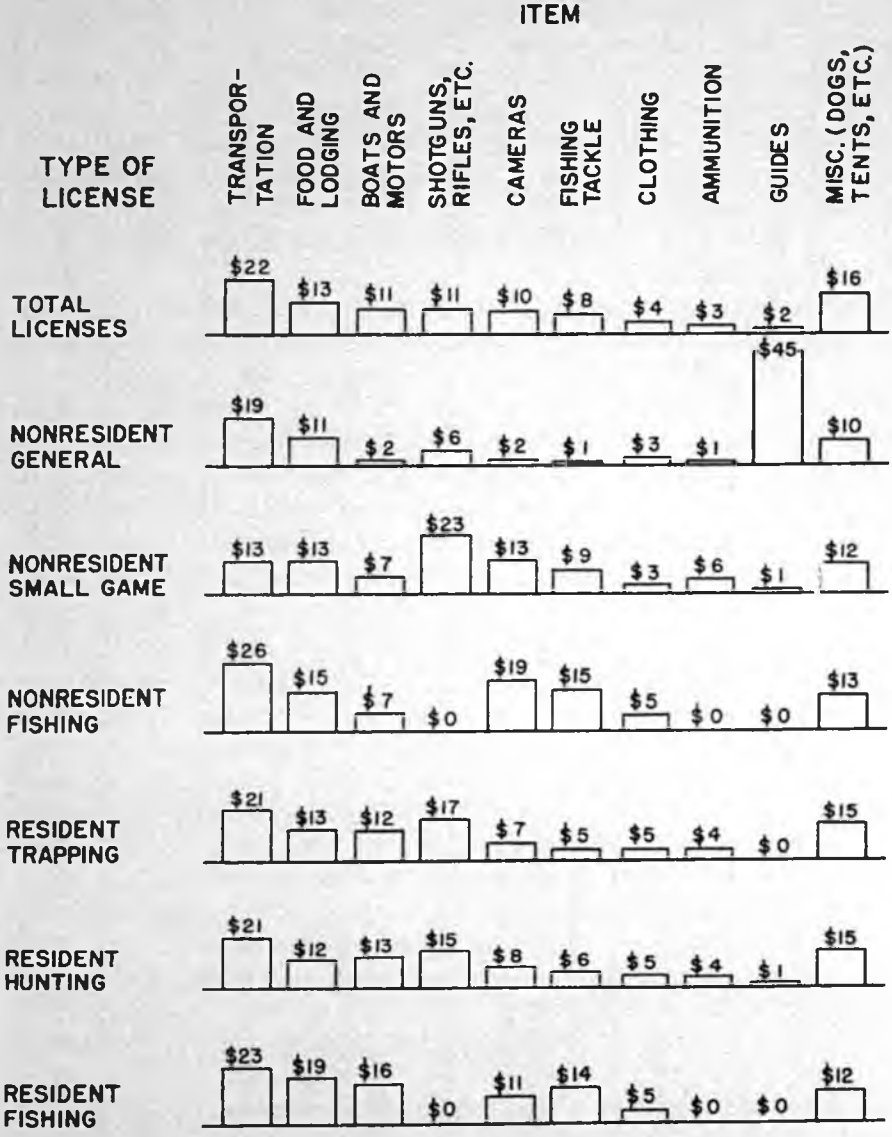


TABLE 3. COST PER DAY BY LICENSE TYPE AND TYPE OF SPORT.

License type	Type of Sport				
	Small game (dollars)	Big game (dollars)	Waterfowl (dollars)	Fishing (dollars)	Average (dollars)
Nonresident General	6.47	94.08	12.50	30.33	56.62
Nonresident Small Game	10.93	39.17[a]	9.69	12.50	14.36
Nonresident Fishing				15.13	15.13
Nonresident Average	10.63	69.85	10.00	15.03	16.53
Resident Trapping	8.91	18.15	11.98	19.78	15.26
Resident Hunting	13.29	26.34	17.00	15.91	17.74
Resident Fishing				14.28	14.28
Resident Average	12.27	23.92	15.23	16.07	16.94
GRAND AVERAGE	12.00	26.51	14.91	15.10	16.82

a/ Some holders of nonresident small game licenses reported expenditures for hunting big game, although such hunting is illegal.

Figure 2 indicates the distribution of total expenditures among the five major categories of the questionnaire (i.e. fishing, big game hunting, small game hunting, waterfowl hunting, and miscellaneous expenditures) and the distribution by type of license. The importance of fishing, engendering an expenditure of over five million dollars, is readily apparent. The high total for fishing is understandable in the light of the extremely long seasons in comparison to those for game. Next to fishing in total expenditures is big game hunting, with over two and a half million dollars spent, followed by small game with over a million dollars, and lastly waterfowl with less than three-fourths of a million dollars expended. Miscellaneous expenditures not attributable to any one category make up nearly two and a half million dollars.

The second measure of the importance of recreational use of wildlife is the amount of time spent hunting and fishing. The relative importance of the four categories of sport is the same by this criterion as it is by expenditures. The total and average number of man-days spent hunting and fishing, by type of sport and license, are shown in Table 1 and Figure 3. Figures 4 and 5 show respectively the percentage distribution of man-days by type of sport and expenditures by type of sport.

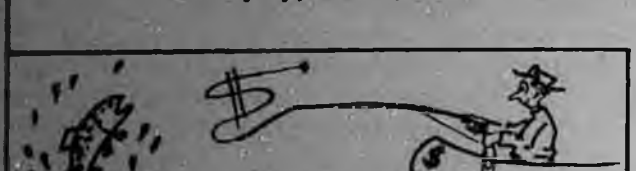
It is certainly of interest to the administrator to know that over half of the time and money spent on hunting and fishing is devoted to fishing, that 27 per cent of the money and 17 per cent of the time is devoted to big game hunting, 12 per cent of the money and 16 per cent of the time to small game hunting, and 7 per cent of the money and 8 per cent of the time to waterfowl hunting. Perhaps the high expenditures on fishing, the relatively low expenditures on waterfowl, and the fact that the man-days spent hunting big game and small game are nearly equal, are the most illuminating features of the expenditure pattern.

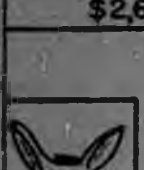
Table 3 shows the cost per day for the various types of license holders. In arriving at these last

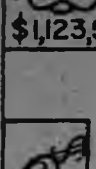
FIGURE 2

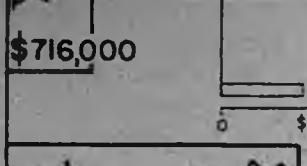
TOTAL EXPENDITURES

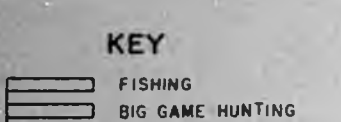
by type of sport and license











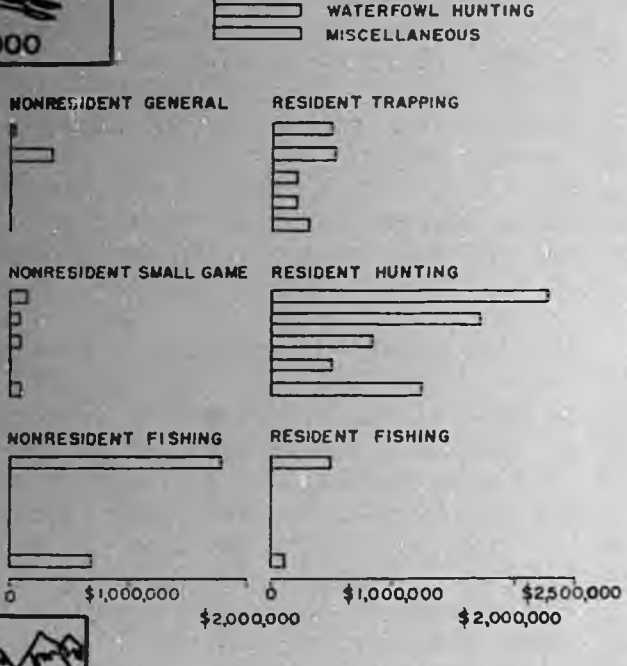


FIGURE 3

AVERAGE NUMBER OF MAN DAYS SPENT HUNTING & FISHING

by type of sport and license

KEY

FISHING
BIG GAME
SMALL GAME
WATERFOWL

NONRESIDENT GENERAL

RESIDENT TRAPPING

NONRESIDENT SMALL GAME

RESIDENT HUNTING

NONRESIDENT FISHING

RESIDENT FISHING

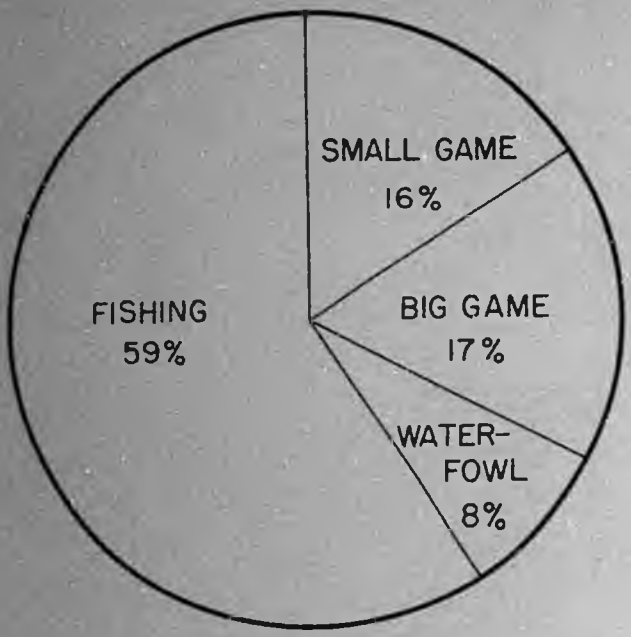
0 5 10 15 0 5 10

5 10

FIGURE 4

DISTRIBUTION OF MAN DAYS

by type of sport and license



NONRESIDENT GENERAL

NONRESIDENT SMALL GAME

NONRESIDENT FISHING

RESIDENT TRAPPING

RESIDENT HUNTING

RESIDENT FISHING

FIGURE 5

DISTRIBUTION OF EXPENDITURES

by type of sport and license

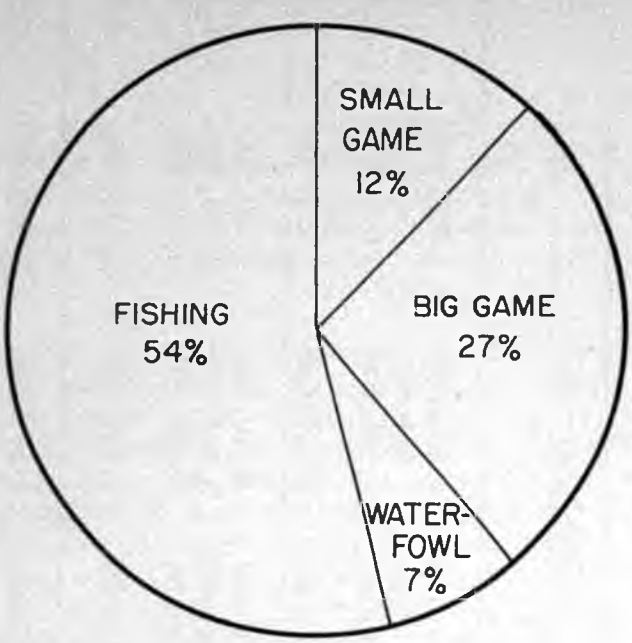


TABLE 4. ESTIMATED EXPENDITURES IN DOLLARS BY LICENSE TYPE BY JUDICIAL DIVISION.

License type	Judicial Division 1	2	3	4	Total
Nonresident General	98,000	10,000	206,000	105,000	419,000
Small Game	19,000	3,000	316,500	118,000	456,500
Fishing	69,000	5,000	1,695,000	691,000	2,460,000
Total	186,000	18,000	2,217,500	914,000	3,335,500
Resident Trapping	425,000	35,000	810,500	403,500	1,674,000
Hunting	1,107,500	84,500	3,719,000	1,602,500	6,513,500
Fishing	46,000	3,500	400,500	148,500	598,500
Total	1,578,500	123,000	4,930,000	2,154,500	8,786,000
GRAND TOTAL	1,764,500	141,000	7,147,500	3,068,500	12,121,500

figures, we pro-rated the amounts spent on "Miscellaneous" expenditures over the types of sport in accordance with the percentage of the total money spent that is spent on each kind of sport by each type of license holder. It is immediately evident that big game hunting is the most expensive sport, followed by fishing, waterfowl hunting, and small game hunting. The high cost of big game hunting is probably attributable largely to the high transportation costs associated with this type of hunting. The high cost of fishing is probably due in part to the expenditures for boats (all expenditures for boat purchases or rentals were assigned to fishing, although boats are used for hunting also).

The geographic distribution of the total expenditure has been computed by assuming an equal expenditure per licensee and combining the expenditure with the place of residence of the license holder (See Appendix Table C). The method of computation employed may have introduced a minor error, because the average expenditure per licensee may differ from place to place in the Territory. Table 4 lists the estimated expenditures by license types by Judicial Divisions. The Third Judicial Division leads, with 60.5 per cent of all license buyers and 58.9 per cent of all expenditures. Next is the Fourth, with 25.5 per cent of the license buyers and 25.3 per cent of all expenditures; then the First, with 13.0 per cent and 14.6 per cent, respectively; and finally the Second, with 1.0 per cent of the licensees and 1.2 per cent of the expenditures.

We may also inquire as to what the sportsman gets for his money. Table 5 presents figures compiled from records of the U. S. Fish and Wildlife Service for the harvest of game by Judicial Divisions. The average take per hunter for the Territory as a whole is shown graphically in Figure 6. Of the big game animals, moose led in total harvest with 3,994 animals. Next were deer with a harvest of 2,251, followed by caribou with 1,959 and black bear with 1,824. Among the small game animals, ducks led the harvest with 75,500, followed by hare, grouse, ptarmigan, and geese and brant.

TABLE 5. GAME HARVESTED BY LICENSED HUNTERS, JULY 1, 1951 - JUNE 30, 1952, BY JUDICIAL DIVISION. (Based on records of the U. S. Fish and Wildlife Service, Juneau, Alaska.)

Species	Judicial Division				Total
	1	2	3	4	
Brown bear	71		478		549
Grizzly bear	9		99	19	127
Black bear	186	4	1,430	204	1,824
Polar bear		6			6
Moose	44	8	3,449	493	3,994
Caribou		32	1,464	463	1,959
Deer	2,014		237		2,251
Mountain goat	93		623		716
Mountain sheep		4	284	65	353
Hare	536		55,239	3,461	59,236
Ducks	11,714	795	55,273	7,761	75,543
Geese and brant	1,235	60	10,542	1,104	12,941
Grouse	1,866	268	25,901	23,659	51,694
Ptarmigan	2,927	746	26,243	8,988	38,904

Unfortunately, no figures are available for the harvest of sport fish. Expressed in other terms, the average hunter obtained 104 pounds of big game, 14.0 pounds of small game, 4 pounds of waterfowl, and an undetermined amount of fish.

To sum up, then, in fiscal 1952, 43,421 license buyers spent an estimated total of $12,121,500 in the course of 720,600 man-days spent hunting and fishing, or an average of $279.16 and 16.6 man-days per license holder. In fiscal 1953 the expenditures had increased to $15,039,500 and 900,400 man-days, and in fiscal 1954 to $16,157,000 and 993,300 man-days. Fishing engendered the largest expenditures and provided the greatest number of days of recreation (over half of the totals), followed by big game and small game hunting, and finally waterfowl hunting.

FIGURE 6
"THE AVERAGE SPORTSMAN"

COMMERCIAL VALUE

We will consider the commercial value of wildlife as "the income derived from the sale of wild animals or their products, or from the direct and controlled use of wild animals and their progeny; e.g., commercial fishes, furs, fur and game farming, domestication."[2]

COMMERCIAL FISH

First, and most important, is the value of commercial fish. Since data are not available for the period of time that our survey covers (July 1, 1951 - June 30, 1952), the figures used here apply to calendar 1951. However, most of the fishing season falls during the summer months, and hence in our survey period. Two sets of figures are employed here: the first, value to the fisherman, is included so that direct comparison may be made with the value of raw fur. The second figure is the value of products prepared for market, which represents the value of the fish, the cost of harvest, and the cost of preparation. The latter figure represents more nearly the contribution of commercial fish to the economy of Alaska, since most of the processing is done in Alaska. The detailed breakdown of the harvest and value of fisheries in Alaska during 1951 is shown in Table 6. To summarize the table: 408,728,312 pounds of fisheries products were harvested in 1951, worth $39,260,240 to the fishermen and $95,839,201 as prepared for market.

RAW FUR

Second in importance to commercial fishing is the trade in raw furs. This value is discussed in two parts: the first being land furbearing animals; the second, fur seals.

TABLE 6. HARVEST AND VALUE OF FISHERIES PRODUCTS IN ALASKA, 1951. (From "Alaska Fisheries 1951," USFWS., C.F.S. No. 811.)

Species	Weight of fish (pounds)	Value to fishermen (dollars)	Value of products prepared for market (dollars)
Salmon	276,588,312	32,368,160	85,887,641
Chinook	15,790,840	3,037,202	
Chum	52,934,320	4,377,615	
Pink	113,666,596	13,137,186	
Red	57,916,908	6,712,566	
Silver	36,279,648	5,103,591	
Other	119,554,286	5,655,592	6,823,292
Herring	81,624,700	1,003,292	2,069,608
Halibut	32,045,000	4,117,608	4,198,542
Trout	30,560	3,359	4,391
Flounder	4,548	682	723
Sablefish	5,815,405	529,368	548,426
Rockfishes	7,564	254	684
Lingcod	13,152	684	763
Shark	11,008	110	155
Trash Fish	2,349	235	
Shellfish	11,548,098	1,236,488	3,128,268
Clams	2,387,834	350,148	813,031
Crabs	7,488,448	707,039	1,881,036
Shrimp	1,707,816	179,301	434,201
TOTAL	407,726,696	39,260,240	95,839,201

THE HARVEST OF LAND FUR-BEARING ANIMALS results in direct sale of raw furs by individual trappers to traders, and a direct cash return to the Territory.

The estimated harvest and value of Alaskan furs for the survey period is shown in Table 7. The compilation is not accurate, since actual records of the harvest by

TABLE I. EXPENDITURES OF LICENSE HOLDERS IN ALASKA

Type of License and Type of Sport	Transportation	Food and Lodging	Shotguns, Rifles, Telescopes	Ammunition	Fishing Tackle	Clothing	Dogs and Dog Food
NONRESIDENT GENERAL							
Small Game	3.0	1.5	4.0	1.0		.5	.5
Big Game	62.0	41.0	20.5	3.0		7.5	
Waterfowl	1.0	.5	1.5	1.0		.5	
Fishing	12.0	3.0			5.0	2.0	
General Purchases							
Total	78.0	46.0	26.0	5.0	5.0	10.5	.5
NONRESIDENT SMALL GAME							
Small Game	20.0	10.5	39.5	14.5		2.0	1.0
Big Game	6.5	9.5	60.5	6.0		3.0	
Waterfowl	2.0	4.5	3.5	8.5		1.5	.5
Fishing	32.5	34.0			41.0	7.0	
General Purchases							
Total	61.0	58.5	103.5	29.0	41.0	13.5	1.5
NONRESIDENT FISHING							
Fishing	643.5	354.0			354.0	119.5	
General Purchases							
Total	643.5	354.0			354.0	119.5	
NONRESIDENT TOTAL	782.5	458.5	129.5	34.0	400.0	143.5	2.0
RESIDENT TRAPPING							
Small Game	36.5	33.0	64.5	27.5		15.5	6.0
Big Game	153.5	97.0	160.0	27.0		26.5	
Waterfowl	39.0	30.0	54.5	33.5	87.5	13.0	10.5
Fishing	115.0	60.5				19.5	
General Purchases							
Total	344.0	220.5	279.0	88.0	87.5	74.5	16.5
RESIDENT HUNTING							
Small Game	200.0	149.5	244.5	85.0		76.0	23.5
Big Game	522.0	270.5	616.0	87.0		86.0	
Waterfowl	149.5	80.0	116.0	68.0		42.0	16.0
Fishing	480.0	288.5			376.5	96.5	
General Purchases							
Total	1351.5	788.5	976.5	240.0	376.5	300.5	39.5
RESIDENT FISHING							
Fishing	139.5	115.0			83.5	32.0	
General Purchases							
Total	139.5	115.0			83.5	32.0	
RESIDENT TOTAL	1835.0	1124.0	1255.5	328.0	547.5	407.0	56.0
GRAND TOTAL	2617.5	1582.5	1385.0	362.0	947.5	550.5	58.0

FROM JULY 1, 1951 TO JUNE 30, 1952 (in thousands).

Guides	Decoys	Boats, Motors	Tents	Sleeping Equip.	Stoves, Lanterns	Camera & Camera Supplies	Miscellaneous	Total	Man Days	Total Prorated by Sport
								10.5	1.7	11.0
187.0							20.0	341.0	3.8	357.5
								4.5	.4	5.0
		10.0					11.5	43.5	1.5	45.5
			.5	1.5	1.0	9.5	7.0	19.5		
187.0		10.0	.5	1.5	1.0	9.5	38.5	419.0	7.4	
							4.5	92.0	10.2	115.5
2.5							5.5	93.5	3.0	117.5
	0.5						4.0	25.0	3.2	31.0
		33.0					6.0	153.5	15.4	192.5
			.5	8.5	5.0	61.0	17.5	92.5		
2.5	0.5	33.0	.5	8.5	5.0	61.0	37.5	456.5	31.8	
		182.5					111.5	1765.0	162.6	2460.0
			21.5	41.5	30.0	475.0	127.0	695.0		
		182.5	21.5	41.5	30.0	475.0	238.5	2460.0	162.6	
189.5	0.5	225.5	22.5	51.5	36.0	545.5	414.5	3335.5	201.8	
							14.5	197.5	26.7	238.0
5.5							36.0	505.5	33.6	610.0
	2.0						10.0	192.5	19.4	232.5
		200.0					9.5	492.0	30.0	593.5
			30.5	32.5	18.0	120.0	85.5	286.5		
5.5	2.0	200.0	30.5	32.5	18.0	120.0	155.5	1674.0	109.7	
							45.0	823.5	76.4	1015.0
43.5							80.0	1705.0	79.8	2102.0
	7.5						15.0	494.0	35.8	608.5
		875.5					145.0	2262.0	175.2	2788.0
			76.5	127.5	68.5	495.5	461.0	1229.0		
43.5	7.5	875.5	76.5	127.5	68.5	495.5	746.0	6513.5	367.2	
		95.0					21.5	486.5	41.9	598.5
			2.5	14.5	10.0	63.5	21.5	112.0		
		95.0	2.5	14.5	10.0	63.5	43.0	598.5	41.9	
49.0	9.5	1170.5	109.5	174.5	96.5	679.0	944.5	8786.0	518.8	
238.5	10.0	1396.0	132.0	226.0	132.5	1224.5	1359.0	12121.5	720.6	

TABLE 7. ESTIMATED TAKE AND VALUE OF ALASKAN FURS, JULY 1, 1951 - JUNE 30, 1952.

Species	Total harvest[a]	Value per pelt[b] (dollars)	Total value (dollars)
Beaver	18,617	19.00	358,723
Fox, red & cross	1,500	2.00	3,000
Fox, silver	90	10.00	900
Fox, white	1,200	10.00	12,000
Fox, blue	100	8.00	800
Lynx	600	7.00	4,200
Marten	6,350	22.00	139,700
Mink	39,200	30.00	1,176,000
Muskrat	163,000	1.00	163,000
Otter, land	2,950	18.00	53,100
Weasel	5,230	1.25	6,538
Wolf	779	20.00	15,580
Wolverine	350	25.00	8,750
TOTAL			1,942,291

a/ Based on "Big Game, Small Game and Fur Take Report, July 1, 1951 to June 30, 1952. Territory of Alaska," USFWS, Juneau, Alaska.
b/ From lists of prevailing prices, Seattle Fur Exchange.

non-licensed natives are not maintained. It is, however, the best figure available. Since practically no processing of raw furs, other than for home use, is done in Alaska, the only value to the Territory is that of the raw furs. This raw value represents the potential value of the animals, plus the cost of harvest; a total figure of $1,942,291.

THE FUR SEAL HERD of the Pribilof Islands is managed by the Federal Government under terms of a treaty with Canada. The treaty provides that the United States shall have four-fifths of the seals harvested each year, and that Canada shall have the remaining

fifth. The U. S. Fish and Wildlife Service is the custodian and managing agency for the Federal Government.

During 1951, 60,689 fur seal pelts were harvested. The raw value of the United States share of the pelts in 1951 was estimated to be $2,626,644.[3] In addition 1,001,616 pounds of fur seal by-products worth $76,315 were processed.[4] The net return is deposited in the General Fund of the U. S. Treasury.

Essentially all labor involved in harvesting the seals is performed by the Aleuts of the Pribilof Islands, for which they receive about $165,000 annually.[5] In addition, medical care and educational facilities are provided by the Federal Government from Fur Seal receipts. The total benefit to the Territory directly probably approaches $200,000 annually.

VALUE OF MEAT HARVESTED IN REMOTE AREAS

The game and fish used by natives in organized villages is computed annually by the Alaska Native Service. Table 8 was compiled on the basis of these figures for calendar 1952, and arbitrarily chosen "Value per pound" figures. The 1952 tabulation was based on reports or estimates from 118 villages having a total population of 19,083.

For many of the villages included in this report, there is no source of animal protein other than that which can be harvested locally. In villages where meat or fish is available commercially, prices average much higher than those assigned in this study. Furthermore, it is probable that the estimates of consumption are conservative. For example, Brooks[6] estimates that 980 walrus were taken in 1952, which would represent nearly two million pounds of meat, rather than the 542,750 pounds included in Table 8. Also, figures compiled by George W. Warner, Fishery Biologist of the U. S. Fish and Wildlife Service, during the summer of 1953 indicate that 3.4 times as much fish is taken in 18 villages on the Yukon and Kuskokwim Rivers as is shown by the Alaska Native Service estimates. Warner estimates

that approximately one-third of the fish taken is sold to local traders; using this information, the consumption of these villages is 2.4 times that estimated by the ANS. Thus, the estimates of Table 8 are undoubtedly minimal.

TABLE 8. CONSUMPTION AND VALUE OF FISH AND GAME IN ALASKA NATIVE VILLAGES, 1952. (Based on estimates supplied by the Alaska Native Service.)

Item	Consumption (pounds, except as noted)	Value per pound	Total value
Salmon	3,419,342	$0.15	$ 512,901
Other fish	1,524,288	0.10	152,429
Game animals	1,032,235	0.50	516,117
Game birds	68,819	0.50	34,409
Waterfowl	228,179	0.50	114,089
Seal	1,202,520	0.50	601,260
Walrus	542,750	0.50	271,375
Whale	695,800	0.50	347,900
Bird's eggs (doz.)	5,959	0.50	2,979
TOTAL	8,713,933		2,553,459

The native and non-native peoples living in remote areas and not included in the above estimates probably number at least 5,000 more, which would bring our total estimate to $3,250,000, if they consume at the same rate as those for which we have data.

LESSER COMMERCIAL VALUES

WALRUS IVORY is probably the most important item to be considered under this heading. The harvest of 980 walrus in 1952 yielded approximately 4,000 pounds of raw ivory worth $2.00 a pound, a total of $8,000. Brooks[6] estimates the retail value of carved ivory to be at least $150,000 annually. Since the export of raw

ivory from Alaska is illegal, the entire value of $150,000 may be considered as the contribution of ivory to the Alaskan economy.

REINDEER HERDING, another industry that is included here, involves 250 people, and has an annual value estimated at $115,000.[7]

FUR FARMING is the last of the commercial values to be considered. In 1949, furs produced on fur farms were worth approximately $40,000.[8] This figure has probably not changed greatly to the present time, although the number of licensed fur farms has decreased from 24 in 1950 to 19 in 1951-1952. This decrease is probably in fox farms which contributed very little to the total value of furs sold in 1949.

SOCIAL VALUE

Social values are those values accruing to society as a result of the presence of wildlife.

The principal item in this category is the fact that fully one-third of Alaska, supporting a population of 30,000 people, is habitable only because of the presence of wildlife as a source of food. This value may in part be measured by the value of the animals as food, and as a source of income--thus the meat value, raw ivory, and furs taken by non-licensed natives represent some measure of its worth. These values have already been discussed under the heading of Commercial Value. However, the fact that 30,000 people are enabled to exist in an area that would otherwise be practically devoid of population is also of significance. Based on figures from the 1950 Census,[8] there are more than 32,000 people in the Second and Fourth Judicial Divisions and in the Aleutian area that have no means of subsistence other than wildlife, with the possible exception of mining which involves less than 2,000 persons.

Based on various sources as indicated, Table 9 lists the number of persons involved directly in pursuits dependent upon wildlife. These figures are not additive, for many individuals make portions of their livelihood in two or more of these occupations, e.g. in commercial fishing during the summer and trapping during the winter.

In summary, then, approximately 50,000 people, or well over half of the wage-earners in Alaska, are dependent to a greater or lesser extent upon wildlife for their livelihood.

TABLE 9. ESTIMATED NUMBERS OF PERSONS EMPLOYED IN OCCUPATIONS DEPENDENT UPON WILDLIFE.

Occupation	Number employed
Commercial fishing[a]	31,623
Fishing	14,097
Transporting	2,571
Wholesaling and manufacturing	14,955
Subsistence hunting and fishing	24,000
Trapping[b]	10,500
Licensed	4,800
Non-licensed	5,700
Guiding[c]	120
Management, administration, research[d]	300
Reindeer industry[e]	250
Fur farming[f]	19

a/ "Alaska Fisheries, 1951." USFWS., C.F.S. No. 811.
b/ Estimated from "Big Game, Small Game and Fur Take Report, July 1, 1951 to June 30, 1952, Territory of Alaska," USFWS, Juneau, Alaska.
c/ From List of Registered Guides, USFWS.
d/ Employees of the Alaska Department of Fisheries and U. S. Fish and Wildlife Service.
e/ Belcher, Dale. Letter dtd. Oct. 29, 1953.
f/ Number of Fur Farming licenses sold.

SCIENTIFIC VALUE

Scientific value, as used here, may be considered the worth of wildlife as a means for investigating natural phenomena that may affect man's interests either directly or indirectly. The personnel employed and money expended for basic scientific research involving wildlife, other than research related to wildlife management, can be used as a partial measure of this value.

Several agencies carry out work of this type in Alaska. Among them are the U. S. Public Health Service, the Arctic Research Laboratory, the Arctic Institute of North America, the Arctic Aeromedical Laboratory of the U. S. Air Force, and various universities and museums. On the basis of estimates supplied by some of these organizations, it appears that expenditures exceed $50,000 per annum. This may be considered as a minimum estimate of the scientific value; it is all spent in the Territory and can be considered as net gain.

ESTHETIC VALUE

According to King, esthetic values are "the values of objects and places possessing beauty, affording inspiration and opportunities for communion, contributing to the arts through music, poetry, literature, and painting, and possessing historic and patriotic significance....These values are largely purely personal but are, nevertheless, of vital concern to practically everyone spending any amount of time in the out-of-doors and, in addition, are the values that induce a goodly number to become interested in the out-of-doors and the conservation and proper management and administration of its various related aspects."[2]

These values are extremely difficult to assess in terms of dollars and cents. Some partial estimate can be made on the basis of a survey made by the U. S. National Park Service.[9] During the summer of 1951, 20,252 tourists came to the Territory. Independent estimates indicate that about one-quarter of the attraction for tourists is the wildlife of the Territory. The 20,252 tourists spent $6,336,424; thus, about $1,600,000 could be attributed to attraction by wildlife during a single summer. The total worth is surely far greater than this, for appeal to residents is entirely excluded because of a lack of information.

COSTS OF MANAGEMENT

Although the responsibility for Alaska's wildlife lies with the U. S. Fish and Wildlife Service, a number of other agencies spend funds on management of the resource. During fiscal 1952 funds totaling $2,474,256 were spent by the Fish and Wildlife Service, the Alaska Department of Fisheries, the International Pacific Halibut Commission, the Fisheries Research Institute of the University of Washington, the University of Alaska, the Wildlife Management Institute, the American Museum of Natural History, the Treasurer of Alaska (for bounties on wolves, coyotes, and hair seals), and by private individuals. The breakdown of these expenditures is shown in Table 10.

In order to assess the inadequacy of these management funds we can compare the percentages of annual income spent on management of Alaska's wildlife and other resources. The cost of management averaged 4.0 per cent of the raw value of wildlife in Alaska in fiscal 1952 (see Table 11). Management expenditures, expressed as percentages of the fiscal 1952 income from the different kinds of wildlife, ranged from 1.4 per cent for "other marine mammals" to 6.3 per cent for "resident game and fur." Direct comparisons with expenditures for management of other resources are difficult to make. However, expenditures for management of farm woodlots throughout the United States were 10.9 per cent of the gross sale value of products from the woodlots in 1952 and 13.6 per cent in 1953.[10] Furthermore, expenditures for research alone by 1,934 commercial organizations in the United States in 1952 averaged 2.0 per cent of total sales.[11]

To further explore the expenditures made for management of wildlife in Alaska, we can compare wildlife

TABLE 10. EXPENDITURES ON MANAGEMENT OF WILDLIFE IN ALASKA, FISCAL 1952.[a]

Item	Expenditure (dollars)	Per cent of total
Commercial fish	1,628,144	65.8
Sport fish	109,978	4.4
Resident game and fur	574,144	23.2
Waterfowl	43,397	1.8
Fur seal	96,013	3.9
Marine mammals	22,580	.9
TOTAL	2,474,256	100.0

a/ Includes expenditures by U. S. Fish and Wildlife Service, Alaska Department of Fisheries, International Pacific Halibut Commission, Fisheries Research Institute, University of Alaska, Wildlife Management Institute, American Museum of Natural History, Treasurer of Alaska, and private individuals.

TABLE 11. COMPARISON OF MANAGEMENT EXPENDITURES ON DIFFERENT CATEGORIES OF ALASKAN WILDLIFE, FISCAL 1952.

Item	Raw value	Management expenditure	% of value spent on management
Commercial fish	40,108,490	1,628,144	4.1
Resident game and fur	9,115,791	574,144	6.3
Sport fish	6,656,500	109,978	1.6
Fur seal	2,702,959	96,013	3.6
Other marine mammals	1,561,500	22,580	1.4
Waterfowl	1,062,250	43,397	4.3
	61,207,490	2,474,256	4.0

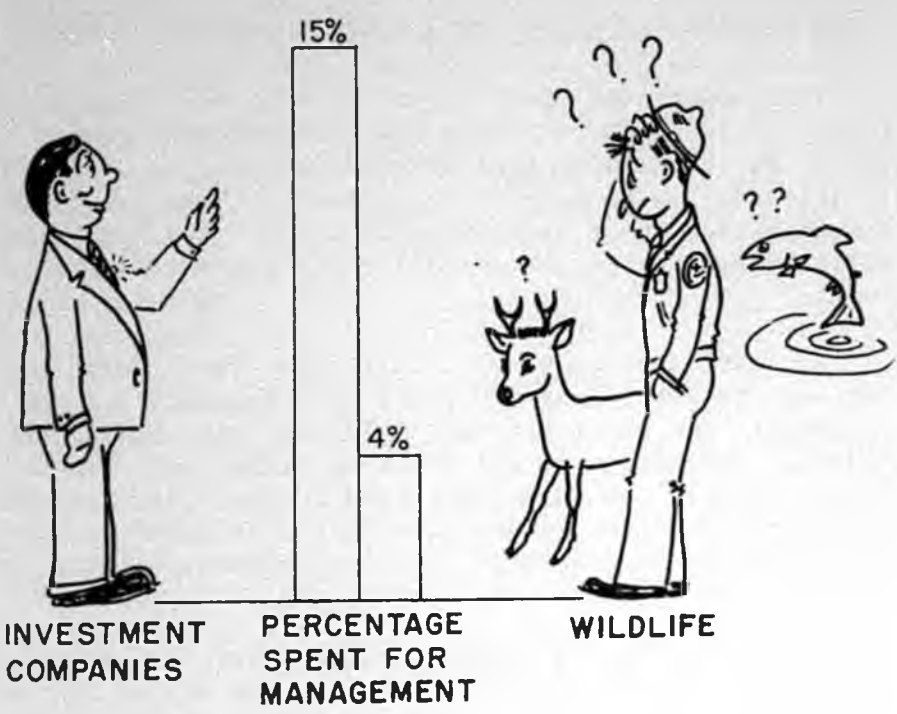
to the investments handled by investment companies. The parallel is not so absurd as it may seem, for the objectives of managing trust funds and wildlife are nearly identical: to conserve the capital stock and to produce the maximum annual income on a sustained basis. The comparison is made in Table 12.

TABLE 12. COMPARISON OF CAPITAL, ANNUAL INCOME, AND PER CENT OF INCOME SPENT ON MANAGEMENT BY INVESTMENT COMPANIES AND FOR ALASKA'S WILDLIFE.

Item	Investment companies[a]	Alaska's wildlife[b]
Capital (dollars)	5,000,000,000	1,360,166,000
Annual income (dollars)	225,000,000	61,207,490
Income spent on management (per cent)	15	4

a/ Information supplied by Prof. J. B. Fetzer, Head of the Department of Business Administration at the University of Alaska.
b/ Capital computed by capitalizing the fiscal 1952 income at 4 1/2 per cent.

Thus it is apparent that the 4.0 per cent spent on management of wildlife annually is certainly minimal!


15%
4%
INVESTMENT COMPANIES
PERCENTAGE SPENT FOR MANAGEMENT
WILDLIFE

THE VALUE OF WILDLIFE COMPARED WITH OTHER RESOURCES

The comparisons set forth here should be of considerable interest to policy makers concerned with resource use. Although more detailed studies for specific areas may be necessary to determine the amount of consideration to be given to wildlife in each area, the general importance of wildlife is evident from this work.

The estimated value of wildlife is the sum of its various values minus the costs of management. A comparison of the estimates for wildlife and for other natural resources is set forth in Table 13 and in the Frontispiece. Raw values are used in the comparison in order to eliminate value added as a result of transportation and processing, and to compare products as nearly as possible at their source.

It is immediately evident that wildlife in 1952 was worth nearly three times as much as the mining industry, and over thirty times as much as agriculture. Even leaving out the value of commercial fish, wildlife exceeded mining in financial value. In terms of employment, the relative importance is the same. The total annual value of wildlife, as determined for fiscal 1952, exceeds the combined value of all other industries based on natural resources in Alaska by nearly 200 per cent.

TABLE 13. COMPARISON OF THE VALUE OF WILDLIFE AND OTHER NATURAL RESOURCES IN ALASKA, FISCAL 1952.

Resource	Raw value (dollars)	Participation or employment (no. of men)
WILDLIFE		
Commercial value		
Commercial fish	$ 39,260,240	31,623
Subsistence	3,250,000	24,000
Raw land fur	1,942,291	10,500
Raw fur seal	2,702,959	---[a]
Raw ivory	8,000	---[a]
Reindeer	115,000	250
Fur farms	40,000	19
Subtotal	47,318,490	
Recreational value	12,394,000	43,421
Scientific value	50,000	?
Esthetic value	1,600,000	?
Gross wildlife value	61,362,490	50,000[b]
Management expenditures	-2,474,256	
Net wildlife value	58,888,234	
MINING	18,000,000	1,925[c]
AGRICULTURE	2,763,166	525[c]
FORESTRY	255,000	100[c]

a/ These figures are lumped together with "subsistence" and "raw land fur."

b/ Many of these people are included in more than one category; hence the figures are not additive. The 50,000 total is my estimate.

c/ Figures for mining and agriculture are from the "Annual Report of the Governor of Alaska" for fiscal 1952, and for forestry, from the "Census of Agriculture: 1950."

APPENDIX I -- METHODS

The data from which the recreational value was computed were obtained by a mail questionnaire sent to 4,119 individuals who bought Alaska Game Commission licenses entitling them to hunt or fish during fiscal 1952. The selection of licensees, the design of the questionnaire, and the handling of the results were patterned closely after the excellent study made by Professor Robert F. Wallace for the State of Washington.[1]

The sample of license holders was obtained from the files of the U. S. Fish and Wildlife Service in Juneau. They were selected by taking the first two names on the list, skipping the next 18 names, taking the next two, etc. (except that all "nonresident general" licensees were included). Each group of two names was designated a pair, with the first name considered the primary respondent and the second name, the alternate. This method of pairing names was used in order to increase the rate of return, since it was known that there was a rapid turnover of the population in Alaska. The effect of the turnover was expected to be especially noticeable, since nearly 16 months had elapsed from the beginning of the license year until the questionnaires were mailed. The return as undeliverable of 1,113 of the 4,119 questionnaires mailed verified our expectation.

In early October, 1952, 4,119 questionnaires (designated the "first wave") were mailed; a month later 2,094 follow-up questionnaires(designated the "second wave") were sent to both members of all pairs for which replies had not been received. Copies of the questionnaires and the accompanying letters are included on the following pages. Because studies in the State of

University of Alaska
College, Alaska

October 10, 1952

Dear Sportsman:

The University of Alaska is making a study of the annual expenditures of hunters and fishermen in Alaska. Commercial fisheries are first and furs are third in importance of the natural resources in the Territory. Wildlife and sport-fishing are also important---just how important only you can help us determine. If we find that expenditures on hunting and fishing are as large as we expect, this information will be very valuable in the management and protection of our fish and game.

Your name was one of several hundreds selected from a list of the 1951 license holders to furnish estimates of the amount of money spent for hunting and fishing in Alaska from July 1, 1951 to June 30, 1952. No expenditure is too large or too small.

We would appreciate greatly the few minutes of your time that it will take to fill out the enclosed questionnaire and return it to us by October 25. No postage is required. Thanking you for your co-operation, I am

Sincerely,

John L. Buckley

John L. Buckley
Assoc. Prof. of Wildlife Management

JLB:lh

University of Alaska
College, Alaska

November 10, 1952

Dear Sportsman:

We are enclosing a duplicate copy of our Wildlife Economic Survey questionnaire on the chance that you may have misplaced the one we sent you a week or so ago. If you have already answered the questionnaire and we have not yet received it because of the distance involved, please disregard this letter.

Our sample was drawn on a scientific basis from the Alaska Game Commission records. It is therefore necessary for us to follow up each name on our list to get the dope from him. If we were to simply substitute some other man's figures for yours it would seriously affect the reliability of our results.

Do not hesitate to return the questionnaire because your expenditures were small. What we need is a reliable average that includes all types of expenditures. Therefore small expenditures are as important as large if our survey is to be accurate.

Preliminary returns suggest that hunting and fishing expenditures are about 12 million dollars a year in Alaska. We are now trying to get all the questionnaires back by November 30. Will you help?

Thanking you for your help, I am

Sincerely,

John L. Buckley

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TERRITORY OF ALASKA WILDLIFE ECONOMIC SURVEY

Please fill out the following questionnaire and return in stamped, self-addressed envelope. No postage is necessary.

URGENT--We need your help in getting these questionnaires back by October 25.

IT IS IMPORTANT that you include ONLY expenditures made IN ALASKA FROM JULY 1, 1951 to JUNE 30, 1952, in connection with hunting or fishing.

1. Amount spent in Alaska from July 1, 1951 to June 30, 1952, for Upland Game Hunting (ptarmigan, grouse, spruce hens, rabbits, etc.)

Transportation.....$_____
Food and lodging.....$_____
Guns.....$_____
Ammunition.....$_____
Clothing.....$_____
Dogs and dog food.....$_____
Miscellaneous (_____)..$_____
Total.....$_____
Number of days spent hunting.....

2. Amount spent in Alaska from July 1, 1951 to June 30, 1952, for Big Game Hunting (deer, caribou, moose, sheep, goat, elk, buffalo, etc.)

Transportation.....$_____
Food and lodging.....$_____
Rifles and telescopes.....$_____
Ammunition.....$_____
Clothing.....$_____
Guides, horses and packers.....$_____
Miscellaneous (_____)..$_____
Total.....$_____
Number of days spent hunting.....

3. Amount spent in Alaska from July 1, 1951 to June 30, 1952, for Waterfowl (ducks, geese, etc.)

Transportation.....$_____
Food and lodging.....$_____
Guns.....$_____
Ammunition.....$_____
Decoys.....$_____
Clothing.....$_____
Dogs and dog food.....$_____
Miscellaneous (_____)..$_____
Total.....$_____
Number of days spent hunting.....

4. Amount spent in Alaska from July 1, 1951 to June 30, 1952, for Sport Fishing.

Transportation.....$_____
Food and lodging.....$_____
Fishing tackle.....$_____
Clothing.....$_____
Boat and motors.....$_____
Miscellaneous(_____)..$_____
Total.....$_____
Number of days spent fishing.....

5. Other General Purchases in Alaska from July 1, 1951 to June 30, 1952, in connection with hunting and fishing.

Tents.....$_____
Sleeping equipment.....$_____
Stoves and lanterns.....$_____
Cameras and camera supplies.....$_____
Miscellaneous (_____)..$_____
Total.....$_____

GRAND TOTAL OF ALL EXPENSES FROM JULY 1, 1951 TO JUNE 30, 1952...$_____

Washington have indicated that there is little difference in the replies to follow-up questionnaires and to personal interviews, and because the geographic size of Alaska made personal interviews impracticable, only the two waves of questionnaires were used. Hereafter completed questionnaires are termed replies, and questionnaires returned unopened are called returns.

The data from the completed questionnaires were tabulated by license types. Replies from the first and second wave were segregated. It was assumed that a reply from either member of a pair constituted a reply, but if replies were received from both members of a pair, only that from the primary member was used. In order to obtain data for each pair, the following procedure was followed: In those instances where no replies were received from either member of a pair, the average figures for the pairs with replies were used, because it was believed that the proportion of first and second wave replies would be approximately the same in the two groups. On the other hand, the average of the second wave replies was used for those pairs where the questionnaires were delivered to the respondent but no replies received, because it seemed likely that these would be the most difficult replies to obtain and would thus more closely resemble the second wave returns [the expenditures reported in replies to the second wave averaged about 20 per cent less than did those to the first wave (c.f. references 1 and 12)].

The results were then tabulated, the averages computed, and the results expanded for each type of license. An example may serve to clarify the method: Among resident trapping license buyers there were 152 replies to the first wave and 56 to the second; three pairs were returned unopened and there were 104 pairs with no replies. The $24,109.77 estimated spent by the 104 pairs with no replies and the $996.39 estimated by the three pairs of unopened questionnaires were added to the total of $58,789.70 reported by the 177 usable pairs to arrive at an estimated total expenditure of $83,976.86 by the 284 pairs. This last figure was expanded by multiplying by the factor 19.94 (5,663

licenses divided by 284 pairs) to estimate the total expenditure for all licensed trappers.

The same procedure was followed for each item on the questionnaire for all groups of license buyers except nonresident general licensees. In the latter case, two groups of people are involved: those that buy a license to hunt big game, and those that buy the license to trap. Judging from the addresses of the license holders, 75 per cent bought licenses for hunting. Furthermore, no follow-up questionnaires were sent to the nonresident general license holders; instead, the average amount spent by those individuals that replied was reduced by 20 per cent to arrive at an estimate of the amount that would have been reported by respondents to the second wave questionnaire. The expenditures by hunters exceed by far the expenditures by trappers, so the average of each group was used in a proportion of 3 hunters to 1 trapper in the final computation. Except for the factors just mentioned, the computations for the nonresident general license buyers were performed in the same manner as for all other groups.

The validity of the sample was estimated by computing the standard error of the mean for all license groups combined, based on all replies but exclusive of estimated expenditures supplied for missing returns as outlined above. The standard error is $20.81. The fiducial limits at two standard errors (approximately the 95 per cent level) are ±11.7 per cent of the mean. Fiducial limits computed for the different kinds of licenses or categories of expenditures would almost undoubtedly be wider than the limit for the total expenditure, because there were fewer respondents in these smaller groups. Nevertheless, we can be reasonably sure that our total estimate of $12,121,500 is within 11.7 per cent of the total expenditure.

APPENDIX II -- SUPPLEMENTARY TABLES

APPENDIX TABLE A. PERCENTAGE OF POPULATION PURCHASING LICENSES, AND AVERAGE EXPENDITURES OF SPORTSMEN IN ALASKA AND IN SELECTED STATES.

Area and license type	Date	Percentage of population buying license		Average expenditure Per resident license buyer	
		Hunting	Fishing	Hunting (dollars)	Fishing (dollars)
Alaska		15.9	18.6	294.58	
Trapping	1951-52			190.80	104.80
Hunting	" "			188.50	141.06
Fishing	" "				136.05
Maine	1952	13.5	15.9	125.00	130.00
New York	1942[a]	5.4	5.4	118.00	
North Carolina	1949	6.8	7.0	51.36	88.71
Ohio	1947	10.5	8.9	41.88	56.95
Oregon	1951[b]	19.4	14.2		83.24
Vermont	1944	19.0	17.0	17.67	
Washington	1950	17.8	17.4	200.00	
Entire United States	1950	8.3	9.8		

a/ Deer only.
b/ Salmon and steelhead only.

APPENDIX TABLE B. PERCENTAGE DISTRIBUTION OF EXPENDITURES BY LICENSE TYPE.

Item	Type of license						
	Combined	Nonresident General	Nonresident Small Game	Nonresident Fishing	Resident Trapping	Resident Hunting	Resident Fishing
Transportation	22	19	13	26	21	21	23
Food	13	11	13	15	13	12	19
Boats & motors	11	2	7	7	12	13	16
Shotguns, rifles, etc.	11	6	23	—	17	15	--
Cameras	10	2	13	19	7	8	11
Fishing tackle	8	1	9	15	5	6	14
Clothing	4	3	3	5	5	5	5
Ammunition	3	1	6	—	5	4	—
Guides	2	45	1	—	--	1	--
Misc. (dogs, tents, sleeping equip., etc.)	16	10	12	13	15	15	12
TOTAL	100	100	100	100	100	100	100

APPENDIX TABLE C. NUMBER OF LICENSE HOLDERS, BY LICENSE TYPE, IN JUDICIAL DIVISIONS.

License Type		Judicial Division 1	2	3	4	Total
Nonresident General	Civilian	100	8	197	103	408
	Military		2	13	4	19
	Total	100	10	210	107	427
Nonresident Small Game	Civilian	78	12	799	218	1107
	Military			480	258	738
	Total	78	12	1279	476	1845
Nonresident Fishing	Civilian	318	25	4995	1442	6780
	Military			2808	1735	4543
	Total	318	25	7803	3177	11323
Nonresident Total		496	47	9292	3760	13595
Resident Trapping	Civilian	1440	120	2722	1361	5643
	Military			20		20
	Total	1440	120	2742	1361	5663
Resident Hunting	Civilian	3364	229	9008	3115	15716
	Military		30	2282	1736	4048
	Total	3364	259	11290	4851	19764
Resident Fishing	Civilian	340	24	1884	438	2686
	Military			1059	654	1713
	Total	340	24	2943	1092	4399
Resident Total		5144	403	16975	7304	29826
	Civilian	5640	418	19605	6677	32340
GRAND TOTAL	Military		32	6662	4387	11081
	Total	5640	450	26267	11064	43421

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