

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WASHINGTON, D. C. 20240

December 6, 1963

Informational

Memorandum

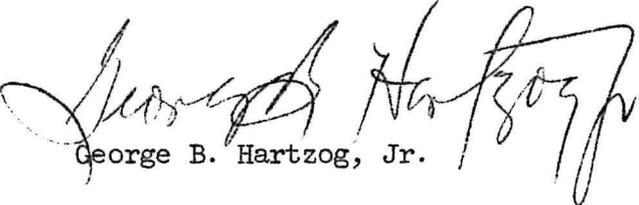
To: All Field Offices

From: Acting Director

Subject: Transmittal of Dr. Leopold's Address at Yosemite
Conference of Challenges

The brilliant address of Dr. A. Starker Leopold at the Conference of Challenges at Yosemite has received a great deal of attention, as it should. Dr. Leopold--Professor of Zoology and lately serving as Acting Vice Chancellor at the University of California--is a foremost authority in the field of Wildlife Management.

Recently he served as chairman of the Secretary's Advisory Board on Wildlife Management in the parks. The report of that Board emphasized the need for research and management in the preservation of the parks. This report and Dr. Leopold's remarks at Yosemite should be read and studied by each of you. We hope you will share this material, also, with your staff.


George B. Hartzog, Jr.

Enclosure

WILDLIFE MANAGEMENT IN THE FUTURE

Dr. A. Starker Leopold
University of California, Berkeley

There are several built-in anachronisms in the legislation that created the National Park System. Congress specified that the parks are to be preserved in a natural state, and in the same sentence provided that they be used and enjoyed by the public. Preservation and use are inherently antagonistic purposes, and as all of you know only too well, some of the most difficult problems of park management revolve around the differing interpretations of what constitutes a proper blend of preserving and using the national parks. Additionally, there is considerable latitude in defining the term "natural state." What ecologic situation is, or was, natural? Notwithstanding the most conscientious efforts of Congress to define park management policies, it falls in the final analysis upon you men to decide many of these moot questions.

Today I am taking advantage of the very kind invitation to meet with your group to present some of my own personal views on this subject with the emphasis on the wildlife resource within the park--its preservation, management, use and enjoyment by the public. Although, as the chairman stated, I serve with the Secretary's Advisory Board on Wildlife Management, I am speaking today strictly in an unofficial and completely informal capacity as an interested citizen. Naturally I shall draw upon many of the ideas which were brought out in the various discussions held by this Board and which were reflected in our report to the Secretary on the subject of "Wildlife Management in the National Parks."

I understand that Secretary Udall has essentially adopted our report, and that the National Park Service has been asked to implement it, at least in its general or broad aspects. And so I shall direct my remarks today to the problems of implementation, as I see them.

I would like to frame my discussion under five main headings: First of all, long range ecologic planning; secondly, the problem of regulating wildlife populations within the parks; thirdly, the problem of restoration of wildlife populations within the parks; fourthly, the question of use and enjoyment by the public; and lastly, the matter of the research program that must underlie this whole area of endeavor.

Long-Range Ecologic Planning

I would like to start by re-stating what I consider to be the goal of wildlife management in the national parks, as defined in our report to the Secretary. May I quote one sentence of that report: "As a primary goal, we would recommend that the biotic associations within each park be maintained or, where necessary, recreated, as nearly as possible in the condition that prevailed when the area was first visited by the white man. A national park should represent a vignette of primitive America." If that is the goal, what are the problems that face you, gentlemen, in arriving at this goal, in other words, in implementing this concept?

First of all, it is quite clear that long range ecologic planning must accompany the long range developmental planning which has been characteristic of the national park program in the past and is being greatly accelerated and better developed today than ever before. It is the need for and the nature of this long range ecologic planning that I would like to spend a few minutes on.

In the past it has seemed to me that within the national parks the ecologic situations, which as we all know are never static, always changing, have been subject to modifications, changes, evolutions, and progressions, or, in the terminology of ecologists, successions, without planning, and without adequate management. Many of the operational policies of the Service that have influenced the successions of plants and animals, in other words, the ecologic situations within the natural areas in the parks, have been inadvertent and sometimes unintended. There have been policies regarding fire, for example. If a fire breaks out, extinguish it. If too many insects appear in a forest stand, kill them. For a long time the policy of the Service was that we couldn't have too many animals because people like to see animals. This policy subsequently was changed by recognition that sometimes you can have too many animals, and so now if there are too many deer or too many elk, the policy is: reduce them--trap them--or if you have to, shoot them. All of these and many other operational programs within the park have ecologic implications of one sort or another and the aggregate effect of many such programs operating superimposed one upon another, has been the creation of ecologic situations frequently far from what was intended for preservation in the first place.

I would like to take an individual park and illustrate this problem in terms of several different, in fact quite contrary, ecologic situations. It so happened that when we had coffee half an hour ago I had the good fortune of walking out with Oscar Dick. I had another park in mind as an example, but having taken five minutes to talk with Oscar about the current situation on Mt. McKinley, I will use that one. It is a park that I have known in the past and did a little work on ten years ago with Lowell Summer. On Mt. McKinley National Park we have, of course, a fabulous mountain which is one of the great attributes of the park. Additionally, of all the parks in our system, McKinley has perhaps one of the greatest displays of wildlife. Certainly it is the objective of the Service to maintain in maximum variety and reasonable abundance this display of wild animals which is so spectacular on McKinley National Park.

What is this actually going to mean in terms of the operation of that park and the things that face Oscar Dick today? Let's start with the caribou. The caribou was the abundant ungulate of the Arctic. It certainly is an animal that we ought to maintain on McKinley in reasonable abundance forever into the future. What is its status in the park?

Caribou come to Mt. McKinley in the summertime. The park is summer range. That, of course, is the period when visitors come to Mt. McKinley, too, so they often have the opportunity to see bands of caribou drifting across the foothills and lower reaches of the park. During the other six months of the year, the winter months, those caribou are not in the park at all. They drift to the north into a

winter range completely removed from the jurisdiction of the National Park Service. The winter range happens to be Bureau of Land Management owned, but the present operational responsibility for wildlife management is in a large part being assumed by the State of Alaska. Certainly the National Park Service, McKinley Park administration specifically, has a substantial vested interest in what happens on that winter range, even if it is off the park. The problem as we understand caribou management today is that many or most of the winter ranges that once supported the fabulous herds of caribou have been burned out. The lichen range which keeps the caribou alive in wintertime can be destroyed more rapidly by a fire than by any other one factor. Therefore, the maintenance of this particular facet of wildlife display in the park is, in the long run, going to hinge on an adequate, effective program of fire control on the winter range, which lies to the north of the park and outside its boundary.

Yet another animal that occurs within the park, namely the moose, has just exactly the opposite type of ecologic affinity. The moose was not an abundant animal in this area originally. It certainly was present. But many of the fires which in the past have destroyed the caribou range have at the same time, and within the national park, created range for moose--stands of willow, birch, aspen, mostly along river bottoms. These are the winter foods of the moose. And so over the past half century, the moose population has increased. It is an important part of the wildlife display that people see on Mt. McKinley Park. The animals have increased to the point where now there is some concern about the impact of the moose upon its own range, and the relationship between the total moose population and the carrying capacity of the aspen and willow ranges for moose in the future.

The problem here becomes an entirely opposite one from that of the caribou. It is highly likely that there shall have to be some form of regulation of the moose population to maintain the balance between the winter forage and the animals that are using it.

But looking beyond that, and far more difficult really from an administrative standpoint, is that the critical vegetation involved--willow, aspen and birch--is only a transitory stage. It is a successional stage following a fire that may have burned 40 years ago. And if we are going to stay in the moose business, this vegetation has to be not only protected from over-use by moose, but has to be renewed by burning or some other cultural method that will renovate the stands of these growing broadleaf trees on which the moose are supported.

These are two absolute diametric opposites in terms of ecologic problems, and both of them are being posed to Oscar Dick and his administration of that park today.

There are many other animals on the park besides these two. The Dall sheep, high on the mountains, are maintained as part of the climax arctic alpine ecosystem. Single protection of their sheep and their range is probably going to be adequate, as nearly as we can tell, to maintain the Dall sheep forever.

Wolverines and other carnivores, will be maintained insofar as their food supply is available. When it comes to the wolf, for example, and to a lesser extent the grizzly bear, the populations of these two species will be a function of the amount of available live or dead meat in the form of caribou or moose available to these flesh-eating animals in the future. All of these animals then, in one form or another, we want to maintain, but it will require a highly skillful, and, in many cases, exceedingly difficult job of management, of manipulation of ecologic situations to preserve what it is that we have set up to display before the public.

This involves many things. Obviously it involves a form of zoning. We are going to have natural areas where no management is contemplated. There will be managed areas--frequently these will be the areas visited by people who come to see the park. Lastly, of course, there are the developed areas which don't particularly enter into the subject of my talk.

The functioning of the management program on those areas designated for management for specific ecologic purposes is, as I see it, much the most complicated and much the most difficult problem of park management today. Thus, if a long-range plan is developed for Mt. McKinley as part of the total and very healthy program long-range planning which is emerging now within your service, it would include a specific spelling out of the goal of management and envisioning what McKinley should look like 20 years from now and what should it look like 100 years from now, in terms of the maintenance of these ecologic resources; and then subsequently every single step in day to day administration...the manner in which fire is handled (that is I'm thinking here of accidental fires that are started); the control of insects; the regulation of game levels...all of these become part of a plan with a specific long-range objective in the future. In one area a fire would most certainly be most rigorously put out--and in another area it may be permitted to burn, so long as it conforms to the long-range plan for this Park.

Thus handled, it seems to me that a future visitor coming to Mt. McKinley 100 years from now may have the opportunity to see the type of scene that was observed by the pioneers, the first white men who came into that country, Lt. Schwatka, or whoever was the first visitor to that area. This, I think, is the objective of ecologic planning in the parks.

Take another example closer to home. What Oscar Dick will try to do is to devise a plan to maintain something which we now have. He may have to regulate populations, he may have to manipulate environment to some extent, but this will be a maintenance plan.

In some areas within our National Park System, and certainly within State parks and other areas of lesser acreage, the problem may be to completely recreate scenes that represent the natural situation in a given area. One I gave some consideration to some years ago is an area under the administration of the California Division of Beaches and Parks. Button Willow, in the heart of the San Joaquin Valley, was set aside as a refuge for the Tule elk...the typical ungulate that was native in the San Joaquin and Sacramento Valleys. Under the administration of the

Fish and Game Department, Button Willow became essentially an outdoor zoo. It was then turned over to Beaches and Parks for administration. There were a large number of elk in a small fenced enclosure--2,600 acres I think it is. A few years ago when Elmer Aldrich still worked with State Beaches and Parks, prior to his assuming the directorship of the Division of Recreation, we discussed this operation. Why could not this little 2,600 acre park be rebuilt into a scene such as had been typical of the San Joaquin and Sacramento Valleys at the time of its exploration? This would mean a certain pattern of Tule marshes. The elk would be one of the components. So also would be the Maryland yellowthroats and certain types of blackbirds--red wings and tri-colored, and yellow warblers. There should be wildflower areas also. Components of what might have been a part of the original Valley could be rebuilt into that little area starting in this case from scratch.

Fortunately, there aren't many areas so completely run down within the National Park System that you have to start at that level. But I see no reason why this is not possible in any park system. If we are trying to show a natural scene typical of an area, we can build it--if we have to. Best of all, if we have such a scene as Oscar Dick has we certainly should, with skill, be able to maintain it.

Regulation of Wildlife Populations

One of the aspects of this wildlife management program will be the regulation of game populations. Certainly it is well known and accepted by everyone now, I believe, that too many ungulates in a given habitat can destroy not only their own habitat but that of any other animals that live in the area. The classic case that you have had to fight within your service has been, of course, the case of the Yellowstone elk. Some people recognized 30 years ago, that the park was over-populated. However, there was indecision about control, and inadequate efforts were made to reduce the elk by trapping or by other methods that were not completely satisfactory in coping with the problem. So over the years the north Yellowstone area occupied by this particular elk population slowly deteriorated. The elk herd dropped down to roughly 1/3 of what it had been and it still was overstocked. The habitat for the white-tailed deer and to a considerable extent that of the mule deer was destroyed in the willow bottoms. Even the moose habitat in the willows was being threatened.

Finally, a couple of years ago, this problem was faced squarely, and I may say that the job that was done by the Service, by Lon Garrison and his full crew, in bringing that elk herd down to estimated carrying capacity of the range was magnificent. I'll go on and say one more thing--had it not been for this completely decisive piece of work by the Park Service in coping with an excess game population, it would have been completely impossible for the Advisory Board to have gone to the Secretary and said--"The Park Service is able to cope with its game problems without recourse to public hunting." We were able to do this because we could point to one recent example where it had been done incisively and done well. So we have that to be extremely thankful for.

But the job is only beginning. In the case of the Yellowstone elk there was a tremendous public relations problem--selling a new idea to a hostile public--but this had to be done by Lon, with a great deal of help that he received. Wherever we have excess population of game in the Parks and where control becomes necessary I don't doubt you will have it all to do again. Every bit of it. It is completely impractical, politically, to feel that a lesson learned in one State has any real application elsewhere in terms of selling people--you have to start right from scratch and do it all again. I'm speaking here as an authority. Everybody in the game business in the United States knows that you have to control deer herds. We have done as much research on this in the State of California as anyone, yet we have been unable politically to bring about an adequate control of deer populations in this State. We will someday. The fact that Utah is doing it, that Nevada is doing it--doesn't help us a bit. We have to sell it all here--and you will, too, wherever you have to face anything comparable to the Yellowstone elk situation. It must be done! Certainly this is part of the long-range plan of maintaining the wildlife population, and, had this been done 20 years earlier, Lon would be carrying 10,000 elk now as a basic breeding stock instead of 5,000--maybe more than that. So, one of our purposes, and a major one, is to maintain in maximum, reasonable abundance these wildlife populations for people to come to see in the Parks. The regulation of populations certainly will have to be done wherever game begins to get out of hand and to destroy its own habitat.

I had a very enlightening view of a situation in East Africa recently where this problem was not faced squarely and where a stage of degradation was reached far beyond anything that has happened in Yellowstone or even could happen in the next 10 years. This is the case of the elephants in Murchison Falls National Park, Uganda. I scarcely could have believed the impact these animals have had on the landscape. Murchison Falls is a tremendous natural park area, with a spectacular falls of the Nile River, and rich forests interspersed with open grassland areas, populated with the great variety of game which is indigenous in Africa.

Over a long period of years, before Murchison became a National Park, it was a game reserve, and the elephant population which, presumably, was quite low initially slowly has built up over a period of 30-40 years of complete protection. Finally, in the last 10 or 15 years, the elephants literally have erupted. In numbers there are now approximately 80,000 elephants in and around this area. In any given time during the recurrent census periods they often count 20 or 25 thousand elephants within the Park. Remember that Lon's difficulty has to do with 10,000 elk. I'm talking about twice that many elephants. They have gradually exhausted their forage supplies in and around the grasslands and moved into the forests. Some elephant back along the line learned to girdle trees by use of the tusks to obtain the bark for food when nothing else was available. This trick quickly spread through a population of 20,000 elephants who now go around girdling trees. They hook the bark with their tusks and a strip about 8 or 10 feet high is cleaned of bark and then they go on to another one. This bark keeps them alive, although it must be rather poor forage. The girdled trees die, and recurrent hot grass fires prevent regeneration of the forest.

Murchison Falls Park is being turned rapidly from a forest into a pure grassland, with elephant grass about 8' high which is essentially sterile. Nothing lives in the tall grass except one little species of antelope. As far as you can see on the hills of this magnificent piece of parkland, remnants of forest are visible, in the form of stubs and snags that the termites have not yet eaten up. As you enter the edge of the Park you come to the current belt of girdling--about a mile of dying timber surrounding the open grass area. Given another ten years and the natural wildlife of Murchison Falls National Park will be essentially gone because those elephants cannot go on girdling forever. They sooner or later are going to exhaust their own food supply. The elephant population will certainly collapse. Additionally, they will have destroyed the habitats of all the monkeys, the variety of birds that lived in the forest, the forest antelopes, and many of the forest border species that occurred there. A complex and tremendously interesting fauna will be reduced to a highly simplified fauna of very little public or scientific interest. Murchison Falls will still be there--but the original park values will not.

Thank goodness, we don't have elephants in our national parks. But when you go away from home and see the principles we talk about here exemplified to an extreme degree, you come home more determined than ever to see that the concepts of ecologic management in our own parks will be properly applied.

And so, it seems to me, that keeping constant track of populations of animals that might destroy habitats, that might seriously inhibit or alter ecologic situations in the parks is a responsibility that will never leave you. It will be with you forever. Often this involves cooperative programs with outside agenciessuch as maintenance of winter range of the caribou I was speaking of at McKinley. Certainly, many of the herds of deer and elk, and even of antelope, that occur in our parks are migratory. They are in the park seasonally and outside part of the time. Proper management of these herds will involve cooperation with the Forest Service, BIM, State Fish and Game Departments, and other organizations that are actively involved with management of these animals during some season of the year. I repeat, had the Yellowstone elk been so managed 20 years ago, they would now be a far more abundant resource than they are today.

Where this type of management is necessary, it will involve not only cooperative management with outside agencies, but I would hope, cooperative research with these agencies as well.

There is one other thing I would like to comment upon briefly concerning control of game. A year ago when we were gathering information and preparing our report for the Secretary, the concept that there might be effective birth control methods in wild animal population seemed so remote as to be a little bit far out, and we decided to skip the whole thing in terms of our report. Gordon Fredine and others had been saying to us, though, for a long time "If only we could find some adequate way of developing a birth control program in these animals we wouldn't have to kill them within the parks." Recently, in connection with another assignment I have with the Secretary, namely a reappraisal of the whole program of

Federal predator control, I find that there is a great deal of experimentation and research going on in birth control methods in wild populations--with some of the results looking quite practical. For example, at the Denver laboratory of the Fish and Wildlife Service it has been found that pills containing stilbesterol fed to coyotes during the short period in the spring when mating and actual implantation and development of embryos takes place, can effectively knock a whole generation of baby coyotes out--they simply don't appear. Now if this can be developed for other types of animals, this may give us a painless, invisible, but nevertheless effective tool that can be used for regulating game populations where they are threatening to be excessive in numbers. The method would be especially applicable in park areas where we don't want to shoot animals unless we have to. Here would be an alternative way to do it. In terms of the coyote experiment, they actually dropped 5,000 of these baits from an airplane in a given area known to be well populated with coyotes, and came back later and made an intensive collection of the animals within that area and found only one pregnant female out of all the females that they collected. In short--it appears to be effective. If we can develop birth control methods for coyotes, maybe we can for deer and elk.

Restoration of Wildlife Populations

Population control is one of the problems that you must meet head on when it develops. Perhaps more important, though, in the long run is the matter of population restoration. Here is an area that I don't think the Park Service has adequately approached yet, in the long-range planning, and frequently not in the short-range planning. When a native animal is missing from a park it should, if at all possible, be restored and put back on display for the public coming to see this park. To me, this is a grave moral responsibility. As an example--perhaps not a typical one--of opinions that I have encountered here and there in the Park Service, during our tour of Parks a year or so ago, I talked to one junior official within a park and asked about a deer herd that I knew had been a problem herd. There are several publications on this herd. It was a herd that summered in the national park and dropped down and wintered outside, on an area under the jurisdiction of the Forest Service and the local State game commission. This lad assured me that the herd was no longer a problem. They had all died off. To me, that is a major problem. If that herd is gone, I would want to know why, as administrator of the park, and what can we do about getting it back. These were animals that were in the park in the summer. They were there to be seen. Now they are all dead. Obviously we are involved here again with a cooperative approach to management. The park has an invested interest in the game. So also do a couple of other agencies. Jointly, I think, they should investigate and then manage the remnants of this herd to build it back to a healthy condition, so that once again deer are on display for the people who come to the park. The "natural state," to me, would seem to mean that there should be some deer in the landscape....if there were deer originally.

Sometimes population restoration involves simple reintroduction of an animal we know to have been there, where there is reason to think the range will be able to maintain the animals today. One such case I know was considered 8 or 10

years ago--the question of putting the bighorn back in Big Bend National Park. I can recall discussing that problem with Olans Murie on an occasion when I was working on wildlife in Mexico and Olans wanted to know about the availability of bighorn stock across the Rio Grande River from Big Bend. Could we get a breeding stock that would be essentially the native strain? As it turned out we could not. The bighorn was extinct at that time or on the verge of extinction in the whole state of Coahuila. To my knowledge the Park has not brought bighorns back into this area. I know that bighorns are being shipped into the Big Bend area. But it is my understanding that the State Fish and Game Department is releasing them in an adjoining mountain range, from which they will perhaps reenter and reinvade the Chisos within the park.

But why should not the Park Service itself have brought them in? The desert type of bighorn was native. They were exterminated before the area was brought into the park system. The restoration of the bighorn, it seems to me, would be one of the first things I would want to consider in recreating the area as a natural area representing the arid or semi-arid type of mountain range in Texas.

There are many other areas where antelope and even bighorn could be brought back. I don't know what the status of the Lava Beds National Monument may be in terms of its capacity to support bighorns, but as part of the long-range plan for the lava beds, certainly the restoration of the bighorns should be a major consideration.

When it comes to bringing back large predators that once were present and now are extinct...you get into some additional complications. But I'm not convinced that it is impossible. For example: At one time Isle Royale had a grossly excessive population of moose with destruction of range and periodic die-offs. Accidentally, a group of wolves crossed the ice and reinvaded Isle Royale. Now you have an extremely interesting balance between wolves and moose on that island being studied by Durward Allen and his crew from Purdue. I am raising the question--are there any similar situations to this, where a predator could be brought back deliberately? What of Acadia, for example...where you have an incipient problem of white-tail deer overpopulation in the Park? Might either wolves or cougars, which were native in the northeastern part of the continent, be brought back on that island, thus not only helping solve the deer problem, but, at the same time, adding a component of the natural fauna back in the park where it belongs?

Grizzly bears and wolves in areas adjoined by livestock ranching are considerably more difficult. I talked to Lon Garrison this morning about some careful inquiries he had been making into the possibility of restoring wolves in the Yellowstone. He said the reaction is quite negative, to put it mildly, in the adjoining areas. Putting wolves back in cattle country is liable to lead to a great deal of trouble. Yet as a general principle, and a long-range objective in all the parks, the restoration of as many native animals as possible should certainly be a part of your planning. Sometimes expediency may prevent you from bringing in a dangerous predator to solve one problem that would create three or four more.

Frequently, the mere reintroduction of a breeding stock is not the problem at all...but rather, a complete restoration of a range, a reconstruction of ecologic situations to make possible reintroduction of a species, such as antelope in one place or bighorn some place else. This is always more difficult to do. A great deal more research is required...before management is considered, and certainly before management is undertaken. Because it is difficult, however, does not mean it should not be done. The possibilities and limitations of restoration of game range is one of the first things I would like to see research carried out on. The resultant management might, I think, be essentially invisible. For example, a sagebrush flat that has antelope in it, and another sagebrush flat that won't support antelope, may not look very different. Management may be a question of adding a mixture of grasses, or weeds, or various other natural plants. The management could be accomplished, the antelope restored, and frequently there would be no drastic change in the appearance of the country at all. But certainly the change with animals there would be a substantial one in terms of impact on the visiting public.

Public Use and Enjoyment of the Parks

Speaking of the public and their use and enjoyment of the parks, I have taken the view all along, and I would certainly continue to defend it, that the visit to a national park should be a qualitative experience and should emphasize natural values. I'm speaking about the natural parks, not the recreation type areas which have problems entirely their own. Scenery, wildlife, the plant associations in a given area are components of a qualitative experience. You simply add one species of animal, or take one animal out, and you have changed the qualitative experience substantially for the individual visitor. Our responsibility, I think, is to maintain this qualitative level of experience, and to me this means maintaining the native animals along with the scenery and along with the forest and the other components of the natural scene. A very small area, really, of the whole United States is involved in the national parks as you all know...less than 1% or a fraction thereof. Within this tiny area relatively no effort, I think, should be spared in terms of supplying a qualitative product to the visiting public, as a part of but by no means as a subservient part of, the great rush that is developing within this country for creation in the man sense. We have millions of people wanting millions of places to go, for all sorts of active and passive forms of recreation. The part that I envision within this total complex for the natural parks within your system is strictly a qualitative one based on natural values. And the proper management of wildlife and the restoration of these natural values to their absolute ultimate seems to me a responsibility of the Park Service.

On the whole, if you think of your visitors in the total numbers that come through a Park, as for example here in Yosemite, the vast majority are going to look at the park through a windshield. Roadside ecologic management, including roadside wildlife management, may be the most important facet of all, in creating this vision I am talking about. The great primitive areas that lie in the back country, are generally not subject to intensive management. Frequently there is no reason for managing other than offering basic protection and maintenance of the

natural values as they exist. The intensive management where you are putting back things (and this costs a great deal of money when it involves rebuilding of the habitat), will probably be those roadside areas that people see, as they drive in and out of the parks. So, the wildlife management that I speak of may, in the final analysis, not be spread over your park evenly. There will be certain jobs to do here and there in perhaps any part of a park, but the intensive part may be the roadside area to present to the visitor the game, the native animals, the native flowers, and of course the trees. Sometimes this may call for clearing the forests--the actual removal of types of vegetation to create something entirely different. If this is part of a total long-range plan, the objectives of which are to reconstruct the native scene, it is just as legitimate an activity in the national parks as the removal of elk where they are destroying something. To me a tree is no more sacred than an elk, and if it requires the removal of some trees to create or maintain natural scenes other than forest, then I would say it is an entirely appropriate facet of management.

Ecological Research

Now the research program--the last item on which I want to comment. The research that will be required to do this job intelligently is simply enormous. And, I must say, in my opinion, and apparently that of others, the contribution by the National Park Service to this type of research has been very little indeed...in the past. I think there will have to be a complete overhaul in your thinking, in the thinking of the Park Service at the Washington Office level when they are going after appropriations, and lastly the thinking in Congress regarding research in the National Parks.

To begin to do the research job will require utilizing all the cooperation, all the help, all the knowledge that can be obtained from the Forest Service, Fish and Wildlife Service, and any other bureaus, that conduct research, but nevertheless constructing at the same time your own research program. This idea is stated in strong language in a report by the Advisory Committee to the National Park Service on research from the National Academy of Sciences and the National Research Council. This report was alluded to in one or two of the previous talks today. I am not sure it has been released or how many of you have seen it. It is fairly recent. The letter of transmittal to the Secretary of the Interior was dated August 1. But let me read to you a few of the statements which I am afraid may be true. This is from the abstract of the report regarding the National Park Service's responsibility in the research area. I quote:

"Examination of natural history research in the National Park Service shows that it has been only incipient, consisting of many reports, numerous recommendations, vacillations in policy and little action. Research in the National Park Service has lacked continuity, coordination or depth. It has been marked by expediency rather than long-range consideration. It has, in general, lacked direction, has been fragmented between divisions and branches, has been applied piecemeal, has suffered because of a failure to recognize distinctions between research and administrative decision making, and has failed to insure the implementation of the results of the research in operational management."

This is only one brief paragraph of a long string of them. In other words, there is a job to be done here--an enormous one.

The Committee goes far beyond anything we had to say in our very brief report on wildlife management. The need for research was stressed in our report too. But this advisory committee actually proposes a plan as to how research might fit administratively in the structure of your service. Among the 20 some odd recommendations they make to the Secretary of the Interior, here are four or five of them that are pertinent.

"A permanent and identifiable research unit should be established within the National Park Service to conduct and supervise research in natural history in the national parks, and to serve as consultant on natural history problems within the entire Service.

"The research unit in natural history, within the Park Service, should be organized as a line arrangement with an assistant director for research in the natural sciences reporting to the director of the Service. Most of the research by the National Park Service should be mission oriented (by that they mean management oriented--the type of knowledge needed to do the sort of thing we have been discussing today).

"The National Park Service should itself plan and administer its own mission oriented research program, directed toward the preservation, restoration and interpretation of the National Park."

Unless this research is undertaken now and warmly supported by every one of you that is administering areas of the park system...not only supported but actually furthered in every possible way...then this talk of ecologic management that I'm calling for is impossible. With the limited knowledge that we have now, there are very few steps on management of the National Parks that I personally would want to endorse or see you undertake. Until you know precisely what you are doing and what the effects are going to be, management could be risky indeed. The research program in other words, is just priority in developing the management program for which I am calling.

Summary

To sum up--I look upon wildlife management in the National Parks as a dynamic, live, and positive activity in the future, designed to maintain or to restore the natural scene in all its biotic variety. The Parks should be reservoirs of native wildlife, presented to the public as one facet of primitive America. To accomplish this objective will require sound, long-range planning, some highly skillful management, a greatly amplified research program, and, on the part of the gentlemen, a lot of administrative determination.

Thank you

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