

United States
Department of
Agriculture

Forest Service

Intermountain
Research Station
Ogden, UT

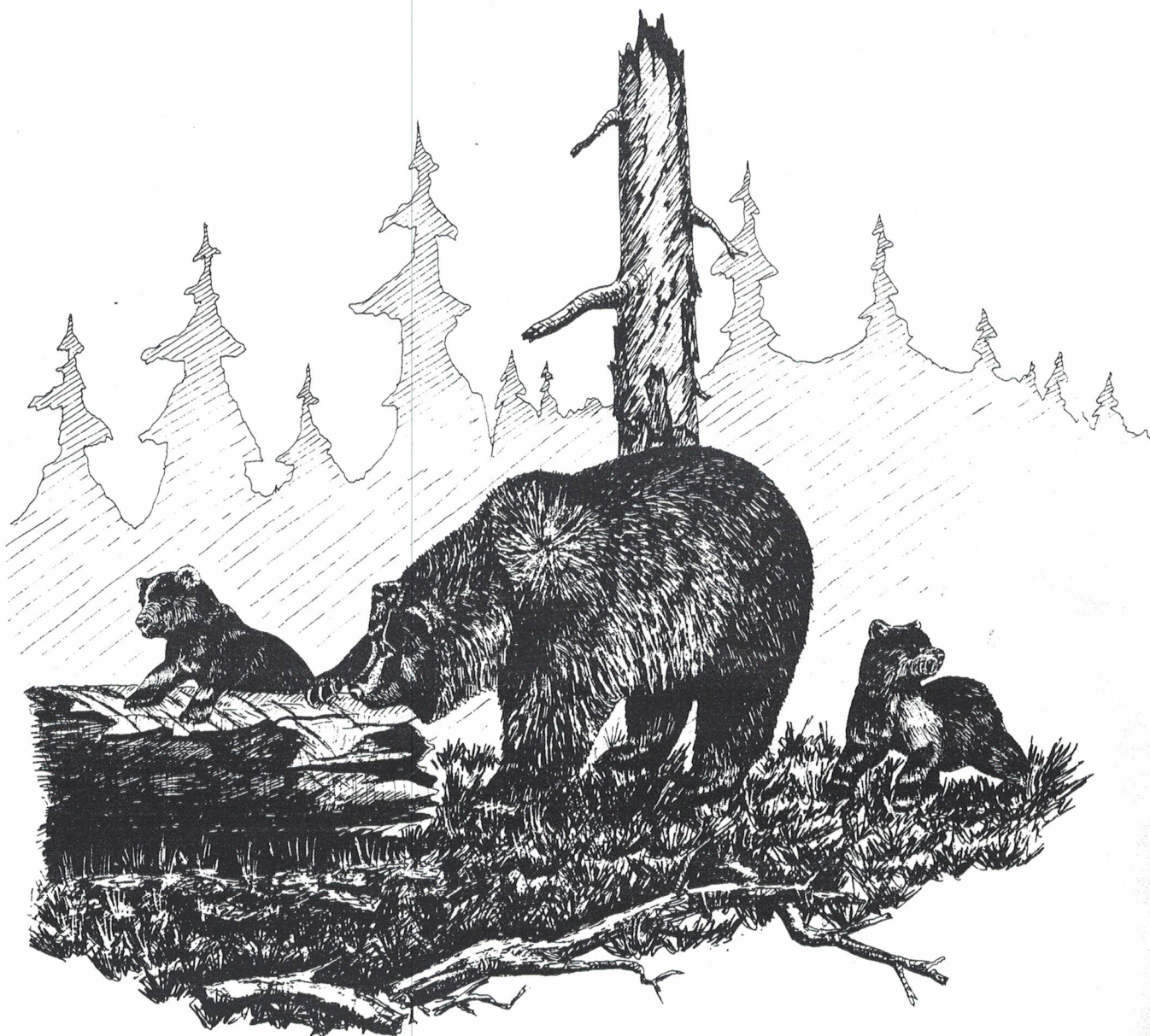
General Technical
Report INT-207

May 1986



Proceedings— Grizzly Bear Habitat Symposium

Missoula, Montana,
April 30—May 2, 1985



A COMMON SENSE APPROACH TO GRIZZLY BEAR HABITAT EVALUATION

Matthew M. Reid and Steven D. Gehman

ABSTRACT: The common sense approach to evaluating grizzly bear habitat includes three main efforts: (1) collecting and mapping of all known information pertaining to grizzly bear use of an area; (2) on-the-ground reconnaissance and resource sampling (including habitat sampling and mapping, ungulate use surveys, and grizzly bear use surveys); and (3) analysis of data. Ecological and philosophical considerations related to the approach are discussed. Critiques of the Forest Service approach to evaluating grizzly bear habitat in the Clark's Fork Corridor (Shoshone National Forest) and the Mount Hebgen area (Gallatin National Forest) are provided. Special attention is given to Forest Service oversight of critical components of the evaluation process and to the implications of such oversight. The purpose is not to espouse a new methodology, but to remind resource managers that appropriate existing methodologies are frequently overlooked, and that the common sense approach can yield valuable management information if properly conducted. A case study (by Reid Environmental Services) of the proposed evaluation approach to grizzly bear habitat in the Northern Yellowstone Rim area is reviewed. Specific procedures and findings are presented, as are conclusions regarding the applicability of the findings to management of grizzly bear habitat in the Greater Yellowstone Ecosystem. Suggestions for future grizzly bear research efforts in the Greater Yellowstone Ecosystem are presented.

INTRODUCTION

Current delineations of grizzly bear management situations (USDA and USDI 1979) do not accurately reflect grizzly bear use of habitat in many portions of the Greater Yellowstone Ecosystem (GYE). Although the guidelines were intended to define management situations ecologically, many situation boundaries actually reflect political, social, and economic concerns (Hawkes 1976). The purposes of this paper are to review a common sense approach to evaluating grizzly bear habitat in the GYE and to illustrate the applicability and effectiveness of such an approach. We present our methodology and examples of our work in three areas of the Gallatin and Shoshone National Forests, where we determined that delineations of

grizzly bear management situations did not reflect grizzly bear use.

The common sense approach to evaluating grizzly bear habitat consists of three main categories of effort: (1) collection and mapping of all known information pertaining to grizzly bear use of an area, (2) on-the-ground reconnaissance and resource sampling, and (3) data analysis.

Collection of pertinent information should include reviews of published literature, agency reports and data, and existing habitat maps and aerial photographs, as well as interviews with agency personnel, researchers, landowners, residents, and users of the area (outfitters, sportsmen, recreationists). Information that should be recorded includes dates, locations, and details of grizzly bear activity in the area and details of habitat alterations (fire, agriculture, logging, development) that have occurred in the area. The product of this phase of work should be a series of map overlays, showing the locations of grizzly bear activity and relevant habitat information.

Habitat sampling and mapping and grizzly bear and ungulate use surveys are critical components that should be conducted during the field work phase of the habitat evaluation process. Appropriate methodologies have been developed for sampling and mapping grizzly bear habitat components in the northern ecosystem (Christensen 1979; Mealey 1977; Mealey and others 1977) and in the Yellowstone Ecosystem (Puchlerz and others 1984). Methods of Puchlerz and others (1984) require determinations of habitat types (Pfister and others 1977), cover types, and nonforest components as the basis for delineating grizzly bear habitat components. We used these methods extensively during our 1984 field season and found them to be appropriate for describing habitat in the northern Yellowstone area. Widespread use of existing methodologies by researchers and resource managers will facilitate uniform documentation, interpretation, and comparison of habitat information.

Thorough surveys of the study area should be conducted during all seasons to document grizzly bear use. Field crews should systematically search for and record observations of bear tracks, scats, day beds, feed sites, and dens. Samples of bear hair should be collected from vegetation, logs, rocks, trails, day beds, and other features for species determinations to be made by a qualified expert. Whenever possible, bear scats should be collected and analyzed to further our knowledge of bear food habits.

If ungulates have been shown to be an important food source for grizzlies, as is the case in the

Paper presented at the Grizzly Bear Habitat Symposium, Missoula, MT, April 30-May 2, 1985.

Matthew M. Reid is President of Reid Environmental Services, Bozeman, MT; Steven D. Gehman is an independent consulting wildlife biologist, Bozeman, MT.

Yellowstone Ecosystem (Knight and others 1980), then surveys of ungulate use patterns should be conducted in conjunction with habitat sampling and grizzly bear use surveys. Efforts should include documentation of species and numbers of ungulates observed, availability of ungulate carrion, and seasonal use patterns of ungulates (including general ranges, and concentrated use areas such as elk calving areas and winter and spring transition ranges). Censuses conducted from roads and transects through ungulate ranges are effective means of obtaining ungulate use data. Whenever possible, results of aerial surveys conducted by State and Federal agencies should be obtained to supplement data.

When planning field activities, factors such as timing of efforts, level of effort, and qualifications of personnel should be carefully considered. Timing of field efforts can seriously affect habitat sampling, grizzly bear activity surveys, and ungulate use surveys. Habitat sampling should be coordinated with the area's plant phenology to ensure that indicator species are present. Grizzly bear use surveys should be conducted during all seasons when bears are active. Special searches should be made to locate den sites, evidence of predenning and postdenning activity, and carcass feed sites. Surveys of ungulate use should be conducted year round; however, special attention should be given to early spring and birthing periods when grizzlies are most likely to prey upon vulnerable ungulates. It is impossible to establish specific guidelines for appropriate levels of field activities; however, effort should be expended until experienced personnel feel that samples representative of the area have been obtained during all critical periods of the year. Finally, it is important to have trained personnel conducting the field sampling and surveys. All of these factors contribute to the accuracy and applicability of results obtained from field work.

Data analysis should include compilation of qualitative and quantitative descriptions of habitat and associated use by grizzly bears. Habitat components should be mapped and assigned importance values. Grizzly bear and ungulate use data should be mapped on overlays to aid in visualizing habitat-animal interactions. Several guidelines should be kept in mind when examining results from the habitat evaluation process:

1. Although it may be desirable or necessary to divide an area into smaller units for evaluation, always maintain a broad perspective of grizzly bear requirements and of options available to grizzlies for achieving those requirements; that is, keep in mind the biological characteristics of the animal and ecological relationships that govern the animal's behavior (U.S. Government 1983; Mealey 1977).

2. Consider cumulative impacts to grizzly bears on an ecosystem-wide basis; when considered as small, individual pieces of habitat, few areas are absolutely critical to the survival of grizzly bears in a particular ecosystem; however, the

juxtaposition of habitat units and knowledge of the cumulative characteristics of and pressures on those units play a significant role in the value or importance of any one unit.

3. Acknowledge the variable nature of biological and ecological relationships; results from one season or one area are only samples.

FOREST SERVICE EVALUATIONS

Mount Hebgen Area.--Our first example of grizzly bear habitat evaluation in the Greater Yellowstone Ecosystem comes from the Mount Hebgen area of the Gallatin National Forest in southwestern Montana. In 1973, Ski Yellowstone, Inc., applied for a special use permit to develop a winter sports complex at Mount Hebgen. The Ski Yellowstone Corporation then funded a wildlife study in the Mount Hebgen area during spring and summer of 1973 (Haglund 1973). The study consisted of two flights over the study area and an undocumented amount of on-the-ground reconnaissance work. The objective of the study apparently was to evaluate potential impacts of development on wildlife in the Mount Hebgen area. The project report dealt mainly with big game animals (elk and moose) and included one short paragraph about grizzly bears (Haglund 1973). Grizzly bear activity was documented in three drainages near the proposed development site, but not on the primary study area.

The Forest Service, U.S. Department of Agriculture, then issued the special use permit for the Ski Yellowstone development. In response to public opposition to this decision and to concerns about potential impacts to wildlife, particularly grizzly bears, the Ski Yellowstone Corporation funded a second wildlife study near the development site. This study was conducted by Mealey (1976) during late spring and early summer, 1976, and was oriented toward evaluating grizzly bear habitat quality in the Mount Hebgen area. Based on the area's low potential for producing grizzly bear food, Mealey (1976) concluded that the area was low-quality grizzly habitat. Other important factors related to grizzly bear ecology were not considered in this study (Mealey 1977).

In 1977, the Forest Service completed an Environmental Impact Statement (EIS) for development in the Mount Hebgen area. The EIS indicated the preferred alternative was to construct the proposed Ski Yellowstone development. In the EIS, all data concerning potential impacts to wildlife came from the previously mentioned studies of Haglund (1973) and Mealey (1976). Included in the EIS was a Fish and Wildlife Service, U.S. Department of the Interior, biological opinion of "no jeopardy" to the Yellowstone grizzly bear population.

For the next several years, public comments and debate were heard regarding the EIS and the proposed development. Meanwhile, in 1979, the "Guidelines for Management Involving Grizzly Bears in the Greater Yellowstone Area" were published

sites where grizzlies had recently fed upon elk, three grizzly bear day beds, three bear scats, and two sets of grizzly bear tracks (Reid 1984). Because of the potential impacts of a project like Ski Yellowstone, these kinds of evidence should have been gathered and documented by Forest Service personnel each year since the development proposal was made.

We feel that Forest Service and Fish and Wildlife Service personnel have not demonstrated an adequate ecological perspective of grizzly bear needs in the Yellowstone Ecosystem. They isolated and examined the Mount Hebgen area as an island of habitat and paid little attention to habitat quality, geographical position, or human pressures in surrounding areas; nor did they relate that information to grizzly bear ecology and the Mount Hebgen management problem. Knight and Blanchard (1984) expressed similar concerns, noting that although food and cover on the Mount Hebgen site may not be critical to the Yellowstone grizzly bear population, the proposed development has the potential to become a population sink that could have serious negative impacts upon grizzlies.

In the summer of 1984 the Forest Service initiated its newly formed Cumulative Effects Analysis process (Puchlerz and others 1984) in the Mount Hebgen area. The results of such analysis, if accompanied by more intensive surveys of grizzly bear and ungulate activity and a broader perspective of the Yellowstone grizzly bear situation, could provide a more realistic evaluation of grizzly bear habitat in the Hebgen area and a more appropriate delineation of management situations. It is our hope that the Forest Service will proceed along these lines.

Clark's River Corridor.--Our second example of inadequate evaluation of grizzly bear habitat by the Forest Service comes from the Clark's Fork River Corridor in the Shoshone National Forest (northwestern Wyoming).

In 1978, the Forest Service began to study the potential for a snowmobile route from Cooke City, MT, to Crandall Junction, WY, through the Clark's Fork Corridor. The proposed route would use existing cleared trailways but would cross grizzly bear habitat. When grizzly bear management situations were delineated in this area in 1979, the Forest Service classified the Clark's Fork Corridor as MS 2 and MS 3, although area surrounding the corridor on three sides was classified as MS 1 (USDA and USDI 1979; fig. 2). Classification of the corridor was ecologically unfounded and was instead based upon land ownership and political concerns (KRA Natural Resource Consultants 1983).

In 1982, the Forest Service released its final Environmental Assessment for the proposed project, reporting that the project would have little environmental impact. The Forest Service concluded that there would be no effect on threatened or endangered species and consequently did not consult with the U.S. Fish and Wildlife Service regarding the project. The Forest Service

evaluation of grizzly bear habitat along the proposed trail route was based solely on importance values (Mealey 1977) for existing vegetative types (USDA 1982).

In October 1983, a private landowner hired Kopeck-Reid Associates (now Reid Environmental Services) to investigate and document grizzly bear use of the Clark's Fork Corridor. KRA based its investigation on the common sense approach that we have outlined, and obtained data that refuted Forest Service conclusions about the area's value to grizzly bears (KRA Natural Resource Consultants 1983). First, KRA used IGBST data to show that home ranges of 12 radio-collared grizzlies included portions of the Clark's Fork Corridor (fig. 2) and that the study bears used the corridor primarily during spring and fall. KRA sampled habitat along the corridor and documented the occurrence of high-value grizzly bear habitat components. An ungulate survey revealed significant use of the corridor by moose, and a survey of grizzly bear activity indicated that grizzlies were present and preyed upon moose during fall, 1983. Study results also indicated that suitable grizzly bear denning habitat was available adjacent to the corridor.

The following example illustrates the inadequacy of the Forest Service habitat evaluation process. The Forest Service assessment showed the absolute and relative weightings of grizzly use of One Mile Creek, along the Clark's Fork Corridor, to be zero (USDA n.d., field notes by B. Haflich); that is, One Mile Creek had no value to grizzly bears. KRA surveys revealed that moose use One Mile Creek during spring and fall and that grizzlies had fed on a moose carcass in the One Mile Creek drainage. The point of this example is that use of habitat importance values to determine grizzly bear habitat quality should be accompanied by review of known data and intensive on-the-ground ungulate and grizzly bear use surveys during appropriate seasons.

West Gardiner Unit.--Our third and most recent example of grizzly bear habitat evaluation is from the West Gardiner unit of the Gallatin National Forest. In 1977, the Forest Service began to explore the possibility of increasing public access into the Mol Heron Creek drainage (USDA 1977), which flows from the northern boundary of Yellowstone National Park into the Yellowstone River. By 1983 the Forest Service had expanded its intentions, deciding that increased access into five major drainages of the West Gardiner unit would be desirable. In September 1984, the Forest Service released an Environmental Assessment (EA) of the proposed access program (USDA 1984). The EA and accompanying Biological Evaluation were extremely vague and lacked specific details regarding proposed actions and environmental impacts of those actions. Although all areas under consideration were within Occupied Grizzly Habitat (USDA and USDI 1979), few data were presented relating to potential or actual grizzly bear use of those areas or to potential impacts to grizzly bears. The EA included a listing of IGBST-instrumented bears that used the

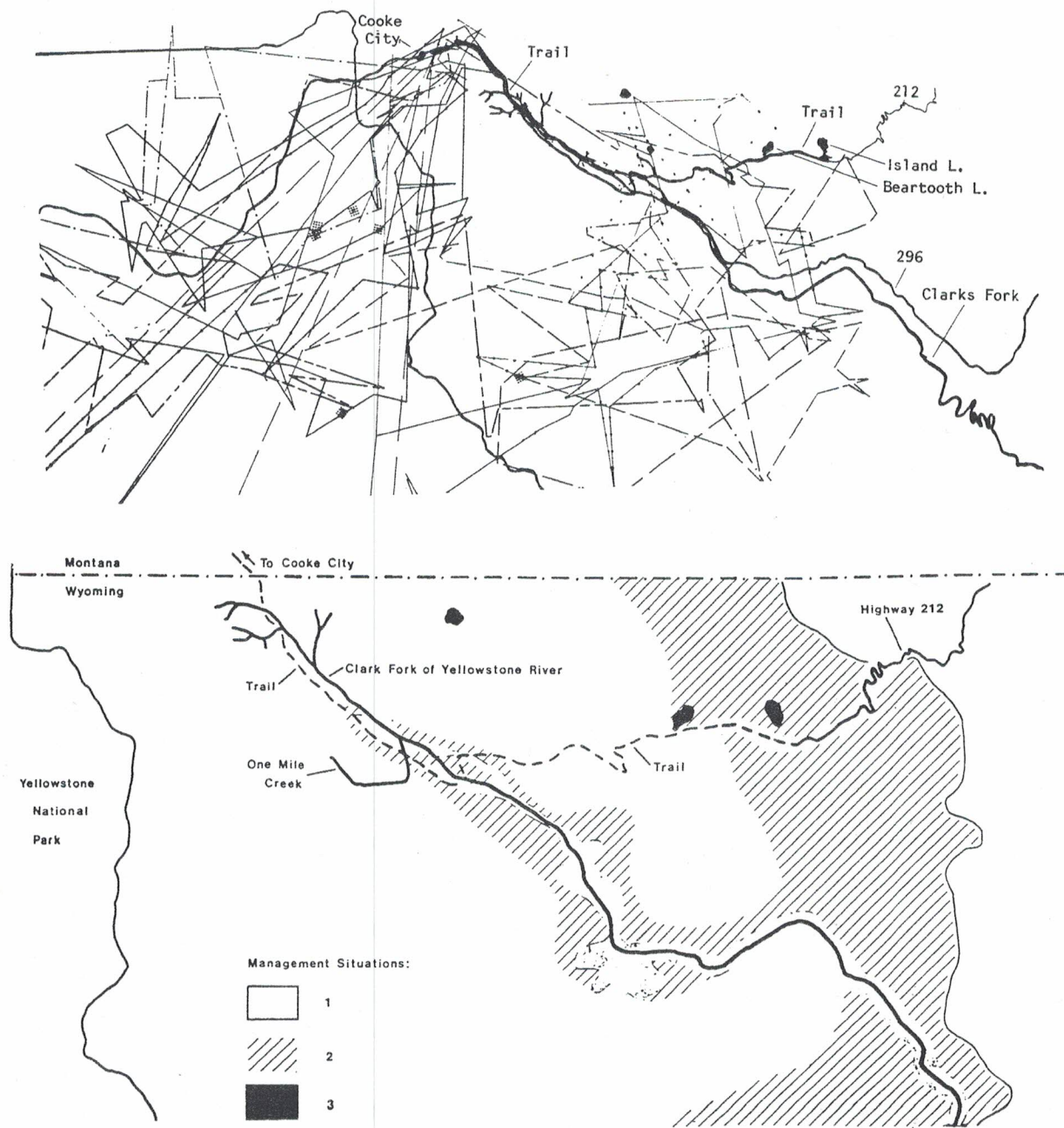


Figure 2.--Life ranges of 12 radio-instrumented grizzly bears (top), and delineations of management situations (bottom) in the Clark's Fork Corridor, Shoshone National Forest.

study area and some general information regarding cub production and denning by grizzlies in the Yellowstone Ecosystem (USDA 1984). No analyses of previously collected grizzly bear use data were presented, and no field work was conducted as part of the Forest Service evaluation process.

Out of concern for their land, their lifestyles, and the natural resources of the area, landowners, residents, and users of the West Gardiner unit formed a group (the Northern Yellowstone Rim Alliance) and hired Reid Environmental Services to investigate natural resource issues related to the

Forest Service proposal. Preliminary planning and collection of background information began in January 1984, and field work began in early May. The majority of our work centered around evaluation of the area as grizzly bear habitat.

We examined all IGBST data pertaining to the West Gardiner unit and constructed maps of radio-locations, recorded sightings, and life ranges of grizzly bears. This information alone demonstrated significant use of the area by grizzlies between 1974 and 1984.

Our own field work consisted of (1) interviews with residents and users of the area, (2) extensive surveys of grizzly bear and ungulate activity in all drainages included in the access proposal, (3) intensive sampling and mapping of grizzly bear habitat components in selected portions of the area, and (4) reconnaissance of potential denning habitat.

During this process we collected and documented locations of bear scats and samples of bear hair, located ungulate carcasses fed upon by grizzlies, located numerous grizzly bear day beds and several grizzly bear dens, made overlays of grizzly bear habitat components in the selected areas, documented sightings of grizzly bears by residents and users of the area, and documented seasonal habitat use patterns of ungulates.

Overall, we documented relatively high use of the area by grizzlies during spring, summer, and fall, 1984. Our data plus those of the IGBST indicate that grizzly bear use of the area is substantial and that management situation delineations do not accurately reflect grizzly bear use of the West Gardiner unit. Again, we believe that a common sense approach has led to a more realistic evaluation of grizzly bear habitat than have Forest Service procedures.

REDEFINING MANAGEMENT SITUATIONS

Ultimately, we believe that a more conservative view of critical grizzly bear habitat, such as the delineation presented by Craighead (1980), is needed in the Yellowstone Ecosystem until the grizzly bear population recovers. However, we realize that such a change may be unrealistic under current management constraints. If the current system is to be followed, we feel that grizzly bear management situations for the Yellowstone Ecosystem need to be redefined, and in many instances redelineated, to more accurately reflect grizzly bear habitat use and needs. Many MS boundaries reflect political, social, or economic convenience and do not correspond to the ecologically based definitions of management situations. We propose the following redefinition of management situations, based on ecological and management considerations:

Management Situation 1: All public land within occupied grizzly habitat (USDA and USDI 1979); grizzly bear recovery is the main priority.

Management Situation 2: The fringe of public lands outside of occupied grizzly habitat, representing an ecological buffer zone to MS 1; these areas are used by grizzlies for various reasons but do not represent population centers.

Management Situation 3: Private land within occupied grizzly habitat and the ecological fringe surrounding it; private activities in these areas could jeopardize the grizzly population; agency jurisdiction is limited.

Management Situation 4: Private land outside of occupied grizzly habitat and the ecological

fringe surrounding it; activities on these lands are not likely to jeopardize the grizzly population; agency jurisdiction is limited.

Management Situation 5: Public land outside of occupied grizzly habitat and the ecological fringe surrounding it; lands occasionally used by grizzlies but activities not likely to jeopardize the grizzly population; management issues should be decided on a case-by-case basis.

If management situations are redefined in this manner, we believe they will more realistically represent grizzly bear needs and jurisdictional concerns of management agencies. On the basis of our evaluation we suggest reevaluating grizzly bear habitat in 11 areas of the Yellowstone Ecosystem (fig. 3).

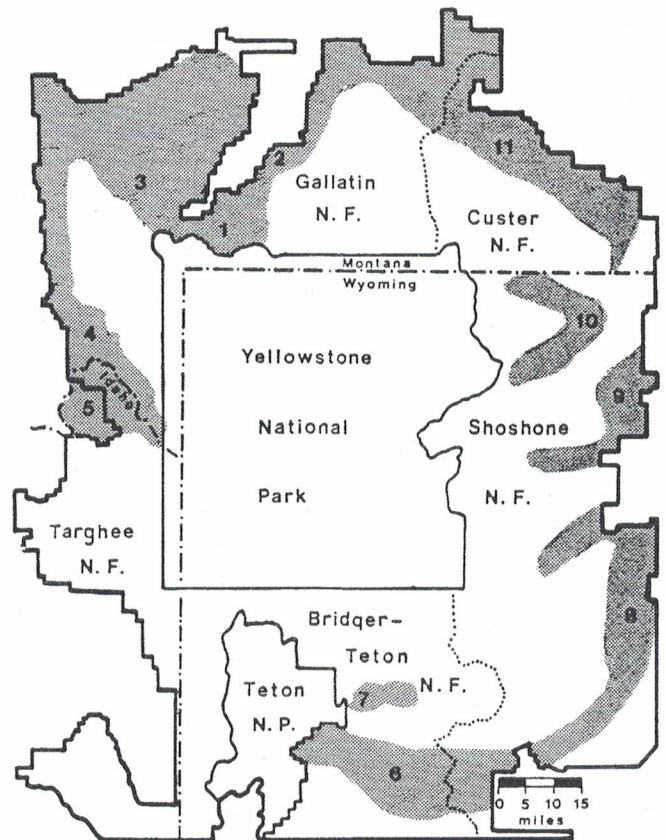


Figure 3.--Locations of areas within the Yellowstone ecosystem that need reevaluation of grizzly bear habitat: 1, West Gardiner unit (Gallatin National Forest); 2, West front of north Absaroka Range (Gallatin National Forest); 3, Southern Gallatin Range (Gallatin National Forest); 4, Hebgen Lake--West Yellowstone area (Gallatin National Forest); 5, Henry's Lake--Island Park area (Targhee National Forest); 6, Gros Ventre River (Bridger-Teton National Forest); 7, Area east of Moran Junction (Bridger-Teton National Forest); 8, Shoshone River System (Shoshone National Forest); 9, Sunlight Creek--Crandall area (Shoshone National Forest); 10, Clark's Fork of the Yellowstone River (Shoshone National Forest); 11, Boulder--Stillwater River Systems (Gallatin National Forest, Custer National Forest).

REFERENCES

- Brewster, Wayne G. [Memo to Tom Coston, Regional Forester]. 1984 January 4. Located at: U.S. Department of Agriculture, Forest Service, Northern Region, Missoula, MT.
- Christensen, A. G. Cumulative effects analysis process. Libby, MT: U.S. Department of Agriculture, Forest Service, Kootenai National Forest; 1979. 11 p.
- Craighead, John J. A proposed delineation of critical grizzly bear habitat in the Yellowstone region. Bear Biology Association, Monograph Series No. 1; 1980. 20 p.
- Haglund, Brent M. Wildlife ecology. In: Montagne, J., ed. Ski Yellowstone environmental study. 1973. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Gallatin National Forest, Bozeman, MT.
- Hawkes, Lewis. [Internal memo to Forest Supervisor of Shoshone National Forest]. 1976 November 16. Located at: U.S. Department of Agriculture, Forest Service, Shoshone National Forest, Cody, WY.
- Knight, R. R.; Blanchard, B. M. 1985. Unpublished data on file at: Interagency Grizzly Bear Study Team, U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Bozeman, MT.
- Knight, R. R.; Blanchard, B. M. Potential effects of the Ski Yellowstone development on grizzly bears. 1984. Unpublished paper on file at: Interagency Grizzly Bear Study Team, U.S. Department of Agriculture, Forest Service, Intermountain Research Station, Bozeman, MT. 5 p.
- Knight, R. R.; Blanchard, B. M.; Kendall, K. C.; Oldenburg, L. F. Yellowstone grizzly bear investigations: annual report of the Interagency Study Team, 1979. Bozeman, MT: U.S. Department of the Interior, Park Service; 1979. 91 p.
- KRA Natural Resource Consultants. Assessment of grizzly bear utilization and habitat quality in the Clark's Fork Snowmobile Trail Corridor. 1983. Unpublished report on file at: Reid Environmental Services, Bozeman, MT. 76 p.
- Mealey, Stephen P. A survey for grizzly bear habitat on the Mount Hebgen winter sports special use application site and adjacent areas. 1976. Unpublished report on file at: U.S. Department of Agriculture, Forest Service, Gallatin National Forest, Bozeman, MT. 22 p.
- Mealey, Stephen P. Method for determining grizzly bear habitat quality and estimating consequences of impacts on grizzly habitat quality. 1977. Unpublished paper on file at: U.S. Department of Agriculture, Forest Service, Northern Region, Missoula, MT. 35 p.
- Mealey, S. P.; Jonkel, C. J.; Demarchi, R. Habitat criteria for grizzly bear management. Proceedings, International Congress of Game Biologists. 13: 276-289; 1977.
- Pfister, R. D.; Kovalchik, B. L.; Arno, S. F.; Presby, R. C. Forest habitat types of Montana. General Technical Report INT-34. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station; 1972. 174 p.
- Puchlerz, T.; Despain, D.; Mattson, D. Grizzly bear habitat component mapping handbook for the Yellowstone ecosystem. Bozeman, MT: U.S. Department of the Interior, National Park Service; U.S. Department of Agriculture, Forest Service; 1984. 31 p.
- Reid, M. M. [Letter to Wayne Brewster]. 1984 June 19. Located at: Reid Environmental Services, Bozeman, MT.
- U.S. Department of Agriculture, Forest Service. [Field notes by Bruce Haflich]. n.d. Unpublished data on file at: U.S. Department of Agriculture, Forest Service, Shoshone National Forest, Clarks Fork Ranger District, Powell, WY.
- U.S. Department of Agriculture, Forest Service. Gallatin National Forest access report. Bozeman, MT: U.S. Department of Agriculture, Forest Service, Gallatin National Forest; 1977. 20 p.
- U.S. Department of Agriculture, Forest Service. Environmental assessment for Clark's Fork Snowmobile Trail. Powell, WY: U.S. Department of Agriculture, Forest Service, Shoshone National Forest, Clarks Fork Ranger District; 1982. 65 p.
- U.S. Department of Agriculture, Forest Service. Environmental assessment for the West Gardiner Access Unit. Gardiner, MT: U.S. Department of Agriculture, Forest Service, Gallatin National Forest, Gardiner Ranger District; 1984.
- U.S. Department of Agriculture; U.S. Department of the Interior. Guidelines for management involving grizzly bears in the Greater Yellowstone area. Bozeman, MT; 1979. 136 p.
- U.S. Government. [Proposed rules for critical habitat delineation]. In: Federal Register, Vol. 41, No. 215; 1976 November 5. Washington, DC: U.S. Government Printing Office; 1976.
- U.S. Government. The Endangered Species Act as amended by Public Law 97-304-1982. Washington, DC: U.S. Government Printing Office; 1983. 53 p.