



# Management of Large Mammalian Carnivores in North America

A Technical Review published by The Wildlife Society

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**As human populations expand, conflicts between larger carnivores and human interests, such as public safety and property value, are increasingly common. Yet these species are also vital components in maintaining healthy ecosystems in many regions.**

The Wildlife Society convened an expert committee to analyze the latest scientific literature on carnivore management, develop a technical review examining the most significant issues facing management of large mammalian carnivores, and providing recommendations to wildlife professionals grappling with these challenges.

This technical review considers brown bears (*Ursus arctos*), black bears (*U. americanus*), coyotes (*Canis latrans*), wolves (*Canis lupus*, *C. lycaon*), mountain lions (*Felis concolor*), as well as several prey species impacted by management of these carnivores. Key findings and recommendations of this review are as follows:

## FINDINGS:

- ◆ **Prey population dynamics are influenced by compounding factors such as weather conditions, habitat composition, and predator species and populations**, making it difficult for managers to determine if predator control is needed to reduce moose and caribou mortality where increases in prey numbers is desired (p. 16).
- ◆ **Mountain lion management is heavily influenced by public sentiment**, but other biological considerations are important in determining appropriate harvest, such as age and sex of harvested individuals. One study indicated that populations did not begin to decline until adult females (3 years or older) comprised at least 25% of the harvest.
- ◆ **Wolf populations can sustain hunting mortality of 30% of the winter population (p. 39)**. Immigration of wolves from adjacent populations greatly influences the rate of recovery.



Radio-collared gray wolf. Credit: William Campbell/FWS



The District of Squamish in British Columbia, Canada, a certified Bear Smart community. Credit: District of Squamish

- ◆ **Black bears are managed primarily as game animals in North America, depending upon the demographics, geography, and local traditions of jurisdictions (p. 42)**. Hunting regulations depend primarily on hunter numbers, access, effectiveness, public safety, and local culture, concurrent with species population productivity.
- ◆ **Education and enforcement of regulations are key to preventing bears from establishing home ranges in human-occupied lands (p. 48)**. Formal “Bear Aware” programs to educate the public as well as remove attractants are on-going and described in a case study on British Columbia.
- ◆ **Hunters appear not to be removing bears that are most likely to cause property damage (p. 49)**. However, reductions in bears through hunting, particularly in areas where the potential for human-bear conflict is high, could help reduce depredations.

## RECOMMENDATIONS:

- ◆ **A well-designed, science-based analysis of predation pressure should be completed prior to initiating predator control.** Failure to adequately document ungulate habitat quality prior to predator removal causes uncertainty as to whether the habitat can support increased prey numbers.
- ◆ **Coordination between state/provincial and federal jurisdictions should be pursued** to facilitate better understanding of a predator species' current status in an area and lead to appropriate management actions.
- ◆ **Estimates of prey populations and trends, condition of prey, its habitat, and effects of severe winters or prolonged drought should be considered** when determining if certain actions to manage predators are warranted.



A caribou calf, killed by predators in Newfoundland, was fitted with a radio collar as part of study on calf mortality. *Credit: Government of Newfoundland and Labrador*

- ◆ **Predictive models should be developed prior to predator control efforts to estimate likely ungulate responses given a range of removal levels (p. 59).** Other relevant factors, such as compensation by remaining predators, immigration of new predators, and changes in habitat quality following ungulate population response should also be considered.



Collecting data from a tranquilized grizzly bear in Glacier National Park prior to attaching a radio collar. *Credit: National Park Service*

- ◆ **If public hunting is substituted for agency efforts, highly regulated and monitored forms of harvest must be employed,** including sometimes giving preference to targeting problem individuals of a predator species. In addition, the public must be adequately advised of these activities.
- ◆ **Education programs designed to inform the public of ways to minimize damage from large mammalian carnivores can help maintain some level of tolerance for these species.**
- ◆ **If managers choose to use adaptive management, they should advise the public of the uncertain outcomes of these activities in producing intended results (p. 60).** Managers should also document all aspects of the situation as completely as possible to aid future control efforts.
- ◆ **Hunting activities should not be halted during periods of predator control.** Although there may be a desire to curtail human harvest when there are low ungulate densities, this situation confounds the interpretation of any prey demographic change following predator removal.

**While predator management is a complex issue without an appropriate, uniform approach that can be applied across regions and species, this review provides data that can assist managers in effectively managing large mammalian carnivores.**



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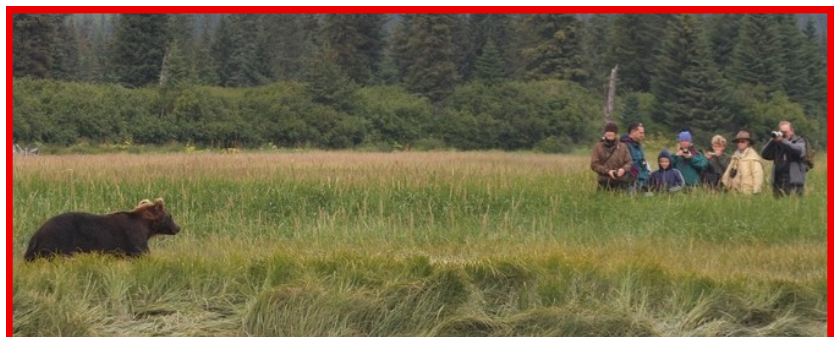
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Visitors to Lake Clark National Park observing a wild brown bear. *Credit: Kevyn Jalone/National Park Service.*