

Black Bear Species/Area Relationships Studied at Rocky Mountain NP

By Henry E. McCutchen

Our research team is conducting a study on a black bear population at Rocky Mountain National Park (ROMO) that exhibits considerable difference from similar situations in other parks.

When the park was established in 1915, grizzly bears and black bears were present in low numbers. The grizzly became extinct here by the late 1920s. Historical records indicate that the black bear population increased to some degree over the years, but the species has never been common. In the past, the black bear population in the park has been estimated at 30 to 40 animals.

The park, 265,000 acres in size, received 2,523,122 total visits in 1986. This is relatively high visitor use, ranking 7th in visits among the 48 National Parks. Some national parks with high visitation and black bears have high numbers of bear problems. Yosemite, Sequoia, Kings Canyon, and Great Smokies are examples. However, ROMO has never been an area noted for many bear problems. Records of bear incidents in the park from 1959 to 1983 totaled 133, with an average of about 5 per year. This is low compared to Sequoia and Kings Canyon NPs, which between 1959 and 1976 had a total of 3,968 bear incidents for an average of 220 per year.

An exception occurred at ROMO in 1984. That year bear incidents reached a record of 90. Most of these occurred in the backcountry. This was unexpected because the park has an intensive backcountry management program that encourages trash pack out and clean camps.

The depredations of bears at backcountry sites in the park in 1984 caused even more intensive management to be undertaken. This included backcountry closures, an intensive bear information program, increased backcountry patrols, enforcement of food handling and storage rules, and a bear capture and transplant effort. Bear reports and sightings during this period indicated that at least two sub-adult males were the cause of the depredations. One of these was captured and transplanted out of the area.

Because of the events, a number of questions were raised about the bears in the park, such as: What caused the increased number of bear problems? Considering the apparent low densities of bears, what level of management or control could be tolerated by the population without risk? Can bear depredations be predicted by some environmental parameter such as dry weather? What is the population density and ecology of the bears in the park, and what is the relation of those parameters to the heavy backcountry visitation and outside pressures?

To answer these questions, in 1985 a 3-5 year research program was initiated. The study area is a 120 square mile section located in the southeastern third of the park. The area contained the sites where most of the bear depredations occurred in 1984. It also receives the highest front and backcountry use, and has the most intensive urban and suburban development along the boundary.

Bears are difficult to census because they are solitary and occupy forested habitat. Thus, research methods involved an intensive capture, marking-recapture and radio collaring effort throughout the study area. When research was initiated, we assumed that

the bear population was static and at carrying capacity. It was anticipated that the area would have a "core population" of adults with stable home ranges with surplus sub-adults migrating or dispersing outside the park.

To date, however, the research results (tentative) have not supported the original assumptions. After an intensive effort, only 6 resident bears have been captured in the study area. The average density is low with only 1 bear per 20 square miles. These data sharply contrast with a black bear density of 1 bear per 3-5 square miles found by another study in south central Colorado.

Among the bears captured in the study at ROMO was a single adult female. The rest were sub-adult males and females. An adult male has been observed in the area during breeding season, but has not yet been captured. It appears that his usual home range is outside of the study area. Unfortunately this age structure exhibits the classic symptoms of an exploited population. It appears that mortality is so heavy upon adult bears in the study area that a stable population and land tenure system cannot be established. Sub-adult bears appear to be immigrating into the area from outside. This scenario was not expected in a national park and International Biosphere Reserve. Thus, the research has raised a new question. A combination of small park size, habitat encroachment, and human predation most likely caused the extirpation of two of the park's wide-ranging carnivores, the wolf and grizzly bear. Is the park's black bear population now at risk from similar pressures?

The research has not yet identified the underlying causes of the 1984 bear problems. The source of the depredating sub-adult males of 1984 could have been offspring of the single adult female or siblings which immigrated here from an outside area. The future

offspring of the females in the area will be monitored to determine their behavior. Also, weather records are being correlated with bear behavior to determine if poor food years are related to bear incidents.

During the field seasons of 1985 and 1986, the research team was equipped and ready, not only to capture and mark bears, but to respond to any backcountry depredation with a capture effort. However, these years were relatively quiet with only a few bears even being sighted by park visitors.

Some additional information obtained by the research is noteworthy. The bears in the study area are small in body size. The largest was a 3-year old male weighing 180 pounds. The adult female, cementum aged at 13 plus years, weighed only 108 pounds in 1985. The single mortality of a radio-collared bear to date was of a sub-adult male, which wandered outside of the park and was killed by a hunter.

In many parks bears are highly visible and are attracted to human use areas. At ROMO, visitor observations of bears are low. Radiotelemetry has revealed that generally the black bears are secretive and avoid areas of human use and developments. This type of behavior can be considered a "model" for park bears. For example, one 4-year old female has an exclusive home range in one of the most heavily visited areas of the park. Her range includes a ski area, several trails, several picnic grounds and a good portion of the heavily used Trail Ridge Road. Although there are numerous refuse cans and dumpsters scattered throughout the area, the little bear does not visit them. She is seldom observed in the park at all. Instead, she feeds on small patches of natural food and stays out of sight of roads and trails. At the time of her initial capture in the summer of 1985, she weighed 78 pounds. When she was examined in her den during the winter of 1985-1986, she weighed only 54 pounds.



The use of skilled biological technicians pays off on the black bear project at Rocky Mountain National Park. Janice Gruttadauria poses with a bear which she snared and tranquilized in the park. Janice, previously employed with the Pennsylvania Game Commission, has several hundred bear captures to her credit.



Small size is a curious phenomenon of the black bears at Rocky Mountain National Park. Biological technicians Bob Stark and Shelly Ament heft a tranquilized 3-year-old.

This is considered to be an extreme weight loss. It is considered curious that this small bear's strategy for survival would be to risk starvation in the den and feed upon natural foods rather than forage upon readily available, high energy, human refuse within her home range.

The cause or causes of low bear densities in the study area are now being investigated. Four major factors appear to be involved. First, the Town of Estes Park is located adjacent to the eastern park boundary and increasing numbers of subdivisions, summer homes, condominiums, dude ranches and convention centers are being constructed here. These are usurping bear travel corridors and habitat. Second, there is apparent heavy hunting pressure on bears adjacent to the park. The only mortality of a park radio-collared bear to date was from outside hunting. Third, there is heavy visitor use of a concentrated network of roads and trails in the study area, which may cause disturbance to the bears. Many trails pass through productive patches of bear habitat. Fourth, in the park, forest fires have been suppressed for about 70 years. This has caused an increase in mature stands of forest and a decrease in patches of earlier stages of plant succession. The research is indicating that patches of earlier plant succession are important to the bears. Evaluation of the first two factors is important because they relate to the park's susceptibility in becoming an "ecological island" for the bears.

Some mitigation of the risk of hunting pressure on the park bears has occurred recently. Information on the low bear densities in the park was provided to the Colorado State Division of Wildlife in 1986 during its consideration of bear hunting regulations. Subsequently, the State placed more restrictions and lower limits on bear hunting in areas adjacent to the park.

Also, a comprehensive fire management program is being planned for the park. When it is implemented, the reestablishment of the fire regime will create a

mosaic of vegetation that includes early successional stages. An important by-product of this program will be bear habitat improvement.

It could be argued that the park's bears are where management wants them; that is, with low densities and creating few problems with property or with visitors. However, the NPS must also meet its preservation mandate for all species, including black bears. Thus, at ROMO, a new bear study is being selected in the park for additional censusing. This area contains more mesic forests, receives less visitor use, and is adjacent to large tracts of National Forest Land. A comparison of bear densities and population parameters between the two areas should clarify the status

and trend of the park bear population.

For ROMO, the black bear shows potential as an important "indicator species" for ecosystem health. It is hoped that the research will show the park is large enough, and contains sufficient habitat and bear numbers for a viable population.

Ultimately the research should provide park managers with information from which to develop bear/visitor management programs. Further, the study should have implications in regard to species/area size, bear habitat/fire management programs and bear management programs in other National Parks.

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