

5. Redefining Bear-Management Strategy

Synopsis: Management objectives for Kodiak archipelago bears currently are based on harvest figures. ADF&G biologists, however, make management decisions and harvest recommendations based both on biological carrying capacity and on wildlife-acceptance capacity¹¹. At present, the total bear population on the Kodiak archipelago is stable and can be sustained at this high level by the natural habitat. Habitat in different areas is capable of sustaining different bear densities. Although the entire Kodiak archipelago is high-quality bear habitat, there are areas where human development and residence take precedence. Thus, biological carrying capacity and wildlife-acceptance capacity may be different. With this awareness, the Citizens Advisory Committee (CAC) recommends a shift in strategy to managing the bear population by density rather than by harvest alone. To do this, biologists need accurate data on bear populations and habitat carrying capacities. The CAC also recommends reducing, through liberalized sport-hunting seasons in the spring and issuance of appropriate depredation permits, the bear population along the road system of northeastern Kodiak Island by 10-20 percent below the current estimated level.

Current bear-management objectives are based on maintaining a population that can support certain harvest criteria. Consequently, harvest data collection and analysis are important components of bear-management reports produced by the Alaska Department of Fish and Game (ADF&G). ADF&G has historically relied primarily on harvest data because it lacked detailed bear census information. Since the Terror Lake hydroelectric project, however, increasing amounts of data on bears have been collected. Although the present stated management strategy and objectives relate only to harvest figures, in reality ADF&G biologists make management decisions and harvest recommendations based on both biological carrying capacity and wildlife-acceptance capacity⁹.

5.1 Population Assessment and Monitoring

As part of an ongoing cooperative management program between ADF&G and the Kodiak National Wildlife Refuge (KNWR), a bear survey is conducted annually in one of five different areas (management subunits) of the archipelago to provide an objective indicator of population trends (see Figure 5-1); these areas correspond to the five subunits of Game Management Unit 8 (GMU 8). Under this cyclic survey program, census information gathered from any one area will not be updated for at least another five years.

Population figures for three of the subunits are considered by biologists to be fairly precise; census figures for Afognak Island and for northeastern Kodiak Island (along the Kodiak road system), however, are less precise.

¹¹ reflects the maximum wildlife population level in an area that is acceptable to people (Decker and Purdy 1988)

At present, the total bear population on the Kodiak archipelago is stable and can be sustained at this high level (approximately 2,980 animals) by the natural habitat (see chapter 3 for detailed information about Kodiak bear habitat). From 1990 through 1999, the population sustained an average annual hunter harvest of 160 bears, of which 69 percent were males.

Reported nonsport harvest (e.g., DLP, illegal, subsistence) has averaged 18 animals each year for the same time period. Annual human-caused mortality (sport hunter and nonsport kills) have averaged approximately 6 percent of the estimated population. As noted in chapter 6, section 6.2, however, the accuracy of the number of DLP kills is questionable.

5.2 Biological Carrying Capacity

Habitat in different areas of the Kodiak archipelago is capable of sustaining different bear densities. For example, southern Kodiak Island (made up primarily of KNWR and having the largest sockeye salmon systems) has the highest-quality bear habitat. Northeastern Kodiak Island, on the other hand, has the least suitable habitat because of high concentrations of humans, large tracts of agricultural land and private property, and smaller salmon systems. In the late 1990s., ADF&G biologists estimated the bear densities in each of the five subunits surveyed (see Table 5-1). (The current high population of Kodiak bears on the archipelago is assumed to be appropriate to the high end of the biological carrying capacity of bear habitat.)

A high cycle in Alaska salmon productivity has been documented during the past 20 years. The current high population of bears on the Kodiak archipelago may reflect this cyclic high in salmon productivity.

Fisheries researchers are just beginning to understand natural cycles and long-term regime shifts in the North Pacific Ocean. These shifts in the ocean environment cause significant changes in salmon populations and fluctuations in the availability of other near-shore species used as food sources by bears.

Depending on how strongly bear population density is linked to salmon population strength or weakness, ocean regime shifts may determine bear population ranges and should be factored into a proposed bear-density management strategy.

Table 5-1. Current estimated bear densities for five management subunits of the Kodiak archipelago

Subunit	Geographic Unit	Area (mi ²)	Total Bears	Bears/mi ²	mi ² /bear
1	Afognak and northern islands	923	334	0.36	2.78
2	Northeastern Kodiak (road system)	533	181	0.34	2.94
3	Southeastern Kodiak	619	468	0.76	1.32
4	Southwestern Kodiak	1,635	1,250	0.76	1.31
5	Northwestern Kodiak	1,048	750	0.72	1.40
TOTAL		4,758	2,980	0.63	1.59

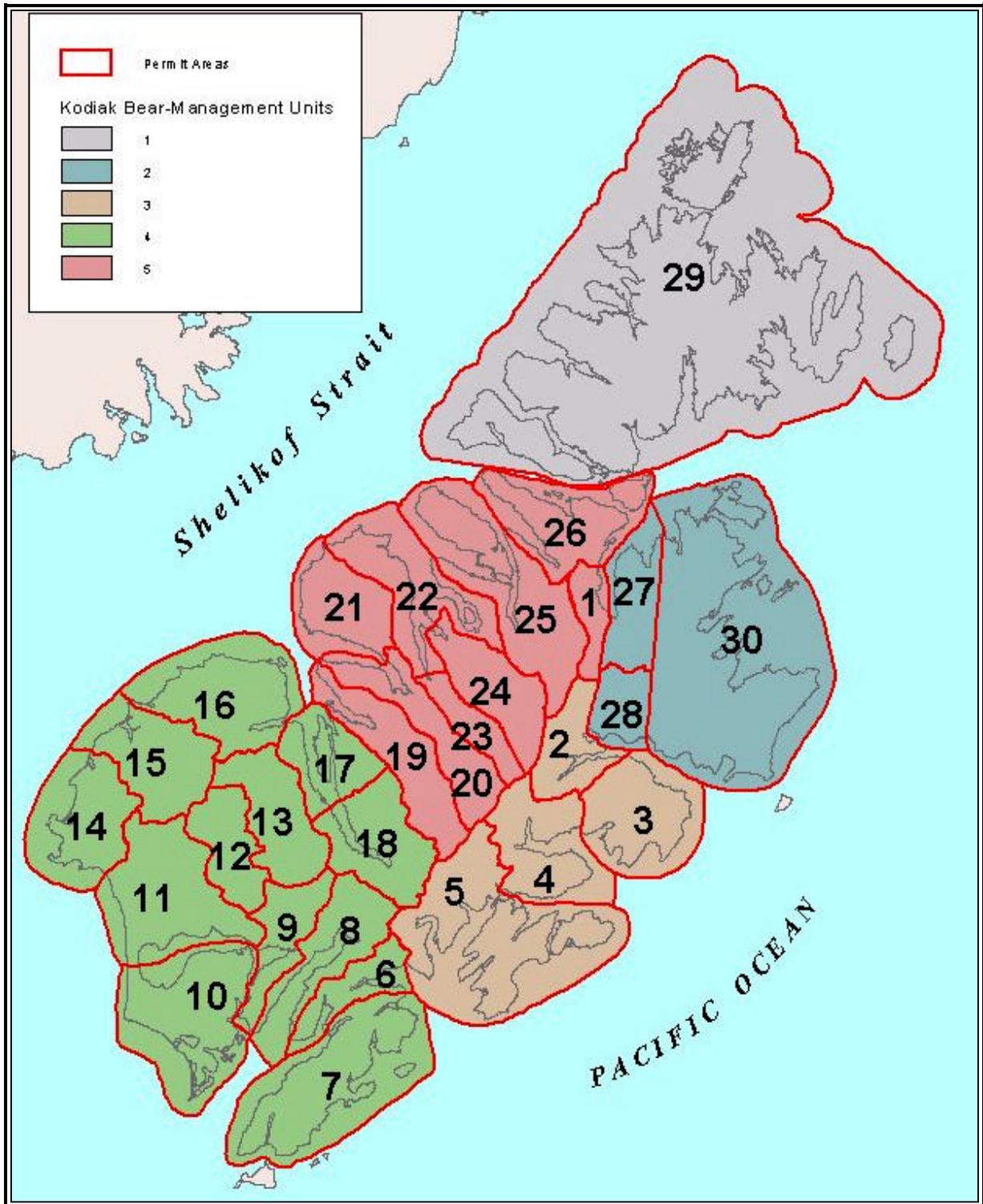


Figure 5-1. Management subunits for Game Management Unit 8

5.3 Wildlife-Acceptance Capacity

While biological carrying capacity refers to habitat that fulfills the requirements of bears, wildlife-acceptance capacity refers to fulfilling the needs and desires of human populations living in bear habitat.

Human development (e.g., communities, agricultural activities) in bear habitat result in increased interactions between bears and humans. The entire Kodiak archipelago is high-quality bear habitat in many respects. But there are areas—for example, the Buskin River area—where humans are living in this high-quality bear habitat. Thus, biological carrying capacity and wildlife-acceptance capacity may be different, and the fact that there are places where people have to exist with bears needs to be acknowledged.

Although residents of the Kodiak archipelago are proud of their bears, they also recognize needs for lower numbers of bears in areas where interaction between bears and humans is either undesirable or could prove detrimental to human safety and might result in DLP mortality of bears. People have made conscious decisions to limit the number of bears on certain portions of the archipelago, particularly on the Kodiak road system. Kodiak National Wildlife Refuge, however, was established to protect bears and their natural habitat, and that will remain its purpose.

Just as food is a focus in assessing biological carrying capacity of bear habitat, human safety is a focus when determining the wildlife-acceptance capacity for bears in an area. Thus, it is important to consider the needs and desires of numerous entities—the bears themselves, various recreational and subsistence users, other animals sharing the habitat, and the human residents—when making management decisions regarding the desired level of bear density in given areas of the archipelago.

5.4 Bear-Management Strategy on the Kodiak Archipelago

With awareness of bear habitat's biological carrying capacity and also the wildlife-acceptance capacity of the bear-management subunits within GMU 8 (the Kodiak archipelago), the CAC wishes to promote a strategy of bear-management objectives based on bear densities in various habitat areas as well as on harvest numbers.

More than two decades of conservative hunting seasons and abundant food resources have brought the Kodiak bear population to an overall density that is probably near biological carrying capacity of the habitat. In an effort to maintain the population at its maximum sustainable yield, the CAC proposes to manage most of the archipelago at or slightly below (10 percent) the current estimated density, as shown in Table 5-2. These targets should recognize natural fluctuations in cub production (and statistical limitations of available procedures). They should also be reevaluated if significant natural changes in habitat (e.g., climatic shifts) are detected (see section 5.2 regarding ocean regime shifts and fluctuations in salmon populations).

On northeastern Kodiak Island—which includes the Kodiak road system (area 30 in management subunit # 2 on Figure 5-1); most of the livestock ranches; and the vast majority of the human population—the CAC believes a reduction in bear density is appropriate. Reducing the current population of bears occupying that area by 10–20 percent below current estimates

would help reduce negative bear-human interactions. Such a reduction is consistent with agreements that established KNWR in 1941 and is in keeping with the ADF&G policies promulgated in 1970 (see section 6.4). Reductions would be made by liberalizing sport-hunting seasons in the spring and by issuing depredation permits when appropriate (see footnote 16 on page 6-17 for information about depredation permits). If bear populations in the area were to drop below the target level, appropriate actions to reduce harvests would be taken.

While the CAC is recommending this shift in strategy to managing the bear population by density rather than by harvest alone, it recognizes that bear population numbers must be as accurate as possible. ADF&G biologists have indicated that the population figures they have for Afognak Island and the Kodiak road system area are those in which they have the least statistical confidence. Once new population figures have been established, the density numbers presented in Table 5-2 should be adjusted and management plans adapted accordingly.

Table 5-2. Proposed bear density ranges for five management subunits of the Kodiak archipelago

Subunit	Geographic Unit	Area (mi ²)	Total Bears	Bears/mi ²	mi ² /bear
1	Afognak and northern islands	923	300–335	0.33–0.36	3.00–2.78
2	Northeastern Kodiak (road system)	533	150–165	0.28–0.31	3.58–3.23
3	Southeastern Kodiak	619	425–470	0.69–0.76	1.46–1.32
4	Southwestern Kodiak	1,635	1,125–1,250	0.69–0.76	1.45–1.31
5	Northwestern Kodiak	1,048	675–750	0.64–0.72	1.55–1.40
TOTAL		4,758	2,670–2,945	0.56–0.62	1.79–1.61

5.5 Recommendations for Redefining Kodiak Bear-Management Strategy

- ADF&G manage bear populations based on carrying capacity and density as well as on harvest objectives (see Figure 5-1 and Table 5-2).
- ADF&G reduce the bear population on northeastern Kodiak Island (i.e., along the road system; area 30 of management subunit #2 on Figure 5-1) by 10–20 percent below the current estimated level through liberalized sport hunting seasons in the spring (see also section 4.3) and issuance of appropriate depredation permits.
- Urge ADF&G and USFWS to dedicate funds to survey Afognak Island and the Kodiak road system (management subunit # 1 and area 30 of management subunit #2) as soon as possible to determine accurate bear populations (also see chapter 7, “Research and Monitoring”).
- Encourage ADF&G, USFWS, and village tribal councils to work together to gather data on bear populations and carrying capacity for management purposes.