

population density for the Medicine Bow Mountains was 2.5/100 km² (6.4/100 mi²). Values for other mountainous areas of western North America tend to be 10–20 times higher.¹³

Black bears have ecological effects that are diverse and difficult to assess. Much of their diet overlaps with that of the grizzly bear, and the two species are often pooled in reports where field sign of both species can be confused. Therefore, ecological contributions of the two species are difficult to parse. Black bears accounted for only 3% of predation mortality and 1.5% of total mortality among Yellowstone elk in the 1990s.¹⁴ The species also disperses fruit seeds, removes some mammal carrion, and causes some tree death among Engelmann spruce and lodgepole pine.¹⁵

CONSERVATION AND MANAGEMENT: The species is managed as a trophy game species outside protected areas and is hunted in spring and fall hunting seasons. Harvest is managed by a quota for the several hunt areas; around 300 animals per year were killed by hunters during 2005–2009.¹⁶ Most bear habitat conservation actions tend to focus on grizzlies, but a diversity of stand types and successional stages has been proposed to address the seasonally diverse diets of black bears.¹¹

NOTES AND REFERENCES

1. Grogan (1997).
2. Wyoming Game and Fish Department, Trophy Game Section, unpublished data, 2013.
3. Wyoming Statutes 23-1-101-a-xii.
4. Long (1965), Hall (1981).
5. See chapter on Zoogeography. Genetic distances are from Cachelin and McDonald, unpublished data.
6. Turner (1974).
7. Holm et al. (1999).
8. Murie (1937), Reinhart and Mattson (1990), Pelton (2003).
9. Kendall (1983).
10. Jacoby et al. (1999).
11. Irwin and Hammond (1985).
12. Mattson et al. (1992), Holm et al. (1999), Gunther et al. (2002).
13. 95% confidence interval: 2.1–3.0, Grogan and Lindzey (1999).
14. Singer et al. (1997).
15. Bailey (1930).
16. Wyoming Game and Fish Department (2010b).

Grizzly bear, *Ursus arctos*

DESCRIPTION: Grizzlies are large bears with fur of seasonally variable length and color, but seldom coal black. In northwestern Wyoming, most adults have some degree of banding or grizzling of the dorsal guard hairs at some time of year. The rostrum is not as consistently or uniformly tan as in black bears, but tends to be lighter than the other facial pelage. A hump over the shoulder is visible in most adults, and the feet, long foreclaws, and behavior are distinctive with experience. The rostrum in adults is dished in profile in contrast to that of a black bear, and the ears are small in proportion to the head.



Grizzly bear (adult male).

Measurements (**Sex** [n] mean (mm, g), *range*): adults, northwestern counties, L = F [67] 1466–1730; M [117] 1622, 1320–1860; HF = F [67] 217, 180–245; M [119] 246, 115–285; WT = F [67] 119, 70.3–168; M [119] 180, 58.5–302.¹ Dental formula: 3/3, 1/1, 4/4, 2/3 = 42.

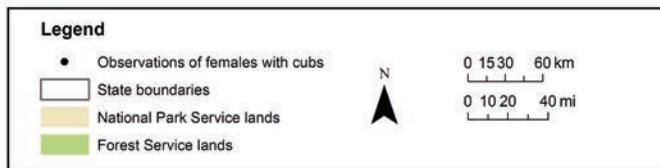
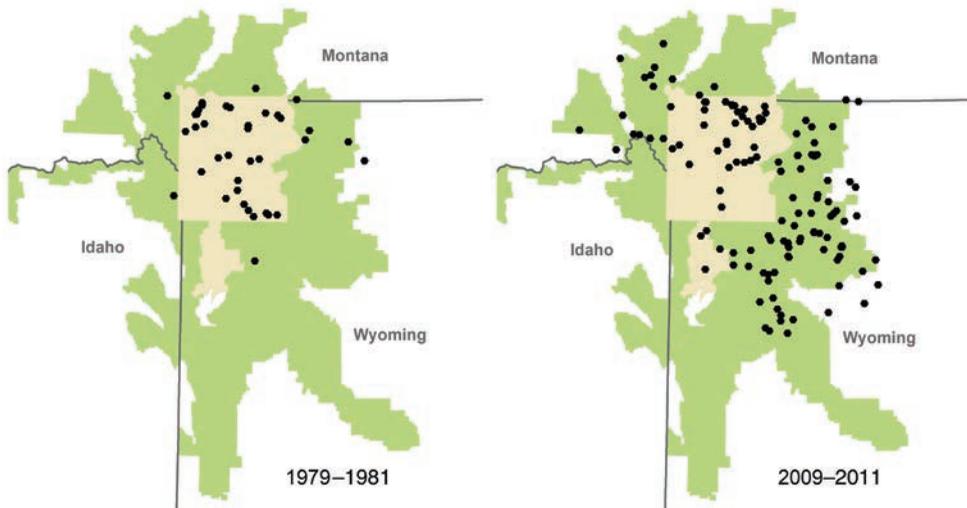
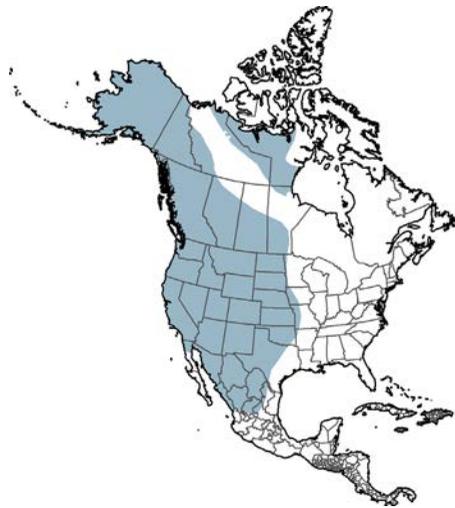
STATUS: This is a “trophy game animal” under state statute.² The species was listed as “threatened” in the contiguous United States under E.S.A. in 1975. In 2007, the Yellowstone Distinct Population Segment was found to no longer meet the E.S.A. definition of Threatened or Endangered, and E.S.A. protections were removed. However, a 2009 court decision reversed that decision and reinstated the Yellowstone population as Threatened.³

NOMENCLATURE AND SYSTEMATICS: This genus name has been in use since the mid-eighteenth century; the specific epithet has been revised multiple times. Merriam’s (1918) classification, repeated in Hall (1981), identified at least 86 “forms” of brown-grizzly bears, of which no fewer than seven putative species were named in and near Wyoming.⁴ Today, only a single Holarctic brown bear species is recognized: *Ursus arctos*. It is likely that subspecies names will not again be assigned by systematists to Wyoming forms, because even the original species names were not assigned with regard to valid biological species, and subspecies names were assigned even less cautiously. A further problem is that most of the geographic range over which these many taxa were distributed was depopulated of grizzly bears by the early twentieth century. It would be difficult to correctly assign a subspecies name to the population that has expanded out of Yellowstone National Park.⁵ The population has experienced some loss of genetic variability over the nearly 100 years of isolation from other populations, but the loss is less severe than was long hypothesized, and not believed capable of affecting population persistence over the next few decades.⁶ The common name “brown bear” is correctly applied to all members of the species in North America and Eurasia.

DISTRIBUTION AND HABITAT ASSOCIATIONS: This species was once broadly distributed (shown) west of the Mississippi River, and occurred statewide when Europeans arrived. Historical accounts show the presence of the species in virtually every habitat statewide: shrub-steppe, forests, and alpine tundra; densities would have been low in the Red Desert. With human hunting and settlement, grizzlies were soon limited to the northwestern mountains and by the mid-twentieth century to only a portion of Yellowstone National Park. Subsequent recovery has expanded the geographic range to beyond the borders of Yellowstone National Park into Jackson Hole, the Teton and Wind River Mountains, and the Wind River Indian Reservation.⁷

ECOLOGY: The ecology of grizzlies in the Yellowstone area is well documented. This is a solitary omnivore that in northwestern Wyoming seasonally shifts among highly disparate food sources: carrion, herbaceous plant leaves and flowers, berries, spawning trout, neonatal ungulates, whitebark pine seeds, and aggregated insects.⁸ This species has one of the slowest life histories of any North American land vertebrate, with mean age of first reproduction in Yellowstone of 5.7 years, reproductive interval among females thereafter of 2.6–3.2 years, and litters averaging around two cubs. So, the typical female grizzly bear in Yellowstone has produced two cubs by the age of 8.5 years. The number of animals in the Yellowstone area has increased from as few as 136 animals in the mid-1970s to more than 700 animals as of 2013.⁹ Cubs living within Yellowstone National Park have an 83% probability of living to one year; those outside the Grizzly Bear Recovery Zone have a corresponding 12% survival rate.¹⁰ About 85% of all deaths of independent grizzlies in the Yellowstone population are human-caused.¹¹ Population density in the Yellowstone population has been estimated at 14–18/1000 km² (36–46/1000 mi²).¹² Grizzlies have a number of ecological effects, aside from participating in energy and biomass cycling. They are important seed predators on whitebark pine, likely are important seed dispersers for berry-producing shrubs, and have been hypothesized to be effective predators on neonatal elk in the Yellowstone area.¹³

CONSERVATION AND MANAGEMENT: A long history, controversial at times, describes efforts to conserve the greater Yellowstone population of grizzlies. Steps have included hunting prohibitions; educating recreational users, grazing lessees, and landowners about reducing conflicts; eliminating open garbage dumps; removing and securing other food attractants where possible; and adopting nonlethal control methods.¹⁴ In response, the distribution and abundance of grizzlies in northwestern Wyoming have expanded markedly since the 1970s. Grizzlies have a long-standing tendency to depredate livestock, and nearly all sheep grazing leases and some cattle grazing leases on public land in northwestern Wyoming have been canceled to reduce conflicts. It is unlikely that the Yellowstone population will grow much further in size or farther in area because of social and economic constraints. Grizzlies within Yellowstone National Park began to face new dietary limitations in the 1990s, with declines of spawning Yellowstone cutthroat trout and whitebark pine nuts. Pine nuts had been a protein source second only to meat before the major die-off of whitebark pine. And the loss of cutthroat trout spawning has resulted in bears shifting their distribution to areas where elk are calving during that season.¹⁵ Whether elk calves will prove to be



Distribution of observations of female grizzly bears with cubs of the year gathered by state and federal agencies and compiled by the Interagency Grizzly Bear Study Team for two periods, 1979–1981 and 2009–2011. Each point shows the initial observation of a female-cub group for each year during the interval. Much of the increase in numbers of female grizzly bears with cubs has occurred via range expansion to areas outside Yellowstone National Park.

a food resource equivalent to trout and to what degree hunter-taken ungulate carrion will offset the loss of whitebark pine nuts in the autumn seasons is not yet known.

NOTES AND REFERENCES

1. Wyoming Game and Fish Department, Trophy Game Section unpublished data 2013.
2. Wyoming Statutes 23-1-101-a-xii.
3. See US Fish and Wildlife Service (2010c) for a review of regulatory and judicial actions.
4. Merriam (1918) described *Ursus horribilis*, *U. idahoensis*, *U. mirus*, *U. rogersi rogersi*, and *U. washake* from the Greater Yellowstone Area; *U. absarokus* from the Bighorns; and *U. rogersi bisonophagus* from the Black Hills area. Hall (1981).
5. The US Fish and Wildlife Service (2010c) refers to the Yellowstone population as *U. arctos horribilis*, although four other species or subspecies were named from the same population during the early 1900s.
6. Miller and Waits (2003).
7. Schwartz, Haroldson, Gunther et al. (2006). Location data used by permission of the Intera-gency Grizzly Bear Study Team.
8. Mattson et al. (1991), French et al. (1994), Green et al. (1997), Mattson (1997), Schwartz et al. (2003).
9. Van Manen et al. (2013).
10. Schwartz, Haroldson, and White (2006).
11. Haroldson et al. (2006).
12. Schwartz et al. (2003).
13. Middleton, Morrison et al. (2013).
14. Murie (1948) described conflicts between grizzlies and cattle grazing. Anderson et al. (2002), Schwartz et al. (2003).
15. Felicetti et al. (2003), Haroldson et al. (2005), Koel et al. (2005).

CATS—FAMILY FELIDAE

The cats are a broadly distributed group of medium-sized to large carnivores with short rostrums, four digits per foot that touch the ground, retractile claws in most species, shearing cheek teeth, and highly predacious foraging. Short- and long-tailed species occur. The first upper molar is a vestigial nub, and the second lower molar, posterior to the shearing carnassial tooth, is absent. This reflects the unimportance of plants foods, which must be thoroughly chewed, in the diets of cats. The group tends toward stalking or ambush as a means of prey capture. Taxonomic structure below the family level has been unstable for decades, with various subfamily and genus-level organizations proposed.

Mountain lion, *Puma concolor*

DESCRIPTION: A distinctive large cat with a short rostrum, short fur, and long, agile tail. Pelage is uniformly buff or reddish tan. Measurements (**Sex** [n] mean (cm, kg), *range*): Bighorn Mountains, **L** = **F** [9] 200, 187–208; **M** [8] 208, 170–223; **TL** = **F** [9] 79, 71–85; **M** [7] 80, 75–84; **WT** = **F** [9] 41.9, 36.3–45.4; **M** [8] 60.7, 45.4–74.8.¹ Dental formula: 3/3, 1/1, 3/2, 1/1 = 30.