Black Bear
Management Report
of survey-inventory activities
1 July 2001–30 June 2004

Cathy Brown, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation

Jamie Karnik, ADF&G

Funded through
Federal Aid in Wildlife Restoration
Grants W-27-5, W-33-1 and W-33-2
December 2005

STATE OF ALASKA

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Please note that population and harvest data in this report are estimates and may be refined at a later date.

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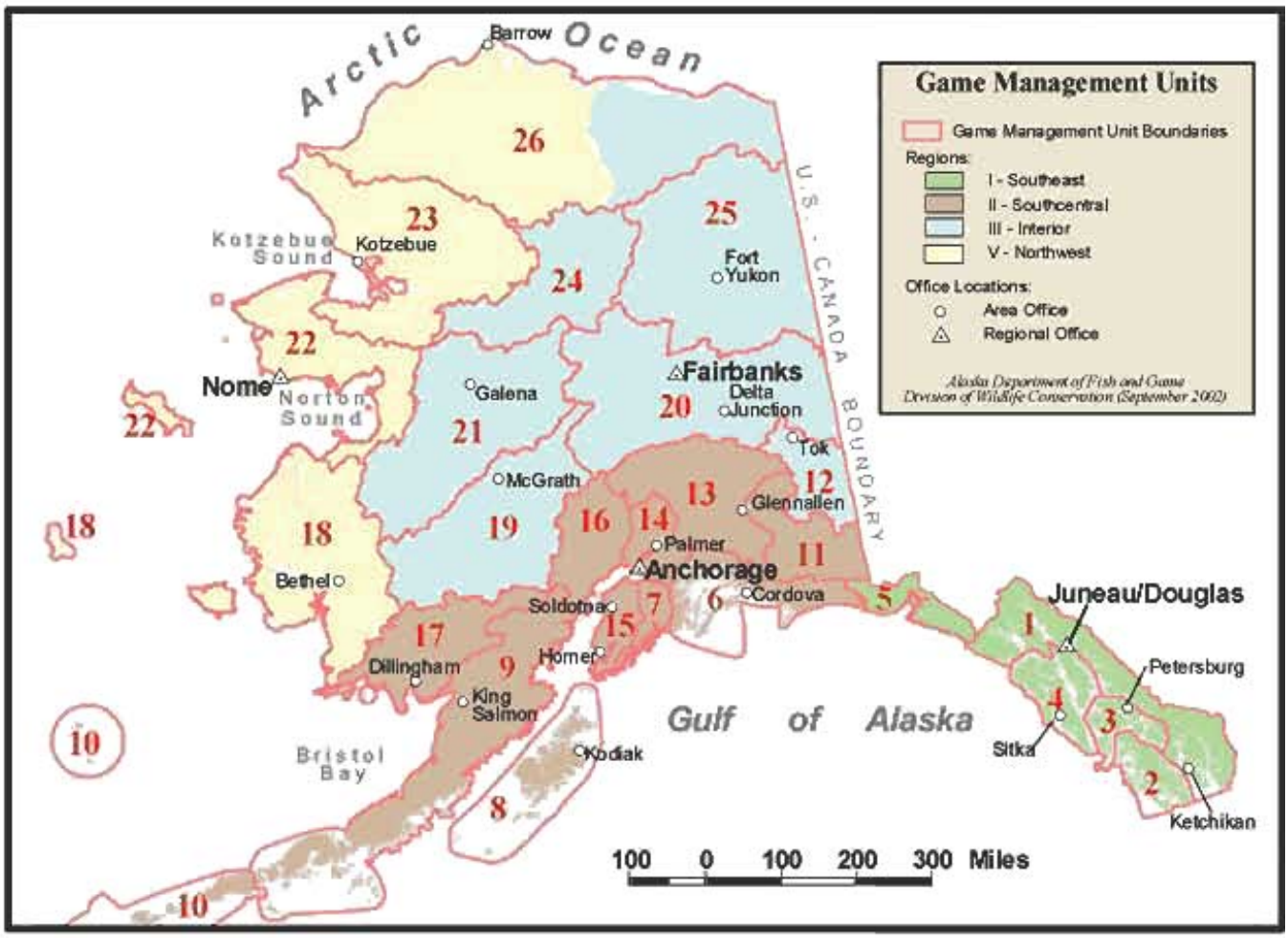
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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: Unit 1A (5300 mi^2)

GEOGRAPHICAL DESCRIPTION: That portion of Unit 1 lying south of Lemesurier Point, including all drainages into Behm Canal and excluding all drainages into Ernest Sound.

BACKGROUND

HABITAT DESCRIPTION

Unit 1A includes portions of the Cleveland Peninsula and Misty Fjords National Monument on the mainland, and Revillagigedo (Revilla), Gravina, Annette, and Duke Islands. Most high quality mainland black bear habitat in Unit 1A is confined to a relatively narrow band of forested landscapes between saltwater and the high elevation peaks and ice fields of the coastal mountains. An exception is the broader bays and lower peaks of southern Cleveland Peninsula. Revilla Island has many productive salmon streams and generally low-elevation, productive forest that provides high quality habitat. Gravina, Annette, and Duke Islands generally have lower-quality habitat. A few large mainland river valleys, such as the Unuk, Chickamin, Blossom, Wilson, Keta, and Marten, as well as many Revilla Island stream systems, support salmon and other anadromous fish.

Portions of Revilla, Gravina, and Annette Islands have been logged and have clearcuts with habitats in various stages of regeneration. As is the case elsewhere in Southeast Alaska, habitat changes continue to occur from clearcut logging. Although early successional stages (3–20 years after logging) provide black bears with an abundance of plant foods, later stages result in the disappearance of understory plants as conifer canopies close and light does not penetrate to the forest floor. Second-growth stands lack large hollow trees and root masses used for denning habitat. We believe that, although logging may create food for bears in the short term, the long-term result of logging will be a decline in bear numbers (Suring et al. 1988).

During summer and fall, bears accumulate fat reserves necessary for winter hibernation. Bears with access to salmon streams consume large quantities of fish, and consequently, poor fish runs or reduced berry crops can result in low cub production and survival the following spring (Jonkel and Cowan 1971). If food supplies have been poor during the past summer and the female has not accumulated adequate energy reserves, the fertilized egg may not implant and no cubs will be produced. Poor food may also cause losses after implantation or may result in the death of

cubs that are born. In most years, cub mortality is around 20% but may be as high as 50% during food-scarce years. The most critical period is when a bear first becomes independent at 16–17 months old (Jonkel and Cowan 1971). The age at first reproduction ranges from 2 years old for females on a high nutritional plane, to as late as 7 years of age for some females in poor habitats (Kolenosky and Strathearn 1987).

Small openings and disturbed areas, such as wetlands, avalanche chutes, clearcuts, and subalpine meadows, are important areas for foraging. In some areas and during some seasons, black bear diets may range from mostly vegetarian to mostly carnivorous, and the species may subsist by scavenging or by predation on small mammals or fish. In Unit 1A, black bears primarily eat vegetation during early spring. Major foods include grasses and sedges, *Equisetum* spp., skunk cabbage (*Lysichiton americanum*), and berries (*Vaccinium* spp. *and Rubus* spp.) that have persisted through the winter. Later in spring, Unit 1A black bears may be efficient predators of moose calves in the Unuk River valley as well as Sitka black-tailed deer fawns in some mainland areas and on Revilla, Gravina, and Annette Islands. During summer and fall, when bears accumulate fat reserves for winter hibernation, bears with access to salmon streams eat large quantities of fish. Berries are also important during summer and fall. On the mainland and the Cleveland Peninsula, black bears share habitats with brown bears; however, brown bears are rare on the Unit 1A islands.

ADF&G has estimated approximately 890 square miles of forested habitat on the Unit 1A mainland and 1600 additional square miles of forested habitat on the Unit 1A islands and a portion of the lower Cleveland Peninsula within Unit 1A. Large portions of Unit 1A are designated wilderness within the Misty Fjords National Monument.

Bear habitat near Ketchikan is significantly influenced by human garbage. Although bears have probably always been numerous locally, the availability of an attractive alternative food source promotes high bear densities, especially when restrictions against firearm discharge within urban areas provide a refugium surrounding the city, where bears are not available for hunter harvest. At the same time, the high human density in the area and differing attitudes toward responsible garbage-handling promotes a high level of human–bear conflict.

HUMAN USE HISTORY

Black bears have long been hunted in Unit 1A for trophies and food. Sealing of black bears was first required in 1973. Resident bear hunters are not required to have a permit, so information on the effort of unsuccessful hunters has never been available. We collect information from a mandatory sealing requirement for all successful hunters.

Regulatory history

Since statehood black bear hunting season has extended from 1 September through 30 June, and the bag limit for residents has been 2 bears annually, only 1 of which can be a blue or glacier bear. Nonresident bag limits were the same as resident limits until 1990, when the nonresident limit was reduced from 2 to 1 black bear per regulatory year.

Historical harvest patterns

Annual harvest in Unit 1A increased from about 25 bears in the 1970s and early 1980s to 60 bears by the late 1980s. Annual harvest dropped to about 45 bears in the early 1990s and remained constant until the late 1990s, when it began to increase. The 1999 and 2000 seasons had the highest harvests on record, but the recent harvest has declined and is now near the long-term average. The 2003 harvest of 56 bears was slightly below the long-term average of 67.

Fluctuations in annual harvest are probably linked more to human activity and weather during hunting season than to changes in bear numbers. Earlier harvest cycles may have been linked to the amount of logging and road building activity in the unit. The harvest increase in the 1990s may have been linked to an increase in hunting effort by residents and nonresidents alike and may also be associated with renewed logging in some areas. Logging activity not only opened up more areas to hunt by providing good access, it also brought more humans in contact with bears. During some of the peak logging years in the mid 1980s and early 1990s, highway vehicles provided more than 25% of the hunter transport. During the past 3 years, vehicles only accounted for 1 percent of the hunter transport, well below the 10-year average of more than 8 percent.

Boats historically have been the favored mode of transport by Unit 1A bear hunters, with airplanes ranking a distant second. Many bears frequent the beaches in search of grasses and sedges during the early spring, making them visible and accessible to hunters. The majority of hunters target male bears. By using the spot-and-stalk technique along the many miles of beaches in the spring, hunters are able to observe multiple animals and be selective. Consequently, over 70% of the Unit 1A annual bear harvest occurs during spring.

By state regulation, starting in 1996 the edible meat from spring bears must be salvaged for human consumption, but the meat from fall bears does not require salvage. The meat from spring bears is very tasty, while fall bears taken in Southeast Alaska are rarely edible because of the salmon component in their diet.

Resident hunters historically have accounted for about 75% of the Unit 1A harvest over the years. There is no guide requirement for nonresident hunters, and most out-of-state hunters have historically hunted without a registered guide in this unit. Nonresident hunters must purchase locking tags and must affix them on a bear immediately after it is harvested. Neither the cost of a hunting license ($85), tags ($225–$300), nor the cost of transportation to this area seems to limit the number of nonresident hunters who pursue black bears in Unit 1A.

Historical harvest locations

Hunters harvest bears throughout the unit, although the highest harvests continue to come from Wildlife Analysis Areas (WAAs) 406 (Carroll Inlet), 407 (George Inlet and the Ward Cove–Harriet Hunt Lake road), and 510 (northwest Revilla Island). On the mainland, WAAs 822 (Boca De Quadra) and 823 (Nakat Bay) also contribute substantially to the harvest. Because of its proximity to Ketchikan, WAA 406 is a popular recreational area for Ketchikan residents. U.S. Coast Guard personnel stationed at the Shoal Cove Loran Station along Carroll Inlet regularly harvest bears in that area. WAA 407 is also easily accessed by Ketchikan residents, by boat via George Inlet and by vehicle up the Ward Cove–Harriet Hunt Lake road system. Ketchikan

residents and personnel from the Neets Bay fish hatchery account for several bears taken in WAA 510 each season. WAAs 822 and 823 are accessible by boat from Ketchikan and are very popular places to hunt.

History of urban bear management in Ketchikan

Responding to "bear calls" in Ketchikan continues to consume large amounts of staff time. Tasks include responding to complaints, explaining proper garbage handling and providing public safety precautions. We continue to work with the Ketchikan Police Department and Alaska Bureau of Wildlife Enforcement (ABWE) troopers to reduce bear–human conflicts. We use all of the available media sources to promote public service messages, and we also conduct several local education programs geared toward awareness and prevention. The combination of these efforts and good cooperation with the other agencies seems to be making a positive change, with fewer nuisance calls and fewer bears being killed each season.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a male:female ratio of 3:1 in the harvest.
- Maintain an average male spring skull size of at least 17.5 inches.
- Minimize human–bear conflicts by providing information and assistance to the public and to other agencies.
- Maintain a harvest of at least 65% males in the combined harvest during the most recent 3 years.

Age, genetics, and environmental factors such as habitat and forage quality combine to influence black bear skull size. Sealing records indicate that mature Unit 1A black bears generally have smaller skulls than bears from the nearby Unit 2. The skull size management objective of 17.5 inches for males harvested in the spring was established in the early 1990s after data analysis showed this to be the long-term average. We view any reduction in the average skull size as a reflection of harvest intensity or possible changes in the age structure.

Skull size is used as a management tool because we believe that a change in mean skull size may indicate changes in population size and composition and provide some measure of the sustainability of the harvest levels. A decreasing average skull size may indicate a decline in that segment of the population composed of large, older bears and could indicate an overall population decline. However, an increasing average skull size could also indicate a reduction in the proportion of younger bears in the population. Probably the most important and safest use of skull size data at this time is as an indicator of some change in the population or in hunter effort. We do not have a technique to tell us precisely what such a change might indicate, but instead use it in conjunction with other data to make our best assessment of current population trends.

Harvest sex ratio is the second most common parameter for monitoring black bear populations. It is relied upon as a primary means of assessing population status in 19 states and provinces and as

supporting information for population assessment in another 8 areas (Garshelis 1990). Sex ratio of the harvest is thought by some bear biologists to suggest changes in the population. As a measure of harvest intensity, we expect the ratio to change with cohort age. In the younger age classes, males will outnumber females in the harvest. However, the higher harvest mortality of males causes their numbers to decline more rapidly with age. Although the males remain more vulnerable, the ratio of males to females in the harvest declines with age because of the progressive depletion of males (Bunnell and Tait 1980). A 3:1 sex ratio in favor of more males in the harvest has been suggested (Sterling, personal communication) to be a sustainable yield from a healthy bear population.

METHODS

Black bear hides and skulls taken by successful hunters were sealed by ADF&G staff, public safety staff, and designated sealers. Biological and hunt information collected at the time of sealing included sex, skull size (length and width), pelage color, date and location of kill, number of days hunted, transportation method, guide use, and hunter use of commercial services. A premolar was collected from most bears and sent to Matson's Laboratory for age determination.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Black bear population estimates are not available. Information obtained during sealing cannot be used directly to measure population trends. While harvest information gained from sealing records, such as average skull sizes, average ages, and sex ratios, may provide some indication of black bear population trends, in the absence of accompanying demographic data, correlations between these measures and harvest sustainability will continue to elude us. Research is needed to identify population parameters, so that we might better assess population trends and harvest sustainability.

Population Size

No black bear population studies have been conducted in Unit 1A. Estimates of population size or density are difficult and expensive to obtain. The species generally inhabits forested areas, where aerial surveys are impractical. Vast, remote areas in the unit also make studies difficult and expensive to undertake. Conservative black bear density estimates for Unit 1A are based on studies in similar habitats in western Washington state in the 1960s (Poelker and Hartwell 1973) where they estimated 1.4 bears/mi^2. Wood (1990) and Larsen (1990) calculated a slightly higher density of 1.5 bears/mi^2 for most of the forested islands and mainland, and lower densities for the more barren portions of the mainland and unproductive island habitats. In 1990, they made the following assumptions about bear density and derived a population estimate for all of Unit 1A.

- Revilla Island – 1176 mi^2 x 1.5 bears per mi^2 = 1764 bears
- Gravina Island – 96 mi^2 X 0.75 bears per mi^2 = 72 bears
- Cleveland Peninsula south of Yes Bay – 203 mi^2 X 1.5 bears per mi^2 = 305 bears
- Duke and Annette Islands – 140 mi^2 X 0.25 bears per mi^2 = 35 bears

- Remainder of Unit 1A – 890 forested mi^2 X 1.5 bears per mi^2 = 1344 bears for a total estimated Unit 1A population of 3520 black bears (Larsen 1990)

Density estimates for North American black bears vary between 0.3 and 6.0 bears/mi^2. A study in forested Sitka spruce habitat in Washington state that included logged areas and road access comparable to Prince of Wales Island (POW) resulted in the high estimate of 2.4 bears/$mile^2$ (Lindzey and Meslow 1977). A mark recapture estimate using a biomarker technique on a 400-mi^2 portion of Kuiu Island resulted in a density estimate of 2.4 bears/mi^2 (range 2.1–2.4) (Peacock 2004). These 2 study results found the highest density estimates ever published for black bears in coastal rain forest habitat. From Southcentral Alaska in Eastern Prince William Sound, estimates were 1.0 bear/mi^2 (Modafferi 1982). Density estimates in forested Minnesota habitat using biomarker mark-recapture methods resulted in higher values than we estimate for Unit 1A, and ranged from 4–6 bears/mi^2 (Garshelis 1989). The highest black bear density estimate found in forested habitat outside of Alaska, Minnesota, or Washington was in Virginia and ranged from 0.96–1.49 bears/mi^2 (Carney 1985).

Female reproductive history is now available from analysis of markings laid down in teeth during years in which they give birth. Preliminary information from 43 harvested females from Units 1A and 2 suggests that age at first reproduction varies, with 9% of females producing cubs at age 4, 37% at age 5, 35% at age 6, and 17% from 7 to 9 years of age. In general, females had young in alternate years.

Population Composition

Our management objective of a 3:1 male-to-female harvest ratio is aimed at assuring a minimal harvest of female bears. We lack reliable information on the composition of the bear population, but use the harvest sex ratio for insight into the availability of male bears in the population. On a very gross scale, if the harvest of females increases, we may interpret that to suggest there are fewer large male bears available to hunters.

Distribution and Movements

Black bears are thought to be more numerous on the islands of Unit 1A than on the mainland; however, population estimates or quantitative information about home ranges and movement patterns of Unit 1A black bears is not available.

Black bears typically emerge from winter dens in April and May. Following emergence from dens, bears typically occupy low elevation habitats, where they feed on vegetation. As spring proceeds into summer, bears typically disperse throughout forested and alpine habitats where they continue to feed on grasses, sedges, forbs, and berry-producing shrubs. In the late summer and early fall, bears typically congregate near anadromous fish streams, where they feed on spawning salmon. We also know some bears never visit salmon streams but instead rely on other foods to build fat deposits necessary for hibernation. As fish runs decline in the late summer and fall, bears disperse from salmon streams and feed primarily on berries and alpine vegetation before denning in October and November.

Black colored pelage is most common and occurs throughout the bears' range. The cinnamon color phase occurs only in mainland portions of the unit. Black bears with glacier (blue) pelage

are also found in Unit 1A. Kermody bears, or those with white pelage, have been reported in extreme southern mainland portions of the unit near Hyder, Alaska.

MORTALITY

Harvest

Season	Bag Limit
1 Sep–30 Jun	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 Sep–30 Jun	Nonresident hunters: 1 bear

Game Board Action and Emergency Orders: No Board of Game actions took place, and no emergency orders were issued during this report period.

Hunter harvest. Hunters harvested 82, 74, and 55bears during 2001, 2002, and 2003 seasons respectively. The most recent 3-year average ($\bar{x}$ = 71 bears) was similar to the 10-year mean ($\bar{x}$ = 72 bears) but lower than the previous 3-year average of 92 bears. The 2003 harvest of 55 bears is the lowest harvest since 1996, when hunters harvested 48 bears (Table 1).

Miller (1990) suggested it would be more important to monitor the number of females in the harvest than percentage of males. Taylor (1986) noted the effect of hunting pressure on breeding females was critical in sustained yield management. Males typically compose over 75% of the Unit 1A bear harvest, and during the past 10 years 76% (range 73–92%) of the kill has been male. The 3-year male average is slightly lower at 74% (range 73–76%).

The average male skull size during this report period ($\bar{x}$ = 18.3 inches, range 17.7–18.5) was slightly higher than the past 10-year average ($\bar{x}$ = 17.9 inches, range 17.5–18.5). During the past 3 years the average spring male skull measured 18.3 inches, and we continue to meet our management objective of 17.5-inch average for male spring bears. These data show only slight variation between yearly and spring-only male skull size. Female skull size average for the past 10-year period was 16.0 inches (range 15.4–16.7 inches) (Table 5).

The annual average number of hunters during this report period (68) remained similar to the 10-year average of 70 (range 33–95). The number of successful hunters peaked in 1999 at 95 and slowly declined to only 56 in 2003. The 2003 season also saw the fewest total days hunted (137) since 1996, when successful hunters spent 103 days afield. The spring 2004 season saw average numbers of hunters but the fewest days afield since 1997. That spring was one of the driest on record and resulted in a very different distribution of bears as they were not attracted to the beaches by the succulent grasses that are more the norm during May and June in this unit. Days in the field per successful hunter increased slightly from 2.5 days (range 1.6–3.1) over the past 10 years to 2.6 days during this 3-year report period (range 2.4–3.1 (Table 5). Total days hunted during the spring reached a 10-year high of 201 days during 2001 (range 38–201). The spring 1991 was the only time hunters spent more time in the field in Unit 1A than during 2001. The historical high during 1991 was 272 days of hunting.

Hunter residency and success. Nonresident participation in Unit 1A black bear hunting has varied but remained low during the past 20 years, averaging 30% of the kill (10–57). This pattern continued through the most recent 10-year period (35%) but has increased during the past 3 years to a combined average of 50%. During the 2001, 2002 and 2003 seasons, 57%, 46% and 28% respectfully of the successful hunters were nonresidents. The high of 57% in 2002 is the highest nonresident participation on record for this unit. Alaska residents not living in Unit 1A historically only harvest 5–10% of the bears in this area (Table 2).

Harvest chronology during report period. Unit 1A bears are most visible and accessible during the spring, when they are near the coast feeding on sedges and grasses. The hides are also most prime and full during this same period. During this report period, May continued to be the most popular month for Unit 1A harvest (46%), followed by September (27%) and June (21%). The May trend during the past 3 years (46%), was similar to the 10-year average of 48% (range 33–61). (Table 3).

Harvest in particular areas (WAAs). Hunters harvest bears throughout the unit. However, more than 60% of the Unit 1A harvest has historically been taken from Wildlife Analysis Areas 0406 (Carroll Inlet), 407 (George Inlet and the Ward Cove–Harriet Hunt Lake road), 0822 (Boca De Quadra), and 0510 (northwest Revilla Island), listed in order. On the mainland, WAAs 822 and 823 (Nakat Bay) also contribute substantially to the harvest. Because of its proximity to Ketchikan, WAA 406 is a popular recreational area for Ketchikan residents. U.S. Coast Guard personnel at the Shoal Cove Loran station in Carroll Inlet regularly harvest bears in this WAA. WAA 407 is also easily accessed by Ketchikan residents, by boat via George Inlet and by highway vehicle up the Ward Cove–Harriet Hunt Lake road system. Ketchikan residents and personnel from the Neets Bay fish hatchery account for several bears taken in WAA 510 each season. Most defense of life or property (DLP) and reported vehicle collisions occur in WAA 408 along the Ketchikan road system (Table 6).

Bait stations. Bear baiting has never been popular in Unit 1A. Only 2–5 bait permits are issued each year, and bears are occasionally harvested using this method. Only 2 bears were reported killed using bait during this report period (2003) (Table 1).

Hunting with dogs. Hunting bears with dogs in Unit 1A requires a permit. Hound hunting has never been popular in this unit, and permits are issued only occasionally. No permits were issued to hunt bears with dogs in Unit 1A during this report period.

Guided hunter harvest. Guided black bear hunts are not popular in Unit 1A, and most are sold as part of mixed bag hunt. Five guides are currently permitted under state guiding regulations to conduct hunts in Unit 1A. During the past 3 years, guides have conducted an average of 5 successful hunts (range 1–11) in Unit 1A. The most guided hunts on record were conducted during the 2000 season when guides took 11 successful clients afield.

Transport methods. The use of transporters in Unit 1A is increasing, and at this time all licensed transporters are using boats to take hunters to the field. Boats continue to be the most popular mode of transportation used by all bear hunters in Unit 1A. This was especially true during the past 3 years when 90% of the successful hunters used boats to access hunting areas in Unit 1A

(range 84–99%). This most recent boat use is up from the 10-year average of 80% (Table 4). Consequently, air and highway travel were down during the same period.

Other mortality

Wounding loss. Wounding loss is not believed to be a significant source of mortality for Unit 1A bears. However, if the nonresident harvest continues to increase, we expect this to become a more serious issue. The Southeast rain forest understory is dense, and frequent rainfall complicates the task of tracking wounded animals. Nonresident hunters are more vulnerable to wounding loss because of their unfamiliarity with bear behavior, terrain, vegetation types, and overall difficult tracking conditions. In many cases a wounded bear may move a great distance through dense cover before leaving any sign of blood because of thick fur and dense fat that tends to close wounds and slow the loss of blood.

HABITAT

Assessment

Several more timber sales are planned in Unit 1A. Proposed sales on Gravina Island include construction of roads into the interior of the island, which is currently roadless. The timber sales target some of the most important old-growth areas what are very important bear habitat. With better access and more hunters, we anticipate a higher harvest of bears from that area if road access improves.

Second-growth stands at many previously logged Revilla Island sites are now reaching the closed canopy stem-exclusion stage, and we expect the productivity of the habitat to decline and result in lower bear densities.

Enhancement

No habitat enhancement projects specifically to benefit black bears have been attempted in the unit. Although intended as a silvicultural practice, precommercial thinning and pruning has been performed in some young second-growth stands in unit. Although not the primary intent, this effort provides a benefit to wildlife by improving and extending habitat suitability in the short-term by permitting sunlight to reach the forest floor and increase understory production. These benefits are short-lived (20–25 years), after which time canopy closure again results in loss of understory vegetation. The long-term effects of clearcut logging will be detrimental to black bear populations.

NONREGULATORY MANAGEMENT PROBLEMS AND NEEDS

Nonhunting issues. Margaret Creek, located on Revilla Island approximately 20 miles north of Ketchikan, is a contentious area. The U.S. Forest Service recently improved a trail to an existing fish weir providing better access for bear viewing. Several air charter services now provide bear viewing trips from Ketchikan to visiting cruise ship passengers. There have been several clashes with hunters and bear viewers during the past several years. Signs are now posted and the immediate area around the bear viewing platform and access trail are closed to hunting, by Forest Supervisor Order.

Neets Bay, also on Revilla Island, has recently developed into a substantial bear viewing site. Southern Southeast Regional Aquaculture Association (SSRAA) operates a salmon hatchery at this site and contracts with air charter services to transport cruise ship passengers to the site for bear viewing. SSRAA provides a natural history bear guide from the dock to the viewing site. SSRAA has reported observing up to 40 or more bears in one evening feeding in the salmon stream and estuary near this viewing site.

Nuisance bear problems/urban bear management activities. Household garbage, bird feeders, and pet foods continue to attract bears to urban locations. We are working with the police departments, city managers, and ABWE to provide educational material on how to reduce bear encounters by residents of Unit 1A. Combined, ABWE, Ketchikan Police Department, and the Ketchikan ADF&G office receive 200–600 calls annually from residents asking for help with food conditioned bears. While responding to these calls, we inform the public about their responsibilities and options. The city of Ketchikan has distributed approximately 2000, 90-gallon roller-cans to residents in an attempt to reduce the availability of garbage to bears. We also spend time talking to school classes about bear safety and bear awareness. All of these efforts seem to be paying off recently. Nuisance bear calls are down by about 25%, and the number of bears killed under defense of life or property is also down during this report period.

The Ketchikan landfill site was closed in 1994, and many food-conditioned bears were either relocated or killed. Prior to that closure an average of 2–8 bears per year were killed in Ketchikan; since 1997 an average of 10 bears (range 5–20) have been killed annually, some of which could be bears (or their offspring) that frequented the dump prior to 1994. Residents continue to provide opportunities for bears to access human foods and are likely educating new bears. Consequently, bears are common around town in the summer and fall, and are periodically killed either by ADF&G, enforcement officers, or local residents. A total of 9 bears were killed under DLP situations across the entire unit during this report period (Table 1). We continue to educate the public about proper garbage handling to prevent bears from becoming food-conditioned, which ultimately results in public safety issues and needless killing of bears.

CONCLUSIONS AND RECOMMENDATIONS

Black bears are an important big game species in Southeast Alaska, and the Unit 1A harvest continues to increase because of a long hunting season, liberal bag limit, and an attractive meat source to hunters.

The current harvest ratio, proportion of females, average skull size, and age structure of the harvest all suggest a stable bear population. Harvest records indicate the annual kill remains low relative to our crude population estimate. Harvest records also indicate a healthy male component and have not shown any discernible changes in skull size, age, or sex parameters. We continue to see increasing numbers of nonresident hunters, some unguided and others using transporters or licensed big game guides.

As local bear viewing interest continues to grow, we will undoubtedly be faced with allocation issues related to both human safety and bear preservation, requiring compromise by hunters and wildlife watchers. Town bears continue to occupy staff time, although we are making some

headway in this arena, and public education efforts continue. The problem cannot be solved until city decision makers take responsibility for garbage problems. As logging continues, and large tracts of previously logged habitat rapidly convert to second-growth forest, we anticipate reductions in Unit 1A bear numbers and consequently fewer bears will be harvested by hunters. Research is needed to better identify and understand the dynamics of Unit 1A black bears.

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Table 1 Unit 1A black bear harvest, regulatory years 1980 through 2003

Regulatory year	Reported																	
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1980																		
Fall 1980	3	5	0	8		0	0	0	0	0	0	3	(38)	5	(62)	0	(0)	8
Spring 1981	18	1	0	19		3	1	0	4	0	0	21	(91)	2	(9)	0	(0)	23
Total	21	6	0	27	--	3	1	0	4	0	0	24	(77)	7	(23)	0	(0)	31
1981																		
Fall 1981	5	2	0	7		0	0	0	0	0	0	5	(71)	2	(29)	0	(0)	7
Spring 1982	26	2	0	28		0	0	0	0	0	0	26	(93)	2	(7)	0	(0)	28
Total	31	4	0	35	--	0	0	0	0	0	0	31	(89)	4	(11)	0	(0)	35
1982																		
Fall 1982	5	2	1	8		0	0	0	0	0	0	5	(63)	2	(25)	1	(12)	8
Spring 1983	21	4	1	26		0	0	0	0	0	0	21	(81)	4	(15)	1	(4)	26
Total	26	6	2	34	--	0	0	0	0	0	0	26	(76)	6	(18)	2	(6)	34
1983																		
Fall 1983	13	10	0	23		1	0	0	1	0	0	14	(58)	10	(42)	0	(0)	24
Spring 1984	17	6	0	23		1	0	0	1	0	0	18	(75)	6	(25)	0	(0)	24
Total	30	16	0	46	--	2	0	0	2	0	0	32	(67)	16	(33)	0	(0)	48
1984																		
Fall 1984	9	13	0	22		2	3	0	5	0	0	11	(41)	16	(59)	0	(0)	27
Spring 1985	28	0	0	28		1	1	0	2	0	0	29	(97)	1	(3)	0	(0)	30
Total	37	13	0	50	--	3	4	0	7	0	0	40	(70)	17	(30)	0	(0)	57
1985																		
Fall 1985	11	10	1	22		4	2	0	6	0	0	15	(54)	12	(43)	1	(3)	28
Spring 1986	33	5	0	38		1	1	0	2	0	0	34	(85)	6	(15)	0	(0)	40
Total	44	15	1	60	--	5	3	0	8	0	0	49	(72)	18	(27)	1	(1)	68

Table 1 continued

Regulatory year	Reported																	
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1986																		
Fall 1986	15	9	1	25		1	0	0	1	0	0	16	(62)	9	(35)	1	(3)	26
Spring 1987	39	4	0	43		0	0	0	0	0	0	39	(91)	4	(9)	0	(0)	43
Total	54	13	1	68	--	1	0	0	1	0	0	55	(80)	13	(19)	1	(1)	69
1987																		
Fall 1987	13	7	0	20		0	2	1	3	0	0	13	(57)	9	(39)	1	(4)	23
Spring 1988	39	4	0	43		0	0	0	0	0	0	39	(91)	4	(9)	0	(0)	43
Total	52	11	0	63	0	0	2	1	3	0	0	52	(79)	13	(20)	1	(1)	66
1988																		
Fall 1988	8	4	1	13		3	1	0	4	0	0	11	(65)	5	(29)	1	(6)	17
Spring 1989	29	2	12	43		0	0	0	0	0	0	29	(67)	2	(5)	12	(28)	43
Total	37	6	13	56	0	3	1	0	4	0	0	40	(67)	7	(12)	13	(21)	60
1989																		
Fall 1989	5	0	4	9		0	1	0	1	0	0	5	(50)	1	(1)	4	(40)	10
Spring 1990	43	5	8	56		0	0	2	2	0	0	43	(74)	5	(9)	10	(17)	58
Total	48	5	12	65	0	0	1	2	3	0	0	48	(71)	6	(9)	14	(20)	68
1990																		
Fall 1990	9	3	1	13		1	0	2	3	0	0	10	(62)	3	(19)	3	(19)	16
Spring 1991	62	5	2	69		0	0	0	0	0	0	62	(90)	5	(7)	2	(3)	69
Total	71	8	3	82	0	1	0	2	3	0	0	72	(85)	8	(9)	5	(6)	85
1991																		
Fall 1991	11	7	2	20		2	0	1	3	0	0	13	(57)	7	(30)	3	(13)	23
Spring 1992	33	3	1	37		0	0	0	0	0	0	33	(89)	3	(8)	1	(3)	37
Total	44	10	3	57	0	2	0	1	3	0	0	46	(77)	10	(17)	4	(6)	60
1992																		
Fall 1992	5	8	0	13		0	4	0	4	0	0	5	(29)	12	(71)	0	(0)	17
Spring 1993	18	2	0	20		0	0	0	0	0	0	18	(90)	2	(10)	0	(0)	20
Total	23	10	0	33	0	0	4	0	4	0	0	23	(62)	14	(38)	0	(0)	37

Table 1 continued

Regulatory year	Reported									Estimated kill		Total estimated kill						
	Hunter kill					Nonhunting kill[a]												
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1993																		
Fall 1993	9	1	0	10		0	0	0	0	0	0	9	(90)	1	(10)	0	(0)	10
Spring 1994	37	3	0	40		1	0	0	1	0	0	38	(93)	3	(7)	0	(0)	41
Total	46	4	0	50	1	1	0	0	1	0	0	47	(92)	4	(8)	0	(0)	51
1994																		
Fall 1994	5	2	0	7		2	0	1	3	0	0	9	(90)	1	(10)	0	(0)	10
Spring 1995	31	8	0	39		0	0	0	0	0	0	38	(93)	3	(7)	0	(0)	41
Total	36	10	0	46	1	2	0	1	3	0	0	47	(92)	4	(8)	0	(0)	51
1995																		
Fall 1995	17	9	0	26		0	1	0	1	0	0	17	(63)	10	(37)	0	(0)	27
Spring 1996	35	6	0	41		0	0	0	0	0	0	35	(85)	6	(15)	0	(0)	41
Total	52	15	0	67	1	0	1	0	1	0	0	52	(76)	16	(24)	0	(0)	68
1996																		
Fall 1996	11	4	0	15		0	1	0	1	0	0	11	(69)	5	(31)	0	(0)	16
Spring 1997	30	3	0	33		0	0	0	0	0	0	30	(91)	3	(9)	0	(0)	33
Total	41	7	0	48	1	0	1	0	1	0	0	41	(84)	8	(16)	0	(0)	49
1997																		
Fall 1997	13	3	0	16		0	1	0	1	0	0	13	(76)	4	(24)	0	(0)	17
Spring 1998	52	5	0	57		0	0	0	0	0	0	52	(91)	5	(9)	0	(0)	57
Total	65	8	0	73	1	0	1	0	1	0	0	65	(88)	9	(12)	0	(0)	74
1998																		
Fall 1998	19	11	0	30		0	0	0	0	0	0	19	(63)	11	(37)	0	(0)	30
Spring 1999	48	5	1	54		2	2	0	4	0	0	50	(86)	7	(12)	1	(2)	58
Total	67	16	1	84	1	2	2	0	4	0	0	69	(79)	18	(20)	1	(1)	88
1999																		
Fall 1999	15	21	0	36		4	0	0	4	0	0	19	(48)	21	(52)	0	(0)	40
Spring 2000	54	5	0	59		1	0	0	1	0	0	55	(92)	5	(8)	0	(0)	60
Total	69	26	0	95	2	5	0	0	5	0	0	74	(74)	26	(26)	0	(0)	100

Table 1 continued

Regulatory year	Reported											Estimated kill		Total estimated kill						
	Hunter kill					Nonhunting kill[a]														
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total			Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
2000																				
Fall 2000	18	11	0	29		2	1	0	3			0	0	20	(63)	12	(37)	0	(0)	32
Spring 2001	57	11	0	68		1	1	0	2			0	0	58	(83)	12	(17)	0	(0)	70
Total	75	22	0	97	2	3	2	0	5			0	0	78	(76)	24	(24)	0	(0)	102
2001																				
Fall 2001	13	14	0	27	0	5	1	0	6[c]			0	0	18	(53)	15	(47)	0	(0)	34
Spring 2002	50	5	0	55	0	0	0	0	0			0	0	50	(91)	5	(9)	0	(0)	55
Total	63	19	0	82	0	6	0	0	6[d]			0	0	68	(76)	20	(24)	0	(0)	89
2002																				
Fall 2002	14	13	0	27	0	1	0	0	1			0	0	15	(54)	13	(46)	0	(0)	28
Spring 2003	40	7	0	47	0	0	0	0	0			0	0	40	(85)	7	(15)	0	(0)	47
Total	54	20	0	74	0	1	0	0	1[e]			0	0	55	(73)	20	(27)	0	(0)	75
2003																				
Fall 2003	6	7	0	13	1	2	0	0	2			0	0	8	(53)	7	(47)	0	(0)	15
Spring 2004	34	8	0	42	1	1	0	0	1			0	0	35	(81)	8	(19)	0	(0)	43
Total	40	15	0	55	2	3	0	0	3[f]			0	0	43	(74)	15	(26)	0	(0)	58

[a] Includes defense of life or property kills, research mortalities, and other known human-caused mortality.
[b] Bears reported harvested over bait.
[c] One female bear killed by vehicle
[d] Includes 5 DLP and one killed by vehicle.
[e] Includes 1 DLP.
[f] Includes 3 DLP.

Table 2 Unit 1A successful black bear hunter residency, regulatory years 1980 through 2003

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown residency[b]	(%)	Total
1980–1981	17	(55)	3	(10)	7	(22)	4	(13)	31
1981–1982	25	(71)	0	(0)	10	(29)	0	(0)	35
1982–1983	24	(71)	0	(0)	10	(29)	0	(0)	34
1983–1984	21	(44)	20	(42)	5	(10)	2	(4)	48
1984–1985	33	(58)	4	(7)	13	(23)	7	(12)	57
1985–1986	33	(49)	11	(16)	16	(23)	8	(12)	68
1986–1987	41	(59)	5	(7)	22	(32)	1	(2)	69
1987–1988	48	(73)	5	(8)	10	(15)	3	(4)	66
1988–1989	30	(50)	1	(2)	25	(42)	4	(6)	60
1989–1990	42	(62)	9	(13)	14	(21)	3	(4)	68
1990–1991	57	(67)	14	(16)	11	(13)	3	(4)	85
1991–1992	29	(48)	8	(13)	20	(33)	3	(6)	60
1992–1993	23	(62)	1	(3)	9	(24)	4	(11)	37
1993–1994	35	(69)	6	(12)	9	(18)	1	(1)	51
1994–1995	29	(59)	7	(14)	10	(21)	3	(6)	49
1995–1996	44	(65)	11	(16)	12	(18)	1	(1)	68
1996–1997	32	(65)	3	(6)	13	(27)	1	(2)	49
1997–1998	38	(51)	11	(15)	24	(32)	1	(2)	74
1998–1999	51	(58)	14	(16)	19	(22)	4	(4)	88
1999–2000	48	(48)	8	(8)	39	(30)	5	(5)	100
2000–2001	45	(44)	2	(2)	50	(49)	5	(5)	102
2001–2002	41	(50)	5	(6)	36	(43)	1	(1)	83
2002–2003	28	(38)	4	(5)	42	(57)	0	(0)	74
2003–2004	25	(45)	5	(9)	25	(46)	0	(0)	55
Average	35	(57)	7	(10)	19	(28)	3	(5)	63

[a] Local hunters are those hunters that reside in Unit 1A.
[b] Includes DLP kills, research mortalities, and other known human-caused mortality.

Table 3 Unit 1A black bear harvest chronology by month[a], regulatory years 1980 through 2003

Regulatory year	Month												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
1980–1981	5	(16)	3	(10)	0	(0)	4	(13)	17[b]	(55)	2[c]	(6)	31
1981–1982	3	(8)	3	(9)	1	(3)	0	(0)	17	(49)	11	(31)	35
1982–1983	6	(18)	2	(6)	0	(0)	3	(9)	16	(49)	6	(18)	33
1983–1984	17	(37)	5	(11)	1	(2)	8	(18)	13	(28)	2	(4)	46
1984–1985	23[c]	(42)	2[b]	(4)	0	(0)	1	(2)	25[b]	(46)	3[b]	(6)	54
1985–1986	22[c]	(34)	2	(4)	0	(0)	3	(4)	26[b]	(41)	11[b]	(17)	64
1986–1987	18	(27)	3	(4)	4	(6)	1	(1)	36	(53)	6	(9)	68
1987–1988	14	(22)	4[c]	(6)	3	(5)	6	(9)	25	(39)	12	(19)	64
1988–1989	8[b]	(14)	4	(7)	2	(3)	0	(0)	38	(67)	5	(9)	57
1989–1990	7	(10)	3[b]	(4)	1	(1)	1	(1)	50[b]	(75)	6	(9)	68
1990–1991	11[d]	(13)	4	(5)	0	(0)	2	(2)	51	(61)	16	(19)	84
1991–1992	12	(21)	4	(7)	4[b]	(7)	3	(5)	29	(51)	5	(9)	57
1992–1993	13[d]	(35)	4[c]	(11)	0	(0)	4	(11)	14	(38)	2	(5)	37
1993–1994	5	(10)	5	(10)	0	(0)	3	(6)	27	(54)	10	(20)	50
1994–1995	6	(13)	2	(4)	0	(0)	1	(2)	28	(60)	10	(21)	47
1995–1996	18	(26)	9[b]	(13)	0	(0)	2	(3)	31	(46)	8	(12)	68
1996–1997	12[b]	(25)	4	(8)	0	(0)	3	(6)	25	(51)	5	(10)	49
1997–1998	10[b]	(14)	7	(9)	0	(0)	11	(15)	43	(58)	3	(4)	74
1998–1999	26	(30)	4	(4)	0	(0)	3	(3)	35[b]	(40)	20[d]	(23)	88
1999–2000	21	(21)	14[b]	(14)	1	(1)	4	(4)	46	(46)	10[b]	(10)	96
2000–2001	22	(22)	7	(7)	1[b]	(1)	8[b]	(8)	42	(43)	19	(19)	99
2001–2002	26	(29)	6	(7)	0	(0)	0	(0)	37	(42)	19	(21)	88
2002–2003	24	(32)	4	(5)	7	(0)	0	(0)	25	(33)	21	(28)	81
2003–2004	13	(24)	1	(1)	0	(0)	0	(0)	34	(61)	9	(16)	57
Average	14	(22)	4	(7)	1	(1)	3	(5)	30	(49)	9	(15)	59

[a] Does not include bears killed during closed season
[b] Includes 1 DLP
[c] Includes 2 DLPs
[d] Includes 3 DLPs

Table 4 Unit 1A black bear harvest percent by transport method, regulatory years 1980 through 2003

Regulatory year	Transport												
	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
1980–1981	7	(22)	16	(52)	3	(10)	1	(3)	0	(0)	4	(13)	31
1981–1982	12	(34)	22	(63)	1	(3)	0	(0)	0	(0)	0	(0)	35
1982–1983	14	(41)	15	(44)	3	(9)	2	(6)	0	(0)	0	(0)	34
1983–1984	8	(17)	27	(56)	6	(13)	4	(8)	1	(2)	2	(4)	48
1984–1985	11	(19)	28	(49)	8	(14)	0	(0)	3	(6)	7	(12)	57
1985–1986	10	(15)	42	(62)	5	(7)	1	(1)	0	(0)	10	(15)	68
1986–1987	17	(25)	42	(61)	7	(10)	0	(0)	2	(3)	1	(1)	69
1987–1988	11	(17)	35	(53)	19	(29)	0	(0)	0	(0)	1	(1)	66
1988–1989	13	(22)	33	(55)	12	(20)	0	(0)	0	(0)	2	(3)	60
1989–1990	2	(3)	46	(68)	15	(22)	0	(0)	1	(1)	4	(6)	68
1990–1991	8	(10)	66	(78)	8	(9)	0	(0)	1	(1)	2	(2)	85
1991–1992	10	(17)	34	(57)	6	(10)	4	(6)	3	(5)	3	(5)	60
1992–1993	0	(0)	22	(59)	6	(16)	1	(3)	4	(11)	4	(11)	37
1993–1994	2	(4)	35	(69)	10	(20)	2	(3)	1	(2)	1	(2)	51
1994–1995	6	(13)	31	(63)	6	(12)	3	(6)	1	(2)	2	(4)	49
1995–1996	6	(9)	46	(68)	12	(18)	3	(4)	0	(0)	1	(1)	68
1996–1997	4	(8)	37	(76)	4	(8)	3	(6)	0	(0)	1	(2)	49
1997–1998	4	(6)	61	(82)	5	(7)	3	(4)	0	(0)	1	(1)	74
1998–1999	0	(0)	66	(75)	11	(12)	7	(8)	0	(0)	4	(5)	88
1999–2000	4	(4)	79	(79)	5	(5)	5	(5)	2	(2)	5	(5)	100
2000–2001	0	(0)	86	(84)	6	(6)	2	(2)	2	(2)	6	(6)	102
2001–2002	7	(8)	73	(82)	2	(2)	0	(0)	0	(0)	7	(8)	89
2002–2003	0	(0)	73	(97)	0	(0)	1	(1)	0	(0)	1	(1)	75
2003–2004	1	(1)	51	(88)	0	(0)	3	(6)	0	(0)	3	(6)	58
Average	7	(12)	44	(66)	7	(11)	2	(3)	1	(2)	3	(5)	63

[a] Includes 3- or 4-wheelers or other ORV

[b] Includes DLP and vehicle collisions

Table 5 Unit 1A black bear hunter effort, mean skull size, and mean age, regulatory years 1980 through 2003

Regulatory year	Hunter effort: Total days	Hunter effort: Nr hunters	Hunter effort: Mean days per hunter	Mean skull size[a] (inches): Male	*n*[c]	Mean skull size[a] (inches): Female	*N*	Average age (years)[b]: Male	*n*	Average age (years)[b]: Female	*n*
1980–1981											
Fall 1980	24	8	3.0	15.7	3	15.8	4				
Spring 1981	56	23	2.4	17.6	16	14.6	1				
Total/ $\bar{x}$	80	31	2.6	$\bar{x}$ =7.3	19	$\bar{x}$ =15.5	5	---		---	
1981–1982											
Fall 1981	18	7	2.6	17.0	5	14.5	1				
Spring 1982	70	28	2.5	17.8	24	16.1	2				
Total/ $\bar{x}$	88	35	2.5	$\bar{x}$ =17.7	29	$\bar{x}$ =15.5	3	$\bar{x}$ =8.0	19	$\bar{x}$ =12.0	2
1982–1983											
Fall 1982	23	8	2.9	16.8	5	16.8	2				
Spring 1983	105	26	4.0	17.1	20	16.2	3				
Total/ $\bar{x}$	128	34	3.8	$\bar{x}$ =17.1	25	$\bar{x}$ =16.4	5	$\bar{x}$ =7.0	17	$\bar{x}$ =11.0	5
1983–1984											
Fall 1983	57	24	2.4	16.7	10	15.7	10				
Spring 1984	73	24	3.0	18.0	15	16.5	4				
Total/ $\bar{x}$	130	48	2.7	$\bar{x}$ =17.5	25	$\bar{x}$ =15.9	14	$\bar{x}$ =7.2	18	$\bar{x}$ =6.3	12
1984–1985											
Fall 1984	49	26	1.9	16.0	11	15.9	16				
Spring 1985	90	28	3.2	18.2	24	16.0	1				
Total/ $\bar{x}$	139	54	2.6	$\bar{x}$ =17.5	35	$\bar{x}$ =15.9	17	$\bar{x}$ =7.0	27	$\bar{x}$ =9.7	12
1985–1986											
Fall 1985	79	25	3.2	17.4	11	15.8	10				
Spring 1986	95	40	2.4	18.3	32	15.4	5				
Total/ $\bar{x}$	174	65	2.7	$\bar{x}$ =18.1	43	$\bar{x}$ =15.7	15	$\bar{x}$ =8.0	31	$\bar{x}$ =9.4	12
1986–1987											
Fall 1986	52	26	2.0	17.1	13	15.6	9				
Spring 1987	123	43	2.9	17.5	36	16.4	4				
Total/ $\bar{x}$	175	69	2.5	$\bar{x}$ =17.4	49	$\bar{x}$ =15.8	13	$\bar{x}$ =7.8	44	$\bar{x}$ =9.8	13

Table 5 continued

Regulatory year	Hunter effort: Total days	Hunter effort: Nr hunters	Hunter effort: Mean days per hunter	Mean skull size[a] (inches): Male	*n*[c]	Mean skull size[a] (inches): Female	*n*	Average age (years)[b]: Male	*n*	Average age (years)[b]: Female	*n*
1987–1988											
Fall 1987	38	22	1.7	18.4	10	15.7	8				
Spring 1988	125	43	2.9	18.1	36	15.5	4				
Total/ $\bar{x}$	163	65	2.5	$\bar{x}$ =18.1	46	$\bar{x}$ =15.6	12	$\bar{x}$ =7.9	39	$\bar{x}$ =6.3	9
1988–1989											
Fall 1988	32	13	2.5	17.5	7	16.1	4				
Spring 1989	131	43	3.0	18.8	27	16.2	1				
Total/ $\bar{x}$	163	56	2.9	$\bar{x}$ =18.5	34	$\bar{x}$ =16.1	5	$\bar{x}$ =10.0	15	$\bar{x}$ =7.0	1
1989–1990											
Fall 1989	19	8	2.4	17.1	5	---	0				
Spring 1990	151	56	2.7	18.5	39	16.0	5				
Total/ $\bar{x}$	170	64	2.6	$\bar{x}$ =18.4	44	$\bar{x}$ =16.0	5	---	---	---	---
1990–1991											
Fall 1990	16	13	1.2	16.7	9	16.4	3				
Spring 1991	272	67	4.1	18.0	56	15.6	5				
Total/ $\bar{x}$	288	80	3.6	$\bar{x}$ =17.8	65	$\bar{x}$ =15.9	8	$\bar{x}$ =10.2	67	$\bar{x}$ =11.0	8
1991–1992											
Fall 1991	44	20	2.2	18.1	11	15.9	7				
Spring 1992	120	37	3.2	18.2	32	16.4					
Total/ $\bar{x}$	164	57	2.9	$\bar{x}$ =18.1	43	$\bar{x}$ =16.1	10	$\bar{x}$ =11.0	42	$\bar{x}$ =9.6	10
1992–1993											
Fall 1992	22	13	1.7	16.3	5	16.6	10				
Spring 1993	38	20	1.9	17.9	18	15.8	2				
Total/ $\bar{x}$	60	33	1.8	$\bar{x}$ =17.6	23	$\bar{x}$ =16.4	12	$\bar{x}$ =8.0	21	$\bar{x}$ =9.0	13
1993–1994											
Fall 1993	12	10	1.2	17.7	8	16.1	1				
Spring 1994	87	40	2.2	17.4	38	15.8	3				
Total/ $\bar{x}$	99	50	2.0	$\bar{x}$ =17.5	46	$\bar{x}$ =15.9	4	$\bar{x}$ =9.0	46	$\bar{x}$ =9.0	4

Table 5 continued

Regulatory year	Hunter effort: Total days	Hunter effort: Nr hunters	Hunter effort: Mean days per hunter	Mean skull size[a] (inches): Male	Mean skull size[a] (inches): n[c]	Mean skull size[a] (inches): Female	Mean skull size[a] (inches): n	Average age (years)[b]: Male	Average age (years)[b]: n	Average age (years)[b]: Female	Average age (years)[b]: n
1994–1995											
Fall 1994	10	8	1.3	16.8	7	14.6	2				
Spring 1995	98	39	2.5	18.1	31	16.0	7				
Total/ $\bar{x}$	108	47	2.3	$\bar{x}$ =17.8	38	$\bar{x}$ =15.7	9	$\bar{x}$ =9.6	36	$\bar{x}$ =11.0	10
1995–1996											
Fall 1995	38	27	1.4	17.5	18	15.7	8				
Spring 1996	73	41	1.8	18.3	35	15.9	6				
Total/ $\bar{x}$	111	68	1.6	$\bar{x}$ =18.0	53	$\bar{x}$ =15.8	14	$\bar{x}$ =8.3	51	$\bar{x}$ =8.8	14
1996–1997											
Fall 1996	30	16	1.9	16.8	12	15.0	3				
Spring 1997	73	33	2.2	18.4	30	15.8	3				
Total/ $\bar{x}$	103	49	2.1	$\bar{x}$ =17.6	42	$\bar{x}$ =15.4	6	$\bar{x}$ =10.9	40	$\bar{x}$ =4.9	7
1997–1998											
Fall 1997	47	17	2.8	17.2	12	15.6	4				
Spring 1998	139	56	2.5	17.9	52	15.9	3				
Total/ $\bar{x}$	186	73	2.5	$\bar{x}$ =17.8	64	$\bar{x}$ =15.7	7	$\bar{x}$ =9.0	65	$\bar{x}$ =10.0	8
1998–1999											
Fall 1998	62	30	2.1	17.1	19	16.3	11				
Spring 1999	172	54	3.2	17.9	50	15.1	7				
Total/ $\bar{x}$	234	84	2.8	$\bar{x}$ =17.7	69	$\bar{x}$ =15.8	18	$\bar{x}$ =7.8	64	$\bar{x}$ =10.0	16
1999–2000											
Fall 1999	71	37	1.9	17.5	15	16.0	21				
Spring 2000	154	58	2.7	18.1	54	16.6	5				
Total/ $\bar{x}$	225	95	2.3	$\bar{x}$ =17.9	69	$\bar{x}$ =16.1	26	$\bar{x}$ =8.1	69	$\bar{x}$ =9.9	26
2000–2001											
Fall 2000	64	29	2.2	17.7	18	15.8	11				
Spring 2001	201	66	3.0	18.5	53	16.0	10				
Total/ $\bar{x}$	265	85	3.1	$\bar{x}$ =18.3	71	$\bar{x}$ =15.9	21	$\bar{x}$ =9.0	72	$\bar{x}$ =9.8	24

Table 5 continued

Regulatory year	Hunter effort: Total days	Hunter effort: Nr hunters	Hunter effort: Mean days per hunter	Mean skull size[a] (inches): Male	*n*[c]	Mean skull size[a] (inches): Female	*n*	Average age (years)[b]: Male	*n*	Average age (years)[b]: Female	*n*
Total/ $\bar{x}$	192	78	2.4	$\bar{x}$ =18.5	59	$\bar{x}$ =16.1	16	$\bar{x}$ =9.8	55	$\bar{x}$ =10.9	17
2002–2003											
Fall 2002	74	26	2.9	17.7	13	16.3	13	9.7	12	10.1	11
Spring 2003	130	43	3.0	18.3	38	17.0	7	9.0	40	10.1	7
Total/ $\bar{x}$	204	69	3.0	$\bar{x}$ =18.0	51	$\bar{x}$ =16.7	20	$\bar{x}$ =9.4	52	$\bar{x}$ =10.1	18
2003–*2004*											
Fall 2003	32	14	2.3	18.4	6	16.2	8	9.8	6	5.1	8
Spring 2004	105	42	2.5	18.4	34	15.8	8	9.8	34	5.1	8
Total/ $\bar{x}$	137	56	2.4	$\bar{x}$ =18.4	40	$\bar{x}$ =16.0	16	$\bar{x}$ =9.8	40	$\bar{x}$ =5.1	16

[a] Skull sizes equal length plus zygomatic width.

[b] Bear ages not available for 1980–1981 and 1989–1990.

[c] *n* represents sample size. Not all skulls sealed can be measured.

Table 6 Unit 1A black bear harvest[a] by Wildlife Analysis Area (WAA), regulatory years 1992–2003

WAA	1991[b]	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
0101		2			1	2			1	1		1	1
0303				1							1		
0404	7	3	4	2	1	1	1	4	6	8	5	6	3
0405	1		2		3	3		2	4		1	1	
0406	11	7	17	13	13	8	20	25	22	22	11	12	8
0407	6	5	7	12	12	7	5	13	15	12	13	15	7
0408	3	5			2	3		8	5	7	16	4	4
0509	2	4	2	3	10	2	3	1	4	4	1	1	4
0510	10	4	8	5	5	2	12	12	10	13	15	11	10
0511	1	1					1	1			1		4
0612				1					1		1	1	
0613	1	3	2	1	5	2	1	3		3	2	2	1
0614			2		2			1	1				1
0715	2						2	3		3	1		1
0716	3					1		2		1	1		
0717						1		1	2			2	
0718				1									
0719	2					2	1		2	2		1	1
0820	2	1		1		2	4		2	4	1	2	4
0822	3	2	5	3	6	7	12	2	18	14	19	13	2
0823	5		2	6	5	5	8	5	2	2		1	3
0824					1	1	1		4	3		3	1
0825					1			1		1			2
0826					1		2	1	1	1			
1209								1					
1210								1					
1319								1					
1526							1						

[a] Includes DLP and road kills

[b] Does not include 1 harvested bear, unspecified location

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: Unit 1B (3000 mi2)

GEOGRAPHIC DESCRIPTION: Southeast Alaska mainland, Cape Fanshaw to Lemesurier Point.

BACKGROUND

HABITAT DESCRIPTION

Most high quality black bear habitat in Unit 1B is confined to a relatively narrow band of forested landscape between saltwater and the coastal mountains. A large portion of the unit encompasses high elevation peaks and ice fields. ADF&G has estimated that of the 3000 square miles in Unit 1B, only about 850 square miles is forested habitat. A few large river valleys, such as the Farragut, Stikine, Bradfield, Harding, Eagle, and Thomas Bay drainages, support salmon and other anadromous fish. The Anan Creek drainage also supports large, accessible salmon runs and attracts many bears, as well as humans who view them. Portions of the unit have been logged and have clearcuts in various stages of seral habitats and some logging roads.

Small openings and disturbed areas, such as wetlands, avalanche chutes, clearcuts, and subalpine meadows, are important black bear foraging areas. Black bear diets may range from mostly vegetarian to mostly carnivorous, and the species may subsist by scavenging or by predation on large and small mammals or fish. In Unit 1B, black bears primarily eat vegetation during early spring. Major foods include grasses and sedges, *Equisetum* spp., and berries that have persisted through the winter. Later in spring, black bears may be efficient predators of moose calves and/or Sitka black-tailed deer fawns. During summer and fall, when bears accumulate fat reserves for winter hibernation, those bears with access to salmon streams eat large quantities of fish. Berries are also important during the summer and fall months. Poor fish runs or berry crops are thought to result in low cub production and survival the following spring. In most areas of the mainland, black bears share habitats with brown bears.

Over 20,000 acres of forested habitat in Unit 1B have been logged to date. As a result, timber harvest poses the most serious threat to black bear habitat in the unit over the long term. Black bears appear able to exploit increases in forage in early-successional plant communities immediately after logging and may temporarily benefit from clearcutting. However, this food source is lost approximately 20–25 years postlogging with canopy closure, and second-growth forests provide little habitat for bears. Precommercial thinning and pruning of second-growth stands can extend the short-term benefits to bears, but the long-term effects of logging will be detrimental.

HUMAN USE HISTORY

Black bears are indigenous to Unit 1B and have traditionally been hunted for food and trophies. Information about black bears in the unit is limited to sealing records, anecdotal public reports, and observations by our staff. Although we lack quantitative demographic information on black bears in the unit, we believe the population is stable.

Regulatory history

Statewide sealing of black bears began in 1973. Hunters have not been required to obtain a hunt registration permit for black bear; thus, effort data for unsuccessful hunters have never been available. We have information on hunt effort only for successful hunters.

For most years since statehood the black bear hunting season extended from 1 September through 30 June with a resident bag limit of 2 bears annually, only 1 of which could be a blue or glacier bear. From 1980 through 1983 the season closed on 15 June, and the bag limit for residents and nonresidents was only 1 bear. In 1984, the limit increased to 2 bears. In 1990, the nonresident bag limit was reduced from 2 bears to 1 per year. In 1982 it became legal to use bait to hunt black bears year-round. In 1988 the Board of Game limited baiting in Southeast Alaska to the spring period 15 April–15 June. The use of dogs for hunting black bears has been allowed since 1966. Hunting with dogs requires a permit issued by ADF&G. No permit requests to hunt bears with dogs have been received for the unit. Since 1996, hunters have been required to salvage the edible meat of all black bears killed in Southeast Alaska during the period 1 January–31 May.

Historical harvest patterns

Because of difficult access to most areas and a low human population, the annual harvest in the unit has remained low, averaging 8 bears per year from 1973 to 1979, 15 bears per year in the 1980s, and 17 bears per year in the 1990s. The 29 bears killed during the 1995–96 regulatory year represent the highest recorded annual harvest. While there is no clear explanation for this harvest spike, there was a relatively high take by guided nonresident hunters (38%) and local resident hunters (28%) that year, but we do not know if total hunter effort was higher than normal. Approximately 70–85% of the annual harvest occurs during the spring season. Since 1973, males have outnumbered females in the harvest by about 7 to 1. Beginning in 1993, the nonresident harvest began to exceed the resident harvest, with nonresidents accounting for more than 60% of the harvest in recent years. Most nonresidents hunt with a guide in the unit. Nonresident hunters must purchase a tag to affix to each bear harvested. The cost of these tags ($225 for nonresidents and $300 for nonresident aliens) may limit the number of nonresident hunters who pursue black bears. Nonresidents willing to purchase a tag are more likely to hunt the adjacent Unit 3 islands, which are better known for producing trophy-sized bears.

Historical harvest locations

Between 1973 and 2000 black bear harvest was documented in 15 Wildlife Analysis Areas (WAAs) in Unit 1B. These include WAAs in the Cape Fanshaw, Farragut Bay, Thomas Bay, LeConte Bay, Stikine River, Eastern Passage, Bradfield Canal, Frosty Bay, and Cleveland Peninsula areas. WAA 1603, the Dry Bay/Thomas Bay area, accounted for a disproportionately high percentage (20%) of the total harvest. Proximity to and accessibility from the communities of Petersburg and Wrangell probably influence harvest areas. Most harvest areas are associated

with river drainages that support anadromous fish runs. Roads associated with logging at Thomas Bay and the Bradfield River valley provide easy access to hunters previously restricted to airplanes or boats.

Anan Creek management

Anan Creek, on the upper Cleveland Peninsula, has long been a popular black bear viewing area. Since statehood, the Anan Creek drainage has been closed to black bear hunting. In October 1996, the Board of Game changed the boundaries of the Anan Creek Closed Area. Effective July 1, 1997, the Anan Creek drainage within 1 mile of Anan Creek downstream from the mouth of Anan Lake, including the area within a 1-mile radius from the mouth of Anan Creek Lagoon, was closed to taking black and brown bear. The rationale for this regulatory change was a desire to protect bears that had become vulnerable to harvest due to human habituation as a result of bear viewing at Anan Creek.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain an average spring skull size and an average annual male skull size of at least 17.5 inches.

- Maintain a male to female ratio of 3:1 in the harvest.

We have been using skull size as a management objective since the late 1980s because we believe that year-to-year trends in average skull size may indicate changes in population size and composition and provide some measure of the sustainability of harvest levels. A decreasing average skull size may indicate a decline in that segment of the population composed of large, older bears and could indicate an overall population decline. However, an increasing average skull size could also indicate a reduction in the proportion of younger bears in the population. Probably the most appropriate use of skull size data at this time is as an indicator of some change in the population or in hunter effort. We do not have a technique to tell us precisely what such a change might indicate, but use it in conjunction with other data to make our best assessment of the current population.

Age, genetics, and environmental factors such as habitat and forage quality all combine to influence black bear skull size. Sealing records and anecdotal evidence indicate that mature mainland black bears generally have smaller skull sizes compared to those found on Southeast Alaska islands. The skull size management objective of 17.5 inches was established after analysis of previous years' data showed this to be the long-term average. We wanted to maintain skull size in the harvest at the long-term high, and we have looked at any reduction in this mean as a possible indication of changes in the population's age structure.

METHODS

Staff of the Departments of Fish and Game and Public Safety and state-appointed sealing agents sealed hides and skulls of black bears. Hunters are required to submit bear skulls and hides for

sealing within 30 days of the kill. Biological and hunt information collected included pelage color, sex, skull size (length and width), date and location of kill, number of days hunted, transportation method, guide use, and hunter use of commercial services. A premolar was collected from most bears and sent to Matson's Laboratory for age determination. We also seal any bear that is killed under defense of life or property (DLP) provisions, as a road kill or illegal kill, or during research efforts. During this report period, tissue samples were opportunistically collected from some bears harvested in the unit for DNA and stable isotope analysis. Comparison of current and historical data indicates harvest trends and may offer indirect evidence of population trends.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population estimates are not currently available for black bears in this unit. Information obtained during sealing cannot be used to measure population trends. While harvest information gained from sealing records, such as average skull sizes, average ages, and sex ratios, may provide some indication of black bear population trends, in the absence of accompanying demographic data, correlations between these measures and harvest sustainability will continue to elude us. Research is needed to identify population parameters so we might better assess population trends and harvest sustainability.

Population Size

No black bear population studies have been conducted in Unit 1B. Estimates of population size or density are difficult to obtain, as the species generally inhabits forested areas, and aerial surveys are impossible. The vast, remote areas in the unit also make studies difficult and expensive to undertake. Black bear density estimates for Unit 1B are based on studies in similar habitats in western Washington state in the 1960s. We believe minimum densities in mainland Southeast Alaska are slightly higher than the 1.4 bears per square mile found in the Washington study (Poelker and Hartwell 1973). Assuming a density of approximately 1.5 bears per square mile of forested habitat, ADF&G estimated 1230 black bears in Unit 1B in 1990. Densities of black bears are probably similar in Unit 1B to other Southeast Alaska mainland areas.

Black bears with cinnamon-colored pelage occur primarily in a few isolated pockets in Unit 1B. A relatively high proportion of bears taken by hunters from the Farragut Bay, Stikine River, and Eastern Passage areas have cinnamon pelage. Although there exist a few unverified reports of glacier bear sightings in the unit, no glacier bears have been noted in the harvest. No Kermody bears (those with white pelage) have been reported in the unit.

Population Composition

We lack quantitative information with which to estimate the sex and age composition of the Unit 1B black bear population. The male-to-female ratio in the harvest may provide a better indicator of harvest sustainability and population status than does average skull size. Considering their high reproductive potential, survival of breeding females is critical to sustained yield management. Prolonged overharvest of females is likely to result in population declines. A decreasing trend in the male-to-female harvest ratio could signal a decline in that segment of the

population composed of older, larger males. Region I staff established the 3:1 male-to-female guideline in the late 1980s, based on work done on black bears elsewhere.

Distribution and Movements

Black bears are thought to be evenly distributed throughout the forested habitats in Unit 1B. Unlike black bears on most Southeast Alaska islands, Unit 1B black bears share mainland habitat with brown bears. Quantitative information about home ranges and movement patterns of Unit 1B black bears is not available.

The only quantitative information on black bear movement patterns in Southeast Alaska comes from a single denning study conducted on Mitkof Island in Unit 3 during 1980–1981 (Erickson et al. 1982). Black bear movement patterns are influenced to a large degree by seasonal changes and annual differences in the occurrence, abundance, and quality of preferred food items. Reproductive activities also influence bear movement patterns, particularly for males. As a result, males typically have larger home ranges than do females.

Black bears typically emerge from winter dens in March and April. Following emergence from dens, bears typically occupy low elevation habitats, where they feed on greening vegetation. As spring proceeds into summer, bears typically disperse throughout forested and alpine habitats, where they continue to feed on grasses, sedges, forbs, and berry-producing shrubs. In the late summer and early fall bears typically congregate near anadromous fish streams, where they feed on spawning salmon. As fish runs decline in the late summer and fall, bears disperse from salmon streams and feed primarily on berries and alpine vegetation before denning again in October and November.

MORTALITY

Harvest

Season	Bag Limit
1 Sep–30 Jun	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 Sep–30 Jun	Bag Limit Nonresident hunters: 1 bear

Board of Game Action and Emergency Orders. No Board of Game actions took place, and no emergency orders were issued during this report period.

Hunter Harvest. The Unit 1B black bear harvest has remained relatively stable at low levels since about 1980. However, the level of harvest during the most recent 5-year period decreased 7% over the preceding 5-year period. The harvest decrease was primarily due to an unusually low harvest in 2003–04. The harvest of just 7 bears in 2003–04 represents the lowest annual harvest since 1981. The low harvest in 2003–04 was probably the result of atypical winter and spring weather conditions rather than a decline in the bear population.

Hunter harvest in Unit 1B ranged from 7 to 30 bears annually during this report period (Table 1). The 30 bears harvested from July 2001 through June 2002 represent the highest documented annual harvest on record.

Males made up 80%, 83%, and 100% of the kill in regulatory years 2001, 2002, and 2003, respectively. During this report period the average male skull size ranged from 18.1 to 18.4 inches, well above the management objective of 17.5 inches, during all 3 years (Table 2). The male-to-female ratio during this report period was 5:1, well above the management goal of 3:1.

Hunter Residency and Success. Although the ratio varies annually, during this report period nonresident hunters took approximately 76% of the total annual harvest, local residents took about 21%, and nonlocal Alaska hunters took 4% of the bears harvested in the unit (Table 3).

Harvest Chronology. Most black bears are taken in the spring, with 54–71% of bears killed in May this report period (Table 4).

Harvest in Particular Areas (WAAs). During this report period black bear harvest occurred in 14 WAAs in Unit 1B. These include WAAs in the Cape Fanshaw, Farragut Bay, Dry Bay, Thomas Bay, Horn Cliffs, LeConte Bay, Stikine River, Eastern Passage, Bradfield Canal, and Cleveland Peninsula areas. WAAs in the Cape Fanshaw, Dry Bay and Thomas Bay areas produce 51 percent of the unitwide harvest.

Bait Stations. No permits were applied for or issued for the operation of bait stations in the unit.

Hunting with Dogs. No permit requests have been made to hunt bears with dogs in the unit.

Guided Hunter Harvest. Guided nonresident harvest has increased considerably as a percentage of the harvest over the past 5 years. During the most recent 5-year period, guided hunters accounted for 58% of the unitwide harvest, compared to 36% during the preceding 5-year period. During this report period most successful nonresident hunters used a guide (74%), while 12 percent used commercial services for transportation to and from the field.

Transport Methods. Hunter transportation is primarily by boat with infrequent use of hiking to access hunting areas (Table 5). There are no communities in Unit 1B, and with the exception of Thomas Bay and Bradfield Canal, there are very few roads.

Other Mortality

There were no reports of nonhunting mortality in Unit 1B during the report period (Table 1). No DLPs or illegal harvests were reported. While possibly significant, no information is currently available on the amount of wounding loss that occurs in the unit.

HABITAT

Assessment

Timber harvest continues to pose the most serious threat to black bear habitat in the unit. Postlogging increases in berry production, primarily *Vaccinium* sp., may contribute to short-term bear population growth. This forage source will be lost as the canopy closes, as will habitat diversity associated with old-growth forests, accompanied by a loss of denning trees. The long-term effects of logging will be detrimental to black bears. Roads associated with logging increase human access and can make bears increasingly vulnerable to harvest.

Although no new logging activity occurred during this report period, several proposed timber sales are in planning stages. Two timber sale offerings, one at Crystal Creek near Thomas Bay and another at Bradfield Canal, were sold, but the purchasers later defaulted on the sales. Nonetheless, the U.S. Forest Service is currently in the planning stages for future timber sales at Farragut Bay, Upper Muddy River, Madan Bay, Frosty Bay, and Emerald Bay.

Enhancement

No habitat enhancement projects specifically intended to benefit black bears have been attempted in the unit. Although primarily intended as a silvicultural practice, habitat manipulation in the form of precommercial thinning and pruning has been performed in some young second-growth stands in the Thomas Bay area. While not the primary intent, this effort does provide a secondary benefit to wildlife by improving and extending habitat suitability in the short-term, by reducing canopy cover, permitting sunlight to reach the forest floor, and increasing the production and availability of understory forage plants and berries. These benefits are relatively short-lived, approximately 20–25 years, after which time canopy closure again results in loss of understory vegetation. The long-term effects of clearcut logging will be detrimental to black bear populations.

NONREGULATORY MANAGEMENT PROBLEMS AND NEEDS

Nuisance Bear Problems. There are no established communities on the Unit 1B mainland. We have, however, received occasional reports of bears breaking into cabins and campers in the Thomas Bay area.

Kuiu Island Nonresident Harvest. In fall 2000, due to concerns over the steadily increasing harvest of black bears on Kuiu Island in Unit 3, the Board of Game established a nonresident harvest guideline of 120 bears per year there. In 2001 this new harvest guideline resulted in the emergency closure of the entire fall nonresident season on Kuiu. Since fall 2001, no subsequent emergency closures have been necessary. However, in anticipation of additional season closures on Kuiu Island, some guides and transporters may have redirected clients to alternative hunt areas along the Unit 1B mainland. This may explain the record high harvest the unit experienced during 2001–02.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 1B black bear harvest has remained relatively stable at low levels. The harvest level during the most recent 5-year period decreased 7% over that of the preceding 5-year period. The harvest of 7 bears in 2003–04 represents the lowest annual harvest since 1981. The low harvest in 2003–04 was likely the result of atypical winter and spring weather, rather than a decline in the bear population. In order to ensure that black bears are managed on a sustained yield basis, research is needed to estimate the black bear population in the unit. Research is also needed to identify possible correlations between sealing data and population trends. A better understanding of the short- and long-term impacts of clearcut logging on black bear populations is also needed. The percentage of males in the harvest and average male skull size were above the management

objectives during this 3-year period and indicates that black bear populations are stable in Unit 1B. No management or regulatory changes are recommended at this time.

Timber harvest continues to pose the most serious threat to black bear habitat in the unit. Roads associated with logging increase human access and can make bears increasingly vulnerable to harvest. The long-term effects of logging will be detrimental to black bears.

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Table 1 Unit 1B black bear harvest, 1996–2003

Regulatory year	Hunter kill						Nonhunting kill [a]			Total estimated kill					
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
Fall 96	7	0	0	0	7	NA	0	0	0	7	100	0	0	0	7
Spring 97	14	1	7	0	15	0	0	0	0	14	93	1	7	0	14
Total	21	1	5	0	22	0	0	0	0	21	95	1	5	0	22
Fall 97	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0
Spring 98	9	2	18	0	11	0	0	0	0	9	82	2	18	0	11
Total	9	2	18	0	11	0	0	0	0	9	82	2	18	0	11
Fall 98	1	0	0	0	1	NA	0	0	0	1	100	0	0	0	1
Spring 99	23	0	0	0	23	0	0	0	0	23	100	0	0	0	23
Total	24	0	0	0	24	0	0	0	0	24	100	0	0	0	24
Fall 99	4	0	0	0	4	NA	0	0	0	4	100	0	0	0	4
Spring 00	8	1	11	0	9	0	0	0	0	8	89	1	11	0	9
Total	12	1	8	0	13	0	0	0	0	12	92	1	8	0	13
Fall 00	4	1	25	0	5	NA	0	0	0	4	80	1	20	0	5
Spring 01	16	1	6	0	17	0	0	0	0	16	94	1	6	0	17
Total	20	2	10	0	22	0	0	0	0	20	91	2	9	0	22
Fall 01	5	2	29	0	7	NA	0	0	0	5	71	2	29	0	7
Spring 02	19	4	17	0	23	0	0	0	0	19	83	4	17	0	23
Total	24	6	20	0	30	0	0	0	0	24	80	6	20	0	30
Fall 02	2	1	33	0	3	NA	0	0	0	2	67	1	33	0	3
Spring 03	13	2	13	0	15	0	0	0	0	13	87	2	13	0	15
Total	15	3	17	0	18	0	0	0	0	15	83	3	17	0	18
Fall 03	1	0	0	0	1	NA	0	0	0	1	100	0	0	0	1
Spring 04	6	0	0	0	6	0	0	0	0	6	100	0	0	0	0
Total	7	0	0	0	7	0	0	0	0	7	100	0	0	0	7

[a] Includes DLP kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 1B black bear mean skull size[a], 1992–2003

Regulatory year	Males	*n*	Females	*n*
1992–1993	17.9	11	16.9	2
1993–1994	18.4	9	16.0	4
1994–1995	18.2	8	16.9	4
1995–1996	18.1	28	17.2	1
1996–1997	18.6	19	18.7	1
1997–1998	17.4	9	16.0	1
1998–1999	17.7	23	N/A	0
1999–2000	18.7	12	N/A	0
2000–2001	18.5	19	15.7	2
2001–2002	18.1	24	16.2	6
2002–2003	18.4	15	16.1	3
2003–2004	18.1	7	N/A	0

[a] Skull size = total length + zygomatic width in inches.

Table 3 Unit 1B successful black bear hunter residency, 1992–2003

Regulatory year	Local resident [a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total successful hunters
1992–1993	8	57	2	14	4	29	14
1993–1994	2	15	3	23	8	62	13
1994–1995	2	17	3	25	7	58	12
1995–1996	8	28	1	3	20	69	29
1996–1997	7	32	0	0	15	68	22
1997–1998	3	27	1	9	7	64	11
1998–1999	8	34	1	4	15	62	24
1999–2000	2	15	1	8	10	77	13
2000–2001	7	32	1	4	14	64	22
2001–2002	4	16	1	1	25	83	30
2002–2003	4	22	0	0	14	78	18
2003–2004	3	43	1	14	3	43	7

[a] Local residents are those that reside in Petersburg, Wrangell, or Kake.

Table 4 Unit 1B black bear harvest chronology by percent, 1992–2003

Regulatory year	Month						
	September	October	November	April	May	June	*n*
1992–1993	21	7	0	0	64	7	14
1993–1994	8	8	0	15	38	31	13
1994–1995	0	0	0	8	84	8	12
1995–1996	17	0	0	3	76	4	29
1996–1997	18	9	4	0	55	14	22
1997–1998	0	0	0	27	55	18	11
1998–1999	4	0	0	13	70	13	24
1999–2000	31	0	0	7	46	16	13
2000–2001	22	0	0	14	50	14	22
2001–2002	23	0	0	10	54	13	30
2002–2003	11	0	6	6	71	6	18
2003–2004	14	0	0	29	57	0	7

Table 5 Unit 1B black bear harvest in percent by transport method, 1992–2003

Regulatory year	Airplane	Boat	Highway vehicle	Foot	Unknown	*n*
1992–1993	0	100	0	0	0	14
1993–1994	7	93	0	0	0	14
1994–1995	8	84	0	8	0	12
1995–1996	7	93	0	0	0	29
1996–1997	14	82	0	4	0	22
1997–1998	0	100	0	0	0	11
1998–1999	0	100	0	0	0	24
1999–2000	0	100	0	0	0	13
2000–2001	0	100	0	0	0	22
2001–2002	0	100	0	0	0	30
2002–2003	0	100	0	0	0	18
2003–2004	0	86	0	14	0	7

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 1C (7600 mi^2)

GEOGRAPHICAL DESCRIPTION: The Southeast Alaska mainland and the islands of Lynn Canal and Stephens Passage lying between Cape Fanshaw and the latitude of Eldred Rock, including Sullivan Island and the drainages of Berners Bay.

BACKGROUND

HABITAT DESCRIPTION

Most high-quality Unit 1C black bear habitat is confined to a relatively narrow band of forest between saltwater and the coastal mountains. A large portion of the unit encompasses high elevation peaks and ice fields. A few large river valleys, such as the Taku, Speel, Endicott, Chuck, Port Houghton, and Berners Bay, have streams that support salmon and other anadromous fish. Portions of the unit have been logged and contain clearcuts that are in various seral stages. As elsewhere in Southeast Alaska, habitat changes continue to occur from clearcut logging. Although early successional stages (3–20 years postlogging) provide black bears with an abundance of forage, later stages result in the disappearance of understory plant species as conifer canopies close and light does not penetrate to the forest floor. Second-growth stands also lack large hollow trees and root masses that are used for dens. Therefore, although logging may result in an increase in black bear forage in the short term, the long-term result of logging will be a decline in bear numbers due to the disappearance of a productive understory (Suring et al. 1988). The Alaska Department of Fish and Game (ADF&G) has estimated approximately 1300 square miles of forested habitat in Unit 1C with approximately 38–50 mi^2 having been logged by clearcutting. These logging operations occurred from the time of World War II in Excursion Inlet to 1999 near Echo Cove. Several proposed logging operations could take place over the next few years, including 2 at Pt. Couverden and Hobart Bay.

Unit 1C black bears primarily eat vegetation during early spring, although they likely prey on moose calves and Sitka black-tailed deer fawns where available. Important foraging areas are beach lines, estuaries, small forest openings, subalpine meadows, and disturbed areas such as wetlands, avalanche chutes, and clearcuts. Major vegetative foods include grasses and sedges, skunk cabbage, devil's club, *Equisetum,* and berries that have persisted through the winter. During summer and fall bears accumulate fat for hibernation, and their diets may change from mostly vegetative to largely fish for individuals with access to salmon streams. Berries are also

important during summer and fall. Poor fish runs or berry crops are thought to result in low cub production and survival in the following spring because of low fat accumulation prior to den-up. Mainland black bears share ranges with brown bears, especially in major river valleys. Brown bears are rare to nonexistent on the Unit 1C islands and are seen only occasionally in the immediate Juneau area.

Bear habitat near Juneau is currently affected by one significant nonnatural factor, human garbage. Although bears are numerous locally due to productive natural habitat, the availability of garbage as an attractive alternative or additional food source promotes high bear densities. With restrictions against firearms discharge within the city and borough of Juneau (CBJ), these urban areas provide a "refuge," where bears are not subjected to hunter harvest. This absence of a harvest, along with the high human density in the area, ensures a high level of conflict with bears.

HUMAN USE HISTORY

Black bears have been hunted for many years in Unit 1C, although harvest information was not collected until 1973 when sealing was first required. Since then, all successful hunters have been required to take hides and skulls to a sealing agent, allowing ADF&G to acquire information on harvested bears and hunter effort. Because permits or harvest tickets are not required for black bear hunting, we have no way of gathering effort data from unsuccessful hunters.

Regulatory history

For most years since statehood the black bear hunting season has been from 1 September through 15 June or 30 June, and the bag limit for residents has been 1–3 bears annually, only 1 of which could be a blue or glacier bear. Since 1990, the bag limit for residents has been 2 bears (not more than 1 glacier bear) and for nonresidents, 1 bear per year.

Historical harvest patterns

The harvest percentage by residency status has not changed significantly during the past 30 years. Resident hunters historically accounted for 60–70% of the annual harvest. Approximately half of nonresidents hunt without a guide in the unit. Nonresident hunters must purchase tags to affix to each bear harvested. The fact that black bear hunting opportunities exist in most other states, along with the cost of these tags ($225 for nonresident citizens and $300 for nonresident aliens), probably reduces the number of nonresidents who hunt black bears in Unit 1C.

The Unit 1C annual harvest has risen steadily over the past 30 years, with a mean of 47 in the 1970s, 73 in the 1980s, and 96 bears in the 1990s. Approximately 80% of the harvest has occurred in the spring season, with males outnumbering females in the harvest about 3 to 1. There are differences, though slight, in the sex ratio of the harvest in spring vs. fall, with the fall harvest having a higher percent of female bears. This is probably due to females kicking out yearling cubs by the fall season, and thereby being single and legal for harvest. From 1992 through 2000, the percent males in the harvest during spring ranged from 81 to 98 with a mean of 89%, while the fall ranged from 59 to 100% males in the harvest, with a mean of 78%.

From 1990 through 1993, black bear movement, disease, and toxicology studies were conducted in the areas of 2 proposed gold mines. Through cooperative agreements between the mining

companies and ADF&G, black bears were captured and radiocollared at each mine site, hair and blood samples were collected, and data on bear movements was recorded. The studies were designed to provide baseline data prior to the mines' development. Since then, 1 of the 2 projects was abandoned, leaving the Kensington Mine north of Berners Bay as the sole prospect for large mine development in the near term. Due partly to the limited resources devoted to the studies, results were inconclusive. Findings suggested that bears in the study area have smaller home range sizes than reported elsewhere, and the sites are rich environments for bears, capable of supporting higher densities than other study sites (Robus and Carney 1995, Robus and Carney 1996). We believe roads, settlements, and development nodes associated with mine development have the potential for changes in disturbance levels, access, and availability of refuse which could adversely affect bears.

Historical harvest locations

The black bear harvest in Unit 1C is fairly well distributed. The areas with the most harvest are the west side of Lynn Canal and the area south of the Taku River (Table 6). WAA 2304 is the St. James Bay area that attracts mostly local residents of Unit 1C. It contains several good anchorages for boaters, and the estuary provides bear hunters with ample opportunity to spot and stalk bears. WAAs 2305 and 2306 are at the southern end of the Chilkat Range and have been partially logged. The road system in this area provides opportunities for hunters to use ATVs to hunt bears. This is a very popular area for Hoonah residents because of its proximity to their community, and because it is the nearest area to Hoonah where black bears are present. WAAs 2823–2927 (Table 6) are located between Snettisham and Cape Fenshaw in the southern portion of the subunit. Nonresidents who are on combination hunts for brown and black bears harvest many of the bears taken in this area. A typical hunt begins in Unit 4 for brown bears, and then finishes in this area for black bears.

Urban bear management

The tendency for black bears to take advantage of human food or garbage as alternative foods has been the greatest management problem regarding black bears within this unit. Bears that have become conditioned to human food are difficult to discourage, and it has often been necessary to move or destroy such animals. In 1986 the number of complaints involving nuisance bears received by the Juneau Police Department (JPD) and ADF&G far exceeded those of previous years. In an effort to reduce the bear population around Juneau, the Unit 1C bag limit, lowered to 1 bear per year from 1980 to 1986, was increased to 2 bears per year in 1987. In spite of the liberalized bag limit, 17 bears were killed in 1987 because of public safety concerns over aggressive behavior of garbage-conditioned bears. Despite enforcement and public education efforts, the number of bear–human conflicts and resulting complaints to ADF&G and public safety agencies required a significant and growing expenditure of effort and resources. A weak municipal ordinance requiring garbage cans to have tight-fitting lids was passed in 1987, but garbage conditioning and conflicts with residents continued. Studies to determine the usefulness of aversive conditioning to discourage bears were conducted in 1989 and 1990, but little success was seen with garbage-conditioned bears, and intensive and repeated treatment of bears was not practical (McCarthy and Seavoy 1992).

In 1991, 21 garbage-conditioned bears were killed. In subsequent years, bear kills related to garbage were low (4 during 1992–1994), due more to the high 1991 harvest than an active refuse

management program. We speculate that the bear population grew, and in 1995 five bears were killed; that number doubled to 10 in 1996. In 1997, as expected, the kill declined to just 1 bear. It became increasingly apparent that killing or removing urban bears was nothing but a short-term fix to the so-called "bear problem" in Juneau.

During 1999 problems associated with urban bears accessing garbage brought the real problem (refuse management) to the forefront once again. During the fall mayoral election, the newly elected mayor promised to address the refuse/bear concern in Juneau and began by appointing an Ad Hoc Bear Committee. This committee consisted of representatives from ADF&G, CBJ, JPD, Arrow Refuse, and several private citizens. The charge of this committee was to identify problems and solutions related to refuse and bears. This eventually led to the passage of several key city ordinances that addressed the management and handling of refuse by residents within the city and borough of Juneau. Most notably were the requirements for people to keep their refuse in a bear resistant container, a prohibition on putting garbage cans out before 4 am on the morning of pickup, and the requirement that all dumpsters have a metal locking lid (CBJ 2004).

Along with the sporadic killing of urban bears, Douglas area staff also trapped and moved bears throughout the 1990s, in spite of the general ADF&G policy to not move bears (ADF&G 1990). In many cases a combination of public sentiment and staff incentive made moving bears a less onerous option than destroying them, especially after a single incident for an animal. In some cases bears were simply hauled to the end of the Juneau road system, while at other times they were transported to a more remote mainland location by boat. As one would expect, translocation of bears is not effective, as many problem animals returned to former urban neighborhoods and habits. In addition, moving bears is expensive in terms of transportation costs and staff time. Altogether, from 1986 through 1997 ADF&G staff captured and relocated 90 bears.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a mean annual male skull size (length plus width) of at least 17.5 inches.
- Maintain a 3:1 male to female ratio in the harvest.

It is difficult to obtain direct population information on black bears (such as aerial surveys for population size and composition), so we collect sealing data as an indirect method of monitoring the populations. Skull measurements and sex ratios are indices we have historically used in this effort. Hunters will generally select the largest bear they encounter on a hunt, and these large bears tend to be males. If the availability of larger male bears decreases, then hunters are likely to shoot smaller bears, male and female.

The 3:1 male to female objective in the harvest was arrived at by consensus among ADF&G biologists as a means to manage the harvest in a conservative manner. The reasoning is that there is a 50:50 sex ratio at birth, and ½ of the breeding-age sows are legal for harvest each year (sows with cubs are protected). Because of the relative low productivity of black bears, it is imperative to protect the female portion of the population as much as possible. By monitoring the female portion of the harvest, we can also gain insight into the availability of male bears in the population.

The objective of maintaining a 17.5-inch mean male skull size is based on the long-term average for male bears harvested in Unit 1C. If skull size or age of harvested bears changes over time significantly, this could be an indication that the population parameters have changed. If the mean skull size declines, this may mean that availability of larger bears has declined as well.

As black bear managers, we use the above indices as trend indicators more than decision trigger points. We continually look for ways to interpret these data in a meaningful manner, and measures such as hunter effort and guided hunters vs. unguided hunters can affect the size and sex of bears harvested. Harvest data, collected during sealing, may or may not reflect any real changes in the population as a whole. Management biologists take these variables into consideration when interpreting the above indices, as well as changes to habitat, weather, and access patterns. We stress that skull size and age of harvested bears is at best a general, indirect measure of what is happening with a portion of the population. Whether these indices can measure real changes to populations and can be of management use has not yet been demonstrated.

There was much discussion about black bear management and management objectives in Region 1 during this report period, focusing on the value and rationale of using skull sizes and ages to measure population change. Harvested bears are not representative of the population as a whole, but rather a measure of hunter selectivity. Thus, hunter demographics and selectivity may have more to do with changes in skull size and age than do changes in the population structure. Also, there could be several scenarios that lead to changes in these indices, and without population information we have no way of determining what is causing the change. If the average age of bears declines, this could be due to fewer older bears being available, or due to a productive bear population where younger bears are more prevalent and more likely to be taken. Based on Sterling Miller's work (Miller and Miller 1990), skull size and age are not sensitive enough to show changes in a population until major changes have already taken place. Therefore, managers need to be careful when interpreting the meaning behind any such changes.

METHODS

Staff of the Departments of Fish and Game and Public Safety sealed black bear hides and skulls taken by successful hunters. Hunters were legally required to seal bears within 30 days of the date of kill. Biological and hunt information collected at the time of sealing included pelage color, sex, skull size (length and width), date and location of kill, number of days hunted, transportation method, and use of commercial services, including guides. All bears were checked for tattoos or ear tags, an indication that ADF&G personnel captured the bear previously. A premolar was collected from each bear and sent to Matson's Laboratory in Montana for age determination. Tissue samples were collected from a sample of bears, to be sent to the University of Alaska Fairbanks for DNA analysis. In addition, we collected 2 premolars, a tissue sample, and a toe bone for tetracycline marker analysis from bears killed on Kuiu Island as part of a mark recapture population estimate study.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population estimates are not available for Unit 1C black bears. Information obtained during sealing cannot be used to measure population trends. While harvest information gained from sealing records, such as skull size, age, and sex ratios, may provide some indication of population trends, correlations between these measures and harvest sustainability will continue to elude us in the absence of accompanying demographic data. Research is needed to identify population parameters so we might better assess population trends and harvest sustainability.

Population size

There have been no black bear population studies in Unit 1C. Estimates of population size or density are difficult to obtain. The species generally inhabits forested areas, where aerial surveys are impractical. Vast remote areas in the unit also make studies difficult and expensive to undertake. Density estimates for Unit 1C are based on studies conducted in similar habitats in western Washington State in the 1960s (Poelker and Hartwell 1973). We believe minimum densities in mainland Southeast Alaska are slightly higher than the 1.4 bears per mi^2 found in the Washington study area. Assuming a density of 1.5 bears per mi^2 of forested habitat, ADF&G estimates 1950 black bears in Unit 1C. Black bear densities are probably similar in Unit 1C to other Southeast mainland areas, and we have assumed density to be consistent throughout the forested areas of the unit. Depending on the availability of human food to bears, mainly garbage, and the tolerance of the human population, bear density near communities may differ from elsewhere in the unit. For example, in comparing bear densities near Juneau with Gustavus, because of conditions noted above, the bear density near Juneau is probably higher than the extended natural habitat. In Gustavus, where there are no restrictions on firearms discharge and most bears that frequent residential areas are killed, there is undoubtedly a lower bear density near the community than away from it.

Our estimate of black bear population status is based on data collected during the sealing process. There have been no significant changes in skull size and age data we have collected over the past 3 report periods. We consider this indicative of a population that has not changed significantly. The harvest increase is reason for concern, but thus far other indices do not indicate a problem. If our population estimate of 1950 bears is reasonable, the mean annual harvest of 147 bears during this report period is about 8% of the population, and therefore considered sustainable.

The number of bears near the city of Juneau appears to be increasing, based on the number of nuisance bear calls to the JPD and ADF&G. This is as likely the result of learned behavior in which bears are more persistent and visible, thus giving the impression of an increase in bear numbers. If this is the case, it may result from female bears teaching their cubs to feed on refuse, resulting in a generational increase of nuisance bears.

Population composition

Our management objective of a 3:1 male-to-female harvest ratio is aimed at assuring a minimal harvest of female bears. We lack reliable information on the composition of the bear population, but use the indirect index of the harvest sex ratio for insight into the availability of male bears in

the population. On a very gross scale, if the harvest of females increases, we interpret that as meaning fewer large male bears are available to hunters.

Distribution and movements

Bears are present throughout the mainland and on most islands in Unit 1C. The larger mainland river drainages harbor brown bears that likely displace black bears from some locations. The distances black bears move in and around the unit is generally unknown, except in the areas adjacent to 2 proposed mining sites: the Alaska Juneau Mine (AJ Mine) in the Sheep Creek valley just southeast of Juneau and the Kensington mine just north of Berners Bay. Home ranges for black bears were estimated at both of these sites using radiocollared animals (n=7 and n=12 respectively). Average home range sizes were 6 km^2 and 8 km^2, respectively, at the 2 sites (Robus and Carney 1995, Robus and Carney 1996). These compare similarly to home ranges of bears in Washington state (Poelker and Hartwell 1973), giving some credibility to our rationale of using black bear density data from the Washington state study for Southeast Alaska.

Unit 1C black bears exhibit a wide range of colors, including black, cinnamon, and blue (glacier) color. We have received one report of a white bear in the Petersen Creek drainage from ADF&G fisheries staff. Glacier bears are more likely to be found from the Taku River north, and reports of them seem to be increasing. In recent years at least 4 glacier bears were seen from Juneau north to Petersen Creek. A relatively high proportion of bears between the Taku River and Tracy Arm have an amber tint, and are often referred to as cinnamon bears by hunters. However, ADF&G records them as black during sealing.

MORTALITY

Harvest

Season	Bag Limit
1 Sep–30 Jun	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 Sep–30 Jun	Nonresident hunters: 1 bear

Game Board Action and Emergency Orders. No Board of Game actions were taken pertaining to this unit, nor were any emergency orders issued.

Hunter Harvest. Hunters reported killing 142, 119, and 72 bears in regulatory years 2001, 2002, and 2003, respectively (Table 1). This is a 32% decrease over the mean harvest of 147 during the previous 3-year reporting period. Males composed 80, 79, and 81% of the harvest, exceeding the management objective of 75%. Average skull size for male bears was 17.7 inches, slightly lower than the 17.8 from the previous reporting period. The mean age of male bears increased, going from 7.7 years of age during the previous report period to 8.0 years in 2001–2003 (Table 5). The majority of bears harvested had black pelage, although one glacier bear was killed by JPD in 2003 as a nuisance kill. Successful hunters spent an average of 3.2 days afield (Table 5), slightly higher than the 2.7 days of effort expended per successful hunter during the previous reporting period.

Hunter Residency and Success. Nonlocal Alaskans took 11% of all black bears harvested during the reporting period, while local residents harvested 43%. Nonresident hunters took an average of 45% of the harvest, ranging from 40 to 51%. This is a significant increase when compared to a nonresident mean kill of 31% during 1992–2000.

Harvest Chronology. During the reporting period, 78% of the bears taken were killed in the spring season, ranging from 72% in 2002 to 82% in 2003 (Table 3). This compares to the previous 3-year mean of 87% of the harvest occurring in the spring.

Harvest in Particular Areas (WAAs). The harvest during this reporting period was again concentrated in the handful of WAAs that produced most of the bears in the preceding 2 reporting periods. These areas were again centered on the south end of the Chilkat Range and the area between Snettisham and Cape Fanshaw (Table 6).

Guided Hunter Harvest. Nonresidents harvested 45% of the bears taken during this reporting period, which is a 13% increase from the mean nonresident harvest from the previous 6 years. This may be a result of local hunting effort declining, as nonresident harvest has been relatively consistent and local harvest has decreased each year since 2000. Harvest dropped significantly for all hunters in 2003.

Transport Methods. Boats continued to dominate means of transport to the field, used by 77% of hunters during the report period (Table 4). Other methods included foot, highway vehicles, airplanes, and off-road vehicles. The reason boat access is so prevalent is that, during the spring, black bears can be found on nearly any uninhabited beach as they forage for newly emergent sedges. By using a boat, hunters can cover a lot of area with relative ease and likely will have opportunity to pursue one or more bears.

Other Mortality. During this reporting period, ADF&G, JPD, and private citizens killed 10, 3, and 3 bears respectively. The bears were killed either in defense of life or property, or because they were garbage conditioned and considered to be a public safety concern. Three of these bears were killed during regulatory year 2001, ten in 2002, and three in 2003. During this same time period 18 bears were killed on the road system by vehicles, 1 additional animal was found dead from unsubstantiated causes, and 2 bears were taken illegally.

The number of nuisance kills was up slightly from the previous report period when 12 were destroyed. The number of bears struck and killed by highway vehicles has averaged 6 per year for this report period, an increase of more than 100% from the previous 9 years.

HABITAT

Assessment

The most critical impacts to habitat in this unit have been associated with logging operations in Hobart Bay, Port Houghton, and Pt. Couverden. Clearcutting at Pt. Couverden began in 1975 and continued into the mid 1980s. There is currently a proposal to continue logging in this area. Hobart Bay and Port Houghton logging operations took place in the late 1980s, and there is additional logging proposed for Port Houghton. A 1999 clearcut of about 300–400 acres borders the north side of Cowee Creek near Echo Cove. There has also been some helicopter logging on the southwest side of Douglas Island near Pt. Hilda. Helicopter operations are much less

destructive to forest habitat and will probably not have the long-term negative effect on bears that traditional clearcuts have. These areas could benefit bears in the short term, but older clearcuts will soon become less valuable to bears as second growth takes over.

A number of proposed developments in Unit 1C could have local impacts on bear populations. A proposed 400-acre golf course on north Douglas Island will likely lead to additional development by private homeowners as lands become available. This area is attractive to bears because of the salmon in Petersen Creek, as well as abundant skunk cabbage and blueberries in the area. Undoubtedly, this development will affect bears more from a human–bear interaction standpoint than from the footprint of the golf course itself. Another potential area of development is the mainland coast from Echo Cove to Cascade Point. Plans are in the making to build a road between these areas, along with additional development that includes a store, dock, and fuel storage. This could affect the bear population in that area due to increased highway traffic, increased access to the area by recreational users, and interactions between bears and refuse at the newly developed area.

Enhancement

No habitat enhancement projects specifically intended to benefit black bears have been attempted in the unit. Although primarily intended as a silvicultural practice, precommercial thinning and pruning has been performed in some young second-growth stands in the unit. While not the primary intent, this effort does provide a secondary benefit to wildlife by improving and extending habitat suitability in the short-term by reducing canopy cover, which permits sunlight to reach the forest floor and increase the production of understory forage plants. These benefits are relatively short-lived, approximately 20–25 years, after which time canopy closure again results in loss of understory vegetation. The long-term effects of clearcut logging will be detrimental to black bear populations. Enhancement of habitat for black bears in Southeast Alaska is not a very realistic endeavor because of the highly productive state of the natural habitat. The best way to provide good habitat for black bears is to limit the development of productive natural habitat.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Urban Bear Management Activities. During the report period staff continued a substantial effort to shift ADF&G involvement away from instant response to nuisance bear reports to advising callers on how to reduce the attraction for bears in the hopes that the animals would return to wild habitats. Only in the case of an intractable bear that repeatedly caused problems did we make an effort to trap and remove or relocate an animal. Even so, we captured and relocated 8, 11, and 7 garbage conditioned bears in 2001, 2002, and 2003, respectively. This does not include the 10 bears euthanized by ADF&G during the 3-year report period.

We continued to work to provide the public with bear and refuse information through public service announcements via the daily newspaper, a weekly newspaper, radio, television, and signs on city buses. In addition, ADF&G staff took part in a local radio program each year to reinforce the message that bears are only a symptom of a refuse problem. Throughout the report period ADF&G staff presented information to local groups and interested parties such as the Rotary Club, the U.S. Forest Service and University of Alaska Southeast housing personnel about bears and refuse and the need for a comprehensive refuse plan led by CBJ. By fall 2000 many people

in the community were pushing the bear issue during the mayoral election, and the newly elected mayor established an Ad Hoc Bear Committee in November 2000 to address the issue. This committee submitted a set of recommendations to the city assembly, resulting in an ordinance that included some of the recommendations. One of the most important ordinance stipulations was the requirement to keep garbage cans off the street until the morning of pickup. The ordinance also required residents to keep garbage in a bear resistant garage or container. Although this was a step in the right direction, there was little to no enforcement regarding this ordinance during the summer of 2001. The result was as many or more bear calls to ADF&G (400+ calls) and JPD (1000 calls) as ever before. In addition, 10 bears were killed by ADF&G or JPD, and another 8 were transported out of town by ADF&G staff.

The level of bear activity in Juneau and local public opposition to killing bears led to a renewed effort to implement the recommendation of the Ad Hoc Bear Committee and to keep refuse away from bears. At present this conflict continues, but it appears the CBJ has finally assumed this task in a serious manner.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 1C bear harvest declined each year of the report period, with the 2003 harvest of 72 bears being the lowest since 1994. However, our indirect indices of population health (skull size and age) were similar throughout the report period, as were days hunted per bear. These measurements were also similar to those of the means of the previous report period. The stable skull size and age structure of the harvest gives us some comfort as managers that the black bear population appears to be healthy

We should continue to monitor the bear harvest through sealing requirements, while gathering more specific information on kill locations. Eventually, we will need more detailed information on kill and effort location to anticipate areas of concern with black bear harvest. We will continue to assess the results of Kuiu Island research to determine the feasibility of conducting a similar project in Unit 1C. Work should continue toward a strategy for refuse management in the CBJ, and success in this issue should be made available to other ADF&G offices.

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Table 1 Unit 1C black bear harvest and other mortality, regulatory years 1992 through 2003

Regulatory year	Reported														
	Hunter kill					Nonhunting kill[a]				Total estimated kill					
	M	F	Unk	Total	Baited	M	F	Unk	Total	M	(%)	F	(%)	Unk	(%)	Total
1992–1993																
Fall 1992	18	6	0	24	NA	1	1	0	2	19	(73)	7	(27)	0	(0)	26
Spring 1993	35	5	1	41	NA	0	0	0	0	35	(85)	5	(12)	1	(3)	41
Total	53	11	1	65	NA	1	1	0	2	54	(81)	12	(18)	1	(1)	67
1993–1994																
Fall 1993	7	3	0	10	NA	0	0	0	0	7	(64)	3	(36)	0	(0)	10
Spring 1994	45	1	0	46	NA	1	0	0	1	46	(98)	1	(2)	0	(0)	47
Total	52	4	0	56	NA	1	0	0	1	53	(93)	4	(7)	0	(0)	57
1994–1995																
Fall 1994	7	1	0	8	NA	1	1	0	0	8	(80)	2	(20)	0	(0)	10
Spring 1995	43	4	0	47	NA	2	0	0	0	45	(92)	4	(8)	0	(0)	49
Total	50	5	0	55	NA	3	1	0	4	53	(90)	6	(10)	0	(0)	59
1995–1996																
Fall 1995	10	3	0	13	NA	4	1	0	5	14	(78)	4	(22)	0	(0)	18
Spring 1996	65	6	0	71	NA	1	0	0	1	66	(92)	6	(8)	0	(0)	72
Total	75	9	0	84	NA	5	1	0	6	80	(89)	10	(11)	0	(0)	90
1996–1997																
Fall 1996	26	2	0	28	NA	7	5	1	13	33	(80)	7	(17)	1	(3)	41
Spring 1997	61	6	1	68	NA	1	1	1	3	62	(87)	7	(10)	2	(3)	71
Total	87	8	1	96	NA	8	6	2	16	95	(85)	14	(13)	3	(2)	112
1997–1998																
Fall 1997	8	0	0	8	NA	0	0	0	0	8	(100)	0	(0)	0	(0)	8
Spring 1998	67	12	0	79	NA	1	1	0	2	68	(84)	13	(16)	0	(0)	81
Total	75	12	0	87	NA	1	1	0	2	76	(85)	13	(15)	0	(0)	89

Table 1 continued

Regulatory year	Reported														
	Hunter kill					Nonhunting kill				Total estimated kill					
	M	F	Unk	Total	Baited	M	F	Unk	Total	M	(%)	F	(%)	Unk	(%)	Total
1998–1999																
Fall 1998	9	1	0	10	NA	4	0	0	4	13	(93)	1	(7)	0	(0)	14
Spring 1999	136	5	1	142	NA		0	0	0	136	(96)	5	(3.5)	1	(.5)	142
Total	145	6	1	152	NA	4	0	0	4	149	(96)	6	(3.5)	1	(.5)	156
1999–2000																
Fall 1999	22	4	0	26	NA	0	2	0	2	22	(79)	6	(21)	0	(0)	28
Spring 2000	94	16	0	110	NA	1	1	0	2	95	(85)	17	(15)	0	(0)	112
Total	116	20	0	136	NA	1	3	0	4	117	(84)	23	(16)	0	(0)	140
2000–2001																
Fall 2000	8	8	0	16	NA	10	4	0	14	18	(58)	12	(42)	0	(0)	30
Spring 2001	112	24	2	138	NA	0	1	0	1	112	(82)	25	(18)	2	(2)	139
Total	120	32	2	154	NA	10	5	0	15	130	(76)	37	(22)	2	(1)	169
2001–2002																
Fall 2001	18	12	0	30	NA	2	4	0	6	20	(56)	16	(44)	0	(0)	36
Spring 2002	96	16	0	112	NA	1	0	1	2	97	(85)	16	(14)	1	(1)	114
Total	114	28	0	142	NA	3	4	1	8	117	(78)	32	(22)	1	(0)	150
2002–2003																
Fall 2002	30	8	0	38	NA	10	7	4	21	40	(68)	15	(25)	4	(7)	59
Spring 2003	64	17	0	81	NA	0	0	1	1	64	(78)	17	(21)	1	(1)	82
Total	94	25	0	119	NA	10	7	5	22	104	(74)	32	(23)	5	(3)	141
2003–2004																
Fall 2003	7	6	0	13	NA	5	1	0	6	12	(63)	7	(37)	0	0	19
Spring 2004	51	8	0	59	NA	1	0	0	1	52	(87)	8	(13)	0	0	60
Total	58	14	0	72	NA	6	1	0	7	64	(81)	15	(19)	0	0	79

Table 2 Unit 1C black bear successful hunter residency, regulatory years 1992 through 2003

Regulatory year	Local resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown residency	(%)	Total
1992–1993	35	(54)	9	(14)	21	(32)	0	(0)	65
1993–1994	30	(53)	6	(11)	20	(36)	0	(0)	56
1994–1995	36	(63)	9	(16)	10	(17)	2	(4)	57
1995–1996	50	(60)	15	(18)	19	(22)	0	(0)	84
1996–1997	51	(56)	6	(7)	34	(37)	0	(0)	91
1997–1998	47	(55)	7	(8)	32	(37)	0	(0)	86
1998–1999	86	(57)	27	(17.5)	38	(25)	1	(.5)	151
1999–2000	68	(50)	24	(18)	44	(32)	0	(0)	136
2000–2001	73	(47)	20	(13)	62	(40)	0	(0)	155
2001–2002	60	(42)	19	(13)	63	(45)	0	(0)	142
2002–2003	43	(36)	15	(13)	61	(51)	0	(0)	119
2003–2004	37	(52)	6	(8)	29	(40)	0	(0)	72

Table 3 Unit 1C black bear harvest chronology by month, regulatory years 1992 through 2003

Regulatory year	Harvest periods												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
1992–1993	19	(30)	4	(6)	1	(1.5)	2	(3)	37	(58)	1	(1.5)	64
1993–1994	6	(10.5)	0	(0)	1	(2)	6	(10.5)	37	(65)	7	(12)	57
1994–1995	6	(10)	2	(3)	0	(0)	1	(2)	41	(70)	9	(15)	59
1995–1996	11	(13)	3	(3)	1	(1)	5	(6)	55	(63)	12	(14)	87
1996–1997	29	(28)	6	(6)	0	(0)	0	(0)	54	(51)	16	(15)	105
1997–1998	6	(7)	2	(2)	0	(0)	3	(3)	71	(80)	7	(8)	89
1998–1999	8	(5)	2	(1)	0	(0)	4	(3)	106	(70)	31	(21)	151
1999–2000	21	(15.5)	4	(3)	1	(.5)	3	(2)	89	(66)	18	(13)	136
2000–2001	14	(9)	2	(1)	1	(.5)	12	(8)	101	(66)	24	(15.5)	154
2001–2002	20	(14)	10	(7)	0	(0)	2	(1)	83	(59)	27	(19)	142
2002–2003	27	(23)	8	(7)	3	(3)	2	(2)	69	(58)	10	(8)	119
2003–2004	10	(14)	3	(4)	0	(0)	2	(3)	52	(72)	5	(7)	72

Table 4 Unit 1C black bear harvest percent by transport method, regulatory years 1992 through 2003

Regulatory year	Transport												
	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	Other	(%)	Unk	(%)	*n*
1992–1993	5	(8)	49	(79)	4	(6)	4	(6)	1	(1)	0	(0)	63
1993–1994	2	(3)	51	(92)	1	(2)	2	(3)	0	(0)	0	(0)	56
1994–1995	0	(0)	46	(82)	2	(3)	6	(10)	1	(2)	2	(3)	57
1995–1996	1	(1)	67	(80)	6	(7)	10	(12)	0	(0)	0	(0)	84
1996–1997	7	(8)	68	(74)	8	(9)	7	(8)	0	(0)	1	(1)	91
1997–1998	5	(6)	71	(82)	6	(7)	4	(5)	0	(0)	0	(0)	86
1998–1999	2	(1)	125	(83)	16	(10.5)	7	(5)	1	(.5)	0	(0)	151
1999–2000	7	(5)	106	(78)	11	(8)	9	(7)	3	(2)	0	(0)	136
2000–2001	5	(3)	117	(76)	16	(10)	7	(5)	8	(5)	2	(1)	155
2001–2002	4	(3)	112	(79)	16	(11)	7	(5)	3	(2)	0	(0)	142
2002–2003	3	(3)	86	(72)	16	(13)	4	(3)	10	(8)	0	(0)	119
2003–2004	0	(0)	55	(76)	10	(14)	0	(0)	7	(10)	0	(0)	72

Table 5 Unit 1C successful black bear hunter effort, mean skull size, and mean age, regulatory years 1992 through 2003

Regulatory year	Successful hunter effort			Mean skull size[a] (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
1992–1993											
Fall 1992	46	24	1.9	16.0	18	15.8	6				
Spring 1993	150	41	3.7	17.8	31	16.1	5				
Total	196	65	3.0	17.1	49	15.9	11	9.0	6	11	2
1993–1994											
Fall 1993	16	7	2.3	18.1	7	16.2	3				
Spring 1994	145	49	3.0	17.8	44	15.7	1				
Total	161	56	2.9	17.8	51	15.8	4	8.2	50	14.8	4
1994–1995											
Fall 1994	18	6	3.0	18.6	7	11.3	1				
Spring 1995	124	49	2.5	18.1	43	16.1	4				
Total	142	55	2.6	18.1	50	15.2	5	8.0	42		
1995–1996											
Fall 1995	50	17	2.9	18.3	10	16.9	3				
Spring 1996	200	67	3.0	18.2	63	16.2	6				
Total	250	84	3.0	18.2	73	16.4	9	9.6	62	8.1	9
1996–1997											
Fall 1996	90	29	3.1	17.0	24	---	---				
Spring 1997	167	67	2.5	18.1	57	16.0	6				
Total	257	96	2.7	17.8	81	16.0	6	8.7	80	6.2	6
1997–1998											
Fall 1997	15	8	1.9	17.5	8	---	---				
Spring 1998	228	79	2.9	17.7	64	15.7	12				
Total	243	87	2.8	17.7	72	15.7	12	7.3	64	7.0	10

Table 5 continued

Regulatory year	Successful hunter effort			Mean skull size[a] (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
1998–1999											
Fall 1998	21	10	2.1	18.2	8	17.4	1	4.5	9	19	1
Spring 1999	385	141	2.7	17.7	133	15.6	5	7.9	126	6.2	5
Total	406	151	2.7	17.7	141	15.9	6	7.7	135	8.3	6
1999–2000											
Fall 1999	49	26	1.9	16.9	21	16.8	4	6.5	21	12.0	4
Spring 2000	292	110	2.7	18.0	90	15.3	16	7.9	84	6.2	15
Total	341	136	2.5	17.7	111	15.6	20	7.6	105	7.5	19
2000–2001											
Fall 2000	36	15	2.6	17.9	8	16.3	9	6.3	8	10.0	9
Spring 2001	377	139	2.8	17.9	111	16.1	23	7.9	104	12.0	23
Total	413	154	2.7	17.9	119	16.2	32	7.6	112	11.5	32
2001–2002											
Fall 2001	116	30	3.9	17.4	17	15.5	12	6.0	20	7.6	15
Spring 2002	345	112	3.1	17.8	94	16.1	15	8.4	93	9.8	16
Total	461	142	3.2	17.8	111	15.8	27	7.9	113	8.7	31
2002–2003											
Fall 2002	91	38	2.4	17.1	28	16.0	8	7.8	36	7.3	9
Spring 2003	294	81	3.6	17.9	58	16.3	17	8.3	62	11.2	16
Total	385	119	3.2	17.6	86	16.2	25	8.1	98	9.8	25

Table 5 continued

Regulatory year	Successful hunter effort			Mean skull size[a] (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
2003–2004											
Fall 2003	33	13	2.5	17.5	*6*	15.9	*6*	5.1	*11*	9.0	*7*
Spring 2004	187	59	3.2	17.8	*50*	15.9	*8*	8.7	*52*	8.3	*8*
Total	220	72	3.1	17.8	*56*	15.9	*14*	8.1	*63*	8.6	*15*

Table 6 Unit 1C black bear harvest from all Wildlife Analysis Areas (WAA), regulatory years 1994 through 2003

	Regulatory year										
WAA	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
2202	0	3	0	1	4	4	2	2	1	0	17
2203	1	2	1	4	0	3	0	3	2	1	17
2304	4	2	13	2	10	12	14	11	7	6	81
2305	3	4	6	4	14	7	6	5	8	6	63
2306	9	10	4	8	14	15	23	10	17	13	123
2307	0	0	9	1	5	7	7	5	14	3	51
2408	1	2	1	2	6	1	4	0	1	0	18
2409	4	3	5	2	4	1	3	1	3	1	27
2410	1	2	0	0	0	0	0	1	1	3	8
2411	0	2	0	0	1	1	0	1	1	0	6
2412	0	0	1	0	0	0	0	0	0	0	1
2413	0	0	0	0	0	0	0	0	0	0	0
2514	5	4	4	4	11	5	6	6	5	5	55
2515	1	3	6	4	10	7	2	11	10	6	60
2516	0	0	0	0	0	0	0	0	0	0	0
2517	4	12	8	2	6	5	7	7	12	5	68
2518	1	2	9	2	2	5	7	5	1	0	34
2519	2	2	0	2	1	1	1	1	2	2	14
2722	3	2	4	0	2	2	3	7	6	1	30
2823	6	17	14	13	32	25	17	20	12	11	167
2824	1	2	7	4	4	11	6	3	4	6	48
2825	3	6	2	10	7	6	20	14	9	5	82
2926	6	0	4	14	14	17	18	26	15	3	117
2927	3	8	13	9	10	5	7	10	10	2	77
Total	58	88	111	88	157	140	153	149	141	79	1164

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 1D (2700 mi^2)

GEOGRAPHICAL DESCRIPTION: That portion of the Southeast Alaska lying north of the latitude of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay.

BACKGROUND

HABITAT DESCRIPTION

Unit 1D contains approximately 210 mi^2 of forested habitat. About 160 mi^2 is owned by the state (ADNR 1979), and the remainder is in federal ownership, including the Tongass National Forest (37 mi^2) and Klondike Gold Rush National Historic Park (13 mi^2). The Alaska Chilkat Bald Eagle Preserve consists of 75 mi^2 along the Chilkat River. Many large river systems with abundant fish populations, notably salmon, are in the southern portion of the Unit 1D. These include the Chilkat River and its major tributaries, the Klehini, Tsirku, Little Salmon, Kelsall, and Takhin Rivers. Two other rivers, the Chilkoot and Ferebee, also have important anadromous fish runs, as does the Katzehin River on the east side of Lynn Canal. In the Skagway area, the Taiya and Skagway Rivers also support anadromous fish runs.

Small openings and disturbed areas, such as wetlands, avalanche chutes, clearcuts, and subalpine meadows, are important foraging areas. In some areas during some seasons, black bear diets may range from mostly vegetarian to mostly carnivorous, and the species may subsist by scavenging or by predation on small mammals or fish. In Unit 1D, black bears primarily eat vegetation during early spring. Major foods include grasses, sedges and horsetail (*Equisetum* spp.) in estuarine areas, cow parsnip (*Heracleum lanatum)*, skunk cabbage (*Lysichiton americanum),* and berries (*Vaccinium* spp. and *Viburnum edule*) that have persisted through the winter. Later in spring, Unit 1D black bears may also prey on moose calves. During summer and fall, when bears accumulate fat reserves for winter hibernation, bears with access to salmon streams eat large quantities of fish. Berries are also important during summer and fall. Poor fish runs or berry crops are thought to result in low cub production and survival the following spring. Unit 1D black bears share habitat with brown bears and in some areas, such as the Chilkoot River valley, may have been displaced by them.

Large areas of the Klehini, Kelsall, and Chilkat River valleys are encompassed by the Haines State Forest, and portions of the forest have been subjected to clearcut logging over the past few decades. More areas will be cut in the future, as the forest is generally on a 125-year cutting rotation. Similar to elsewhere in Southeast Alaska, habitat changes continue to occur as a result

of timber harvest. Although early succession stages (3–20 years) provide black bears with an abundance of plant foods, later stages result in the disappearance of understory as conifer canopies close and light cannot penetrate to the forest floor. Second-growth stands lack large hollow trees and root masses important for denning. An increase in the number of logging roads in Unit 1D has resulted in more human access to areas that formerly experienced lighter use. We believe that although logging may create food for bears in the short term, the long-term result will be a decline in bear numbers (Suring et al. 1988), at least partly due to increased access and decreased forage.

HUMAN USE HISTORY

Black bears have a long history of being hunted in Unit 1D. Sealing of black bears was first required in 1973. Because hunters are not required to have hunting permits, information about unsuccessful hunter effort has never been available. We only have information for successful hunts.

Regulatory history

Since statehood, the black bear hunting season has extended from 1 September through 30 June, and the annual bag limit for residents has been 2 bears, only 1 of which can be a blue or glacier bear. Nonresident bag limits were the same as those for residents until 1990 when the nonresident limit was reduced to 1 bear per year. The use of dogs for hunting black bears has been allowed since 1966; hunting with dogs requires a permit issued by ADF&G. No permits to hunt with dogs have been issued in Unit 1D, nor has there been any interest expressed in this pursuit. Following a regulatory change in 1996, hunters must salvage the edible meat of all black bears killed in Southeast Alaska during the period 1 January–31 May. In 1982 using bait to hunt black bears became legal year-round. However, in 1988 the Board of Game limited baiting in Southeast Alaska to the spring period 15 April–15 June.

Historical harvest patterns

The Unit 1D average annual harvest has steadily increased over the last 3 decades. During the 1970s, average annual harvest was around 18 bears, in the 1980s it increased by nearly 50 percent to around 26 bears, and in the 1990s it continued to increase to an average of 33 bears per year. Within each decade, no clear trends have been apparent, as harvest varies greatly from year to year. From 1998 to 2001, the annual average was 42 black bears. However, the mean harvest for this reporting period was 26 bears per year, a sizeable drop, probably due in part to changes in bear baiting regulations.

Local residents have typically accounted for about three-quarters of the annual harvest. However, this reporting period has shown an increase in nonresident successful hunters, possibly due to guided hunters participating in multispecies hunts. Many hunters use highway vehicles for transport, probably because of the abundance of logging roads in the most heavily hunted Wildlife Analysis Areas (WAAs) in the unit. During the last decade more than half of the successful black bear hunters used highway vehicles and approximately one-third used boats. During this reporting period, an increasing number of bears were taken by hunters using boats as their primary transportation. Between 10 and 20 percent of hunters report "by foot" as their means of transportation. However, this may be misleading, as "transportation" can be interpreted varyingly.

Males constituted an overall average of 77% of the harvest during the 14-year period 1990–2003. Overall, nonresident hunters killed 18% females in this period, versus 2% by local residents and 2% by nonlocal residents.

A relatively high percentage of bears harvested in Unit 1D have been killed over bait in recent years. During 1992–1994, 19% of the harvest was killed over bait. That percentage increased to 39% during 1995–1997 (Barten 1999). A recent increase in the percentage of bears taken in the spring probably resulted from increased popularity of hunting over bait. During the 7-year period 1986–1992, an average of 64% of the harvest occurred in the spring. However, during 1993–1997 (5 years), spring harvest averaged 86% of the annual hunter kill. In the last reporting period, spring harvest decreased slightly to 79%; the September kill has crept up to 20%. A regulatory change restricting bait stations from a 1-mile corridor of the main roads in the Haines area took effect beginning in spring 2003, evidently resulting in a decrease of spring bears taken.

Historical harvest locations

The majority of the Unit 1D black bear harvest has been confined to 2 WAAs, 4302 (along the Haines Highway and Chilkat and Klehini Rivers) and 4303 (the Kelsall River drainage) (Table 6). To a lesser extent, WAA 4405, which includes Taiya Inlet and the immediate area west of Skagway, is also used. Because 4302 and 4303 are relatively accessible by highway vehicles and boats, most hunters use these areas, as well as establish bait stations there in the spring.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a mean annual male skull size of at least 17.0 inches
- Maintain a 3:1 male to female ratio in the harvest

Because population information, either estimate or census, is costly and difficult to obtain, we collect data on other biological parameters, such as skull size and sex of harvested bears, as a means of monitoring the status of the population over time. Theoretically, a change in the sex ratio or in skull size over time might reflect a change in population structure that would need to be addressed through some regulatory change. In reality, changes in skull size or sex ratio are likely subtle and would need to be extreme in order for us to recognize the need for a regulatory change. However, we will continue to collect the information and to pursue other ways of examining these data that will be more perceptive to change over time, and thus more useful for managers.

Using a 3:1 ratio of males to females is one way of managing relatively conservatively. Assuming a 1:1 male to female ratio at birth, half the animals in the population are females. Theoretically, the breeding interval is typically 2 years, so half the adult females are accompanied by young in a given year. It is illegal to shoot a female accompanied by young; thus, half the females are protected annually. However, breeding intervals may be longer than 2 years (Garshelis 1994), and we have no data on age at first reproduction, which might also result in a higher number of females in unprotected status each year.

The 17.0-inch skull size objective is based on long-term data from this unit. A significant change could reflect a change in age composition of this population, possibly signifying overharvest. However, population changes resulting in such a change would likely need to be extreme for such a change to be evident and not simply an artifact of small sample size.

METHODS

Staff of the Departments of Fish and Game and Public Safety sealed black bear hides and skulls taken by successful hunters. Biological and hunt information collected at the time of sealing included pelage color, sex, skull size (length and width), date and location of kill, number of days hunted, transportation method, and hunter use of commercial services. A premolar was collected from most bears and sent to Matson's Laboratory for age determination. Tissue samples collected from some bears are currently being analyzed for DNA and other information. All black bear hunters using bait stations were required to register with ADF&G. Bait station registration has recently been changed to a statewide, computer-based system. Hunters desiring a bait station permit are registered in the statewide database at the time of permit issuance.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

No black bear population studies have been conducted in Unit 1D. Estimates of population size or density are difficult to obtain. The species generally inhabits forested areas, where aerial surveys are impractical. Vast, remote areas in the unit also make studies difficult and expensive to undertake.

Population size

Black bear densities are probably lower in Unit 1D than in any other Southeast Alaska mainland area. Brown bear numbers, on the other hand, appear to be high compared to black bears. ADF&G estimated 275 black bears in Unit 1D in 1990, an average of 1.3 bears per forested mi^2. However, if we use estimates based on work by Linzey et al. (1986) that estimated an average of 3.8 black bears per mi^2, there might be 1357 bears in forested habitat in the unit. Without having more direct estimates of black bear numbers, it is virtually impossible to have a sense of the population size in this unit. Numbers may be higher because of productive salmon streams in the area. Conversely, black bear populations may be affected by brown bears and perhaps suppressed by them. A relatively high proportion of black bears harvested in Unit 1D exhibit cinnamon pelage. One glacier (blue) pelage bear has been reported in the harvest during this reporting period.

Population composition

Around one-third of the black bears harvested in Unit 1D exhibit cinnamon pelage, although this designation is somewhat subjective and may depend on the experience of the sealing agent. A guided nonresident hunter took the only glacier bear in Unit 1D, according to sealing records in June 2000. During this report period, about 22% of the harvested bears were females, meeting our management objective.

Distribution and movement

We have little information about black bear distribution in this unit. Human population growth is resulting in increasing interactions between bears and rural dwellers. Because the status of the Haines refuse disposal is in flux, we expect to continue to see bears killed in defense of life and property (DLP).

MORTALITY

Harvest

Season	Bag Limit
1 Sep–30 Jun	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 Sep–30 Jun	Nonresident hunters: 1 bear

Board of Game Action and Emergency Orders. A regulatory change during the fall 2002 meeting prohibited establishing bait stations within 1 mile of the Haines Highway, Lutak Road, and along the Chilkat Lake road.

Hunter Harvest. Hunters reported killing 36, 21 and 20 black bears in 2001, 2002 and 2003, respectively. This was slightly higher than the previous 3 years' harvest. However, the ratio of males to females was within management objectives (Table 1).

Hunter Residency and Success. Roughly one-half to three-quarters of the black bear harvest is by local residents, who primarily use bears for meat. There was a slight increase in the number of nonresident hunters who took black bears.

Hunter Effort. Using days hunted (Table 5) as an indicator of the presence of bears may be misleading, as several hunters reported bear hunts lasting for months. The lack of Division of Wildlife Conservation personnel in Haines may have resulted in the collection of inconsistent data in some instances. This variable may not be an accurate measure of black bear abundance.

Harvest Chronology. Spring months account for most Unit 1D harvest, with May and June accounting for 47% and 26% of the report period kill. September accounted for about 20% of the most recent 3-year harvest (Table 3).

Harvest in Particular Areas (WAAs). Since 1990, about 56% of the harvest has come from along the Haines Highway and the lower Chilkat River, WAA 4302 (Table 6). Another 25% has come from the upper Chilkat, and about 11% originated from the Chilkoot and Ferebee watersheds.

Bait Stations. Data on percentages of bears taken over bait in earlier years is not readily available. The increasing popularity of black bear baiting in this unit prior to this reporting period raised several management concerns. First, the increase in harvest over the past 2 report periods is largely the result of successful baiting operations and may reach a non-sustainable level if the trend continues. Second, there is some concern from local Alaska Bureau of Wildlife Enforcement troopers and other unit residents that the harvest of brown bears at or near black bear bait stations may be occurring. Furthermore, some residents are highly concerned that black

and particularly brown bears may become food conditioned at bait stations, and thus, have a higher likelihood of becoming nuisance bears. Because there are no wildlife personnel stationed in Haines, hunters are not likely to be queried consistently by ADF&G personnel sealing bears. Thus, bears killed over bait may be underreported.

Hunting with Dogs. No permit requests have been made to hunt bears with dogs in the unit.

Guided Hunter Harvest. Nonresident hunters took only 11% of the 1990–2000 harvest (Table 2), but that percentage increased during the report period to 20.6%. There has been increased interest in guided brown bear hunting in the unit, and because hunts for both species are common, we speculate that the increased take of black bears reflects this greater effort.

Transport Methods. As Table 4 indicates, most successful black bear hunters used highway vehicles (39%) or boats (34%) during the report period.

Other Mortality

During 2001–2003, 2 black bears were killed in DLP circumstances, compared with 3 during the last reporting period. Since 1990, a total of 10 DLP bears have been reported, which is also the number reported between 1971 and 1989. Also during the current reporting period, 1 bear was found dead, likely hit by a vehicle. Two bears were caught in traps, one in a wolf snare left out after the season had ended. A second, young bear was caught in a conibear trap midwinter; the trapper reported that the bear seemed unusually thin.

HABITAT

Assessment

Logging continues to have a large effect on black bear habitat in Unit 1D. In addition, the number of land sales of University of Alaska holdings has increased the number of residents moving to rural locations in the unit, which is also expected to have negative influences on black bears. It also appears that in some areas isostatic rebound is raising riparian habitat and possibly decreasing available moose browse, which could result in a decreased prey base for black and brown bears.

Enhancement

We performed no habitat enhancement work during this reporting period.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Nuisance Bear Problems/Urban Bear Management Activities. The Haines dump was closed in 1999, and collected garbage is now sorted for recycling and barged out of the area or composted locally. Garbage disposal in Unit 1D has historically been problematic. Rather than pay the fees for refuse disposal, some residents have constructed garbage sheds on their property. They accumulate garbage over time, and then haul it to the baling facility. These stockpiles attract bears. Also, several landowners in Haines grow fruit trees, particularly apples and cherries. One owner of several cherry trees shot black bears in his orchard in 1999 and in 2000.

A toll-free number was installed to allow unit residents to make direct contact with the area Wildlife Conservation office in Douglas. The amount of information about black (and brown) bears that we dispense to the public has increased, and has elicited positive responses.

CONCLUSIONS AND RECOMMENDATIONS

During the report period, regulatory years 2001–2003, the harvest was composed of 74% male bears, dipping below our 3:1, male to female harvest ratio management objective. We did not evaluate skull size for the 3-year report period. We will evaluate this parameter to determine if there is a continuing trend in the decline noted in the previous report. The change in harvest over bait needs to be further examined for possible long-term effects. We continue to collect teeth for aging bears, and we will assess reproductive history of females using tooth analysis by Matson's lab (Milltown, MT). High brown bear numbers and habitat changes may cause a decline in black bear numbers and harvest in the future.

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Table 1 Unit 1D black bear harvest, regulatory years 1990 through 2004

Regulatory year	Hunter kill					Nonhunting kill[a]				Illegal kill	Total reported kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total		M	(%)	F	(%)	Unk	(%)	Total
1990–1991																	
Fall 1990	4	5	1	10	0	0	0	0	0	0	4	(40)	5	(50)	1	(10)	10
Spring 1991	16	8	0	24	0	0	0	0	0	0	16	(67)	8	(33)	0	(0)	24
Total	20	13	1	34	0	0	0	0	0	0	20	(59)	13	(38)	1	(3)	34
1991–1992																	
Fall 1991	6	7	0	13	0	0	0	0	0	0	6	(46)	7	(54)	0	(0)	13
Spring 1992	17	2	0	19	0	0	0	0	0	0	17	(89)	2	(11)	0	(0)	19
Total	23	9	0	32	0	0	0	0	0	0	23	(72)	9	(28)	0	(0)	32
1992–1993																	
Fall 1992	15	2	0	17	0	0	0	1	1	0	15	(83)	2	(11)	1	(6)	18
Spring 1993	10	2	0	12	3	0	0	0	0	0	10	(83)	2	(17)	0	(0)	12
Total	25	4	0	29	3	0	0	1	1	0	25	(83)	4	(13)	1	(4)	30
1993–1994																	
Fall 1993	2	0	0	2	0	0	0	0	0	0	2	(100)	0	(0)	0	(0)	2
Spring 1994	14	6	0	20	4	1	0	0	1	0	15	(71)	6	(29)	0	(0)	21
Total	16	6	0	22	4	1	0	0	1	0	17	(74)	6	(26)	0	(0)	23
1994–1995																	
Fall 1994	3	1	0	4	0	0	0	0	0	0	3	(75)	1	(25)	0	(0)	4
Spring 1995	13	3	0	16	2	0	0	0	0	0	13	(81)	3	(19)	0	(0)	16
Total	16	4	0	20	2	0	0	0	0	0	16	(75)	4	(25)	0	(0)	20
1995–1996																	
Fall 1995	0	1	0	1	0	0	0	0	0	0	0	(0)	1	(100)	0	(0)	1
Spring 1996	27	4	1	32	6	0	1	0	0	1	27	(82)	4	(15)	1	(3)	33
Total	27	5	1	33	6	0	1	0	0	1	27	(79)	5	(18)	1	(3)	34
1996–1997																	
Fall 1996	4	0	0	4	0	0	1	0	1	0	4	(80)	1	(20)	0	(0)	5
Spring 1997	31	5	0	36	15	1	0	0	1	0	32	(86)	5	(14)	0	(0)	37
Total	35	5	0	40	15	1	1	0	2	0	36	(86)	6	(14)	0	(0)	42

Table 1 continued

Regulatory	Hunter kill					Nonhunting kill[a]				Illegal	Total reported kill						
year	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	kill	M	(%)	F	(%)	Unk	(%)	Total
1997–1998																	
Fall 1997	6	5	0	11	0	1	0	0	1	0	7	(58)	5	(42)	0	(0)	12
Spring 1998	23	6	1	30	18	0	0	0	0	0	23	(77)	6	(20)	1	(3)	30
Total	29	11	1	41	18	1	0	0	1	0	30	(71)	11	(26)	1	(2)	42
1998–1999																	
Fall 1998	4	1	0	5	0	0	0	0	0	0	4	(80)	1	(20)	0	(0)	5
Spring 1999	23	8	0	31	12	0	0	0	0	0	23	(74)	8	(26)	0	(0)	31
Total	27	9	0	36	12	0	0	0	0	0	27	(75)	9	(25)	0	(0)	36
1999–2000																	
Fall 1999	9	3	0	12	0	0	1	0	1	0	9	(69)	4	(31)	0	(0)	13
Spring 2000	26	6	0	32	2	0	0	0	0	0	26	(81)	6	(19)	0	(0)	32
Total	35	9	0	44	2	0	1	0	1	0	35	(78)	10	(22)	0	(0)	45
2000–2001																	
Fall 2000	6	0	0	6	0	0	0	0	0	0	8	(100)	0	(0)	0	(0)	8
Spring 2001	30	9	0	39	18	0	0	0	0	0	30	(77)	9	(23)	0	(0)	39
Total	36	9	0	45	18	0	0	0	0	0	38	(81)	9	(19)	0	(0)	47
2001–2002																	
Fall 2001	2	3	0	5	0	0	1	0	1	0	2	(33)	4	(67)	0		6
Spring 2002	26	5	0	31	10	0	2	0	2	0	26	(79)	7	(21)	0		33
Total	28	8	0	36	10	0	3	0	3	0	28	(72)	11	(28)	0		39
2002–2003																	
Fall 2002	4	4	0	8	0	1	0	0	1	0	5	(56)	4	(44)	0		9
Spring 2003	9	4	0	13	5	1	0	0	1	0	10	(71)	4	(29)	0		14
Total	13	8	0	21	5	2	0	0	2	0	15	(65)	8	(35)	0		23
2003–2004																	
Fall 2003	2	2	0	4	0	0	0	0	0	0	2	(50)	2	(50)	0		4
Spring 2004	14	2	0	16	6	0	0	0	0	0	14	(88)	2	(12)	0		16
Total	16	4	0	20	6	0	0	0	0	0	16	(80)	4	(20)	0		20

[a] Includes DLP kills, research mortalities, and other known human-caused mortality.
[b] May be underreported.

Table 2 Unit 1D black bear successful hunter residency, regulatory years 1990 through 2004

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown[b] residency	(%)	Total
1990–1991	26	(76)	7	(21)	1	(3)	0	(0)	34
1991–1992	28	(88)	0	(0)	4	(12)	0	(0)	32
1992–1993	24	(84)	4	(13)	1	(3)	1	(0)	30
1993–1994	15	(66)	4	(17)	3	(13)	1	(4)	23
1994–1995	15	(75)	2	(10)	3	(15)	0	(0)	20
1995–1996	27	(79)	3	(9)	4	(12)	0	(0)	34
1996–1997	35	(83)	2	(5)	3	(7)	2	(5)	42
1997–1998	31	(74)	3	(7)	7	(17)	1	(2)	42
1998–1999	27	(75)	3	(8)	6	(17)	0	(0)	36
1999–2000	32	(71)	9	(20)	3	(7)	1	(2)	45
2000–2001	33	(70)	5	(11)	7	(15)	2	(4)	47
2001–2002	27	(69)	1	(2)	8	(21)	3	(8)	39
2002–2003	13	(57)	2	(8.5)	6	(26)	2	(8.5)	23

[a] Local hunters are those hunters that reside in Unit 1D.
[b] Includes DLP kills, research mortalities, and other known human-caused mortality.

Table 3 Unit 1D black bear harvest chronology by month[a], regulatory years 1990 through 2004

Regulatory	Month												
year	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
1990–1991	5	(15)	5	(15)	0	(0)	1	(3)	14	(41)	9	(26)	34
1991–1992	10	(33)	2	(6)	0	(0)	2	(6)	10	(32)	7	(23)	31
1992–1993	14	(47)	3	(1)	1	(3)	1	(3)	5	(17)	6	(20)	30
1993–1994	2	(9)	0	(0)	0	(0)	0	(0)	15	(65)	6	(26)	23
1994–1995	3	(15)	1	(5)	0	(0)	1	(5)	13	(65)	2	(10)	20
1995–1996	1	(3)	0	(0)	0	(0)	3	(9)	23	(68)	7	(20)	34
1996–1997	3	(7)	1	(2)	0	(0)	0	(0)	27	(66)	10	(25)	41
1997–1998	11	(27)	0	(0)	0	(0)	0	(0)	23	(56)	7	(17)	41
1998–1999	4	(11)	1	(3)	0	(0)	1	(3)	18	(50)	12	(33)	36
1999–2000	13	(29)	0	(0)	0	(0)	0	(0)	25	(55)	7	(16)	45
2000–2001	6	(13)	2	(4)	0	(0)	0	(0)	26	(55)	13	(28)	47
2001–2002	6	(16)	0	(0)	0	(0)	0	(0)	17	(45)	15	(39)	38
2002–2003	8	(36)	0	(0)	0	(0)	1	(5)	10	(45)	3	(14)	22
2003–2004	2	(10)	2	(10)	0	(0)	0	(0)	11	(55)	5	(25)	20

[a] Does not include bears killed during closed season

Table 4 Unit 1D black bear harvest percent by transport method, regulatory years 1990 through 2004

Regulatory	Transport												
	Highway												
year	vehicle	(%)	Boat	(%)	Walk	(%)	Plane	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
1990–1991	6	(18)	9	(26)	5	(15)	0	(0)	5	(15)	9	(26)	34
1991–1992	8	(25)	6	(19)	6	(19)	0	(0)	7	(22)	5	(15)	32
1992–1993	15	(50)	1	(3)	5	(17)	3	(10)	2	(7)	4	(13)	30
1993–1994	16	(70)	1	(4)	5	(22)	0	(0)	1	(4)	0	(0)	23
1994–1995	8	(40)	10	(50)	2	(10)	0	(0)	0	(0)	0	(0)	20
1995–1996	13	(38)	12	(35)	4	(12)	2	(6)	2	(6)	1	(3)	34
1996–1997	26	(62)	7	(17)	6	(14)	0	(0)	1	(2)	2	(5)	42
1997–1998	25	(59)	12	(29)	1	(2)	0	(0)	0	(0)	4	(9)	42
1998–1999	18	(50)	11	(31)	5	(14)	0	(0)	2	(5)	0	(0)	36
1999–2000	14	(31)	16	(35)	11	(24)	0	(0)	3	(7)	1	(2)	45
2000–2001	20	(44)	14	(31)	10	(22)	1	(3)	0	(0)	0	(0)	45
2001–2002	15	(38)	15	(38)	4	(10)	2	(5)	0	(0)	3	(8)	39
2002–2003	11	(48)	7	(30)	1	(4)	0	(0)	2	(9)	2	(9)	23
2003–2004	6	(30)	6	(30)	4	(20)	1	(5)	3	(15)	0	(0)	20

[a] Includes 3- or 4-wheelers or other ORV

[b] Includes DLP, or other known human-caused mortality

Table 5 Unit 1D black bear hunter effort, mean skull size, and mean age, regulatory years 1994 through 2004. Days hunted over 30 are excluded from table. Ages not available for all years. Mean skull size not available for all bears.

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)[b]			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
1994–1995	4	4	1.0	15.6	3	16.7	1				
Spring 1995	43	16	2.7	18.1	13	10.0	3				
Total	47	20	2.4	17.6	16	11.7	4				
1995–1996											
Fall 1995	1	1	1.0			12.3	1				
Spring 1996	84	33	2.5	16.5	27	16.2	5				
Total	85	34	2.5	16.5	27	15.6	5	6.8	17	9.3	6
1996–1997											
Fall 1996	15	4	3.8	16.9	4						
Spring 1997	154	36	4.3	16.7	31	15.8	5				
Total	169	40	4.2	16.8	35	15.8	5	7.4	36	7.0	3
1997–1998											
Fall 1997	20	11	1.8	14.8	6	16.5	5				
Spring 1998	171	29	5.9	16.9	23	16.1	6				
Total	191	40	4.8	16.5	29	16.3	11	6.2	24	6.3	8
1998–1999											
Fall 1998	10	5	2.0	16.7	4	16.0	1				
Spring 1999	187	31	6.0	16.6	22	14.8	8				
Total	197	36	5.5	16.6	27	14.9	9	5.5	28	10.0	7
1999–2000											
Fall 1999	28	12	2.3	16.7	9	16.2	3				
Spring 2000	83	32	2.6	17.1	26	15.5	6				
Total	111	44	2.5	17.0	35	15.7	9	6.8	22	9.7	6

Table 5 continued

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)[b]			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
2000–2001											
Fall 2000	8	6	1.3	16.2	6						
Spring 2001	236	39	6.1	17.3	30	15.5	9				
Total	244	45	5.4	17.1	36	15.5	9	7.0	37	9.6	9
2001–2002											
Fall 2001	14	5	2.8	16.5	2	14.8	3				
Spring 2002	135	31	4.4	17.1	25	15.1	5				
Total	149	36	4.1	17.1	27	15.0	8	7.9	28	6.5	10
2002–2003											
Fall 2002	12	7	1.7	17.3	4	15.5	4				
Spring 2003	79	12	6.6	17.9	9	15.7	4				
Total	91	19	4.8	17.7	13	15.6	8	8.8	14	11.4	7
2003–2004											
Fall 2003	6	4	1.5	15.8	2	15.5	2				
Spring 2004	58	14	4.1	17.8	15	15.8	2				
Total	64	18	3.6	17.6	17	15.6	4				

[a] Skull sizes equal length plus zygomatic width.

[b] Bear ages not available for 1980–1981and 1989–1992.

[c] *n* represents sample size.

Table 6 Unit 1D black bear harvest[a] by Wildlife Analysis Areas (WAA), regulatory years 1990 through 2004

	WAA							
Regulatory years	4302	4303	4304	4405	4406	4407	4408	Total
1990–1991	24	9	0	1	0	0	0	34
1991–1992	22	3	2	5	0	0	0	32
1992–1993	20	6	1	2	1	0	0	30
1993–1994	14	7	0	2	0	0	0	23
1994–1995	12	5	0	1	0	0	1	19
1995–1996	14	10	1	8	0	0	1	34
1996–1997	19	17	0	4	0	2	0	42
1997–1998	19	16	0	4	0	1	1	41
1998–1999	23	7	0	5	0	1	0	36
1999–2000	28	5	1	3	1	2	5	47
2000–2001	24	8	1	7	7	0	0	47
2001–2002	21	10	1	5	0	0	2	39
2002–2003	10	8	0	2	0	2	1	23
2003–2004	7	12	0	0	0	1	0	20

[a] Includes DLP kills, research mortalities, and other known human-caused mortality.

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 2 (3600 mi^2)

GEOGRAPHICAL DESCRIPTION: Prince of Wales Island and adjacent islands south of Sumner Strait and west of Kashevarof Passage.

BACKGROUND

HABITAT DESCRIPTION

Prince of Wales (POW) and adjacent islands have some of the best black bear habitat in Southeast Alaska. Unit 2 has an abundance of productive salmon streams, many large estuaries, and subalpine and alpine areas at lower, more hospitable elevations compared to mainland locations, thus supporting a large number of bears. The larger average skull sizes of Unit 2 bears compared to other Southeast Alaska bears also suggest that Unit 2 bears have access to extremely productive, healthy habitats.

Small openings and disturbed areas, such as wetlands, avalanche chutes, clearcuts, and subalpine meadows are important areas for foraging. Black bear diets range from mostly vegetarian to mostly carnivorous, and the species may subsist by scavenging or by predation on a variety of mammals or fish. Unit 2 black bears primarily eat vegetation during early spring. Major foods include grasses and sedges, *Equisetum* spp., skunk cabbage (*Lysichiton americanum*), and berries (*Vaccinium and Rubus sp*.) that have persisted through the winter. Later in spring, bears are efficient predators of Sitka black-tailed deer fawns. During summer and fall, bears accumulate fat reserves necessary for winter hibernation. Bears with access to salmon streams consume large quantities of fish, and poor fish runs (or reduced berry crops) can result in low cub production and survival (Jonkel and Cowan 1971). If food supplies have been poor during the previous summer and the female has not accumulated adequate energy reserves, the fertilized egg may not implant and consequently will not produce cubs. Poor food may also cause losses after implantation or may result in the death of cubs that are born. In most years, cub survival is around 20% but may be as high as 50% during good food years. The most critical period is when a bear becomes independent at 16–17 months old (Jonkel and Cowan 1971). The age when females first produce cubs is also related to available food supply and ranges from 3 to 7 years of age, depending on their nutritional plane, a measure of habitat quality (Kolenosky and Strathearn 1987).

Despite the abundance of healthy and productive habitats, more clearcut logging has occurred in Unit 2 than in other Southeast black bear habitats. Counting national forest and private lands, ADF&G estimates about 470 mi^2 of forested black bear habitat has been cut during the past 50 years, including over 40% of the old-growth forest once found in Unit 2. Logging-associated road building in Unit 2 has created the highest density of roads in Southeast, with over 2200 miles of drivable roads on national forest land and additional large tracts of road on private Native corporation lands. Only a few roads have been closed after logging operations are finished, as required by the Forest Plan (USFS 1997). As a result, habitat changes continue to occur from clearcut logging. Although early seral stages (3–20 years postlogging) provide black bears with an abundance of plant foods, later stages result in the disappearance of understory as conifer canopies close and light does not penetrate to the forest floor. Second-growth stands also lack large hollow trees and root masses important for denning. We believe that, although logging may create food for bears in the short term, the long-term result will be a decline in bear numbers (Suring et al. 1988).

The faunal history of Southeast Alaska is far more complex than previously thought. Recent discoveries in several limestone caves in Unit 2 show that prehistorically black bears (*Ursus americanus)* shared this range with brown bear (*Ursus arctos*). Brown bears are no longer present on POW or the surrounding archepelago. Radiocarbon dating methods on fossils found in the caves suggest both species of bears were present during the last glacial maximum dating back to 35,000–45,000 years ago, and the range overlap existed during the Pleistocene until at least 7200 B.P. What finally drove *U. arctos* to extinction on the southern islands is unclear, but a likely factor is the dense forest habitat that developed during the Holocene, covering all but the highest mountain peaks (Banfield 1974; MacDonald and Cook 1996, 1999). Stable isotope analysis on both modern and fossil *U. americanus* from POW using $\delta^{13}C$ values suggest this species has an almost exclusive terrestrial diet in spite of the fact that these bears are occasionally seen catching salmon (Heaton 1995). Along with *U. arctos*, several other extirpated species have been identified from fossils found in the caves. They include red fox (*Vulpes vulpes),* arctic fox (*Alopex logopus),* wolverine (*Gulo gulo),* and barren ground caribou (*Rangifer tarandus).*

HUMAN USE HISTORY

Black bears are indigenous to Unit 2 and have traditionally been hunted for food and trophies. Information about black bears in the unit is limited to sealing records, anecdotal public reports, and observations by our staff.

Regulatory history

Statewide sealing of black bears began in 1973. Hunters have not been required to obtain a hunt registration permit for black bears; thus, effort data for unsuccessful hunters has never been available. We have information on hunt effort only for successful hunters.

Seasons and bag limits. Since statehood, the bear hunting season has extended from 1 September through 30 June, and the annual bag limit for residents has been 2 bears, only 1 of which can be a blue bear. Nonresident and resident bag limits were the same until 1990, when the nonresident limit was reduced to 1 bear per year. In 1982 it became legal to bait black bears year-round. However, in 1988, the Board of Game limited baiting in Southeast Alaska to the 15 April–15

June period. This was the same year that ADF&G records began to accurately document the number of bait permits issued. Beginning in 1996, hunters were required to salvage the edible meat of all spring black bears killed in Southeast Alaska during 1 January–31 May. The salvage rule is a contentious issue with many big game guides and hunters.

Hunting with dogs. POW is the only place in Southeast with a history of hunting bears with dogs, and unlike other areas of the state, such hunters are primarily nonresidents. Many other states have eliminated the use of dogs for bear hunting, but the practice has been allowed since 1966 in Alaska. In the early 1990s, numerous complaints about this practice on POW prompted ADF&G to develop a policy for hunting bears with dogs in the region. That policy, adopted in 1992, restricts hunting bears with dogs to the fall, September–December, because deer fawns, bear cubs, and other young wildlife are most vulnerable to disruption during the spring. Currently, a maximum of 5 permits are issued in Unit 2 during any year, to keep this hunt within manageable limits and to minimize disruption to wildlife and other user groups. Prior to 1998, the annual 5-permit limit had never been reached. In 1994 the Board of Game adopted additional permit conditions into regulation, and Region I added additional conditions requiring a report of the number of bears treed and harvested and proof of health certificates for all dogs used. Many of the same hunters consistently apply for the permits each year. Approximately 2–4 bears are harvested with dogs each year, a small portion of the overall bear harvest. In contrast, outside of Alaska, dog-related hunting harvests have been increasing and have accounted for up to 15% of the annual take in other states. For example, hound hunters may take up to 50% of the bear harvest in a state that does not allow baiting or hunting during the deer season. In a state that allows baiting, hound hunters may be taking 20 percent or less of the harvest. When an alternative hunting method is available that the general public can use effectively, the percentage of bears taken with hounds is usually low. This is true for Southeast Alaska. Most hunters find spot-and-stalk methods very effective, and they consequently rely less on other methods.

Historical harvest patterns

After averaging 123 bears per year during 1980–1988 and 221 bears annually from 1989 to 1995, the Unit 2 black bear harvest increased to a yearly average of 301 bears during 1994–2002. Males have accounted for about 72% of the harvest during the past 18 years, exceeding our management objective. On average about 65% of the harvest occurs during the spring season. Black bear hunting by nonresidents in Unit 2 has steadily increased over the past decade and now accounts for 61% of the harvest. During the past 10-year period, Alaska residents living in Unit 2 accounted for 13% and nonlocal residents another 17% of the harvest. Most nonresidents do not use a registered guide when black bear hunting in this unit, but guided hunts are increasing. Nonresident hunters must purchase a locking tag to affix to each bear harvested. Neither the cost of these tags ($250–$300) nor the cost of travel to the area appears to limit the number of nonresident hunters.

Until 1985 Unit 2 bear hunters used airplane, boat, and highway transportation in relatively equal amounts. However, logging-associated road construction peaked in the 1980s, and beginning in 1986, most hunters used the road system to access hunting areas. During the past 10 years, highway vehicles accounted for 56% of the transportation used by successful Unit 2 hunters (Table 4).

Historical harvest locations

Wildlife Analysis Areas (WAAs) 1318 and 1422 accounted for about 21% of the harvest during 1991–2003 (Table 6). WAA 1318 encompasses the area around the communities of Craig and Klawock, POW's primary population center that affords hunters easy road access. WAA 1422, which includes Tuxekan and El Capitan passages on west POW, also offers easy road access. Additional WAAs that have received notable hunting pressure more recently include 1420 (Ratz Harbor to Coffman Cove on the east side of POW), 1317 (the area south and west of Hollis), and 1530 (Whale Pass and Exchange Cove on the northeast corner of the island). Many of these areas also offer good access from saltwater along protected bays and passages.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain an average skull size of at least 19.1 inches for male bears harvested each spring (January–June) or 18.8 inches for all males taken during a regulatory year.

- Maintain a male to female sex ratio of 3:1 in the harvest.

- Minimize human–bear conflicts by providing information and assistance to the public and to other agencies.

- Maintain a harvest of at least 65% males in the combined harvest during the most recent 3 years.

Age, genetics, and environmental factors, such as habitat and forage quality, combine to influence black bear skull size. Sealing records indicate that harvested mature black bears in Unit 2 generally have larger skulls than bears from the nearby mainland. The skull size management objective of 19.1 inches for males harvested in the spring was established in the late 1980s after analysis of several previous years data showed this to be the long-term average. We wanted to maintain skull size in the harvest at the long-term high, and we have looked at any reduction in this mean as a possible indication of changes in the population's age structure.

Skull size is used as a management tool because we believe that average skull size trends may indicate changes in population size and composition, and they provide some measure of the sustainability of the harvest. A decreasing average skull size may indicate a decline in that segment of the population composed of large, older bears and could indicate an overall population decline. However, an increasing average skull size could also indicate a reduction in the proportion of younger bears in the population. Probably the most important and safest use of skull size data is as an indicator of some change in the population or in hunter effort. We do not have a technique to tell us precisely what such a change might indicate, but use it in conjunction with other data to make our best assessment of the current population.

Sex ratio is another parameter commonly used when monitoring black bear harvests. It is relied on as a primary means of assessing population status in 19 states and provinces and as supporting information for population assessment in another 8 areas (Garshelis 1990). Harvest sex ratio is thought by some bear biologists to suggest changes in the population. A 3:1 male to

female sex ratio in the harvest has been suggested to be a sustainable yield from a healthy bear population (Sterling Miller, former ADF&G research biologist, personal communication).

METHODS

Hunters are required to submit bear skulls and hides for sealing within 30 days of the kill. Fish and Game staff, designated sealers, or Alaska Bureau of Wildlife Enforcement troopers must seal black bear hides and skulls taken by successful hunters. Biological and hunt information collected at the time of sealing includes hide color, sex, skull length and width, date and location of kill, number of days hunted, transportation method, and any use of commercial services, including guides. A premolar is collected and sent to Matson's Laboratory for age determination. During this report period, tissue samples were collected from harvested bears for DNA and stable isotope analysis.

We currently are completing research on predator–prey relationships in Unit 2; this work is in the publication phase. We are hoping in the future to be able to conduct research on black bears in this unit. A pilot study in 2000, using radio collars on newborn Sitka black-tailed deer, confirmed bears are efficient predators of young deer. Adding bears to this research project will provide valuable data on hunting vulnerability due to road density, wounding loss, habitat use, and home ranges.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population estimates are not currently available for black bears in this unit. Information obtained during sealing cannot be used to measure population trends. While harvest information gained from sealing records, such as average skull size, average age, and sex ratio may provide some indication of black bear population trends, in the absence of accompanying demographic data, correlations between these measures and harvest sustainability will continue to elude us. Research is needed to identify population parameters so we might better assess population trends and harvest sustainability.

Population Size

No black bear population studies have been conducted in Unit 2. Density estimates of North American black bears vary between 0.3 and 3.4 bears/mile^2, depending on the region and habitat conditions. At the high end, a Washington state study in forested Sitka spruce habitat that included logged areas comparable to POW, resulted in the 3.4 bears/mile^2 estimate (Lindzey and Meslow 1977). Bear densities in Unit 2 may be similar or even higher than those found in western Washington State because of the abundance of salmon and the extended period that several species of salmon are available.

Elsewhere, Modafferi (1982) estimated 1 bear/mile^2 in eastern Prince William Sound, Alaska. Density estimates from forested habitat in Minnesota using biomarker mark-recapture methods resulted in higher values than we estimate for Unit 2, ranging from 4–6 bears/mile^2 (Garshelis 1989). The highest black bear density estimated in forested habitat outside of Alaska, Minnesota, or Washington was in Virginia and ranged from 0.96–1.49 bears/mile^2 (Carney 1985).

Wood (1990) indicated that unlogged portions of Unit 2 contain some of the best black bear habitat in Southeast Alaska. Based on population estimates from other North American coastal areas (Poelker and Hartwell 1973), Wood estimated the Unit 2 black bear density at 1.5 bears/mi^2. Using Wood's density estimate, we derived a population estimate of 5400 bears for the unit (Larsen 1995). In making this estimate, we assumed a consistent bear density throughout the unit, but some areas undoubtedly have more bears than others.

In 2000, ADF&G began supporting a study on a 400-mile^2 portion of Kuiu Island in Unit 3 that uses tetracycline biomarkers to estimate black bear density. Preliminary results estimate density at 1.3 bears/mile^2 (range 0.91–1.8) (Peacock and Berger 2001). Because this effort is focused on an island adjacent to Unit 2 with similar logging patterns, its results may be more applicable to Unit 2 bear populations than studies done elsewhere.

Population Composition

We lack quantitative information with which to estimate the sex and age composition of the Unit 2 black bear population. The male to female harvest ratio may provide a better indicator of harvest sustainability and population status than does average skull size. Considering their high reproductive potential, survival of breeding females is critical to sustained yield management. Prolonged overharvest of females is likely to result in population declines. A decreasing trend in the male to female harvest ratio could signal a decline in that segment of the population made up of older, larger males. Region I staff established the 3:1 male to female guideline in the late 1980s, based on work done on black bears elsewhere.

Information on the reproductive history of harvested females is now available from cementum annuli analysis, and can indicate in which years sows give birth. Preliminary information from 43 harvested female bears from Units 1A and 2 suggests that age at first reproduction varies, with 9% of females producing cubs at age 4, 37% at age 5, 35% at age 6, and 17% from 7 to 9 years of age. In general, females in this sample had young in alternate years.

Distribution and Movements

As stated above, Unit 2 black bears are probably not evenly distributed. For example, islands in the POW archipelago that lack productive salmon streams likely support fewer bears/mi^2 than those with fish streams. Also, a high proportion of southern POW is characterized by muskeg and low volume timber and probably supports a lower density of bears than the more productive northern half of the island. Quantitative information about home ranges and movement patterns of Unit 2 black bears is not available.

Unlike mainland Southeast Alaska, Unit 2 black bears occur in the absence of brown bears. The cinnamon-colored black bear, which occurs in mainland populations, is absent from Unit 2, as are the glacier (blue) and Kermody (white) bears, which occur infrequently in nearby British Columbia and occasionally along the mainland of Southeast Alaska.

MORTALITY

Harvest

Season	Bag limit
1 Sep–30 Jun	Resident hunters: 2 bears, not more than 1 of which may be a blue, or glacier, bear
1 Sep–30 Jun	Nonresident hunters: 1 bear

Board of Game Action and Emergency Orders. No Board of Game actions or emergency orders were issued during the report period. However, a board action in fall 2000 regarding Unit 3 black bears may affect Unit 2. This action placed an annual nonresident harvest cap of 120 bears for Kuiu Island. Currently, nonresidents account for 80% of the annual Kuiu bear harvest. The access to and availability of bears on Kuiu is similar to Unit 2, and consequently, we anticipate a deflection of effort from Kuiu to POW. The Kuiu harvest was within 10 bears of the cap by the end of the spring 2001 season, resulting in an emergency closure of the subsequent nonresident fall season. Similar closures are expected in the future. The harvest deflection issue has been discussed several times and will likely be an issue at future board meetings. The U.S. Forest Service (USFS) has experienced an increase in the number of guide and transporter requests for Unit 2 Special Use Permits, and we expect this trend to continue as registered guides and outfitter/transporters look for other areas to conduct black bear hunts.

Hunter Harvest. The 2001–2003 average of 409 bears per year indicates a continuing upward harvest trend. Bunnell and Tait (1985) developed a deterministic simulation model showing that maximum allowable annual hunting mortality on black bears over 1 year old is 14.2% of the estimated population. Using our population estimate of 5400 bears (Larsen 1995), this percentage would result in a maximum annual harvest of 767 bears. To date, the high 2003 harvest of 405 bears constituted only 8% of the population estimate. This suggests the current harvest is within sustainable levels, according to this simulation model, if our density estimate is reasonably accurate. However, we feel it is important to evaluate site-specific harvests in order to track potential overharvest and to evaluate our population estimate, which is currently based only on available habitat in Unit 2.

Sex ratio of the harvest during the past 10 years has remained stable and even increasing slightly during 2003. A sex ratio of 3 males to 1 female bear in the harvest is thought to be sustainable over the long term, and we have maintained that level with a couple of exceptions during the past 10 years. The 2003 harvest had a 4:1 sex ratio.

The mean or median age of the harvest (or some ratio among age classes) is often assumed to directly reflect the level of exploitation. If mortality is age-biased, as bear hunting appears to be, changes in the age structure will lag well behind changes in population size (Garshelis 1990). The mean age of harvested Unit 2 bears has remained fairly constant during the past 10 years, with males averaging 7.0 and females 8.2 years (Table 5). We will continue to evaluate the age trends of harvested male bears.

Hunter Residency and Success. Nonresident hunters continue to harvest more bears in Unit 2 than local and nonlocal Alaska residents combined. Between 1980 and 1990, nonresidents

represented less than 50% of the Unit 2 bear harvest. During this report period, nonresidents took more than 80% of the reported harvest. Unit 2 residents took only 7% of the harvest during the same period, down from an average of 13% during the past 10 years. Successful nonlocal Alaskans have declined from a 10-year average of 17% to an average of 10 during this report period. During the past 10 years, residents accounted for 30% of the harvest (range 12–43%). This is radically lower than the previous 10 years (1980–1990) when residents averaged 59% (range 27–75%) of the harvest (Table 2). Most strikingly, the Unit 2 human population has changed in the past 5 years with the closure of many logging camps and overall reductions in timber-related activities. During the past 30–40 years, the logging industry provided a steady flow of new hunters into the area. These were often new residents to Alaska, and a high proportion were avid hunters. The remote locations of the many operations allowed workers easy access to game populations. Prior to these developments, bears in remote timber sale locations had rarely been exposed to hunters. Since the decline of the timber industry, newer Unit 2 residents are more involved in tourism and charter fishing and less invested in a lifestyle that involves hunting. This latter fact may explain some of the reduced resident harvest.

The abundance and accessibility of Unit 2 black bears for hunters, due in part to the ease of access along the road system, is attractive and appealing to many. The recent release of several bear hunting videos and articles in popular hunting magazines probably contributes to an increasing nonresident interest. POW has gained recognition for producing large bears, with regular entries into the Boone and Crockett and Pope and Young record books. A strong economy, with more hunters having disposable income during the past several years, may also be a factor driving nonresident hunter activity. Bear hunting closures and/or shorter seasons in other states and in Canada have likely contributed to the increased attraction of black bear hunting in Southeast Alaska.

Harvest Chronology. Spring seasons have accounted for the majority of the increased effort and harvest in Unit 2. The mean male skull size during the spring met our management objective of 19.0 inches during 2 of the 3 years, 2001 ($\bar{x}$ =19.3), 2002 ($\bar{x}$ = 18.0) and 2003 ($\bar{x}$ = 19.4). During those same 3 years 73, 85, and 124 male bears respectively had over 20-inch skulls in the spring. The average age of these large male bears was 10 (range 4–17). Many Unit 2 male bears also exceed 21-inch skull measurements each year, qualifying them for Boone and Crocket and Pope and Young record books.

Most Unit 2 bears are taken in the spring (65%) with May consistently ranking as the peak harvest month. The May 2002 harvest represented 51% of the year's total and was similar to the past 10-year average ($\bar{x}$ = 50%). September consistently has the second highest harvest (24%) with only a few bears taken in October and November (Table 3). Spring 2004 had the most hunters (320) and the most hunter-days (1138) for a spring hunt on record (Table 5).

Harvest in particular areas (WAAs). As stated earlier, 2 WAAs on POW, 1318 and 1422, have accounted for almost one quarter of the total harvest in Unit 2. WAA 1422 showed the most obvious increase during recent years, increasing from a 10-year average of 35 bears to 63 during the 2000 season. That increasing trend has slowed during the past several years but WAA 1422 still ranks as the top harvest area. Additional WAAs that have received notable hunting pressure more recently include 1210, 1420, 1317, and 1530. All include sizeable communities and

extensive road access. These same areas have been areas of concern prior to this report because of the rapidly growing harvest.

Bait stations. Alaska faced a ballot initiative during November 2004 to ban bear baiting under state hunting regulations. Anti-hunters felt using bait to lure bears was unfair chase and unethical hunting practice, and they were able to get the required signatures to bring it to a statewide vote. The initiative brought about a great deal of news coverage on both sides, but in the end the initiative was defeated at the polls.

Bait permits are issued by registration permit, and each permit allows the hunter to establish 2 bait sites. Baiting is only allowed during the spring hunting season. During the past 10 years, we have issued an average of 74 permits. In the 2004 season we issued the most permits ever—134. That translates into more than 260 bait sites across Unit 2. Hunting bears over bait has historically accounted for only a small percentage of the Unit 2 bear harvest. During the past 10 years an average of 13 bears (range 1–29) were reportedly harvested over bait. As the ballot initiative gained momentum and hunters became aware the hunting method was being criticized, we issued the most bait permits and had the highest reported harvest over bait in Unit 2 history. During 2002 and 2003, 29 and 27 bears respectively, were reported killed over bait (Table 1). More than 80% of the hunters harvesting bears each season in Unit 2 over bait are nonresidents. Most hunters using bait report taking bears with archery equipment.

Hunting with Dogs. Currently, hunting with dogs in Unit 2 requires a permit issued by the Ketchikan area wildlife biologist. Hunting bears with dogs is restricted to the fall, a maximum of 5 permits are issued per year, and permittees must report the number of bears treed and harvested at the end of the season. Proof of health certificates for dogs are also required before entering Alaska. During the past 3 years we have issued all 5 allowable hound hunting permits. Of the 5 permits issued during each of the past 3 years only 1 bear each season has been reported harvested using hounds. All the permits issued during the past 10 years have been to nonresident hunters. Hunting with dogs has been banned in most states, and those displaced hounds men appear to be taking advantage of the unrestricted opportunity in Alaska. Many of the hounds men who apply for permits each year are repeat hunters, mostly from Idaho and Montana.

Guided Hunter Harvest. Nonresidents accompanied by a licensed big game guide are allowed to harvest 1 bear. Historically, 2–4 licensed big game guides have operated in Unit 2 annually. Guides must first be licensed by the state for specific guide use areas and then be permitted by the U.S. Forest Service (USFS) under a special use permit. Guided hunters are not guaranteed success, although personal contact with several Southeast guides suggests 95–100% of guide-assisted hunters take bears. Successful guided hunts have increased recently and reached a high during 2002 and 2003, when 43 guided hunters harvested bears each of those years. This is compared to an average of 5 guided kills from 1980 to 1999. One guide working from a land-based camp on the east side of POW is responsible for majority of the increase in guide-assisted hunts recently.

We are concerned about instances of nonresident black bear hunters being guided illegally in Unit 2 under the guise of hunting with friends. The simple access to good bear hunting locations enables unlicensed “guides” to bring multiple out-of-state hunters with them and assist them in harvesting bears. Repeat nonresident hunters return to POW, many times with a different group

of friends. There are currently several investigations into this form of abuse, but investigating or prosecuting the activity is difficult.

The use of outfitters and transporters to access hunting areas, especially by nonresidents, is also increasing. Outfitters using boats as floating hotels and transportation are the most troublesome. This increase is difficult to monitor or manage. Outfitters must obtain a state transporter license, and those operating on marine waters must also have U.S. Coast Guard approval. Outfitters are not legally allowed to assist hunters in locating or stalking game or help clients care for trophies. These regulations are frequently abused, yet few cases are ever prosecuted due to the difficulty of gathering evidence and monitoring outfitters' activities. The USFS is currently evaluating outfitters' activities and may eventually change its special use permit system to provide better records across the Tongass National Forest.

Transport Methods. During this report period 48 of successful hunters used highway vehicles to reach Unit 2 hunting destinations. Another 50 reported using boats, and the remaining 2 went by air or walked (Table 4). A new highway improvement and paving project recently completed improved a large tract of the main road from Klawock to Thorne Bay and east to Naukati and will eventually be paved along the 30 Road to Coffman Cove. Beginning in early 2002, a new inter-island ferry started making daily runs from Ketchikan and POW, making the area more accessible. Another new ferry is under construction and is scheduled to make daily runs from Petersburg to Coffman Cove starting in 2006. All of these access issues will increase the number of people using Unit 2 for hunting, fishing, and other recreational activities.

Other mortality

Wounding loss is thought to be a significant source of mortality for Unit 2 bears, but this is based on anecdotal information with little documentation. Forest understory is dense, and frequent rainfall complicates the task of tracking wounded animals. At the time of sealing, hunters sometimes volunteer that they shot at or hit additional bears while hunting and were unable to find them. Hunters are unlikely to report such incidents. Nonresident hunters probably wound more animals than residents because of unfamiliarity with local conditions, distance, and animal behavior.

At this time we are not aware of any large-scale poaching or other illegal activity associated with Unit 2 bears. However, these activities are difficult to detect due to the ease of access and large size of the area with relatively few protection officers.

In the past few years we have documented a few defense of life or property (DLP) kills, but prior to that, few cases were ever reported. Bears killed at logging camps and in the many small Unit 2 communities have historically gone mostly unreported. Locals tend to avoid involving law enforcement or Fish and Game officials and the subsequent investigation and paperwork. Even law enforcement officers are slow to relay information about nuisance or DLP-killed bears. Fish and Game is making a greater effort to build relationships with enforcement officials to foster better documentation and data collection in the future. Since the closure of the landfill in Craig, several bears have been killed under DLP regulations near Craig and Klawock. Several bears are also killed in vehicle collisions each year along the new stretch of paved highway. We expect

vehicle collisions to increase with more miles of road being paved each year and more drivers spending additional time on the road at higher speeds.

HABITAT

Assessment

Timber harvest continues to pose the most serious threat to black bear habitat in the unit. Postlogging increases in berry production, primarily *Vaccinium* spp., may contribute to short-term bear population growth. This forage source will be lost as the canopy closes, as will habitat diversity associated with old-growth forests, accompanied by a loss of denning trees. The long-term effects of logging will be detrimental to black bears. Roads associated with logging increase human access and can make bears increasingly vulnerable to harvest.

Enhancement

No habitat enhancement projects specifically intended to benefit black bears have been attempted in the unit. Although used as a silvicultural practice, precommercial thinning and pruning has been performed in some young second-growth stands in Unit 2. While not the primary intent, this effort does provide a benefit to wildlife by improving and extending habitat suitability in the short-term by reducing canopy cover, permitting sunlight to reach the forest floor, and increasing the production and availability of understory forage. These benefits are relatively short-lived, approximately 20–25 years, after which time canopy closure again results in loss of understory. The long-term effects of clearcut logging will be detrimental to black bear populations.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Nuisance Bear Problems. Historical records are inaccurate regarding of the number of bears killed while getting into garbage in Unit 2. We receive only 1–2 DLP reports from POW each year, and anecdotal information suggests a number of bears have been killed around logging camps and near communities each year; however, very few of these were ever reported or documented. Because most of these areas are not restricted by city ordinance, landowners are more likely to shoot and tag a nuisance bear under hunting regulations than surrender it to authorities.

Until recently there have been open landfills near many communities luring bears near people, and consequently, creating generations of food-conditioned bears. A recent effort by the Alaska Department of Environmental Conservation to bring landfill managers into compliance with state regulations will eventually result in fewer refuse attractions for Unit 2 bears. The city of Thorne Bay recently relocated and fenced its landfill. The city of Hydaburg was found to be out of compliance and is now looking at other waste management alternatives. The city of Klawock was found to be out of compliance and has since built a barge transfer site, which was complete in 2002. We entered a cooperative agreement with the Craig Police Department (CPD) to help prepare for this change. Up to 30 black bears have been known to frequent the Klawock landfill, with 12–15 bears on-site being very common. The CPD estimates 2–8 bears are killed each year under DLP terms, but with no ADF&G wildlife staff on hand we have little data from nuisance bear kills or those killed by vehicles.

CONCLUSIONS AND RECOMMENDATIONS

Considerable effort is being expended to obtain better DLP kill records. Past records are incomplete and underestimate the number of nuisance bears killed in Unit 2. With several open landfills on POW recently closed, this issue will be given higher priority.

The Unit 2 black bear harvest has been steadily increasing and is at a record level. Research is needed to estimate black bear density to determine if the harvest is sustainable and to better address future management needs. Research is also needed to ascertain the relationship between sealing data (such as skull size and age) and sustainability of the increasing harvest. Current Kuiu Island population estimation techniques may eventually be applicable to Unit 2 now that these methods have proven to be effective. Some of the research needs for Unit 2 include better information on wounding loss, vulnerability in high use areas, home range size and habitat use.

Hunting Unit 2 black bears with dogs continues to be a contentious issue. We have capped the number of permits issued each year at 5, which appears to be keeping the practice within manageable limits and minimizing disruption to other wildlife and other user groups. At this point, hound hunters are acting responsibly by avoiding high use areas and human population centers, and complaints have been minimal.

The issue of hunting bears over bait is controversial and has faced more scrutiny recently from groups that have been successful in eliminating bear baiting in other states. The Alaska ballot initiative was nearly successful and shows the opposition to this hunting practice. However, the fact remains that the majority of Alaskans did not want to ban the practice.

The general age trend of male bears appears to be stable, but we are also seeing an older age class of female bears in the harvest. We will continue to monitor female age to see if the trend continues and whether it is areawide.

Unit 2 hunters would benefit from an educational video with information on identifying male bears in the field and concerns about wounding loss. Such a video would help hunters and managers by promoting more male-specific hunting.

We will continue to monitor specific harvest locations in order to track harvest and adjust future population estimates. This is especially important because 2 WAAs, both easily accessible along the road system, make up nearly one-quarter of the past 18 seasons' harvest. Based on available literature, data collected and crude density estimates, we believe the existing harvest is within sustained yield limits.

As logging continues, and large tracts of previously logged habitat rapidly convert to second-growth forest, we anticipate reductions in Unit 2 bear numbers. Research is needed to better identify and understand the dynamics of Unit 2 black bears.

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Table 1 Unit 2 black bear harvest, regulatory years (RY)1980–RY 2003

Regulatory year	Reported																	
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1980																		
Fall 1980	17	13	0	30		0	0	0	0	0	0	17	(57)	13	(43)	0	(0)	30
Spring 1981	49	7	0	56		0	0	0	0	0	0	49	(87)	7	(13)	0	(0)	56
Total	66	20	0	86	--	0	0	0	0	0	0	66	(77)	20	(23)	0	(0)	86
1981																		
Fall 1981	19	4	1	24		0	0	0	0	0	0	19	(79)	4	(17)	1	(4)	24
Spring 1982	71	8	0	79		1	0	0	1	0	0	72	(90)	8	(10)	0	(0)	80
Total	90	12	1	103	--	1	0	0	1	0	0	91	(88)	12	(11)	1	(1)	104
1982																		
Fall 1982	20	14	1	35		0	0	1	1	0	0	20	(55)	14	(39)	2	(6)	36
Spring 1983	48	10	6	64		0	0	0	0	0	0	48	(75)	10	(16)	6	(9)	64
Total	68	24	7	99	--	0	0	1	1	0	0	68	(68)	24	(24)	8	(8)	100
1983																		
Fall 1983	16	8	0	24		0	0	0	0	0	0	16	(67)	8	(33)	0	(0)	24
Spring 1984	79	15	1	95		0	0	1	1	0	0	79	(82)	15	(16)	2	(3)	96
Total	95	23	1	119	--	0	0	1	1	0	0	95	(79)	23	(19)	2	(2)	120
1984																		
Fall 1984	20	12	0	32		0	0	0	0	0	0	20	(63)	12	(37)	0	(0)	32
Spring 1985	46	11	1	58		0	0	0	0	0	0	46	(79)	11	(19)	1	(2)	58
Total	66	23	1	90	--	0	0	0	0	0	0	66	(73)	23	(26)	1	(1)	90
1985																		
Fall 1985	26	20	2	48		4	0	1	5	0	0	30	(57)	20	(38)	3	(5)	53
Spring 1986	95	24	2	121		0	0	0	0	0	0	95	(79)	24	(20)	2	(1)	121
Total	121	44	4	169	--	4	0	1	5	0	0	125	(72)	44	(25)	5	(3)	174
1986																		
Fall 1986	23	16	0	39		1	0	0	1	0	0	24	(60)	16	(40)	0	(0)	40
Spring 1987	107	7	0	114		0	0	0	0	0	0	107	(94)	7	(6)	0	(0)	114
Total	130	23	0	153	--	1	0	0	1	0	0	131	(85)	23	(15)	0	(0)	154

Table 1 continued

Regulatory year	Reported																	
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1987																		
Fall 1987	27	12	1	40		0	0	0	0	0	0	27	(68)	12	(30)	1	(2)	40
Spring 1988	100	12	0	112		0	2	0	2	0	0	100	(88)	14	(12)	0	(0)	114
Total	127	24	1	152	1	0	2	0	2	0	0	127	(82)	26	(17)	1	(1)	154
1988																		
Fall 1988	63	28	1	92		2	0	1	3	0	0	65	(69)	28	(29)	2	(2)	95
Spring 1989	74	16	21	111		3	2	0	5	0	0	77	(66)	18	(16)	21	(18)	116
Total	137	44	22	203	5	5	2	1	8	0	0	142	(67)	46	(22)	23	(11)	211
1989																		
Fall 1989	27	17	27	71		1	1	2	4	0	0	28	(37)	18	(24)	29	(39)	75
Spring 1990	92	16	39	147		0	0	1	1	0	0	92	(62)	16	(11)	40	(27)	148
Total	119	33	66	218	22	1	1	3	5	0	0	120	(54)	34	(15)	69	(31)	223
1990																		
Fall 1990	44	21	16	81		4	3	2	9	0	0	48	(53)	24	(27)	18	(20)	90
Spring 1991	98	16	11	125		1	0	0	1	0	0	99	(79)	16	(13)	11	(9)	126
Total	142	37	27	206	14	5	3	2	10	0	0	147	(68)	40	(19)	29	(13)	216
1991																		
Fall 1991	34	26	5	65		0	2	0	2	0	0	34	(51)	28	(42)	5	(7)	67
Spring 1992	103	29	21	153		1	0	0	1	0	0	104	(67)	29	(19)	21	(14)	154
Total	137	55	26	218	1	1	2	0	3	0	0	138	(62)	57	(26)	26	(12)	221
1992																		
Fall 1992	42	26	12	80		0	0	1	1	0	0	42	(52)	26	(32)	13	(16)	81
Spring 1993	116	18	8	142		0	0	1	1	0	0	116	(81)	18	(13)	9	(6)	143
Total	158	44	20	222	24	0	0	2	2	0	0	158	(70)	44	(20)	22	(12)	224
1993																		
Fall 1993	52	35	3	90		0	0	0	0	0	0	52	(58)	35	(39)	3	(3)	90
Spring 1994	114	19	2	135		0	0	0	0	0	0	114	(84)	19	(15)	2	(1)	135
Total	166	51	5	225	18	0	0	0	0	0	0	166	(74)	54	(24)	5	(2)	225

Table 1 continued

Regulatory year	Reported																	
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
1994																		
Fall 1994	59	25	2	86		2	1	0	3	0	0	61	(69)	26	(29)	2	(2)	89
Spring 1995	118	29	2	149		0	0	0	0	0	0	118	(79)	29	(20)	2	(1)	149
Total	177	54	4	235	14	2	1	0	3	0	0	179	(75)	55	(23)	4	(1)	238
1995																		
Fall 1995	50	35	0	85		0	0	0	0	0	0	50	(59)	35	(41)	0	(0)	85
Spring 1996	138	27	0	165		1	0	0	1	0	0	139	(84)	27	(16)	0	(0)	166
Total	188	62	0	251	8	1	0	0	1	0	0	189	(75)	62	(25)	0	(0)	251
1996																		
Fall 1996	49	39	0	88		0	0	1	1	0	0	49	(23)	39	(18)	1	(1)	89
Spring 1997	106	20	0	126		1	0	0	1	0	0	107	(50)	20	(9)	0	(0)	127
Total	155	59	0	214	8	1	0	1	2	0	0	156	(72)	59	(27)	1	(1)	216
1997																		
Fall 1997	65	37	1	103		0	0	1	1	0	0	65	(62)	37	(36)	2	(2)	104
Spring 1998	154	35	1	190		0	0	0	0	0	0	154	(81)	35	(18)	1	(1)	190
Total	219	72	2	293	3	0	0	1	1	0	0	219	(75)	72	(24)	3	(1)	294
1998																		
Fall 1998	53	66	0	119		0	0	2	2	0	0	53	(44)	66	(55)	2	(1)	121
Spring 1999	170	26	1	197		0	0	0	0	0	0	170	(86)	26	(13)	1	(1)	197
Total	223	92	1	316	1	0	0	2	2	0	0	223	(70)	92	(29)	3	(1)	318
1999																		
Fall 1999	50	46	0	96		1	0	0	1	0	0	51	(16)	46	(14)	0	(0)	97
Spring 2000	196	31	1	228		0	1	0	1	0	0	196	(60)	32	(10)	1	(0)	229
Total	246	77	1	324	15	1	1	0	2	0	0	247	(76)	78	(24)	1	(0)	326
2000																		
Fall 2000	88	58	0	146		0	1	0	1	0	0	88	(60)	59	(40)	0	(0)	147
Spring 2001	195	40	0	235		3	0	1	4	0	0	198	(83)	40	(17)	1	(0)	239
Total	283	98	0	381	12	3	1	1	5	0	0	286	(74)	99	(26)	1	(0)	386
2001																		
Fall 2001	55	55	0	110	0	0	1	0	1	0	0	55	(50)	56	(50)	0	(0)	111
Spring 2002	204	40	0	244	8	0	0	0	0	0	0	204	(84)	40	(16)	0	(0)	244
Total	259	95	0	354	8	0	1	0	1	0	0	259	(67)	96	(33)	0	(0)	355

Table 1 continued

Regulatory year	Reported																	
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill						
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	(%)	Total
2002																		
Fall 2002	70	54	0	124	0	0	1	0	1	0	0	70	(56)	55	(44)	0	(0)	125
Spring 2003	235	45	0	280	29	0	0	0	0	0	0	235	(84)	45	(16)	0	(0)	280
Total	305	99	0	404	29	0	1	0	1	0	0	305	(80)	100	(20)	0	(0)	405
2003																		
Fall 2003	66	54	0	120	0	0	2	0	2	0	0	66	(54)	56	(36)	0	(0)	122
Spring 2004	276	46	0	322	27	3	0	0	3	0	0	279	(86)	46	(14)	0	(0)	325
Total	342	100	0	442	27	3	2	0	5	0	0	345	(77)	102	(23)	0	(0)	447

[a] Includes DLP kills, research mortalities, and other known human-caused mortality.
[b] Bears reported harvested over bait.

Table 2 Unit 2 black bear successful hunter residency, RY 1980–RY 2003

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown[b] residency	(%)	Total
1980–1981	15	(18)	39	(45)	32	(37)	0	(0)	86
1981–1982	23	(22)	51	(49)	29	(28)	1	(1)	104
1982–1983	22	(22)	44	(44)	33	(33)	1	(1)	100
1983–1984	28	(23)	46	(38)	45	(38)	1	(1)	120
1984–1985	20	(22)	48	(53)	22	(25)	0	(0)	90
1985–1986	49	(28)	71	(41)	49	(28)	5	(3)	174
1986–1987	44	(29)	53	(34)	56	(36)	1	(1)	154
1987–1988	38	(25)	46	(30)	62	(40)	8[c]	(5)	154
1988–1989	33	(16)	47	(22)	123	(58)	8	(4)	211
1989–1990	39[b]	(18)	52[b]	(23)	127	(57)	5	(2)	223
1990–1991	46	(21)	71	(33)	89	(41)	10	(5)	216
1991–1992	40	(18)	72	(33)	106	(48)	3	(1)	221
1992–1993	24	(11)	73	(32)	125	(56)	2	(1)	224
1993–1994	35	(15)	58	(26)	132	(59)	0	(0)	225
1994–1995	29	(12)	55	(23)	151	(64)	3	(1)	238
1995–1996	62	(25)	45	(18)	143	(57)	1	(0)	251
1996–1997	35	(16)	40	(19)	139	(64)	2	(1)	216
1997–1998	46	(16)	38	(13)	209	(71)	1	(0)	294
1998–1999	35	(11)	55	(17)	226	(71)	2	(1)	318
1999–2000	26	(8)	44	(13)	254	(78)	2	(1)	326
2000–2001	29	(8)	53	(14)	299	(77)	5	(1)	386
2001–2002	25	(7)	48	(13)	284	(80)	0	(0)	357
2002–2003	27	(7)	47	(12)	330	(82)	0	(0)	404
2003–2004	31	(7)	23	(5)	388	(88)	0	(0)	442
Average	33	(17)	52	(28)	133	(53)	3	(1)	221

[a] Local hunters are those hunters that reside in Unit 2.
[b] Includes DLP kills, research mortalities, and other known human-caused mortality.
[c] Six unknown and 2 DLPs.

Table 3 Unit 2 black bear harvest chronology by month[a], RY 1980–RY 2003

Regulatory year	Harvest periods												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
1980–1981	16	(19)	6	(7)	7	(8)	5	(6)	45	(53)	6	(7)	85
1981–1982	11	(11)	11	(10)	2	(2)	6[b]	(6)	64	(61)	10	(10)	104
1982–1983	18	(20)	11	(11)	5	(5)	8	(8)	37	(38)	18	(18)	97
1983–1984	15	(13)	4	(3)	5	(4)	7	(6)	76[b]	(63)	13	(11)	120
1984–1985	26	(29)	5	(6)	1	(1)	8	(9)	40	(44)	10	(11)	90
1985–1986	26[b]	(15)	17[b]	(10)	8	(5)	21	(12)	91	(53)	8	(5)	171
1986–1987	21	(14)	13	(9)	5	(3)	23	(15)	69	(45)	21	(14)	152
1987–1988	24	(15)	14	(9)	1	(1)	21	(14)	80[c]	(52)	14	(9)	154
1988–1989	72	(35)	21[b]	(10)	1	(1)	9	(4)	92[e]	(44)	13	(6)	208
1989–1990	55	(25)	14	(6)	2[b]	(1)	14[b]	(6)	115	(53)	19	(9)	219
1990–1991	63[c]	(30)	17[c]	(8)	7[c]	(3)	16	(8)	88[c]	(41)	22	(10)	213
1991–1992	38	(17)	17[b]	(8)	8	(4)	28	(13)	107[b]	(49)	19	(9)	217
1992–1993	56	(25)	23[b]	(10)	2	(1)	19	(8)	116[b]	(52)	8	(4)	224
1993–1994	67	(30)	14	(6)	9	(4)	15	(7)	94	(42)	26	(11)	225
1994–1995	62[d]	(26)	20	(8)	6[b]	(3)	12	(5)	119	(50)	18	(8)	237
1995–1996	67	(27)	12	(5)	5	(2)	16	(6)	137[b]	(55)	13	(5)	250
1996–1997	75	(35)	9	(4)	4	(2)	14	(7)	100	(46)	13[b]	(6)	215
1997–1998	82	(28)	21	(7)	0	(0)	30	(10)	152	(52)	9	(4)	294
1998–1999	96	(30)	22	(7)	2[c]	(1)	25	(8)	149	(47)	23	(7)	317
1999–2000	82	(25)	10	(3)	4	(1)	18	(6)	187	(58)	23[b]	(7)	324
2000–2001	129	(34)	17	(4)	0	(0)	27	(7)	176[c]	(46)	36[c]	(9)	385
2001–2002	113	(31)	10	(3)	3	(1)	20	(5)	194	(52)	30	(8)	370
2002–2003	97	(24)	18	(5)	9	(2)	36	(9)	205	(51)	36	(9)	401
2003–2004	104[f]	(24)	13	(3)	2	(<1)	21	(5)	264[b]	(60)	37[g]	(8)	441
Average	57	(24)	14	(7)	4	(2)	17	(8)	110	(50)	18	(9)	221

[a] Does not include bears killed during closed season.
[b] Includes 1 DLP or other known human-caused mortality.
[c] Includes 2 DLPs or other known human-caused mortality.
[d] Includes 3 DLPs or other known human-caused mortality.
[e] Includes 4 DLPs or other known human-caused mortality.
[f] Includes 1 DLP and one roadkill.
[g] Includes 2 roadkill.

Table 4 Unit 2 black bear harvest percent by transport method, RY 1980–RY 2003

Regulatory year	Transport												
	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
1980–1981	13	(15)	16	(19)	23	(27)	0	(0)	31	(36)	3	(3)	86
1981–1982	24	(23)	19	(18)	19	(18)	7	(7)	34	(33)	1	(1)	104
1982–1983	13	(13)	26	(26)	36	(36)	4	(4)	17	(17)	4	(4)	100
1983–1984	35	(29)	35	(29)	33	(28)	0	(0)	14	(12)	3	(2)	120
1984–1985	16	(18)	39	(43)	26	(29)	1	(1)	8	(9)	0	(0)	90
1985–1986	26	(15)	39	(22)	80	(46)	5	(3)	11	(6)	13	(8)	174
1986–1987	16	(10)	53	(34)	73	(48)	0	(0)	3	(2)	9	(6)	154
1987–1988	14	(9)	39	(25)	99	(64)	0	(0)	0	(0)	2	(1)	154
1988–1989	30	(14)	68	(32)	102	(48)	0	(0)	3	(2)	8	(4)	211
1989–1990	18	(8)	70	(31)	118	(53)	0	(0)	6	(3)	11	(5)	223
1990–1991	7	(3)	69	(32)	118	(55)	0	(0)	12	(5)	10	(5)	216
1991–1992	11	(5)	64	(29)	126	(57)	5	(2)	5	(2)	10	(5)	221
1992–1993	18	(8)	59	(26)	135	(60)	10	(5)	0	(0)	2	(1)	224
1993–1994	15	(7)	63	(28)	124	(55)	23	(10)	0	(0)	0	(0)	225
1994–1995	13	(5)	53	(22)	159	(68)	10	(4)	0	(0)	3	(1)	238
1995–1996	19	(9)	69	(27)	134	(53)	27	(11)	1	(0)	1	(0)	251
1996–1997	11	(5)	56	(26)	114	(53)	32	(15)	1	(0)	2	(1)	216
1997–1998	19	(6)	82	(28)	170	(58)	22	(7)	0	(0)	1	(1)	294
1998–1999	8	(3)	98	(31)	175	(55)	33	(10)	0	(0)	4	(1)	318
1999–2000	13	(4)	107	(33)	196	(60)	8	(2)	0	(0)	2	(1)	326
2000–2001	13	(3)	146	(38)	197	(51)	21	(5)	4	(1)	5	(2)	386
2001–2002	0	(0)	169	(46)	198	(54)	0	(0)	0	(0)	0	(0)	367
2002–2003	2	(1)	201	(51)	195	(48)	0	(0)	0	(0)	0	(0)	398
2003–2004	6	(1)	236	(54)	187	(43)	0	(0)	0	(0)	0	(0)	429
Average	15	(9)	71	(30)	115	(49)	9	(4)	7	(6)	4	(2)	221

[a] Includes 3- or 4-wheelers or other ORV

[b] Includes DLP or other known human caused mortality

Table 5 Unit 2 black bear hunter effort, mean skull size, and mean age, RY 1980–RY 2003

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)[b]			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
1980											
Fall 1980	92	30	3.1	18.8	15	17.2	10				
Spring 1981	190	55	3.5	18.7	40	16.7	7				
Total/average	282	85	3.3	18.7	55	16.9	17	----		-----	
1981											
Fall 1981	70	23	3.0	18.1	15	15.4	3				
Spring 1982	235	79	3.0	19.2	58	17.3	8				
Total/average	305	102	3.0	19.0	73	16.8	11	8.0	61	11.0	8
1982											
Fall 1982	76	34	2.2	18.2	16	17.4	13				
Spring 1983	224	64	3.5	19.7	44	16.8	10				
Total/average	300	98	3.1	19.3	60	17.1	23	7.2	56	9.4	19
1983											
Fall 1983	49	24	2.0	18.0	15	16.8	7				
Spring 1984	237	96	2.5	19.3	72	17.0	14				
Total/average	286	120	2.4	19.1	87	16.9	21	7.4	89	9.6	20
1984											
Fall 1984	76	32	2.4	18.5	15	16.4	9				
Spring 1985	190	58	3.3	19.7	42	16.6	9				
Total/average	266	90	3.0	19.3	57	16.5	18	7.5	55	8.7	19
1985											
Fall 1985	119	48	2.5	18.4	22	16.5	17				
Spring 1986	398	121	3.3	19.1	74	16.8	18				
Total/average	517	169	3.1	18.9	96	16.7	35	7.2	95	8.5	32
1986											
Fall 1986	131	40	3.3	17.7	17	16.4	6				
Spring 1987	349	114	3.1	19.6	19	16.4	7				
Total/average	480	154	3.1	19.3	36	16.4	13	8.1	104	6.9	20

Table 5 continued

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)[b]			
	Total days	Nr hunters	Mean days per hunter	Male	n[c]	Female	n	Male	n	Female	n
1987											
Fall 1987	105	40	2.6	17.2	23	16.7	9				
Spring 1988	293	113	2.6	19.5	94	17.2	12				
Total/average	398	153	2.6	$\bar{x}$ =19.0	117	$\bar{x}$ =17.0	21	$\bar{x}$ =8.0	99	$\bar{x}$ =7.7	20
1988											
Fall 1988	328	92	3.6	18.0	57	16.9	26				
Spring 1989	414	114	3.6	19.4	70	16.7	18				
Total/average	742	206	3.6	$\bar{x}$ =18.8	127	$\bar{x}$ =16.8	44	$\bar{x}$ =58	7.8	$\bar{x}$ =8.4	10
1989											
Fall 1989	231	71	3.3	18.4	22	17.0	12				
Spring 1990	442	147	3.0	19.5	89	16.9	16				
Total/average	673	218	3.1	$\bar{x}$ =19.3	111	$\bar{x}$ =16.9	28	----		----	
1990											
Fall 1990	228	86	2.7	17.8	39	16.6	19				
Spring 1991	448	124	3.6	19.1	93	16.5	16				
Total/average	676	210	3.2	$\bar{x}$ =18.7	132	$\bar{x}$ =16.5	35	$\bar{x}$ =7.7	128	$\bar{x}$ =8.1	33
1991											
Fall 1991	184	67	2.7	18.1	31	16.8	25				
Spring 1992	653	154	4.2	19.4	103	17.0	28				
Total/average	837	221	3.8	$\bar{x}$ =19.1	134	$\bar{x}$ =16.9	53	$\bar{x}$ =7.6	132	$\bar{x}$ =8.2	56
1992											
Fall 1992	231	80	2.9	17.3	37	16.6	25				
Spring 1993	774	141	5.5	19.0	115	16.7	18				
Total/average	1005	221	4.5	$\bar{x}$ =18.6	152	$\bar{x}$ =16.6	43	$\bar{x}$ =7.1	153	$\bar{x}$ =8.4	42
1993											
Fall 1993	295	90	3.3	17.6	52	16.9	35				
Spring 1994	480	135	3.6	19.3	112	16.9	18				
Total/average	775	225	3.4	$\bar{x}$ =18.8	164	$\bar{x}$ =16.9	53	$\bar{x}$ =7.1	161	$\bar{x}$ =7.2	49

Table 5 continued

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)[b]			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
1994											
Fall 1994	223	85	2.6	$\bar{x}$ =18.2	60	$\bar{x}$ =16.8	24				
Spring 1995	601	149	4.0	$\bar{x}$ =19.2	112	$\bar{x}$ =17.3	27				
Total/average	824	234	$\bar{x}$ =3.5	$\bar{x}$ =18.9	172	$\bar{x}$ =17.1	51	$\bar{x}$ =7.1	177	$\bar{x}$ =8.4	55
1995											
Fall 1995	233	85	2.7	$\bar{x}$ =18.3	50	$\bar{x}$ =16.8	35				
Spring 1996	588	166	3.5	$\bar{x}$ =19.2	135	$\bar{x}$ =17.0	26				
Total/average	821	251	$\bar{x}$ =3.3	$\bar{x}$ =18.9	185	$\bar{x}$ =16.9	61	$\bar{x}$ =7.1	185	$\bar{x}$ =8.0	62
1996											
Fall 1996	355	88	4.0	$\bar{x}$ =17.2	48	$\bar{x}$ =16.8	38				
Spring 1997	543	127	4.3	$\bar{x}$ =19.5	102	$\bar{x}$ =16.6	19				
Total/average	898	215	$\bar{x}$ =4.2	$\bar{x}$ =18.8	150	$\bar{x}$ =16.7	57	$\bar{x}$ =6.9	154	$\bar{x}$ =8.7	57
1997											
Fall 1997	345	103	3.3	$\bar{x}$ =17.6	63	$\bar{x}$ =16.5	36				
Spring 1998	704	187	3.8	$\bar{x}$ =19.2	151	$\bar{x}$ =17.0	34				
Total/average	1049	290	$\bar{x}$ =3.6	$\bar{x}$ =18.8	214	$\bar{x}$ =16.8	70	$\bar{x}$ =6.5	215	$\bar{x}$ =8.2	71
1998											
Fall 1998	397	119	3.3	17.7	51	16.6	65				
Spring 1999	709	189	3.8	19.1	163	17.3	25				
Total/average	1106	308	$\bar{x}$ =3.6	$\bar{x}$ =18.8	214	$\bar{x}$ =16.8	90	$\bar{x}$ =7.1	215	$\bar{x}$ =7.8	89
1999											
Fall 1999	281	96	2.9	17.0	48	16.5	44				
Spring 2000	984	228	4.3	19.2	190	17.1	32				
Total/average	1265	324	$\bar{x}$ =3.9	$\bar{x}$ =18.7	238	$\bar{x}$ =16.7	76	$\bar{x}$ =6.6	237	$\bar{x}$ =7.2	71

Table 5 continued

Regulatory year	Hunter effort: Total days	Hunter effort: Nr hunters	Hunter effort: Mean days per hunter	Mean skull size[a] (inches): Male	*n*[c]	Mean skull size[a] (inches): Female	*n*	Average age (years)[b]: Male	*n*	Average age (years)[b]: Female	*n*
2000											
Fall 2000	557	143	3.9	17.4	88	16.6	57				
Spring 2001	987	230	4.3	19.3	193	17.2	40				
Total/average	1544	373	$\bar{x}$ = 4.1	$\bar{x}$ =18.7	281	$\bar{x}$ =16.8	97	$\bar{x}$ =6.5	276	$\bar{x}$ =8.8	94
2001											
Fall 2001	391	112	3.5	17.8	52	16.7	57	4.5	53	8.9	53
Spring 2002	913	243	3.8	18.0	200	17.9	38	5.5	195	9.3	39
Total/average	1304	633	$\bar{x}$ =3.7	$\bar{x}$ =17.9	252	$\bar{x}$ =17.3	95	$\bar{x}$ =5.0	248	$\bar{x}$ =9.1	92
2002											
Fall 2002	376	125	3.0	17.5		16.9		6.9	69	5.9	45
Spring 2003	1068	270	4.0	19.4		17.2		8.1	230	8.4	50
Total/average	1444	645	$\bar{x}$ =3.5	$\bar{x}$ =18.5		$\bar{x}$ =17.0		$\bar{x}$ =7.5	299	$\bar{x}$ =7.2	95
2003											
Fall 2003	355	120	3.2	17.5	67	16.7	49	5.0	77	10.3	44
Spring 2004	1138	320	3.5	19.4	274	17.2	45	7.9	274	10.3	44
Total /average	1493	440	$\bar{x}$ =3.4	$\bar{x}$ =18.5	341	$\bar{x}$ =17.0	94	$\bar{x}$ =6.5	351	$\bar{x}$ =10.3	88

[a] Skull sizes equal length plus zygomatic width.
[b] Bear ages not available for 1980–1981 and 1989–1990.
[c] *n* represents sample size.

Table 6 Unit 2 black bear harvest[a] from the most heavily harvested Wildlife Analysis Areas (WAA), RY 1991–RY 2003

	Regulatory years												
WAA	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1107	7	11	8	14	8	8	12	12	16	21		44	16
1210	6	6	8	8	7	6	10	20	15	11	11	6	26
1211	4	2	12	6	8	8	7	9	11	24	21	29	20
1213	2	7	2	2	7	1	6	6	7	13	11	18	9
1214	18	15	15	10	18	11	36	28	31	13	30	40	37
1315	18	12	15	6	14	16	17	22	16	16	9	19	24
1316	3	4	0	4	10	1	2	1	3	3	1	2	3
1317	14	20	14	17	23	13	17	25	29	33	40	30	34
1318	16	17	19	21	18	19	15	22	16	16	16	11	25
1319	17	14	13	14	15	14	15	19	23	30	20	18	21
1332	9	9	8	6	8	12	6	9	10	13	0	0	0
1420	16	20	18	22	14	18	21	26	30	21	15	21	16
1421	6	6	9	9	5	6	8	14	14	16	3	12	11
1422	23	25	25	38	36	33	37	28	40	63	52	46	50
1526	2	1	12	1	6	7	20	12	15	19	16	16	26
1527	2	7	7	8	5	5	21	13	15	15	12	16	16
1529	12	13	10	15	9	9	23	14	7	24	18	9	10
1530	23	17	13	25	19	7	9	12	6	8	18	15	17
1531	0	1	6	7	5	2	4	7	3	17	6	4	4

[a] Includes DLP kills, research mortalities, and other known human-caused mortality.

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 3 (3000 mi^2)

GEOGRAPHIC DESCRIPTION: Islands of the Petersburg, Kake, and Wrangell area.

BACKGROUND

HABITAT DESCRIPTION

Most high quality black bear habitat in Unit 3 is associated with low-elevation, old-growth forest with abundant and productive salmon streams. Small openings and disturbed areas, such as wetlands, avalanche chutes, clearcuts, and subalpine meadows are important black bear foraging areas. Black bear diets may range from mostly vegetarian to mostly carnivorous, and the species may subsist by scavenging or by predation on large and small mammals or fish. In Unit 1B, black bears primarily eat vegetation during early spring. Major foods include grasses and sedges, *Equisetum* spp., and berries, primarily *Vaccinium* sp., that persist through winter. Later in spring, black bears may be efficient predators of moose calves and/or Sitka black-tailed deer fawns. During summer and fall, when bears accumulate fat reserves for winter hibernation, those bears with access to salmon streams eat large quantities of fish. Berries are also important during the summer and fall months. Poor fish runs or berry crops are thought to result in low cub production and survival the following spring.

We remain concerned about the extensive habitat changes occurring throughout the unit due to logging. ADF&G has estimated that of the 3000 mi^2 of terrestrial habitat in Unit 3, about 1500 mi^2 is forested. Over 129,000 acres of forested habitat in Unit 3 have been logged to date. As a result, timber harvest poses the most serious threat to black bear habitat in the unit over the long term. Black bears are able to exploit increases in forage in early-successional plant communities immediately after logging and may temporarily benefit from clearcutting. However, this food source is lost approximately 20–25 years postlogging with canopy closure, and second-growth forests provide little bear habitat. Precommercial thinning and pruning of second-growth stands can extend the short-term benefits to bears, but the long-term effects of logging will be detrimental. Large clearcuts on Mitkof, Wrangell, and northwest Kupreanof Islands will diminish in value as bear habitat over the next few decades (Suring et al. 1988). The proliferation of roads associated with logging is also of concern as roads increase human access and make bears increasingly vulnerable to harvest.

HUMAN-USE HISTORY

Black bears are indigenous to Unit 3 and traditionally have been hunted for food and trophies. Information about black bears in the unit is limited to sealing records, anecdotal public reports, and staff observations. Although we lack quantitative demographic information on black bears in the unit, we believe the population is stable.

Regulation History

Sealing of black bears was first required in 1973. Hunters are not required to obtain registration permits or harvest tickets prior to black bear hunting, so information on the effort of unsuccessful hunters has never been available.

For most years since statehood black bear hunting season extended from 1 September through 30 June, and the bag limit for residents has been 2 bears annually, only 1 of which could be a blue or glacier bear. From 1980 through 1983 the season closed on 15 June, and the resident bag limit was only 1 bear. Nonresident bag limits were the same as for residents until 1990, when the nonresident bag limit was reduced from 2 bears to 1 bear per year. In 1982 it became legal to use bait to hunt black bears year-round. In 1988 the Board of Game limited baiting in Southeast Alaska to 15 April–15 June. From 1989 to 1997 the department issued an average of 3 bear baiting permits per year in the unit. The highest number of baiting permits issued was 12 in 1991. Hunting bears with dogs requires a permit issued by ADF&G. The use of dogs for black bear hunting has been allowed since 1966. No permit requests to hunt bears with dogs have been received for the unit. Since 1996 hunters have been required to salvage the edible meat of all black bears killed in Southeast Alaska from 1 January to 31 May.

Historical harvest patterns

Annual harvests remained relatively stable from 1973 to 1980, averaging 43 bears per year. The harvest began to increase in the early 1980s, rising from 81 bears in 1981 to 166 bears in 1992. By the early 1990s the unit had gained worldwide recognition for producing trophy-sized black bears, and in 1993 the harvest increased to 232 bears. By 1997 the annual harvest had increased nearly ten-fold since 1973, when 29 bears were killed. In the 1997–98 regulatory year the Unit 3 harvest was 244 bears, with 151 (62 %) of those taken on Kuiu Island.

Approximately 75–80% of the annual harvest occurs during the spring season. Since 1973, males have outnumbered females in the harvest about 4 to 1. Nonresident hunters have accounted for a growing percentage of the harvest in the past 10 years, growing from less than 50% in 1990 to 70% in 1997. Since 1992, the majority of black bears taken in the unit by nonresidents have come from Kuiu Island. Most nonresidents hunt without a guide in the unit. Nonresident hunters must purchase tags to affix to each bear harvested. The cost of these tags ($225 for nonresident citizens and $300 for nonresident aliens) may limit the number of nonresident hunters who hunt black bears.

As a result of increasing interest by nonresident hunters, the Unit 3 black bear harvest grew at annual rate of 7% between 1990 and 2000. The Kuiu Island harvest increased more rapidly, at 9% annually, during the same period. The increasing harvest by nonresident hunters, particularly on Kuiu Island, has given rise to concerns about the sustainability of current harvest levels.

Historical harvest locations

Kuiu Island accounts for 25% of the Unit 3 land area and produced about 55% of the total black bear harvest from 1990 to 2000. Kuiu Island male skull sizes are larger on average than those from any other area of the state except Prince of Wales Island in Unit 2. Compared to other Unit 3 islands, Kuiu Island has a relatively high number of salmon streams and more shoreline miles per square mile of area than other islands. Roads associated with logging also provide easy access to the north end of Kuiu, where the highest harvest occurs. After increasing dramatically during the late 1990s, the percentage of successful hunters using motor vehicles on Kuiu decreased during this report period

Kupreanof and Mitkof Islands produced annual black bear harvests averaging 33% and 8% of the Unit 3 bear harvest, respectively, throughout the 1990s. These percentages correspond closely to the percentage of Unit 3 land area on each island, 36% and 7%, respectively. Both islands have several highly productive salmon streams and extensive logging road networks, which aid hunter access.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain an average spring skull size and an average annual male skull size of at least 18.5 inches.

- Maintain a male to female ratio of 3:1 in the harvest.

We have been using skull size as a management objective since the late 1980s because we believe that year-to-year trends in average skull size may indicate changes in population size and composition and provide some measure of the sustainability of harvest levels. A decreasing average skull size may indicate a decline in that segment of the population composed of large, older bears and could indicate an overall population decline. However, an increasing average skull size could also indicate a reduction in the proportion of younger bears in the population. Probably the most appropriate use of skull size data at this time is as an indicator of some change in the population or in hunter effort. We do not have a technique to tell us precisely what such a change might indicate, but use it in conjunction with other data to make our best assessment of the current population.

Age, genetics, and environmental factors, such as habitat and forage quality, all combine to influence black bear skull size. Sealing records and anecdotal evidence indicate that mature mainland black bears generally have smaller skull sizes compared to those found on Southeast Alaska islands. The skull size management objective of 18.5 inches was established in the late 1980s after analysis of previous years data showed this to be the long-term average. We wanted to maintain skull size in the harvest at the long-term high, and we have looked at any reduction in this mean as a possible indication of changes in the population’s age structure.

METHODS

Hunters are required to submit bear skulls and hides for sealing within 30 days of the kill. State-appointed sealing agents and staff from the departments of Fish and Game and Public Safety sealed hides and skulls of black bears. Biological and hunt information collected included pelage color, sex, skull size (length and width), date and location of kill, number of days hunted, transportation method, and hunter use of commercial services, including guide use. A premolar was collected from most bears and sent to Matson's Laboratory for age determination. We also sealed any bear killed under defense of life or property provisions (DLP) or any that died as road kill, illegal kill, or during research efforts. To estimate the Kuiu Island black bear population size, successful hunters were asked to submit a toe bone (metatarsal) sample from bears harvested between fall 2000 and spring 2003, thus allowing researchers to determine a tetracycline marked-to-unmarked ratio. During this report period tissue and hair samples were collected opportunistically from bears harvested in the unit for DNA and stable isotope analysis. Comparison of current and historical data indicates harvest trends and may offer indirect evidence of population trends. No effort data is collected from unsuccessful hunters.

KUIU ISLAND RESEARCH

In May 2000, ADF&G entered into a cooperative agreement with the University of Nevada initiating a study using tetracycline biomarking and noninvasive DNA sampling as means of estimating the black bear population on northern Kuiu Island. In June of 2000 and 2002, Elizabeth Peacock (Peacock 2004) used tetracycline biomarking (Garshelis and Visser 1997) to estimate the size of the black bear population on Kuiu Island, north of the Bay of Pillars and Port Camden isthmus (673 km^2). Baits were laced with the antibiotic tetracycline and distributed; when a bait was taken by a bear, the tetracycline was incorporated in the newly formed bone tissue (Johnson 1964). As the recovery sample, hunters were asked to submit toe bone (metatarsal) samples from bears harvested on Kuiu and neighboring Kupreanof Islands during the period from fall 2000 and spring 2003. The bone samples were examined later under an ultraviolet microscope for the presence of a tetracycline-induced fluorescent mark

In June 2000 a total of 188 baits were deployed, resulting in 138 marked bears.
In June 2002, a total of 263 baits were deployed, resulting in 191–201 marked bears.
A total of 32 marked bears were later recovered via hunter-submitted bone samples (27 from within the study area, 5 from outside the study area). Based on the 2000 and 2002 baiting efforts, and after adjusting for double-marking, emigration and immigration, Peacock developed an overall density estimate of 1.51 bears/km^2 on northern Kuiu Island. At the time the experiment was conducted, an estimated 1019 bears were on northern Kuiu Island. The estimate of 1.51 bears/km^2 is among the highest published black bear densities across the entire distribution of the species.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Information about Unit 3 black bears is limited to a Mitkof Island denning study (Erickson et al. 1982), the recently-completed population estimation study on Kuiu Island (Peacock 2004), harvest sealing records, anecdotal public reports, and observations by ADF&G staff.

Except for northern Kuiu, population estimates are not available for black bears in the unit. Information obtained during sealing cannot be used to measure population trends. Although harvest information gained from sealing records, such as average skull size, average age, and sex ratio, may provide some indication of black bear population trends, in the absence of accompanying demographic data, correlations between these measures and harvest sustainability will continue to elude us. Research is needed to identify population parameters so we might better assess population trends and harvest sustainability.

Population Size

Precise population estimates are not available for black bears in this unit. Information collected during sealing cannot be used to measure population trends. Prior to the recently completed study on northern Kuiu Island, no black bear population studies had been conducted in Unit 3. Estimates of population size or density are difficult to obtain because the species generally inhabits forested areas, and aerial surveys are impossible. Vast, remote areas in the unit also make studies difficult and expensive to undertake.

Past black bear density estimates for Unit 3 were based on studies in similar habitats in western Washington state in the 1960s (Poelker and Hartwell 1973). We believe minimum densities in most of Southeast Alaska are slightly higher than the 1.4 bears per mi^2 found in the Washington study area. Assuming a density of approximately 1.5 bears per mi^2 of forested habitat, ADF&G estimated 3340 black bears in Unit 3 in 1990 based on an estimate of 2220 forested mi^2. Since then, it has been necessary to revise forested acreage estimates downward. Bear density is probably not consistent throughout the forested areas of the unit. For instance, until recently black bears were unknown on Zarembo Island. Within the past 5 years a few resident bears have become established on Zarembo, but numbers remain low. Bear densities are also relatively low on Etolin and other islands south of Sumner Strait. Density is much higher on Kuiu, Kupreanof, and Mitkof Islands, which have more abundant and productive salmon streams.

Black bears with cinnamon pelage occur on a few islands in Unit 3. A relatively high proportion of bears taken from Mitkof, Wrangell, and Kuiu Islands are cinnamon colored. Glacier bears are uncommon in the unit. Two records exist of glacier bears being harvested in the unit since 1973, both taken from Kuiu Island. We are aware of one anecdotal report of a glacier bear that was reportedly taken at Security Bay, Kuiu Island in the years prior to 1973, when sealing began. No Kermody bears (those with white pelage) have been reported in the unit.

Population Composition

We lack quantitative information to estimate sex and age composition of the Unit 3 black bear population. The male to female ratio in the harvest may provide a better indicator of harvest sustainability and population status than average skull size. Considering their high reproductive potential, survival of breeding females is critical to sustained yield management. Prolonged overharvests of females will likely result in population declines. A decreasing trend in the male to female harvest ratio could signal a decline in that segment of the population composed of older, larger males. Region I staff established the 3:1 male to female guideline in the late 1980s, based on work done on black bears elsewhere.

Distribution and Movements

Quantitative information about home ranges and movement patterns of Unit 3 black bears is not available. The only quantitative information on black bear movement patterns in Southeast comes from a single denning study conducted on Mitkof Island during 1980–1981 (Erickson et al. 1982). Black bear movement patterns are influenced to a large degree by seasonal changes and annual differences in the occurrence, abundance, and quality of preferred food items. Reproductive activities also influence bear movement patterns, particularly for males. As a result, males typically have larger home ranges than females.

Black bears typically emerge from winter dens in March and April. Following emergence from dens, bears typically occupy low elevation habitats, where they feed on greening vegetation. As spring proceeds into summer, bears typically disperse throughout forested and alpine habitats, where they continue to feed on grasses, sedges, forbs, and berry-producing shrubs. In the late summer and early fall, bears typically congregate near anadromous fish streams, where they feed on spawning salmon. As fish runs decline in the late summer and fall, bears disperse from salmon streams and feed primarily on berries and alpine vegetation before denning in October and November.

MORTALITY

Harvest

Season	Bag Limit
1 Sep–30 Jun	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear.
1 Sep–30 Jun	Nonresident hunters: 1 bear.

Game Board Action and Emergency Orders. At the statewide Board of Game meetings held in February 2004, the board passed a regulation allowing the sale of handicraft articles made from the fur of black bears and brown bears. In fall 2000, due to concerns over the steadily increasing harvest of black bears by nonresident hunters, the Board of Game established a harvest guideline of 120 bears per year for nonresident hunters on Kuiu Island. In 2001, the new harvest guideline resulted in the emergency closure of the entire fall nonresident season on Kuiu after nonresidents harvested 110 bears, or 92 percent of the allowable quota, during the spring season.

Hunter Harvest. Unit 3 hunter harvests ranged from 207 to 286 bears annually during this report period (Table 1). The 207 bears killed in 2003–04 represent the lowest annual harvest since the 1992–93 season.

Males made up 80% of the Unit 3 harvest in 2001, 74% in 2002, and 77% in 2003. During this report period, the average male skull size ranged from 18.3 inches to 18.5 inches (Table 2). The male to female ratio during this report period was 3:1—equaling the management objective.

Hunter Residency and Success. Although the percentage varies annually, from 2001 to 2003 nonresidents took approximately 79% of the bears harvested in the unit, nonlocal Alaskans took about 12%, and local residents about 9% (Table 7).

Harvest Chronology. During this report period, 82–83% of the overall harvest occurred during the spring season, with 51–56% of all bears killed in May (Table 8).

Harvest in Particular Areas. Harvest occurred in 20 individual Unit 3 Wildlife Analysis Areas (WAAs) during this report period. Of the 720 bears harvested, over 47% were taken from 6 WAAs on Kuiu Island. WAA 5012 alone, on northern Kuiu Island, accounted for 19% of the total unitwide harvest (Table 5).

Bait Stations. A total of 18 bear baiting permits were issued during this report period, including 6 per year during this report period.

Hunting with Dogs. No permits were requested to hunt bears with dogs during this report period. However, since spring 2001 a special permit has been issued annually to a registered big game guide interested in experimenting with the use of a dog to track and aid in the recovery of black bears wounded by clients. Between spring 2001 and fall 2003, the guide reported that his clients struck a total of 63 black bears, 13 (21%) of which were wounded and never recovered. Three wounded bears (5%) that might otherwise have been lost were successfully recovered with the aid of a tracking dog. Information obtained as a result of a stipulated reporting requirement provided the only tangible information on wounding loss currently available in the region.

Guided Hunter Harvest. During the report period, harvest by guided nonresident hunters increased slightly as a percentage of the overall harvest. Guided nonresidents accounted for 28% of the harvest in 2001, 39% in 2002, and 42% in 2003.

Transport Methods. Hunter transportation is primarily by boat and highway vehicle (Table 9). However, the unitwide percentage of hunters using highway vehicles decreased slightly during this report period. Although the percentage of Kuiu Island hunters using vehicles increased at a rate of 214% annually from 1995 to 2000, the percentage of hunters using highway vehicles on the island decreased during this report period.

Other Mortality

There were 6 instances of confirmed illegal harvest during the report period. We continue to receive unconfirmed reports of bears being shot and left in the field by individuals believing that bears are detrimental to deer and moose populations.

While possibly significant, little information is currently available on the amount of wounding loss that is occurring in the unit. One registered guide reported that, despite the use of heavy caliber rifles and backup shots by professional guides, his clients failed to recover 13 (21%) of 63 black bears struck and wounded between spring 2001 and fall 2004. It is reasonable to assume that wounding loss rates for nonguided hunters are considerably higher than for guided hunters.

HABITAT ASSESSMENT

Assessment

Timber harvest continues to pose the most serious threat to black bear habitat in the unit. Postlogging increases in berry production, primarily *Vaccinium* sp., may contribute to short-term bear population growth. This forage source will be lost as the canopy closes, as will habitat

diversity associated with old-growth forests, accompanied by a loss of denning trees. Roads associated with logging increase human access and can make bears increasingly vulnerable to harvest. The long-term effects of logging will be detrimental to black bears.

During this report period, timber harvest occurred on Kuiu, Kupreanof, Mitkof, Etolin, Zarembo, Deer, and Wrangell Islands. Timber harvest is planned or already scheduled for additional sale areas on Etolin, Kupreanof, Kuiu, Mitkof, Zarembo, Woronkofski, and Wrangell Islands.

Enhancement

No habitat enhancement projects specifically intended to benefit black bears have been attempted in the unit. Although primarily intended as a silvicultural practice, precommercial thinning and pruning has been performed in some young, second-growth stands in the unit. While not the primary intent, this effort does provide a secondary benefit to wildlife by improving and extending habitat suitability in the short-term by reducing canopy cover, which permits sunlight to reach the forest floor and increase the production of understory forage plants. These benefits are relatively short-lived, approximately 20–25 years, after which time canopy closure again results in loss of understory vegetation. The long-term effects of clearcut logging will be detrimental to black bear populations.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Nuisance Bear Problems. Black bears in close proximity to human settlements quickly learn to seek out human-related food sources, including livestock, pet food, and improperly secured garbage. During this report period there was only 1 documented instance of a black bear being killed in the unit under defense of life and property (DLP) regulations. This represents a significant decline from the 24 bears killed under DLP regulations during the previous 3-year period. Historically, the majority of documented DLPs occur during late summer and early fall, when bears are drawn into communities as a result of improper waste management and the declining availability of natural food sources.

It is likely that additional DLPs in Wrangell and Kake went unreported. In 1998 ADF&G and the Petersburg Police Department (PPD) entered into a cooperative Black Bear Response Program. Under the terms of this agreement, PPD must report any bears destroyed due to public safety concerns. In the absence of similar agreements between ADF&G and the City of Wrangell and the Organized Village of Kake, DLPs in these communities have a higher likelihood of going unreported. For example, we continue to receive occasional reports of carcasses or remains of bears at the Kake landfill. While it is unclear if these mortalities are the result of DLPs or other legal or illegal harvests, the presence of unsealed skulls and hides with carcasses suggests that some of these mortalities were not the result of legal harvests.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 3 black bear harvest increased at a rate of 7% annually from 1990 to 2000. During the same period, the Kuiu Island harvest increased at a rate of 9% annually. The unitwide harvest of 207 bears in 2003–04 was the lowest since 1992–93. The relatively low harvests in 2002–03 and 2003–04 were probably the result of atypical winter and spring weather conditions, rather than a decline in black bear populations. In fall 2000, due to concerns over the steadily increasing

harvest of black bears by nonresident hunters, the Board of Game established a nonresident harvest guideline of 120 bears per year on Kuiu Island. In 2001 the new harvest guideline resulted in the emergency closure of the entire fall nonresident season on the island. Since the spring 2001 implementation of the 120-bear nonresident harvest guideline, the Kuiu harvest declined to an average of 113 bears annually during this report period. In anticipation of additional season closures on Kuiu Island, some guides and transporters may have redirected clients to alternative hunt areas in Unit 3 or along the Unit 1B Mainland. Uncertainties about the season length on Kuiu may also have influenced nonguided nonresident bear hunters to select areas elsewhere in which to hunt.

In order to ensure that the bear population is managed on a sustained yield basis, additional research is needed to estimate the black bear population in the unit. Research is also needed to identify possible correlations between sealing data and population trends. A better understanding of the short- and long-term impacts of clearcut logging on black bear populations is needed. Some estimate of black bear mortality as a result of wounding loss is needed.

In the wake of steadily increasing harvest by both resident and nonresident hunters, ensuring that black bear populations are managed within sustainable harvest limits will remain a formidable challenge for wildlife managers. Although the Unit 3 black bear harvest remained at a high level during the report period, the percentage of males in the harvest met the management objective. The average male skull size met the management objective in 2001–02 and 2003–04 and was only slightly below the objective in 2002–03. No management or regulatory changes are recommended at this time.

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Table 1 Unit 3 black bear harvest, 1996–2003

	Hunter kill						Nonhunting kill[a]			Total estimated kill					
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
Fall 96	33	24	42	0	57	NA	0	0	0	33	58	24	42	0	57
Spring 97	150	26	15	0	176	0	0	0	0	150	85	26	15	0	176
Total	183	50	21	0	233	0	0	0	0	183	79	50	21	0	233
Fall 97	41	21	34	0	62	NA	0	0	0	41	66	21	34	0	62
Spring 98	157	25	14	0	182	0	0	0	0	157	86	25	14	0	182
Total	187	46	19	0	244	0	0	0	0	198	81	46	19	0	244
Fall 98	52	21	29	0	73	NA	6	6	0	58	68	27	31	0	85
Spring 99	190	28	13	1	219	1	0	0	0	190	87	28	13	1	219
Total	242	49	17		292	1	6	6	0	248	82	55	18	1	304
Fall 99	29	31	52	0	60	NA	0	4	3	29	43	35	52	3	67
Spring 00	195	32	14	0	227	2	0	0	0	195	86	32	14	0	227
Total	224	63	22		287	2	0	4	3	224	76	67	23	3	294
Fall 00	47	24	33	0	71	NA	1	2	2	48	63	26	34	2	76
Spring 01	203	35	15	0	238	2	0	0	0	203	85	35	15	0	238
Total	250	59	19	0	309	2	1	2	2	251	80	61	19	2	314
Fall 01	28	20	42	0	48	NA	0	0	0	28	58	20	42	0	48
Spring 02	201	37	16	0	238	1	0	0	1	201	84	37	16	1	239
Total	229	57	20	0	286	1	0	0	1	229	80	57	20	1	287
Fall 02	24	19	44	0	43	NA	0	0	2	24	53	19	42	2	45
Spring 03	147	38	21	0	185	2	0	0	0	147	79	38	21	0	185
Total	171	57	25	0	228	2	0	0	2	171	74	57	25	2	230

Table 1 continued

	Hunter kill						Nonhunting kill[a]			Total estimated kill					
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
Fall 03	25	13	34	0	38	NA	1	0	0	26	67	13	33	0	39
Spring 04	135	34	20	0	169	5	0	0	0	135	80	34	20	0	169
Total	160	47	23	0	207	5	1	0	0	161	77	47	23	0	208

[a] Includes DLP kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 3 harvested black bear mean skull size[a], 1992–2003

Regulatory year	Males	*n*	Females	*n*
1992–1993	18.5	119	16.5	33
1993–1994	18.7	172	16.5	47
1994–1995	18.6	166	16.6	39
1995–1996	18.3	182	16.5	45
1996–1997	18.2	179	16.5	48
1997–1998	18.3	192	16.5	45
1998–1999	18.6	232	16.6	48
1999–2000	18.5	216	16.7	60
2000–2001	18.5	249	16.9	58
2001–2002	18.5	222	16.8	57
2002–2003	18.3	167	16.8	56
2003–2004	18.5	157	16.6	45

[a] Skull size = total length + zygomatic width in inches.

Table 3 Unit 3 harvested black bear mean age, 1992–2003

Regulatory year	Males	*n*	Females	*N*
1992–1993	8.4	117	9.4	35
1993–1994	7.6	173	8.5	51
1994–1995	8.0	169	8.5	43
1995–1996	7.2	179	9.7	46
1996–1997	7.2	180	8.2	49
1997–1998	6.8	181	8.5	42
1998–1999	7.3	222	8.5	46
1999–2000	7.4	217	9.4	59
2000–2001	7.2	245	9.3	58
2001–2002	7.3	228	9.3	57
2002–2003	7.4	171	9.1	57
2003–2004	N/A		N/A	

Table 4 Unit 3 harvested black bear mean days hunted per successful hunter, 1992–2003[a]

Regulatory year	Total days	Total hunters	Average days hunted
1992–1993	525	164	3.2
1993–1994	863	231	3.7
1994–1995	699	215	3.3
1995–1996	682	231	3.0
1996–1997	663	233	2.8
1997–1998	720	242	3.0
1998–1999	892	292	3.1
1999–2000	871	282	3.1
2000–2001	930	309	3.0
2001–2002	964	286	3.4
2002–2003	775	228	3.4
2003–2004	682	207	3.3

[a]Totals do not include DLP.

Table 5 Unit 3 black bear hunter harvest by island and density, 1992–2003

Regulatory year	Kupreanof 1090 mi²				Kuiu 746 mi²				Mitkof 211 mi²			
	Kill	Percent of Unit 3	Average mi²/bear kill		Kill	Percent of Unit 3	Average mi²/ bear kill		Kill	Percent of Unit 3	Average mi²/ bear kill	
			Male	Female			Male	Female			Male	Female
1992	53	31	27	109	88	51	11	39	17	10	23	23
1993	81	34	16	91	120	51	8	25	22	9	13	35
1994	78	34	14	91	114	52	8	31	20	9	16	30
1995	91	39	16	50	124	53	7	36	9	4	35	70
1996	71	30	19	78	129	55	8	25	20	9	14	42
1997	74	30	18	73	151	62	6	26	8	3	30	211
1998	107	37	12	78	161	55	6	25	11	4	26	70
1999	104	38	13	52	168	59	6	19	5	2	42	No females
2000	124	40	11	40	166	54	5	25	10	3	26	106
2001	161	56	9	29	106	37	8	41	14	5	18	106
2002	97	43	15	42	111	49	9	26	11	5	19	No females
2003	69	33	21	64	121	58	8	31	13	6	26	42

Table 6 Unit 3 black bear mean male skull size[a] and percent of harvest by major island and season, 1998–2003

		1998				1999				2000			
Island	Season	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*
Kupreanof	Fall	21	70	18.1	20	5	45	17.8	5	16	59	18.1	15
	Spring	72	94	18.9	69	78	84	18.5	77	81	84	18.9	81
	Total	93	87	18.7	89	83	80	18.4	82	97	78	18.7	96
Kuiu	Fall	24	69	18.4	22	22	49	18.2	21	28	70	18.0	28
	Spring	107	85	18.4	104	107	87	18.7	103	108	86	18.6	108
	Total	131	81	18.4	126	129	77	18.6	124	136	82	18.5	136
Mitkof	Fall	5	100	20.3	4	1	100	NA	0	2	67	15.1	2
	Spring	3	50	19.2	3	4	100	18.6	4	6	86	17.2	6
	Total	8	73	19.8	7	5	100	18.6	4	8	80	16.7	8

Table 6 continued

		2001				2002				2003			
Island	Season	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*
Kupreanof	Fall	22	55	17.8	22	10	59	18.8	10	3	60	18.7	2
	Spring	102	84	18.4	97	61	76	18.2	58	49	77	18.5	49
	Total	124	77	18.3	119	71	73	18.3	68	52	75	18.5	51
Kuiu	Fall	3	60	18.0	3	8	42	17.0	8	21	72	17.9	20
	Spring	85	84	18.8	84	74	80	18.5	74	76	83	18.6	75
	Total	88	83	18.8	87	82	74	18.4	82	97	80	18.5	95
Mitkof	Fall	2	100	19.0	2	5	100	16.8	5	1	33	15.5	1
	Spring	10	83	17.2	9	6	100	17.5	5	7	70	17.5	7
	Total	12	86	17.5	11	11	100	17.1	10	8	62	17.2	8

[a]Skull size = total length + zygomatic width.

Table 7 Unit 3 black bear successful hunter residency, 1992–2003

Regulatory year	Local resident[a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total successful hunters
1992–1993	36	22	27	16	101	62	164
1993–1994	27	12	75	32	129	56	231
1994–1995	33	15	61	28	121	57	215
1995–1996	34	14	51	22	151	64	236
1996–1997	41	18	38	16	154	66	233
1997–1998	31	13	41	17	172	70	244
1998–1999	45	15	41	14	206	71	292
1999–2000	18	6	38	13	213	81	287
2000–2001	27	8	36	12	246	80	309
2001–2002	28	10	44	15	214	75	286
2002–2003	24	10	29	13	175	77	228
2003–2004	12	6	16	8	179	86	207

[a]Local residents are those that reside in Petersburg, Wrangell, or Kake.

Table 8 Unit 3 black bear harvest chronology by percent, 1992–2003

Regulatory year	Month									
	September	October	November	December	March	April	May	June	July	*n*
1992–1993	25	4	0	1	0	11	53	5	1	171
1993–1994	15	3	0	0	0	18	47	17	0	235
1994–1995	10	4	0	1	0	11	57	20	1	219
1995–1996	17	2	0	0	0	10	57	13	1	236
1996–1997	22	1	1	0	0	9	57	10	0	233
1997–1998	22	3	1	0	1	14	49	10	0	244
1998–1999	22	3	1	0	0	10	49	15	0	292
1999–2000	19	2	0	0	1	9	50	19	0	287
2000–2001	20	3	0	0	0	16	49	12	0	309
2001–2002	15	1	0	0	0	8	56	20	0	286
2002–2003	16	1	0	0	0	11	51	21	0	228
2003–2004	18	0	0	0	0	12	56	14	0	207

Table 9 Unit 3 black bear harvest, in percent by transport method, 1992–2003

Regulatory year	Airplane	Boat	3-4 wheeler	Snowmachine	Off-road vehicle	Highway vehicle	Foot	Unknown	*n*
1992–1993	6	74	0	0	0	13	3	4	172
1993–1994	11	66	0	0	0	18	3	1	235
1994–1995	4	72	1	0	0	23	3	1	219
1995–1996	5	78	0	0	<1	15	<1	1	236
1996–1997	7	81	0	0	0	11	1	0	233
1997–1998	7	79	1	0	0	11	2	0	244
1998–1999	8	72	1	0	0	17	2	0	292
1999–2000	2	71	0	0	0	27	0	0	287
2000–2001	3	75	0	0	0	20	2	0	309
2001–2002	1	78	0	0	0	21	0	0	285
2002–2003	1	79	0	0	0	19	1	0	228
2003–2004	7	77	0	0	0	16	0	0	207

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 5 (5800 mi^2)

GEOGRAPHICAL DESCRIPTION: Cape Fairweather to Icy Bay, Eastern Gulf Coast.

BACKGROUND

Within Game Management Unit 5, black bears are found almost exclusively in Unit 5A. Unit 5B, dominated by the Malaspina Glacier, has accounted for only a few harvested black bears since sealing records have been kept; all have been reported from the head of Disenchantment Bay, at the junction of the subunits 5A and B. "Glacier" (gray pelage color variant) bears occur more frequently in Unit 5 than in other management units, and usually several are harvested each year. The opportunity to harvest one of these unusual bears attracts hunters not only from other parts of Alaska, but also from throughout the world.

HABITAT DESCRIPTION

The entire Yakutat Forelands between the coast and the ice fields is potentially good black bear habitat. The forelands contains a variety of habitats, including open sedge meadows, willow flats, mixed stands of spruce and cottonwood, thick stands of spruce and hemlock, riparian stream corridors, beach fringes, and mountainous regions. These habitats contain vegetative forages such as grasses, sedges, devil's club, skunk cabbage, cow parsnip, blueberries, salmonberries, strawberries, and cranberries, to name a few. In addition, the forelands are rich in salmon, including sockeye, chum, pink, Chinook, and coho. Streams containing salmon are distributed throughout the forelands, and bears have widespread access to fish. There are also eulachon (*Thaleichtys pacificus*) present in some streams during the early spring. Calf moose might provide additional feeding opportunities in the spring; the forelands harbor an estimated 600–800 moose. In spite of this apparently productive habitat for black bears, they are common only near the mountainous regions due to the presence of numerous brown bears in the remainder of the area. We estimate there are approximately 522 brown bears in Unit 5A (based on a habitat capability model), and they likely displace black bears from lower elevations. Probably the biggest testament to the scarcity of black bears in the non-mountainous regions of the Yakutat Forelands is the near absence of black bears taken during the moose-hunting season. Generally there are moose hunters scattered throughout the forelands, but seldom is a black bear harvested.

Habitat alterations and concerns are mostly in the form of successional changes of logged areas. There are nine townships of land near the town of Yakutat that have been largely logged by

clearcutting. These areas are currently in a productive stage for bears in that they contain abundant berry bushes as well as other forage. Although these early successional stages (3–20 years post logging) provide black bears with an abundance of forage, later stages result in the disappearance of understory forage species as conifer canopies close and light does not penetrate to the forest floor.

HUMAN USE HISTORY

Black bears have long been hunted in Unit 5. Statewide black bear sealing began in 1973. Hunters have not needed hunting permits, thus information on the effort of unsuccessful hunters has never been available. We have information only for successful hunts.

Regulatory history

Since statehood, black bear hunting season has extended from 1 September through 30 June, and the bag limit for residents has been 2 bears annually, only 1 of which can be a blue or glacier bear. Nonresident bag limits were the same as for residents until 1990, when the nonresident limit was reduced to 1 bear per year. Use of dogs for hunting black bears has been allowed since 1966, although this requires a permit issued by ADF&G. To date no one has ever applied for one of these permits. Since 1996, hunters have had to salvage the edible meat of any black bears they kill in Southeast Alaska during the period 1 January–31 May.

Historical harvest patterns

Black bear harvest averaged 14 bears per year during the 1970s. During the 1980s, the average annual harvest increased to 24 bears. The highest harvest occurred in 1985 when hunters took 39 bears. That year was the first that subsistence moose hunting regulations were in place, and nonresidents and many nonlocal residents were prohibited from hunting moose. It may be that many nonlocals chose to hunt black bear rather than abandon their Yakutat area hunting trip entirely. Moose regulations in subsequent years reinstated a nonresident general season.

Annual harvests remained at about 24 black bears through the late 1980s then rose to 33 and 32 bears in 1990 and 1991, respectively; we have no explanation for this spike in harvest. Subsequent annual harvest during 1992–2000 averaged only 15 bears. More glacier bears are taken in the Unit 5 harvest, an average of 2–3 a year, than from other areas of Southeast Alaska. The harvest of glacier bears was 13% of all black bears killed by hunters during 1971–1989 and 17% of bears killed during 1990–1997.

The spring season has accounted for 92% of the Unit 5 harvest, which has been made up of 77% males since 1971. The percentage of males in the harvest increases to 82% if only the years 1990–1998 are considered. Nonresidents have taken 65% of Unit 5 black bears since 1971 and 68% of the harvest from 1990 through 1998. Aircraft and boats are the 2 predominant means of transport for Unit 5 black bear hunters, regularly accounting for more than 90% of reported hunts.

Historical harvest locations

There have been no changes in the primary locations where black bears have been killed in Unit 5.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

- Maintain a 3:1 male to female ratio in the harvest.

- Maintain a mean annual male skull size (length plus width) of at least 17.0 inches.

METHODS

Staff members of the Departments of Fish and Game and Public Safety sealed black bear hides and skulls. Biological and hunt information collected at the time of sealing included pelage color, sex, skull size (length plus width), date and location of kill, transportation method, and the type of any commercial services used. A premolar was collected from most bears and sent to Matson's Laboratory for age determination. Anecdotal information about conditions in the field was gathered at the same time. Tissue samples were collected from a sample of bears during the first year of the report period and sent to the University of Alaska Fairbanks for DNA analysis.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population information is not available for Unit 5 black bears, and because only data from successful hunters are available (Tables 1 and 2), effort information is incomplete. Harvest increased by 15% over the level of the previous reporting period (Table 3), and was similar to the harvest levels that occurred throughout the 1980s. Mean total skull size for male bears was below the previous 3-year mean, but met the management goal of 17.0 inches for the report period. A 3:1 male to female harvest ratio continued to be maintained, with 88% males in the harvest during the report period. The mean age of male and female bears was 8.0 and 11.0 years, respectively, greater than the previous report period.

Population size

No Unit 5 black bear population studies have been conducted. Population size or density estimates are difficult to obtain. The species generally inhabits forested areas, where aerial surveys are impractical, and vast remote areas also make studies difficult and expensive. Density estimates for Unit 5 are based on studies conducted in western Washington State in the 1960s (Poelker and Hartwell 1973). We believe minimum densities in mainland Southeast Alaska are slightly higher than the 1.4 bears per mi^2 found in the Washington study area. This equates to about 600 black bears in Unit 5A. Although this density is used in Unit 1C, it probably overestimates the number of Unit 5 black bears due to their displacement from some habitats by brown bears.

Population composition

Our management objective of a 3:1 male to female harvest ratio is aimed at assuring a minimal harvest of female bears. We lack reliable information on the composition of the bear population, but use the indirect index of the harvest sex ratio for insight into the availability of male bears in the population. On a very gross scale, if the female harvest increases, we interpret that as an

indication of fewer large male bears available to hunters. Based on the nearly 100% male harvest during this report period, it appears that there is no shortage of male bears in the population.

Glacier bears occur more frequently in Unit 5 than in other management units and are regularly harvested in small numbers. No cinnamon or Kermody (white) pelage black bears have been reported in Unit 5.

Distribution and movements

Our most reliable information on Unit 5 black bear distribution comes from hunter harvest. Unit 5B has few black bears, while Unit 5A has black bears distributed throughout. Brown bears are also abundant throughout the unit, and they displace black bears from many non-mountainous locales. Because of this displacement, most of the black bear harvest and observations are either along the coast or in foothills and mountainous areas within the subunit.

One human-caused factor that may affect the Unit 5 black bear distribution is the presence of an open landfill at the city of Yakutat. Black bears have occasionally been seen foraging at the landfill, and some harvest occurs in nearby areas.

MORTALITY

Harvest

Season	Bag Limits
1 Sep–30 June	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear.
1 Sep–30 Jun	Nonresident hunters: 1 bear.

Game Board Actions and Emergency Orders. No emergency orders were issued relating to black bears in Unit 5 during this report period.

Hunter Effort and Harvest. Black bear harvests ranged from 19 to 27 from 2001 to 2003, averaging 22.0 per regulatory year (Table 3), an increase of nearly 3 bears annually over the previous report period. More males were harvested than females, exceeding a 3:1 male-to-female ratio in all years. Ten bears, or approximately 15% of the harvest during this reporting period, were glacier bears (Table 3).

Effort expended by successful hunters per bear killed was 3.2 days compared to 4.7 for the previous report period. While nonresident effort dropped slightly, local effort more than tripled during this report period (Table 1). Although baiting is a legal method of pursuing black bears during the spring season in Unit 5, our records indicate that there is very little interest in using this method.

Hunter Residency and Success. Unlike the 3 previous report periods, nonresidents did not take the majority of Unit 5 black bears during the report period. The percentage of successful black bear hunters who were nonresidents was only 41%, compared to 62% from 1998 through 2000

(Table 1). Alaskans residing outside of Unit 5 harvested 9%, and Unit 5 residents harvested 50% of the bears taken.

Harvest Chronology. Historically, most Unit 5 black bears have been harvested during the spring. This trend continued throughout this report period, with 61 of the 66 bears harvested taken in spring. The reason for the concentrated spring harvest has to do with black bear accessibility. In spring black bears forage along beaches that hunters can access by boat, allowing them to effectively hunt large areas fairly easily. In the fall, however, bears are much harder to locate and access because they are foraging on fish streams bordered by dense vegetation or in mountainous terrain that is difficult to access.

Harvest in Particular Areas (WAAs). No changes stand out in analysis of the harvest distribution. Since 1990 (Table 4) the area between the Dangerous and Alsek rivers has produced 28% of the kill, and the Puget Peninsula abutting Yakutat Bay has accounted for another 24%.

Bait Stations. Although baiting is legal during the Unit 5 spring season, we did not issue any permits for this type of hunt.

Guided Hunter Harvest. Guided hunters accounted for 17 of 66 bears harvested, or 26% of the total during the report period. This is a significant decline from 1998–2000, when guided hunters accounted for 53% of the harvest.

Transport Methods and Commercial Services Used. Boats were the predominant transport means for Unit 5 black bear hunters (Table 1). Aircraft was the primary means of transportation on only 11% of reported hunts while boats were used on 74 percent. Commercial services were used by 27 (41%) of the 66 hunters, with 17 of these using a commercial guide, and 10 others using only transportation to the field (Table 2).

Other mortality

We do not have records of any DLP kills, road kills, or illegal kills during the period.

HABITAT

Assessment

Habitat alterations and concerns are mostly in the form of successional changes of logged areas. Future logging on U.S. Forest Service lands is likely to be confined to the area at the southern end of Russell Fjord. Most private land in the Yakutat area has already been logged.

Enhancement

No habitat enhancement projects intended to benefit black bears have been attempted in the unit. Although primarily intended as a silvicultural practice, precommercial thinning and pruning has been performed in some young second growth stands in Unit 5. While not the primary intent, this effort does provide a secondary benefit to wildlife by improving and extending habitat suitability in the short-term by reducing canopy cover which permits sunlight to reach the forest floor and increase the production of understory forage plants. These benefits last only 20–25 years, after which time canopy closure again results in loss of understudy vegetation. The long-term effects of clearcut logging will be detrimental to black bear populations.

NONREGULATORY MANAGEMENT PROBLEMS

In small communities, fish camps, and remote areas it is unusual to receive nuisance bear complaints because such issues are often dealt with locally without ADF&G being alerted. We do not believe that we have a significant issue with illegal harvest in Unit 5.

CONCLUSIONS AND RECOMMENDATIONS

The management objective of maintaining a 3:1 male to female harvest ratio was achieved in all three years of this report period. Our objective for male skull size was also met in each of the years. The mean age of harvested bears remained the same for males but increased substantially for females – this is likely related to sample size (n = 4). Although the number of black bears harvested from this unit is not great, the recent increase in local harvest needs to be closely monitored. Trends in harvest parameters should be looked at critically to keep us abreast of possible conservation concerns.

LITERATURE CITED

POELKER R.J. AND H.D. HARTWELL. 1973. Black bear of Washington. Biological Bulletin No. 14. Federal Aid Project W-71-R. Olympia, Washington. 180pp.

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Table 1 Unit 5 residency, mean days hunted, and transportation used by successful black bear hunters, 1992 through 2003

Regulatory year	Unit resident hunters	Unit resident days	Other AK resident hunters	Other AK resident days	Nonresident hunters	Nonresident days	Total effort hunters	Total effort days	Plane	Boat	ORV	Hwy vehicle	Foot	Unk
1992	2	2.5	4	4.0	12	3.6	18	3.6	9	9	0	0	0	0
1993	0	0.0	1	10.0	9	3.6	10	4.2	5	5	0	0	0	0
1994	4	1.5	4	5.8	6	3.2	14	3.4	4	6	0	0	0	0
1995	1	1.0	2	5.5	9	3.4	12	3.6	9	3	0	0	0	0
1996	1	1.0	3	7.0	11	5.4	15	5.4	9	6	0	0	0	0
1997	5	2.6	0	0.0	9	4.8	14	4.0	2	10	0	1	1	0
1998	1	4.0	10	6.1	13	5.9	24	5.8	13	10	0	0	1	0
1999	6	2.8	2	5.5	10	3.3	18	3.4	5	10	1	0	1	1
2000	2	3.5	1	1.0	13	5.1	16	4.6	3	10	3	0	0	0
2001	13	2.3	4	4.0	10	2.6	27	2.7	4	22	1	0	0	0
2002	12	2.3	1	7.0	7	3.8	20	3.1	0	15	0	5	0	0
2003	8	1.9	1	1.0	10	5.9	19	3.9	3	12	2	2	0	0
1995–1997 Mean	2.3	1.5	1.7	4.2	9.7	4.5	13.7	4.3	6.7	6.3	0	0.3	0.3	0
1998–2000 Mean	3.0	3.4	4.3	4.2	12	4.8	19.3	4.6	7.0	10.0	1.3	0	0.7	0.3
2001–2003 Mean	11.0	2.2	2.0	4.0	9.0	4.1	22	3.2	2.3	16.3	1.0	2.3	0	0

Table 2 Unit 5 commercial services used by successful black bear hunters, 1992 through 2003

Regulatory year	Unit residents		Other AK residents		Nonresidents		Total use		Transport	Registered guide
	NO	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**		
1992	2	0	2	2	1	13	5	15	7	8
1993	0	0	0	1	1	8	1	9	0	7
1994	4	0	4	0	2	5	7	5	0	0
1995	1	0	2	0	0	9	3	9	0	9
1996	1	0	2	1	0	11	3	9	0	9
1997	5	0	0	0	2	7	7	7	7	7
1998	1	0	7	3	2	11	10	14	3	10
1999	6	0	1	1	1	9	8	10	2	8
2000	2	0	1	0	0	13	3	13	0	13
2001	13	0	3	1	2	8	18	9	2	7
2002	12	0	0	1	0	7	12	8	2	6
2003	8	0	1	0	0	10	9	10	6	4
1995–1997 Mean	2.3	0	1.3	0.3	0.7	9.0	4.3	8.3	2.3	8.3
1998–2000 Mean	3.0	0	3.0	1.3	1.0	11.0	7.0	12.3	1.6	10.3
2001–2003 Mean	11.0	0	1.3	0.7	0.7	8.3	13.0	9.0	3.3	5.7

Table 3 Unit 5 black bear harvest, 1992 through 2003

Regulatory year		Harvest	Males	Females	Unk.	Male Mean skull	Male (n)	Male Mean age	Male (n)	Female Mean skull	Female (n)	Female Mean age	Female (n)	Color variant black	Color variant blue	
	Total	18	10	8	0	17.1	9	6.3	8	16.1	8	6.7	3	17	1	
1992	Fall	1	0	1	0	--	0			15.8	1					
	Spring	17	10	7	0	17.1	9			16.2	7					
	Total	10	8	2	0	17.5	8	5.0	1	15.2	2	--	0	8	2	
1993	Fall	0	0	0	0	--	0			--	0					
	Spring	10	8	2	0	17.5	8			15.2	2					
	Total	14	14	0	0	18.1	13	10.0	9	--	0	--	0	12	2	
1994	Fall	0	0	0	0	--	0									
	Spring	14	14	0	0	18.1	13									
	Total	12	12	0	0	17.0	11	10.4	9	--	0	--	0	11	1	
1995	Fall	0	0	0	0	--	0									
	Spring	12	12	0	0	17.0	11									
	Total	15	14	1	0	16.8	13	6.3	8	14.3	1	3.0	1	14	1	
1996	Fall	0	0	0	0	--	0			--	0					
	Spring	15	14	1	0	16.8	13			14.3	1					
	Total	14	11	3	0	15.9	10	5.3	6	15.5	3	3.0	3	12	2	
1997	Fall	2	1	1	0	13.6	1			16.9	1					
	Spring	12	10	2	0	16.1	9			14.8	2					
	Total	24	24	0	0	17.1	21	8.1	18	--	--	--	-	18		0
1998	Fall	1	1	0	0	16.3	1	5.0	1							
	Spring	23	23	0	0	17.1	20	8.3	17							

Table 3 continued

Regulatory year		Harvest	Males	Females	Unk.	Male				Female				Color variant	
						Mean skull	(n)	Mean age	(n)	Mean skull	(n)	Mean age	(n)	black	blue
	Total	18	15	3	0	17.6	15	7.6	15	15.8	3	10.3		14	4
1999	Fall	0	0	0	0	--	0								
	Spring	18	15	3	0	17.6	15								
	Total	16	15	1	0	17.2	15	6.9	15	15.8	1	6.0		15	2
2000	Fall	0	0	0	0	--									
	Spring	16	15	1	0	17.2	15								
	Total	27	24	3	0	17.1	21	7.7	18	15.9	3	6.0	1	24	3
2001	Fall	0	0	0	0	--	0								
	Spring	27	24	3	0	17.1	21								
	Total	20	17	3	0	16.9	17	8.5	13	15.9	3	13.5	2	17	3
2002	Fall	3	3	0	0	16.6	3								
	Spring	17	14	3	0	17.0	14								
	Total	19	17	2	0	17.7	17			16.0	2			15	4
2003	Fall	2	2	0	0	16.1	2								
	Spring	17	15	2	0	17.9	15								

Table 3 continued

Regulatory year	Harvest	Males	Females	Unk.	Male				Female				Color variant	
					Mean skull	(n)	Mean age	(n)	Mean skull	(n)	Mean age	(n)	black	blue
1995–1997 Mean	13.7	12.3	1.3	0.0	16.6*		7.3*		14.9*		3.0*		12.3	1.3
1998–2000 Mean	19.1	18.0	1.3	0.0	17.6*		7.6*		15.8*		9.3*		15.7	2.0
2001–2003 Mean	22.0	19.3	2.7	0.0	17.2*		8.0*		15.9*		11.0*		18.7	3.3

* Weighted mean

Table 4 Unit 5A black bear harvest from all Wildlife Analysis Areas (WAA), regulatory years 1992 through 2003

	Regulatory year									
WAA	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total
2101	0	2	0	0	4	0	0	0	2	8
2102	2	0	0	3	0	1	0	2	3	11
4503	7	5	5	7	4	5	5	4	5	47
4504	0	1	0	2	0	0	1	1	0	5
4505	1	2	4	1	1	3	4	2	5	23
4506	3	1	2	7	5	5	12	2	4	41
4508	0	1	4	4	4	1	5	9	0	28
4607	0	0	0	0	0	0	0	0	0	0
Unknown	0	2	1	0	1	2	0	0	0	6
TOTAL	13	14	16	24	19	17	27	20	19	169

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 6 (10,140 mi^2)

GEOGRAPHIC DESCRIPTION: Prince William Sound and North Gulf of Alaska coast

BACKGROUND

Black bears are common throughout most of Unit 6, with the exception of Montague, Hinchinbrook, several smaller islands in Prince William Sound (PWS), and Kayak and Middleton Islands along the North Gulf of Alaska Coast (NGC). Density is highest in western PWS and lower in eastern PWS and along the NGC. Modafferi (1978) roughly estimated densities of 0.5, 0.23, and 0.3 bears/km^2 in western PWS, eastern PWS, and along the NGC, respectively. Other density estimates for good habitat in PWS have ranged from 0.4 to 10 bears/km^2 (Grauvogel 1967; McIlroy 1970; Modafferi 1982). None of these estimates, however, was obtained by methods considered reliable for estimating bear population size or density.

Hunting pressure may have occasionally affected local populations. McIlroy (1970) reported that declining harvest and hunter success and increasing hunter-days per harvested bear indicated a declining black bear population in Valdez Arm (Unit 6D) between 1966 and 1969. Relatively high hunter effort documented by Modafferi (1978) around Whittier in 1977 may also have indicated a reduced population in western Unit 6D. In Unit 6C average skull size of male bears decreased during the mid to late 1990s, coincident with an increase in hunter harvest and effort.

Food abundance and weather conditions can affect black bear populations in Unit 6. Harvest data and incidental observations by guides, charters, and local hunters indicated that distribution and general abundance increased throughout Unit 6 during the mid to late 1990s and was at a high level. High salmon escapement and relatively mild winters probably contributed to the increase. Competition and predation by brown bears also may influence black bear numbers locally. The highest density occurs in western PWS where very few brown bears are present.

Harvest monitoring began in 1973 with mandatory sealing of hides. Before this requirement, annual harvests ranged from “practically nil” (Robards 1954) to more than 100 during 1965 and 1966 (McIlroy 1970). Sealing records indicated an average annual take of 118 bears from 1973 to 1983, 232 from 1984 to 1994, and 294 from 1995 to 2000. The Anton Anderson Memorial Tunnel (Whittier road) opened to highway vehicles in June 2000, which has allowed easier access to bear hunters in Unit 6D. Although the increasing trend in harvest began 4 years before the Whittier road opened, easier access has allowed the number of hunters to continue increasing in Unit 6D.

MANAGEMENT OBJECTIVES

The management objective for Unit 6 black bear is to maintain a black bear population that will sustain a 3-year average annual harvest of 200 bears composed of at least 75% males with a minimum average skull size of 17 inches.

METHODS

I assessed population size of black bears in Prince William Sound using a simple model combining harvest density within Uniform Coding Units (UCUs) and bear density estimates obtained by researchers who intensively studied limited areas of western PWS. UCUs are small areas within game management units generally bounded by watersheds, islands, or island groups in PWS. I subtracted alpine rock and ice from the total area of each UCU to obtain a measure of available habitat. Location of kill was obtained from sealing records. For UCUs in which the most recent 3-year average of harvest density was highest (arbitrarily set at ≥ 0.10 bears killed/km^2), I assumed the population was being harvested at 20%. For UCUs with lower harvest density, I assigned density estimates derived by Modafferi (1978) or McIlroy (1970). I divided UCUs in PWS into ecological units established by Modafferi (1982), derived density estimates for each area, and compared my results to other regions in which reliable density estimates had been obtained.

We sealed hides and skulls of all black bears in the reported harvest. Reported harvest included bears taken by licensed hunters and bears killed in defense of life or property. Staff checked each hide for sex identifiers and took skull measurements for total length and zygomatic width. We recorded harvest date, days hunted, location of harvest, and type of transportation used for access to the hunting area. We estimated unreported and illegal kills. Unreported harvest included wounding loss and bears taken by hunters and not sealed.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

My modeling exercise suggested black bear densities ranged from 0.35 to 0.73 bears/km^2 in Unit 6D (Appendix 1, Table 1). Peacock (2004) estimated a black bear density of 1.51 bears/km^2 on Kuiu Island in Southeast Alaska. Because of the more northerly latitude of PWS, I would not expect that bear density here would be as high. However, 10 out of 60 UCUs modeled did produce bear densities of ≥ 1.0 bears/km^2 in Unit 6D. Several UCUs sustained a harvest density greater than reported bear densities from various other populations (Appendix 1, Table 2).

Given that hunting pressure is not decreasing in western PWS (Unit 6D), an examination of annual harvest distribution could be an indication of population trend within smaller areas. In Appendix 1, Table 1, ecological units (EUs) 4 and 5 were most easily accessed by hunters coming out of Whittier. Harvest increased in these areas through 1998–2000, after which it abruptly stabilized or slightly decreased. EUs 3 and 6, which are farther out from Whittier, lagged behind by a 2–3 year period before harvest in these areas also stabilized or decreased. On Knight Island (EU 7), a less popular destination for bear hunters, harvest still was increasing. These data suggest harvest may have halted the increasing trend in bear density that began during the mid 1990s. There is little evidence that bear density is decreasing, with the possible

exception of EU 3. However, other parameters, including male and female skull size and proportion of females in the harvest, indicated that bears in EU 3 were not yet decreasing. Behavioral factors may have also contributed to decreased harvest, such as avoiding beaches (as do the majority of females bears) or using beaches late at night.

MORTALITY

Harvest

Season and Bag Limit. The season for Units 6A and B was 20 August–30 June, and for Units 6C and D the season was 1 September–30 June. The bag limit was one bear in Unit 6.

Board of Game Actions and Emergency Orders. The Board of Game changed the season opening date for black bears from 1 September to 20 August beginning in regulatory year 2001 for Units 6A and 6B. This was to provide bear-hunting opportunity for early-season goat hunters. The board prohibited the shooting of black bears from a boat beginning in regulatory year 2003 in Unit 6D in an effort to reduce wounding loss that undoubtedly occurred.

Hunter Harvest. Black bear harvest in Unit 6 is reported in Table 1. The majority of the harvest was male (71–78%), and most bears were taken in Unit 6D (83–89%). Hunter harvest during the past 5 regulatory years averaged 428 bears. The harvest peaked in regulatory year 2001–02 at 491 bears. Modeling suggested a harvest rate of 12.5% in Unit 6D.

Mean skull size among males harvested during the past 3 years was 17.1 inches (Table 2). The largest skulls (18.0 inches average) came from Unit 6A, and the smallest (16.9 inches) were reported in Unit 6C. Over the past 5 years, no trends were obvious.

Unit 6D is of special concern because of historically high harvest and easier access into Prince William Sound from the largest population center of Alaska. Although hunting pressure continued to increase through the reporting period, harvest peaked in 2001 at 435 bears and remained below 400 bears during subsequent years (Table 1). The number of days hunted/bear killed was on a slight upward trend after a record low of 3.2 days/kill set in 2000. The proportion of females in the harvest exceeded the management objective of 25% during 2001 and 2002 but fell below 25% in 2003 (Table 1). Average skull size for males in Unit 6D declined by about 0.2 inches between 1987 and 1996, but remained stable since. During the same period, the average skull size for male bears in Unit 6C, which had a smaller bear population with heavy harvest, declined by 0.75 inches. Average female skull sizes in both 6C and 6D did not change.

Harvest distribution in Unit 6D has changed during the last 10 years. Much of the harvest was focused near Whittier and Valdez during the 1990s but is now distributed to the far reaches of PWS (Figure 1). An increasing number of transporters, fuel-efficient four-stroke engines, and inexpensive GPS (global positioning system) units have contributed to the longer range of bear hunters.

Hunter Residency. Nonresident hunters killed the majority of bears in Units 6A and 6B (Table 3). Nonlocal residents took most bears in Units 6C and 6D. Residency of successful hunters did not change significantly over the past 5 years in Units 6A–C. In Unit 6D the proportion of

nonresident harvests was increasing (Table 3). This trend began during the early 1990s, when the proportion of nonresident hunters in Unit 6D was approximately 18%.

Harvest Chronology. Most bears were taken in May during this reporting period (Table 4) and during the past 5 years. Black bears exhibited sexual segregation during the spring (Modafferi 1982). Male black bears in Unit 6D tended to move down to beaches after emerging from winter dens to feed on new sedges and grasses, making them more vulnerable to harvest during this period. Females tended to remain away from beaches, instead favoring south-facing slopes and avalanche chutes that green up early in the season. Both in Alaska (Schwartz et. al. 1986) and Minnesota (Rogers 1987), den emergence was correlated with weather conditions. By the time the fall season opens, most bears were feeding on berries at higher elevations, where they were much less vulnerable to hunting, as indicated by the fall harvest in Table 4. Although fewer bears were harvested in the fall, a higher proportion of females were taken (Table 1). Most bears were in the den by mid October.

Transport Methods. Most successful hunters used boats and airplanes for transportation during the past 3 years (Table 5). Airplanes provided most of the transportation in Units 6A and 6B. Highway vehicles, boats and 4-wheelers were important in Unit 6C, and boats were used most in Unit 6D.

Other Mortality

An unknown proportion of bears was wounded by hunters, not recovered and died (wounding loss). I arbitrarily set the rate of wounding loss at 10–15% of the harvest. This was recorded as part of the estimated unreported kill (Table 1). At least 10 black bears were illegally snared for the gall bladder market by poachers during 2002 in Unit 6D. The poachers were caught, convicted, and fined heavily.

CONCLUSIONS AND RECOMMENDATIONS

Black bear populations and harvest in Units 6A–6C were at acceptable levels. I recommend no changes or management actions.

In unit 6D, where harvest may be impacting the population, I recommend shortening the spring season by several weeks. It is difficult to predict if the current harvest is sustainable because of the lack of a population estimate. Therefore, I also recommend that we conduct a population study using the tetracycline biomarker method (Garshelis and Visser 1997; Peacock 2004). At minimum, we should collect teeth from harvested bears to compare the age structure in the harvest and female reproductive histories (Coy and Garshelis 1992) now versus during the mid 1990s. Finally, we should have bear sealing available in Whittier, during which successful and unsuccessful hunters could complete a brief questionnaire on hunting effort. From these data I could estimate hunter success and the number of unsuccessful hunters.

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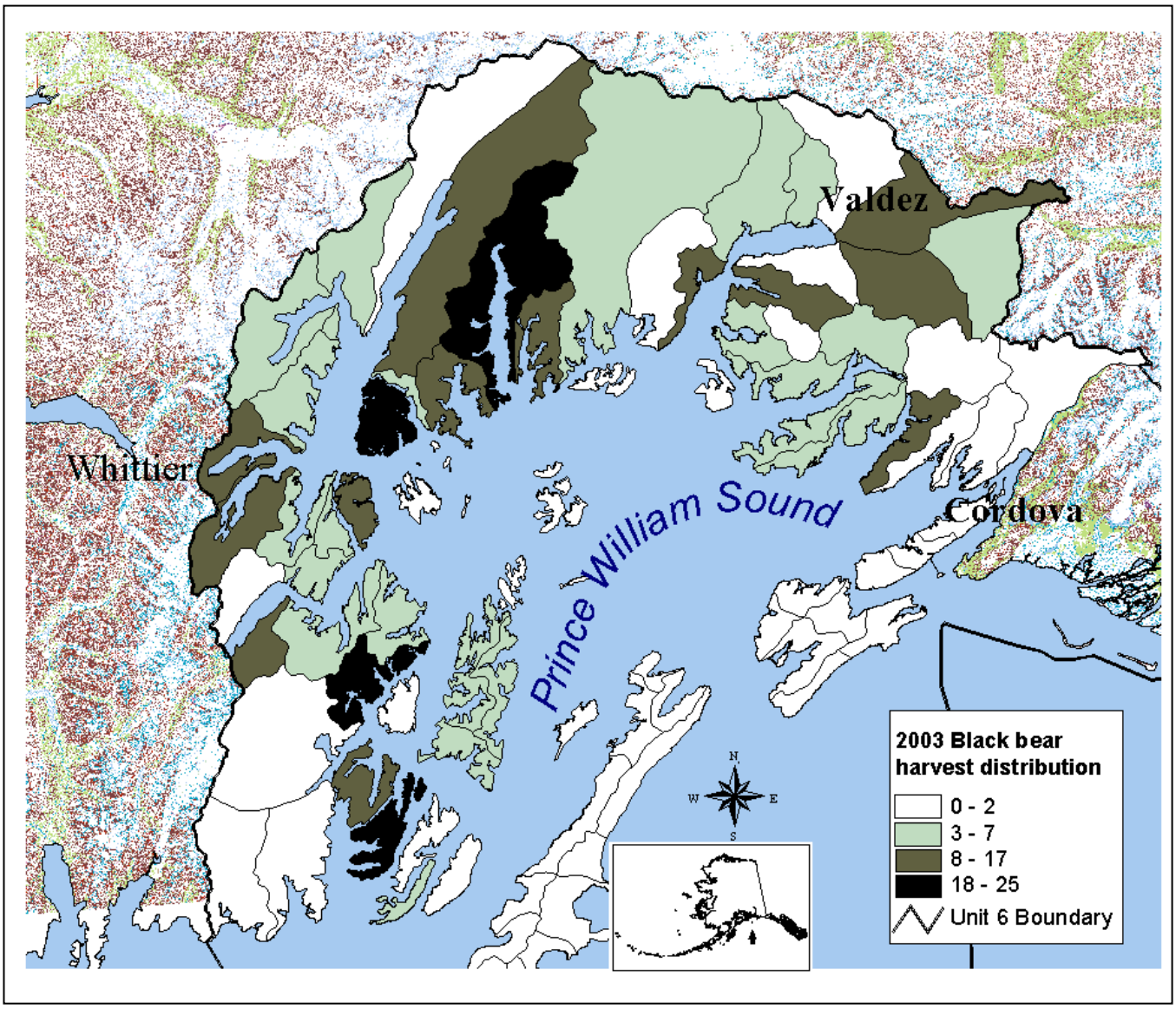

Figure 1 Distribution of black bear harvest in Unit 6D during regulatory year 2003

Table 1 Unit 6 black bear harvest, 1999–2003

Subunit/	Reported																
Regulatory	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
Year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
6A/1999																	
Fall 99	3	1	(25)	0	4	0	0	0	0	0		3	(75)	1	(25)	0	4
Spring 00	16	1	(6)	0	17	0	0	0	0	2		16	(94)	1	(6)	2	19
Total	19	2	(10)	0	21	0	0	0	0	2	0	19	(90)	2	(10)	2	23
6A/2000																	
Fall 00	3	0	(0)	0	3	0	1	0	1	0	0	4	(100)	0	(0)	1	5
Spring 01	15	0	(0)	0	15	0	0	0	0	2	0	15	(100)	0	(0)	2	17
Total	18	0	(0)	0	18	0	1	0	1	2	0	19	(100)	0	(0)	3	22
6A/2001																	
Fall 01	0	1	(100)	0	1	0	0	0	0	0	0	0	(0)	1	(100)	0	1
Spring 02	12	1	(8)	0	13	1	0	0	0	2	0	12	(92)	1	(8)	2	15
Total	12	2	(14)	0	14	1	0	0	0	2	0	12	(86)	2	(14)	2	16
6A/2002																	
Fall 02	5	0	(0)	0	5	0	0	0	0	1	0	5	(100)	0	(0)	1	6
Spring 03	23	2	(8)	0	25	0	0	0	0	3	0	23	(92)	2	(8)	3	28
Total	28	2	(7)	0	30	0	0	0	0	4	0	28	(93)	2	(7)	4	34

Table 1 continued

Subunit/	Reported																
Regulatory	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
Year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
6A/2003																	
Fall 03	4	2	(33)	0	6	0	0	0	0	1		4	(67)	2	(33)	1	7
Spring 04	23	1	(4)	0	24	0	0	0	1	3		23	(96)	1	(4)	4	28
Total	27	3	(10)	0	30	0	0	0	1	4	0	27	(90)	3	(10)	5	35
6B/1999																	
Fall 99	2	0	(0)	0	2	0	0	0	0	0	0	2	(0)	0	(0)	0	2
Spring 00	8	0	(0)	0	8	0	0	0	0	1	0	8	(100)	0	(0)	1	9
Total	10	0	(0)	0	10	0	0	0	0	1	0	10	(100)	0	(0)	1	11
6B/2000																	
Fall 00	0	0	(0)	0	0	0	0	0	0	0	0	0	(0)	0	(0)	0	0
Spring 01	6	0	(0)	1	7		0	0	0	1	0	6	(0)	0	(0)	2	8
Total	6	0	(0)	1	7	0	0	0	0	1	0	6	(100)	0	(0)	2	8
6B/2001																	
Fall 01	1	0	(0)	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	1
Spring 02	9	0	(0)	0	9	0	0	0	0	1	0	9	(100)	0	(0)	1	10
Total	10	0	(0)	0	10	0	0	0	0	1	0	10	(100)	0	(0)	1	11

Table 1 continued

Subunit/	Reported																
Regulatory	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
Year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
6B/2002																	
Fall 02	0	0	(0)	0	0	0	0	0	0	0	0	0	(0)	0	(0)	0	0
Spring 03	12	1	(8)	0	13	0	0	0	0	2	0	12	(0)	1	(0)	2	15
Total	12	1	(8)	0	13	0	0	0	0	2	0	12	(0)	1	(0)	2	15
6B/2003																	
Fall 03	1	0	(0)	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	1
Spring 04	6	0	(0)	0	6	0	0	0	1	1	0	6	(100)	0	(0)	2	8
Total	7	0	(0)	0	7	0	0	0	1	1	0	7	(100)	0	(0)	2	9
6C/1999																	
Fall 99	10	2	(17)	0	12	0	0	1	0	1	0	10	(77)	3	(23)	1	14
Spring 00	17	3	(15)	0	20	5	0	0	0	2	1	17	(85)	3	(15)	3	23
Total	27	5	(16)	0	32	5	0	1	0	3	1	27	(82)	6	(18)	4	37
6C/2000																	
Fall 00	8	2	(20)	0	10	0	0	0	0	1	0	8	(80)	2	(20)	1	11
Spring 01	20	8	(29)	0	28	9	1	0	0	3	0	21	(72)	8	(28)	3	32
Total	28	10	(26)	0	38	9	1	0	0	4	0	29	(74)	10	(26)	4	43

Table 1 continued

Subunit/	Reported																
Regulatory	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
6C/2001																	
Fall 01	9	3	(25)	0	12	0	1	1	0	1	0	10	(71)	4	(29)	1	15
Spring 02	16	4	(20)	0	20	3	0	0	0	2	0	16	(80)	4	(20)	2	22
Total	25	7	(22)	0	32	3	1	1	0	4	0	26	(76)	8	(24)	4	38
6C/2002																	
Fall 02	4	4	(50)	0	8	0	0	0	1	1	0	4	(50)	4	(50)	2	10
Spring 03	12	2	(14)	0	14	1	0	0	0	2	0	12	(86)	2	(14)	2	16
Total	16	6	(27)	0	22	1	0	0	1	3	0	16	(73)	6	(27)	4	26
6C/2003																	
Fall 03	4	6	(60)	0	10	0	2	0	0	1	0	6	(50)	6	(50)	1	13
Spring 04	16	2	(11)	0	18	2	0	0	0	2	0	16	(89)	2	(11)	2	20
Total	20	8	(29)	0	28	2	2	0	0	3	0	22	(73)	8	(27)	3	33
6D/1999																	
Fall 99	36	15	(29)	0	51	0	2	1	3	6	1	38	(70)	16	(30)	10	64
Spring 00	225	42	(16)	1	268	14	1	1	2	32	1	226	(84)	43	(16)	36	305
Total	261	57	(18)	1	319	14	3	2	5	38	2	264	(82)	59	(18)	46	369

Table 1 continued

Subunit/	Reported																
Regulatory	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
6D/2000																	
Fall 00	35	16	(31)	0	51	0	1	0	0	6	0	36	(69)	16	(31)	6	58
Spring 01	282	60	(18)	1	343	20	1	1	1	41	0		(0)	61	(100)	43	104
Total	317	76	(19)	1	394	20	2	1	1	47	0	319	(81)	77	(19)	49	445
6D/2001																	
Fall 01	48	34	(41)	0	82	0	1	0	0	10	0	49	(59)	34	(41)	10	93
Spring 02	253	100	(28)	0	353	34	0	0	0	42	0	253	(72)	100	(28)	42	395
Total	301	134	(31)	0	435	34	1	0	0	52	0	302	(69)	134	(31)	52	488
6D/2002																	
Fall 02	46	27	(37)	0	73	0	0	0	0	9	10	46	(63)	27	(37)	19	92
Spring 03	182	69	(27)	0	251	27	0	0	0	30	0	182	(73)	69	(27)	30	281
Total	228	96	(30)	0	324	27	0	0	0	39	10	228	(70)	96	(30)	49	373
6D/2003																	
Fall 03	23	28	(55)	0	51	0	1	1	2	6		24	(45)	29	(55)	8	61
Spring 04	249	51	(17)	2	302	59	0	0	0	36		249	(83)	51	(17)	38	338
Total	272	79	(23)	2	353	59	1	1	2	42	0	273	(77)	80	(23)	46	399

Table 1 continued

Subunit/	Reported																
Regulatory	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
Year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
UNIT 6																	
TOTAL																	
1999																	
Fall 99	51	18	(26)	0	69	0	2	2	3	7	1	53	(73)	20	(27)	11	84
Spring 00	266	46	(15)	1	313	19	1	1	2	38	2	267	(85)	47	(15)	43	357
Total	317	64	(17)	1	382	19	3	3	5	45	3	320	(83)	67	(17)	54	441
2000																	
Fall 00	46	18	(28)	0	64	0	2	0	1	7	0	48	(73)	18	(27)	8	74
Spring 01	323	68	(17)	2	393	29	2	1	1	47	0	325	(82)	69	(18)	50	444
Total	369	86	(19)	2	457	29	4	1	2	55	0	373	(81)	87	(19)	59	519
2001																	
Fall 01	58	38	(40)	0	96	0	2	1	0	12	0	60	(61)	39	(39)	12	111
Spring 02	290	105	(27)	0	395	38	0	0	0	47	0	290	(73)	105	(27)	47	442
Total	348	143	(29)	0	491	38	2	1	0	59	0	350	(71)	144	(29)	59	553
2002																	
Fall 02	56	31	(36)	0	87	0	0	0	0	10	10	56	(64)	31	(36)	20	107
Spring 03	229	74	(24)	0	303	28	0	0	0	36	0	229	(76)	74	(24)	36	339
Total	285	105	(27)	0	390	28	0	0	0	47	10	285	(73)	105	(27)	57	447

Table 1 continued

Subunit/ Regulatory year	Reported									Estimated kill		Total estimated kill					
	Hunter kill						Nonhunting kill										
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
2003																	
Fall 03	32	36	(53)	0	68	0	3	1	0	8	0	35	(49)	37	(51)	8	80
Spring 04	294	54	(16)	2	350	61	0	0	2	42	0	294	(84)	54	(16)	46	394
Total	326	90	(22)	2	418	61	3	1	2	50	0	329	(78)	91	(22)	54	474

Table 2 Unit 6 black bear harvest mean skull size (length + width), 1999–2003

Subunit	Regulatory year	Males		Females	
		Mean (in)	*n*	Mean (in)	*n*
6A	1999–00	17.50	19	16.40	1
	2000–01	17.80	20		0
	2001–02	18.10	12	15.85	2
	2002–03	17.87	28	15.50	2
	2003–04	17.97	25	16.73	3
6B	1999–00	17.30	10		0
	2000–01	17.70	6		0
	2001–02	17.09	10		0
	2002–03	18.21	12	16.69	1
	2003–04	17.84	7		0
6C	1999–00	16.50	27	15.30	5
	2000–01	16.60	28	15.20	10
	2001–02	16.89	25	15.36	8
	2002–03	16.52	14	15.42	6
	2003–04	17.19	22	15.48	7

Table 2 continued

Subunit	Regulatory year	Males		Females	
		Mean (in)	*n*	Mean (in)	*n*
6D	1999–00	17.20	237	15.40	53
	2000–01	16.90	295	15.40	61
	2001–02	17.08	290	15.59	126
	2002–03	17.10	219	15.60	96
	2003–04	17.01	262	15.59	78
Unit 6	1999–00	17.13	293	15.70	59
Total	2000–01	16.90	349	15.40	71
	2001–02	17.10	337	15.58	136
	2002–03	17.12	273	15.59	105
	2003–04	17.12	316	15.54	88

Table 3 Unit 6 black bear successful hunter residency, 1999–2003

Subunit	Regulatory year	Local resident [a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total Successful hunters [b]
6A	1999–00	2	(10)	8	(38)	11	(52)	21
	2000–01	0	(0)	3	(17)	15	(83)	18
	2001–02	4	(29)	1	(7)	9	(64)	14
	2002–03	4	(13)	3	(10)	23	(77)	30
	2003–04	1	(3)	7	(23)	22	(73)	30
6B	1999–00	3	(30)	3	(30)	4	(40)	10
	2000–01	0		3	(43)	4	(57)	7
	2001–02	0		3	(30)	7	(70)	10
	2002–03	2	(15)	4	(31)	7	(54)	13
	2003–04	2	(29)	2	(29)	3	(43)	7
6C	1999–00	20	(63)	10	(31)	2	(6)	32
	2000–01	15	(39)	17	(45)	6	(16)	38
	2001–02	7	(22)	22	(69)	3	(9)	32
	2002–03	11	(50)	6	(27)	5	(23)	22
	2003–04	6	(21)	13	(46)	9	(32)	28

Table 3 continued

Subunit	Regulatory year	Local resident [a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total Successful hunters [b]
6D	1999–00	19	(6)	210	(66)	90	(28)	319
	2000–01	35	(9)	260	(66)	98	(25)	394
	2001–02	30	(7)	276	(63)	129	(30)	435
	2002–03	32	(10)	185	(57)	106	(33)	324
	2003–04	36	(10)	186	(53)	127	(36)	353
Unit 6	1999–00	44	(12)	231	(60)	107	(28)	382
Total	2000–01	50	(11)	283	(62)	123	(27)	457
	2001–02	41	(8)	302	(62)	148	(30)	491
	2002–03	49	(13)	198	(51)	141	(36)	389
	2003–04	45	(11)	208	(50)	161	(39)	418

[a] Residents of Unit 6.

[b] Total includes hunters with unknown residency and subunit.

Table 4 Unit 6 black bear harvest chronology percent by harvest period, 1999–2003

		Harvest periods [a]										
	Regulatory	September		October		April		May		June		
Subunit	year	1–15	16–30	1–15	16–31	1–15	16–30	1–15	16–31	1–15	16–30	*n*
6A	1999–00	10	0	0	10	0	10	33	38	0	0	21
	2000–01	0	11	6	0	0	6	33	44	0	0	18
	2001–02	0	0	7	0	0	7	43	43	0	0	14
	2002–03	10	3	3	0	0	3	43	33	3	0	30
	2003–04	13	3	3	0	0	10	37	33	0	0	30
6B	1999–00	0	10	10	0	0	10	0	70	0	0	10
	2000–01	0	0	0	0	0	0	86	14	0	0	7
	2001–02	10	0	0	0	0	0	40	40	10	0	10
	2002–03	0	0	0	0	0	15	54	31	0	0	13
	2003–04	14	0	0	0	0	0	29	57	0	0	7
6C	1999–00	19	6	13	0	0	0	13	41	9	0	32
	2000–01	13	8	5	0	0	3	8	37	21	5	38
	2001–02	28	6	3	0	0	0	3	56	3	0	32
	2002–03	9	18	9	0	0	0	27	18	18	0	22
	2003–04	25	7	4	0	4	0	36	11	7	7	28
6D	1999–00	12	3	2	0	0	1	13	47	18	5	319
	2000–01	8	4	3	0	0	1	15	46	21	4	394
	2001–02	12	4	3	0	0	0	13	45	22	2	432
	2002–03	11	7	3	1	0	1	19	44	11	2	324
	2003–04	9	3	2	0	0	0	17	46	19	3	353
Unit 6	1999–00	12	3	3	1	0	2	14	46	16	4	382
Total[b]	2000–01	8	5	1	0	0	1	16	45	20	4	457
	2001–02	13	4	3	0	0	0	13	45	19	2	488
	2002–03	11	7	3	1	0	2	22	42	10	2	389
	2003–04	11	3	2	0	0	1	20	43	16	3	418

[a] Bears were not taken during November–March.
[b] Total includes bears taken in unknown subunits.

Table 5 Unit 6 black bear harvest percent by transport method, 1999 to 2003

Subunit	Regulatory year	Percent of harvest								
		Airplane	Horse	Boat	3- or 4-wheeler	Snow-machine	ORV	Highway Vehicle	Unknown	*n*
6A	1999–00	76	0	5	5	0	0	10	10	21
	2000–01	83	0	6	6	0	0	0	0	18
	2001–02	100	0	0	0	0	0	0	0	14
	2002–03	93	0	0	0	0	0	3	3	29
	2003–04	87	0	3	3	0	0	7	0	30
6B	1999–00	50	0	0	0	0	0	40	40	10
	2000–01	29	0	14	14	0	0	43	43	7
	2001–02	10	0	30	0	20	0	40	0	10
	2002–03	46	0	8	15	0	0	31	0	13
	2003–04	43	0	29	14	14	0	0	0	7
6C	1999–00	3	0	19	22	0	0	44	44	32
	2000–01	0	0	8	21	0	0	58	58	38
	2001–02	0	0	22	16	0	0	56	56	32
	2002–03	0	0	18	23	0	0	55	5	22
	2003–04	4	0	11	11	0	0	57	18	28

Table 5 continued

Subunit	Regulatory year	Percent of harvest								n
		Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	
6D	1999–00	7	0	87	1	0	0	3	3	318
	2000–01	4	0	89	2	0	0	4	4	394
	2001–02	7	0	87	3	0	0	2	2	435
	2002–03	3	0	87	3	0	0	4	4	324
	2003–04	3	0	89	3	0	0	4	4	353
Unit 6 Total [a]	1999–00	12	0	75	3	0	0	8	8	381
	2000–01	7	0	77	4	0	0	9	9	457
	2001–02	9	0	79	4	0	0	6	6	491
	2002–03	11	0	74	5	0	0	7	7	388
	2003–04	10	0	77	4	0	0	8	8	418

[a] Total includes bears taken in unknown subunits.

Appendix 1

Table 1 Results of Unit 6D black bear population assessment. Modeling results are speculative and should not be considered actual estimates of population or density.

Ecological Unit	3-year average 2001–2003		Change in 3-year average harvests			Modeling results		
	Hunter kill	Harvest density (kill/km^2)	1998–00 minus 1995–97	2000–03 minus 1998–00	2003 minus 2000–02[a]	Density (bears/km^2)	Population size	Theoretical harvest rate (%) 3-year avg.
1) Eastern PWS	33	0.04	+14	+6	-6	0.35	372	10.3
2) Valdez Arm	53	0.06	+16	+7	+5	0.44	441	14.2
3) Esther Is. – Columbia Gl.	97	0.09	+25	+39	–23	0.56	701	16.2
4) Port Wells/College Fiord	24	0.04	+14	–6	+1	0.45	332	8.5
5) Passage Canal (Whittier) – west side Nellie Juan	45	0.11	+24	+1	–2	0.55	422	12.4
6) Southwestern PWS	97	0.08	+18	+26	0	0.73	1007	11.2
7) Knight Island	13	0.05	+2	+9	+6	0.52	122	12.6
Total PWS	362	0.07	+112	+82	–19	0.54	3397	12.5

[a] Most recent harvest (from 2003–04) minus the previous 3-year average (2000–2002).

Appendix 1

Table 2 Various estimates of black bear density and harvest density.

Source/location	Bears/ km^2	Bears/mi^2
Black bear density estimates		
Prince William Sound, modeling results[a]	0.54	1.40
Modafferi 1982, western PWS [a]	0.50	1.30
Peacock 2004, Kuiu Island, Southeast Alaska	1.51	3.90
Schwartz and Franzmann (1991), Kenai 1947 burn	0.21	0.53
Schwartz and Franzmann (1991), Kenai 1969 burn	0.27	0.69
Kontio et al. 1998, central Minnesota	0.33	0.85
Miller et al. 1997, Mid Susitna River Basin	0.09	0.23
Selected harvest densities (kill/km^2), western Prince William Sound[b]		
SE Kings Bay: 1999 and 2001	0.33	0.85
Culross Island: 1999–2001	0.24	0.63
Blackstone Bay: 2000, 2001 and 2003	0.19	0.50
Average harvest density, 2001–2003	0.08	0.21

[a] Not a true estimate, based on unverified assumptions.
[b] From bear sealing records.

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNITS: 7 and 15 (8,397 mi^2)

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Black bear densities in Unit 15A were estimated at 205 bears/1000 km^2 within the 1947 burn and 265/1000 km^2 in the 1969 burn (Schwartz and Franzmann 1991). No other surveys to assess population size have been conducted. There have been several studies conducted on black bears on the Kenai Peninsula looking at predation (Franzmann and Schwartz 1986; Schwartz and Franzmann 1983 and 1989), food habits (Smith 1984), habitat (Schwartz and Franzmann 1991), dispersal (Schwartz and Franzmann 1992), and denning (Schwartz et al. 1987).

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Provide the opportunity to hunt black bears, using seasons and bag limits to regulate the take so we do not exceed an average of 40% females in the harvest during the most recent 3-year period.

METHODS

The department monitors the harvest of black bears through a mandatory sealing program established in 1973. Hides and skulls of all black bears reported killed are sealed with metal locking tags, and information is collected and entered on bear sealing forms. All of the harvest data is now kept at the department's Web-based database called WinfoNet. This report reflects updated tables using data from WinfoNet; therefore, data may differ slightly from past reports.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The black bear population on the Kenai Peninsula appears stable. Using Schwartz and Franzmann's (1991) lower density estimate of 205 bears/1000 km^2 from Unit 15A and assumed higher densities along the southern outer coast, we estimate about 3000–4000 black bears throughout Units 7 and 15.

Distribution and Movements

The distribution and abundance of devil's club is an important factor affecting distribution and movements of black bears (Schwartz and Franzmann 1991). Devil's club may be affected by spruce beetle infestation when more light penetrates to the forest floor after the removal of the canopy. Black bears appear in greater densities along the southern outer coast, probably due to healthy salmon runs coupled with low densities of competing brown bears.

MORTALITY

Harvest

Season and Bag Limit. Black bear hunting has been open year-round on the Kenai Peninsula since 1980. Since 1994, the bag limit has been 2 bears per regulatory year (1 bear 1 Jul–31 Dec; 1 bear 1 Jan–30 Jun). It is illegal to take cubs or females accompanied by cubs.

Bear baiting is allowed through a registration permit from 15 April through 15 June, except in Resurrection Creek and its tributaries in Unit 7 or within 1/4 mile along the Kenai, Kasilof, and Swanson Rivers in Units 7 and 15. Baiting is also restricted within the Kenai National Wildlife Refuge. Completion of a bear-baiting clinic is required by all permit holders in Units 7 and 15.

Board of Game Action and Emergency Orders. There have been no Board of Game actions for black bears during the reporting period.

Hunter Harvest. During the most recent 3-year period (regulatory years 2001–2003), the annual average for percent females in the harvest was 26%. The average 5-year harvest was 349 bears taken annually (Table 1). Females averaged 26% of the harvest during this period. Hunters harvested an average of 83 bears each year over bait, which accounted for an average of 24% of the annual harvest during the past 5 years (Table 2).

Hunter Residency and Success. Local residents of the Kenai Peninsula and other Alaskan residents participate in black bear baiting and non-baiting hunting in Units 7 and 15 in similar proportions (Tables 3 and 4). Black bear hunting by nonresidents appears to be increasing (Table 4).

Harvest Chronology. May is the month when most of the black bear harvest occurs (Table 5).

Transport Methods. Transport by boat was the top method used by successful bear hunters (Table 6), which is probably driven by the popularity of hunting black bears around the outer coast in the southern part of the Kenai Peninsula.

CONCLUSIONS AND RECOMMENDATIONS

Black bears are an important big game species in Units 7 and 15, second only to moose in numbers of animals harvested. Bear hunting continues to increase in popularity because of a lengthy season, liberal bag limit, and an alternative meat source to other big game. The department will continue to assess the sustainability of the harvest by monitoring the percent females in the harvest, skull size trends, and anecdotal assessments while flying surveys for other

species. We are meeting our management objective using the current seasons and bag limits, so no changes are recommended at this time.

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Table 1 Units 7 and 15 black bear harvest[a], 1999–2003

Regulatory	Reported Hunter Kill						Nonhunting Kill[a]			Total Estimated kill					
year	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
1999															
Fall 99	49	20	(29)	1	70		2	5	1	51	(65)	25	(32)	2	78
Spring 00	188	45	(19)	0	233		1	0	0	189	(81)	45	(19)	0	234
Total	237	65	(22)	1	301	92	3	5	1	240	(77)	70	(23)	2	312
2000															
Fall 00	82	31	(27)	0	113		6	5	0	88	(71)	36	(29)	0	124
Spring 01	160	68	(30)	0	228		2	0	0	162	(70)	68	(30)	0	230
Total	242	99	(29)	0	341	80	8	5	0	250	(69)	104	(29)	0	354
2001															
Fall 01	91	42	(32)	1	134		3	4	0	94	(67)	46	(33)	1	141
Spring 02	187	51	(21)	0	238		1	1	0	188	(78)	52	(22)	0	240
Total	278	93	(25)	1	372	64	4	5	0	282	(74)	98	(26)	1	381
2002															
Fall 02	70	24	(25)	0	94		5	2	0	75	(74)	26	(26)	0	101
Spring 03	183	61	(25)	0	244		3	0	1	186	(75)	61	(25)	1	248
Total	253	85	(25)	0	338	94	8	2	1	261	(75)	87	(25)	1	349
2003															
Fall 03	56	38	(40)	1	95		2	1	1	58	(60)	39	(39)	2	99
Spring 04	188	56	(23)	2	246		3	2	0	191	(77)	58	(23)	2	251
Total	244	94	(28)	3	341	87	5	3	1	249	(72)	97	(28)	4	350

[a]Includes defense of life or property kills, deaths due to vehicle collision, research mortalities, illegal kills, and unknown causes of mortality.
All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 2 Units 7 and 15 black bear harvest over bait stations, 2000–2004

Spring season	Unit 7		Subunit 15A		Subunit 15B		Subunit 15C		Total	%F
	M	F	M	F	M	F	M	F		
2000	43	13	23	7	0	0	5	1	92	(23)
2001	34	16	14	12	0	0	2	2	80	(38)
2002	29	6	19	5	0	0	4	1	64	(19)
2003	47	18	16	8	0	0	3	2	94	(30)
2004	50	17	9	5	1	1	2	2	87	(29)

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 3 Units 7 and 15 black bear baiting station information for the Kenai Peninsula, 1999–2003

Spring season	Local residents[a]	Nonlocal residents	Nonresidents	Total permits	Total stations	Bears harvested
2000	89	126	0	148	215	92
2001	136	151	0	209	290	80
2002	147	139	4	211	290	64
2003	141	154	4	212	299	94
2004	168	179	0	205	347	87

[a] Resident of Unit 7 or 15.

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 4 Units 7 and 15 black bear harvest by residency, 1999–2003

Regulatory year	Local[a] Resident	(%)	Nonlocal Resident	(%)	Nonresident	(%)	Residency Unknown	(%)	Total Successful Hunters[b]
1999–00	137	(44)	110	(35)	61	(20)	4	(1)	312
2000–01	151	(43)	117	(33)	75	(21)	11	(3)	354
2001–02	190	(50)	106	(28)	83	(22)	2	(1)	381
2002–03	131	(38)	125	(36)	92	(26)	1	(<1)	349
2003–04	133	(38)	109	(31)	105	(30)	3	(1)	350

[a] Resident of GMU 7 or 15.
[b] Includes nonsport harvest.
All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 5 Units 7 and 15 chronology of black bear harvest (%), 1999–2003

Regulatory year	Harvest Periods July	August	September	October	November	April	May	June	unk	*n*
1999–00	3	5	10	5	0	2	49	23	3	312
2000–01	2	9	14	6	0	3	42	19	4	354
2001–02	2	6	21	7	0	1	45	16	3	381
2002–03	3	5	12	7	0	3	50	17	3	349
2003–04	2	7	15	4	0	1	50	19	3	350

All data has been updated from the ADF&G online database: WildlifeInfoNet

Table 6 Units 7 and 15 black bear harvest (%) by transport method, 1999–2003

Regulatory year	Percent of Harvest									
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway vehicle	Foot	Other/Unknown	*n*
1999–00	9	2	35	7	0	0	28	15	4	312
2000–01	7	2	37	7	0	0	23	19	5	354
2001–02	7	2	41	9	0	0	18	19	3	381
2002–03	6	2	36	9	0	<1	25	17	4	349
2003–04	10	3	40	9	0	0	21	14	3	350

All data has been updated from the ADF&G online database: WildlifeInfoNet

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 11 (12,784 mi^2)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Black bears are numerous in those portions of Unit 11 having favorable forested habitat. Harvests averaged 8 (range = 1–14) black bears per year during the 1980s with wide yearly fluctuations in the number of bears taken. Black bears have been gaining status as desirable big game animals, as evidenced by the increase in average harvest to 15 (range = 8–21) black bears per year since 1990.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain the existing population of black bears with a sex and age structure that will sustain a harvest composed of at least 60% males.

METHODS

We monitored the black bear harvest by interviewing successful hunters and by sealing black bears presented for examination. We measured skulls of sealed bears, determined sex of bears, and extracted a premolar tooth for aging.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Black bear surveys or censuses have not been conducted in Unit 11. However, field observations and harvest data indicate black bears are abundant in suitable habitat throughout the unit. The lower Chitina River Valley is especially favorable bear habitat with salmon available in a number of streams. National Park Service (NPS) biologists estimated 100–200 black bears/1000 km^2 in the McCarthy area during 2001 (Mason Reid, Wrangell St. Elias National Park biologist, personal communication). This figure approaches densities observed elsewhere in Southcentral Alaska.

MORTALITY

Harvest

Season and Bag Limit. There was no closed season for black bears in Unit 11, and the bag limit was 3 bears.

Board of Game Actions and Emergency Orders. The Board of Game passed a regulation that required the salvage of meat from black bears taken from 1 January to 31 May, starting in the spring of 1997.

Hunter Harvest. Hunters reported taking 12 black bears during the 2003–04 season, down by 29% from the 2002–03 take of 17 (Table 1). The mean annual take of black bears for the last 5 years is 16. Males have composed 68% of the harvest for the last 5 years (1999–2004), down slightly from the 80% average reported from 1994 to 1998. The mean skull size for males taken in 2003 was 16.9 inches, slightly above the 30-year mean of 16.7 inches. The average skull size of females both last year and for the last 30 years is 15.7 inches.

Hunter Residency and Success. Nonresident hunters have taken 14% of the harvest (2.6 bears) during the last 5 years (Table 2). Between 1973 and 1998, nonresidents averaged 3–4 bears per year (range = 0–18), or 30% of the harvest in Unit 11. Most nonresidents reported using a guide and usually harvested a bear during the fall while hunting other big game species, such as sheep. The percent of black bears in the harvest taken by local residents has varied between years but averaged 23% (3.6 bears) a year during the last 5 years. This average has risen to 41% (6.0 bears) since 2002–03 (Table 2). Successful bear hunters spent an average of 2.7 days hunting during the 2003 season, similar to the 5-year average of 2.8 days.

Data from bear sealing certificates indicates 71% of successful hunters were specifically hunting black bears during this reporting period. The remainder reported taking a bear incidentally to other hunting activities. In the last 5 years, 76% of successful hunters salvaged some or all of the bear meat. There was only one black bear reported taken over bait each year from 1990 to 1992, but on average 3.6 (22%) have been reported annually during the last 5 years (Table 1). Bear-baiting activity through spring 2002 was fairly high, but dropped in 2003.

The majority of Unit 11 bait stations were located near the Crystalline Hills along the McCarthy Road. In 2002 the NPS improved a trailhead at mile 34.8 and began publicizing the area as a hiking spot in the Preserve. To avoid conflict among users, beginning in 2003, bear baiters were asked not to put stations between mile 34 and 36. This may have been partly responsible for the decline in bait stations in 2003 because this area was very popular with bear baiters.

Harvest Chronology. May and August are the most important months for harvesting black bears (Table 3). During the last 5 years on average, 9.0 (55%) bears have been taken in the fall and 7.4 (45%) bears have been taken in the spring. Since 1973, 60% of the black bear harvest occurred during the fall season. Harvest chronology data shows that between 1993 and 2002 spring harvests exceeded fall harvests due to the increased interest in bear baiting during the spring by nonlocal Alaska residents.

Transportation Methods. Highway vehicles, aircraft, and walking were the methods of transportation most often reported by successful black bear hunters (Table 4). Aircraft use was primarily by nonresidents on mixed-bag hunts during the fall, and walking was common with locals.

Other Mortality

Remote rural residents continue to make unreported harvests. These most likely involve defense of life or property (DLP) kills around remote cabins. Hunters taking a bear under DLP conditions are required to turn over the hide and skull to the Alaska Department of Fish and Game. Reporting is minimal, mostly because of the transportation difficulties from remote portions of the unit. Some DLP bears are claimed under the general season take because of the liberal bag limit and 12-month season.

CONCLUSIONS AND RECOMMENDATIONS

After increasing in the early 1990s, the Unit 11 black bear harvest has been relatively stable overall, although yearly fluctuations are observed. Much of the observed harvest increase since 1993 can be attributed to increased popularity of spring bear baiting. Considering access is so limited in Unit 11, the increase in baiting activities is not likely to affect the population, though it probably keeps problem bears away from communities and keeps DLP kills down. In some years spring harvests are higher than the fall take, with bears taken over bait accounting for up to 42% of the take. Males continue to predominate in the harvest, meeting management objectives for harvest composition. Even with the increased take in recent years, the harvest of black bears remains quite low for the amount of available habitat. Black bear numbers in Unit 11 are thought to be similar to other timbered areas in Southcentral Alaska, and current low harvest has little impact on unitwide bear numbers.

Because most of Unit 11 is included in Wrangell-St Elias Park/Preserve, the black bear population will always receive relatively light hunting pressure. NPS regulations prohibit hunting by nonlocal residents in portions of the unit designated as park. Subsistence hunting by local rural residents continues in these areas; however, aircraft cannot be used to access park areas, although it can be used in the preserve. This effectively closes most of the park to all hunting. As a result, most of the harvest is along the road system. No changes in season length or bag limits are recommended.

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Table 1 Unit 11 black bear harvest, 1998–99 to 2003–04

Regulatory	Reported hunter kill							Nonhunting kill[a]			Total kill			
Year	M	(%)	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	F	Unk.	Total
1998–99														
Fall 98	3	(50)	3	(50)	0	6		0	0	0	3	3	0	6
Spring 99	5	(83)	1	(17)	0	6		0	0	0	5	1	0	6
Total	8	(67)	4	(33)	0	12	5	0	0	0	8	4	0	12
1999–00														
Fall 99	5	(71)	2	(29)	1	8		0	1	0	5	3	1	9
Spring 00	7	(58)	5	(42)	0	12		0	0	0	7	5	0	12
Total	12	(63)	7	(37)	1	20	5	0	1	0	12	8	1	21
2000–01														
Fall 00	3	(43)	4	(57)	0	7		0	0	0	3	4	0	7
Spring 01	5	(50)	5	(50)	0	10		0	0	0	5	5	0	10
Total	8	(47)	9	(53)	0	17	7	0	0	0	8	9	0	17
2001–02														
Fall 01	6	(55)	5	(45)	0	11		0	0	1	6	5	1	12
Spring 02	5	(100)	0	(0)	0	5		0	0	0	5	0	0	5
Total	11	(69)	5	(31)	0	16	4	0	0	1	11	5	1	17
2002–03														
Fall 02	10	(77)	3	(23)	0	13		0	0	0	10	3	0	13
Spring 03	3	(75)	1	(25)	0	4		0	0	0	3	1	0	4
Total	13	(76)	4	(24)	0	17	0	0	0	0	13	4	0	17
2003–04														
Fall 03	4	(67)	2	(33)	0	6		0	0	0	4	2	0	6
Spring 04	6	(100)	0	(0)	0	6		0	0	0	6	0	0	6
Total	10	(83)	2	(17)	0	12	2	0	0	0	10	2	0	12

[a] Includes DLP kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 11 black bear successful hunter residency, 1998–99 to 2003–04

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
1998–99	2	(17)	5	(42)	5	(42)	12
1999–00	3	(15)	10	(48)	7	(33)	20
2000–01	2	(12)	13	(76)	2	(12)	17
2001–02	1	(6)	13	(81)	2	(13)	16
2002–03	7	(41)	8	(47)	2	(12)	17
2003–04	5	(42)	7	(58)	0	(0)	12

[a] Resident of Unit 11 or NPS subsistence community for Wrangell-St. Elias National Park/Preserve.

Table 3 Unit 11 black bear harvest chronology percent by month, 1998–99 to 2003–04

Regulatory year	Harvest periods														*n*
	July		August		September		October		April		May		June		
1998–99	0	(0)	3	(25)	3	(25)	0	(0)	0	(0)	6	(50)	0	(0)	12
1999–00	1	(5)	4	(19)	4	(19)	0	(0)	1	(5)	8	(38)	3	(14)	21
2000–01	0	(0)	5	(29)	2	(12)	0	(0)	0	(0)	7	(41)	3	(18)	17
2001–02	1	(6)	4	(25)	6	(38)	0	(0)	0	(0)	5	(31)	0	(0)	16
2002–03	1	(6)	6	(38)	3	(19)	2	(12)	0	(0)	2	(12)	2	(12)	16
2003–04	0	(0)	4	(33)	2	(17)	0	(0)	0	(0)	3	(25)	3	(25)	12

Table 4 Unit 11 black bear harvest percent by transport method, 1998–99 to 2003–04

Regulatory year	Airplane		Horse		Boat		3- or 4-Wheeler		Snowmachine		Highway vehicle		Walk		Unknown		*n*
	Percent of harvest																
1998–99	5	(42)	0	(0)	0	(0)	2	(17)	0	(0)	2	(17)	3	(25)	0	(0)	12
1999–00	6	(28)	0	(0)	4	(19)	0	(0)	0	(0)	9	(43)	2	(10)	0	(0)	21
2000–01	3	(18)	0	(0)	2	(12)	1	(6)	0	(0)	8	(47)	2	(12)	1	(6)	17
2001–02	5	(31)	0	(0)	0	(0)	0	(0)	0	(0)	10	(63)	1	(6)	0	(0)	16
2002–03	3	(18)	0	(0)	2	(12)	2	(12)	0	(0)	5	(29)	5	(29)	0	(0)	17
2003–04	2	(17)	1	(8)	1	(8)	3	(25)	0	(0)	3	(25)	2	(17)	0	(0)	12

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 12 (9978 mi^2)

GEOGRAPHIC DESCRIPTION: Upper Tanana and White River drainages, including the northern Alaska Range east of the Robertson River, and the Mentasta, Nutzotin, and northern Wrangell Mountains

BACKGROUND

Historically, human use of black bears in Unit 12 was relatively low, despite liberal hunting regulations and moderate bear population levels. Most black bear hunting occurred along the highway system and the Tanana River.

In 1992 interest in black bear hunting increased, particularly at bait stations, and has remained relatively high. Most bears are taken by local residents in the spring and are an important meat source. Even before regulations were implemented requiring the salvage of black bear meat from 1 January to 31 May, meat was salvaged from over 90% of all black bears harvested by local residents. In the fall most black bears were harvested incidentally during hunts for other species.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.

- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVE

- Manage for a harvest of black bears that maintains 55% or more males in the combined harvests during the most recent 3 years.

METHODS

Annual harvest information was collected from hunters during the mandatory sealing process of hunter-killed bears and bears killed in defense of life or property (DLP). These reports provided data on harvest location and date, hunter residency and effort, sex of the bear, skull

size, baiting, salvage of meat, incidental take, and DLP. A premolar was extracted from most of the bears during the sealing process; however, black bear teeth have not been sectioned or aged for several years. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY03 = 1 Jul 2003–30 Jun 2004).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

During RY01–RY03 no population surveys were conducted in Unit 12 to determine the black bear population size and trend. Based on limited radiotelemetry data collected in Unit 12 (Kelleyhouse 1990) and on more rigorous data collected in Unit 20A (Hechtel 1991), estimated black bear density in Unit 12 was 16–22 bears/100 mi^2 of black bear habitat and the estimated population size was ~700–1000 bears. During RY01–RY03, harvest was estimated to be sustainable, and no substantial climatic anomalies or habitat alterations occurred. Population trend was probably stable.

Population Composition

Few data were available on population composition in Unit 12. Sex ratios in the harvest were not representative of the population because females with cubs were protected by regulation. During RY01–RY03 productivity of the black bear population in Unit 12 appeared adequate based on the animals harvested and on numerous sightings of family groups. The reproductive interval (length of time between parturition and weaning), determined by observations of radiocollared bears, was 2–3 years (Kelleyhouse 1990). This was similar to other black bear populations in Interior Alaska (Miller 1987).

Distribution and Movements

Black bears are distributed throughout the forested areas that include approximately 4500 mi^2 of Unit 12. In fall and spring, bears move into the shrub zones to feed on berries and succulent vegetation. In 1990 a forest fire burned approximately 156 mi^2 of black bear habitat in the Tok River valley and reduced black bear use of the area. By 1994 bears began using the edges of the burn for feeding. Beginning in 1997, incidental sightings indicated black bears were utilizing most areas of the burn. In 2004, fires burned 434 mi^2 of black bear habitat in Unit 12. These fires initially reduced habitat availability, but likely will result in long-term positive effects on black bear habitat.

Kelleyhouse (1990) investigated black bear movements in a portion of Unit 12. He reported home ranges of 16 mi^2 for an adult female (29 relocations over 3 summers), 3 mi^2 for a subadult male (7 relocations over 1 summer), and 63 mi^2 for an adult male (15 relocations over 1 year).

MORTALITY

Harvest

Season and Bag Limit. There was no closed season for black bears in Unit 12, and the bag limit was 3 bears. Harvest of cubs (in first year of life) or females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. In January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur. In January 1996 the board adopted a regulation requiring the salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units requiring sealing, which includes Unit 12.

Hunter Harvest. During RY01–RY03, 22–41 ($\bar{x}$ = 34) black bears were harvested (Table 1). Estimated harvest rate was 3–7%. Since RY92, black bear harvest has increased. During this 12-year period the average annual harvest was 36.1 bears, compared to 25.1 bears from RY80 through RY91. During RY01–RY03, males composed 59–73% of the harvest ($\bar{x}$ = 62%), meeting the harvest objective. The previous 5-year average was 73% males.

Mean skull size of males taken during RY01–RY03 was 15.9–16.8 inches ($\bar{x}$ = 16.3 inches). Increased harvest since RY92 has not affected male skull size. Average skull size of harvested male black bears in Unit 12 has remained consistent since RY80. During RY92 through RY97 average skull size was 16.4 inches (s = 0.326), compared to 16.4 inches (s = 0.437) during RY80 through RY91.

About 80% of black bear harvest in Unit 12 occurred along the road system within the Tok and Tanana River valleys. Few hunters accessed remote portions of Unit 12 to hunt black bear.

Circumstantial evidence indicates that berry abundance may affect bear harvest. During years of poor berry production (Gardner 2002), bears may travel more in search of berries and/or may be more attracted to hunter-killed moose or caribou or other human foods. These behaviors increase the vulnerability of bears to hunters. Black bear harvest in fall RY02 was the second highest fall harvest since RY98.

Hunter Residency and Success. During RY01–RY03 Alaska residents harvested 69–90% ($\bar{x}$ = 82%) of the black bears taken in Unit 12 (Table 2). Of these, Unit 12 residents took 45–58% ($\bar{x}$ = 53%). During the previous 5 years, the average annual percent harvest for Alaska residents was 87%. The average percent harvest by Unit 12 residents was 66%. Historically, nonresidents harvested few black bears in Unit 12. During RY90 through RY95, nonresidents took an average of 1 black bear/year, 3.3% of the annual harvest. Annual harvest by nonresidents increased to an average of 4.2 bears/year (11% of the harvest) in RY96–RY00 and to 5.0 bears/year (18% of the harvest) in RY01–RY03. Guided nonresidents harvested about half of the bears killed by nonresidents.

No measure of hunter success was available because unsuccessful hunters were not required to report. During RY01–RY03 successful hunters spent an average of 3.9 and 4.1 days afield hunting black bears during the fall and spring, respectively. The yearly average time spent hunting black bears was 4.2 days in RY01–RY03 compared to 3.8 days in RY95–RY00. During RY90–RY94 the average number of days afield was 8.7 days. The differences among the periods probably reflect improved success at bait stations and increased satisfaction by hunters harvesting only 1 bear. During RY95–RY00, an average of 15.5% of hunters took >1 bear compared to 28.0% during RY90–RY94, and the average number of hunters who took >1 bear per year declined from 4.0 to 2.8.

Harvest Chronology. During RY01–RY03 the average percent of the harvest taken during the spring was 72%, similar to the mean of 69% seen in RY96–RY00 (Table 3).

During RY01–RY03, hunters at bait stations accounted for an average of 67% of the spring harvest, compared to 62% (11–27 bears) during RY93–RY00. The use of bait stations by successful hunters increased substantially in 1992. During RY89 and RY91, 45% of the spring harvest was taken over bait (5–8 bears). Most fall harvest (60–75%) was incidental to hunts for other species.

Transport Methods. For the first time, 3- or 4-wheelers were the most commonly used (annual $\bar{x}$ = 36%) mode of transportation for successful black bear hunters during RY01–RY03 (Table 4). In previous years, highway vehicles were the most common mode of transportation. During RY98–RY00, hunters who used highway vehicles killed an annual average of 44% of the black bears reported taken. Most black bear baiting occurred in areas accessible by highway vehicles. Unless the harvest success rate declines in these areas, the use of other transportation types will remain low.

Other Mortality

Most black bear mortality in Unit 12 is natural, rather than human-caused. There is no data on the mortality rate of cubs in this area; however, Miller (1987) found that cubs of the year in the Susitna Basin had a natural mortality rate of 35%.

HABITAT

Assessment

Approximately one-half of Unit 12 is composed of suitable black bear habitat. Because grizzly bears are moderately abundant and have been documented as an important source of mortality for black bears of all age classes in other Alaskan areas (Miller 1987), they may limit black bear distribution to areas offering adequate escape cover. Berry species used by black bears in Unit 12 are generally available throughout the unit. Their annual abundance is directly affected by climate. The Tok wildfire in 1990 burned approximately 156 mi^2 of prime black bear habitat. Its initial impact on the local black bear population is unknown, but suitable black bear food sources are increasing annually, and based on incidental sightings more black bears are using the area. Similarly, wildfires consumed 434 mi^2 in Unit 12 during 2004, which can be expected to result in improved habitat quality for black bears in the future.

Enhancement

The implementation of the Alaska Interagency Fire Management Plan and the 1990 and 2004 wildfires are expected to enhance black bear habitat over the long term in Unit 12. Extensive areas of climax black spruce forest exist in the unit with, understories nearly devoid of high-quality black bear food. A younger, more diverse habitat mosaic will provide more productive food plants preferred by black bears.

CONCLUSIONS AND RECOMMENDATIONS

During the report period we met the management goals and objective. In Unit 12 an average of 82% of the black bear harvest was by Alaska residents, of which 53% were local residents. Most bears were taken in spring (72%) over bait (67%). Black bear meat was an important food source for local residents, particularly in the spring. Based on hunter report data and public and departmental sightings, there was no indication that harvest was excessive. The percentages of males in the harvest were high ($\bar{x}$ = 62%). Average male skull size was 16.3 inches and has remained consistent since 1980. I recommend no changes in the seasons and bag limits or management goals and objectives.

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Table 1 Unit 12 black bear harvest, regulatory years 1990–1991 through 2003–2004

Regulatory year	Reported								Estimated kill		Total reported and estimated kill							
	Hunter kill					Nonhunting kill[a]												
	M	F	Unk	Total	Baited	M	F	Unk	Unreported	Illegal	M	(%)	F	(%)	Unk	(%)	Total	
1990–1991																		
Fall 1990	5	1	0	6	0	0	0	0	0	0	5	(83)	1	(17)	0	(0)	6	
Spring 1991	12	5	1	18	5	0	0	0	0	0	12	(67)	5	(28)	1	(5)	18	
Total	17	6	1	24	5	0	0	0	0	0	17	(71)	6	(25)	1	(4)	24	
1991–1992																		
Fall 1991	3	0	0	3	0	0	0	0	0	0	3	(100)	0	(0)	0	(0)	3	
Spring 1992	12	3	0	15	8	0	0	0	0	0	12	(80)	3	(20)	0	(0)	15	
Total	15	3	0	18	8	0	0	0	0	0	15	(82)	3	(18)	0	(0)	18	
1992–1993																		
Fall 1992	8	3	1	12	0	0	0	0	0	0	8	(67)	3	(25)	1	(8)	12	
Spring 1993	17	6	0	23	14	0	0	0	0	0	17	(74)	6	(26)			23	
Total	25	9	1	35	14	0	0	0	0	0	25	(71)	9	(26)	1	(3)	35	
1993–1994																		
Fall 1993	3	0	1	4	0	4	1	0	0	0	7	(78)	1	(11)	1	(11)	9	
Spring 1994	17	6	0	23	13	0	0	0	0	0	17	(74)	6	(26)	0	(0)	23	
Total	20	6	1	27	13	4	1	0	0	0	24	(75)	7	(22)	1	(3)	32	
1994–1995																		
Fall 1994	7	0	0	7	0	0	0	0	0	0	7	(100)	0	(0)	0	(0)	7	
Spring 1995	23	4	0	27	13	0	0	0	0	0	23	(85)	4	(15)	0	(0)	27	
Total	30	4	0	34	13	0	0	0	0	0	30	(88)	4	(12)	0	(0)	34	
1995–1996																		
Fall 1995	5	3	0	8	0	0	0	0	0	0	5	(63)	3	(37)	0	(0)	8	
Spring 1996	17	6	0	23	11	0	0	0	0	0	17	(74)	6	(26)			23	
Total	22	9	0	31	11	0	0	0	0	0	22	(71)	9	(29)	0	(0)	31	
1996–1997																		
Fall 1996	21	2	0	23	0	0	1	0	0	0	21	(88)	3	(12)	0	(0)	24	
Spring 1997	14	6	0	20	16	0	0	0	0	0	14	(70)	6	(30)	0	(0)	20	
Total	35	8	0	43	16	0	1	0	0	0	35	(80)	9	(20)	0	(0)	44	
1997–1998																		
Fall 1997	2	2	0	4	0	0	0	0	0	0	2	(50)	2	(50)	0	(0)	4	
Spring 1998	30	7	0	37	27	0	0	0	0	0	30	(81)	7	(19)	0	(0)	37	
Total	32	9	0	41	27	0	0	0	0	0	32	(78)	9	(22)	0	(0)	41	

Table 1 continued

Regulatory year	Reported: Hunter kill M	F	Unk	Total	Baited	Nonhunting kill[a] M	F	Unk	Estimated kill: Unreported	Illegal	Total reported and estimated kill: M (%)	F (%)	Unk (%)	Total
1998–1999														
Fall 1998	8	3	0	11	0	0	0	0	0	0	8 (73)	3 (27)	0 (0)	11
Spring 1999	19	10	0	29	18	0	0	0	0	0	19 (66)	10 (34)	0 (0)	29
Total	27	13	0	40	18	0	0	0	0	0	27 (68)	13 (32)	0 (0)	40
1999–2000														
Fall 1999	7	2	0	9	0	0	0	0	0	0	7 (78)	2 (22)	0 (0)	9
Spring 2000	13	5	0	18	11	0	0	0	0	0	13 (72)	5 (28)	0 (0)	18
Total	20	7	0	27	11	0	0	0	0	0	20 (74)	7 (26)	0 (0)	27
2000–2001														
Fall 2000	13	3	0	16	0	0	0	0	0	0	13 (81)	3 (19)	0 (0)	16
Spring 2001	18	13	0	31	21	0	1	0	0	0	18 (56)	14 (44)	0 (0)	32
Total	31	16	0	47	21	0	1	0	0	0	31 (65)	17 (35)	0 (0)	48
2001–2002														
Fall 2001	4	5	0	9	0	0	0	0	0	0	4 (44)	5 (56)	0 (0)	9
Spring 2002	10	4	0	14	11	0	0	0	0	0	10 (71)	4 (29)	0 (0)	14
Total	14	9	0	23	11	0	0	0	0	0	14 (61)	9 (39)	0 (0)	23
2002–2003														
Fall 2002	7	2	0	9	0	0	1	0	0	0	7 (70)	3 (30)	0 (0)	10
Spring 2003	17	14	0	31	27	0	0	0	0	0	17 (55)	14 (45)	0 (0)	31
Total	24	16	0	40	27	0	1	0	0	0	24 (59)	17 (41)	0 (0)	41
2003–2004														
Fall 2003	3	2	0	5	0	0	0	0	0	0	3 (60)	2 (40)	0 (0)	5
Spring 2004	13	4	0	17	15	0	0	0	0	0	13 (76)	4 (24)	0 (0)	17
Total	16	6	0	22	15	0	0	0	0	0	16 (73)	6 (27)	0 (0)	22

[a] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 12 successful black bear hunter residency, regulatory years 1990–1991 through 2003–2004

Regulatory year	Unit resident (%)	Other residents (%)	Nonresident (%)	Total successful hunters[a]
1990–1991	15 (63)	7 (29)	2 (8)	24
1991–1992	10 (56)	8 (44)	0 (0)	18
1992–1993	26 (74)	8 (23)	1 (3)	35
1993–1994	21 (78)	5 (19)	1 (3)	27
1994–1995	24 (71)	8 (24)	1 (3)	34
1995–1996	20 (69)	8 (28)	1 (3)	29
1996–1997	32 (73)	7 (16)	5 (11)	44
1997–1998	27 (73)	5 (14)	5 (14)	41
1998–1999	25 (63)	12 (30)	3 (8)	40
1999–2000	18 (67)	6 (22)	3 (11)	27
2000–2001	30 (64)	12 (26)	5 (11)	47
2001–2002	12 (52)	4 (17)	7 (31)	23
2002–2003	23 (58)	11 (27)	6 (15)	40
2003–2004	10 (45)	10 (45)	2 (10)	22

[a] Total may include hunters who did not specify whether or not they were residents.

Table 3 Unit 12 black bear harvest chronology percent by month, regulatory years 1990–1991 through 2003–2004

Regulatory year	Percent harvested each month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1990–1991	0	4	21	0	0	0	54	21	24
1991–1992	0	6	6	0	0	0	41	47	17
1992–1993	3	11	20	0	0	3	46	17	35
1993–1994	0	7	7	0	0	0	41	44	27
1994–1995	7	7	10	0	0	0	33	43	34
1995–1996	7	10	10	0	0	0	38	34	29
1996–1997	9	7	36	0	0	0	39	9	44
1997–1998	5	0	5	0	0	0	71	20	41
1998–1999	0	8	20	0	0	0	58	15	40
1999–2000	0	15	19	0	0	0	33	33	27
2000–2001	4	11	19	0	0	2	43	21	47
2001–2002	9	9	17	4	0	0	35	26	23
2002–2003	0	5	18	0	0	2	48	27	40
2003–2004	0	14	9	0	0	0	54	23	22

Table 4 Unit 12 black bear harvest by transport method, regulatory years 1990–1991 through 2003–2004

Regulatory year	Harvest by transport method (%)									*n*
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	
1990–1991	1 (4)	1 (4)	2 (8)	3 (13)	0 (0)	0 (0)	12 (50)	0 (0)	5 (21)	24
1991–1992	1 (6)	0 (0)	1 (6)	2 (12)	0 (0)	0 (0)	13 (71)	0 (0)	1 (5)	18
1992–1993	3 (9)	0 (0)	4 (11)	7 (20)	0 (0)	2 (6)	16 (46)	1 (3)	2 (6)	35
1993–1994	1 (4)	0 (0)	1 (4)	9 (36)	0 (0)	1 (4)	11 (44)	1 (4)	1 (4)	25
1994–1995	2 (6)	1 (3)	3 (9)	7 (21)	0 (0)	1 (3)	12 (35)	7 (21)	1 (3)	34
1995–1996	2 (7)	1 (3)	1 (3)	4 (14)	0 (0)	0 (0)	16 (55)	5 (17)	0 (0)	29
1996–1997	5 (11)	1 (2)	2 (5)	8 (18)	0 (0)	0 (0)	19 (43)	6 (14)	3 (7)	44
1997–1998	0 (0)	0 (0)	2 (5)	10 (24)	0 (0)	0 (0)	22 (54)	7 (17)	0 (0)	41
1998–1999	3 (8)	2 (5)	2 (5)	2 (5)	0 (0)	0 (0)	19 (48)	12 (30)	0 (0)	40
1999–2000	5 (19)	1 (4)	1 (4)	6 (22)	0 (0)	0 (0)	11 (41)	3 (11)	0 (0)	27
2000–2001	1 (2)	0 (0)	3 (6)	14 (30)	1 (2)	0 (0)	20 (43)	8 (17)	0 (0)	47
2001–2002	1 (4)	0 (0)	0 (0)	6 (26)	0 (0)	0 (0)	10 (43)	5 (22)	1 (4)	23
2002–2003	3 (7)	0 (0)	1 (2)	19 (46)	0 (0)	2 (5)	8 (20)	7 (17)	1 (2)	40
2003–2004	4 (18)	0 (0)	0 (0)	7 (32)	0 (0)	0 (0)	6 (27)	5 (23)	0 (0)	22

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 13 (23,000 mi^2)

GEOGRAPHIC DESCRIPTION: Nelchina Basin

BACKGROUND

Black bears are numerous in portions of Unit 13 with suitable forest habitat. Harvest data have been available since 1973, when the sealing of black bears became mandatory. Black bear harvests averaged 67 per year during the 1970s, 81 per year during the 1980s, and 93 per year during the 1990s. The increasing harvest trend shows black bears are gaining in status as a desirable big game animal, and black bear hunting is much more popular than in the past.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain the existing population of black bears with a sex structure that will sustain a harvest of at least 60% males.

METHODS

Department staff members monitor the black bear harvest by interviewing successful hunters and by sealing bears presented for examination. Data obtained at sealing include measuring skulls and determining sex of bears, hunter methods, means, and effort.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

A black bear population estimate was conducted in 1985 along a portion of the upper Susitna River in conjunction with the Susitna Hydroelectric Project (Miller 1987). Results indicated a density estimate of 90 black bears/1000 km^2. Females had an observed mean litter size of 2.1 (range = 1–4) cubs of the year, or 1.9 (range = 1–3) yearlings. However, Miller considered the study area to be marginal black bear habitat and not indicative of bear densities in more favorable forested habitat within the unit. Field observations and harvest data indicate black bears are abundant in large portions of 13D and 13E. A population estimate for Unit 13 has not been attempted because density estimates for bears in more favorable or typical forested habitat are not available. Black bear densities in the favorable habitats within Unit 13 are thought to be

similar to densities in other portions of Southcentral Alaska. Trends in bear abundance have not been documented.

Distribution and Movements

Black bears usually inhabit forested habitats except during the fall and occasionally in spring when they move into shrub zones to feed on berries and succulent vegetation (Miller 1987).

MORTALITY

Harvest

Season and Bag Limit. There is no closed season on black bears in Unit 13, and the bag limit is 3 bears per year.

Board of Game Actions and Emergency Orders. The Board of Game passed a regulation that required the salvage of meat from black bears taken 1 January–31 May, starting in the spring of 1997.

Hunter Harvest. The reported harvest of black bears during the 2003–04 season was 123 bears, down from the 1998 record harvest of 162 (Table 1). Harvests during the last 10 years have averaged 109 bears a year, 27% higher than the average of 80 bears a year between 1984 and 1993. Males composed 69% (n = 85) of the 2003–04 harvest and females 31% (n = 38). Overall, males composed 69% of the harvest during this reporting period. Black bear harvests consisting of 60% or more males are considered sustainable.

Mean skull size for males was 16.9 inches in 2003–04, close to the recent 5-year average of 16.8 inches. Mean skull size for females was 15.4 inches in the 2003–04 harvest, only slightly below the 5-year mean of 15.7 inches. The average yearly skull size for males has been quite high and stable over the last 5 years (range = 16.7–16.9). This suggests larger males are being maintained in the population, and the increase in harvest is not just attributed to large cub cohorts.

Annually, bears killed in subunit 13D account for 46% of the total Unit 13 harvest, followed by 13E with 36%, 13A with 8%, 13C with 4%, 13B with only 4%, and 2% in unknown subunits.

The defense of life or property (DLP) kill averaged about one bear/year throughout this reporting period. Despite increased human settlement, reported DLP kills remain low because many DLP bears are likely sealed under general season take. With a 3-bear bag limit and no closed season, there is little incentive to report the take of black bears as DLP, which would require surrendering the hide and skull to ADF&G.

Hunting of black bears over bait is allowed during the spring. Registration of bait stations is required, and hunters must follow special baiting regulations. In the 2003 season 46 bears were taken over bait, and the 5-year average was 30. Clearly, the popularity of bear baiting has increased in recent years. Prior to 1993, the highest annual harvest over bait was 7 bears in 1988. The annual harvest over bait has climbed consistently since the early 1990s. During this report period, baiting accounted for 50% of the spring harvest.

Successful hunters reported taking a bear incidentally while hunting other game only 26 percent of the time during this reporting period. Also, 75% of the successful hunters salvaged some or all of the meat.

Hunter Residency and Success. Nonresidents took 26 (21%) black bears during 2003–04 (Table 2). During the last 6 years, the black bear take by nonresidents has averaged 30 bears/year. This is an increase of 88% over the 1988–97 average of 16 bears/year. Local residents of Unit 13 harvested 17 (14%) black bears during 2003–04 and have averaged 17 (15%) bears/year throughout this reporting period. The remaining 80 bears (65%) harvested during 2003–04 were taken by nonlocal Alaska residents, who also accounted for the largest portion of the Unit 13 black bear harvest (62%) during this report period.

Successful black bear hunters spent an average of 4.5 days in the field in 2003–04, somewhat more time than the average of 4.2 days/year during this report period. Data suggest successful hunters are now spending more time in the field to take a bear when compared to the 3.8-day average reported by all hunters since 1979. Breaking down effort data by season shows little difference between hunter effort in the spring versus fall until 2002–03, when the fall effort dropped down to a 2.9-day average. Days spent hunting in the spring, however, increased to a 4.7-day average. This also coincides with the doubling of bait stations in the spring in the last 2 years. If a hunter sets out a bait station, it is only logical he will spend more time in the field, perhaps waiting for a better trophy.

Harvest Chronology. During the 2003–04 season, the spring harvest was 72 bears (59%), compared to 51 (41%) in the fall. During this reporting period, 58% of the Unit 13 black bear harvest occurred during spring, up from 42% during the previous reporting period. May has the highest spring harvest, while September is the most important month during the fall season (Table 3). During the last 5 years, harvests during July and August have contributed quite a few bears to the harvest (Table 3). The bears killed during the summer usually have lesser quality hides, suggesting summer kills were either for meat or that a higher incidence of DLP bears were reported under general season regulations.

Transport Methods. Among successful 2003–04 bear hunters, highway vehicles (32%) and boats (21%) were the most popular methods of transportation (Table 4). Highway vehicles have been the most important method of transportation throughout this reporting period, while boats have increased in importance only in the last 2 years. Aircraft use has declined in recent years. The last time it was the most important method of transportation was during the 1995–96 season. Since 1992–93, 4-wheelers have steadily increased as an important method of transportation for bear hunters. The highest year for 4-wheeler use was 2002–03 (28%). The combined importance of highway vehicles and walking indicates roadside black bear populations received the greatest hunting pressure.

Other Mortality

Miller (1987) observed 35% mortality among cubs of the year accompanying radiocollared females in the upper Susitna River study area. In this study, additional natural mortality also occurred among radiocollared adult black bears. Miller believed predation by brown bears was an important source of natural mortality for black bears of all age classes in Unit 13. DLP reports

and other human sources of mortality remain low with no trends evident (Table 1). Other than hunting, human influence on bear survival appears minimal.

HABITAT

Assessment

Black bears in Unit 13 use extensive tracts of spruce forest and, to a lesser degree, forested land bordering rivers, and upland shrub zones. Units 13D and 13E have more black bears than other subunits and also have the most extensive areas of heavily timbered mature spruce forests. Current fire management objectives specify a reduction in fire suppression activities in remote portions of Unit 13, supporting a return to a natural fire regime. This may eventually result in an interspersion of forest stands in different successional stages that could reduce prime black bear habitat. Seasonal availability of salmon can also influence numbers of black bears in subunits 13D and 13E; salmon provide an alternative source of nutrition unavailable in more interior subunits.

CONCLUSIONS AND RECOMMENDATIONS

Black bear harvests increased during this reporting period. It appears black bears have become a very important and primary game species, rather than being just an animal taken incidentally while hunting other more important game animals. This conclusion is supported by chronology data showing high harvests during periods when other big game hunting opportunities are limited. Methods and means data indicate baiting, a black bear-specific hunting method, has increased tremendously in recent years.

Harvest levels currently reported on black bears in Unit 13 are considered sustainable. Unit 13 has extensive areas of forest habitat ideal for black bears, especially subunits D and E. Access is extremely limited, and harvests are low over much of the best black bear habitat. Both plotting black bear bait station locations and transportation data indicate most harvest occurs near the road system. Increased harvests along the road system have not resulted in a decline in the percent males or the average skull size of all bears in the harvest. In fact, the average skull size for males has increased over the last decade. These data suggest we are not overharvesting local populations. If bears were being overharvested along the road system, immigration by sub-adults from unharvested or lightly harvested areas would be expected. Also, the fact that taking cubs and sows with cubs is prohibited ensures that productive females are afforded protection and assures annual productivity and recruitment to offset hunting loss. Females would have to predominate in the harvest for a number of years before a population decline would be a concern.

Especially evident during this reporting period was the large increase in spring baiting harvest. The reason for the leap in baiting activity in 2003 and 2004 is, of course, open to speculation. One theory is that a black bear baiting initiative scheduled to be on the fall 2004 ballot would have made this activity illegal if passed. I speculate that a number of hunters participated because they felt it might pass and that would be the last opportunity (2004) to try bear baiting. Since the initiative failed and bear baiting is still legal, it will be interesting to see if as many hunters participate in the spring of 2005.

Harvest data are not currently collected from unsuccessful black bear hunters; thus, we have no way of determining total hunting effort. There has been an increase in the number of hunters seeking information on black bears, and it appears that black bear hunting has become more popular. This trend is expected to continue as hunters seek alternative big game hunting opportunities because of increasing competition, shorter hunting seasons, and increased use of Tier II permit hunts for the more popular big game species. Data used to evaluate changes in hunting pressure and success rates are important in monitoring hunt conditions and, to some extent, bear abundance. Currently, this information is collected only from successful hunters. I recommend that a system to collect these data from unsuccessful hunters be developed and implemented. Additional changes to season length or bag limits are not recommended at this time.

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Table 1 Unit 13 black bear harvest, 1998–99 to 2003–04

Regulatory	Reported hunter kill							Nonhunting kill[a]			Total kill			
Year	M	(%)	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	F	Unk.	Total
1998–99														
Fall 98	66	(65)	35	(35)	1	102		3	1	0	69	36	1	106
Spring 99	44	(75)	15	(25)	1	60		0	1	0	44	16	1	61
Total	110	(69)	50	(31)	2	162	23	3	2	0	113	52	2	167
1999–00														
Fall 99	32	(58)	23	(42)	1	56		2	1	0	34	24	1	59
Spring 00	31	(72)	12	(28)	0	43		0	0	0	31	12	0	43
Total	63	(64)	35	(36)	1	99	15	2	1	0	65	36	1	102
2000–01														
Fall 00	38	(66)	20	(34)	1	59		0	1	0	38	21	1	60
Spring 01	36	(75)	12	(25)	0	48		0	0	0	36	12	0	48
Total	74	(70)	32	(30)	1	107	12	0	1	0	74	33	1	108
2001–02														
Fall 01	26	(70)	11	(30)	2	39		0	0	0	26	11	2	39
Spring 02	38	(79)	10	(21)	0	48		0	0	0	38	10	0	48
Total	64	(75)	21	(25)	2	87	26	0	0	0	64	21	2	87
2002–03														
Fall 02	37	(66)	19	(34)	0	56		1	1	0	38	20	0	58
Spring 03	60	(68)	28	(32)	0	88		0	0	1	60	28	1	89
Total	97	(67)	47	(33)	0	144	51	1	1	1	98	48	1	147
2003–04														
Fall 03	32	(63)	19	(37)	0	51		0	0	0	32	19	0	51
Spring 04	53	(74)	19	(26)	0	72		0	0	0	53	19	0	72
Total	85	(69)	38	(31)	0	123	46	0	0	0	85	38	0	123

[a] Includes DLP kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 13 black bear successful hunter residency, 1998–99 to 2003–04

Regulatory year	Local resident	(%)	Other resident	(%)	Nonresident	(%)	Successful hunters[a]
1998–99	22	(14)	95	(59)	45	(27)	162
1999–00	17	(17)	51	(52)	31	(31)	99
2000–01	18	(17)	61	(57)	28	(26)	107
2001–02	16	(18)	44	(51)	27	(31)	87
2002–03	19	(13)	101	(70)	24	(17)	144
2003–04	17	(14)	80	(65)	26	(21)	123

[a] Includes residency unknown hunters.

Table 3 Unit 13 black bear harvest chronology percent by month, 1998–99 to 2003–04

	Harvest periods												
Regulatory year	July		August		September		October		April		May		June		n^a
1998–99	5	(3)	25	(15)	69	(43)	3	(2)	0	(0)	38	(23)	22	(14)	162
1999–00	4	(4)	14	(14)	36	(36)	2	(2)	0	(0)	18	(18)	25	(25)	99
2000–01	6	(6)	12	(11)	37	(35)	4	(4)	1	(1)	27	(25)	20	(19)	107
2001–02	5	(6)	11	(13)	18	(21)	4	(5)	0	(0)	23	(26)	25	(29)	87
2002–03	3	(2)	22	(15)	29	(20)	2	(1)	0	(0)	59	(41)	29	(20)	144
2003–04	3	(2)	20	(16)	25	(20)	3	(2)	0	(0)	36	(29)	36	(29)	123

[a] May include bears with unknown harvest date.

Table 4 Unit 13 black bear harvest (percent) by transport method, 1998–99 to 2003–04

Regulatory year	Airplane		Horse		Boat		3- or 4-wheeler		Snowmachine		ORV		Highway Vehicle		Walk		Other[a]		*n*
1998–99	37	(23)	5	(3)	14	(9)	31	(19)	0	(0)	0	(0)	47	(29)	24	(15)	4	(2)	162
1999–00	16	(16)	7	(7)	17	(17)	17	(17)	1	(1)	0	(0)	27	(27)	11	(11)	3	(3)	99
2000–01	22	(21)	2	(2)	12	(11)	20	(19)	1	(1)	1	(1)	34	(32)	14	(13)	1	(1)	107
2001–02	13	(15)	3	(3)	15	(17)	18	(21)	2	(2)	0	(0)	22	(25)	13	(15)	1	(1)	87
2002–03	13	(9)	5	(3)	33	(23)	41	(28)	0	(0)	1	(1)	36	(25)	13	(9)	2	(1)	144
2003–04	16	(13)	3	(2)	26	(21)	20	(16)	0	(0)	1	(1)	39	(32)	14	(11)	4	(3)	123

Column group heading: Percent of harvest (spans Airplane through Other).

[a] Other includes unknown

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 14 (6625 mi^2)

GEOGRAPHIC DESCRIPTION: Upper Cook Inlet

BACKGROUND

In the late 1980s the black bear population for Unit 14 was estimated at 750–1050 with a sustainable annual harvest of 83–158 bears (Harkness 1990; Grauvogel 1990). Griese (1999) evaluated total available habitat and harvest trends and projected the black bear population was near 700 with a maximum sustainable harvest of 24–30 sows. McDonough (2002) reported that the population likely remains between 500 and 1000 bears.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Since 1976 the management goal in Units 14A and 14B was to provide the greatest opportunity to participate in hunting black bears. The goals in Unit 14C were to provide an opportunity to hunt black bears under aesthetically pleasing conditions and to provide an opportunity to view and photograph black bears.

MANAGEMENT OBJECTIVES

The management objective was to maintain a population largely unaffected by human harvest. The human-use objective was to provide liberal opportunities to hunt black bears with annual total harvests of less than 80 bears and the annual sow harvest not exceeding 30 (not to exceed 14 sows in Unit 14A or 8 sows in each of Units 14B and 14C).

METHODS

Department staff monitored black bear mortality by collecting harvest information through the sealing of skulls and hides of bears taken by hunters or killed for other reasons. During sealing, skull measurements, sex identification, hunting effort, location, and date of kill were recorded. Bears taken over bait, incidental harvest, and meat salvage were noted on the sealing reports. To hunt bears over bait, hunters were required to have a department permit. No more than 2 bait stations were allowed per permit.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

The black bear population in Unit 14 was previously projected to be between 530 and 1080 by Griese (1996). Based on more recent information available, we assume the population was stable or increasing during the reporting period. Reports of bear–human conflicts have decreased, probably due largely to season liberalization in Unit 14A in 2003. It is likely that bears previously taken in defense of life or property (DLP) are being taken with a hunting license during the summer when nuisance bear activity tends to occur. Increased harvest and recent trends in hunter activities indicate a healthy black bear population; however, these may be the result of increased human activity in bear habitat and more hunting pressure.

MORTALITY

Season and Bag Limit. In 2003, the Board of Game extended the open season in Unit 14A to year-round. In Unit 14C within Chugach State Park, the season was open from the day after Labor Day to May 31. The remainder of Unit 14 had no closed season. The bag limit was one bear in all portions of Unit 14. Baiting black bears was not allowed within Unit 14C. Baiting was allowed by registration permit 15 April–25 May in Unit 14A and 15 April–31 May in Unit 14B. Baiting was extended to 15 June in Units 14A and 14B by the Board of Game in 2003. Hunters are required to successfully complete a bear baiting class in order to get a bait registration permit.

Board of Game Actions. In 2003, the Board of Game extended the season in Unit 14A to year-round. It also extended the baiting period to 15 June in Units 14A and 14B.

Hunter Harvest. The harvest in Unit 14 increased during 2001–2004 (Table 1). During 2001–2004, hunters reported an average annual kill of 125 bears, including an average of 37 (30%) sows. Nonresident hunters reported an average harvest of 14 bears. This was up from an average harvest of 7 reported from 1995 to 2001. Thirty-six percent of the black bears harvested in Units 14A and 14B were taken over bait (Tables 2–3). The harvest in Unit 14C averaged 35 during this period (Table 4), up from the average of 30 black bears during the 1998–2001 period.

Baiting Participation. The average number of hunters using bait to hunt bears in Unit 14 during the report period was 137. This was below the previous 13-year average of 157 permit holders (Table 5).

Hunter Residency and Success. Unit 14 residents averaged 85% of the harvest during this reporting period (Table 6). On average, nonresident success more than doubled compared to the last 2 reporting periods.

Harvest Chronology. May produces the highest harvest in Unit 14, with the peak occurring during the second half of the month (Table 7). A large portion of this is due to harvest over bait. During late September, a smaller peak in harvest occurs when large numbers of moose and other big game hunters are in the field, and there is opportunity for the incidental take of black bears (Table 7).

Transport Methods. Most hunters in Unit 14 used ORVs/ATVs to access the field (Table 8). Highway vehicles were reported as the second and airplanes as the third most-preferred methods of transportation to access the field.

Other Mortality

Nonhunting kills represented 15% of all reported mortality in Unit 14 in 2001–2002. This dropped to 3% in 2002–2003 and 5% in 2003–2004. This was most obvious in Unit 14A, which saw an increase in hunting harvest and a drop in DLP mortality following the extension of the hunting season in the unit in 2003.

CONCLUSIONS AND RECOMMENDATIONS

Given current and historic harvest trends, the population of black bears in Unit 14 is likely at the upper end of the range of 500–1000. This is unverifiable under the data collection methods currently used by the management staff.

Human-use objectives were exceeded during this report period. The average annual harvest of 125 bears was higher than the management objective of 80 bears, and the average sow harvest of 37 females was greater than the estimated allowable harvest of 30 females. During 2001–2004, the proportion of females in the harvest in Unit 14 was 30%. This is less than the previous 20-year average of 32%. The trends in female harvest and total harvest did not show a problem with the bear population. It is possible that the increased harvest may have been a result of increased development and human activity in the unit. The harvest, proportion of females, and age of bears harvested will need to be monitored closely for negative population trends.

The number of black bears taken in defense of life or property was reduced. This is partially due to the extension of the season to year-round in Unit 14A. Because of this, it is likely that there were some problem bears that were taken on a hunting license that would have been killed otherwise. However, the increased hunter harvest in June probably was due to hunter effort in Unit 14A with the extension of the season. The expanding human population and encroachment into bear habitat in the unit probably will result in increased conflicts and more bears being killed one way or the other. It is possible the reduction in DLP bear mortality was due in part to unit residents becoming more aware of potential bear problems through bear awareness programs promoted by ADF&G, various federal agencies, and groups like the Bear Necessities Coalition of Talkeetna. Because of the potential for increased bear–human conflicts in Unit 14, the department must continue to provide information and education to the public about bears and how to avoid problems with them.

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Table 1 Unit 14 black bear harvest composition, 1973–2003

Regulatory	Reported Harvest					
Year	Male	(%)[a]	Female	(%)[a]	Unk	Total
1973–74	54	71%	22	29%	3	79
1974–75	22	58%	16	42%	9	47
1975–76	50	62%	31	38%	9	90
1976–77	25	61%	16	39%	7	48
1977–78	24	59%	17	41%	8	49
1978–79	27	61%	17	39%	11	55
1979–80	37	71%	15	29%	6	58
1980–81	62	69%	28	31%	10	100
1981–82	58	74%	20	26%	9	87
1982–83	45	67%	22	33%	8	75
1983–84	52	68%	24	32%	10	86
1984–85	48	59%	34	41%	6	88
1985–86	55	56%	44	44%	9	108
1986–87	67	55%	55	45%	9	131
1987–88	75	60%	49	40%	9	133
1988–89	56	63%	33	37%	8	97
1889–90	61	64%	35	36%	5	101
1990–91	47	67%	23	33%	1	71
1991–92	60	70%	26	30%	4	90
1992–93	59	71%	24	29%	3	86
1993–94	30	65%	16	35%	1	47
1994–95	61	77%	18	23%	1	80
1995–96	52	71%	21	29%	0	73
1996–97	71	76%	22	24%	0	93
1997–98	66	68%	31	32%	0	97
1998–99	101	74%	35	26%	0	136
1999–00	68	74%	24	26%	2	94
2000–01	84	78%	24	22%	0	108
2001–02	63	67%	31	33%	0	94
2002–03	103	75%	35	25%	0	138
2003–04	96	68%	45	32%	1	142

[a] Includes bears of known sex only

Table 2 Unit 14A black bear harvest, 1999–2003

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1999													
Fall 99	2	3 (60)	1	6	0	4	3	0		6 (50)	6 (50)	1	13
Spring 00	22	7 (24)	1	30	21	1	0	0		23 (77)	7 (23)	1	31
Total	24	10 (29)	2	36	21	5	3	0	4	29 (69)	13 (31)	6	48
2000													
Fall 00	15	4 (21)	0	19	0	3	0	0		18 (82)	4 (18)	0	22
Spring 01	15	8 (35)	0	23	14	2	0	0		17 (68)	8 (32)	0	25
Total	30	12 (29)	0	42	14	5	0	0	4	35 (74)	12 (26)	4	51
2001													
Fall 01	16	7 (30)	0	23	0	5	4	0		21 (66)	11 (34)	0	32
Spring 02	10	9 (47)	0	19	13	2	0	0		12 (57)	9 (43)	0	21
Total	26	16 (38)	0	42	13	7	4	0	4	33 (62)	20 (38)	4	57
2002													
Fall 02	16	2 (11)	0	18	0	0	3	0		16 (76)	5 (24)	0	21
Spring 03	38	22 (37)	0	60	38	0	0	0		38 (63)	22 (37)	0	60
Total	54	24 (31)	0	78	38	0	3	0	8	54 (67)	27 (33)	8	89
2003													
Fall 03	21	9 (30)	1	31	0	0	1	0		21 (68)	10 (32)	1	32
Spring 04	34	24 (41)	0	58	30	1	0	0		35 (59)	24 (41)	0	59
Total	55	33 (38)	1	89	30	1	1	0	9	56 (62)	34 (38)	10	100

[a] Bears reported taken over legally established bait stations

[b] Includes DLP kills, illegal kills, and other known human-caused accidental mortality

[c] Assumes approximately 10% of reported harvest

Table 3 Unit 14B black bear harvest, 1999–2003

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1999													
Fall 99	6	2 (25)	0	8	0	0	0	0		6 (75)	2 (25)	0	8
Spring 00	9	1 (10)	0	10	4	0	0	0		9 (90)	1 (10)	0	10
Total	15	3 (35)	0	18	4	0	0	0	2	15 (83)	3 (17)	2	20
2000													
Fall 00	6	0 (0)	0	6	0	0	0	0		6 (100)	0 (0)	0	6
Spring 01	6	1 (14)	0	7	5	0	0	0		6 (86)	1 (14)	0	7
Total	12	1 (8)	0	13	5	0	0	0	1	12 (92)	1 (8)	1	14
2001													
Fall 01	5	1 (17)	0	6	0	1	0	0		6 (68)	1 (22)	0	7
Spring 02	5	2 (29)	0	7	1	1	0	0		6 (73)	3 (27)	0	8
Total	10	3 (23)	0	13	1	2	0	0	1	12 (69)	3 (31)	1	16
2002													
Fall 02	11	1 (8)	0	12	0	0	0	0		11 (92)	1 (8)	0	12
Spring 03	12	5 (29)	0	17	7	0	0	0		12 (71)	5 (29)	0	17
Total	23	6 (21)	0	29	7	0	0	0	3	23 (79)	6 (21)	3	32
2003													
Fall 03	2	2 (50)	0	4	0	0	1	0		2 (40)	3 (60)	0	5
Spring 04	12	2 (14)	0	14	9	0	0	0		12 (86)	2 (14)	0	14
Total	14	4 (22)	0	18	9	0	1	0	2	14 (92)	5 (8)	2	21

[a] Bears reported taken over legally established bait stations

[b] Includes DLP kills, illegal kills, and other known human-caused accidental mortality

[c] Assumes approximately 10% of reported harvest

Table 4 Unit 14C black bear harvest, 1999–2003

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1999													
Fall 99	3	1 (25)	0	4	0	2	2	0		5 (63)	3 (37)	0	8
Spring 00	19	4 (17)	0	23	0	0	1	0		19 (79)	5 (21)	0	24
Total	22	5 (19)	0	27	0	2	3	0	3	24 (76)	8 (23)	3	35
2000													
Fall 00	11	2 (15)	0	13	0	10	3	0		21 (81)	5 (19)	0	26
Spring 01	14	6 (30)	0	20	0	2	0	0		16 (73)	6 (27)	0	22
Total	25	8 (24)	0	33	0	12	3	0	3	37 (77)	11 (23)	3	51
2001													
Fall 01	8	6 (43)	0	14	0	3	0	0		11 (65)	6 (35)	0	17
Spring 02	19	6 (24)	0	25	0	0	0	0		19 (76)	6 (24)	0	25
Total	27	12 (31)	0	39	0	3	0	0	4	30 (71)	12 (29)	4	46
2002													
Fall 02	7	1 (13)	0	8	0	1	0	0		8 (63)	1 (37)	0	9
Spring 03	19	5 (21)	0	24	0	1	0	0		20 (79)	5 (21)	0	25
Total	26	6 (19)	0	32	0	2	0	0	3	28 (82)	6 (18)	3	37
2003													
Fall 03	11	4 (27)	0	15	0	2	1	0		13 (72)	5 (28)	0	18
Spring 04	16	4 (20)	0	20	0	0	0	0		16 (80)	4 (20)	0	20
Total	27	8 (23)	0	35	0	2	1	0	4	29 (76)	9 (24)	4	42

[a] Bears reported taken over legally established bait stations

[b] Includes DLP kills, illegal kills, and other known human-caused accidental mortality

[c] Assumes approximately 10% of reported harvest

Table 5 Unit 14 black bear hunter baiting participation, 1988–2003

Regulatory year	Number of permittees	Number of stations registered SU 14A	SU 14B
1988–89	166	240	32
1989–90	130	153	41
1990–91	200	259	65
1991–92	165	215	41
1992–93	175	237	42
1993–94	190	256	39
1994–95	147	183	44
1995–96	159	185	52
1996–97	146	164	46
1997–98	137	155	40
1998–99	153	162	40
1999–00	140	169	54
2000–01	141	159	43
2001–02	137	158	35
2002–03	114	135	35
2003–04	161	183	40

Table 6 Unit 14 black bear successful hunter residency, 1993–2003

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
1993–94	45	(96)	1	(2)	0	(0)	47
1994–95	72	(90)	2	(3)	3	(4)	80
1995–96	69	(95)	0	(0)	4	(5)	73
1996–97	88	(95)	1	(1)	4	(4)	93
1997–98	91	(94)	3	(3)	3	(3)	97
1998–99	117	(86)	3	(2)	16	(12)	136
1999–00	89	(95)	0	(0)	5	(5)	94
2000–01	97	(90)	3	(3)	8	(7)	108
2001–02	83	(88)	2	(2)	9	(10)	94
2002–03	116	(84)	4	(3)	18	(13)	138
2003–04	117	(82)	2	(1)	23	(16)	142

[a] Unit 14 residents

Table 7 Unit 14 black bear hunter harvest chronology percent by month, 1993–2003

	Percent of harvest									
Regulatory year	July–Aug	Sep 1–15	Sep 16–30	Oct	Nov–Mar	Apr	May 1–15	May 16–31	June	*n*
1993–94	6	6	9	2	2	9	26	26	15	47
1994–95	10	8	5	3	3	0	33	29	11	80
1995–96	11	12	8	3	0	1	22	38	4	73
1996–97	9	14	10	6	1	5	18	31	5	93
1997–98	4	14	2	1	0	3	16	51	8	97
1998–99	18	24	14	4	0	0	7	22	10	136
1999–00	16	5	9	1	0	0	17	43	10	94
2000–01	22	7	12	9	0	5	7	31	7	108
2001–02	6	21	14	4	0	3	12	34	5	94
2002–03	2	7	14	3	1	2	12	39	20	138
2003–04	11	8	11	6	1	1	11	29	23	142

Table 8 Unit 14 black bear harvest percent by transport method, 1993–2003

Regulatory year	Percent of harvest							
	Airplane	Horse	Boat	Snowmachine	ORV/ATV	Highway vehicle	Other/ unknown	*n*
1993–94	9	2	19	0	15	30	25	47
1994–95	13	1	13	1	23	34	16	80
1995–96	18	3	4	0	26	26	23	73
1996–97	17	0	11	1	32	28	11	93
1997–98	14	0	6	0	35	27	18	97
1998–99	21	2	4	0	33	17	22	136
1999–00	19	3	2	0	28	21	27	94
2000–01	19	1	4	0	26	14	37	108
2001–02	19	3	10	0	26	20	22	94
2002–03	12	1	12	0	33	25	18	138
2003–04	14	2	9	1	35	17	23	142

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 16 (12,445 mi^2)

GEOGRAPHIC DESCRIPTION: West side of Cook Inlet

BACKGROUND

Trends in black bear harvest in Unit 16 vary with fluctuations in the fall berry crops (Faro 1990), the length of moose season, and access conditions during late spring (Harkness 1993). Reported harvest levels have fluctuated from 67 to 250 since sealing requirements began. During recent years, the bulk of the harvest shifted from fall to spring, a product of baiting opportunity and increased interest in hunting black bears (Faro 1989).

Harkness (1993) expressed concern about the unknown level of nuisance bears killed and not reported. Based on work by Scott et al. (1993) regarding harvest rates per household in Unit 16B, McDonough (2002) concluded the reported harvest in Unit 16 over that last 15 years probably does not accurately reflect the actual harvest due to the ratio between the number of households in the unit and the number of bears reported as resident harvest.

Reported harvest rates have been increasing for the last several years. More recently there was a desire to increase the harvest objective to reduce the bear population in order to reduce predation on moose calves. The department spent little effort to assess the bear population in the unit, but continued to collect basic information from sealing of bears harvested and otherwise killed.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

The management goal in Unit 16 is to provide the greatest opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVES

The population objective is to maintain a population that appears largely unaffected by human harvest. The human-use objective is a 3-year average harvest of greater than 270 black bears (45 in 16A, >225 in 16B) with >30% being female.

METHODS

Department staff monitored the black bear harvest by sealing skulls and hides of bears taken by hunters or killed for other reasons. We measured skulls of sealed bears, determined sex, and

recorded date and location of kill and the number of days hunted. Hunters were asked if the harvest was incidental, or if the bear was taken over bait, and if any meat was salvaged. Hunters who used bait were required to register with the department and get a permit (a maximum of 2 bait stations were allowed per bait permit).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Previous estimates were based on 25–50 black bears/100 mi^2 (Griese 1996) using available moose habitat to determine black bear habitat. These produced a mid-point estimate similar to the line transect survey results of 2700 bears for Unit 16 (Quang and Becker 1999). The previous range estimate of 1825–3650 black bears (Griese 1996; Griese 1999) covered the potential variation in the habitat quality throughout the unit. (Previous reports [Griese 1996; Griese 1999] failed to include the Unit 16A portions of the total Unit 16 population, thereby underestimating the Unit 16 black bear population at 2100.)

There were no comprehensive surveys of bears done in Unit 16 from 2001 to 2004. Based on the work done by others (Earl Becker, ADF&G, personal communication) and given recent harvest trends, we assumed that the black bear population in Unit 16 was increasing during the report period.

Population Composition

No composition information is available for Unit 16 black bears.

Distribution and Movements

No information is available on movements of Unit 16 black bears.

MORTALITY

Harvest

Season and Bag Limit. During this report period there was no closed season for black bear hunting in Unit 16. The bag limit was 3 bears, excluding cubs and sows accompanied by cubs. Baiting black bears was allowed by registration permit 15 April–15 June outside of Denali State Park in Unit 16A. The baiting season in Unit 16B was 15 April–30 June.

Board of Game Actions and Emergency Orders. During the March 2003 meeting, the board revised the black bear baiting restrictions on some rivers in Unit 16B. The ¼-mile restriction on bait site location on portions of the Yentna and Skwentna Rivers was dropped.

Hunter Harvest. The record harvest of 219 bears (152 male) in 1998 was surpassed by a harvest of 225 bears (164 males) in 2003 (Table 1). The average annual harvest for this report period was 196 bears. The percent females harvested averaged 29%, which is below the total average of 32% female (Table 1).

Baiting Participation. The number of bear hunters using bait increased during this report period (Table 2). The proportion of the total harvest of spring bears taken over bait also increased, averaging about 48% in 16A and about 40% in 16B (Tables 3 and 4).

Hunter Residency and Success. During 2001–2004 there was a slight increase in nonresident success and a corresponding decrease in nonlocal resident success. Alaska residents averaged 68% of the harvest during the report period (Table 5).

Harvest Chronology. During the 1990s the harvest shifted from the fall to the spring. This is probably due to more interest in bear baiting opportunities (Griese 1996) and hunting bears specifically as compared to incidental harvest, which occurred during the fall. Late May and June accounted for majority of this harvest. This reached a peak in 2003–04 when 74% of the annual harvest occurred between 16 May and 30 June (Table 6).

Transport Methods. Successful bear hunters in Unit 16 preferred aircraft and boats as their method of transportation, although ATVs have become more popular where there is access (Table 7). Transportation methods have not changed substantially in the past 10 years (Table 7).

Other Mortality

Reported nonhunting kills represented a minor portion of the total reported mortality. However, we suspect that nuisance black bear kills are numerous and seldom reported due to inconvenience and time requirements for reporting. Estimates of unreported bears (Tables 3 and 4) were adjusted to reflect a higher portion in the total harvest (Griese 1996).

CONCLUSIONS AND RECOMMENDATIONS

McDonough (2002) reported the bear population in Unit 16 appeared to be largely unaffected by human harvest. During this report period, the harvest was high and near record levels, yet the average percent of females in the harvest has remained below 30% (Table 1). Human-use objectives were not attained during this report period. The average annual reported harvest was 195 bears, well below the objective of a minimum of 270 bears. The reported average sow harvest was 57, with an average of 24 females for Unit 16A and 32 females for Unit 16B. The actual harvest could be higher due to unreported kills.

The black bear population and human use objectives were adjusted during the last report period to match moose management. In 1999 and 2001 the Board of Game intended to reduce black bear numbers to aid in the moose population recovery. The board's position on this management strategy has not changed. The human use objective is a 3-year average harvest of greater than 270 black bears (45 in 16A, 225 in 16B) with >30% being females. These objectives were not met during this reporting period, although the trend in the harvest is increasing.

Given current management strategies and budgets, it is unlikely that there will be efforts to survey or otherwise collect population data on black bears in Unit 16 anytime in the near future. Because the population objective is unverifiable, it would be to the department's benefit to collect a tooth specimen from bears during sealing. This is an inexpensive and relatively efficient technique to collect age data on bears harvested.

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Table 1 Unit 16 historical reported black bear harvest by hunters, 1973–2003

Regulatory year	Males	Females	(%)	Unk	Total
1973–74	119	58	(33)	15	192
1974–75	47	14	(23)	6	67
1975–76	65	30	(32)	11	106
1976–77	55	33	(38)	14	102
1977–78	74	33	(31)	15	122
1978–79	78	59	(43)	16	153
1979–80	67	27	(29)	14	108
1980–81	145	78	(35)	27	250
1981–82	71	44	(38)	14	129
1982–83	46	35	(43)	6	87
1983–84	58	41	(41)	4	103
1984–85	85	53	(38)	11	149
1985–86	98	46	(32)	4	148
1986–87	87	46	(35)	9	142
1987–88	73	50	(41)	8	131
1988–89	97	38	(28)	3	138
1989–90	74	37	(33)	7	118
1990–91	74	41	(36)	11	126
1991–92	111	46	(29)	4	161
1992–93	87	32	(27)	7	126
1993–94	88	31	(26)	2	121
1994–95	77	32	(29)	1	110
1995–96	101	36	(26)	3	140
1996–97	101	32	(24)	0	133
1997–98	107	39	(27)	0	146
1998–99	152	67	(31)	0	219
1999–00	81	26	(24)	0	107
2000–01	117	50	(30)	1	168
2001–02	108	57	(34)	1	166
2002–03	142	53	(27)	0	195
2003–04	164	60	(26)	1	225

Table 2 Hunter participation in baiting Unit 16 black bear, 1988–2003

Regulatory year	Number of permittees	Number of stations	
		SU 16A	SU 16B
1988–89	47	33	40
1989–90	52	38	35
1990–91	107	60	114
1991–92	112	79	93
1992–93	121	104	92
1993–94	118	91	99
1994–95	130	124	96
1995–96	123	114	86
1996–97	124	116	95
1997–98	97	89	67
1998–99	83	81	64
1999–00	98	85	66
2000–01	91	80	56
2001–02	98	80	72
2002–03	124	97	98
2003–04	124	98	105

Table 3 Unit 16A black bear harvest, 1993–2003

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1994													
Fall 94	4	1 (20)	0	5	0	1	0	0		5 (83)	1 (17)	0	6
Spring 95	24	11 (31)	0	35	26	0	0	0		24 (69)	11 (31)	0	35
Total	28	12 (32)	0	40	26	1	0	0	7	30 (71)	12 (29)	0	49
1995													
Fall 95	9	3 (25)	0	12	0	0	0	0		9 (75)	3 (25)	0	12
Spring 96	22	11 (33)	0	33	21	1	0	0		23 (68)	11 (32)	0	34
Total	31	14 (31)	0	45	21	1	0	0	8	32 (70)	14 (30)	8	54
1996													
Fall 96	6	7 (54)	0	13	0	0	0	0		6 (46)	7 (54)	0	13
Spring 97	28	11 (28)	0	39	31	0	0	0		28 (72)	11 (28)	0	39
Total	34	18 (35)	0	52	31	0	0	0	9	34 (65)	18 (35)	9	61
1997													
Fall 97	11	6 (35)	0	17	0	0	0	0		11 (65)	6 (35)	0	17
Spring 98	15	12 (44)	0	27	18	0	0	0		15 (56)	12 (44)	0	27
Total	26	18 (41)	0	44	18	0	0	0	8	26 (59)	18 (41)	8	52
1998													
Fall 98	24	10 (29)	0	34	0	0	0	0		24 (71)	10 (29)	0	34
Spring 99	16	11 (41)	0	27	19	0	0	0		16 (59)	11 (41)	0	27
Total	40	21 (34)	0	61	19	0	0	0	10	40 (66)	21 (34)	10	71

Table 3 continued

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1999													
Fall 99	9	4 (31)	0	13	0	0	1	0		9 (64)	5 (36)	0	14
Spring 00	28	8 (22)	0	36	24	0	0	0		28 (78)	8 (22)	0	36
Total	37	12 (24)	0	49	24	0	1	0	8	37 (74)	13 (26)	8	58
2000													
Fall 00	14	9 (39)	0	23	0	0	0	0		14 (61)	9 (39)	0	23
Spring 01	23	6 (21)	0	29	17	0	0	0		23 (79)	6 (21)	0	29
Total	37	15 (29)	0	52	17	0	0	0	8	37 (71)	15 (29)	0	60
2001													
Fall 01	12	9 (42)	0	21	0	0	0	0		12 (57)	9 (42)	0	21
Spring 02	24	15 (38)	0	39	33	0	0	0		24 (61)	15 (38)	0	39
Total	36	24 (40)	0	60	33	0	0	0	9	36 (60)	24 (40)	9	69
2002													
Fall 02	14	12 (46)	0	26	0	1	0	0		15 (55)	12 (44)	0	27
Spring 03	28	14 (33)	0	42	28	0	0	0		28 (67)	14 (33)	0	42
Total	42	26 (38)	0	68	28	1	0	0	9	43 (62)	26 (37)	0	69
2003													
Fall 03	11	8 (42)	1	20	0	1	0	0		12 (60)	8 (40)	0	20
Spring 04	37	14 (27)	0	51	34	0	0	0		37 (73)	14 (27)	0	51
Total	48	22 (31)	0	70	34	1	0	0	11	49 (59)	22 (26)	11	82

[a] Bears reported taken over legally established bait stations

[b] Includes defense of life or property (DLP) kills, illegal kills, and other known human-caused accidental mortality.

[c] Assumes an unreported harvest of roughly 15–17% of reported harvest.

Table 4 Unit 16B black bear harvest, 1993–2003

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1994													
Fall 94	18	2 (11)	0	20	0	1	0	0		19 (89)	2 (11)	0	21
Spring 95	29	16 (36)	1	46	30	0	0	0		29 (64)	16 (36)	1	46
Total	47	18 (28)	1	66	30	1	0	0	13	48 (73)	18 (27)	14	80
1995													
Fall 95	24	12 (33)	0	37	0	0	0	0		24 (67)	12 (33)	1	37
Spring 96	32	10 (24)	2	44	24	0	0	0		32 (76)	10 (24)	2	44
Total	56	22 (28)	3	81	24	0	0	0	16	56 (72)	22 (28)	19	97
1996													
Fall 96	13	8 (38)	0	21	0	1	0	0		14 (64)	8 (36)	0	22
Spring 97	39	6 (13)	0	45	21	1	0	0		40 (87)	6 (13)	0	46
Total	52	14 (21)	0	66	21	2	0	0	13	54 (79)	14 (21)	0	81
1997													
Fall 97	27	10 (37)	0	37	0	0	0	0		27 (63)	10 (37)	0	37
Spring 98	43	11 (20)	0	54	31	1	0	0		44 (80)	11 (20)	0	55
Total	70	21 (23)	0	91	31	1	0	0	18	71 (77)	21 (23)	18	110
1998													
Fall 98	80	37 (32)	0	117	0	1	1	0		81 (68)	38 (32)	0	119
Spring 99	20	6 (23)	0	26	11	0	0	0		20 (77)	6 (23)	0	26
Total	100	43 (30)	0	143	11	1	1	0	28	101 (70)	44 (30)	28	173

Table 4 Continued

Regulatory year	Reported: Hunter kill M	F (%)	Unk.	Total	Baited[a]	Reported: Nonhunting kill[b] M	F	Unk.	Estimated unreported kill[c]	Total estimated kill M (%)	F (%)	Unk.	Total
1999													
Fall 99	13	7 (35)	0	20	0	0	0	0		13 (65)	7 (35)	0	20
Spring 00	30	6 (17)	0	36	16	0	0	0		30 (83)	6 (17)	0	36
Total	43	13 (23)	0	56	16	0	0	0	11	43 (77)	13 (23)	11	67
2000													
Fall 00	26	20 (43)	1	48	0	1	0	0		27 (57)	20 (43)	1	49
Spring 01	53	14 (21)	0	67	29	0	1	0		53 (78)	15 (22)	0	68
Total	79	34 (30)	1	116	29	1	1	0	23	79 (70)	34 (30)	24	139
2001													
Fall 01	21	14 (40)	0	35	0	1	1	0		22 (59)	15 (40)	0	37
Spring 02	52	19 (26)	1	72	37	0	0	0		52 (74)	19 (26)	1	72
Total	73	33 (30)	1	107	37	1	1	0	16	74 (68)	34 (31)	17	125
2002													
Fall 02	22	6 (21)	0	28	0	0	0	0		22 (78)	6 (22)	1	28
Spring 03	66	20 (26)	0	86	42	0	0	0		66 (76)	20 (23)	0	86
Total	88	26 (23)	0	114	42	0	0	0	17	88 (77)	26 (22)	14	128
2003													
Fall 03	21	6 (21)	0	27	0	2	0	0		23 (79)	6 (21)	0	29
Spring 04	90	31 (25)	1	122	69	3	1	0		93 (75)	32 (25)	1	125
Total	111	37 (24)	1	149	69	5	1	0	22	116 (75)	37 (25)	24	176

[a] Bears reported taken over legally established bait stations

[b] Includes DLP kills, illegal kills, and other known human-caused accidental mortality.

[c] Assumes an unreported harvest equaling roughly 20% of reported harvest.

Table 5 Reported residency by successful Unit 16 black bear hunters, 1993–2003

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
1993–94	7	(6)	84	(69)	30	(25)	121
1994–95	8	(8)	77	(73)	20	(19)	110
1995–96	9	(7)	102	(76)	24	(18)	140
1996–97	11	(8)	80	(61)	40	(31)	133
1997–98	3	(2)	99	(68)	44	(30)	146
1998–99	8	(4)	144	(66)	66	(30)	219
1999–00	4	(4)	75	(70)	31	(29)	107
2000–01	6	(4)	128	(76)	39	(23)	168
2001–02	8	(5)	95	(57)	63	(38)	166
2002–03	6	(3)	144	(75)	41	(22)	191
2003–04	6	(3)	139	(62)	78	(35)	223

[a] Unit 16 residents

Table 6 Chronology of Unit 16 black bear harvest by hunters, percent by month, 1993–2003

Regulatory year	Harvest period									*n*
	July–Aug	Sep 1–15	Sep 16–30	Oct	Nov–Mar	Apr	May 1–15	May 16–31	June	
1993–94	11	6	7	2	0	1	7	36	31	121
1994–95	15	5	0	3	0	1	3	37	36	110
1995–96	15	14	11	2	0	1	4	24	28	140
1996–97	10	11	5	0	0	2	8	35	30	133
1997–98	12	11	14	1	1	1	2	34	26	146
1998–99	19	34	17	4	<1	0	<1	6	19	219
1999–00	8	14	8	2	<1	0	3	25	39	107
2000–01	18	10	13	<1	0	<1	5	22	30	168
2001–02	16	10	7	1	<1	<1	2	18	46	166
2002–03	8	5	12	1	<1	1	9	25	38	191
2003–04	6	9	5	<1	0	2	4	32	42	223

Table 7 Reported method of transportation by hunters harvesting Unit 16 black bear, percent by transport method, 1993–2003

Regulatory year	Method of transportation (percent of *n*)							
	Airplane	Horse	Boat	Snowmachine	ORV[a]	Highway vehicle	Other/ Unk[b]	*n*
1993–94	37	1	34	1	7	12	8	121
1994–95	23	0	41	1	14	12	10	110
1995–96	46	1	22	0	9	12	10	140
1996–97	26	2	37	0	17	13	5	133
1997–98	42	6	23	1	13	11	4	146
1998–99	42	5	19	0	15	12	6	219
1999–00	25	<1	38	2	12	11	11	107
2000–01	37	4	29	<1	11	13	7	168
2001–02	26	0	26	<1	22	20	5	166
2002–03	42	0	27	0	17	9	5	191
2003–04	34	0	33	1	19	5	9	223

[a] Includes 3- and 4-wheelers, tracked vehicles, etc.
[b] Includes hunters who indicated they “walked.”

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 17A, B, and C (18,800 mi^2)

GEOGRAPHIC DESCRIPTION: Northern Bristol Bay

BACKGROUND

Black bears inhabit some of the forested areas of Game Management Unit 17 and are most visible during the fall while they forage for berries along open hillsides in Subunits 17B and 17C. Black bears are less common along salmon streams and near human settlements, primarily because of competition with, and predation by, brown bears. There has been no black bear research conducted in Unit 17, so we do not have a complete understanding of the density, key denning areas, and other aspects of this population.

Before 1994 hunters were not required to report or seal black bears harvested in Unit 17, and the department did not allocate funding specifically for black bear management. Consequently, we had no way of assessing the number of bears killed, the sex or age composition of the harvest, or the distribution of harvest.

Incidental observations by biologists during caribou surveys and anecdotal reports by local residents suggest the black bear population along upper Nushagak River drainages has been declining for the past several years. Nothing is known about the status of black bear populations in other portions of the unit.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.

- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVES

- Maintain existing populations of black bears with a sex and age structure that will sustain a harvest of at least 60% males.

Related Management Activities

- Monitor the hunt by interviewing hunters and sealing all harvested black bears.

METHODS

Each black bear legally harvested or killed in defense of life or property (DLP) in the unit is sealed, the skull is measured, and sex determined. At the time of sealing, we record data on hunter residency, number of days hunted, date of kill, transportation used, and location of the kill. When possible, we investigate circumstances surrounding DLP and illegal kills. We collect subjective population data during caribou and moose surveys. Reports from field workers are also used to estimate bear population trends.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

No objective data are available on the population density of black bears in the unit. Anecdotal reports by local residents suggest black bear numbers in the upper Nushagak River drainages have declined from previous years.

Distribution and Movements

We know little about the overall distribution and movements of black bears in this unit. I suspect the greatest densities are in the spruce forests along the upper Mulchatna and Nushagak Rivers and along the Chichitnok River. Black bears also are seen occasionally along the upper Kokwok and Nuyakuk Rivers, and in the Muklung Hills. Black bears are most obvious when they feed along hillsides in the autumn where berries are abundant. We occasionally see individual bears and family groups near post-calving aggregations of caribou in June and July. Areas important for denning remain unknown.

MORTALITY

Harvest

Season and Bag Limit.

1 August–31 May	Residents:	2 bears per year
	Nonresidents:	1 bear per year

Board of Game Actions and Emergency Orders. No Board of Game actions or emergency orders occurred during this reporting period.

Human-Induced Mortality. Before 1994 there were no sealing or reporting requirements for black bear hunters in Unit 17. Our incidental observations indicated black bears were subject to the same increasing hunting pressure as other big game species in Unit 17B because more hunters came into the area to harvest caribou from the Mulchatna herd. Local residents also expressed concerns of overharvest by hunters and fishermen along the upper Nushagak River drainages.

During the 2001–02 season, hunters in Unit 17 reported harvesting 10 black bears, including 8 males (80%) and 1 female (10%) and 1 bear of unknown sex (Table 1). The average total skull

size was 17.2 inches for males and 14.9 inches for females. Successful hunters spent an average of 4.8 days afield. No hunters killed more than 1 bear. At least some meat was salvaged from 4 bears (40%). Guided hunters took 3 of the 10 bears. None of the successful nonresident hunters took black bears using big game tags from other species.

During the 2002–03 season, hunters in Unit 17 reported harvesting 8 black bears, 4 males and 4 females. The average total skull size was 17.1 inches for males and 17.1 inches for females. Successful hunters spent an average of 2.8 days afield. No hunters reported killing more than 1 bear. At least some meat was salvaged from 4 bears (50%). Guided hunters took 6 of the 8 bears. At least 2 of the successful nonresident hunters took black bears using big game tags from other species.

During the 2003–04 season, hunters in Unit 17 reported harvesting 13 black bears, including 7 males (54%), and 6 females (46%). The average total skull size was 17.5 inches for males and 15.8 inches for females. Successful hunters spent an average of 3.8 days afield. No hunters reported killing more than 1 bear. At least some meat was salvaged from 3 bears (38%). Guided hunters took 7 of the 13 bears. At least 3 of the successful nonresident hunters took black bears using big game tags from other species. For information on harvest by subunit, see Table 2.

Hunter Residency and Success. Nonresidents account for most of the reported black bear harvest in Unit 17. During the 2001–02 season, nonresidents took 70% of the harvested bears reported in the unit, Unit 17 residents didn't report taking any bears, and other Alaska residents took 30%. During the 2002–03 season, nonresidents took 87% of the harvested bears reported in Unit 17, Unit 17 residents didn't report taking any bears, and other Alaska residents took 13%. During the 2003–04 season, nonresidents took 85% of the bears reported harvested in the unit, Unit 17 residents took none, and other Alaska residents took 15% (Table 3).

Harvest Chronology. All black bears reported harvested in Unit 17 during this reporting period were killed during the fall. (Table 4).

Transport Methods. All successful black bear hunters during this reporting period used aircraft for access. (Table 5).

Other Mortality

Although natural deaths associated with age, brown bears, and moose occur in the unit, we do not collect data on natural mortalities for black bears in Unit 17.

HABITAT

Assessment

Black bear habitat in Unit 17 is virtually unaltered and in excellent condition. Salmon stocks are carefully managed, and escapements are adequate for the needs of the current bear population. Ungulates and seasonally abundant berry crops provide a plentiful food supply for bears. Human settlements are relatively small and unobtrusive.

NONREGULATORY PROBLEMS/NEEDS

Black bears rarely occur near human settlements in Unit 17, and there have been few reports of adversarial encounters between humans and black bears in the backcountry. There are no nonregulatory problems or needs in the unit at this time.

CONCLUSIONS AND RECOMMENDATIONS

Initiation of mandatory sealing in 1994 and restricted seasons are indications of the importance the department places on this resource in Unit 17. Data derived from these actions, when coupled with continued information from hunters and local residents, enhance our ability to evaluate the status of the black bear population and allow us to make more informed management decisions. No changes in the present hunting regulations for black bears in Game Management Unit 17 are recommended at this time.

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Table 1 Unit 17 black bear harvest, 1994–95 through 2003–04

Regulatory Year	Hunter Kill				Nonhunting Kill				Total reported kill			
	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1994–95	6	7	0	13	0	0	0	0	6	7	0	13
1995–96	13	5	0	18	0	0	0	0	13	5	0	18
1996–97	19	6	1	26	0	0	0	0	19	6	1	26
1997–98	12	6	0	18	0	0	0	0	12	6	0	18
1998–99	17	12	0	29	0	0	0	0	17	12	0	29
1999–00	16	4	0	20	0	0	0	0	16	4	0	20
2000–01	8	2	0	10	0	0	0	0	8	2	0	10
2001–02	8	1	1	10	0	0	0	0	8	1	1	10
2002–03	4	4	0	8	0	0	0	0	4	4	0	8
2003–04	7	6	0	13	0	0	0	0	7	6	0	13

Table 2 Unit 17 black bear harvest by subunit, 1994–95 through 2003–04

Regulatory	Subunit															
	17A				17B				17C				Unit 17 total			
Year	M	F	Unk	Total	M	F	Unk	Total	M	F	Unk	Total	M	F	Unk	Total
1994–95	0	0	0	0	6	7	0	13	0	0	0	0	6	7	0	13
1995–96	0	0	0	0	12	4	0	16	1	1	0	2	13	5	0	18
1996–97	0	0	0	0	18	6	1	25	1	0	0	1	19	6	1	26
1997–98	0	0	0	0	10	5	0	15	2	1	0	3	12	6	0	18
1998–99	0	0	0	0	16	12	0	18	1	0	0	1	17	12	0	29
1999–00	0	0	0	0	14	4	0	18	2	0	0	2	16	4	0	20
2000–01	0	0	0	0	8	2	0	10	0	0	0	0	8	2	0	10
2001–02	0	0	0	0	7	1	1	9	1	0	0	1	8	1	1	10
2002–03	0	0	0	0	4	4	0	8	0	0	0	0	4	4	0	8
2003–04	0	0	0	0	7	6	0	13	0	0	0	0	7	6	0	13

Table 3 Unit 17 black bear successful hunter residency, 1994–95 through 2003–04

Regulatory Year	Local[a] resident (%)	Nonlocal resident (%)	Nonresident (%)	Total successful hunters[b]
1994–95	0 (---)	2 (15%)	11 (85%)	13
1995–96	1 (6%)	4 (22%)	13 (72%)	18
1996–97	0 (---)	4 (15%)	22 (85%)	26
1997–98	0 (---)	2 (11%)	16 (89%)	18
1998–99	0 (---)	3 (10%)	26 (90%)	29
1999–00	0 (---)	0 (---)	20 (100%)	20
2000–01	0 (---)	2 (20%)	8 (80%)	10
2001–02	0 (---)	3 (30%)	7 (70%)	10
2002–03	0 (---)	1 (13%)	7 (87%)	8
2003–04	0 (---)	2 (15%)	11 (85%)	13

[a] Residents of Unit 17.
[b] Total may be higher than the sum of the columns due to hunters of unknown residency.

Table 4 Unit 17 black bear harvest chronology percentage by month, 1994–95 through 2003–04

Regulatory Year	Month of harvest										
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
1994–95[a]	46%	39%	15%	0%	0%	0%	0%	0%	0%	0%	13
1995–96[a]	33%	67%	0%	0%	0%	0%	0%	0%	0%	0%	18
1996–97[a]	42%	58%	0%	0%	0%	0%	0%	0%	0%	0%	26
1997–98[a]	33%	67%	0%	0%	0%	0%	0%	0%	0%	0%	18
1998–99	10%	90%	0%	0%	0%	0%	0%	0%	0%	0%	29
1999–00	15%	85%	0%	0%	0%	0%	0%	0%	0%	0%	20
2000–01	20%	70%	10%	0%	0%	0%	0%	0%	0%	0%	10
2001–02	30%	70%	0%	0%	0%	0%	0%	0%	0%	0%	10
2002–03	38%	62%	0%	0%	0%	0%	0%	0%	0%	0%	8
2003–04	31%	69%	0%	0%	0%	0%	0%	0%	0%	0%	13

[a] Season dates: 1 August–31 May; 2 bears for residents, 1 bear for nonresidents

Table 5 Unit 17 black bear harvest percentage by transport method, 1994–95 through 2003–04

Regulatory Year	Percent of harvest									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Unknown	Total
1994–95	39%	0%	54%	0%	0%	0%	0%	8%	0%	13
1995–96	78%	22%	0%	0%	0%	0%	0%	0%	0%	18
1996–97	81%	19%	0%	0%	0%	0%	0%	0%	0%	26
1997–98	89%	0%	0%	0%	0%	0%	0%	11%	0%	18
1998–99	72%	0%	28%	0%	0%	0%	0%	0%	0%	29
1999–00	85%	0%	10%	5%	0%	0%	0%	0%	0%	20
2000–01	70%	0%	30%	0%	0%	0%	0%	0%	0%	10
2001–02	100%	0%	0%	0%	0%	0%	0%	0%	0%	10
2002–03	100%	0%	0%	0%	0%	0%	0%	0%	0%	8
2003–04	100%	0%	0%	0%	0%	0%	0%	0%	0%	13

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNITS: 19, 21A and 21E (59,756 mi^2)

GEOGRAPHIC DESCRIPTION: All drainages of the Kuskokwim River upstream from the village of Lower Kalskag; Yukon River drainage from Paimiut upstream to, but not including, the Blackburn Creek drainage; the entire Innoko River drainage; and the Nowitna River drainage upstream from the confluence of the Little Mud and Nowitna Rivers.

BACKGROUND

Black bears are distributed throughout Units 19A, 19B, 19C, 19D, 21A, and 21E, and bear densities and hunter interest vary among units. Lower elevation areas associated with boreal forest and river floodplains (Units 19A, 19D, 21A and 21E) provide great opportunity, but harvest pressure by local resident hunters is low. Harvest pressure is very light in other portions of the units and in Units 19B and 19C.

Reported harvest was low due to the lack of sealing requirements for black bears in most of the McGrath Area. Therefore, harvest data probably do not provide a good indication of population status or trend.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Unit 19D East (upstream from the Selatna and Black River drainages)

- Provide for the increased harvest of black bears.

Units 19A, 19B, 19C, the remainder of 19D and 21A and 21E

- Provide the opportunity to take black bears.

MANAGEMENT OBJECTIVE

- Maintain reported harvest of at least 30 black bears in Unit 19D East as part of the intensive management program.

METHODS

Harvest data for hunter residency and hunting methods, black bear harvest demographics, sex ratio of the harvest, and timing and location of harvest is usually provided from sealing

certificates. However, sealing was not required in the McGrath Management Area, except in Unit 19D East and for black bear hides or skulls that were intended to be transported out of Alaska. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY03 = 1 Jul 2003 through 30 Jun 2004). Estimated population densities were based on extrapolations from research in other areas.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

Population surveys or density estimates have not been conducted in these units. However, I estimated the population based on known bear densities (Miller et al. 1997) in similar habitats in other game management units in Interior Alaska. The habitat in Unit 19A is of moderate to high quality, which should support a density of 250–300 bears/1000 mi^2, or 2475–2970 black bears. Unit 19B contains about 5000 mi^2 of good quality bear habitat, with an estimated density of 250–300 bears/1000 mi^2 or 1250–1500 bears. Unit 19C has about 3000 mi^2 of good habitat (250–300 bears/1000 mi^2 = 750–900 bears) and about 1500 mi^2 of moderate-quality habitat (150–175 bears/1000 mi^2 = 225–265 bears). Unit 19D generally contains about 12,000 mi^2 of high quality habitat (250–300 bears/1000 mi^2 = 3000–3600 bears). Using these figures, my estimate of the Unit 19 black bear population was 7700–9235 bears.

I used the same approach to estimate population size in Units 21A and 21E. The higher elevation areas include moderate quality bear habitat, and low elevation areas contain high quality habitat. I estimated density at 250–300 bears/1000 mi^2 in high quality bear habitat and 150–175 bears/1000 mi^2 in the moderate quality habitat. In Unit 21A, there are about 11,500 mi^2 of high quality habitat (250–300 bears/1000 mi^2 = 2875–3450 bears) and about 4500 mi^2 of moderate quality habitat (150–175 bears/1000 mi^2 = 675–785 bears). The total population estimate for Unit 21A was 3550–4235 bears. Unit 21E consists of about 7000 mi^2 of high quality habitat (250–300 bear/1000 mi^2 = 1750–2100 bears) and about 1000 mi^2 of moderate quality habitat (150–175 bear/1000mi^2 = 150–175 bears.) The total population estimate for Unit 21E was 1900–2275 black bears.

My estimate for the entire 59,756-mi^2 area was 9600–11,500 black bears, based on extrapolated densities of 150–300 bears/1000 mi^2. The population was probably stable or slowly increasing during the past 10 years, based on field observations, nuisance reports, hunter harvest and sightings.

MORTALITY

Harvest

Season and Bag Limit (RY01–RY03).

Units and Bag Limits	Resident Open Season (Subsistence and General Hunts)	Nonresident Open Season
Unit 19, except Units 19D East and		

21A and 21E.

Three bears.	No closed season	No closed season

Unit 19D East

Three bears.	No closed season	No closed season
Beginning in RY02: plus 2 additional bears by registration permit RL338.	No closed season	No closed season

Harvest of cubs (in first year of life) or females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders. No regulations were changed for Units 21A and 21E during RY01–RY03, and no emergency orders were issued for any units during the report period.

At the March 2000 meeting, the Board of Game passed a regulation that required hunters to seal black bears if the bears were taken in Unit 19D during 1 January–31 May and the hide was transported out of Unit 19. At the March 2002 meeting, the board changed the Unit 19D sealing requirement so that all black bears taken in Unit 19D East had to be sealed in Unit 19. In the remainder of Unit 19D, only hides of black bears taken 1 January–31 May had to be sealed if the hides were transported from Unit 19. Additionally, in Unit 19D East, the board required that both the hide and skull had to be salvaged from all bears harvested, whereas either the hide or meat had to be salvaged in the remainder of Unit 19D. The board also passed a regulation in 2002 that allowed hunters to obtain a registration permit (RL338) to harvest 2 black bears in addition to the 3-bear bag limit in Unit 19D East.

In January 2000 the Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. In January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur.

Prior to RY00, black bears in the area were required to be sealed only if the untanned hide or skull were transported out of Alaska. The meat had to be salvaged from black bears harvested during 1 January–31 May, and either the hide or the meat had to be salvaged from black bears harvested during 1 June–31 December.

Hunter Harvest. During RY01–RY03, 89 black bears (72% males) harvested in the McGrath area were sealed. Eighteen of these bears were harvested in Unit 19D (where sealing was required for all black bears taken in a portion of the unit), 6 were harvested in Unit 19A, 25 in Unit 19B, 22 in Unit 19C, and 2 each in Units 21A and 21E. Four bears were taken in unknown areas of Unit 19. It is likely a higher number of black bears were taken due to nuisance bears that were killed at fish camps or bears hunted by local residents for food.

Hunter Residency and Success. During RY01–RY03, 89 black bears harvested in the McGrath area were sealed, 64 males and 25 females. Sixty-seven of these bears were harvested by nonresidents, and 5 died from capture-related causes during an ADF&G research program within Unit 19D East. Of the 18 bears from Unit 19D, 14 were taken in Unit 19D East. Of the 4 bears

taken downstream from Unit 19D East, all were taken by nonresident hunters, 3 in RY02 and 1 in RY03.

Two of the bears harvested in Unit 19D East were killed during RY01, (1 by a local resident, 1 by ADF&G), 7 were harvested during RY02 (4 by local residents, 1 by a nonlocal resident, and 2 by nonresidents), and 5 were taken during RY03 (1 by a local resident, and 4 by ADF&G.) Although RL338 registration permits were available to hunters in Unit 19D East during RY02–RY03, none were issued.

It is difficult to assess hunter residency and success for black bear harvest in the McGrath area because in all units except Unit 19D East, sealing was required only for bears transported out of Alaska. It is likely a higher number of black bears were taken by residents than nonresidents due to nuisance bears that were killed in fish camps and localized use for food.

Harvest Chronology. Although most harvest probably occurred by residents during spring and summer, the fall harvest reporting was greater, primarily due to nonresidents who sealed bears because they were required to do so before taking the hides and skulls out of Alaska. Guided hunters opportunistically killed black bears while hunting ungulates in the fall. Eighty-three of the 89 bears sealed in the area were harvested in the fall. Of the 6 bears sealed during the spring, 5 were bears that died from capture-related causes during an ADF&G research program (ADF&G, unpublished data), and 1 was harvested by a guided nonresident hunter.

Transport Methods. During the past 5 years, 83–91% of successful hunters who sealed black bears used airplanes as their primary access method. The proportion of hunters who used aircraft has not changed substantially since sealing began. However, it is likely that a substantial portion of the unreported harvest was taken by local residents who used boats as their method of transportation.

CONCLUSIONS AND RECOMMENDATIONS

Black bears are common, and the population estimates are high throughout most of the McGrath area. Studies conducted near McGrath indicate that black bears are a significant source of moose calf predation (ADF&G 2004 Research Performance Report, Juneau, unpublished). Seasons and bag limits are liberal to afford maximum opportunity for hunting, to reduce the incidence of bears killed in defense of life and property, and reduce predation on moose calves in areas of low moose numbers. No changes are needed in the regulations at this time. However, registration permit hunt RL338 appears unnecessary to meet hunting demand.

During RY01–RY03, we did not meet our objective to maintain reported harvest of at least 30 black bears in Unit 19D East as part of the intensive management program. However, reported harvest increased somewhat during the report period. We have made efforts through educational opportunities to enhance the local knowledge of the sealing regulations. It is likely increases in reported harvest will result in the future. We will continue to work with local hunters and advisory committees to achieve increases in black bear harvest in Unit 19D East to reach the management objective.

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 20A, 20B, 20C, and 20F (34,079 mi^2)

GEOGRAPHIC DESCRIPTION: Central–Lower Tanana and Middle Yukon River drainages

BACKGROUND

Black bears live throughout Interior Alaska (approximately 2000–4000 in the 4 units discussed in this report); however, only a few studies of black bear ecology or population dynamics have been completed. During 1988–1991 a cooperative project conducted by ADF&G with support from the U.S. Army yielded important information about black bear reproduction, mortality, and density on the Tanana Flats (Hechtel 1991). A portion of this project involved a study of black bear habitat use and denning ecology (Smith 1994). In 1967 Hatler completed a master's thesis on Interior Alaska black bear ecology. Johnson (1982) investigated production of offspring by female black bears in Units 20A and 20B.

Black bears provide an important source of meat, hides, and recreation for hunters in some areas. With growth of the Fairbanks human population, interest in hunting black bears is increasing, especially during spring. More information about black bear ecology and population dynamics has helped ensure the current year-round season and 3-bear bag limit is sustainable.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect and maintain the black bear population and its habitat in concert with other components of the ecosystem.
- Provide the greatest sustained opportunity to participate in hunting black bears.
- Protect human life and property in human–bear interactions.

MANAGEMENT OBJECTIVES

Sex ratio of the harvest is a key indicator of appropriate levels of harvest used for management in these units; therefore, management objectives call for a minimum percentage of males in the harvest.

- Maintain a black bear population that sustains a harvest of at least 55% males in the combined harvests for the most recent 3 years in all units.

- Minimize human–bear conflicts by providing information and assistance to the public and to agencies.

METHODS

We collected annual harvest data from sealing reports of black bears killed by hunters and in defense of life and property (DLP). Black bear sealing certificates included data on kill date and location, sex, skull size, amount of meat salvaged, DLP kills, hunter residency, incidental take, commercial services used, and baiting. We recorded the distribution of bears killed in the area using the uniform coding units. During sealing, we collected premolars and sent them to Matson's Laboratory (Milltown, Montana, USA) for sectioning and age determination.

Since 1989, hunters have been required to register bait stations before hunting black bears over bait in spring. We also prepared hunter information leaflets to summarize black bear baiting regulations and encourage hunters to harvest males instead of females.

There are some differences between annual harvest data reported here and annual harvest data reported previously. Prior to 1988, data were summarized by calendar year. Since 1988, data were summarized by regulatory year (RY), which runs from 1 July through 30 June (e.g., RY02 = 1 Jul 2002 through 30 Jun 2003).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Densities of northern black bears are relatively low compared to other areas. Current estimates for the number of black bears in the area included 500–700 bears in the Tanana Flats in Unit 20A, 750–1200 bears in Unit 20B, 700–1000 in the portion of Unit 20C outside Denali National Park, and 400–700 in Unit 20F (Boudreau 1995). Population estimates were calculated based on Hechtel's (1991) density estimate of 12–18 black bears/100 mi^2 (46–67/1000 km^2), excluding cubs of the year, inhabiting the Tanana Flats study area in 1989. The density estimate was then applied to the estimated amount of suitable black bear habitat in each unit. This density is similar to the estimate of 17 bears/100 mi^2 in the Susitna River area (Miller et al. 1987), but is much lower than the 39–52 bears/100 mi^2 estimated to inhabit portions of the Kenai Peninsula (Schwartz and Franzmann 1991).

Population Composition

No estimate of population composition is available for this black bear population. Sex ratios in the harvest were not representative of sex ratios in the population because females with cubs were protected by regulation. In addition, behavioral differences of male and female bears may have resulted in higher vulnerability of males, and many hunters try to select adult males.

Distribution and Movements

The distribution of black bears shifts seasonally. During spring, bears use moist lowlands where early growing vegetation, especially *Equisetum*, makes up the bulk of their diet (Hatler

1967). Dispersal of young occurs in the spring usually before the breeding season. Immature males disperse longer distances from maternal home ranges than immature females. During fall, black bears feed primarily on berries in open meadows or alpine areas. Mean home range sizes of marked black bears in the Tanana Flats were 23 mi^2 for adult females, 32 mi^2 for subadult females, 230 mi^2 for adult males, and 93 mi^2 for subadult males (Hechtel 1991).

MORTALITY

Harvest

Season and Bag Limit. The black bear hunting season was open year-round in Unit 20 with a bag limit of 3 bears (baiting was restricted to 15 Apr–30 Jun). Since July 1972, the taking of cubs (first year of life) and females accompanied by cubs has been prohibited.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation that required hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. During January 1998 the board adopted a regulation that allowed the sale of handcrafted items made from black bear fur. In January 1996 the board passed a regulation that required salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units where black bears are required to be sealed.

Hunter Harvest. In Unit 20A the annual black bear harvest was relatively stable during RY98–RY00, averaging 55 bears with a range of 50–58 bears (Table 1). The annual harvest decreased during RY01–RY03, averaging 43 bears with a range of 35–48 bears and 59% males.

In Unit 20B the average annual harvest of black bears during RY98–RY00 was 157 bears with a range of 147–174 (Table 1). The annual harvest remained similar during RY01–RY03, averaging 158 bears with a range of 124–190 bears and 56% males.

In Unit 20C, the average annual harvest of black bears during RY98–RY00 was 47 bears with a range of 46–48 (Table 1). The annual harvest decreased during RY01–RY03, averaging 26 bears with a range of 18–39 bears and 55% males.

In Unit 20F the average annual harvest of black bears during RY98–RY00 was 39 bears with a range of 33–48 (Table 1). The annual harvest decreased during RY01–RY03, averaging 31 bears with a range of 26–36 bears and 76% males.

In all units, the average annual reported harvest from RY98 through RY00 was 297 bears, compared to an average annual reported harvest of 258 bears during RY01–RY03. The decrease in the 3-year mean harvest may be attributed to the low harvest of 219 in RY01, the lowest annual harvest since RY91. The low RY01 harvest can be traced to a low spring harvest in Units 20A, 20B, and 20C. Several factors may have contributed to this decrease, including changes in military deployment, inclement weather that may have hampered hunters or use of transportation methods, and availability of alternative food sources, which may have made bears less vulnerable. The average percentage of males in the harvest was 61% during RY98–RY00 and 59% during RY01–RY03.

The estimated maximum sustainable exploitation rate for Interior black bear populations is approximately 12% (Hechtel 1991). Based on our population estimates for each of the units and the mean harvest during the last 3 regulatory years, we estimated the proportion of black bears harvested was approximately 6–9% in Unit 20A, 14–22% in Unit 20B, 3–4% in Units 20C, and 4–8% in Unit 20F. The harvest rate in Unit 20B has been sustained in excess of the estimated maximum harvest rate of 12% for 11 of the 14 years from RY90 through RY03. This may suggest either the estimates of maximum harvest rate or density may be inaccurate.

Distribution of Harvest. Most black bear harvest was during the spring within the road-accessible portions of Unit 20B. Bait stations were more prevalent along the road system because of the difficulty of transporting heavy, bulky bait. The distribution of harvests reflected this trend. Other trends in harvest included hunters traveling farther away from the road system and from Fairbanks to hunt black bears, possibly to avoid crowding by other hunters.

Nonresident military hunters can hunt black bears without purchasing a big game tag or license if they hunt on military land. Therefore, military land such as the Yukon Maneuver Area in Unit 20B and the Fort Wainwright land in Unit 20A were hunted more intensively than some other areas of Units 20A, 20B, 20C, and 20F. Approximately half of the bear harvest in these areas was by military personnel.

Registration of Bait Stations. Regulations for hunting black bears at bait stations changed several times during the past 20 years. Prior to RY81, black bear baiting was legal with minimal regulations. From mid 1982 through 1983, permits were required to hunt bears at bait stations. From RY84 through RY87, baiting was legal without permits or restrictions in season. Since RY88, baiting has been limited to the spring season, and hunters using baits have been required to register their bait stations prior to setting them up, have no more than 2 bait stations, and post a sign at bait stations that includes their hunting license number. Other hunters using these bait stations were required to add their license number to the bait station sign. In addition, baiting was restricted to 15 April–15 June during RY89, but extended to 15 April–30 June during RY90–RY03 in response to the later emergence of bears from hibernation north of the Alaska Range.

The number of hunters who registered black bear bait stations increased from 220 hunters registering 314 bait stations in spring 1989, when registration became mandatory, to a peak of 615 hunters registering 1154 bait stations in spring 1992 (Table 2). An average of 530 hunters registered an average of 808 bait stations during RY01–RY03.

Harvest at Bait Stations. The proportion of the harvest that was taken over bait has remained fairly consistent since the early 1990s. During RY89–RY00, 71% of the black bear harvest occurred at bait stations (Table 2). From RY01 through RY03, the average was 75%.

Hunter Residency and Success. During RY01–RY03, most black bear harvest (85%) was by residents of Alaska, and 80% was by local residents of Unit 20 (Table 3). Because only successful hunters were required to report, we have no data on success rate.

Harvest Chronology. From RY00 through RY03, 80% of the harvest occurred during May and June (Table 4), which coincides with den emergence and the baiting season. Factors that influenced harvest chronology for black bears included the opportunity to use bait, vulnerability of bears, hide quality, and seasonal activity of hunters.

Transport Methods. From RY01 through RY03, the most common methods of transportation used (listed in descending order) by successful black bear hunters were 4-wheelers, boats, highway vehicles, and airplanes (Table 5).

Defense of Life or Property. During RY01 through RY03, no black bears were recorded as taken under DLP provisions of the hunting regulations. With a year-round season and a bag limit of 3 black bears, some black bears that might have otherwise been taken under the DLP regulations were taken under the general hunting regulations.

Other Mortality

Causes of natural mortality of black bears include predation, food shortages that result in undernourished cubs and yearlings (Rogers 1977), and flooding of natal dens (Alt 1984). Hechtel (1991) reported several instances of natural mortality. During the spring 1996 recollaring effort, a bear died after being immobilized, but necropsy results revealed the presence of extensive cancerous tissue in several internal organs.

Bear baiting has become an important issue for antihunting groups in the United States. Their efforts have succeeded in eliminating this black bear hunting method in some western states, especially during the spring. Such campaigns have sometimes been predicated on the likelihood of cubs being orphaned when their mothers are killed at bait stations or during spring hunts. Our records show little incidence of this result, despite the fact that most harvest takes place during May and June (Table 4). A ballot initiative in November 2004 failed to outlaw bear baiting in Alaska. The practice in Alaska will probably continue to receive close scrutiny.

CONCLUSIONS AND RECOMMENDATIONS

We met our management objective for sex ratio of the black bear harvests. The average percentage of males in the harvest during RY01–RY03 was 59%, which was above the minimum objective of 55%.

Based on the population estimates for individual units, the average annual harvest rates for RY01–RY03 were below the maximum sustainable exploitation rate of 12% in Units 20A (6–9%), 20C (3–4%), and 20F (4–8%). In Unit 20B the average annual harvest rate was 14–22% of the estimated population during RY01–RY03, exceeding the maximum sustained exploitation rate for the third consecutive 3-year period. In fact, the harvest rate in Unit 20B has been sustained in excess of the estimated maximum harvest rate of 12% for 11 of the 14 years from RY90 through RY03. The factual sustainability of this high harvest rate suggests that either estimates of maximum harvest rate or density were inaccurate, or that immigration rates from adjacent units were high. The extrapolation of the density estimate in Unit 20A to Unit 20B may be a source of inaccuracy. It is also possible that black bear populations can sustain higher than 12% harvest in some areas when distribution of harvest is considered. For

instance, Unit 20B harvest is concentrated along roads, and bears may be harvested above the level at which they can reproduce in these areas, making these roaded areas "sink" populations. However when the surrounding inaccessible and essentially unhunted areas are considered as "source" populations, immigration into the roaded areas may allow a higher sustainable harvest than previously predicted.

We met our objective of minimizing bear–human conflicts in the Fairbanks area. Relatively high black bear harvest in this area may be a factor in the reduction or near elimination of potential problems. We also provided the public with information to reduce garbage availability to bears and worked to reduce the need for DLP kills. We should continue to closely monitor public interest in black bear hunting and subsequent harvest. As an important part of this monitoring, I recommend teeth from harvested black bears continue to be processed to provide age structure data.

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Table 1 Units 20A, 20B, 20C and 20F black bear harvest[a], regulatory years (RY) 1989–90 through 2003–04

		Fall				Spring				Annual total			
RY	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1989–90	20A	7	3	1	11	8	6	0	14	15	9	1	25
	20B	13	4	0	17	49	23	0	72	62	27	0	89
	20C	6	3	0	9	3	1	0	4	9	4	0	13
	20F	3	0	0	3	6	2	0	8	9	2	0	11
	Total	29 (74%)	10	1	40	66 (67%)	32	0	98	95 (69%)	42	1	138
1990–91	20A	7	3	0	10	19	11	0	30	26	14	0	40
	20B	6	7	0	13	93	49	2	144	99	56	2	157
	20C	4	1	0	5	14	5	2	19	18	6	2	26
	20F	3	2	0	5	18	7	0	25	21	9	0	30
	Total	20 (61%)	13	0	33	144 (67%)	72	4	220	164 (66%)	85	4	253
1991–92	20A	9	5	1	15	13	5	0	18	22	10	1	33
	20B	11	8	1	20	47	28	6	81	58	36	7	101
	20C	3	2	0	5	12	3	2	17	15	5	2	22
	20F	4	3	0	7	12	4	0	16	16	7	0	23
	Total	27 (60%)	18	2	47	84 (68%)	40	8	132	111 (62%)	58	10	179
1992–93	20A	13	8	0	21	27	16	0	43	40	24	0	64
	20B	25	11	0	36	74	48	0	122	99	59	0	158
	20C	12	2	0	14	6	1	1	8	18	3	1	22
	20F	5	3	0	8	19	12	0	31	24	15	0	39
	Total	55 (70%)	24	0	79	126 (62%)	77	1	204	181 (63%)	101	1	283

Table 1 continued

		Fall				Spring				Annual Total			
RY	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1993–94	20A	6	9	0	15	21	10	1	32	27	19	1	47
	20B	9	6	1	16	81	38	3	122	90	44	4	138
	20C	3	0	0	3	12	4	1	17	15	4	1	20
	20F	2	2	0	4	28	9	0	37	30	11	0	41
	Total	20 (53%)	17	1	38	142 (70%)	61	5	208	162 (66%)	78	6	246
1994–95	20A	6	1	0	7	31	5	0	36	37	6	0	43
	20B	11	3	0	14	111	51	1	163	122	54	1	177
	20C	3	2	0	5	13	3	0	16	16	5	0	21
	20F	2	2	0	4	28	14	0	42	30	16	0	46
	Total	22 (73%)	8	0	30	183 (71%)	73	1	257	205 (71%)	81	1	287
1995–96	20A	9	1	1	11	24	15	1	40	33	16	2	51
	20B	14	6	0	20	103	39	0	142	117	45	0	162
	20C	5	0	0	5	5	2	0	7	10	2	0	12
	20F	1	0	0	1	20	13	0	33	21	13	0	34
	Total	29 (81%)	7	1	37	152 (69%)	69	1	222	181 (70%)	76	2	259
1996–97	20A	15	16	0	31	17	10	0	27	32	26	0	58
	20B	25	14	1	40	81	53	0	134	106	67	1	174
	20C	12	7	0	19	18	4	0	22	30	11	0	41
	20F	5	0	0	5	22	13	0	35	27	13	0	40
	Total	57 (61%)	37	1	95	138 (63%)	80	0	218	195 (63%)	117	1	313

Table 1 continued

		Fall				Spring				Annual Total			
RY	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1997–98	20A	9	8	0	17	30	12	1	43	39	20	1	60
	20B	12	8	1	21	98	40	0	138	110	48	1	159
	20C	3	3	0	6	15	13	1	29	18	16	1	35
	20F	2	0	0	2	21	8	0	29	23	8	0	31
	Total	26	19	1	46	164	73	2	239	190	92	3	285
		(58%)				(69%)				(67%)			
1998–99	20A	9	6	0	15	27	15	0	42	36	21	0	57
	20B	20	11	0	31	75	41	0	116	95	52	0	147
	20C	3	5	0	8	30	10	0	40	33	15	0	48
	20F	2	5	0	7	30	11	0	41	32	16	0	48
	Total	34	27	0	61	162	77	0	239	196	104	0	300
		(56%)				(68%)				(65%)			
1999–00	20A	10	6	0	16	17	17	0	34	27	23	0	50
	20B	5	10	0	15	82	52	0	134	87	62	0	149
	20C	2	2	0	4	29	13	0	42	31	15	0	46
	20F	2	2	0	4	27	5	0	32	29	7	0	36
	Total	19	20	0	39	155	87	0	242	174	107	0	281
		(49%)				(64%)				(62%)			
2000–01	20A	11	10	0	21	23	14	0	37	34	24	0	58
	20B	20	12	0	32	76	66	0	142	96	78	0	174
	20C	8	0	0	8	19	19	0	38	27	19	0	46
	20F	4	2	0	6	17	10	0	27	21	12	0	33
	Total	43	24	0	67	135	109	0	244	178	133	0	311
		(64%)				(55%)				(57%)			

Table 1 continued

		Fall				Spring				Annual Total			
RY	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2001–02	20A	10	10	0	20	19	9	0	28	29	19	0	48
	20B	12	13	0	25	51	48	0	99	63	61	0	124
	20C	3	2	0	5	8	8	0	16	11	10	0	21
	20F	1	1	0	2	19	5	0	24	20	6	0	26
	Total	26	26	0	52	97	70	0	167	123	96	0	219
		(50%)				(58%)				(56%)			
2002–03	20A	5	8	0	13	16	17	0	33	21	25	0	46
	20B	19	15	1	35	90	65	0	155	109	80	1	190
	20C	3	5	0	8	20	11	0	31	23	16	0	39
	20F	1	1	0	2	24	5	0	29	25	6	0	31
	Total	28	29	1	58	150	98	0	248	178	127	1	306
		(49%)				(60%)				(58%)			
2003–04	20A	8	6	0	14	18	3	0	21	26	9	0	35
	20B	13	4	0	17	83	61	0	144	96	65	0	161
	20C	0	1	0	1	9	8	0	17	9	9	0	18
	20F	2	1	0	3	24	9	0	33	26	10	0	36
	Total	23	12	0	35	134	81	0	215	157	93	0	250
		(66%)				(62%)				(63%)			

[a] Includes DLP kills. Parentheses indicate percentage of bears of known sex that were male. Data for 1989–1992 from counts of sealing certificates.

Table 2 Units 20A, 20B, 20C, and 20F black bear bait station registration and harvest, regulatory years 1989–1990 through 2003–2004

Regulatory year	Hunters registering bait stations	Bait stations	Harvest		
			Taken over bait (%)	Not taken[a] over bait (%)	Total harvest[b]
1989–1990	220	314	71 (51)	67 (49)	138
1990–1991	450	767	175 (70)	76 (30)	251
s1991–1992	615	1154	118 (66)	62 (34)	180
1992–1993	542	901	176 (64)	100 (36)	276
1993–1994	575	899	175 (73)	66 (27)	241
1994–1995	593	958	221 (79)	59 (21)	280
1995–1996	596	951	190 (73)	69 (27)	259
1996–1997	n/a	n/a	197 (63)	116 (37)	313
1997–1998	544	831	217 (76)	68 (24)	285
1998–1999	597	863	217 (73)	80 (27)	297
1999–2000	562	798	224 (81)	51 (19)	275
2000–2001	550	1083	227 (73)	84 (27)	311
2001–2002	521	819	156 (71)	63 (29)	219
2002–2003	558	837	235 (77)	71 (23)	306
2003–2004	512	768	194 (78)	56 (22)	250

[a] Not taken over bait harvest includes bears taken outside of the baiting season.
[b] Total harvest does not include harvest for which it was not known if baits were used.

Table 3 Units 20A, 20B, 20C, and 20F successful hunter residency, regulatory years 1989–1990 through 2003–2004

Regulatory year	Residents			Nonresident	Unk (%)	Total successful hunters[b]
	Local[a] (%)	Nonlocal (%)	Total (%)			
1989–1990	127 (91)	5 (4)	132 (94)	7 (5)	1 (<1)	140
1990–1991	221 (89)	8 (3)	229 (92)	18 (7)	1 (<1)	248
1991–1992	133 (76)	30 (17)	163 (93)	12 (7)	0 (0)	175
1992–1993	234 (82)	14 (5)	248 (87)	27 (9)	12 (4)	287
1993–1994	211 (84)	12 (5)	223 (89)	19 (8)	8 (3)	250
1994–1995	258 (89)	10 (3)	268 (92)	16 (6)	6 (2)	290
1995–1996	226 (87)	19 (7)	245 (95)	14 (5)	0 (0)	259
1996–1997	260 (83)	18 (6)	278 (89)	34 (11)	1 (<1)	313
1997–1998	238 (84)	16 (6)	254 (89)	30 (11)	1 (<1)	285
1998–1999	231 (78)	11 (4)	242 (81)	54 (18)	1 (<1)	297
1999–2000	206 (75)	6 (2)	212 (77)	63 (23)	0 (0)	275
2000–2001	235 (76)	11 (4)	246 (79)	65 (21)	0 (0)	311
2001–2002	166 (76)	14 (6)	180 (82)	39 (18)	0 (0)	219
2002–2003	253 (83)	10 (3)	263 (86)	41 (13)	2 (<1)	306
2003–2004	199 (80)	18 (7)	217 (87)	32 (13)	1 (<1)	250

[a] Resident of Unit 20.

[b] Excludes data from DLPs that were not taken as a legal harvest.

Table 4 Units 20A, 20B, 20C, and 20F black bear harvest chronology by month, regulatory years 2000–2001 through 2003–2004

Unit	Regulatory year	Harvest chronology by month (%)											
		Jul		Aug		Sep		Oct–Apr		May		Jun	
20A	2000–2001	0	(0)	5	(8)	17	(29)	0	(0)	14	(24)	23	(39)
	2001–2002	0	(0)	1	(2)	18	(38)	1	(2)	12	(25)	16	(33)
	2002–2003	2	(4)	1	(2)	10	(22)	0	(0)	24	(52)	9	(20)
	2003–2004	3	(9)	5	(14)	6	(17)	0	(0)	10	(29)	11	(31)
20B	2000–2001	4	(2)	7	(4)	21	(12)	0	(0)	34	(20)	108	(62)
	2001–2002	2	(2)	8	(6)	14	(11)	1	(1)	19	(15)	80	(65)
	2002–2003	6	(3)	4	(2)	25	(13)	0	(0)	56	(29)	99	(52)
	2003–2004	0	(0)	6	(4)	11	(7)	0	(0)	49	(30)	95	(59)
20C	2000–2001	1	(2)	0	(0)	7	(16)	0	(0)	12	(27)	24	(55)
	2001–2002	0	(0)	0	(0)	5	(24)	0	(0)	4	(19)	12	(57)
	2002–2003	0	(0)	5	(13)	3	(8)	1	(3)	10	(26)	20	(51)
	2003–2004	0	(0)	0	(0)	1	(6)	0	(0)	8	(44)	9	(50)
20F	2000–2001	0	(0)	2	(6)	6	(17)	0	(0)	2	(6)	25	(71)
	2001–2002	0	(0)	0	(0)	2	(8)	1	(4)	3	(12)	20	(77)
	2002–2003	1	(3)	0	(0)	1	(3)	0	(0)	7	(23)	22	(71)
	2003–2004	1	(3)	1	(3)	1	(3)	0	(0)	7	(19)	26	(72)
	Total (%)	20	(2)	45	(4)	148	(14)	4	(0)	271	(25)	599	(55)

Table 5 Units 20A, 20B, 20C, and 20F black bear harvest by transport method, regulatory years 2001–2002 through 2003–2004

Unit	Regulatory year	Harvest by transport method (%)									*n*
		Airplane	Dog/ Horse	Boat	4-wheeler	Snowmachine	Other ORV	Highway vehicle	Walk	Other/ Unk	
20A	2001–2002	9 (19)	0 (0)	15 (31)	17 (35)	0 (0)	2 (4)	3 (6)	2 (4)	0 (0)	48
	2002–2003	13 (28)	0 (0)	20 (43)	6 (13)	0 (0)	0 (0)	5 (11)	1 (2)	1 (2)	46
	2003–2004	7 (20)	0 (0)	13 (37)	9 (26)	0 (0)	1 (3)	3 (9)	2 (6)	0 (0)	35
20B	2001–2002	20 (16)	3 (2)	29 (24)	38 (31)	0 (0)	1 (1)	19 (15)	13 (11)	0 (0)	123
	2002–2003	17 (9)	0 (0)	31 (16)	102 (54)	0 (0)	0 (0)	23 (12)	17 (9)	0 (0)	190
	2003–2004	4 (2)	2 (1)	35 (22)	83 (52)	0 (0)	3 (2)	17 (11)	16 (10)	1 (1)	161
20C	2001–2002	6 (29)	0 (0)	14 (67)	1 (5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	21
	2002–2003	13 (33)	0 (0)	17 (44)	4 (10)	0 (0)	0 (0)	2 (5)	3 (8)	0 (0)	39
	2003–2004	5 (28)	0 (0)	9 (50)	2 (11)	0 (0)	0 (0)	0 (0)	2 (11)	0 (0)	18
20F	2001–2002	0 (0)	0 (0)	3 (12)	13 (52)	1 (4)	0 (0)	4 (16)	4 (16)	0 (0)	25
	2002–2003	1 (3)	0 (0)	4 (13)	13 (42)	0 (0)	0 (0)	10 (32)	3 (10)	0 (0)	31
	2003–2004	0 (0)	0 (0)	4 (11)	14 (39)	0 (0)	0 (0)	8 (22)	10 (28)	0 (0)	36

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 20D (5637 mi^2)

GEOGRAPHIC DESCRIPTION: Central Tanana Valley near Delta Junction

BACKGROUND

Black bears are widely distributed in Unit 20D. Most black bear harvest in Unit 20D occurs near the road system south of the Tanana River, in the northwestern portion of the unit along the Richardson Highway, and along major river systems.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.

- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVE

- Manage for a sustained yield of black bears with harvest not to exceed 15 black bears south of the Tanana River and 35 black bears north of the Tanana River.

METHODS

I collected harvest data through mandatory sealing of bears killed by hunters, in defense of life or property, or for other reasons, such as road kill. Data collected from each black bear killed included color phase, sex, skull length and width, transportation used by the hunter, date of kill, number of days hunted, location of kill, hunter name and address, and whether the meat was salvaged. Data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY03 = 1 Jul 2003–30 Jun 2004).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

An accurate estimate of black bear population size and trend was not available for Unit 20D. However, based on Hechtel's (1991) estimate of 17.5 adult black bears/100 mi^2 in adjacent

Unit 20A, I estimated a population of approximately 750 adult black bears in Unit 20D. I also estimated that approximately 525 bears were present north of the Tanana River and 225 bears lived south of the Tanana River. Anecdotal information from residents and hunters in Unit 20D during RY01–RY03 indicated that black bears were numerous throughout the area.

Distribution and Movements

Black bears are distributed throughout Unit 20D except in the most heavily populated areas and in treeless alpine habitat. No information was available concerning movements.

MORTALITY

Harvest

Season and Bag Limit. There was no closed season on black bears in Unit 20D during RY01–RY03. The bag limit was 3 per year. Cubs or females accompanied by cubs were not legal to harvest. Black bear baiting was allowed from 15 April through 30 June; however, hunters using bait could not establish more than 2 bait stations at a time and were required to acquire a permit issued by the Alaska Department of Fish and Game.

Alaska Board of Game Actions and Emergency Orders. No regulatory changes were adopted during this reporting period.

Harvest by Hunters. Reported black bear harvest by hunters during RY01–RY03 ranged from a low of 16 in RY03 to a high of 24 in RY02 (Table 1) and did not exceed the Unit 20D combined harvest objective of 50 bears/year. Mean 3-year annual hunter harvest was 21 bears/year. The number of bears taken at bait stations ranged from a low of 11 in RY03 to a high of 14 in RY01 and RY02. A 3-year mean of 13 bears/year were taken with bait (63% of 3-year annual harvest), a substantial increase from 7 bears/year during the previous 3-year period (Table 1). Most bears killed were males (56–59%) (Table 1).

Nonhunting Mortality. No nonhunting mortality was reported (Table 1).

Harvest Locations. The Unit 20D harvest objective not to exceed 15 bears/year south of the Tanana River was met this reporting period (Table 2). The southern Unit 20D harvest ranged from 9 to 11 bears/year. The 3-year mean harvest south of the Tanana River was 10 bears/year. This take represented an estimated annual harvest of 4.4% of the estimated adult population south of the Tanana River.

The Unit 20D harvest objective not to exceed 35 bears/year north of the Tanana River was met this reporting period (Table 2). The reported harvest north of the Tanana River ranged from 7 to 15 bears/year. The 3-year mean harvest north of the Tanana River was 11 bears/year. This harvest represented an annual estimated take of 2.1% of the estimated adult population north of the Tanana River.

Hunter Residency. Most black bears were taken by local residents (Table 3). Few nonresidents killed black bears in Unit 20D.

Harvest Chronology. Most bears continued to be harvested in May–June and August–September (Table 4).

Transportation Methods. The most popular modes of transportation for black bear hunters in Unit 20D continued to be 3- or 4-wheelers, boats, and highway vehicles (Table 5). Other commonly used modes of transportation include airplanes and walking.

CONCLUSIONS AND RECOMMENDATIONS

We monitored harvest of black bears to assure that hunting did not have negative effects on the population. Liberal seasons and bag limits provided hunters maximum opportunity to hunt black bears in Unit 20D. Harvest levels met management objectives. No changes in regulations are recommended at this time.

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Table 1 Unit 20D black bear harvest, regulatory years 1994–1995 through 2003–2004

Regulatory year	Reported											Estimated kill		Total reported and estimated kill						
	Hunter kill							Nonhunting kill[a]												
	M (%)		F (%)		Unk		Total	Baited	M	F	Unk	Unreported	Illegal	M (%)		F (%)		Unk(%)		Total
1994–1995																				
Fall 1994	3	(100)	0	(0)	0	(0)	3	0	0	0	0	0	0	3	(100)	0	(0)	0	(0)	3
Spring 1995	6	(55)	5	(46)	0	(0)	11	6	0	0	0	0	0	6	(55)	5	(46)	0	(0)	11
Total	9	(64)	5	(36)	0	(0)	14	6	0	0	0	0	0	9	(64)	5	(36)	0	(0)	14
1995–1996																				
Fall 1995	3	(75)	1	(25)	0	(0)	4	0	0	0	0	0	0	3	(75)	1	(25)	0	(0)	4
Spring 1996	10	(67)	5	(33)	0	(0)	15	7	1	0	0	0	0	11	(69)	5	(31)	0	(0)	16
Total	13	(68)	6	(32)	0	(0)	19	7	1	0	0	0	0	14	(70)	6	(30)	0	(0)	20
1996–1997																				
Fall 1996	9	(82)	2	(18)	0	(0)	11	0	0	0	0	0	0	9	(82)	2	(18)	0	(0)	11
Spring 1997	6	(50)	6	(50)	0	(0)	12	8	0	0	0	0	0	6	(50)	6	(50)	0	(0)	12
Total	15	(65)	8	(35)	0	(0)	23	8	0	0	0	0	0	15	(65)	8	(35)	0	(0)	23
1997–1998																				
Fall 1997	8	(73)	3	(27)	0	(0)	11	0	1	0	0	0	0	9	(75)	3	(25)	0	(0)	12
Spring 1998	17	(90)	1	(5)	1	(5)	19	15	1	0	0	0	0	18	(90)	1	(5)	1	(5)	20
Total	25	(87)	4	(13)	1	(3)	30	15	2	0	0	0	0	27	(84)	4	(13)	1	(3)	32
1998–1999																				
Fall 1998	7	(70)	3	(30)	0	(0)	10	0	0	0	0	0	0	7	(70)	3	(30)	0	(0)	10
Spring 1999	6	(50)	6	(50)	0	(0)	12	7	0	0	0	0	0	6	(50)	6	(50)	0	(0)	12
Total	13	(59)	9	(41)	0	(0)	22	7	0	0	0	0	0	13	(59)	9	(41)	0	(0)	22
1999–2000																				
Fall 1999	6	(55)	4	(36)	1	(9)	11	0	0	0	1	0	0	6	(50)	4	(33)	2	(17)	12
Spring 2000	4	(57)	3	(43)	0	(0)	7	4	0	0	0	0	0	4	(57)	3	(43)	0	(0)	7
Total	10	(56)	7	(39)	1	(6)	18	4	0	0	1	0	0	10	(53)	7	(37)	2	(11)	19
2000–2001																				
Fall 2000	14	(64)	8	(36)	0	(0)	22	0	1	1	0	0	0	15	(63)	9	(38)	0	(0)	24
Spring 2001	8	(53)	7	(47)	0	(0)	15	11	0	0	0	0	0	8	(53)	7	(47)	0	(0)	15
Total	22	(60)	15	(41)	0	(0)	37	11	1	1	0	0	0	23	(59)	16	(41)	0	(0)	39
2001–2002																				
Fall 2001	5	(63)	3	(38)	0	(0)	8	0	0	0	0	0	0	5	(63)	3	(38)	0	(0)	8
Spring 2002	8	(57)	6	(43)	0	(0)	14	14	0	0	0	0	0	8	(57)	6	(43)	0	(0)	14
Total	13	(59)	9	(41)	0	(0)	22	14	0	0	0	0	0	13	(59)	9	(41)	0	(0)	22

Table 1 continued

Regulatory year	Reported												Total reported and estimated kill					
	Hunter kill							Nonhunting kill[a]			Estimated kill							
	M (%)		F (%)		Unk		Total	Baited	M	F	Unk	Unreported	Illegal	M (%)		F (%)		Unk(%)	Total
2002–2003																			
Fall 2002	5	(71)	2	(29)	0	(0)	7	0	0	0	0	0	0	5	(71)	2	(29)	0 (0)	7
Spring 2003	9	(53)	8	(47)	0	(0)	17	14	0	0	0	0	0	9	(53)	8	(47)	0 (0)	17
Total	14	(58)	10	(42)	0	(0)	24	14	0	0	0	0	0	14	(58)	10	(42)	0 (0)	24
2003–2004																			
Fall 2003	3	(75)	1	(25)	0	(0)	4	0	0	0	0	0	0	3	(75)	1	(25)	0 (0)	4
Spring 2004	6	(50)	6	(50)	0	(0)	12	11	0	0	0	0	0	6	(50)	6	(50)	0 (0)	12
Total	9	(56)	7	(44)	0	(0)	16	11	0	0	0	0	0	9	(56)	7	(44)	0 (0)	16

[a] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 20D black bear harvest location, regulatory years 1987–1988 through 2003–2004

Regulatory year	South of Tanana River		North of Tanana River				
	n	(%)	*n*	(%)	Unk	(%)	*n*
1987–1988	14	(82)	3	(18)			17
1988–1989	9	(64)	5	(36)			14
1989–1990	10	(59)	7	(41)			17
1990–1991	4	(45)	5	(56)			9
1991–1992	7	(78)	2	(22)			9
1992–1993	13	(57)	10	(44)			23
1993–1994	13	(52)	12	(48)			25
1994–1995	10	(71)	4	(29)			14
1995–1996	13	(68)	6	(32)			19
1996–1997	12	(52)	11	(48)			23
1997–1998	22	(73)	8	(27)			30
1998–1999	16	(73)	6	(27)			22
1999–2000	11	(58)	7	(37)	1	(5)	19
2000–2001	15	(47)	16	(50)	1	(3)	32
2001–2002	11	(50)	10	(46)	1	(5)	22
2002–2003	9	(38)	15	(63)	0	(0)	24
2003–2004	9	(56)	7	(44)	0	(0)	16

Table 3 Unit 20D black bear successful hunter residency, regulatory years 1987–1988 through 2003–2004

Regulatory year	Local[a] resident (%)	Nonlocal resident (%)	Nonresident (%)	Unk (%)	Total successful hunters
1987–1988	13 (76)	3 (18)	1 (6)		17
1988–1989	8 (57)	4 (29)	2 (14)		14
1989–1990	10 (59)	6 (35)	1 (6)		17
1990–1991	6 (67)	1 (11)	2 (22)		9
1991–1992	8 (89)	1 (11)	0 (0)		9
1992–1993	17 (74)	1 (4)	3 (13)	2 (9)	23
1993–1994	8 (32)	13 (52)	4 (16)		25
1994–1995	7 (50)	7 (50)	0 (0)		14
1995–1996	9 (47)	10 (53)	0 (0)		19
1996–1997	12 (52)	10 (44)	1 (4)		23
1997–1998	18 (60)	12 (40)	0 (0)		30
1998–1999	19 (86)	3 (14)	0 (0)		22
1999–2000	12 (63)	5 (26)	1 (5)	1 (5)	19
2000–2001	26 (81)	3 (9)	3 (9)		32
2001–2002	19 (86)	1 (5)	2 (9)		22
2002–2003	22 (92)	1 (4)	1 (4)		24
2003–2004	15 (94)	1 (6)	0 (0)		16

[a] Local residents are residents of Unit 20D.

Table 4 Unit 20D black bear harvest chronology percent by month, regulatory years 1987–1988 through 2003–2004

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1987–1988	12	18	29	0	0	6	24	12	17
1988–1989	7	14	29	0	0	0	21	29	14
1989–1990	0	18	29	0	0	0	41	12	17
1990–1991	0	22	0	0	0	0	33	44	9
1991–1992	33	0	0	0	0	0	33	33	9
1992–1993	0	9	33	0	0	0	29	29	21
1993–1994	0	12	32	0	0	0	32	24	25
1994–1995	7	14	0	0	0	0	43	36	14
1995–1996	11	11	11	0	0	0	32	37	19
1996–1997	17	17	13	0	0	0	30	22	23
1997–1998	3	17	17	0	0	0	43	20	30
1998–1999	5	14	27	0	0	0	27	27	22
1999–2000	11	22	22	6	0	0	11	28	18
2000–2001	3	9	41	0	0	0	9	38	32
2001–2002	0	14	23	0	0	0	18	46	22
2002–2003	0	8	21	0	0	0	21	50	24
2003–2004	13	0	13	0	0	0	19	56	16

Table 5 Unit 20D black bear harvest percent by transport method, regulatory years 1987–1988 through 2003–2004

Regulatory year	Harvest percent by transport method										
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Other	Unk	*n*
1987–1988	6	0	0	0	0	24	24	29		18	17
1988–1989	21	0	29	7	0	7	14	7		14	14
1989–1990	0	6	12	0	0	47	18	0		18	17
1990–1991	0	0	11	22	0	33	22	0		11	9
1991–1992	0	0	11	22	11	0	33	22		0	9
1992–1993	5	0	14	29	0	9	24	19	0	0	21
1993–1994	8	0	24	44	0	0	4	16	4	0	25
1994–1995	0	0	14	29	0	0	29	29	0	0	14
1995–1996	16	0	5	47	0	0	16	11	5	0	19
1996–1997	9	0	26	30	0	4	17	13	0	0	23
1997–1998	10	0	10	30	0	0	47	3	0	0	30
1998–1999	14	0	9	36	0	5	23	10	5	0	22
1999–2000	16	0	21	32	0	0	16	5	11	0	19
2000–2001	6	3	31	25	0	3	16	16	0	0	32
2001–2002	5	0	23	41	0	0	14	18	0	0	22
2002–2003	8	0	29	42	0	0	4	13	0	4	24
2003–2004	0	0	38	44	0	0	13	0	0	6	16

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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2001
To: 30 June 2004

LOCATION

GAME MANAGEMENT UNIT: 20E (10,681 mi^2)

GEOGRAPHIC DESCRIPTION: Fortymile, Charley, and Ladue River drainages, including the Tanana Uplands and all drainages into the south bank of the Yukon River upstream from and including the Charley River drainage

BACKGROUND

Black bears live throughout forested habitat in Unit 20E. Observations by long-term area residents indicate that black bear numbers fluctuated during the past 40 years in relation to grizzly bear population trends. Black bear numbers were thought to be highest following federal predator control poisoning efforts of the 1950s that caused grizzly bear numbers to decline and remain depressed during the 1960s and early 1970s. As grizzly bear numbers recovered during the 1970s through the mid 1980s, black bear numbers appeared to decline. Grizzly bears have been known to kill black bears, but how important that mortality is to black bear population trend in Unit 20E is not known. Black bear abundance may also have declined due to poor habitat quality. Until the 1990s, fire suppression activities in Unit 20E allowed extensive areas of black spruce stands to reach climax stage, a stage that does not produce high-quality black bear food.

During the 1990s the black bear population in Unit 20E appeared stable. The highest densities occurred in hardwood habitats near the community of Chicken and along the Yukon River. Historically, interest in black bear hunting in the unit has been low.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

- Protect, maintain, and enhance the black bear population and its habitat in concert with other components of the ecosystem.

- Provide the greatest sustained opportunity to participate in hunting black bears.

MANAGEMENT OBJECTIVES

- Manage for a harvest of black bears that maintains 55% or more males in the combined harvests of the most recent 3 years.

METHODS

Annual harvest information was collected from hunters during the mandatory process of sealing hunter-killed bears and bears killed in defense of life or property (DLP). Information collected included harvest date and location, sex of the bear, skull size, transportation mode, number of days hunted, salvage of meat, and bait use. A premolar tooth was extracted from most bears brought in for sealing; however, black bear teeth have not been sectioned for aging for several years. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY03 = 1 Jul 2003–30 Jun 2004).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

During RY01–RY03, no surveys were conducted to determine black bear population size or trend. Unit 20E black bear population was estimated to be 1000–1500 bears based on population data collected in adjacent Unit 12 (Kelleyhouse 1990) during the early 1980s and in Unit 20A (Hechtel 1991). The composition of the Unit 20E population is unknown. Several large fires burned in Unit 20E during summer 2004. Effect of wildfires on black bear population trend is not known.

Distribution and Movements

Black bears inhabited all of the forested habitats within Unit 20E. Their movement patterns within the subunit are unknown.

MORTALITY

Harvest

Season and Bag Limit. There was no closed season for black bears in Unit 20E, and the bag limit was 3 bears. Harvest of cubs (first year of life) and females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders. In January 2000 the Alaska Board of Game adopted a regulation requiring hunters who used bait stations registered by another hunter to obtain written permission from that hunter and to place their own hunting license number at the site. In January 1998 the board adopted a regulation allowing the sale of handcrafted items made from black bear fur. In January 1996 the board passed a regulation requiring the salvage of meat, hides, and skulls from black bears harvested during 1 January–31 May in units requiring sealing, which included Unit 20E.

Hunter Harvest. During RY01–RY03 the annual reported harvest ranged from 7 to 18 black bears ($\bar{x}$ =12.7 bears) in Unit 20E (Table 1). A total of 38 black bears, including 21 males were

killed during this 3-year period. Males made up 50–71% of the harvest ($\bar{x}$ = 55.3%) during RY01–RY03, meeting the harvest objective of >55% males for all 3 years combined. The previous 5-year average harvest during RY96–RY00 was 13.6 bears with annual harvests ranging from 48 to 100% males ($\bar{x}$ = 77.3%).

During RY01–RY03 the average skull size of males was 15.7 inches (n = 24). The previous 5-year average was 16.4 inches. Similar skull sizes and high percentage of males in the harvest suggest that human-induced mortality had minimal effects on this population. These 2 parameters will be monitored closely to detect any changes in the black bear population.

Circumstantial evidence indicates berry abundance may affect bear harvest. During years of poor berry production, Gardner (2002) hypothesized that bears may travel more in search of berries and/or may be more attracted to hunter-killed moose or caribou or other human foods. These behaviors would increase the vulnerability of bears to hunters.

Hunter Residency and Success. During RY01–RY03 Alaska residents harvested an average of 92% of the black bears taken in Unit 20E (Table 2). Of these, Unit 20E residents took 32% of the harvest. The previous 5-year average for local resident harvest was 38%. During RY01–RY03, 3 black bears were killed by nonresidents, 8% of the total harvest. From RY96 through RY00, nonresidents killed no black bears during 3 of the 5 years and only 1 bear each year during the other 2 years.

No measure of hunter success was available because unsuccessful hunters were not required to report. During RY01–RY03, the 38 successful hunters who reported their effort spent an average of 5.1 days (range = 1–30 days) hunting black bears. During RY98–RY00 successful hunters spent an average of 6.3 days afield. During RY01–RY03, hunter effort was greatest during the fall seasons when 4 of 31 hunters who reported spent 10–30 days hunting. This coincided with more hunters who specifically hunted black bears and did not take them incidentally to hunting other species. By contrast, only 1 of 13 hunters spent >10 days hunting in the spring.

Harvest Chronology. During RY01–RY03, 46–84% ($\bar{x}$ = 68%) of the black bear harvest occurred during fall, primarily in September (Table 3). During the previous 5 years, 20–55% ($\bar{x}$ = 66%) of the harvest took place in fall (Table 3).

Transport Methods. During RY01–RY03, highway vehicles (42%) and 4-wheelers (39%) were the most common modes of transportation used by successful black bear hunters (Table 4). The use of 4-wheelers for hunting black bears in Unit 20E has increased substantially since RY93. I expect this method of access will become more prevalent among Unit 20E black bear hunters in the near future because of the difficulty of access into area.

HABITAT

Assessment

Black bear habitat is extensive in Unit 20E. Only treeless habitat, generally above elevations of 4000 feet, is not black bear habitat. Blueberries, crowberries, and cranberries are widely available, and bearberries are available in a few areas. Human-caused changes in the quantity

and quality of black bear habitat are not expected because little development has occurred or is planned within black bear habitat in Unit 20E.

Enhancement

The implementation of the Alaska Interagency Fire Management Plan allowed wildfires to burn in more areas than before 1984. Also, 3 prescribed burns were ignited during 1997–1999, affecting about 95,000 acres of black bear habitat. Revegetation of preferred plant species in burned-over areas is expected to provide better forage for black bears than is available in mature forests of black or white spruce. Similarly, in 2004 about 1700 mi^2 of Unit 20E burned and can be expected to provide improvements in usable habitat for black bears in the future.

CONCLUSIONS AND RECOMMENDATIONS

We met all goals and objectives for black bear management in Unit 20E during RY01–RY03. Black bears in Unit 20E were lightly harvested and were hunted primarily during the fall by nonlocal Alaska residents. Highway vehicles and 4-wheelers were used by 82% of the successful hunters. At the estimated harvest rate, harvest was likely to have little effect on the status and trend of the population. Males composed 55% of the harvest during the past 3 years and skull size remained relatively constant. I recommend no changes in seasons or bag limits or in management goals and objectives.

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Table 1 Unit 20E black bear harvest, regulatory years 1990–1991 through 2003–2004

Regulatory year	Reported								Estimated kill		Total reported and estimated kill							
	Hunter kill					Nonhunting kill[a]					M (%)		F (%)		Unk (%)		Total
	M	F	Unk	Total	Baited	M	F	Unk	Unreported	Illegal							
1990–1991																	
Fall 1990	2	4	0	6	0	0	0	0	0	0	2	(33)	4	(67)	0	(0)	6
Spring 1991	3	2	0	5	0	0	0	0	0	0	3	(60)	2	(40)	0	(0)	5
Total	5	6	0	11	0	0	0	0	0	0	5	(45)	6	(55)	0	(0)	11
1991–1992																	
Fall 1991	2	1	0	3	0	1	0	0	0	0	3	(75)	1	(25)	0	(0)	4
Spring 1992	5	0	0	5	0	0	0	0	0	0	5	(100)	0	(0)	0	(0)	5
Total	7	1	0	8	0	1	0	0	0	0	8	(89)	1	(11)	0	(0)	9
1992–1993																	
Fall 1992	6	2	0	8	0	0	0	0	0	0	6	(75)	2	(25)	0	(0)	8
Spring 1993	9	3	0	12	1	0	0	0	0	0	9	(75)	3	(25)			12
Total	15	5	0	20	1	0	0	0	0	0	15	(75)	5	(25)	0	(0)	20
1993–1994																	
Fall 1993	4	2	0	6	0	0	0	0	0	0	4	(67)	2	(33)	0	(0)	6
Spring 1994	4	1	0	5	0	0	0	0	0	0	4	(80)	1	(20)	0	(0)	5
Total	8	3	0	11	0	0	0	0	0	0	8	(73)	3	(27)	0	(0)	11
1994–1995																	
Fall 1994	6	1	0	7	0	0	0	0	0	0	6	(86)	1	(14)	0	(0)	7
Spring 1995	9	2	0	11	2	0	0	0	0	0	9	(82)	2	(18)	0	(0)	11
Total	15	3	0	18	2	0	0	0	0	0	15	(83)	3	(17)	0	(0)	18
1995–1996																	
Fall 1995	11	3	0	14	0	0	0	0	0	0	11	(79)	3	(21)	0	(0)	14
Spring 1996	5	4	0	9	1	0	0	0	0	0	5	(56)	4	(44)	0	(0)	9
Total	16	7	0	23	1	0	0	0	0	0	16	(70)	7	(30)	0	(0)	23
1996–1997																	
Fall 1996	8	7	0	15	0	0	0	0	0	0	8	(53)	7	(47)	0	(0)	15
Spring 1997	2	4	0	6	4	0	0	0	0	0	2	(33)	4	(67)	0	(0)	6
Total	10	11	0	21	4	0	0	0	0	0	10	(48)	11	(52)	0	(0)	21

Table 1 continued

Regulatory year	Reported: Hunter kill M	F	Unk	Total	Baited	Reported: Nonhunting kill[a] M	F	Unk	Estimated kill: Unreported	Illegal	Total reported and estimated kill: M (%)	F (%)	Unk (%)	Total
1997–1998														
Fall 1997	4	0	0	4	0	0	0	0	0	0	4 (100)	0 (0)	0 (0)	4
Spring 1998	3	0	0	3	0	0	0	0	0	0	3 (100)	0 (0)	0 (0)	3
Total	7	0	0	7	0	0	0	0	0	0	7 (100)	0 (0)	0 (0)	7
1998–1999														
Fall 1998	9	4	0	13	0	0	0	0	0	0	9 (69)	4 (31)	0 (0)	13
Spring 1999	2	0	0	2	0	0	0	0	0	0	2 (100)	0 (0)	0 (0)	2
Total	11	4	0	15	0	0	0	0	0	0	11 (73)	4 (27)	0 (0)	15
1999–2000														
Fall 1999	4	2	0	6	0	0	0	0	0	0	4 (67)	2 (33)	0 (0)	6
Spring 2000	4	1	0	5	0	0	0	0	0	0	4 (80)	1 (20)	0 (0)	5
Total	8	3	0	11	0	0	0	0	0	0	8 (73)	3 (27)	0 (0)	11
2000–2001														
Fall 2000	6	1	0	7	0	0	0	0	0	0	6 (86)	1 (14)	0 (0)	7
Spring 2001	7	0	0	7	2	0	0	0	0	0	7 (100)	0 (0)	0 (0)	7
Total	13	1	0	14	2	0	0	0	0	0	13 (93)	1 (7)	0 (0)	14
2001–2002														
Fall 2001	3	2	1	6	0	0	0	0	0	0	3 (50)	2 (33)	1 (17)	6
Spring 2002	4	3	0	7	0	0	0	0	0	0	4 (57)	3 (43)	0 (0)	7
Total	7	5	1	13	0	0	0	0	0	0	7 (54)	5 (38)	1 (8)	13
2002–2003														
Fall 2002	8	7	0	15	0	0	0	0	0	0	8 (53)	7 (47)	0 (0)	15
Spring 2003	1	2	0	3	0	0	0	0	0	0	1 (33)	2 (67)	0 (0)	3
Total	9	9	0	18	0	0	0	0	0	0	9 (50)	9 (50)	0 (0)	18
2003–2004														
Fall 2003	3	2	0	5	0	0	0	0	0	0	3 (60)	2 (40)	0 (0)	5
Spring 2004	2	0	0	2	0	0	0	0	0	0	2 (100)	0 (0)	0 (0)	2
Total	5	2	0	7	0	0	0	0	0	0	5 (71)	2 (29)	0 (0)	7

[a] Includes DLP kills, research mortalities, and other known human-caused accidental mortality.

Table 2 Unit 20E successful black bear hunter residency, regulatory years 1990–1991 through 2003–2004

Regulatory year	Unit resident (%)	Other residents (%)	Nonresident (%)	Total successful hunters
1990–1991	7 (64)	4 (36)	0 (0)	11
1991–1992	6 (75)	2 (25)	0 (0)	8
1992–1993	9 (45)	8 (40)	3 (15)	20
1993–1994	6 (55)	4 (36)	1 (9)	11
1994–1995	13 (72)	5 (28)	0 (0)	18
1995–1996	7 (30)	13 (57)	3 (13)	23
1996–1997	7 (41)	9 (53)	1 (6)	17
1997–1998	3 (43)	4 (57)	0 (0)	7
1998–1999	3 (20)	11 (73)	1 (7)	15
1999–2000	5 (45)	6 (55)	0 (0)	11
2000–2001	6 (43)	8 (57)	0 (0)	14
2001–2002	6 (46)	6 (46)	1 (8)	13
2002–2003	6 (33)	11 (61)	1 (6)	18
2003–2004	0 (0)	6 (86)	1 (14)	7

Table 3 Unit 20E black bear harvest chronology percent by month, regulatory years 1990–1991 through 2003–2004

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1990–1991	0	36	18	0	0	0	27	18	11
1991–1992	13	13	13	0	0	0	13	50	8
1992–1993	5	30	5	0	0	0	30	30	20
1993–1994	9	36	0	9	0	0	36	9	11
1994–1995	12	12	18	0	0	0	41	18	18
1995–1996	0	39	22	0	0	0	39	0	23
1996–1997	14	29	29	0	0	0	10	19	21
1997–1998	0	14	43	0	0	0	29	14	7
1998–1999	0	67	20	0	0	0	7	7	15
1999–2000	0	0	55	0	0	0	18	27	11
2000–2001	14	0	36	0	0	0	43	7	14
2001–2002	8	23	15	0	0	0	38	15	13
2002–2003	6	22	56	0	0	0	17	0	18
2003–2004	0	29	43	0	0	0	29	0	7

Table 4 Unit 20E black bear harvest (% harvest) by transport method, regulatory years 1990–1991 through 2003–2004

Regulatory year	Transport method									*n*
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	
1990–1991	0 (0)	0 (0)	2 (18)	1 (9)	0 (0)	0 (0)	7 (64)	1 (9)	0 (0)	11
1991–1992	2 (25)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	5 (63)	0 (0)	1 (13)	8
1992–1993	2 (10)	0 (0)	4 (20)	0 (0)	0 (0)	0 (0)	12 (60)	1 (5)	1 (5)	20
1993–1994	0 (0)	0 (0)	2 (18)	4 (36)	0 (0)	0 (0)	2 (18)	2 (18)	1 (9)	11
1994–1995	0 (0)	0 (0)	3 (17)	5 (28)	0 (0)	0 (0)	10 (56)	0 (0)	0 (0)	18
1995–1996	1 (4)	0 (0)	7 (30)	2 (9)	0 (0)	0 (0)	10 (43)	2 (9)	1 (4)	23
1996–1997	1 (5)	0 (0)	4 (19)	6 (29)	0 (0)	2 (9)	7 (33)	1 (5)	0 (0)	21
1997–1998	0 (0)	0 (0)	3 (43)	1 (14)	0 (0)	0 (0)	1 (14)	2 (29)	0 (0)	7
1998–1999	0 (0)	0 (0)	2 (13)	5 (33)	0 (0)	0 (0)	5 (33)	3 (20)	0 (0)	15
1999–2000	0 (0)	0 (0)	5 (45)	2 (18)	0 (0)	0 (0)	3 (27)	1 (9)	0 (0)	11
2000–2001	0 (0)	0 (0)	3 (21)	6 (43)	0 (0)	0 (0)	4 (29)	1 (7)	0 (0)	14
2001–2002	0 (0)	0 (0)	2 (15)	5 (38)	0 (0)	0 (0)	5 (38)	1 (8)	0 (0)	13
2002–2003	1 (6)	0 (0)	0 (0)	5 (28)	0 (0)	0 (0)	10 (56)	2 (11)	0 (0)	18
2003–2004	0 (0)	0 (0)	1 (14)	5 (71)	0 (0)	0 (0)	1 (14)	0 (0)	0 (0)	7

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge and attitudes for responsible hunting.

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