



# United States Department of the Interior

NATIONAL BIOLOGICAL SURVEY  
National Ecology Research Center

## Glacier Field Station

July 18, 1994

### Memorandum

To: IGBC members

From: Chair, Research Subcommittee

*K.C. Kendall*

Subject: Effects of trail use on grizzly bear habitat use

At the March 20, 1994 IGBC meeting in Anchorage, Alaska, Tom Puchlerz gave a presentation on the task group report on access management. The group asked for guidance on whether to just address roads or expand coverage to include trails. The meeting participants concluded that there was insufficient information on the effects of trail use on grizzly bear habitat utilization on which to base trail access management. Through Tom, you have asked the Research Subcommittee to prepare a problem description with recommendations on how to proceed. Attached is our problem analysis on the effects of non-motorized human activity on grizzly bears.

# EFFECTS OF NON-MOTORIZED HUMAN ACTIVITY ON GRIZZLY BEARS

Problem statement and analysis  
IGBC Research Subcommittee  
July 18, 1994

## Background:

Research conducted on the impacts of highways, roads, and industrial and recreational development on grizzly bear habitat use patterns and mortality levels has provided a basis for road access management to protect grizzly bear populations. Although less information is available on the effects of non-motorized recreation, it has been clearly demonstrated that even low levels of human use can disturb and displace grizzly bears. On the Rocky Mountain Front, bears tended to use areas near low and moderate use trails more than areas near heavily used trails. Grizzly bears in the South Fork of the Flathead avoid trails and backcountry campsites. Gunther found that the number of bears sighted per day was inversely related to the number of people using an area and that fewer bears were observed near campsites when they were occupied by people than when vacant. Bear fishing activity on Yellowstone Lake spawning streams was at its lowest levels when angler numbers peaked in years of highest spawning runs. After those areas were closed to fishermen, bear use rose to the highest level in seven years of monitoring.

The predictability and intensity of disturbance influence the degree and duration of the displacement. In an experimental study, a hiker approaching grizzly bears in the backcountry or erecting a camp nearby, caused immediate and rapid displacement of bears. These bears moved further and more often and used lower quality habitat than undisturbed bears for at least two days after the disruption. Haroldson and Mattson predicted that Yellowstone bears were likely to be disturbed more than was indicated by this study because the backcountry received more sustained use than was simulated by the tests. Disturbance response is likely to be greater for non-habituated bears and those in open or productive habitats. People hiking more than 500m from primary and secondary roads elicited strong flight responses from bears while people walking on these roads produced a more moderate response. In evaluating displacement effects of human recreation development in Yellowstone, Mattson found that disruption of bear activity extended much further in the backcountry than from roads, presumably, because of the greater human densities and persistently high levels of human activity at night around developments. Other factors contributing to bear response to recreational activity are the bear's dominance status, physiological state, and foraging strategy.

Grizzly bear survival is compromised by recreational activity, particularly where people are allowed to carry firearms. In Alaska, 31% of all non-sport grizzly bear deaths were caused by hunters, most of whom claimed defense of life or

property. Sport fishermen and hikers were responsible for 8% of the non-hunting grizzly bear deaths. In Alberta from 1972-84, excluding legal hunter take, grizzly bear mortalities were tallied as follows: 60% by hunters in self-defense, 30% by hunters mistaking a grizzly bear for a black bear, and 10% were problem bears killed in recreation or tourist camps. Hunter activities are also a source of grizzly bear mortality in Montana and Wyoming.

As more people penetrate into grizzly bear habitat, more bears are killed or removed from the population as the number of bear/human conflicts rises. The correlation between increased visitor use and grizzly bear problems has been documented in many areas. Encounters are especially common when recreation occurs within or near prime bear habitat. Because superimposing high recreational activity on preferred grizzly bear habitat results in direct mortality and reduced habitat effectiveness, concern about expanding human use in productive bear habitat has been expressed for many locales.

Non-motorized use restrictions have been deployed in various locations to protect grizzly bears from human disturbance. Seasonal closure of various areas instituted in Glacier and Yellowstone National Parks in the early 1980's, protect bears frequenting favored feeding sites. The Salish-Kootenai Tribe closed McDonald Peak to climbers in the late summer to ensure that human use did not preclude grizzly bears from feeding on army cutworm moths. It is clear that bears use the areas closed to people but the effect of the closures has not been quantified.

( Interpretation of the impact of human disturbance on grizzly bear activity patterns is hampered by the lack of quantitative information on human use levels. National parks record the number of people registering for backcountry camping permits and thus have tracked backcountry camper levels. Backcountry day use on 60 trails in Glacier NP totaled approximately 160,000 hikers June-August in 1988. Backcountry trail use was categorized in low to high use levels from data collected on 74 trails in Yellowstone NP in 1992. But with no periodic backcountry human use level monitoring, there is no information on the intensity, type, or temporal-geographic distribution of use trends. Comprehensive backcountry use information is not available for any of the areas where intensive grizzly bear research has been conducted.)

### Untapped Data

We believe additional insight on the effects of backcountry use could be extracted from existing data sets. Specifically, we recommend the following analyses:

- 1) Describe grizzly bear mortality in the NCDE and GYE in relation to all man-made landscape features including trails and campsites.
- 2) In areas where grizzly bears have been studied intensively with radio telemetry,

analyze data for evidence of trail/camp avoidance, as has been done for roads. Potential study areas include South Fork, Flathead (Mace), Greater Yellowstone (Knight), Blackfoot (Carney), Cabinet/Yaak (Kaseworm), and Rocky Mountain Front (Aune).

3) For the 15 areas in Yellowstone NP where human use has been restricted since the mid-1980's, compare pre- and post-closure bear habitat use.

### How to Proceed

We recommend the above analyses be completed and evaluated before new research is initiated. At the IGBC's request, the Research Subcommittee could provide guidance on analytical approach and appropriate collaborators and provide technical review of the products. Decisions to be made include:

- 1) Who will take the lead for each topic?
- 2) Can these analyses be accomplished by existing staff and funds? If not, how will it be funded?

Even if new bear research is not immediately initiated, the Research Subcommittee sees a need for more data on backcountry human use levels. At a minimum, we recommend emphasis be placed on monitoring trends in trail and campsite use. This is seen as particularly important in the NCDE and GYE, where recreational use is relatively high and is increasing.

A decision to conduct further research on the effects of recreation on grizzly bears should be made in light of the above and the amount of data managers feel they need to support trail access management. For road access management issues, managers are asking for mortality risk associated with different categories and densities of roads. Such research is very difficult and intensive. In our opinion, it research to establish a link between trail use and grizzly bear mortality would be even more difficult than that with roads and would involve a large commitment of resources. Because of the host of confounding factors, even further refinement of our knowledge of the effects of recreation on habitat use will involve intensive research spanning 5-10 years. We estimate that such a study would cost \$50-100K/yr, even if conducted in conjunction with an existing study which had collared bears.