

N1427 (RMR-MR)

OCT 21 1991

Memorandum

To: Superintendents: Badlands, Canyonlands, Capitol Reef, Glacier, Grand Teton, Mesa Verde, Rocky Mountain, Theodore Roosevelt, Wind Cave, Yellowstone and Zion National Parks; Black Canyon of the Gunnison, Colorado, and Dinosaur National Monuments; Curecanti and Glen Canyon National Recreation Areas

From: ~~Acting~~ Regional Director, Rocky Mountain Region

Subject: Progress Report: RMR Bighorn Sheep Status Project

Attached is the subject report. In fiscal year 1991, the Rocky Mountain Region received funds for a 3-year research/restoration project on bighorn sheep from the NRPP. Francis Singer was transferred from Yellowstone National Park to Colorado State University to serve as coordinator for the project to be supervised by Science Branch Chief Robert Schiller. Bighorns historically occupied 18 National Park Service units in the region, but bighorns were extirpated by human causes in all but 6 of those units. Ultimate goal of the initiative is restoration of bighorns to all occupiable range. Emphasis over the remaining two years will be on assessments of needs, evaluation and prioritization of restoration sites, and upon population, census, genetic, and disease surveys. Restorations may occur during the first initiative, but due to planning requirements and waiting time for bighorn sources, most restorations will likely occur during a second proposed 3-year initiative.

A series of meetings were held in NPS units during the past few months with the input of outside experts. Eighteen units originally submitted written requests for the NRPP funds. Highest regionwide priorities included the establishment of interagency working groups, development of better census techniques, evaluating the implications of reduced genetic exchange and insularity, resolving conflicts with domestic livestock, and GIS-based assessment of potential transplant sites.

A project prospectus for FY92 and FY93 will be prepared and submitted for your review by January 1, 1992.

/s/ Boyd Evlson

Enclosure

bcc:

RMR/MR Huff, Schiller, Chaney
Frank Singer, CSU, Ft Collins

Huff:mp:2650:10/16/91:c:bigrev

Progress Report 1 - August 1991
RMR NRPP Bighorn Sheep Status Project

The Rocky Mountain Region received funding of a initiative, in fiscal years 1991-93 for an assessment of needs relative to bighorn sheep. The eventual goal of the initiative is to restore bighorn sheep to all occupiable historic habitat in and adjacent to National Parks, Monuments, and Recreation Areas (units). In March of 1991, Francis Singer was transferred From Yellowstone National Park to Fort Collins, Colorado, to serve as Bighorn Sheep Coordinator.

Bighorn sheep status and needs in the Rocky Mountain Region were assessed with these Natural Resource Preservation Program (NRPP) funds. A workshop for NPS managers was held in Denver on May 7-9, 1990, concerning bighorn needs. A consensus was reached at this meeting that the complexity of disease, stress, and population biology questions was of sufficient magnitude that a series of problem analyses should be held.

Six different problem analysis meetings were held between July 1990 and May 1991 involving 14 NPS units in the Rocky Mountain Region. Each meeting included members of a scientific advisory panel, park management staff, and staff from other state and federal agencies. The scientific advisory panels consisted of experts in the fields of conservation biology, bighorn ecology, genetics, diseases, population dynamics, and census techniques. Reports have been received from all 6 committees and copies sent to the participating parks. Francis Singer, project coordinator, developed 10 research/management projects that deal with more than one park unit based upon the thoughts of these committees.

In addition, 18 NPS units submitted written requests for the bighorn initiative funds. The non-duplicative total of these 18 requests plus the multi-park projects exceeded the total available from the NRPP fund by a factor of 3! All parties involved with the assessment process were impressed with the scope and magnitude of the needs. The bighorn coordinator has suggested that a second 3-year initiative focusing more on restoration follow this first one in order to meet the needs of all of the NPS units. By necessity, the Chief of the Branch of Science and the Regional Chief Scientist have established a time table priority for projects. No park's needs have been neglected, but some will be deferred until more funding is obtained. The needs so far exceeded the funds available that a degree of resourcefulness has been necessary, particularly in the form of interagency funding. During the months of July-September the bighorn coordinator held a series of additional meetings to seek interagency funding and to initiate interagency cooperation on bighorns. To date, nearly \$200,000 has been tentatively committed from the Bureau of Land Management, the U.S. Forest Service, and 3 state agencies for cooperative bighorn work. By necessity, projects with a high prospect for interagency funding were rated higher in the time table. It should be noted that most NPS bighorn sheep populations utilize some range managed by other agencies.

Suggestions and priorities of the advisory committees varied considerably, but a few common thoughts included:

- (1) Interagency planning, coordination, and cooperation was the single highest priority in the Rocky Mountain Region for bighorn restoration. Some NPS units are too small to support sustaining populations of bighorns entirely within their boundaries. Human activities on lands adjacent to parks may profoundly

affect bighorn recovery within the park units. Therefore, it is only logical to deal with bighorns on a metapopulation level. The committees suggested that each NPS unit initiate an interagency working group and that each group develop a bighorn restoration plan and address bighorn restoration in a cooperative fashion. The interagency working groups might involve one or more NPS units depending on the most logical metapopulation approach.

(2) Overlaps in distributions of wild bighorns and domestic sheep and other exotic sheep and goats were a subject of concern. Five NPS units were known to have had serious disease die-offs in their bighorn populations, all of which were attributed to disease transmissions from domestic sheep. The desert bighorn committee recommended that elimination of possible disease transmission sources was critical to desert bighorn recovery in southern Utah. Resolution of conflicts with domestic sheep were of higher priority, in their opinion, than was the connecting of isolated populations with more transplanted populations of bighorns. Under present circumstances, greater connectedness could also mean that a disease die-off might pass through more groups of bighorns.

(3) Potential problems from extreme insularity of populations such as genetic isolation and inbreeding, lack of dispersal, and possible greater vulnerability to predators was listed as the highest need by 3 of the committees. The committees suggested that studies be conducted into the implications of reduced genetic variability and close relatedness on bighorn population performance. Reduced genetic variability has been shown to reduce productivity, survival and resistance to diseases in many wildlife species. Eight bighorn populations were felt to be small enough that limited genetic interchange and a limited prospect for long-term survival were suspected. A goal should be the attainment of metapopulation sizes of sufficient magnitude to survive catastrophic events and to survive for the foreseeable future, for example for the next 100 years. The committees avoided setting some "magic" figure for a minimum viable population size, but widely held figures include intermixing populations of "500" or "several hundred" depending on the circumstances. Only 4 of 16 units with bighorns appear to fit the criteria for a relatively secure metapopulation.

Larger metapopulation size can only be achieved through further transplants and/or better management of existing populations. Surveys should be conducted of potential available habitat in and near to NPS units for additional transplants of bighorns. These surveys should be as quantitative as possible and should use GIS procedures, where feasible, so that the potential sites can be prioritized and so that agency funds and energy will not be wasted on poor transplant prospects.

(4) Population inventory and demographic surveys were inadequate for most NPS units to assess the effects of any management actions such as transplants, removals, or visitor management. Accelerated monitoring was recommended for all units.

(5) Greater rigor in the experimental design to test the effects of management actions was a subject of concern. More purposeful experiments and adequate replication were also discussed.

(6) Habitat changes due to human activities may have reduced the potential of areas for bighorn restoration. For example, heavy cover that bighorns avoid may have increased due to fire suppression or overgrazing by livestock. Where there are no prospects for removing domestic sheep grazing, the area should be abandoned as a potential site for recovery of bighorns. More research is needed on the extent of habitat changes due to human activities.

The following projects have been identified by the Regional Chief Scientist and Chief of the Branch of Science as first steps in bighorn assessment and restoration:

(a) Interagency meetings should be held and interagency working groups should be established to design, fund, and guide any research and restoration efforts. Four of these meetings were held in late fiscal year 1991 and more are planned for early fiscal year 1992. Interagency bighorn restoration plans should be drafted by 1993 for all of the units.

(b) More accurate census techniques will be tested and applied initially in 2 desert parks and in Badlands National Park.

(c) The bighorn coordinator will review and assess the success/failure of past efforts at transplanting bighorns in the NPS units. A review report and a series of recommended transplant protocols will be prepared by spring of 1992.

(d) A study will be initiated in fall of 1991 into the implications of reduced heterozygosity and close relatedness on bighorn population performance. Data collection will focus on 4 NPS units. Data collection will include genetic information including estimates of heterozygosity and relatedness of individuals from DNA fingerprinting, condition, and disease information, population size and growth rates, and estimates of interchange. The effects of future transplants on population performance will be evaluated through an experimental approach. The genetic work will be done under a cooperative agreement with the University of Wyoming. The field studies will be conducted mostly with park seasonal biotechs on extended appointments and with the cooperation of park resource management staffs.

(e) GIS based habitat assessment procedures will be tested and applied in 5 western Colorado units through a project with Colorado State University. NPS employee Therese Johnson will conduct the study for a Master's thesis while on educational leave in FY92 & FY93. Similar efforts are being considered for Glen Canyon and Zion. A model developed for Capitol Reef by Utah State University will be applied to the entire park.

(f) NPS units will be assisted in the development of monitoring programs for counting bighorns and sampling demography and productivity. A training class will be held in the fall of 1993, following the field testing of techniques.

(g) Three research studies will be conducted in or adjacent to Bighorn Canyon National Recreation Area dealing with the ungulate complex. Competitive interactions, grazing impacts, and estimated carrying capacity of wild horses, bighorn sheep, and mule deer will be assessed through this research. Fifty-five percent of the funds for the work will come from other agencies. NPS funding will include other than bighorn NRPP funds since the questions of wild horse management rather than bighorn restoration are the catalyst for the work.

The first study, assessment of grazing effects, will be conducted by Dr. James Detling of Colorado State University--the remaining 2 studies will be awarded following competition.

(h) Further research is being considered in the Canyonlands, Glen Canyon, Capitol Reef area, and the topic will be discussed at an interagency meeting scheduled to be held in late September.

(i) Several units plan to wait for the results of habitat, genetic, and disease assessments prior to deciding whether or not to proceed with further transplants. However, each unit is encouraged to proceed as rapidly as their conditions permit. Although a second bighorn initiative emphasizing restoration will be sought, there are no guarantees. Mesa Verde National Park plans to augment their minimal bighorn population with a transplant this coming winter (1992). Two other units are seriously considering requesting bighorns for transplants as early as next spring.

The enthusiastic support and participation of the staff of many parks in the bighorn initiative is and has been greatly appreciated.