UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WASHINGTON 25, D.C.

IN REPLY REFER TO:

August 9, 1963

Memorandum

To: Secretary of the Interior

From: Director, National Park Service

Subject: Report, Wildlife Management in the National Parks

Your memorandum of March 28 requested the views of this Service on the report of your committee on wildlife management, and our comments on 22 questions suggested by the report. The questions are discussed in order in the enclosed statement. Our comments on the whole report follow:

The report is a direct and clear statement, and is further, a reaffirmation of National Park Service principle and policy of long standing. The report also clears the air and opens up the immediate, as well as the distant view in good perspective. Critical examination of current practices and interpretation of policy are in order, particularly with regard to wildlife and other resource management and conservation in parks, monuments and recreation areas.

The immediate effect of the report is to establish a sound position with regard to management of wildlife including control of excess animal populations. Representing the findings of men of highest scientific competence and independent judgment, the report lends support to, and has already resulted in better public acceptance of, the position maintained by the Department and the Service on this matter. This position is more secure because of the demonstrated success in handling the Yellowstone elk management program during the past two years. That position is, in brief, that the management of wildlife within the parks is a Service responsibility; that, in the regulation of animal populations, natural predation, transplanting, and hunting outside the parks are the preferred excess population control methods but, that direct reduction, where indicated, will be carried out by the Service without recourse to recreational public hunting; and that close coordination of management plans, and exchange of information between the Service and agencies administering adjacent lands are required. The report also clears the atmosphere concerning wildlife management in national recreation and seashore

areas. It reaffirms recently adopted and emphasized practices of wildlife conservation in National Parks and directs that more intensive management programs based upon management oriented studies and investigations be undertaken and followed.

The long-range implications of the report are of even greater importance. In brief, the following ideas, with which we are in complete accord, are of particular importance to this Service:

1. The management of natural environments, under modern conditions, cannot be achieved by protection alone. To "let nature take its course" will not do the job and active, manipulative management is required to some degree even in most natural areas.

2. Such management, to be sound and effective, must be based upon or backed up and accompanied by scientific fact. This calls for a high degree of ecological understanding, deriving from continuous and comprehensive ecological research and management oriented investigations.

3. The management goal with respect to conserving wildlife values in to restore and maintain ecological conditions as they existed at the time of the white man's discovery. This is a most important and far reaching principle. We interpret this to mean restoration of the ecological "climate", rather than the difficult, and oftentimes impossible, restoration of the exact floral and faunal composition of the environment at the earlier state.

This takes into account the natural evolutionary changes which would normally occur, and seeks to minimize those factors attributable to white man. (An exception may be involved where the objective is the conservation of an individual species.)

Some of the important implications of this principle are:

a. This is a theoretical goal, perhaps rarely perfectly achieved, but nevertheless, a goal toward which to move in each day-to-day, year-to-year management program.

b. The use of fire, clearing, or other direct methods may well be required to restore ecologic factors previously eliminated through intensive protection. Such measures should be indicated by research, and tested by experimentation. Widespread and unsupported application of such methods is not contemplated, nor, do we believe, required.

c. The management goal, as defined, itself limits management to native plants and animals, and discourages "observable artificiality" in management methods and in the display of wildlife or other park features.

4. The restoration and maintenance process should involve four steps if needed or found to be feasible.

a. Historic research to determine original conditions.

b. Ecological research to develop a management hypothesis. This involves an examination of existing conditions, and suggests the development of management plans and methods.

c. Testing the above by experimentation.

d. Application of the most feasible management methods where indicated and under the direction of trained biologists.

Ecological complexities and diversities are such, park to park, that management plans and methods must be tailored to each individual situation.

5. The restoration and most management problems are such that the four-step process should, in general, be carried out by the National Park Service. However, in its execution, the Service will take full advantage of the assistance of other agencies and bureas, of universities and other research institutions, and of cooperative relationships in research and management with states or other agencies administering neighboring lands. The fact remains, however, that the overall responsibility for management and related investigations cannot be delegated to others.

6. The same management goals, policies, and practices prevailing in the existing parks and monuments should apply to all parks and monuments established in the future.

7. Recreation and seashore areas should be administered under a philosophy and policy distinct from those applicable to the National Parks and Monuments. Public hunting in those areas, where appropriate to and consistent with the recreation objective for the area, should be permitted, encouraged, and developed through appropriate management techniques.

8. There is a strong implication in the entire report of the need to re-examine the public use philosophy of National Parks and to achieve accord between public use and the conservation objective. Additional comments relating to this point are as follows:

The report provides an excellent framework within which to carry out the management and conservation of park resources. The use objective should be stated in similar broad and long-range terms, and in a way

consistent with the conservation principle. This matter is not specifically discussed in the report, but is, nevertheless, taken cognizance of in the statement that "it seems incongruous that there should exist in National Parks mass recreation facilities such as golf courses, ski lifts, motorboat marinas, and other estraneous developments which completely contradict the management goal."

On this point, we must first say that the National Parks are not overwhelmed by "mass recreation" developments. I use this term in the sense of "entertainment" of kinds that look within themselves, rather than to the natural scene, for their appeal and interest. In fact, I believe the Service has exercised restraint in this respect. At the same time, it is well to recognize the implications of recreation and its import to fundamental park objectives and values. The present nationwide emphasis on outdoor recreation per se, a needed and most worthy development of recent years, makes this a particularly important consideration at this time. If we are to conserve parks as "vignettes of primitive America", it follows that the parks should be presented and used primarily as "vignettes of primitive America". This is to say, use should be such as to capitalize upon the distinctive qualities and special scientific, educational, and aesthetic values of these areas.

The report puts the part of the act of 1916 relating to park conservation into modern language. In doing so it establishes a standard and a theoretical goal toward which to move. I would suggest that, as a companion piece, that part of the act relating to "public benefit and enjoyment", also should be stated in the language of today--stated in such a way as to establish a standard and a theoretical goal toward which to move in managing public use of the parks.

National Parks have a very important role in outdoor recreation, but it is a distinctive one. Park recreation should have a special quality that measures up to the superior quality of the resources itself. The values which justify the degree of ecological integrity, which it is our obligation to maintain, are the scientific, educational, cultural, and patriotic values. This is where our emphasis, in managing public use of parks, should be. This emphasis should be demonstrated by what we do, what developments we install, and by what uses of National Parks we promote. The public will take the parks at our own evaluation of them--particularly the less restrictive our standards appear to be. They can be brought to support the highest standard of values, if we demonstrate, by the kind and quality of service we render, that these values--scientific, cultural, patriotic--are of primary importance to them.

Perhaps our management goal with respect to public use, paralleling the management goal with respect to conservation, might be stated as follows:

> To so present and interpret the National Parks that the public will come to regard them as a cultural resource whose value to them as such surpass their value as a playground. Herein lies the distinction between National Parks use and the less restrictive use of National Seashore and Recreation Area.

Consideration of immediate needs must be sought and the continued development of a public interest must prevail. But, our demonstration of what National Parks stand for, and what they mean to people and the Nation, should be such that the public will themselves choose to use the parks as "vignettes of primitive America" as well as insist on their conservation as "vignettes of primitive America".

(SGD) CONRAD L. WIRTH

Director

Enclosures:
Reply to 22 questions
Wildlife Management in National Parks, 1961-62

Discussions of the Questions Transmitted with The Secretary's Memorandum of March 28, 1963

1. Is the advisory board's assessment of this season's Yellowstone elk reduction valid, and are similar procedures recommended for the coming year?

Yes. Experience has shown that excess wildlife populations must be reduced to the carrying capacity of the range promptly and surpluses removed annually to prevent habitat damage. While the annual removal of surplus elk, bison, and periodically antelope is essential in Yellowstone for range protection, it also minimizes the necessity and associated public opposition to removal of large numbers of animals in any one year. The method used for the removal of animals must be flexible since the success of a trapping and transplanting program is dependent upon such factors as the demand for live elk, weather, and State cooperation in the establishment of special post season for elk hunting adjoining the Park. We foresee no change in the need for use of the three long established methods of managing the northern Yellowstone elk herd: outside hunting, trapping and transplanting, and direct reduction when necessary. Where similar situations exist in other parks, we will encourage and support State Fish and Game Department efforts to reopen seasons at appropriate times to public hunting and either-sex hunting adjacent to parks where seasonal movement outside parks occurs and these methods could be an important means of reducing surpluses.

2. In which park units are wildlife imbalances evident, and what are advisable control methods in each case?

Deer have caused extensive damage to their habitat in limited areas of Lassen, Sequoia and Kings Canyon, Yosemite, Bryce Canyon, Grand Canyon, Acadia and Mammoth Cave. The degree of over-browsing varies both seasonally and by areas.

Live-trapping and transplanting to State areas outside have been effective in reducing excessive damage at Mammoth Cave, but adjacent to most of the other parks the States have problems similar to ours and have no need for deer for transplanting purposes. In these instances direct reduction is usually the only effective control, particularly where there is no seasonal movement outside the critical range. Close cooperation with the State Fish and Game Departments is needed, including open season on does, reintroduction of predators where feasible, and special hunts outside the parks and in addition to the normal hunting season.

Elk present a similar problem in Yellowstone, Grand Teton, Rocky Mountain, and at Glacier. The remedy seems to be similar to that for deer.

Exotics such as wild burros, Russian boar, rabbits, mongoose, goats and pigs as well as several weed and noxious exotic plants adversely affect the fragile native vegetation, compete directly with native wildlife and present a serious adverse effect on the ecological balance. Intensification of direct control and reduction is required promptly to eliminate, where possible, or greatly reduce their numbers. Hawaii, Channel Islands, Virgin Islands, Lava Beds, Grand Canyon, and several other parks with localized problems are involved.

Domestic livestock grazing under permit or rights exists in 20 parks and monuments and competes with the native wildlife species. Reduction and eventual elimination of grazing is the goal and is gradually being accomplished.

Annual direct or transplant reductions in the bison population at Colorado, Grand Teton, Wind Cave, and Yellowstone are needed to keep these animals at the optimun level.

Black bear present a special problem as a result of abnormal concentrations, relating directly to artificial feeding. The bear management program, as now conducted, provides for preventing access to campground garbage; discouragement of visitor feeding of bear; live-trapping and transplanting and elimination of bear determined to be habitual offenders, and it has proved effective.

In each case of suspected wildlife imbalances, wildlife control measures and the control method used must be according to a management plan based upon wildlife research data.

3. Proposed parks and monuments: What is the status of wildlife control in each proposal; what are the surrounding circumstances; and what alternative policies are recommended after consideration of this report?

Wildlife control in each proposal at present is probably under the jurisdiction of the State, but, in the case of Federal lands, is subject to mutual agreement with the Federal land management agency concerned with respect to details of the control or harvesting programs. No change in this relationship is contemplated for the water impoundment type of proposed National Recreation Areas, or for those National Seashores where hunting already exists as a significant recreation activity.

In the proposed National Parks and Monuments, no public hunting would be permitted. However, in line with recommendations of the advisory board's report, certain specific portions of proposed park areas now under study, where public hunting already exists as a significant recreation activity, would be designated as proposed National Recreation Areas and would provide for a buffer zone and continuation of such hunting.

4. What is the advisability and the feasibility of restoring antelope to Antelope Flats in Grand Teton National Park?

The key to restoring antelope to Antelope Flats is that of restoring the historical migration pattern. Historically antelope and elk migrated annually out of Jackson Hole with the seasons. This migration pattern was seriously altered about the turn of the century due to increasing agricultural developments, associated fencing, uncontrolled meat hunting and a series of severe winter die-offs.

Antelope observations in the Gros Ventre Valley and Hoback Canyon in recent years provides a measure of optimism with respect to the re-establishment of the migration pattern and return of antelope to Jackson Hole.

5. What is the advisability and the feasibility of restoring primitive open forests in some instances on the west slope of the Sierra Nevada at Lassen, Yosemite, Sequoia and Kings Canyon Parks, and the degree to which such restoration is possible?

Restoration of primitive conditions is considered both desirable and feasible as long range management and conservation objective. The degree to which this type of restoration is possible must be determined through ecological research and experimentation. Management practices designed to meet these objectives have been used in selected types of vegetation for many years. These or modified management practices can be expanded to other areas where determined to be desirable. The less intensive control of wild fire is a matter deserving more intensive and authoritative consideration, as it relates to the National Parks, than it has been given in the past. No change in fire suppression policy is contemplated at this time. The restoration of open forest in these areas is not only desirable but imperative if the Service is to conserve the natural condition of the forest and perpetuate the natural flora.

6. What is the feasibility and procedure necessary for restoration of the Sierra bighorn, according to the discussion in the wildlife report?

Feasibilities cannot be precisely forecast at this time because the principal range of the Sierra bighorn has primarily been situated on the east side of the mountain crest, immediately to the east and outside of the National Parks of the Sierra. For this reason restoration measures necessarily will have to be carried out largely on Forest Service lands and perhaps on some private ranch lands situated below these forest lands. We are cognizant of the desirability of such an attempt and the implication in the advisory board's report of leadership by the National Park Service is recognized within the cooperative limitations that exist. The Service will initiate, in cooperation with the Forest Service and California Department of Fish and Game, measures to secure better public recognition and support of needed restoration measures.

7. In which parks are exotic plants or animals obvious, and what procedures would be necessary for their control?

The Hawaiian and Caribbean National Parks exhibit the most extreme examples of severe ecological dislocation by exotic species. The wild burro situation of Death Valley, Grand Canyon, Lake Mead, and to a monor extent, Big Bend, Organ Pipe Cactus and Bandelier afford other examples. Management of wild burros in fragile desert areas is needed for the conservation of vegetation, animals with which burros compete and to prevent present soil erosion and deterioration of all natural features. Some good results have been obtained from a special permit live-trapping and removal program at Death Valley. However, an expanded direct control program is required for all of these areas in association with live-trapping programs when possible. The exotic wild boar in Great Smokies also presents a major control problem requiring development of more adequate control techniques than the current practice of live-trapping and relocating animals on ranges outside the Park.

Some control procedures already are in effect, particularly in the case of goats and pigs in Hawaii and the elimination of the mongoose on Buck Island Reef and Virgin Islands National Park. These and other control measures carried out thus far have demonstrated potential feasibility, but funds have been insufficient to accomplish adequate management control. The

National Park Service needs to conduct studies of the effects, and possibly improve methods of control, of the exotics of the above mentioned areas.

8. In which parks is there "observable artificiality" in wildlife situations, and what remedial measures are recommended?

There is artificiality in some of the western National Parks, wherein garbage cans and garbage dumps are accessible to bears. Action has already been initiated to remove this ready access to garbage.

Artificial hay feeding of elk and bison on a large scale was stopped some years ago in the parks. Wildlife enclosures now exist in only three areas of the West: Platt, Grand Teton, and Wind Cave. These Parks are too small to provide sufficient range for animals without fence. Consideration must be given, in some instances, to the desirability of maintaining representative examples of native wildlife species under appropriately screened enclosures in a natural habitat or eliminating them from the park scene. Free ranging animals of certain species would not be compatible with the management and development of lands adjacent to the park.

9. To what extent have ecological situations within parks been modified by situations outside parks, and by what methods could alterations be redressed, i.e., buffer land acquisition, easements, cooperative agreements with other agencies, community education?

There is wide variation from park-to-park depending on the type of land use adjacent to the park, and also upon the degree of ecological self-sufficiency of the park, which in most cases is proportionate to the size of the park itself.

Where adjacent land use is severely destructive of park-type ecology, easements and cooperative agreements usually are impracticable because of economic considerations. Livestock grazing often precludes the restoration of an adequate population of predators necessary to help keep the ungulates in balance. Even more ecologically destructive is a buildup adjacent to a park or monument of intensively cultivated agricultural cropland. Summer homes and year-round residential area buildups also may create serious permanent ecological changes.

Buffer land acquisition offers promise when the acquisition costs lie within our means. National Parks that are surrounded

by national forestlands provide opportunities for mutual assistance in wildlife management and some buffer protection without an actual change in land jurisdiction.

The extent to which ecological situations within a park have been modified by situations outside reaches extremes as in Everglades National Park. If the dwindling flow of fresh water from the Lake Okeechobee region is curtailed still further, swamps and savannahs will become dry prairie, waterbirds and aquatic life as we know them today will disappear, and these nurseries of the million dollar shrimp industry will vanish. Cooperative agreements with other water planning and water use agencies are vital and are being pursued. Much must be accomplished to achieve a better community realization of the consequences of losing Everglades National Park and its ecological values. The consequences of a lack of public education and information is both economically and recreationally disastrous for the entire Nation.

Ecological situations in the Hawaiian National Parks have been profoundly altered by massive invasions of nonnative plants and animals. These invasions are not easily controllable through cooperation with other landowners, for most such invasions in Hawaii are more or less beyond control, particularly with respect to invading vegetation. The goat control situation might be helped by more effective cooperative arrangements, together with a more intensive management control program on National Park Service lands.

10. What changes in recruiting, training, assigning, etc., or personnel would be necessary to bring "every phase of management under the full jurisdiction of biologically trained personnel* * *?"

Recruiting - The Service has no trouble attracting qualified scientific personnel.

Training - To bring every phase of wildlife management under the full jurisdiction of biologically trained personnel would assuredly require an increase in the number of such personnel. The training of the biological personnel would not be a major problem. Major training efforts would require an increased program with emphasis that responsibility for the ecological health of the units of the National Park System extends beyond the various technicians to include administration and management. The task here is not one of making administrators into ecologists but of helping them appreciate

their responsibility and encouraging them to seek appropriate professional assistance and review--routinely and not after situations have deteriorated.

Assigning - To achieve the advisory board's objective, professional wildlife managers and ecologists would have to be assigned to many areas with major wildlife and ecological values. Since research management studies have shown that professional people working largely alone and out of contact with others of their kind are less productive than those who maintain professional contacts and flows of ideas, increased use of cooperative studies with other agencies and universities is desirable. A few of the larger parks with wide ranges of ecological resources and responsibilities require several trained personnel who, however, could also be responsible for studies and management in other areas of the System. Smaller areas may also be served by personnel working out of regional offices.

11. Where does each park unit stand in relation to the four-step management program recommended on page 12 of the report, and what is the feasibility of applying this concept?

Step 1 has been partly accomplished for most areas; however, research under step 1 usually was done by an outside institution or individual for his own purposes and was not aimed specifically at finding out what the park situation was like before the white man came, or what the situation would be now if there had been no interference by white man. Consequently, step 1 needs to be completed or the available information evaluated by persons oriented to the Service's particular objective.

Step 2, ecological research, is extremely incomplete in all areas. Some good starts have been made on individual projects. Research on the survival requirements of key park species needs to be actively supported and gradually buildt up through the selection and accomplishment of related research subjects, until the resulting pattern of findings can be applied in decision-making situations as well as in protection and restoration programs.

Even with the small starts on step 2 that have been made so far, some strengthening and revision of current management programs can be commenced.

Step 3. Many experimental plots have been constructed in connection with big game range studies; the large experimental plots at Everglades to test the results of controlled burning illustrate the type of plots recommended by the Leopold study.

Application of tested management methods, step 4, has had to be undertaken as an emergency of "brushfire" operation to prevent further ecological deterioration. Because of the emergency nature of the situation, this type of brushfire activity has had to be done before the underlying research was carried out; however, it is recognized that emergency action is not a permanent substitute for research.

Research must be strengthened so as to run ahead of the need. Only in this way can incipient problems be identified and corrective measures applied before the critical state is reached. In the long run, this is not only the logical approach, but most effective and the least costly.

12. In which park units are insecticides applied directly or in adjacent areas?

During calendar year 1963 chlorinated hydrocarbon insecticides have been, or will be, used to control forest insects in 20 Service-administered areas. A total of approximately 8,500 acres of forest, woodland or ornamental shade trees will be treated. This is a 0.01 of 1% of the total forested areas protected.

In 14 areas, individual infested trees on approximately 222,050 acres or 2.5% of the forested area, are being treated with ortho-dichlorobenzine or lindane for control of various bark beetles.

Spraying with chlorinated hydrocarbon insecticides in all cases is restricted to areas of heavy public use where high value trees and the forest scene must be maintained.

Projects in forest types are financed by Forest Pest Control Act funds that have been reviewed and approved by the Federal Pest Control Review Board. (This Board's membership includes representatives of Interior, Agriculture, Defense and Health, Education and Welfare.) Prior to submission to this Board each project is administratively approved by this Service. No Service projects have been disapproved by the Board. Control procedures adopted were

developed from research and pilot tests. They have been determined to be the most effective in suppression of the target pest and the least harmful to other related values. In many instances control was deferred until research and control methods provided us with a feasible method and approved pesticide. The Fish and Wildlife Service in cooperation with the Forest Service reviews at the field level, pesticides acceptable for use, prior to a formal control proposal by the National Park Service.

Control projects not financed by Forest Pest Control Act funds are developed in collaboration with the Agricultural Research Service and are concerned primarily with insects and disease affecting ornamental trees, shrubs, flowers and turf grasses. The Fish and Wildlife Service advises the Agricultural Research Service on pesticides and formulations.

In all instances the National Park Service is applying the pesticide most effective on the target pest and with the least harmful effects on other values. We recognize the desirability of biological controls, but few of these have been developed for field application.

13. What is the advisability and the feasibility of using hot fires to maintain forst conditions on Isle Royale?

Such questions have never received serious study, but the time has come when they should. Step 1, of the four-step management program, has been achieved to a reasonable degree and step 2 is within reach. We believe that step 3, small scale experimentation, could be planned and programmed under suitable conditions. Application of these three steps should indicate the final answer to advisability and feasibility presented by the question. (30,000 acres in the heart of Isle Royale was burned over in 1936)

14. In what park areas can and should buffalo wallows be simulated?

This question should be answered by the four-step method. It is believed that step 1 would indicate Theodore Roosevelt National Memorial Park to be a candidate. Badlands National Monument might also be and a few others might be indicated by further study.

15. In what parks is it advisable and feasible to reintroduce native plants or animals which have been exterminated locally?

The most immediate candidates are: Lava Beds, Lassen, Zion and Badlands for bighorn sheep. Further research

might show that sage hens, prairie dogs, and a few other species could be reintroduced into several areas. Feasibility studies should be conducted for all candidates for reintroduction to make sure that their habitat is now suitable and to identify conflicts which may develop on lands adjacent to a given park as a result of reintroduction. Actual reintroductions of exterminated species may be needed in only a few cases. In others, such species eventually should return by themselves under proper ecological management.

16. In what park areas did predators have a niche in the primitive ecology, and what is the feasibility of restoring predators, and to what degree, in these situations?

National Park Service Fauna No. 1 presents a park-by-park analysis of this situation in 1933, and there has been relatively little change since that time.

All park areas presented a niche for predators originally, but the feasibility of restoring the most effective predators, which are the large ones, remains limited today due to existing use of adjacent lands and ecological requirements of the predator. This is particularly true with respect to the wolf which was one of the most effective of the original predators. There is some feasibility of restoring smaller predators such as the coyote, as soon as public opinion ceases to regard such animals as wholly "bad". This change in public opinion gradually is taking place, with the result that it is easier today to protect coyotes in the National Parks than it was 25 years ago.

A gradual restoration of mountain lions may eventually be possible in some parks where there is no appreciable conflict with livestock interests.

17. In what park areas could and should predator protection be increased in surrounding lands?

Yosemite, Yellowstone, Sequoia and Kings Canyon National Parks; also in Olympic, Mount Rainier, and Grand Canyon as soon as public opinion will permit. Research would probably show that there are several others.

18. To what degree is trapping of ungulates still practical?

To only a limited degree. It is useful for eliminating animals from small, heavily developed areas where excessive wildlife populations are doing much severe ecological

damage, but cannot be reduced by shooting. Trapping is also a valuable supplement in some areas, such as the Yellowstone, where there still is some demand from outside sources for live animals. It should be recognized that demand for live animals will diminish with time

19. Are large wildlife control programs, which may involve deputized hunters, justified in the near future in parks other than Yellowstone?

No. We foresee no instances where reduction programs will be of a magnitude that deputized hunters will be required. In those instances where the local park staff is not adequate to effectively reduce the population we believe it to be more efficient to temporarily assign experienced personnel from other park areas to accomplish the necessary reduction as was done in Yellowstone in 1962.

20. In view of the recommendations of this report, what policies and procedures does the Service recommend with respect to hunting in Grand Teton National Park?

Public hunting to control surplus animals in Grand Teton can be biologically effective. The advisory board's report says that this method as tried in Teton, "is an awkward administrative tool at best". However, all methods have not been given fair trials and it is probably fair to state that only in recent years are both parties inclined toward arranging seasons and locations for shooting on a scale that can be biologically effective.

Public hunting as a means of controlling the elk at Grand Teton can be placed on a realistic basis through increased cooperative wildlife management efforts by all participating agencies.

The excellent study of the Jackson Hole elk problem now underway is resulting in specific and practical recommendations regarding this problem.

21. A broader question is, what are the advantages and disadvantages of an ecological management policy as compared with a passive protection policy?

The Leopold wildlife report substantiates what ecologists and wildlife management biologists, inside and outside the Service, have said for many years; that a passive "protection" policy may be just what is needed in the case of a few large, ecologically self-maintaining areas,

but that for most areas, including some of the most important ones in the National Park System, a hands-off, do nothing, "protection" policy can ultimately result in no real protection and can be an invitation to disaster. This was stated in National Park Service Fauna No. 1

The advisory board's report makes an ecological distinction between the different kinds of parks. It indicates that doing nothing may be all right for Olympic National Park because it is an essentially self-sufficient rain forest whose plant and animal communities can largely take care of themselves. On the other hand, under different ecological circumstances, such as the heavily used Giant Sequoia forest of Yosemite and Sequoia, doing nothing could result in serious impairment of normal ecological conditions.

The pine forests of Everglades are another example of a type of primitive ecology that would vanish if it were not managed. Since uncontrolled, naturally-caused wildfires which produced and perpetuated the pine forests of the glades cannot be tolerated, the Service has introduced controlled fire as a management tool, to be carefully used as a substitute for natural, but uncontrolled conflagrations.

22. On a park-by-park basis how can ecological management be made compatible with mass use and to what degree?

On the basis of what we already know, it can be stated with confidence that ecological management and mass use can, with reasonable mutual accommodation, exist in the same parks, each to a high degree. This was the implication of National Park Service Faunas No. 1 and No. 2 in 1933 and 1935, respectively, and it appears to be implied in the Leopold wildlife report on page 5, last paragraph.

In determining this mutual compatibility, it will be necessary to measure the ecological carrying capacity of all types of areas--for human use, Research can and should be used to determine the carrying capacity that will permit ecological management and mass use of varying, appropriate degrees, without impairment of irreplaceable park values. A preliminary 2-½ year park-by-park study of this question now is being made for the National Park Service by the Conservation Foundation of New York. This should be followed by additional, full-scale studies aimed at producing a detailed research and management master plan for each area.

The 22 questions and their answers as stated point up the fact that a broad program of conservation is needed which would follow the four-step management program suggested by the "Leopold Report". That research should be the basis for a sound management plan is irrefutable and should be implemented as soon as funds can be made available. There are, of course, occasions when immediate remedial action must be taken without the benefit of long-term research projects.

This research must begin with historical ecology--what were the vegetation and wildlife patterns in each park unit at the time of the first encounter by white man? The next phase is a determination of present-day vegetation and wildlife patterns and the formation of a plan by which management can bring about the return of the original ecological scene. In this way, and in this way only, can we conserve our natural national heritage for all future generations.