

STATUS, DISTRIBUTION, AND MANAGEMENT OF MOUNTAIN
GOATS IN THE GREATER YELLOWSTONE ECOSYSTEM

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Objectives

Mountain goats (Oreamnos americanus) are indigenous to western North America but are not native to the Greater Yellowstone Ecosystem. Recent introductions of mountain goats at several sites in National Forests surrounding Yellowstone and Grand Teton National Parks have brought them to the area. The introductions have been successful and goat populations are increasing. Goats are now reported to be in most mountain ranges surrounding the Parks and occasional sightings are reported within the Parks.

The objectives of this project are to:

1. Determine current population status of mountain goats in the Greater Yellowstone Ecosystem;
2. Assess potential impacts of mountain goats on faunal and floral species of the Parks;
3. Based on findings of the first two steps, formulate different management scenarios and assess their feasibility and anticipated impacts.

Methods

To assess the current status of mountain goats, various sources of information are being perused. All of the mountain goat populations surrounding the Parks are from transplant efforts by wildlife personnel from Wyoming, Idaho, or Montana. Each of these wildlife agencies maintain information on the status and distribution of the goats under their jurisdiction in the form of published manuscripts, internal reports, and personal knowledge. Wildlife biologists employed by the National Forests on which goats live will also have information and data on goats. Records of goat sightings in Yellowstone and Grand Teton National Parks are maintained by park personnel. All these agencies are being contacted and any information they have is being compiled.

In addition to compiling existing information on goat sightings, areas where sightings are most prevalent in Yellowstone Park were surveyed on

the ground and by air. All the information gathered is being used to update the current status map of goat distribution (Anonymous 1987).

Mountain goats primarily graze on grass and forb species in alpine meadows (Saunders 1955; Hibbs 1967; Peck 1972; Johnson et al. 1978; Adams and Bailey 1983; Dailey et al. 1984). Their impact on the alpine habitat in the Parks is being assessed by:

1. Determining locations and calculating size of habitat likely to be colonized by mountain goats.
2. Quantifying habitat composition of potential goat range and establishing permanent reference plots.
3. Reviewing current literature on mountain goat food preferences.
4. Determining effect of goat populations on adjacent Forest Service land on alpine habitat.

Location and size of impact areas.-- From available habitat maps, the total amount of alpine habitat in the Parks will be determined with a planimeter. These areas will represent the maximum amount of habitat that might be affected by goats and the possible sites of goat colonization.

Habitat composition of impact areas.-- Plant species lists of areas likely to be used by goats are being compiled from existing Park Service reports and maps. Permanent reference plots in areas most likely to be colonized by goats were established. Photographic records were made of reference points and species abundance and percent cover are being estimated from the photographs.

Food preferences of goats.-- Data are available on food studies of goats in areas similar to the Parks (Saunders 1955; Hibbs 1967; Johnson et al. 1978; Adams and Bailey 1983). Results of these and other studies are being compiled and a list of food preferences for mountain goats is being formed. This list will be compared with species lists for the identified impact areas. From this comparison, plant species most likely to be affected by goat colonization are being identified.

Impact of goats on surrounding Forest Service Lands.-- Goats currently live in alpine habitat in areas adjacent to the Parks. Personnel from local state and federal agencies are being consulted concerning the impact of goats on these areas. Additionally, selected areas are being visited and qualitative and quantitative assessments of habitat composition of these areas are being made. Quantitative measurements will be made of percent cover and species composition from randomly selected photo points. The point frame method described by Floyd and Anderson (1982) is being used for these measurements.

Bighorn sheep (Ovis canadensis) are currently the prevalent ungulate in alpine habitat in the Parks. Colonization by mountain goats will likely be within existing sheep range. Anticipated impacts of goats on sheep are being assessed by:

1. Reviewing current literature on mountain goat and bighorn sheep interactions;
2. Analyzing population trends of goats and sheep in National Forests surrounding Yellowstone and Grand Teton National Parks; and
3. Developing a Habitat Evaluation Procedure (HEP) analysis (Anonymous 1980) of sheep range in the Parks.

Current literature.-- Goats and sheep co-occur in a variety of areas in the northwest. Data exist on several aspects of their relationship (Thompson 1981; Adam et al. 1982; Johnson 1983; Dailey et al. 1984). These studies are being reviewed to assess impacts goats may have on sheep in the Parks. Attention will be given to effects of goats on sheep relative to different population densities of goats.

Population trends in surrounding Forest Service Land.-- Sheep and goats presently co-occur in areas adjacent to the Parks. Records on the population status of bighorn sheep and goats are available from wildlife agencies. These records are being examined for trends in sheep densities relative to introduction and establishment of goat populations.

HEP analysis of bighorn sheep range.-- Data are available on the current status of sheep range in the Parks (Anonymous 1987). These data will be used to develop a Habitat Evaluation Procedure (HEP) analysis of current sheep range. Based on data collected from other phases of the study, and impact assessment of goat colonization is being made and the amount of sheep habitat lost will be estimated.

Based on findings in the first two stages of this study, various management options are being formulated. Each option is being assessed based on:

1. Feasibility of implementation: Cost and logistics in meeting management goals;
2. Implications to Park policy: Compatibility of management plan with Park philosophy;
3. Public acceptance: Anticipated reaction of Public to management plan;
4. Management effectiveness: Potential of obtaining management goals; and

5. Environmental impacts: Impact of management plan on mountain goats and native plants and animals in the Greater Yellowstone Ecosystem.

Results will be collated in a matrix for each proposed management option. This matrix will be used to rank the various options and make management recommendations to Park Service personnel.

Results

Field work to date includes 3 visits to Yellowstone National Park. During the first visit, park personnel were consulted on available information on mountain goats in and near Yellowstone and Park records were perused for sightings of goats. This information was used to select areas most likely to have goats. During the second visit, ground searches for mountain goat sign were made to Mt. Holmes and the Wolverine Peak areas. No goats were sighted on Mt. Holmes but 8-10 goats were sighted on and near Wolverine Peak. While in the Wolverine Peak area, permanent photo plots were established and photographed. Selection of the photoplots was based on observation of mountain goats in the immediate area. Information on percent ground cover and species composition will be determined from the photographs. The third visit was in mid-July. At that time, an aerial survey of the north half of the park was made. All likely goat habitat was searched. The only place goats were sighted was in the Wolverine peak area. An additional ground search was conducted in the vicinity of Hellroaring Mountain because of a recent sighting in that area. No goats were seen.

Personnel at Grand Teton National Park were consulted concerning presence and distribution of goats in the Park. Consultations were also made with state personnel from Idaho, Montana, and Wyoming.

From 22 July to 5 August 1988, visits were made to Glacier National Park and Olympic National Park to consult with biologist's concerning mountain goats in those parks and view mountain goat range. These parks were chosen because Glacier National Park represents an area that has historically had high number of goats and is relatively near Yellowstone and Grand Teton National Parks. Olympic National Park has recently had to develop a management plan for the introduced goat population that is there.

In early September 1988, the Baldy mountain area near Swan Valley, Idaho was visited. This area is in the Greater Yellowstone Ecosystem and has a population of introduced mountain goats. The population density in this area is one of the highest in Idaho and was visited to view mountain goat range under this condition. Random sample points were photographed and percent cover and species composition are being estimated.

Literature review to date included extensive review of pertinent

journals at Idaho State University, visits to Yellowstone National Park and Montana State University to review in-house publications/theses, and consultation with regional biologists of the Idaho Fish and Game Department and Montana Department of Fish, Wildlife, and Parks, and Wyoming Department of Game and Fish.

Conclusions

Based on the ground and air surveys conducted, mountain goats have become established in the northeast corner of Yellowstone Park. In other areas of both parks, the sporadic sightings indicate that goats move in and out of those areas but have not become established as of yet.

Sufficient information on distribution and habits have been collected to begin formulating most sections of the final report. This process has just begun and no definitive conclusions can be drawn at this time.

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