Black Bear
Management Report
of survey-inventory activities
1 July 2004–30 June 2007

Patricia Harper, Editor
Alaska Department of Fish and Game
Division of Wildlife Conservation

Photo by Rich Lowell, ADF&G

Funded through
Federal Aid in Wildlife Restoration
Grants W-33-3, W-33-4, and W-33-5

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

Cover Photo: A black bear cub in a garbage can in Petersburg. *Photo by Rich Lowell.*

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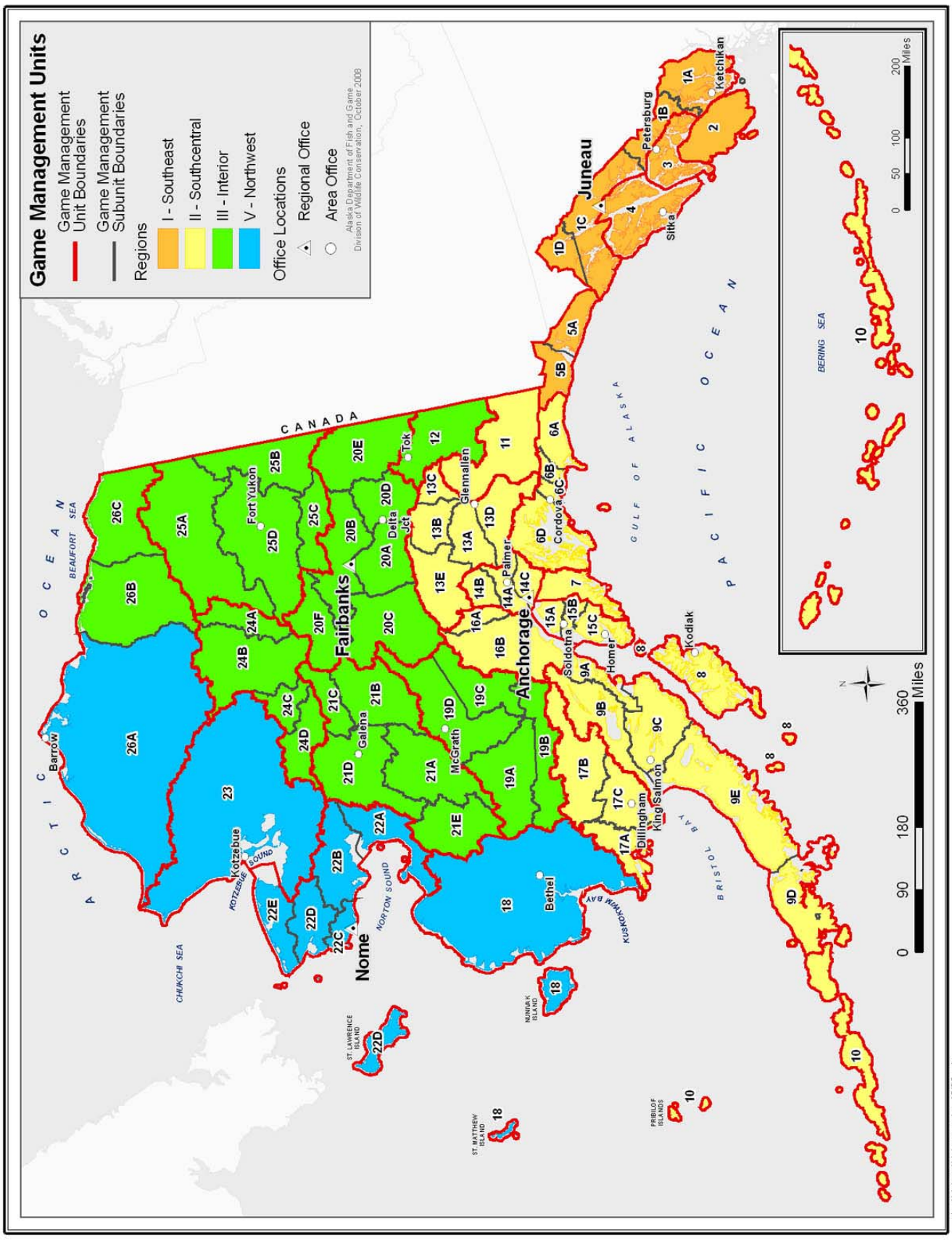
BLACK BEAR MANAGEMENT REPORT

TABLE OF CONTENTS



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WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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, large tracts of young age clear cut stands, and productive forest that provides high quality habitat. Gravina, Annette, and Duke Islands generally have lower-quality black bear 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. Black bears compete with coastal brown bears for foraging opportunities along most of the productive salmon streams in the area.

Portions of Revilla, Gravina, and Annette Islands have been logged and have clear-cuts with habitats in various stages of regeneration. As is the case elsewhere in Southeast Alaska, habitat changes continue to occur from clear-cut 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 sunlight does not penetrate to the forest floor. Second-growth stands lack large hollow trees and root masses used for denning habitat. Although logging may create food for bears in the short term, the long-term result of logging will likely be a decline in bear numbers (Suring et al. 1988).

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 distribution near Ketchikan is significantly influenced by human garbage. Although bears have probably always been numerous locally, the availability of this attractive alternative food source promotes high bear densities. Additionally, restrictions against firearm discharge within urban areas provide a refugium from harvest near the city, allowing the bear population to sustain the high densities in this area. At the same time, the high human density in the area and differing attitudes toward responsible garbage-handling promote 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 remained 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. During the 1990s the mean annual hunter harvest was 64 bears/year, with a range of 33 to 97 bears. During 2000-2006 the mean annual harvest increased to 78 bears/year, with a range of 55 to 103 bears (Table 1).

Fluctuations in annual harvest are probably linked more with 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 hunting 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 accounted for only 7 percent of the hunter transport, slightly higher than the 10-year average of 5 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 (April–June).

By state regulation, starting in 1996 the edible meat from spring bears needed to be salvaged for human consumption, but the meat from fall bears has not required salvage. Many hunters find meat from spring bears very tasty, while fall bears taken in Southeast Alaska are rarely considered edible by hunters because of the salmon component in the bears' diet.

Resident hunters historically accounted for about 75% of the Unit 1A harvest until the late 1990s when nonresidents began harvesting around 50% of the 1A bears. This nonresident pattern has remained similar over the years since 2000 with only slight fluctuation between 43 and 57 percent. 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. The costs of hunting for nonresidents, including a hunting license ($85), tags ($225–$300), and expensive transportation do not seem to limit the number of nonresident hunters who pursue black bears in Unit 1A.

Some logging roads historically open to hunters will soon be closed as part of a statewide effort by the U.S. Forest Service (USFS) to reduce road maintenance costs and liability. The net effect will reduce the number of drivable road miles available to hunters by over one third. That will mean going from more than 300 miles of drivable roads currently available in the Ketchikan area to about 100 miles of roads that will remain open to motorized vehicles. Many of the roads slated to be closed are not connected to the main Ketchikan road system and require the use of a boat to offload a truck or 4-wheeler to the roads.

Historical harvest locations

Hunters harvest bears throughout the unit, although the highest harvests continue to come from Wildlife Analysis Areas (WAAs) 405 (Thorne Arm), 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. WAA 822 is accessible by boat from Ketchikan and remains a very popular place 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.

In 2006 ADF&G and the Ketchikan City Council formed a working group to develop a city ordinance to require residents to secure garbage. During late 2007 the Ketchikan City Council passed an ordinance and is currently working through a warning and citation schedule to track and cite offenders and to make it usable between multiple agencies. This should help a great deal with situations where residents refuse to secure garbage and continue to create irresistible food attractions within the community.

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 harvest data analysis showed this to be the long-term average.

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. An increasing average skull size could 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 use skull size in conjunction with other harvest data to make our best assessment of current bear 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). A changing sex ratio in harvest is thought by some bear biologists to reflect changes in the population. As a measure of harvest intensity, we expect the sex 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. Males remain

more vulnerable and 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 (Miller, S. 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 0.50 bears per mi^2 = 48 bears
- Cleveland Peninsula south of Yes Bay – 203 mi^2 X 1.0 bears per mi^2 = 203 bears
- Duke and Annette Islands – 140 mi^2 X 0.10 bears per mi^2 = 14 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)

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. This is more difficult recently because our hunter population seems to be changing. Recently we have more nonresident hunters anxiously harvesting the first bear they see rather than waiting for a good trophy male or even a representative specimen.

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 are not available.

Black colored pelage is most common and occurs throughout the bears' range. The cinnamon color phase occurs mostly in mainland portions of the unit and occasionally on Revilla Island. Black bears with glacier (blue) pelage are also found in Unit 1A. Kermode bears, or those with pure white pelage, have been reported in extreme southern mainland portions of the unit along the Portland Canal.

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 51, 87, and 103 bears during 2004, 2005, and 2006 seasons respectively. The most recent 3-year average was the same as the 10-year mean ($\bar{x}$ = 80 bears) and higher than the previous 3-year average of 70 bears. The 2006 harvest of 103 bears from Unit 1A was the highest on record (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 bears killed in Unit 1A, and during the past 10 years 78% (range 71–89%) of the kill has been male. The 3-year male average is slightly lower at 76% (range 74–85%) (Table 1).

The average male skull size during this report period ($\bar{x}$ = 18.2 inches, range 17.7–18.7) was slightly higher than the past 10-year average ($\bar{x}$ = 18.1 inches, range 17.7–18.7). 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 16.1 inches (range 15.7–16.7 inches) (Table 5).

The annual average number of hunters during this report period (81) was higher than the 10-year average of 73 (range 52–103). The number of successful hunters peaked in 2006 at 103. The 2006 season also saw the most total days hunted (248) since 2000, when successful hunters spent 265 days afield. The spring 2005 season saw the fewest hunter days since 1997 while the spring of 2007 had the second highest days hunted in the last 20 years. Days in the field per successful hunter remained similar at 2.5 days (Table 5).

Hunter residency and success. Nonresident participation in Unit 1A black bear hunting has varied during the past 20 years, averaging 34% of the kill (15–58%). This nonresident pattern has increased during the past 3 years to a combined average of 52%. During the 2004, 2005 and 2006 seasons, 55%, 53% and 48% respectfully, of successful hunters were nonresidents. The high of 58% in 2002 was the highest nonresident participation on record for this unit. Alaska residents not living in Unit 1A (nonlocal) historically harvest only 5–10% of the bears in this area. This past 3-year period had the least participation by nonlocal residents on record which was (2%) down from the long-term average of 9% (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 (49%), followed by September (27%) and June (16%). The May trend during the past 3 years (49%), was similar to the 10-year average of 47% (range 34–58) (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 annually and bears are occasionally harvested using this method. During the three years of this report period 1, 3, and 2 bears were reported killed in Unit 1A using bait (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 hunts. 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 8 successful hunts (range 1–14) in Unit 1A. This is up from the 10-year average of only 6 guided hunts per season. The most guided hunts on record were conducted during the recent 2006 season, when guides took 14 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 types of bear hunters in Unit 1A. This was especially true during the past 3 years, when 91% of the successful hunters used boats to access hunting areas in Unit 1A (range 85–95%). This most recent boat use is up from the 10-year average of 87% (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 rainforest 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, bear anatomy, terrain, vegetation types, and overall difficult tracking conditions.

HABITAT

Assessment

Several more timber sales are planned in Unit 1A. Proposed sales on Gravina Island include construction of additional roads into the interior of the island. The Alaska Mental Health Trust Authority began doing selective cutting using helicopters on the north side of Gravina Island during 2005. This timber harvest removed much of the large cedar stands from the north face of the island. The State of Alaska also released a large timber sale in the center of Gravina and that timber volume will be removed during 2006 and 2007. Currently the Forest Service is offering several small timber sales during 2008 targeting most of the remaining large timber on the northern half of Gravina Island and adding a few more miles of road. Collectively these timber sales target some of the most important old-growth areas that are very important bear and deer habitat on this island. With better access and more hunters, we anticipate a higher harvest of bears from that area as 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 silviculture practice, precommercial thinning and pruning has been performed in some young second-growth stands. 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 for 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 all firearm discharge 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 employees have 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. Fish and Game staff also spent 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 7 bears were killed

under DLP situations across the entire unit during this report period, which is down from the last report period, when 9 were listed as DLP kills (Table 1). We continue to educate the public about proper garbage handling to prevent bears from becoming food-conditioned and the resulting public safety issues and needless killing of bears.

In 2006 ADF&G and the Ketchikan City Council formed a working group to develop a city ordinance to require residents to secure garbage. During late 2007 the Ketchikan City Council passed an ordinance and currently we are working through a warning and citation schedule to track and cite offenders and to make it usable between multiple agencies. This should help a great deal with situations where residents refuse to secure garbage and continue to create irresistible food attractions within the community.

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 2006 season recorded the most days hunted, most successful hunters, and consequently the most bears harvested on record for Unit 1A. We expect this increasing harvest trend to continue as long as tourism is strong, and Alaska is selected as a popular and safe tourism destination.

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 nonresidents renting boats and vehicles, and other nonresidents employing transporters or licensed big game guides.

As local bear viewing interest continues to grow with tourism, 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 real town bear problem will be resolved now that city decision makers are taking some 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, less visibility, and that 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 1997 through 2006

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
1997																	
Fall 1997	13	3	0	16		0	1	0	1	0	0	13	(76)	4	(24)	0	17
Spring 1998	52	5	0	57		0	0	0	0	0	0	52	(91)	5	(9)	0	57
Total	65	8	0	73	1	0	1	0	1	0	0	65	(88)	9	(12)	0	74
1998																	
Fall 1998	19	11	0	30		0	0	0	0	0	0	19	(63)	11	(37)	0	30
Spring 1999	48	5	1	54		2	2	0	4	0	0	50	(88	7	(12)	1	58
Total	67	16	1	84	1	2	2	0	4	0	0	69	(79)	18	(20)	1	88
1999																	
Fall 1999	15	21	0	36		4	0	0	4	0	0	19	(48)	21	(52)	0	40
Spring 2000	54	5	0	59		1	0	0	1	0	0	55	(92)	5	(8)	0	60
Total	69	26	0	95	2	5	0	0	5	0	0	74	(74)	26	(26)	0	100
2000																	
Fall 2000	18	11	0	29		2	1	0	3	0	0	20	(63)	12	(37)	0	32
Spring 2001	57	11	0	68		1	1	0	2	0	0	58	(83)	12	(17)	0	70
Total	75	22	0	97	2	3	2	0	5	0	0	78	(76)	24	(24)	0	102
2001																	
Fall 2001	13	14	0	27	0	5	1	0	6[c]	0	0	18	(55)	15	(47)	0	34
Spring 2002	50	5	0	55	0	0	0	0	0	0	0	50	(91)	5	(9)	0	55
Total	63	19	0	82	0	5	1	0	6[d]	0	0	68	(77)	20	(22)	0	88
2002																	
Fall 2002	14	13	0	27	0	1	0	0	1	0	0	15	(54)	13	(46)	0	28
Spring 2003	40	7	0	47	0	0	0	0	0	0	0	40	(85)	7	(15)	0	47
Total	54	20	0	74	0	1	0	0	1[e]	0	0	55	(73)	20	(27)	0	75
2003																	
Fall 2003	6	7	0	13	1	2	0	0	2	0	0	8	(53)	7	(47)	0	15
Spring 2004	34	8	0	42	1	1	0	0	1	0	0	35	(81)	8	(19)	0	43
Total	40	15	0	55	2	3	0	0	3[f]	0	0	43	(74)	15	(26)	0	58
2004																	
Fall 2004	13	8	0	21	0	1	0	0	1	0	0	14	(64)	8	(36)	0	22
Spring 2005	25	5	0	30	1	2	0	0	2	0	0	27	(84)	5	(16)	0	32
Total	38	13	0	51	1	3	0	0	3	0	0	41	(76)	13	(24)	0	54
2005																	
Fall 2005	13	13	0	26	2	2	0	0	2	0	0	15	(54)	13	(46)	0	28
Spring 2006	53	8	0	61	3	1	1	0	2	0	0	54	(89)	9	(11)	0	63
Total	66	21	0	87	3	3	1	0	4	0	0	69	(76)	22	(24)	0	91

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
2006																	
Fall 2006	17	8	0	25	0	0	1	0	1	0	0	17	(65)	9	(45)	0	26
Spring 2007	71	7	0	78	2	0	1	0	1	0	0	71	(90)	8	(10)	0	79
Total	88	15	0	103	2	0	2	0	2	0	0	88	(84)	17	(16)	0	105

[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 1997 through 2006

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown residency[b]	(%)	Total
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	(49)	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
2004–2005	21	(41)	3	(5)	28	(55)	0	(0)	52
2005–2006	39	(45)	2	(2)	46	(53)	0	(0)	87
2006–2007	50	(49)	3	(3)	50	(48)	0	(0)	103
Average	38	(54)	6	(8)	25	(35)	2	(3)	71

[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 1997 through 2006

Regulatory year	Month												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
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[c]	(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
2004–2005	17[b]	(33)	4	(8)	0	(0)	1	(2)	24	(47)	5	(10)	51
2005–2006	23	(26)	3	(3)	0	(0)	2	(2)	39	(45)	21	(24)	88
2006–2007	22[b]	(22)	2	(2)	1	(1)	1	(1)	55	(53)	22[b]	(21)	103
Average	16	(22)	5	(7)	1	(1)	3	(4)	35	(51)	11	(15)	70

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

TABLE 4 Unit 1A black bear harvest percent by transport method, regulatory years 1997 through 2006

Regulatory year	Transport												
	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
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	(5)	0	(0)	3	(6)	58
2004–2005	0	(0)	48	(95)	2	(4)	1	(1)	0	(0)	0	(0)	51
2005–2006	0	(0)	80	(94	5	(6)	0	(0)	0	(0)	0	(0)	5
2006–2007	0	(0)	88	(88)	12	(12)	0	(0)	0	(0)	0	(0)	100
Average	2	(2)	71	(85)	5	(6)	2	(2)	1	(1)	3	(4)	84

[a] Includes 3- or 4-wheelers or other ORV
[b] Includes DLP and vehicle collisions

TABLE 5 Unit 1A successful black bear hunter effort, mean skull size, and mean age, regulatory years 1997 through 2006

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	n[b]	Female	n[b]	Male	n	Female	n
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
2001-2002											
Fall 2001	57	25	2.3	18.9	9	16.1	11	10.0	9	11.9	12
Spring 2002	135	53	2.6	18.1	50	16.0	5	9.5	46	9.8	5
Total/ $\bar{x}$	192	78	2.7	$\bar{x}$ =18.5	59	$\bar{x}$ =16.1	16	$\bar{x}$ =9.8	52	$\bar{x}$ =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	$\bar{x}$ =18.5	59	$\bar{x}$ =16.1	16	$\bar{x}$ =9.8	55	$\bar{x}$ =10.9	17

TABLE 5 continued

Regulatory year	Hunter effort			Mean skull size[a] (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	*n*[b]	Female	*n*[b]	Male	*n*	Female	*n*
2004–*2005*											
Fall 2004	61	22	2.8	18.4	14	15.6	8	8.5	11	5.1	7
Spring 2005	73	30	2.4	18.9	24	16.2	4	11.6	25	11.3	4
Total/ $\bar{x}$	134	52	2.6	$\bar{x}$ =18.7	38	$\bar{x}$ =15.9	12	$\bar{x}$ =10.0	36	$\bar{x}$ =8.2	11
2005–2006											
Fall 2005	45	28	1.6	17.4	13	15.7	13	7.5	13	7.9	13
Spring 2006	162	59	2.7	18.7	52	16.5	8	10.3	51	11.1	8
Total/ $\bar{x}$	207	87	2.4	$\bar{x}$ =18.1	65	$\bar{x}$ =16.1	21	$\bar{x}$ =8.9	64	$\bar{x}$ =9.0	21
2006–2007											
Fall 2006	50	25	2.0	16.9	17	15.9	9	7.2	17	11.3	7
Spring 2007	198	78	2.5	18.5	67	16.7	7	10.7	68	15.3	14
Total/ $\bar{x}$	248	103	2.4	$\bar{x}$ =17.7	84	$\bar{x}$ =16.3	16	$\bar{x}$ =9.0	85	$\bar{x}$ =13.3	14

[a] Skull sizes equal length plus zygomatic width.

[b] *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 1997–2006

WAA	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
0101			1	1		1	1	2	1	
0303					1			2	2	
0404	1	4	6	8	5	6	3	1		
0405		2	4		1	1		9	18	10
0406	20	25	22	22	11	12	8	8	12	13
0407	5	13	15	12	13	15	7			6
0408		8	5	7	16	4	4	4	7	3
0509	3	1	4	4	1	1	4	4	7	3
0510	12	12	10	13	15	11	10	9	25	10
0511	1	1			1		4	1		
0612			1		1	1				
0613	1	3		3	2	2	1		1	2
0614		1	1				1			1
0715	2	3		3	1		1		2	5
0716		2		1	1			1	3	2
0717		1	2			2				
0718										
0719	1		2	2		1	1			1
0820	4		2	4	1	2	4	3	2	2
0822	12	2	18	14	19	13	2	7	13	20
0823	8	5	2	2		1	3			
0824	1		4	3		3	1	2	1	6
0825		1		1			2			
0826	2	1	1	1				1		
1209		1								
1210		1								
1319		1								
1526	1									

[a] Includes DLP and road kills

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

LOCATION

GAME MANAGEMENT UNIT: Unit 1B (3000 mi^2)

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. The Alaska Department of Fish and Game (ADF&G) has estimated that of the 3000 square miles in Unit 1B, only about 850 square miles are 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 16,000 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 30 bears killed during the 2001–2002 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 (57%) and local resident hunters (16%) that year, but we do not know if total hunter effort was higher than normal. Approximately 70–100% 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 69% of the harvest since 1995. 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 2003 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 Alaska 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 (Milltown, Montana) for age determination. We also seal any bear that is killed under defense of life or property (DLP) provisions, as a road kill, an 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 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 38% over the preceding 5-year period. The harvest decrease was primarily due to an unusually low harvest in 2003–04. The harvest of just 8 bears in 2005–06 represents the second lowest annual harvest in the unit since 1981. In the absence of a mandatory reporting requirement for unsuccessful black bear hunters we are currently unable to determine if the unusually low

harvests in 2003–2004 and 2005–2006 were simply the result of reduced hunter effort or success, or if other environmental factors were responsible.

Hunter harvest in Unit 1B ranged from 8 to 18 bears annually during this report period and during all 3 years was below the average harvest of 19 bears annually during the preceding 10 year period (Table 1).

Males made up 82%, 88%, and 100% of the kill in regulatory years 2004, 2005, and 2006, respectively. During this report period the average male skull size ranged from 18.4 to 18.5 inches, well above the management objective of 17.5 inches, during all 3 years (Table 2). The male-to-female harvest ratio during this report period was 11:1, 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 68% of the total annual harvest, local residents took about 30%, and nonlocal Alaska hunters took 3% of the bears harvested in the unit (Table 3). During the report period the number of bears harvested by nonresident hunters decreased, while the number taken by local residents increased slightly compared to the previous report period. It is therefore possible that reduced effort by both local residents, and guided and unguided nonresidents contributed to the low harvest in 2005–2006.

Harvest Chronology. Most black bears are taken in the spring, with 55–100% of bears killed in May this report period (Table 4).

Harvest in Particular Areas (WAAs). During this report period black bear harvest occurred in 12 WAAs in Unit 1B. These include WAAs in the Cape Fanshaw, Farragut Bay, Dry Bay, Thomas Bay, LeConte Bay, Stikine River, Eastern Passage, Bradfield Canal, and Cleveland Peninsula areas. WAAs in the Farragut Bay, Bradfield Canal, Dry Bay and Thomas Bay areas produce 59 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. Over the last ten years, the percentage of the unitwide harvest taken by guided nonresidents has averaged 45%. During the most recent 5-year period, guided hunters accounted for 73% of the unitwide harvest, compared to 46% during the preceding 5-year period. During this report period a little more than half of the successful nonresident hunters used a guide (52%), while 23% used commercial services for transportation to and from the field.

Transport Methods. During the report period 100% of successful hunters reported using boats to access black bear 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. Nonetheless, 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, 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. 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. In the absence of additional thinning 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.

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 38% from that of the preceding 5-year period. The harvest of 8 bears in 2005–06 represents the second lowest annual harvest since 1981. The reasons for the unusually low harvests in 2003–2004 and 2005–2006 remain unknown. There is currently no mandatory hunt reporting requirement for unsuccessful black bear hunters. In the absence of information from this group of hunters we are currently unable to evaluate whether the unusually low harvests those years were simply the result of reduced effort or low hunter success, or if they resulted from environmental factors such as atypical winter or spring weather

conditions. The black bear harvest in neighboring Unit 3 experienced a similar harvest decline in 2003–2004, implying that regional environmental factors may have contributed to the harvest reduction that year.

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 well above the management objectives during this 3-year period and indicate 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, 1999–2006

Regulatory year	Hunter kill						Nonhunting kill [a]			Total estimated kill					
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
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	20	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	6
Total	7	0	0	0	7	0	0	0	0	7	100	0	0	0	7
Fall 04	1	1	50	0	2	NA	0	0	0	1	50	1	50	0	2
Spring 05	8	1	11	0	9	0	0	0	0	8	89	1	11	0	9
Total	9	2	18	0	11	0	0	0	0	9	82	2	18	0	11
Fall 05	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0
Spring 06	7	1	13	0	8	0	0	0	0	7	88	1	13	0	8
Total	7	1	13	0	8	0	0	0	0	7	88	1	13	0	8
Fall 06	1	0	0	0	1	NA	0	0	0	1	100	0	0	0	1
Spring 07	17	0	0	0	17	0	0	0	0	17	100	0	0	0	17
Total	18	0	0	0	18	0	0	0	0	18	100	0	0	0	18

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

TABLE 2 Unit 1B black bear mean skull size[a], 1995–2006

Regulatory year	Males	*n*	Females	*n*
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
2004–2005	18.4	9	16.3	2
2005–2006	18.5	7	17.4	1
2006–2007	18.5	18	NA	0

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

TABLE 3 Unit 1B successful black bear hunter residency, 1995–2006

Regulatory year	Local resident [a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total successful hunters
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	33	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
2004–2005	5	45	0	0	6	55	11
2005–2006	1	13	0	0	7	88	8
2006–2007	5	28	1	6	12	67	18

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

TABLE 4 Unit 1B black bear harvest chronology by percent, 1995–2006

Regulatory year	Month						
	September	October	November	April	May	June	*n*
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
2004–2005	9	9	0	18	55	9	11
2005–2006	0	0	0	0	100	0	8
2006–2007	6	0	0	6	89	0	18

TABLE 5 Unit 1B black bear harvest in percent by transport method, 1995–2006

Regulatory year	Airplane	Boat	Highway vehicle	Foot	Unknown	*n*
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
2004–2005	0	100	0	0	0	11
2005–2006	0	100	0	0	0	8
2006–2007	0	100	0	0	0	18

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 has been 2 bears per year for residents (not more than 1 glacier bear) and 1 bear per year for nonresidents.

Historical harvest patterns

The harvest percentage by residency status has not changed significantly during the past 30 years. Alaska 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 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. During this two-year period 34% (22) of the 64 bears hunters harvested in fall were female compared with only 7% (15) females among the 226 bears harvested in spring.

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 were 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 Fanshaw 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. Characteristics of harvested bears are not representative of the population as a whole, but rather provide 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.

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.

All black bears harvested in Unit 1C must be sealed, at which time data on skull size and age are collected as two of the main sets of biological data. These data are used by the department as 2 sets of indices of the status of the black bear populations. Our reasoning is that if the skull sizes and ages of harvested bears are relatively stable, then this may be a reflection of the population being stable as well. On the other hand, if these indices decline significantly, that would be an indication to the department that the population, and therefore availability of bears to hunters, had changed as well. There have been no significant changes in skull size and age data we have collected over the past 3 report periods, so based on these data, we don't have reason to suspect that the population has changed significantly, at least on the Unit 1C level. The harvest during this report period has varied substantially between the first year and the next two. The low harvest in 2004 may have been due to weather factors during the spring of the year. Because most hunters take bears on the tide flats, the timing of green-up can have a major impact on hunter success.

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 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 (in the early 1990s), 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 63, 111, and 116 bears in regulatory years 2004, 2005, and 2006, respectively (Table 1). The mean annual harvest of 97 bears is a 13% decrease over the mean harvest of 111 during the previous 3-year reporting period. Males composed 94, 86,

and 85% of the harvest, exceeding the management objective of 75%. Average skull size for male bears was 18.5 inches, during the first 2 years of the report period, and slightly lower at 17.9 inches during the final year. The mean age of male bears increased, going from a mean of 8.0 years of age during the previous report period to 9.7 years in 2004–2006 (Table 5). The majority of bears harvested had black pelage, although 1 glacier bear was killed by JPD in 2006 as a nuisance kill. Successful hunters spent an average of 3.1 days afield (Table 5), similar to the 3.2 days of effort expended per successful hunter during the previous reporting period.

Hunter Residency and Success. Nonlocal Alaskans took 8% of all black bears harvested during the reporting period, while local residents harvested 34%. Nonresident hunters took 58% of the harvest, ranging from 56% to 59%. This is a significant increase when compared to the previous 2 report periods, when the nonresident take ranged from 25% to 51%.

Harvest Chronology. During the reporting period, 78% of the bears taken were killed in the spring season, ranging from 75% in 2005 and 2006 to 86% in 2004 (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).

Transport Methods. Boats continued to dominate means of transport to the field, used by 84% of successful 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 5, 11, and 12 bears during 2004, 2005, and 2006 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.

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 worth considering because the highly productive state of the natural habitat provides for an abundant population of bears. The best way to provide good habitat for black bears is to limit development within 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.

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.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 1C bear harvest that had declined substantially during the last year of the previous report period was lower still during 2004. However the harvest rebounded somewhat during 2005 and 2006, reversing the downward trend. Hunters began voicing their concerns and

observations of seeing fewer bears, at least in the southern portion of Unit 1C. Whether this is a trend we are seeing will likely be evident in the next few years. The increase in harvest during the last 2 years of the report period over 2005 and 2006 was promising. Two of our 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 may not have changed significantly.

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. 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 1997 through 2006

Regulatory year	Reported													
	Hunter kill					Nonhunting kill				Total estimated kill				
	M	F	Unk	Total	Baited	M	F	Unk	Total	M	(%)	F	(%)	Unk	Total
1997–1998															
Fall 1997	8	0	0	8	NA	0	0	0	0	8	(100)	0	(0)	0	8
Spring 1998	67	12	0	79	NA	1	1	0	2	68	(84)	13	(16)	0	81
Total	75	12	0	87	NA	1	1	0	2	76	(85)	13	(15)	0	89
1998–1999															
Fall 1998	9	1	0	10	NA	4	0	0	4	13	(93)	1	(7)	0	14
Spring 1999	136	5	1	142	NA		0	0	0	136	(96)	5	(4)	1	142
Total	145	6	1	152	NA	4	0	0	4	149	(96)	6	(4)	1	156
1999–2000															
Fall 1999	22	4	0	26	NA	0	2	0	2	22	(79)	6	(21)	0	28
Spring 2000	94	16	0	110	NA	1	1	0	2	95	(85)	17	(15)	0	112
Total	116	20	0	136	NA	1	3	0	4	117	(84)	23	(16)	0	140
2000–2001															
Fall 2000	8	8	0	16	NA	10	4	0	14	18	(60)	12	(40)	0	30
Spring 2001	112	24	2	138	NA	0	1	0	1	112	(82)	25	(18)	2	139
Total	120	32	2	154	NA	10	5	0	15	130	(78)	37	(22)	2	169
2001–2002															
Fall 2001	18	12	0	30	NA	2	4	0	6	20	(56)	16	(44)	0	36
Spring 2002	96	16	0	112	NA	1	0	1	2	97	(85)	16	(14)	1	114
Total	114	28	0	142	NA	3	4	1	8	117	(78)	32	(22)	1	150
2002–2003															
Fall 2002	30	8	0	38	NA	10	7	4	21	40	(73)	15	(27)	4	59
Spring 2003	64	17	0	81	NA	0	0	1	1	64	(79)	17	(21)	1	82
Total	94	25	0	119	NA	10	7	5	22	104	(76)	32	(24)	5	141

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
2003–2004																
Fall 2003	7	6	0	13	NA	5	1	0	6	12	(63)	7	(37)	0		19
Spring 2004	51	8	0	59	NA	1	0	0	1	52	(87)	8	(13)	0		60
Total	58	14	0	72	NA	6	1	0	7	64	(81)	15	(19)	0		79
2004-2005																
Fall 2004	7	2	0	9	NA	0	4	0	4	7	(54)	6	(46)	0		13
Spring 2005	52	2	0	54	NA	0	1	0	1	52	(95)	3	(5)	0		55
Total	59	4	0	63	NA	0	5	0	5	59	(87)	9	(13)	0		68
2005-2006																
Fall 2005	16	11	0	27	NA	5	2	2	9	21	(62)	13	(38)	2		36
Spring 2006	79	5	0	84	NA	0	2	0	2	79	(92)	7	(8)	0		86
Total	95	16	0	111	NA	5	4	2	11	100	(83)	20	(17)	2		122
2006-2007																
Fall 2006	19	9	0	28	NA	5	5	2	12	24	(63)	14	(37)	2		40
Spring 2007	80	8	0	88	NA	0	0	0	0	80	(91)	8	(9)	0		88
Total	99	17	0	116	NA	5	5	2	12	104	(83)	22	(17)	2		128

TABLE 2 Unit 1C black bear successful hunter residency, regulatory years 1997 through 2006

Regulatory year	Local resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown residency	(%)	Total
1997–1998	47	(55)	7	(8)	32	(37)	0	(0)	86
1998–1999	86	(57)	27	(18)	38	(25)	1	(0)	152
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
2004-2005	19	(30)	8	(13)	36	(57)	0	(0)	63
2005-2006	34	(31)	11	(10)	66	(59)	0	(0)	111
2006-2007	46	(40)	5	(4)	65	(56)	0	(0)	116

TABLE 3 Unit 1C black bear harvest chronology by month, regulatory years 1997 through 2006

Regulatory year	Harvest periods												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
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
2004-2005	7	(11)	2	(3)	0	(0)	2	(3)	50	(80)	2	(3)	63
2005-2006	22	(20)	5	(4.5)	0	(0)	7	(6)	72	(65)	5	(4.5)	111
2006-2007	24	(21)	3	(2)	1	(1)	7	(6)	60	(52)	21	(18)	116

TABLE 4 Unit 1C black bear harvest percent by transport method, regulatory years 1997 through 2006

Regulatory year	Transport												
	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	Other	(%)	Unk	(%)	*n*
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
2004-2005	0	(0)	56	(89)	4	(6)	2	(3)	1	(2)	0	(0)	63
2005-2006	1	(1)	94	(85)	7	(6)	3	(3)	6	(5)	0	(0)	111
2006-2007	1	(1)	94	(81)	14	(12)	6	(5)	1	(1)	0	(0)	116

TABLE 5 Unit 1C successful black bear hunter effort, mean skull size, and mean age, regulatory years 1997 through 2006

Regulatory year	Successful hunter effort: Total days	Nr hunters	Mean days per hunter	Mean skull size[a] (inches): Male	*n*[c]	Female	*n*	Average age (years): Male	*n*	Female	*n*
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
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	2.4	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

Table continued next page

TABLE 5 continued

Regulatory year	Successful hunter effort: Total days	Nr hunters	Mean days per hunter	Mean skull size[a] (inches): Male	*n*[c]	Female	*n*	Average age (years): Male	*n*	Female	*n*
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
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*
2004-2005											
Fall 2004	13	9	1.4	18.4	*6*	16.2	*2*	8.8	*6*	9.0	*2*
Spring 2005	176	54	3.3	18.5	*52*	16.7	*2*	9.9	*49*	7.0	*2*
Total	189	63	3.0	18.5	*58*	16.5	*4*	9.8	*55*	8.0	*4*
2005-2006											
Fall 2005	88	27	3.3	18.9	*16*	16.4	*11*	9.9	*14*	9.7	*11*
Spring 2006	261	84	3.1	18.5	*79*	16.4	*5*	10.1	*75*	8.0	*5*
Total	349	111	3.1	18.5	*95*	16.4	*16*	10.1	*89*	9.2	*16*
2006-2007											
Fall 2006	59	28	2.1	16.3	*19*	16.1	*8*	5.5	*19*	11.8	*8*
Spring 2007	284	88	3.2	18.3	*78*	16.0	*8*	10.1	*79*	9.0	*8*
Total	343	116	3.0	17.9	*97*	16.0	*16*	9.2	*98*	10.4	*16*

TABLE 6 Unit 1C black bear mortality from all Wildlife Analysis Areas (WAA), regulatory years 1997 through 2006

	Regulatory year										
WAA	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
2202	1	4	4	2	2	1	0	1	0	2	17
2203	4	0	3	0	3	2	1	1	2	1	17
2304	2	10	12	15	11	7	6	3	7	9	82
2305	4	14	7	8	5	8	6	1	3	9	65
2306	8	14	15	22	10	17	13	8	12	11	130
2307	1	5	7	8	5	14	3	0	4	7	54
2408	2	6	1	4	0	1	0	1	0	0	15
2409	2	4	1	3	1	3	1	0	0	1	16
2410	0	0	0	0	1	1	3	1	0	2	8
2411	0	1	1	0	1	1	0	0	1	0	5
2412	0	0	0	0	0	0	0	0	1	0	1
2413	0	0	0	0	0	0	0	0	0	0	0
2514	4	11	5	6	6	5	5	0	2	10	54
2515	4	10	7	7	11	10	6	5	9	5	74
2516	0	0	0	0	0	0	0	0	0	0	0
2517	2	6	5	14	7	12	5	3	6	11	71
2518	2	2	5	7	5	1	0	1	5	2	30
2519	2	1	1	2	1	2	2	0	2	2	15
2722	0	2	2	4	7	6	1	3	1	0	26
2823	13	32	25	17	20	12	11	8	12	11	161
2824	4	4	11	6	3	4	6	3	2	4	47
2825	10	7	6	19	14	9	5	7	6	6	89
2926	14	14	17	18	26	15	3	15	31	20	173
2927	9	10	5	8	10	10	2	7	16	15	92
Total	88	157	140	170	149	141	79	68	122	128	1242

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 (Alaska Department of Natural Resources 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 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 in the past. 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 is not available. We have information only for successful hunts, gathered during sealing of black bear hides and skulls.

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 and the hide and skull 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 increased steadily 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 other clear trends have been apparent, as harvest varies greatly from year to year. For the periods 1998–2001 and 2001–2003 the average numbers of bears harvested were 42 and 26 bears, respectively (Hessing 2005). The mean harvest for this reporting period (2004–2006) was 35 black bears. The information provided above illustrates the variability in the Unit 1D black bear harvest.

Local residents have typically accounted for about three-quarters of the annual harvest. However, this reporting period has shown an increase in successful nonresident hunters, especially in regulatory year (RY) 2005 (Table 2). This increase is 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 (39%) as their primary transportation. The use of off-road vehicles increased form 8% to 18% of successful hunters. Only 9% of hunters reported "by foot" as their means of transportation; a decrease from 11% during the last reporting period (2001–2003). However, this may be misleading, as "transportation" can be interpreted in different ways.

Male bears constituted an overall average of 77% of the harvest during the 14-year period 1990–2003; the 2004–2006 male harvest was 81%. Overall, nonresident hunters killed 18% females in this period, versus 2% by local residents and 2% by nonlocal residents. The low percentage of female bears harvested by resident hunters reversed itself during 2004–2006; of the resident harvest, 85% were female bears.

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). During this report period, the percentage of black bears taken over bait was 38%, indicating that bear baiting remains a popular and successful method of taking Unit 1D black bears. 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% (Hessing 2005). During this reporting period the spring havest increased to previous levels of approximately 88% of the overall black bear harvest. As reported here in 1999, a regulatory change restricting bait stations from within a 1-mile corridor of the main roads in the Haines area took effect beginning in spring 2003, but it does not appear to have impacted the long-term seasonal black bear harvest.

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 Alaska Departments of Fish and Game (ADF&G) 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. 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

The majority of black bears sealed in Unit 1D during 2004–2006 exhibited the common black pelage color; approximately 27% 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. In fall 2006 a guided nonresident hunter took the only sealed glacier bear in Unit 1D. Reports of a glacier bear cub were received in the summer of 2006. This bear appears to accompany a sow and black colored sibling near the city limits of Skagway, Alaska..

During this report period (2004–2006), 19% of the harvested bears were females, meeting our management objective of a 3:1 (75% to 25%) male to female bear harvest ratio.

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.

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 action occurred during the report period. No Emergency Orders were issued for Unit 1D black bear seasons.

Hunter Harvest. Hunters reported killing 24, 43 and 35 black bears in 2004, 2005 and 2006, respectively. This was slightly higher than the previous 3 years' harvest; 26 bears per year for the previous report period (Hessing 2005) versus 34 bears per year during this report period. regulatory year (RY)2005 represents the highest black bear harvest since 2000, and is the third highest harvest in the last 10 years (Table 1). The ratio of males to females (3:1) was within management objectives (Table 1) for 2004 & 2005, and only slightly below the objective in 2006 (2.9:1)

Hunter Residency and Success. Local resident hunters take the majority of black bears in Unit 1D (range 57%-76%), who primarily use bears for meat. There was a substantial increase in the percentage of bears taken by nonresidents; approximately 25% of bears were taken by nonresidents during the reporting period (Table 2). RY2005 represented a substantial increase in the total harvest of bears; the nonresident harvest in 2005 (15 bears) is the highest nonresident harvest in the previous 10 years.

Hunter Effort. Data indicate that 4.6 days per hunter were required to harvest a black bear during this reporting period (Table 5). This would suggest that more effort is now required, compared to

earlier periods, to harvest a black bear and that the trend is toward increasing effort required. Perhaps this reflects a decreasing availability of bears, but it would be premature to draw this conclusion from this data alone. To more accurately gauge the availability of black bear we would need to obtain effort data from unsuccessful hunters. We have no such data because unsuccessful hunters are not required to report.

Harvest Chronology. Spring months account for most Unit 1D harvest, with May and June accounting for 60% and 29% of the report period kill. September accounted for about 6% of the most recent 3-year harvest (Table 3). As noted above, most local bear hunters, who take up to 75% of the annual harvest, hunt for meat. Spring bears are preferred over fall bears because they are believed to be more palatable.

Harvest in Particular Areas (WAAs). Approximately 51% of the black bear harvest came from along the Haines Highway and the lower Chilkat River, WAA 4302 (Table 7). Another 32% came from the upper Chilkat, and about 12% originated from the Chilkoot and Ferebee watersheds. This reporting period's harvest locations are consistent with long-term trends. Both the Haines Highway and Kelsall River Road provide extensive access to hunting locations and both have hunters with histories of hunting the same areas over the years.

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; the harvest of black bears over bait continued to increase to a total of 39 bears during this period (Table 1) up from 32 and 21 bears from the two previous reports, respectively (Hessing 2005). The increase in harvest over the past 2 report periods is largely the result of successful baiting operations and may reach a nonsustainable level if the trend continues. There is some concern from local Alaska Wildlife 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.

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

Guided Hunter Harvest. Nonresident hunters took 25% of black bears during the report period (Table 2), an increase of approximately 44% over the last report, and the largest increase in any of the 3 black bear hunter demographics (local resident, nonlocal resident, and nonresident). Nonresident hunters are not required to have a registered guide while hunting black bears in Alaska but many have chosen to pursue black bears in combined species hunts (i.e., brown bear, mountain goats). Also, black bears hunting locations are readily accessible due to the extensive road system in the unit, making it fairly easy to conduct hunts, without guides, for black bears.

Transport Methods. Most successful black bear hunters used boats (39%) or highway vehicles (31%) during the report period (Table 4).

Other Mortality

During 2004–2006, 2 black bears were killed in Defense of Life and Property (DLP). The same numbers of bears were taken DLP in the last reporting period; 3 bears were killed in DLP during

1998–2000. Since 1990, a total of 12 DLP bears have been reported. Between 1971 and 1989, only 10 bears were taken under DLP regulations (Hessing 2005); this slight increase in the number of DLP harvests supports department statements concerning people moving into traditional black bear habitat. During the current reporting period, no bears were reported killed in vehicle collisions, and 1 bear was reported to be caught in a trap but was not confirmed.

HABITAT

Assessment

Urban sprawl is the single most important habitat consideration for Unit 1D black bears. Even in small communities, people move into traditional black bear habitat. This will displace bears and increase the number of human/bear conflicts. Logging and subsequent forest succession continue to have an effect on black bear habitat in Unit 1D, and it 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. The extent to which these factors impact unit black bears is unknown.

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, compost, and burial. 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. Fruit bearing trees and shrubs attract bears.

A toll-free number is now available 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. Wildlife staff have suggested bear deterrent techniques and deterrent devices (Critter Gitter© & electric fences) have been fielded in Haines. Wildlife staff will continue to work with Unit 1D residents to alleviate bear/human conflicts.

CONCLUSIONS AND RECOMMENDATIONS

During the report period, regulatory years 2004–2006, the black bear harvest was composed of 81% male and 19% female bears, meeting the management objective of a 3:1 male to female harvest ratio. The 3-year mean male skull size of 16.8 inches was slightly below the management objective of 17.0 inches. We will continue to evaluate this parameter to determine if the declining trend continues. The increase in harvest will be scrutinized for the next report in an attempt to determine if there is a specific mechanism providing for the additional harvest, or if the harvest is simply displaying its variable nature. As noted, regulatory year 2005 represents a substantial increase in harvest compared with the other 2 years of the reporting period,

increasing the mean report period harvest. While the number of bears taken over bait stabilized in this report period, these harvests need 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 Laboratory (Milltown, MT). High brown bear numbers and habitat changes may cause a decline in black bear numbers and harvest in the future.

Black bear hunting is becoming more popular in Southeast Alaska, resulting in concerns of overharvest in a limited number of locations. We anticipate an increase in the total number of hunters in unit 1D and will monitor the overall harvest, considering management objectives and hunter demographics, to evaluate the need for regulatory action.

Several research projects are ongoing in Southeast Alaska using hair snare techniques to collect bear DNA. DNA can used to estimate bear populations and densities in the project areas. Consideration should be given to using these techniques to estimate black bear populations and densities in specific locations within Unit 1D.

Continued public education and outreach will be used to reduce the number of black bears taken DLP and to provide Unit 1D residents with nonlethal options to address black bear concerns.

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TABLE 1 Unit 1D black bear harvest, regulatory years 1997 through 2006

Regulatory	Hunter kill					Nonhunting kill[a]				Illegal	Total reported kill						
year	M	F	Unk	Total	Baited	M	F	Unk	Total	kill	M	(%)	F	(%)	Unk	(%)	Total
1997																	
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	(79)	6	(21)	1	(3)	30
Total	29	11	1	41	18	1	0	0	1	0	30	(73)	11	(27)	1	(2)	42
1998																	
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																	
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																	
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																	
Fall 2001	2	3	0	5	0	0	1	0	1	0	2	(33)	4	(67)	0	(0)	6
Spring 2002	26	5	0	31	10	0	2	0	2	0	26	(79)	7	(21)	0	(0)	33
Total	28	8	0	36	10	0	3	0	3	0	28	(72)	11	(28)	0	(0)	39
2002																	
Fall 2002	4	4	0	8	0	1	0	0	1	0	5	(56)	4	(44)	0	(0)	9
Spring 2003	9	4	0	13	5	1	0	0	1	0	10	(71)	4	(29)	0	(0)	14
Total	13	8	0	21	5	2	0	0	2	0	15	(65)	8	(35)	0	(0)	23
2003																	
Fall 2003	2	2	0	4	0	0	0	0	0	0	2	(50)	2	(50)	0	(0)	4
Spring 2004	14	2	0	16	6	0	0	0	0	0	14	(88)	2	(12)	0	(0)	16
Total	16	4	0	20	6	0	0	0	0	0	16	(80)	4	(20)	0	(0)	20

Table continues next page

TABLE 1 continued

Regulatory	Hunter kill					Nonhunting kill[a]				Illegal	Total reported kill						
year	M	F	Unk	Total	Baited	M	F	Unk	Total	kill	M	(%)	F	(%)	Unk	(%)	Total
2004																	
Fall 2004	1	0	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	(0)	1
Spring 2005	20	3	0	23	11	1	0	0	1	0	21	(88)	3	(12)	0	(0)	24
Total	21	3	0	24	11	1	0	0	1	0	22	(88)	3	(12)	0	(0)	25
2005																	
Fall 2005	5	1	0	6	0	1	0	0	1	0	6	(86)	1	(14)	0	(0)	7
Spring 2006	30	7	0	37	17	0	0	0	0	0	30	(81)	7	(19)	0	(0)	37
Total	35	8	0	43	17	1	0	0	1	0	36	(82)	8	(18)	0	(0)	44
2006																	
Fall 2006	4	1	0	5	0	0	0	0	0	0	4	(80)	1	(20)	0	(0)	5
Spring 2007	22	8	0	30	11	0	0	0	0	0	22	(73)	8	(27)	0	(0)	30
Total	26	9	0	35	11	0	0	0	0	0	26	(74)	9	(26)	0	(0)	35

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

TABLE 2 Unit 1D black bear successful hunter residency, regulatory years 1997 through 2006

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown[b] residency	(%)	Total
1997	31	(74)	3	(7)	7	(17)	1	(2)	42
1998	27	(75)	3	(8)	6	(17)	0	(0)	36
1999	32	(71)	9	(20)	3	(7)	1	(2)	45
2000	33	(70)	5	(11)	7	(15)	2	(4)	47
2001	27	(69)	1	(2)	8	(21)	3	(8)	39
2002	13	(57)	2	(8.5)	6	(26)	2	(8.5)	23
2003	15	(75)	1	(5)	4	(20)	0	(0)	20
2004	19	(76)	2	(8)	4	(16)	0	(0)	25
2005	25	(57)	4	(9)	15	(34)	0	(0)	44
2006	26	(74)	2	(6)	7	(20)	0	(0)	35

[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, regulatory years 1997 through 2006

Regulatory	Month[a]												
year	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
1997	11	(27)	0	(0)	0	(0)	0	(0)	23	(56)	7	(17)	41
1998	4	(11)	1	(3)	0	(0)	1	(3)	18	(50)	12	(33)	36
1999	13	(29)	0	(0)	0	(0)	0	(0)	25	(55)	7	(16)	45
2000	6	(13)	2	(4)	0	(0)	0	(0)	26	(55)	13	(28)	47
2001	6	(16)	0	(0)	0	(0)	0	(0)	17	(45)	15	(39)	38
2002	8	(36)	0	(0)	0	(0)	1	(5)	10	(45)	3	(14)	22
2003	2	(10)	2	(10)	0	(0)	0	(0)	11	(55)	5	(25)	20
2004	0	(0)	1	(4)	0	(0)	0	(0)	18	(75)	6	(25)	25
2005	5	(12)	1	(2)	0	(0)	1	(2)	28	(65)	8	(19)	43
2006	2	(6)	2	(6)	1	(3)	0	(0)	15	(43)	15	(43)	35

[a] Does not include bears killed during closed season.

TABLE 4 Unit 1D black bear harvest percent by transport method, regulatory years 1997 through 2006

Regulatory	Transport												
	Highway												
year	vehicle	(%)	Boat	(%)	Walk	(%)	Plane	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
1997	25	(59)	12	(29)	1	(2)	0	(0)	0	(0)	4	(9)	42
1998	18	(50)	11	(31)	5	(14)	0	(0)	2	(5)	0	(0)	36
1999	14	(31)	16	(35)	11	(24)	0	(0)	3	(7)	1	(2)	45
2000	20	(44)	14	(31)	10	(22)	1	(3)	0	(0)	0	(0)	45
2001	15	(38)	15	(38)	4	(10)	2	(5)	0	(0)	3	(8)	39
2002	11	(48)	7	(30)	1	(4)	0	(0)	2	(9)	2	(9)	23
2003	6	(30)	6	(30)	4	(20)	1	(5)	3	(15)	0	(0)	20
2004	11	(44)	10	(40)	1	(4)	0	(0)	2	(8)	1	(4)	25
2005	8	(19)	20	(46)	5	(12)	1	(2)	8	(19)	2	(2)	43
2006	11	(31)	11	(31)	4	(11)	0	(0)	9	(26)	0	(0)	35

[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 2006. Days hunted over 30 are excluded from table. Ages not available for all bears or years. Mean skull size not available for all bears.

	Hunter effort			Mean skull size[a] (inches)				Average age (years)[b]			
Regulatory year	Total days	Nr hunters	Mean days per hunter	Male	*n*[c]	Female	*n*	Male	*n*	Female	*n*
1997											
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											
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											
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
2000											
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											
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

Table continues next page

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*
2002											
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											
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	8.8	16	10.3	4
2004											
Fall 2004	1	1	1	16.3	1	0.0	0				
Spring 2005	110	23	4.8	17.7	21	16.3	3				
Total	111	24	4.6	16.0	21	16.3	3	12.7	21	9.4	3
2005											
Fall 2005	22	6	3.7	17.4	6	16.1	1				
Spring 2006	170	37	4.6	17.6	30	15.7	7				
Total	192	43	4.5	17.5	36	15.8	8	9.2	35	9.5	8
2006											
Fall 2006	11	5	2.2	16.4	4	15.1	1				
Spring 2007	160	30	5.3	17.3	22	15.5	8				
Total	171	35	4.9	16.5	26	15.5	9	8.3	26	5.6	9

[a] Skull sizes equal length plus zygomatic width.

[b] Ages not available for all bears.

[c] *n* represents sample size..

TABLE 6 3-Year mean hunter effort, bear skull size and age comparison

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*
1998-2000											
Total	355	125	2.8	16.9	99	15.4	27	6.9	82	8.7	23
2001-2003											
Total	274	73	3.8	17.4	58	15.3	20	8.4	57	9.1	21
2004-2006											
Total	474	102	4.6	16.8	81	15.7	20	8.9	82	8.2	20

[a] Skull sizes equal length plus zygomatic width.

[b] Ages not available for all bears.

[c] *n* represents sample size.

TABLE 7 Unit 1D black bear mortality[a] by Wildlife Analysis Areas (WAA), regulatory years 1997 through 2006

	WAA							
Regulatory years	4302	4303	4304	4405	4406	4407	4408	Total
1997	19	16	0	4	0	1	1	41
1998	23	7	0	5	0	1	0	36
1999	28	5	1	3	1	2	5	47
2000	24	8	1	7	7	0	0	47
2001	21	10	1	5	0	0	2	39
2002	10	8	0	2	0	2	1	23
2003	7	12	0	0	0	1	0	20
2004	13	8	0	4	0	0	0	25
2005	25	13	2	1	1	1	1	44
2006	15	12	1	7	0	0	0	35

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

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 abundant 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*.). Later in spring, bears are efficient predators of Sitka black-tailed deer fawns during a short vulnerable period in May. 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 availability may also cause losses after implantation or may result in the death of cubs that are born weak. 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).

Though there are abundant healthy and productive habitats, it is also true that more clearcut logging has occurred in Unit 2 than in other Southeast Alaska (Southeast) black bear habitats. Counting national forest and private lands, the Alaska Department of Fish and Game (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 more than 2500 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 finished, as required by the 1997 Tongass Land Management Plan (TLMP, USFS 1997). As a result of more than 40 years of large scale clearcut logging, habitat changes continue to evolve. Although early seral stages (3–20 years postlogging) provide black bears with abundant 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 in Unit 2 (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 bears (*Ursus arctos*). Brown bears are no longer present on POW or the surrounding archipelago. 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 often 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 bear abundance and distribution 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. Currently, we only have information on hunt effort for successful hunters from sealing data.

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 Fall 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 continues to be a contentious issue with many big game guides and hunters.

Hunting with dogs. POW is the only place in Southeast Alaska 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. However, in cases where 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 353 bears during 1994–2002. Males have accounted for about 72% of the harvest during the past 13 years, exceeding our management objective. On average about 65–75% of the harvest occurs during the spring season. Black bear harvest by nonresidents in Unit 2 has steadily increased over the past decade and recently reached 89% during 2006. During the past 10-year period, Alaska residents living in Unit 2 accounted for 8% and nonlocal residents another 11% of the harvest (Table 2). 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 51% 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, which 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 18.0 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 in Milltown, Montana 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 to be able to conduct research in the future 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 predator prey research project will provide valuable data on hunting vulnerability due to road density and extensive shoreline habitat, and on wounding loss, recruitment, habitat selection, 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/mi^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/mi^2 estimate (Lindzey and Meslow 1977).

Elsewhere, Modafferi (1982) estimated 1 bear/mi^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/mi^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/mi^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 America 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, Larsen derived a population estimate of 5400 bears for the unit (Larsen 1995). In making this estimate, Larsen assumed some areas have more and some less bears than others. 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.

In 2000, ADF&G supported a study on a 400-mi^2 northern portion of Kuiu Island located in Unit 3 that used tetracycline biomarkers to estimate black bear density. This black bear research calculated a bear density estimate at 3.9 bears/mi^2 (1.5 km^2) (Peacock 2004). This higher density estimate is comparable with Lindzey and Meslow's (1977) peak estimate of black bears on Long Island, Washington. Because the Kuiu effort was 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. If we calculate a conservative estimate of Unit 2 bears using 3 bears/mi^2, which is less than the results from the Kuiu study but higher than previous estimates calculated from the Washington state work, we would essentially double the overall estimate for Unit 2 from 5400 to 10,800 bears. The actual number of bears in Unit 2 likely is somewhere between these two density estimates because of the large area and varying habitat quality across the temperate forest landscape.

In 2007 we initiated a pilot study in the central portion of Prince of Wales Island. This study includes the use of noninvasive genetic mark–recapture techniques. We are using noninvasive breakaway single-capture noose snares equipped with barbed wire to capture hair from live bears (Beier et al. 2005). Bears are considered marked when we obtain a genetic signature from hair samples. The recaptures are obtained when bears are harvested during the subsequent hunting seasons. This field project will continue through 2009 and lab work and results should be complete by 2010.

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.

Distribution and Movements

As stated above, Unit 2 black bears are probably not evenly distributed across the unit. 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 are not yet available. Efforts are ongoing to secure funding for a comprehensive research project to determine home range sizes and look at habitat use and seasonal movements by Unit 2 bears.

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 has indirectly impacted 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 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 access to and availability of black bears on Kuiu is similar to Unit 2, and consequently when the Kuui cap was initiated many licensed guides and transporters, and many unguided nonresident hunters shifted from Kuiu to POW. 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 2004–2006 average of 450 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 sustainable annual harvest of 767 bears. To date, the high 2005 harvest of 486 bears constituted only 9% of this conservative population estimate. This suggests the current harvest is within sustainable levels, according to this simulation model, as long as our density estimate is reasonably accurate. However, we feel it is important to evaluate watershed or site-specific harvests in order to track potential localized overharvest and to evaluate our population estimate, which is currently based entirely on available habitat in Unit 2.

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. Sex ratio of the harvest during the past 10 years has remained stable and even increased slightly

during 2003, to 4:1. The 2005 harvest was the highest harvest for Unit 2 on record (486 bears) and also the first time the harvest dropped to a 2:1 male to female ratio (Table 5).

We looked at Unit 2 harvest using smaller scale areas and found increasing female harvest in some Major Harvest Units (MHU). The MHU (the first two digits) is composed of several smaller units (second two digits) called Wildlife Analysis Areas (WAA). The increasing trends included MHUs 1100, 1200, and 1300. Also the proportion of females in the total harvest increased during the last decade in MHUs 1100, 1200, and 1500, but has not changed significantly in MHUs 1300 and 1400. MHUs 1300 and 1400 also have some of the highest road densities in the Unit and bears from these areas seem to be younger compared to ages in areas with less access (Figure 1).

We met our management objective of maintaining at least 65% male harvest during the past 3 years with males representing 72% overall 2004–2006. This male dominated harvest is consistent with the past 20 years as males have represented 72% over the long term harvest (Porter 2002).

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 6.4 years (range 5.0–7.5) and females 8.6 years (range 7.2– 10.3) (Table 5). Males harvested in the spring are always younger on average than bears harvested in the fall. Conversely, there is no age pattern in the female harvest between spring and fall. We will continue to evaluate the age trends of harvested male bears and the age structure of all harvested bears on a smaller landscape scale to look for trends.

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 87% of the reported harvest. Unit 2 residents took only 5% of the harvest during the same period, down from an average of 13% during the past 20 years. Successful nonlocal Alaskans have declined from a 20-year average of 18% to an average of 8% during this report period. During the past 10 years, Alaska residents accounted for 19% of the harvest (range 11–29%). This is radically lower than the previous 10 years (1987–1996) when residents averaged 44% (range 35–55%) 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 of them were avid hunters. The remote locations of the many operations allowed workers easy access to game populations, including bears. 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.

A few years postcutting these clearcut areas provided additional forage; however, currently much of the habitat is changing and converting to closed canopy forest. This is making it much

more difficult to visually locate bears in the thick vegetation over much of the landscape. We also expect this less productive forage production will have a negative impact on carrying capacity for bears.

The abundance and accessibility of Unit 2 black bears for hunters, due in part to the ease of access along the extensive road system, is attractive and appealing to many. Recent releases of bear hunting videos and articles in popular hunting magazines also contribute 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 each year. 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. Harvest of black bears in Unit 2 increased from 1997–2007, however, all of the increase occurred during the spring season. Regression of harvest during autumn 1999–2004 indicated that the slope was not different from 0 ($F= 0.047$, $P= 0.832$) but was negative after 2004 ($F= 109.15$, $P< 0.001$) and a strong negative trend after 2004 ($F = 22.08$, $P = 0.005$). Total harvest steadily declined after 2005, but most of that was due to decline in the spring harvest.

The mean male skull size during the spring met our management objective of 19.0 inches during 2 of the 3 years, 2004 ($\bar{x}$ =19.3), 2005 ($\bar{x}$ = 18.8) and 2006 ($\bar{x}$ = 19.0). During those same 3 years 125, 93, and 106 harvested male bears respectively had 20-inch or larger skulls in the spring. A few bear skulls each year exceed 21 inches and during this report period 2004 (24), 2005 (26) and 2006 (28) were included in that category. Occasionally Unit 2 male bears also exceed the total 21-inch skull measurements, qualifying them for Boone and Crocket and Pope and Young record books. The average age of these large male bears was 11 (range 4–28).

Most Unit 2 bears are taken in the spring (76%) with May consistently ranking as the peak harvest month. The May 2004 harvest represented 59% of the year's total and was slightly higher than the past 10-year average ($\bar{x}$ = 54%). May harvests during the 2005 and 2006 seasons were each 57% of total harvest. September consistently has the second highest harvest (27%) with only a few bears taken in October and November (Table 3). Spring 2006 had the most hunters (360) and the most hunter-days (1306) for a spring hunt on record (Table 5).

Harvest in particular Major Harvest Areas (MHU). As stated earlier, 2 MHUs on POW, 1300 and 1400, have accounted for a large portion of the total harvest in Unit 2. MHU 1400 showed the most obvious increase during recent years and reached an all-time high harvest peak during 2004. That increasing trend has slowed during the 2006 season, but MHU 1400 still ranks as the top harvest area in the unit.

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 allowed only during the spring hunting season. During the past 10 years, we have issued an average of 100 permits each year (range 52–158). During the 2005 season we issued 158 permits, the most permits on record for a single year. Hunters normally choose to establish the maximum of 2 bait sites per registration permit, so in 2005 that meant more than 300 bait sites were likely set up across Unit 2. However, even with the number of registration permits issued in the unit the reported harvested over bait has historically accounted for only a small percentage of the Unit 2 bear harvest. During this report period 2004–2006, hunters reported taking 30, 46, and 37 bears over bait respectively (Table 1). With many other bear hunting options in this area hunters who obtain Unit 2 bait permits often report taking bears using spot and stalk methods during their hunt rather than over the established bait site.

Because additional hunters may hunt over the same site with permission of the owner we do not have good estimates of actual numbers of hunters using bait sites. In an attempt to gather some of that important harvest information we have asked hunters to mail their site permit at the end of the season. This site permit includes hunting license numbers from other visitors if they used another hunter's registered bait site. More than 80% of the hunters harvesting bears each season in Unit 2 over bait are nonresidents. The majority of hunters using bait report taking bears with archery equipment (Table 1).

Hunting with Dogs. Hunting with dogs has been banned in most states, and those displaced houndsmen appear to be taking advantage of the many opportunities in Alaska. Many of the houndsmen who apply for permits each year are repeat hunters, mostly from Idaho and Montana. Currently, hunting with dogs in Unit 2 requires a permit issued by the Ketchikan area wildlife biologist. Hunting bears with dogs in Unit 2 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. Good health certificates are also required for dogs before entering Alaska. The cost of gas and the declining economy has reduced the number of applicants wanting hound permits. Consequently, during the past 3 years we have not issued all 5 allowable hound hunting permits. Until 2003, all permits issued during the past 10 years had been to nonresident hunters. One resident of the unit now owns hounds and has obtained a permit each year since 2003. This hound hunter has also assisted several hunters to find and dispatch wounded and hard to locate bears.

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 2005, when 72 guided hunters harvested bears. This is compared to an average of 5 guided kills from 1980 to 1999. During the 2004–2006 seasons 52, 72, and 57 successful hunters reported using licensed guides to harvest bears.

The use of 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. Transporters must obtain a state transporter license, and those operating on marine waters must also have U.S. Coast Guard approval. Transporters are not legally allowed to influence where hunters go to hunt. They also cannot assist hunters in locating or stalking game, or helping clients care for trophies. These regulations are frequently abused, yet few cases are ever prosecuted due to the difficulty of gathering evidence and monitoring hunting activities. The USFS is currently evaluating these activities and may eventually change its special use permit system to provide better records across the Tongass National Forest. The Alaska Big Game Commercial Services Board is also clarifying existing guide language in State regulation and establishing new guidelines to reduce abuse of this system. One large Unit 2 transporter case was successfully prosecuted in court and several investigations are ongoing. The Forest Service is also looking at ways to bring transporters under the permit umbrella similar to guides and other users. Although the Forest Service use permit system is addressing crowding issues, this mandatory reporting will also provide a way to monitor changes across all of the Tongass National Forest.

Transport Methods. During this report period 50% of successful hunters used highway vehicles to reach Unit 2 hunting destinations. Another 48% reported using boats, and the remaining 2% went by air (Table 4). The shift to more boat reflects both more boat-based transporters offering hunts, and hunters using land vehicles less because bears are harder to find in the overgrown clearcut habitat along the extensive road network.

A new highway improvement and paving project was recently completed along a large tract of the main road from Klawock to Thorne Bay and east to Naukati. Another section of pavement will be complete along the main 30 Road from the Naukati Junction to Coffman Cove summer of 2009. Beginning in early 2002, a new interisland ferry started making daily runs from Ketchikan and POW during all months with 2 daily runs during the peak summer and fall seasons. In 2006 another seasonal ferry route was added from Petersburg to Coffman Cove, making the area more accessible. 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 and vegetation, distance, and bear behavior.

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 unreported. Locals tend to avoid involving law enforcement or Fish and Game officials in these situations to avoid the subsequent investigation and paperwork. Even some 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 in the unit, grasses planted to stabilize hillsides will attract bears, and more drivers will spend 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 den 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. Traditionally used as a silvicultural practice, precommercial thinning and pruning has been performed in some young second-growth stands in Unit 2. Recently there have been some attempts to add a wildlife component to the thinning prescriptions. The problem with most thinning prescriptions meant to benefit wildlife is the remaining slash. Because of additional cost to remove or reduce this material it is seldom treated and creates an impenetrable barrier to most animals for many years, approximately 20–25 years, after which time canopy closure again results in loss of understory. The long-term effects of extensive clearcut logging will be detrimental to black bear populations in this unit.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Nuisance Bear Problems. Historical records are inaccurate regarding 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 are killed around logging camps and near communities each year; however, very few of these were ever reported or documented. Because most of these Unit 2 areas are not restricted by city ordinances, 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 shipping to the Craig/Klawock landfill. The shared Craig/Klawock barge transfer site is now operating and has removed the food attraction for bears.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 2 black bear harvest has been steadily increasing and is currently 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 in Unit 2.

We initiated a pilot research project on central POW to provide some basic information regarding bear vulnerability to hunting in high use areas including the likelihood of a bear being taken during the legal bear seasons. Some additional research needs for Unit 2 include obtaining better information on wounding loss, basic demographics, and reproduction and survival rates.

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 along with slightly smaller male skull averages. This may suggest hunters are searching for the largest bear, but in some cases harvest an older female bear instead of a male because it was the largest animal they encountered. 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 mature male bears in the field and at the same time outlining our concerns about wounding loss. Such a video would help hunters and managers by promoting more male-specific selective hunting and would help educate hunters about shot placement and shot distance.

We will continue to monitor specific harvest locations in order to track harvest and adjust future population estimates. This is especially important because harvests in 2 MHUs, both easily accessible along the road system, make up a large portion of the total bear harvest in the unit during the past 18 seasons. 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 1987–RY 2006

Regulatory year	Reported: Hunter kill M	F	Unk	Total	Baited[b]	Reported: Nonhunting kill[a] M	F	Unk	Total	Estimated kill Unrep	Illegal	Total estimated kill[c] M	(%)	F	(%)	Unk	Total
1987																	
Fall 1987	27	12	1	40		0	0	0	0	0	0	27	(69)	12	(31)	1	40
Spring 1988	100	12	0	112	1	0	2	0	2	0	0	100	(88)	14	(12)	0	114
Total	127	24	1	152	1	0	2	0	2	0	0	127	(83)	26	(17)	1	154
1988																	
Fall 1988	63	28	1	92		2	0	1	3	0	0	65	(70)	28	(30)	2	95
Spring 1989	74	16	21	111	5	3	2	0	5	0	0	77	(81)	18	(19)	21	116
Total	137	44	22	203	5	5	2	1	8	0	0	142	(76)	46	(24)	23	211
1989																	
Fall 1989	27	17	27	71		1	1	2	4	0	0	28	(61)	18	(39)	29	75
Spring 1990	92	16	39	147	22	0	0	1	1	0	0	92	(85)	16	(15)	40	148
Total	119	33	66	218	22	1	1	3	5	0	0	120	(78)	34	(22)	69	223
1990																	
Fall 1990	44	21	16	81		4	3	2	9	0	0	48	(67)	24	(33)	18	90
Spring 1991	98	16	11	125	14	1	0	0	1	0	0	99	(86)	16	(14)	11	126
Total	142	37	27	206	14	5	3	2	10	0	0	147	(79)	40	(21)	29	216
1991																	
Fall 1991	34	26	5	65		0	2	0	2	0	0	34	(55)	28	(45)	5	67
Spring 1992	103	29	21	153	1	1	0	0	1	0	0	104	(78)	29	(22)	21	154
Total	137	55	26	218	1	1	2	0	3	0	0	138	(71)	57	(29)	26	221
1992																	
Fall 1992	42	26	12	80		0	0	1	1	0	0	42	(62)	26	(38)	13	81
Spring 1993	116	18	8	142	24	0	0	1	1	0	0	116	(87)	18	(13)	9	143
Total	158	44	20	222	24	0	0	2	2	0	0	158	(78)	44	(22)	22	224
1993																	
Fall 1993	52	35	3	90		0	0	0	0	0	0	52	(60)	35	(40)	3	90
Spring 1994	114	19	2	135	18	0	0	0	0	0	0	114	(86)	19	(14)	2	135
Total	166	51	5	225	18	0	0	0	0	0	0	166	(75)	54	(25)	5	225

Table continues next page

TABLE 1 continued

Regulatory year	Reported																
	Hunter kill					Nonhunting kill[a]				Estimated kill		Total estimated kill[c]					
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	Total
1996																	
Fall 1996	49	39	0	88	0	0	0	1	1	0	0	49	(56)	39	(44)	1	89
Spring 1997	106	20	0	126	8	1	0	0	1	0	0	107	(84)	20	(16)	0	127
Total	155	59	0	214	8	1	0	1	2	0	0	156	(73)	59	(27)	1	216
1997																	
Fall 1997	65	37	1	103	0	0	0	1	1	0	0	65	(64)	37	(36)	2	104
Spring 1998	154	35	1	190	3	0	0	0	0	0	0	154	(81)	35	(19)	1	190
Total	219	72	2	293	3	0	0	1	1	0	0	219	(75)	72	(25)	3	294
1998																	
Fall 1998	53	66	0	119	0	0	0	2	2	0	0	53	(45)	66	(55)	2	121
Spring 1999	170	26	1	197	1	0	0	0	0	0	0	170	(87)	26	(13)	1	197
Total	223	92	1	316	1	0	0	2	2	0	0	223	(71)	92	(29)	3	318
1999																	
Fall 1999	50	46	0	96	0	1	0	0	1	0	0	51	(53)	46	(47)	0	97
Spring 2000	196	31	1	228	15	0	1	0	1	0	0	196	(86)	32	(14)	1	229
Total	246	77	1	324	15	1	1	0	2	0	0	247	(76)	78	(24)	1	326
2000																	
Fall 2000	88	58	0	146	0	0	1	0	1	0	0	88	(60)	59	(40)	0	147
Spring 2001	195	40	0	235	12	3	0	1	4	0	0	198	(83)	40	(17)	1	239
Total	283	98	0	381	12	3	1	1	5	0	0	286	(74)	99	(26)	1	386
2001																	
Fall 2001	55	55	0	110	0	0	1	0	1	0	0	55	(50)	56	(50)	0	111
Spring 2002	204	40	0	244	8	0	0	0	0	0	0	204	(84)	40	(16)	0	244
Total	259	95	0	354	8	0	1	0	1	0	0	259	(73)	96	(27)	0	355
2002																	
Fall 2002	70	54	0	124	0	0	1	0	1	0	0	70	(56)	55	(44)	0	125
Spring 2003	235	45	0	280	29	0	0	0	0	0	0	235	(84)	45	(16)	0	280
Total	305	99	0	404	29	0	1	0	1	0	0	305	(75)	100	(25)	0	405
2003																	
Fall 2003	66	54	0	120	0	0	2	0	2	0	0	66	(54)	56	(46)	0	122
Spring 2004	276	46	0	322	35	3	0	0	3	0	0	279	(86)	46	(14)	0	325
Total	342	100	0	442	35	3	2	0	5	0	0	345	(77)	102	(23)	0	447

Table continues next page

TABLE 1 continued

Regulatory year	Reported											Total estimated kill[c]					
	Hunter kill					Nonhunting kill[a]				Estimated kill							
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	Unrep	Illegal	M	(%)	F	(%)	Unk	Total
2004																	
Fall 2004	48	66	0	114	0							48	(42)	66	(58)	0	114
Spring 2005	296	61	0	357	30	0	0	0	0	0	0	296	(83)	61	(17)	0	357
Total	344	127	0	471	30	0	0	0	0	0	0	344	(73)	127	(27)	0	471
2005																	
Fall 2005	71	53	0	124	0	0	0	0	0	0	0	71	(57)	53	(43)	0	124
Spring 2006	268	94	0	362	46	0	0	0	0	0	0	268	(74)	94	(26)	0	362
Total	339	147	0	486	46	0	0	0	0	0	0	339	(70)	147	(30)	0	486
2006																	
Fall 2006	44	37	0	81	0	0	0	0	0	0	0	44	(54)	37	(46)	0	81
Spring 2007	240	72	0	312	37	0	0	0	0	0	0	240	(77)	72	(23)	0	312
Total	284	109	0	393	37	0	0	0	0	0	0	284	(72)	109	(28)	0	393

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

[b] Bears reported harvested over bait.

[c] Percent by sex based only on known harvest totals

TABLE 2 Unit 2 black bear successful hunter residency, RY 1986–RY 2006

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown[b] residency	(%)	Total
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	(18)	52	(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
2004–2005	28	(6)	42	(9)	401	(85)	0	(0)	471
2005–2006	20	(4)	41	(8)	425	(87)	0	(0)	486
2006–2007	18	(5)	26	(6)	349	(89)	0	(0)	393
Average	33	(13)	49	(18)	218	(68)	2	(1)	303

[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 1987–RY 2006

Regulatory year	Harvest periods												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
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
2004–2005	99	(21)	11	(2)	4	(1)	37	(8)	278	(59)	42	(9)	471
2005–2006	110	(23)	12	(2)	2	(<1)	18	(4)	276	(57)	68	(14)	486
2006–2007	95	(24)	11	(3)	4	(1)	3	(1)	223	(57)	57	(15)	393
Average	77	(27)	15	(6)	4	(2)	20	(7)	158	(51)	26	(8)	302

[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 1987–RY 2006

	Transport												
Regulatory year	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
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
2004–2005	6	(1)	235	(50)	228	(48)	0	(0)	0	(0)	3	(<1)	471
2005–2006	5	(1)	258	(53)	219	(45)	4	(1)	0	(0)	0	(0)	486
2006–2007	12	(3)	181	(46)	200	(51)	0	(0)	0	(0)	0	(0)	393
Average	12	(5)	116	(35)	160	(54)	10	(4)	2	(1)	3	(2)	302

[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 1986–RY 2006

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 continued next page

TABLE 5 continued

Regulatory year	Hunter effort: Total days	Nr hunters	Mean days per hunter	Mean skull size[a] (inches): Male	n[c]	Female	n	Average age (years)[b]: Male	n	Female	n
1994											
Fall 1994	223	85	2.6	18.2	60	16.8	24				
Spring 1995	601	149	4.0	19.2	112	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	18.3	50	16.8	35				
Spring 1996	588	166	3.5	19.2	135	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	17.2	48	16.8	38				
Spring 1997	543	127	4.3	19.5	102	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	17.6	63	16.5	36				
Spring 1998	704	187	3.8	19.2	151	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 continued next page

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	355	$\bar{x}$ =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	70	16.9	55	6.9	69	5.9	45
Spring 2003	1068	270	4.0	19.4	229	17.2	45	8.1	230	8.4	50
Total/average	1444	395	$\bar{x}$ =3.7	$\bar{x}$ =18.5	299	$\bar{x}$ =17.0	100	$\bar{x}$ =7.5	299	$\bar{x}$ =7.2	95
2003											
Fall 2003	355	120	3.0	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	$\bar{x}$ =3.3	$\bar{x}$ =18.5	341	$\bar{x}$ =17.0	94	$\bar{x}$ =6.5	351	$\bar{x}$ =10.3	88
2004											
Fall 2004	375	112	3.3	17.6	46	16.8	65	4.5	47	9.3	64
Spring 2005	1251	354	3.5	19.3	286	16.9	57	7.8	288	9.6	60
Total/average	1626	466	$\bar{x}$ =3.4	$\bar{x}$ =18.5	332	$\bar{x}$ =16.9	122	$\bar{x}$ =6.2	335	$\bar{x}$ =9.5	124
2005											
Fall 2005	371	124	3.0	17.2	67	16.5	51	4.6	70	7.5	51
Spring 2006	1306	360	3.6	18.8	258	17.2	87	7.4	260	9.6	90
Total/average	1677	484	$\bar{x}$ =3.3	$\bar{x}$ =18.0	325	$\bar{x}$ =16.9	138	$\bar{x}$ =6.0	330	$\bar{x}$ =8.6	141
2006											
Fall 2006	267	81	3.5	16.9	43	16.7	37	4.9	44	9.6	37
Spring 2007	1165	312	3.7	19.0	240	16.7	72	7.8	228	8.1	67
Total/average	1432	393	$\bar{x}$ =3.6	$\bar{x}$ =18.0	283	$\bar{x}$ =16.7	109	$\bar{x}$ =6.4	272	$\bar{x}$ =8.9	104

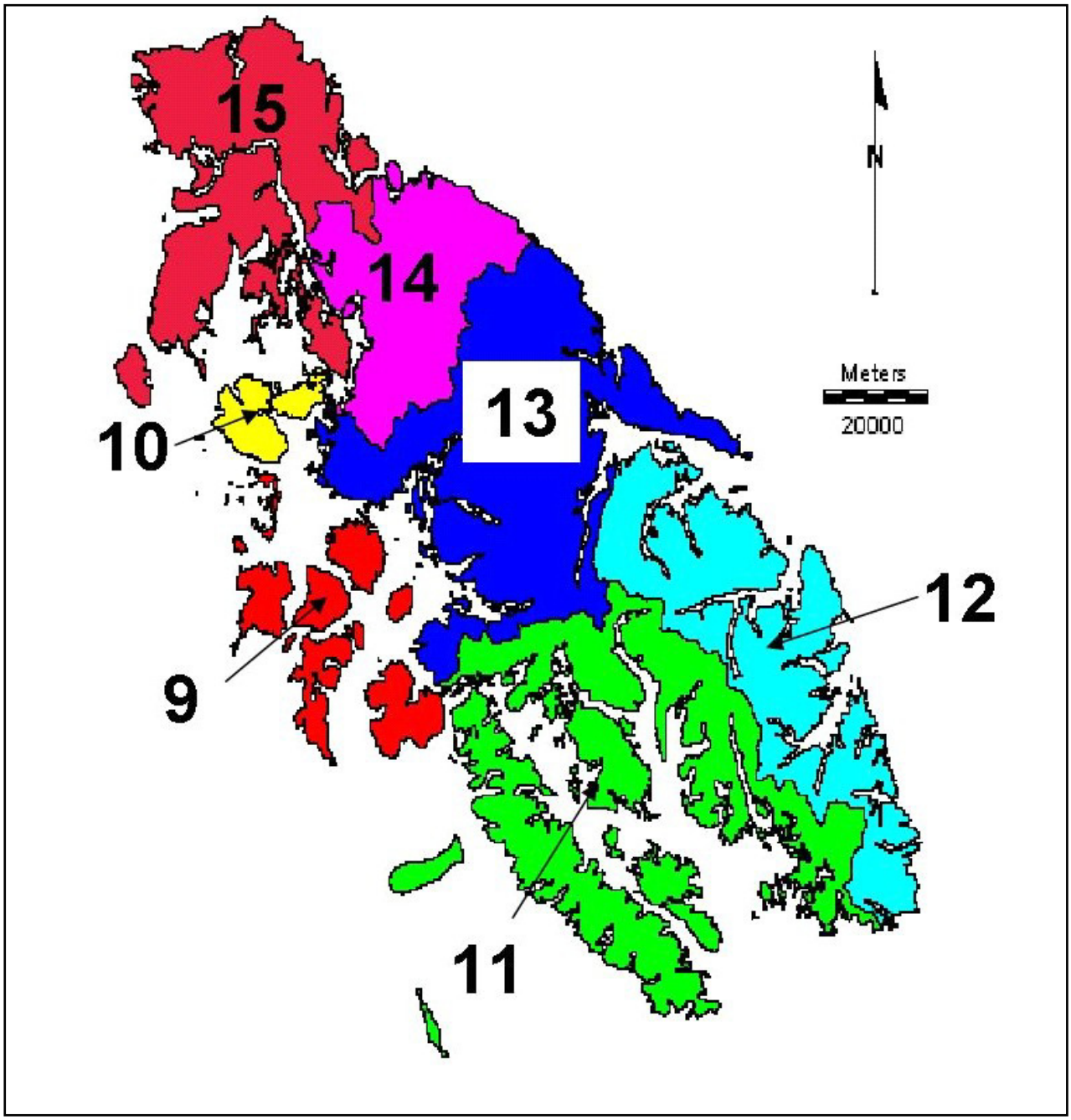
[a] Skull sizes equal length plus zygomatic width.
[b] Bear ages not available for 1980–1981 and 1989–1990.
[c] *n* represents sample size.

TABLE 6 Unit 2 black bear harvest[a] from the most heavily harvested Wildlife Analysis Areas (WAA), RY 1991–RY 2006

	Regulatory years																
WAA	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	$\bar{x}$
1107	7	11	8	14	8	8	12	12	16	21	18	44	16	37	35	23	**18**
1210	6	6	8	8	7	6	10	20	15	11	11	6	26	10	24	12	**12**
1211	4	2	12	6	8	8	7	9	11	24	21	29	20	35	32	28	**16**
1213	2	7	2	2	7	1	6	6	7	13	11	18	9	16	21	7	**8**
1214	18	15	15	10	18	11	36	28	31	13	30	40	37	38	55	21	**26**
1315	18	12	15	6	14	16	17	22	16	16	9	19	24	13	12	16	**15**
1316	3	4	0	4	10	1	2	1	3	3	1	2	3	3	1	3	**3**
1317	14	20	14	17	23	13	17	25	29	33	40	30	34	37	32	36	**26**
1318	16	17	19	21	18	19	15	22	16	16	16	11	25	11	13	16	**17**
1319	17	14	13	14	15	14	15	19	23	30	20	18	21	24	36	22	**20**
1332	9	9	8	6	8	12	6	9	10	13	0	0	0	15	14	19	**9**
1420	16	20	18	22	14	18	21	26	30	21	15	21	16	24	29	23	**21**
1421	6	6	9	9	5	6	8	14	14	16	3	12	11	10	8	11	**9**
1422	23	25	25	38	36	33	37	28	40	63	52	46	50	62	60	46	**42**
1526	2	1	12	1	6	7	20	12	15	19	16	16	26	22	12	19	**13**
1527	2	7	7	8	5	5	21	13	15	15	12	16	16	5	10	12	**11**
1529	12	13	10	15	9	9	23	14	7	24	18	9	10	19	19	21	**15**
1530	23	17	13	25	19	7	9	12	6	8	18	15	17	16	13	13	**14**
1531	0	1	6	7	5	2	4	7	3	17	6	4	4	9	6	4	**5**

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

FIGURE 1 Unit 2 Major Harvest Units (MHUs)



WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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. The Alaska Department of Fish and Game (ADF&G) has estimated that of the 3000 mi^2 of terrestrial habitat in Unit 3, about 1500 mi^2 is forested. More than 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 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 4 bear baiting permits per year in the unit. Each baiting permit allows the permittee to establish 2 individual bear baiting stations in the unit. The highest number of baiting permits issued was 11 in 2004. 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.

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 annually for nonresidents on Kuiu Island. In 2001, the first year implemented, 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. Since that time, no additional emergency closures have been necessary and the nonresident harvest on Kuiu has stabilized at an average of 112 bears annually.

At its statewide meeting in February 2004, the Board of Game passed a regulation allowing the sale of handicraft articles made from the fur of black bears.

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 2000 the annual harvest had increased over ten-fold since 1973, when 29 bears were killed. In the 2000–01 regulatory year the Unit 3 harvest was 309 bears, with 165 (53 %) of those taken on Kuiu Island. Approximately 73–83% of the annual harvest occurs during the spring season. Since 1973, males have outnumbered females in the harvest about 4 to 1. The percentage of the harvest attributable to nonresident hunters has grown over the past 15 years, increasing from less than 50% in 1990 to 80% in 2000.

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 an 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, resulted in concerns about the sustainability of increasing harvest levels. In 2001 the department implemented a newly authorized harvest guideline for Kuiu limiting the nonresident harvest to 120 bears annually. Since that time the Unit 3 harvest distribution has changed slightly and the proportion of the unitwide harvest coming off Kuiu annually has been reduced.

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 has decreased in recent years. The decrease in motor vehicle use on Kuiu is primarily attributable to the departure of one transporter who had previously provided highway vehicles to his clients on the island. 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. From 2001 and 2003 Kupreanof Island provided 45% of the unitwide harvest, Mitkof 5%, and the remainder of the Unit 3 islands 3%.

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 data from previous years 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 (Milltown, Montana) 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. 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). To recover samples, 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 allowing researchers to determine a marked-to-unmarked ratio of bears.

In June 2000 a total of 188 baits were deployed, resulting in 138 marked bears. Using recovery data from regulatory year 2000 Peacock estimated the population size on northern Kuiu was 1019 bears for a density estimate of 1.51 bears/km^2. In June 2002, a total of 263 baits were deployed, resulting in 191–201 marked bears. Using 2002 marks and recovery data, population point estimates for northern Kuiu ranged from 983 bears (1.46 bears/km^2) to 1013 bears (1.51 bears/km^2). Based on the 2000 and 2002 baiting efforts, and after adjusting for double-marking, emigration and immigration, Peacock developed density point estimates ranging from 1.31 to

1.51 bears/km^2 on northern Kuiu. The density estimate of 1.51 bears/km^2 or 3.9 bears/mi^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

With the exception of northern Kuiu Island, precise population estimates are not available for black bears in most of the 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. No Board of Game actions took place, and no emergency orders were issued regarding Unit 3 black bears during this report period.

Hunter Harvest. Unit 3 hunter harvests ranged from 198 to 232 bears annually during this report period (Table 1). The average annual harvest of 219 bears annually during this report period, was below the preceding ten-year average of 254 bears annually. The 198 bears killed in 2004–05 represent the lowest annual harvest since the 1992–93 season.

Males made up 75% of the Unit 3 harvest in both 2004, and 2005, and 81% in 2006. During this report period, the average male skull size ranged from 18.3 inches to 18.6 inches (Table 2). The male to female ratio during this report period was 3.4:1—slightly above the management objective of 3:1.

Hunter Residency and Success. Although the percentage varies annually, from 2004 to 2006 nonresidents took approximately 85% of the bears harvested in the unit, nonlocal Alaskans took about 10%, and local residents about 5% (Table 7).

Harvest Chronology. During this report period, 74–77% of the overall harvest occurred during the spring season, with 42–49% of all bears killed in May (Table 8).

Harvest in Particular Areas. Harvest occurred in 16 individual Unit 3 Wildlife Analysis Areas (WAAs) during this report period. Of the 658 bears harvested, over 50% were taken from 6 WAAs on Kuiu Island, and 44% were taken from 5 WAAs on Kupreanof Island. WAA 5012 alone, on northern Kuiu Island, accounted for 23% of the total unitwide harvest. Combined, the harvest from 5 other Unit 3 WAAs, including those on Mitkof, Wrangell, Etolin, and Woronkofski Islands, accounted for just 6% of the unitwide harvest (Table 5).

Bait Stations. A total of 13 individuals were issued bear baiting permits during the report period. Each bear baiting permit allows a hunter to establish up to 2 individual bait stations. Eleven permittees requested authorization to establish 2 bait stations, while 2 individuals requested a permit to establish a bait station at a single site.

A record number of permits were issued in 2004, when 11 individuals requested authorizations to establish up to 20 bait stations. In 2005, 4 individuals were authorized to establish 8 bait stations. In 2006 3 individuals were issued permits to establish 6 bait stations.

Hunting with Dogs. No permits were requested to hunt bears with dogs during this report period.

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 46% of the harvest in 2004, 39% in 2005, and 34% in 2006.

Transport Methods. Hunter transportation is primarily by boat, highway vehicle and airplane, respectively (Table 9). During this report period the unitwide percentage of hunters using highway vehicles to access hunt areas decreased slightly from the previous report period. The percentage of Kuiu Island hunters using vehicles increased at a rate of 214% annually from 1995 to 2000 before peaking at 20% in 2000. Since 2003, however, the percentage of hunters using highway vehicles on the island has steadily decreased and was just 2% during this report period.

Other Mortality

No DLPs were documented during the report period; however, some DLPs likely go unreported, particularly in the communities of Wrangell and Kake. 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.

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.

While possibly significant, little information is currently available on the amount of wounding loss that is occurring in the unit. Between 2001and 2003 a special permit was issued 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. During a 3 year period, 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. Wounding loss experienced by nonguided hunters is likely much higher than that of guided hunters who have the benefit of expert advice on caliber selection, shot placement, shooting distance, back-up shots and tracking experience.

HABITAT ASSESSMENT

Assessment

Timber harvest continues to pose the most serious threat to black bear habitat in the unit. Clearcut logging reduces habitat diversity associated with old growth forests and eliminates denning trees. While postlogging increases in berry production, primarily *Vaccinium* sp., may contribute to short-term bear population growth, this forage source will be lost as second growth stands regenerate and the canopy closes. 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. 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 were no documented instances of a black bear being killed in the unit under defense of life and property (DLP) regulations. This represents a significant decline from the 23 bears killed under DLP regulations during the 1998–2000 report 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 before peaking at 309 bears in 2000–01. During the same period, the Kuiu Island harvest increased at a rate of 9% annually peaking at 168 bears in 1999–00. 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 first year implemented, the new harvest guideline resulted in the emergency closure of the entire fall nonresident season on Kuiu. Since implementation of the 120-bear nonresident harvest guideline, the Kuiu harvest has stabilized and averaged 112 bears annually. In conjunction with the harvest guideline, in 2002 the USFS implemented a moratorium on increases in the number of guides permitted to operate on Kuiu and the number of hunts each was allowed to conduct. These actions also served to stabilize the annual black bear harvest on the island. In 2006, largely as a result of complaints from big game guides about hunt crowding issues, the USFS also froze the number of guide use authorizations for black bear hunting in all of Unit 3 at current levels pending completion of guide use capacity analysis.

The unitwide harvest of 198 bears in 2004–05 was the lowest since 1992–93, and the average annual harvest of 219 bears annually during this report period was below the preceding 10-year average of 254 bears annually. The reason for the unusually low harvests in 2004–05 remains unclear. There is currently no mandatory hunt reporting requirement for unsuccessful black bear hunters. In the absence of information from this group of hunters we are currently unable to evaluate whether the unusually low harvest that year was the result of reduced effort or low hunter success, or if other environmental factors such as atypical winter or spring weather conditions contributed to the low harvests.

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, particularly on Kupreanof Island. 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 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 dropped below the preceding 10 year average, the percentage of males in the harvest met the management objective. The average male skull size met the management objective in 2005–06 and 2006–07 and was only slightly below the objective in 2004–05. No management or regulatory changes are recommended at this time.

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TABLE 1 Unit 3 black bear harvest, 1999–2006

	Hunter kill						Nonhunting kill[a]			Total estimated kill					
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
Fall 99	29	31	52	0	60	NA	0	4	3	29	45	35	55	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	77	67	23	3	294
Fall 00	47	24	34	0	71	NA	1	2	2	48	65	26	35	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	20	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	56	19	44	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	75	57	25	2	230

Table 1 continues next page

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
Fall 04	34	17	33	0	51	NA	0	0	0	34	67	17	33	0	51
Spring 05	115	32	22	0	147	4	0	0	0	115	78	32	22	0	147
Total	149	49	25	0	198	4	0	0	0	149	75	49	25	0	198
Fall 05	34	28	45	0	62	NA	0	0	0	34	55	28	45	0	62
Spring 06	137	29	17	0	166	0	0	0	0	137	83	29	17	0	166
Total	171	57	25	0	228	0	0	0	0	171	75	57	25	0	228
Fall 06	35	17	33	0	52	NA	0	0	0	35	67	17	33	0	52
Spring 07	153	27	15	0	180	2	0	0	0	153	85	27	15	0	180
Total	188	44	19	0	232	2	0	0	0	188	81	44	19	0	232

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

TABLE 2 Unit 3 harvested black bear mean skull size[a], 1995–2006

Regulatory year	Males	*n*	Females	*n*
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
2004–2005	18.3	148	16.7	49
2005–2006	18.6	168	16.7	56
2006–2007	18.6	184	16.4	43

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

TABLE 3 Unit 3 harvested black bear mean age, 1995–2006

Regulatory year	Males	*n*	Females	*N*
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	
2004–2005	7.4	148	9.3	49
2005–2006	8.0	166	10.1	53
2006–2007	8.2	180	9.3	41

TABLE 4 Unit 3 harvested black bear mean days hunted per successful hunter, 1995–2006[a]

Regulatory year	Total days	Total hunters	Average days hunted
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
2004–2005	651	195	3.3
2005–2006	696	223	3.1
2006–2007	751	227	3.3

[a]Totals do not include DLP.

TABLE 5 Unit 3 black bear hunter harvest by island and density, 1995–2006

	Kupreanof 1090 mi^2				**Kuiu** 746 mi^2				**Mitkof** 211 mi^2			
Regulatory year	Kill	Percent of Unit 3	Average mi^2/bear kill Male	Female	Kill	Percent of Unit 3	Average mi^2/ bear kill Male	Female	Kill	Percent of Unit 3	Average mi^2/ bear kill Male	Female
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	165	53	6	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
2004	77	39	19	55	114	58	9	27	2	1	106	No females
2005	108	47	15	33	107	47	9	36	8	4	35	106
2006	104	45	14	39	110	47	8	57	11	5	26	70

TABLE 6 Unit 3 black bear mean male skull size[a] and percent of harvest by major island and season, 2001–2006

		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

TABLE 6 continued

		2004				2005				2006			
Island	Season	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*
Kupreanof	Fall	11	61	17.6	11	17	50	18.0	17	11	50	17.4	11
	Spring	37	67	18.2	37	58	78	18.8	58	65	79	19.0	62
	Total	48	71	18.1	48	75	69	18.6	75	76	73	18.7	73
Kuiu	Fall	21	58	18.3	21	12	57	17.8	11	21	84	18.2	21
	Spring	64	83	18.7	64	74	86	18.8	73	76	89	18.8	75
	Total	85	75	18.6	85	86	81	18.7	84	97	88	18.7	96
Mitkof	Fall	0	0	0	0	3	60	17.4	3	3	60	16.3	3
	Spring	2	100	17.0	1	3	100	18.9	3	5	83	18.7	5
	Total	2	100	17.0	1	6	75	18.2	6	8	73	17.8	8

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

TABLE 7 Unit 3 black bear successful hunter residency, 1995–2006

Regulatory year	Local resident[a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total successful hunters
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	25	9	31	11	231	80	287
2000–2001	27	9	36	12	246	80	309
2001–2002	28	10	44	15	214	75	286
2002–2003	24	11	29	13	175	77	228
2003–2004	12	6	16	8	179	86	207
2004–2005	8	4	19	10	168	86	195
2005–2006	15	7	11	5	197	88	223
2006–2007	10	4	34	15	183	81	227

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

TABLE 8 Unit 3 black bear harvest chronology by percent, 1995–2006

Regulatory year	Month									
	September	October	November	December	March	April	May	June	July	*n*
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
2004–2005	24	2	1	0	0	14	42	18	0	198
2005–2006	25	2	0	0	0	10	43	21	0	228
2006–2007	20	2	0	0	0	3	49	25	0	232

TABLE 9 Unit 3 black bear harvest, in percent by transport method, 1995–2006

Regulatory year	Airplane	Boat	3-4 wheeler	Snowmachine	Off-road vehicle	Highway vehicle	Foot	Unknown	*n*
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
2004–2005	8	74	<1	0	<1	17	0	0	198
2005–2006	7	77	0	0	0	14	1	0	228
2006–2007	7	70	1	0	2	19	1	0	232

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 contain 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 9 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 postlogging) 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 1992–2006 averaged only 17 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, 17% of bears killed during 1990–1997, and 11% of bears killed during 1998–2006.

The spring season often accounts for 100% of the annual harvest, and although baiting is legal in Unit 5, few bears are taken over bait. Nonresidents generally take 50% or more of the bears, with the goal of finding a glacier bear the impetus for hunting black bears in Unit 5. 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 in Montana for age determination. Anecdotal information about conditions in the field was gathered at the same time.

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 decreased by 27% over the level of the previous reporting period (Table 3). This lower harvest reflects the low harvest in 2004, when only 8 bears were harvested. In 2005 and 2006 the harvest returned to more traditional levels of 20 and 21 respectively. Mean total skull size for male bears was slightly 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 94% males in the harvest during the report period. The mean age of male and female bears was 9.9 and 9.0 years, respectively. For male bears this represents an increase in age over the 2 previous reports periods of 8.6 and 7.8 years. The female mean age was based only on a sample of three animals, and was close to the two previous report periods of 9.6 and 9.3 years.

Population size

No Unit 5 black bear population studies have been conducted. Population size or density estimates are difficult to obtain, and have never been attempted in Unit 5. 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 Kermode (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 8 to 21 from 2004 to 2006, averaging 16 per regulatory year (Table 3), a decrease of 6 bears annually over the previous report period. Only 3 female bears were harvested compared to 46 males during the report period, yielding 94% males. This is an extremely high male sex ration, and easily exceeds our management goal of a 3:1 male-to-female sex ratio. Three bears, or approximately 8% of the harvest during this reporting period, were glacier bears (Table 3).

Effort expended by successful hunters per bear killed was 4.3 days compared to 3.2 for the previous report period. Both nonresident and unit resident hunter effort dropped slightly, while other Alaska resident hunters increased slightly (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. As with the previous report period, resident hunters took the majority of Unit 5 black bears. The percentage of successful black bear hunters who were nonresidents was 47%, compared to 42% during 2001–2003 (Table 1). Alaskans residing outside of Unit 5 harvested 17%, and Unit 5 residents harvested 37% of the bears taken.

Harvest Chronology. Historically, most Unit 5 black bears have been harvested during the spring. This trend continued through this report period, with all 49 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, although different WAAs were the big producers in different years (Table 4). The area near Yakutat Bay on the Puget Peninsula (WAA's 4506 and 4508) always accounts for a large portion of the harvest and did again during this report period, with 57% of the harvest coming from that area. Hunters can easily access this area from small skiffs, and are never far from protected waters. By boating along, they can scan miles of shoreline or hillside, increasing their chances of locating a bear. Another area in which hunters consistently harvest black bears is the foothills of the Brabazon Mountains (WAA 4503). During the report period, 24% of the harvest came from this area. Although the access in this area isn't nearly as easy as WAA 4506 and 4508, hunters still manage to get to bears using boats and in some cases small airplanes. Several hunting guides offer fly in hunting opportunities in this area.

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 16 of 49 bears harvested, or 33% of the total during the report period. During the previous report period guided hunters took 26% of the harvest. Often, the hunters who hire a guide are searching for a glacier bear, and take a black colored bear only because they fail to find a blue colored animal.

Transport Methods and Commercial Services Used. Boats were the predominant transport means for Unit 5 black bear hunters (Table 1), with 63% of the hunters using this method of transport. Highway vehicles were the second most common, with 18% of the hunters using this method, and only 8% using aircraft. Commercial services were used by 17 (35%) of the 49 successful hunters, with 16 of these using a commercial guide, and 1 other 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. Although the number of black bears harvested from this unit is not large, the increase in local harvest during the last 2 report periods needs to be monitored. Trends in harvest parameters should be looked at critically to keep us abreast of possible conservation concerns.

One project of interest would be to collect DNA samples from black bears in Unit 5, and compare the glacier colored bears with the black colored animals as well as amongst themselves. Given the new advances in DNA analysis, some interesting information on color phases of these bears might be a result of this analysis. With all bears requiring sealing, the tissue collection would be an easy task.

LITERATURE CITED

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TABLE 1 Unit 5 residency, mean days hunted, and transportation used by successful black bear hunters, 1997 through 2006

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
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	12	3.6	20	3.6	5	12	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	8	3.6	21	3.0	0	16	0	5	0	0
2003	8	1.9	1	1.0	10	5.9	19	3.9	3	12	2	2	0	0
2004	3	4.3	2	4.5	3	7.0	8	5.4	0	5	1	2	0	0
2005	10	3.1	3	7.7	7	3.6	20	4.0	2	10	2	6	0	0
2006	5	2.4	3	4.3	13	3.8	21	3.6	2	16	2	1	0	0
1998–2000 Mean	3.0	3.4	4.3	4.2	12.7	4.9	20	4.7	7.0	10.7	1.3	0	0.7	0.3
2001–2003 Mean	11.0	2.2	2.0	4.0	9.3	4.0	22.3	3.2	2.3	16.7	1.0	2.3	0	0
2004–2006 Mean	6.0	3.3	2.7	5.5	7.7	4.8	16.3	4.3	1.3	10.3	1.6	3.0	0	0

TABLE 2 Unit 5 commercial services used by successful black bear hunters, 1997 through 2006

Regulatory year	Unit residents		Other AK residents		Nonresidents		Total use			
	No	Yes	No	Yes	No	Yes	No	Yes	Transport	Registered guide
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	11	8	12	2	10
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	8	12	9	2	7
2003	8	0	1	0	0	10	9	10	6	4
2004	3	0	2	0	2	1	7	1	0	1
2005	10	0	3	0	0	7	13	7	0	7
2006	5	0	2	1	5	8	12	9	1	8
1998–2000 Mean	3.0	0	3.0	1.3	1.0	11.7	7.0	13.0	1.6	11.0
2001–2003 Mean	11.0	0	1.3	0.7	0.7	8.7	13.0	9.4	3.3	6.0
2004–2006 Mean	6	0	2.3	.3	2.3	5.3	10.6	5.6	.3	5.3

TABLE 3 Unit 5 black bear harvest, 1997 through 2006

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	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	--	--	--	-	24	0
1998	Fall	1	1	0	0	16.3	1	5.0	1						
	Spring	23	23	0	0	17.1	20	8.3	17						
	Total	20	16	4	0	17.6	15	7.6	15	15.8	3	10.3	3	15	5
1999	Fall	0	0	0	0	--	0								
	Spring	20	16	4	0	17.6	15								
	Total	16	15	1	0	17.2	15	6.9	15	15.8	1	6.0		14	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	21	18	3	0	17.0	17	8.7	15	15.9	3	13.5	2	18	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	10.0	12	16.0	2	7.5	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 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	8	7	1	0	17.3	5	8.3	4	---	0	10.0	1	7	1
2004	Fall	0	0	0	0	--	0			---	0				
	Spring	8	7	1	0	17.3	5			---	0				
	Total	20	20	0	0	18.2	18	9.9	14	---	0	--	0	19	1
2005	Fall	0	0	0	0	--	0			--	0				
	Spring	20	20	0	0	18.2	18			---	0				
	Total	21	19	2	0	17.7	18	10.3	16	16.2	1	8.5	2	20	1
2006	Fall	0	0	0	0	--	0			--	0				
	Spring	21	19	2	0	17.7	18			16.2	1				
1998–2000		60	55	5	0	17.3	52	7.8	42	16.3	5	9.3	4	53	7
2001–2003		67	59	8	0	17.2	55	8.6	45	15.9	8	9.6	5	57	10
2004–2006		49	46	3	0	17.9	41	9.9	34	16.2	1	9.0	3	46	3

TABLE 4 Unit 5A black bear harvest from all Wildlife Analysis Areas (WAA), regulatory years 1997 through 2006

	Regulatory year										
WAA	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
2101	0	0	4	0	0	0	2	0	1	0	7
2102	0	3	0	1	0	2	3	0	0	2	11
4503	5	7	4	5	5	4	5	3	8	1	47
4504	0	2	0	0	1	1	0	1	0	0	5
4505	4	1	3	3	4	2	5	0	2	3	27
4506	2	7	5	5	12	3	4	3	4	11	56
4508	4	4	4	1	5	9	0	1	5	4	37
4607	0	0	0	0	0	0	0	0	0	0	0
Unknown	1	0	0	2	0	0	0	0	0	0	3
TOTAL	16	24	20	17	27	21	19	8	20	21	193

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 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

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, transportation used, and location of harvest within Uniform Coding Units (UCUs). UCUs are small, defined areas within Unit 6 bounded by watersheds, islands, or island groups. We estimated unreported and illegal kills. Unreported harvest included wounding loss and bears taken by hunters and not sealed. Tooth samples were collected from bears harvested in Unit 6D to determine age and female reproductive histories (Coy and Garshelis 1992) and compared to age data collected during 1970s and early 1990s. Also in Unit 6D only, we interviewed returning bear hunters and parties in Whittier to determine hunter success.

I assessed population size of black bears in Unit 6D by examining harvest density within UCUs during the last decade. I subtracted alpine rock and ice from the total area of each UCU to obtain a measure of available habitat. Harvest from a given population is either sustainable or not, and hunting pressure is not decreasing in PWS. Therefore, for UCUs in which harvest density decreased during the last decade, I assumed that the population was being harvested at an unsustainable rate of about 20%. For UCUs with increasing or stable harvest density, I assigned density estimates that resulted in a harvest rate of 12% or less. Thus, the approximate lower limit for density assumed that 10 to 20% of the bear population was being harvested. The exceptions, those UCUs with limited hunter activity, were assigned a density of 0.3 – 0.5 bears/km^2 (Modafferi 1982). Peacock (2004) estimated a black bear density of 1.51 bears/km^2 on Kuiu Island in Southeast Alaska. Bears in PWS have similar food resources to those on Kuiu Island, but because of the more northerly latitude of PWS, I assumed that Kuiu Island density was an approximate upper limit for bear density within UCUs of Unit 6D. I grouped UCUs into Ecological Units (EUs) similar to those established by Modafferi (1982), calculated density estimates for each area, and compared my results to other regions in which reliable density estimates had been obtained.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Harvest assessment by UCU suggested that black bear densities ranged from 0.25 to 1.6 bears/km^2 with an overall density of 0.59 bears/km^2 in Unit 6D. Only five of 60 UCUs assessed produced bear densities of $\geq$ 1.0 bears/km^2 in Unit 6D, 3 of which were over 1.5 bears/km^2.

When pooled into EUs, bear densities ranged from 0.33 to 0.85 bears/km^2 (Appendix 1, Table 1). Several UCUs sustained a harvest density greater than reported bear densities from various other populations (Appendix 1, Table 2). Population size indicated by this method was approximately 3,300 bears in Unit 6D.

MORTALITY

Harvest

Season and Bag Limit. The seasons for Unit 6 were as follows: 6A and B was 20 August–30 June, 6C was 1 September–30 June, and 6D was 1 September–10 June. The bag limit was 1 bear in Unit 6.

Board of Game Actions and Emergency Orders. The Board of Game changed the season closing date for black bears in Unit 6D from June 30 to June 10 beginning in regulatory year 2005. This was an incremental step to limit harvest to 350–400 bears, preceded by prohibiting the shooting of bears from boats (2002) and Alaska Department of Fish and Game (department; ADF&G) implementation of various bear baiting restrictions.

Hunter Harvest. Black bear harvest in Unit 6 is reported in Table 1. The majority of the harvest was male (75–85%), and most bears were taken in Unit 6D (82–86%). Hunter harvest reported during the past five regulatory years averaged 449 bears. The harvest in regulatory year 2006–07 was an all-time high.

Mean skull size among males harvested during the past 3 years was 17.2 inches (Table 2). The largest skulls (average = 18.2 inches) came from Unit 6A, and the smallest (average = 17.1 inches) were reported in Unit 6D. Over the past five years, no trends were obvious.

Unit 6D is of special concern because of high harvest during the last decade and easier access into Prince William Sound from the largest population center of Alaska. Hunter questionnaire surveys indicated a success rate of 45% in Unit 6D. Assessment of harvest by EU indicated a harvest rate of 12.9% of the population (Appendix 1, Table 1). Harvest continued to increase through the reporting period to record highs (Table 1). The proportion of females in the harvest exceeded the management objective of 25% during 2 of the last 5 years. This occurred in 2006 because of a record-high harvest during the fall (Table 1).

Assessing black bear populations using harvest data is fraught with biases (Garshelis 1993). Without a population estimate, however, harvest data must be searched for red flags that indicate possible overharvest, particularly in areas with high harvest pressure such as Unit 6D. The highest indicated harvest rates occurred in EUs 3, 5 and 6 (Appendix 1, Table 1). Harvest increased considerably in these EUs during the late 1990s through early 2000s because of their proximity to Whittier. Harvest has since stabilized at this high level. Average female skull size (an age indicator) in EUs 5, 2, and 7 increased by 0.8, 0.5, and 0.4 in., respectively, during the last decade. Proportion of females in the harvest exceeded the management objective of 25% in 5 of 8 EUs during 2006. These parameters indicated a possible harvest impact on the female population in these areas. Female skull size and percent females harvested showed little change in EU 3 despite high harvest density, suggesting that my bear density estimate was too low.

Although average skull size for males remained stable overall, Appendix 1, Figure 1 suggests a negative relationship between harvest density and average male skull size.

Median age of female bears harvested in Unit 6D was 5 years old during the late 1970s and early 1990s. By 2004 median female age had increased to 7 years. Median age dropped by 1 year for both males and females from 2004 to 2005 (Table 2; 2006 teeth still being processed). Median age for males was 6 years for each age-sampling period since the 1970s until 2005, when it dropped to 5 years. Female reproductive histories could be determined from cementum annuli in only 8 of 62 samples. These indicated that the most common age for first successful litter was 5 years (range 4 – 6) and breeding increment was 2 years (range 2 – 3).

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. 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 opened, 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 number of bears were 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).

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 delaying the fall season by 10 days to protect females and limit harvest. It is difficult to predict if the increasing harvest is sustainable because of the lack of a population estimate. We should continue to collect teeth from harvested bears to determine age structure in the harvest and female reproductive histories.

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TABLE 1 Unit 6 black bear harvest, 2002–2006

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
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
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
6A/2004																	
Fall 04	1	0	(0)	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	1
Spring 05	23	1	(4)	0	24	0	0	0	0	3	0	23	(96)	1	(4)	3	27
Total	24	1	(4)	0	25	0	0	0	0	3	0	24	(96)	1	(4)	3	28
6A/2005																	
Fall 05	9	1	(10)	0	10	0	0	0	0	1	0	9	(90)	1	(10)	1	11
Spring 06	30	1	(3)	0	31	12	0	0	0	4	0	30	(97)	1	(3)	4	35
Total	39	2	(5)	0	41	12	0	0	0	5	0	39	(95)	2	(5)	5	46
6A/2006																	
Fall 06	2	1	(33)	0	3	0	0	0	0	0	0	2	(67)	1	(33)	0	3
Spring 07	49	5	(9)	0	54	0	0	0	0	6	0	49	(91)	5	(9)	6	60
Total	51	6	(11)	0	57	0	0	0	0	7	0	51	(89)	6	(11)	7	64

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
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	(92)	1	(8)	2	15
Total	12	1	(8)	0	13	0	0	0	0	2	0	12	(92)	1	(8)	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
6B/2004																	
Fall 04	0	0		0	0	0	0	0	0	0	0	0		0		0	0
Spring 05	4	0	(0)	0	4	0	0	1	0	0	0	4	(80)	1	(20)	0	5
Total	4	0	(0)	0	4	0	0	1	0	0	0	4	(80)	1	(20)	0	5
6B/2005																	
Fall 05	1	0	(0)	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	1
Spring 06	10	1	(9)	0	11	0	0	0	0	1	0	10	(91)	1	(9)	1	12
Total	11	1	(8)	0	12	0	0	0	0	1	0	11	(92)	1	(8)	1	13
6B/2006																	
Fall 06	1	1	(50)	0	2	0	0	0	0	0	0	1	(50)	1	(50)	0	2
Spring 07	2	2	(50)	0	4	12	0	0	0	0	0	2	(50)	2	(50)	0	4
Total	3	3	(50)	0	6	12	0	0	0	1	0	3	(50)	3	(50)	1	7

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
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
6C/2004																	
Fall 04	4	0	(0)	0	4	0	0	0	2	0	0	4	(100)	0	(0)	2	6
Spring 05	16	2	(11)	0	18	4	0	0	0	2	0	16	(89)	2	(11)	2	20
Total	20	2	(9)	0	22	4	0	0	2	3	0	20	(91)	2	(9)	5	27
6C/2005																	
Fall 05	1	3	(75)	0	4	0	0	0	0	0	0	1	(25)	3	(75)	0	4
Spring 06	26	7	(21)	0	33	4	0	0	0	4	0	26	(79)	7	(21)	4	37
Total	27	10	(27)	0	37	4	0	0	0	4	0	27	(73)	10	(27)	4	41
6C/2006																	
Fall 06	5	4	(44)	0	9	0	5	2	1	1	0	10	(63)	6	(38)	2	18
Spring 07	21	6	(22)	0	27	4	0	1	0	3	0	21	(75)	7	(25)	3	31
Total	26	10	(28)	0	36	4	5	3	1	4	0	31	(70)	13	(30)	5	49

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
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
6D/2004																	
Fall 04	17	8	(32)	0	25	0	0	0	0	3	0	17	(68)	8	(32)	3	28
Spring 05	247	45	(15)	0	292	53	1	0	0	35	0	248	(85)	45	(15)	35	328
Total	264	53	(17)	0	317	53	1	0	0	38	0	265	(83)	53	(17)	38	356
6D/2005																	
Fall 05	38	13	(25)	0	51	0	0	0	0	6	0	38	(75)	13	(25)	6	57
Spring 06	299	64	(18)	0	363	34	4	0	0	44	1	303	(83)	64	(17)	45	412
Total	337	77	(19)	0	414	34	4	0	0	50	1	341	(82)	77	(18)	51	469
6D/2006																	
Fall 06	59	46	(44)	0	105	0	2	1	0	13	0	61	(56)	47	(44)	13	121
Spring 07	283	78	(22)	1	362	52	0	0	0	43	1	283	(78)	78	(22)	45	406
Total	342	124	(27)	1	467	52	2	1	0	56	1	344	(73)	125	(27)	58	527

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
TOTAL																	
2002																	
Fall 02	55	31	(36)	0	86	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	284	105	(27)	0	389	28	0	0	0	47	10	285	(73)	105	(27)	57	447
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
2004																	
Fall 04	22	8	(27)	0	30	0	0	0	0	4	0	22	(73)	8	(27)	4	34
Spring 05	290	48	(14)	0	338	57	1	1	0	41	0	291	(86)	49	(14)	41	381
Total	312	56	(15)	0	368	57	1	1	0	44	0	313	(85)	57	(15)	44	414
2005																	
Fall 05	49	17	(26)	0	66	0	0	0	0	8	0	49	(74)	17	(26)	8	74
Spring 06	365	73	(17)	0	438	50	4	0	0	53	1	369	(83)	73	(17)	54	496
Total	414	90	(18)	0	504	50	4	0	0	60	1	418	(82)	90	(18)	61	569
2006																	
Fall 06	67	52	(44)	0	119	0	7	3	1	14	0	74	(57)	55	(43)	15	144
Spring 07	355	91	(20)	1	447	68	0	1	0	54	1	355	(79)	92	(21)	56	503
Total	422	143	(25)	1	566	68	7	4	1	68	1	429	(74)	147	(26)	71	647

TABLE 2 Unit 6 black bear harvest mean skull size (length + width), 2002–2006, and median age (years) in Unit 6D only

	Regulatory	Males				Females			
Subunit	year	Skull (in)	*n*	Age	*n*	Skull (in)	*n*	Age	*n*
6A	2002–03	17.87	28			15.50	2		
	2003–04	17.97	25			16.73	3		
	2004–05	18.20	24			16.19	1		
	2005–06	18.26	37			15.69	2		
	2006–07	18.25	47			16.37	5		
6B	2002–03	18.21	12			16.69	1		
	2003–04	17.84	7				0		
	2004–05	17.14	4				0		
	2005–06	18.39	11			15.38	1		
	2006–07	17.56	3			16.21	3		
6C	2002–03	16.52	14			15.42	6		
	2003–04	17.19	22			15.48	7		
	2004–05	18.17	20			15.44	1		
	2005–06	17.15	26			15.13	10		
	2006–07	16.96	25			15.63	9		
6D	2002–03	17.10	219			15.60	96		
	2003–04	17.01	262			15.59	78		
	2004–05	17.30	304	6	207	15.95	53	7	35
	2005–06	16.90	324	5	84	15.53	74	6	27
	2006–07	17.03	331			15.72	122		
Unit 6	2002–03	17.12	273			15.59	105		
Total	2003–04	17.12	316			15.54	88		
	2004–05	17.43	352			15.95	55		
	2005–06	17.09	398			15.48	87		
	2006–07	17.17	406			15.75	139		

TABLE 3 Unit 6 black bear successful hunter residency, 2002–2006

Subunit	Regulatory year	Local resident [a] Nr.	(%)	Nonlocal resident Nr.	(%)	Nonresident Nr.	(%)	Total successful hunters [b]
6A	2002–03	4	(13)	3	(10)	23	(77)	30
	2003–04	1	(3)	7	(23)	22	(73)	30
	2004–05	0		2	(8)	23	(92)	25
	2005–06	2	(5)	4	(10)	35	(85)	41
	2006–07	0		10	(18)	47	(82)	57
6B	2002–03	2	(15)	4	(31)	7	(54)	13
	2003–04	2	(29)	2	(29)	3	(43)	7
	2004–05	0		2	(50)	2	(50)	4
	2005–06	0		3	(25)	9	(75)	12
	2006–07	1	(17)	2	(33)	3	(50)	6
6C	2002–03	11	(50)	6	(27)	5	(23)	22
	2003–04	6	(21)	13	(46)	9	(32)	28
	2004–05	8	(36)	9	(41)	5	(23)	22
	2005–06	8	(22)	21	(57)	8	(22)	37
	2006–07	18	(50)	6	(17)	12	(33)	36
6D	2002–03	32	(10)	185	(57)	106	(33)	324
	2003–04	36	(10)	186	(53)	127	(36)	353
	2004–05	20	(6)	184	(58)	113	(36)	317
	2005–06	21	(5)	228	(55)	165	(40)	414
	2006–07	35	(7)	252	(54)	179	(38)	467
Unit 6 Total	2002–03	49	(13)	198	(51)	141	(36)	389
	2003–04	45	(11)	208	(50)	161	(39)	418
	2004–05	28	(8)	197	(54)	143	(39)	368
	2005–06	31	(6)	256	(51)	217	(43)	504
	2006–07	54	(10)	270	(48)	241	(43)	566

[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, 2002–2006

		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	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
	2004–05	0	0	0	0	0	16	36	44	0	0	25
	2005–06	2	22	0	0	0	12	34	29	0	0	41
	2006–07	0	4	0	0	0	9	25	33	21	7	57
6B	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
	2004–05	0	0	0	0	0	25	25	50	0	0	4
	2005–06	0	8	0	0	0	0	42	25	25	0	12
	2006–07[c]	0	0	17	0	0	0	17	50	0	0	6
6C	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
	2004–05	5	14	0	0	0	5	55	23	0	0	22
	2005–06	8	0	3	0	0	0	16	62	3	8	37
	2006–07	17	0	8	0	0	6	19	44	6	0	36
6D	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
	2004–05	6	2	1	0	0	1	21	48	20	2	317
	2005–06	8	3	0	0	0	0	15	59	13	0	414
	2006–07	16	6	1	0	0	0	18	40	19	1	467
Unit 6	2002–03	11	7	3	1	0	2	22	42	10	2	389
Total[b]	2003–04	11	3	2	0	0	1	20	43	16	3	418
	2004–05	5	2	1	0	0	2	24	46	17	2	368
	2005–06	8	5	1	0	0	1	17	56	12	1	504
	2006–07	14	5	2	0	0	1	19	39	18	1	566

[a] Bears were not taken during November–March.
[b] Total includes bears taken in unknown subunits. [c] 1 bear (17%)was taken during August 16-31.

TABLE 5 Unit 6 black bear harvest percent by transport method, 2002–2006

Subunit	Regulatory year	Percent of harvest								
		Airplane	Horse	Boat	3- or 4-wheeler	Snow-machine	ORV	Highway Vehicle	Unknown	*n*
6A	2002–03	93	0	0	0	0	0	3	3	29
	2003–04	87	0	3	3	0	0	7	0	30
	2004–05	88	0	12	0	0	0	0	0	25
	2005–06	49	0	39	10	0	0	2	0	41
	2006–07	33	0	47	11	0	0	0	9	57
6B	2002–03	46	0	8	15	0	0	31	0	13
	2003–04	43	0	29	14	14	0	0	0	7
	2004–05	25	0	0	25	0	0	50	0	4
	2005–06	75	0	0	8	0	0	17	0	12
	2006–07	20	0	0	0	0	0	80	0	5
6C	2002–03	0	0	18	23	0	0	55	5	22
	2003–04	4	0	11	11	0	0	57	18	28
	2004–05	5	0	5	32	0	0	55	5	22
	2005–06	5	0	19	11	0	0	59	5	37
	2006–07	0	0	28	19	0	0	50	3	36

TABLE 5 continued

Subunit	Regulatory year	Percent of harvest								n
		Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV	Highway Vehicle	Unknown	
6D	2002–03	3	0	87	3	0	0	4	3	324
	2003–04	3	0	89	3	0	0	4	1	353
	2004–05	2	0	93	2	0	0	2	0	317
	2005–06	3	0	92	2	0	0	2	1	414
	2006–07	3	0	89	5	0	0	2	1	467
Unit 6 Total [a]	2002–03	11	0	74	5	0	0	7	3	388
	2003–04	10	0	77	4	0	0	8	2	418
	2004–05	8	0	82	4	0	0	6	0	368
	2005–06	8	0	80	3	0	0	7	1	504
	2006–07	6	0	80	6	0	0	5	2	565

[a] Total includes bears taken in unknown subunits.

APPENDIX 1

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

Ecological Unit	3-year average 2004–2006		Change in 3-year average harvests				Density assessment, 3-year average		
	Hunter kill	Harvest density (kill/km^2) [a]	1995–97 minus 1992–94	1998–00 minus 1995–97	2001–03 minus 1998–00	2004–06 minus 2001–03	Bear density (bears/ km^2)	Estimated population size	Theoretical harvest rate (%)
1) Eastern PWS	35	0.04	+2	+15	+5	+1	0.37	398	9.7
2) Valdez Arm	56	0.06	+5	+16	+7	+3	0.47	466	13.3
3) Esther Is. – Columbia Gl.	101	0.09	+2	+25	+39	+4	0.60	745	15.0
4) Port Wells/ College Fiord	34	0.04	-5	+14	-6	+10	0.36	269	11.0
5) Passage Canal – Kings Bay	61	0.10	+1	+27	–1	+3	0.65	439	15.3
6) Southwest PWS Mainland	52	0.12	+10	+8	+18	+2	0.85	402	14.5
7) SW PWS Islands	45	0.06	+3	+6	+10	+12	0.63	450	8.9
8) Knight Island	14	0.05	-1	+2	+9	+1	0.33	111	13.9
Total PWS	398	0.07	+17	+113	+82	+35	0.59	3280	12.9

[a] Reported harvest plus 15% wounding loss

APPENDIX 1 (CONTINUED)

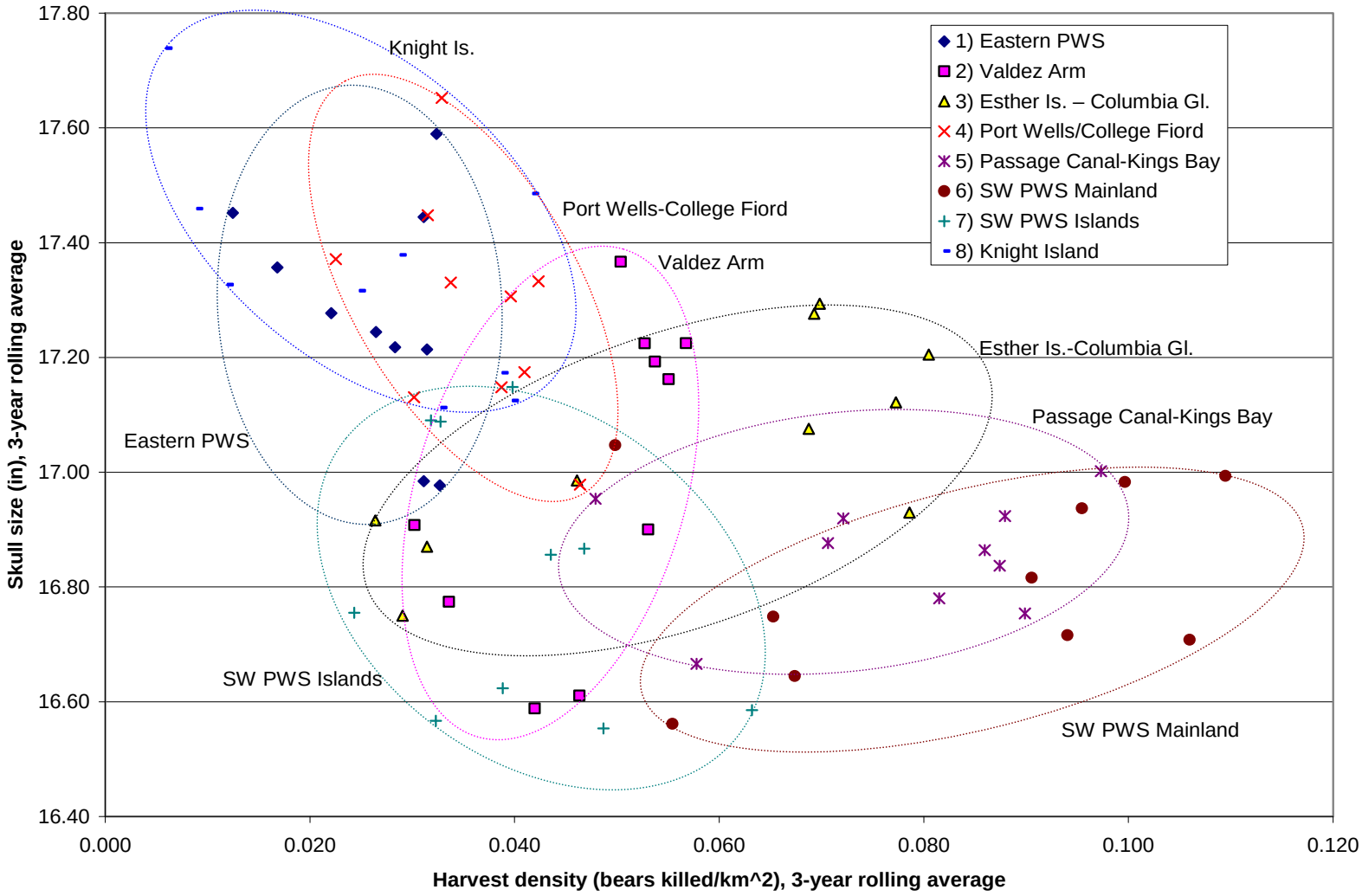
TABLE 2 Various estimates of black bear density and harvest density.

Source/location	Bears/km^2	Bears/mi^2
Black bear density estimates		
Prince William Sound, UCU analysis[a]	0.59	1.53
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
Sustained harvest densities (kills/km^2), selected from western Prince William Sound[b]		
Esther Is. and Passage: average 2004–2006	0.23	0.60
Cullross Island: average 2004–2006	0.18	0.47
Whale Bay: average 2004–2006	0.21	0.54
Average harvest density in Unit 6D 2004–2006	0.08	0.21

[a] Not a true estimate, based on unverified assumptions.
[b] Reported harvest plus 15% wounding loss.

APPENDIX 1 CONTINUED

FIGURE 1 Skull size as related to harvest density for male black bears in Unit 6D, 1995-2006. Those EUs that received the highest harvest in terms of density level and duration produced the smallest skull sizes, suggesting harvest impact on age structure.



WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 PO BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

LOCATION

GAME MANAGEMENT UNITS: 7 and 15 (8397 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 July–31 December and 1 bear 1 January–30 June). It is illegal to take cubs or females accompanied by cubs.

Bear baiting is allowed through a registration permit 15 April–15June, 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 bait 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 2004–2006), the annual average for percent females in the harvest was 24%. The 5-year average annual harvest was 410 bears taken annually (Table 1). The 5-year average annual bait harvest was 86 bears taken per year (Table 2).

Hunter Residency and Success. The percentage of successful hunters who are nonresidents fluctuates annually, but overall appears to be increasing (Table 3).

Harvest Chronology. May is the month when most of the black bear harvest occurs (Table 4).

Transport Methods. Transport by boat was the top method used by successful bear hunters (Table 5), 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, leading all other big game species in the numbers of animals harvested annually for Units 7 and 15. Black 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 have been well within our management objective using the current seasons and bag limits.

We will continue to assess our current season and bag limits relative to our management goal, and consider recommending liberalizing the bag limit to 2 bears per year with no seasonal restrictions at the March 2009 Board of Game meeting

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SELINGER, J. 2008. Units 7 & 15 black bear management report. Pages 143–148 *in* P. Harper, editor. Black bear management report of survey and inventory activities 1 July 2004–30 June 2007. Alaska Department of Fish and Game. Project 17.0. Juneau, Alaska.

TABLE 1 Black bear harvest[a] by season in Units 7, 15A, 15B, and 15C, 2002–2006

Regulatory		Fall				Spring				Fall + Spring			
year	Unit	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2002–03	7	41	10	0	51	93	26	0	119	134	36	0	170
	15A	8	5	0	13	23	12	0	35	31	17	0	48
	15B	14	4	0	18	3	2	0	5	17	6	0	23
	15C	12	7	0	19	68	21	1	90	80	28	1	109
	totals	75	26	0	101	187	61	1	249	262	87	1	350
2003–04	7	24	16	2	42	92	22	2	116	116	38	4	158
	15A	5	8	1	14	15	10	0	25	20	18	1	39
	15B	10	9	0	19	5	4	0	9	15	13	0	28
	15C	19	7	0	26	82	22	0	104	101	29	0	130
	totals	58	40	3	101	194	58	2	254	252	98	5	355
2004–05	7	14	9	1	24	96	27	1	124	110	36	2	148
	15A	4	6	0	10	31	10	0	41	35	16	0	51
	15B	5	3	0	8	5	2	0	7	10	5	0	15
	15C	18	5	0	23	80	18	2	100	98	23	2	123
	totals	41	23	1	65	212	57	3	272	253	80	4	337
2005–06	7	40	23	1	64	122	26	0	148	162	49	1	212
	15A	16	3	0	19	20	8	0	28	36	11	0	47
	15B	19	11	0	30	3	2	0	5	22	13	0	35
	15C	37	17	1	55	130	26	0	156	167	43	1	211
	totals	112	54	2	168	275	62	0	337	387	116	2	505
2006–07	7	34	15	1	50	108	31	0	139	142	46	1	189
	15A	15	4	0	19	12	8	0	20	27	12	0	39
	15B	13	7	0	20	10	3	0	13	23	10	0	33
	15C	57	22	0	79	126	34	1	161	183	56	1	240
	totals	119	48	1	168	256	76	1	333	375	124	2	501

[a]Includes defense of life or property kills, deaths due to vehicle collision, research mortalities, illegal kills, and unknown causes of mortality.

TABLE 2 Number of registered bait stations and baiting harvest in Units 7, 15A, 15B, and 15C, 2002–2006

Spring	Unit 7		Unit 15A		Unit 15B		Unit 15C		Units 7&15	
Year	# stations	Harvest	# stations	Harvest	# stations	Harvest	# stations	Harvest	# stations	Harvest
2003	227	65	62	24	7	0	51	5	347	94
2004	194	67	72	14	8	2	21	4	295	87
2005	165	60	39	25	3	4	23	3	230	92
2006	159	51	38	15	8	2	17	1	222	69
2007	126	68	61	15	10	3	20	1	217	87

TABLE 3 Black bear harvest by residency in Units 7 and 15, 2002–2006

Regulatory	Residents									Total successful
year	Local[a]	(%)	Nonlocal	(%)	Total	(%)	Nonresident	(%)	Unk	hunters
2002–03	109	31	137	39	246	70	92	26	12	350
2003–04	115	32	125	35	240	68	106	30	9	355
2004–05	119	35	115	34	234	69	97	29	6	337
2005–06	150	30	155	31	305	60	187	37	13	505
2006–07	150	30	175	35	325	65	169	34	8	502

[a] Local residents are residents of the Kenai Peninsula

TABLE 4 Black bear harvest chronology in Units 7 and 15, 2002–2006

Regulatory year	Jul	(%)	Aug.	(%)	Sep	(%)	Oct.	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	Unk	(%)	Total harvest
2002–03	11	(3)	16	(5)	42	(12)	25	(7)	0	(0)	9	(3)	175	(50)	61	(17)	11	(3)	350
2003–04	8	(2)	23	(6)	53	(15)	13	(4)	0	(0)	4	(1)	178	(50)	66	(19)	10	(3)	355
2004–05	0	(0)	6	(2)	42	(12)	15	(4)	0	(0)	13	(4)	188	(56)	68	(20)	5	(2)	337
2005–06	4	(1)	35	(7)	102	(20)	16	(3)	0	(0)	6	(1)	253	(50)	73	(14)	16	(3)	505
2006–07	18	(4)	30	(6)	89	(18)	23	(5)	1	(0)	5	(1)	218	(43)	110	(22)	8	(2)	502

TABLE 5 Black bear harvest by transportation method in Units 7 and 15, 2002–2006

RY[1]	Airplane	(%)	Dog/ Horse	(%)	Boat	(%)	ATV	(%)	Snow-machine	(%)	Other ORV	(%)	Highway Vehicle	(%)	Walk	(%)	Other / Unk	(%)	Total harvest
2002	21	(6)	8	(2)	125	(36)	33	(9)	0	(0)	1	(0)	87	(25)	61	(17)	14	(4)	350
2003	35	(10)	9	(3)	142	(40)	31	(9)	0	(0)	0	(0)	75	(21)	52	(15)	11	(3)	355
2004	20	(6)	8	(2)	148	(44)	47	(14)	0	(0)	1	(0)	76	(23)	30	(9)	7	(2)	337
2005	39	(8)	10	(2)	249	(49)	34	(7)	1	(0)	0	(0)	95	(19)	62	(12)	15	(3)	505
2006	30	(6)	8	(2)	257	(51)	37	(7)	0	(0)	0	(0)	96	(19)	62	(12)	12	(2)	502

[1] RY = Regulatory year. A regulatory year runs from 1 July through 30 June (e.g., RY 2006 = 1 July 2006 through 30 June 2007.

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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. Black bears have been gaining status as desirable big game animals, as evidenced by the increase in average harvest from 8 (range = 1–14) per year during the 1980s to 15 (range = 7–20) in the 1990s.

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 when black bears are presented for sealing. 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—31 May, starting in the spring of 1997.

Hunter Harvest. Hunters reported taking 14 black bears during the 2006–07 season, identical to the average take for the prior 5 years (Table 1). Males have composed 79% of the harvest for the last six years (2001–2007). Since sealing of black bears started in 1973, males have composed 73% (range = 25–100%) of the Unit 11 bear harvest. The mean skull size for males taken in 2006 was 17.5 inches, slightly above the 30-year mean of 16.8 inches. The average skull size of females last year was 15.4, slightly below the 30-year average of 15.7.

Hunter Residency and Success. Nonresident hunters have taken 16% (range = 0–36) of the harvest (2.1 bears) during the last six years (Table 2). Between 1973 and 1998, nonresidents averaged 3–4 bears per year (range = 0–18), and 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 percentage of black bears in the harvest taken by local residents has varied between years but averaged 29% (4 bears) a year during the last 6 years (Table 2). Successful bear hunters spent an average of 2.5 days hunting during the 2006 season, similar to the 6-year average of 2.7 days.

Data from bear sealing certificates indicates 82% 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 6 years, 83% of successful hunters salvaged some or all of the bear meat. There was only 1 black bear reported taken over bait each year from 1990 to 1992, but on average 2.8 (21%) have been reported annually during the last 6 years (Table 1). Bear-baiting activity fluctuates considerably between years.

Harvest Chronology. May and August are the most important months for harvesting black bears (Table 3). During the last 6 years, on average 8.0 (57%) bears have been taken in the fall and 6.0 (43%) 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. Boats, 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 for locals.

Other Mortality

Remote rural residents are a source of 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. 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 and 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 they can be used in the preserve. This effectively closes most of the hard 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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TOBEY B. 2008. Unit 11 black bear management report. Pages 149–154 *in* P. Harper, editor. Black bear management report of survey and inventory activities 1 July 2004–30 June 2007. Alaska Department of Fish and Game. Project 17.0. Juneau, Alaska.

TABLE 1 Unit 11 black bear harvest, 2001–02 to 2006–07

Regulatory	Reported hunter kill							Nonhunting kill[a]			Total kill			
Year	M	(%)	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	F	Unk.	Total
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
2004–05														
Fall 04	4	(57)	3	(43)	0	7		1	0	0	5	3	0	8
Spring 05	3	(100)	0	(0)	0	3		0	0	0	3	0	0	3
Total	7	(70)	3	(30)	0	10	0	1	0	0	8	3	0	11
2005–06														
Fall 05	6	(100)	0	(0)	0	6		0	0	0	6	0	0	6
Spring 06	6	(86)	1	(14)	0	7		0	0	0	6	1	0	7
Total	12	(92)	1	(8)	0	13	3	0	0	0	12	1	0	13
2006–07														
Fall 06	3	(75)	1	(25)	0	4		0	0	0	3	1	0	4
Spring 07	9	(90)	1	(10)	0	10		0	0	0	9	1	0	10
Total	12	(86)	2	(14)	0	14	8	0	0	0	12	2	0	14

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

TABLE 2 Unit 11 black bear successful hunter residency, 2001–02 to 2006–07

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
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
2004–05	5	(50)	4	(40)	1	(10)	10
2005–06	2	(15)	8	(62)	3	(23)	13
2006–07	4	(29)	5	(36)	5	(36)	14

[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, 2001–02 to 2006–07

Regulatory year	Harvest periods													
	July		August		September		October		April		May		June		*n*
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
2004–05	1	(10)	4	(40)	2	(20)	0	(0)	0	(0)	3	(30)	0	(0)	10
2005–06	1	(8)	3	(23)	2	(15)	0	(0)	0	(0)	5	(38)	2	(15)	13
2006–07	1	(7)	2	(14)	1	(7)	0	(0)	0	(0)	2	(14)	8	(57)	14

TABLE 4 Unit 11 black bear harvest percent by transport method, 2001–02 to 2006–07

Regulatory year	Percent of harvest																*n*
	Airplane		Horse		Boat		3- or 4-Wheeler		Snowmachine		Highway vehicle		Walk		Unknown		
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
2004–05	2	(20)	0	(0)	3	(30)	0	(0)	0	(0)	1	(10)	4	(40)	0	(0)	10
2005–06	2	(15)	0	(0)	4	(31)	1	(8)	1	(8)	3	(23)	2	(15)	0	(0)	13
2006–07	1	(7)	0	(0)	4	(29)	0	(0)	0	(0)	5	(36)	4	(29)	0	(0)	14

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. Box 115526
Juneau, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007[1]

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 high relative to previous levels. Most bears are taken by local residents in the spring and are an important meat source. Even before regulations were implemented requiring 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.

[1] At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

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. 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 defense of life or property. A premolar was extracted from most 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., RY06 = 1 Jul 2006–30 Jun 2007).

Starting in summer 2000, blueberry abundance has been monitored at 5 permanent blueberry sample areas in Unit 12 and 3 in adjacent Unit 20E. Sample sites were selected for the presence of blueberry plants in a variety of habitat types, aspects, elevations, and slopes. Each year rainfall and temperature has been monitored at each site to determine their effects on blossom and berry production. Berry production is estimated by counts of berries within 5 1-m^2 plots in each area at the same time each year. Through continued monitoring it may be possible to compare berry production between years and sites, and to evaluate effects of berry abundance on bear harvest and problem bear incidents.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

During RY04–RY06 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.

In the adjacent upper Yukon–Tanana grizzly bear control area of Unit 20E, grizzly and black bear populations are being assessed. In 2006, the Alaska Department of Fish and Game (C. Gardner, ADF&G unpublished data, Fairbanks, 2007) conducted a DNA-based mark–recapture population estimate using barbed wire bear hair traps with scent lures. Although Unit 20E may have lower black bear densities than Unit 12, preliminary data from this study suggest black bear densities in Unit 12 may be significantly below previous estimates.

No major climatic anomalies or habitat alterations occurred in Unit 12. Black bear habitat that burned during the reporting period in Unit 12 was limited to 434 mi^2 north of the Alaska Highway in 2004. Some bears were likely displaced from the burned areas but the overall population trend was likely 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 RY04–RY06, productivity of the black bear population in Unit 12 appeared adequate based on the animals harvested and on numerous sightings of sows with cubs. 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 observations from members of the public as well as information gathered incidentally to other fieldwork suggested black bear use of the area was reduced. 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, wildfires 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, 3 mi^2 for a subadult male, and 63 mi^2 for an adult male.

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. During their spring 2006 meeting, the Alaska Board of Game adopted regulations to allow the sale of black bear hides and skulls, and same day airborne hunting of black bears over bait in active predator control areas, including the Upper Yukon–Tanana Predator Control Area in Unit 12 north of the Alaska Highway. No emergency orders were issued during RY04–RY06.

Harvest by Hunters. During RY04–RY06, 39–50 ($\bar{x}$ = 43) black bears were harvested annually in Unit 12 (Table 1). Estimated harvest rate was 3–7%, but without detailed population estimates the precise harvest rate is unknown. Annual average black bear harvest has increased from 25.1 bears during RY80–RY91 to 36.1 bears during RY92–RY03 and 43 bears during RY04–RY06. Males composed 51–78% of the harvest ($\bar{x}$ = 69%) during RY04–RY06 (Table 1), meeting the harvest objective. The RY99–RY03 average was 65% males.

Mean skull size of males taken during RY04–RY06 was 16.4 inches (RY04 = 16.4, RY05 = 16.6, RY06 = 16.3). Increased harvest since RY92 has not affected male skull size. Average skull size of male black bears harvested in Unit 12 has remained consistent since RY80. During RY92–RY97 average skull size was 16.4 inches (σ = 0.326), compared to 16.4 inches (σ = 0.437) during RY80–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. Low blueberry abundance in fall 2006 (Table 2) coincided with the highest fall harvest of black bears since fall 1996.

Hunter Residency and Success. During RY04–RY06 Alaska residents harvested 75–92% ($\bar{x}$ = 86%) of the black bears taken in Unit 12 (Table 3). Of these, Unit 12 residents took 31–58% ($\bar{x}$ = 44%). During the previous 5 years, the average annual percent harvest for Alaska residents was 85%. The average percent harvest by Unit 12 residents was 57%. Historically, nonresidents harvested few black bears in Unit 12. From 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 4.5 bears/year (14% of the harvest) between RY96 and RY03 and remained stable at 5.7 bears/year (13% of the harvest) in RY04–RY06. 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 RY04–RY06 successful hunters spent an average of 4.3 and 4.9 days afield hunting black bears during the fall and spring, respectively. The yearly average time spent hunting black bears was 4.7 days in RY04–RY06 compared to 4.2 days in RY01–RY03. 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 of hunters who harvested only 1 bear. During RY04–RY06 an average of only 10.3% of hunters took >1 bear compared to 15.5% during RY95–RY00, and 28.0% during RY90–RY94. The average number of hunters who took >1 bear per year declined from 4.0 in RY90–RY94 to 2.8 in RY95–RY00 but returned to 4.0 in RY04–RY06.

Harvest Chronology. During RY04–RY06 the average percent of the harvest taken during the spring was 70%. This harvest was similar to the mean of 72% seen in RY01–RY03, and 69% in RY96–RY00 (Table 4).

During RY04–RY06, hunters at bait stations accounted for an average of 75% (18–28 bears) of the spring harvest, compared to 85% of the spring harvest (11–27 bears) during RY01–RY03. 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). During RY04–RY06 most fall harvest (60–75%) was incidental to hunts for other species.

Transport Methods. Since RY01, 3- or 4-wheelers have been the most commonly used mode of transportation for successful black bear hunters, and hunters who used this transportation averaged 37% of the harvest during RY04–RY06 (Table 5). 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. Use of other transportation types will remain low unless the harvest success rate declines in areas where ATVs and highway vehicles can be used.

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 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 areas of Alaska (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. Annual berry 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 Wildland Fire Management Plan* (Alaska Wildland Fire Coordinating Group 1998) 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 that have 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 objective to manage for a harvest of black bears that maintains 55% or more males in the combined harvests during the most recent 3 years, with an average of 70% males. Average male skull size was 16.4 inches and has remained consistent since 1980. An average of 86% of the black bear harvest was by Alaska residents, of which 44% were local residents. During RY04-RY06 an average of 69% of hunter-killed bears were taken in spring over bait (75% of bears taken by hunters in spring). Black bear meat was an important food source for local residents, particularly in the spring. Based on hunter report data and bear sightings by the public and ADF&G staff, there was no indication that harvest was excessive. During RY04–RY06, harvest was estimated to be sustainable. 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 1995–1996 through 2006–2007

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						
1995–1996																
Fall 1995	5	3	0	8	0	0	0	0	0	0	5	(63)	3	(37)	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	31
1996–1997																
Fall 1996	21	2	0	23	0	0	1	0	0	0	21	(88)	3	(12)	0	24
Spring 1997	14	6	0	20	16	0	0	0	0	0	14	(70)	6	(30)	0	20
Total	35	8	0	43	16	0	1	0	0	0	35	(80)	9	(20)	0	44
1997–1998																
Fall 1997	2	2	0	4	0	0	0	0	0	0	2	(50)	2	(50)	0	4
Spring 1998	30	7	0	37	27	0	0	0	0	0	30	(81)	7	(19)	0	37
Total	32	9	0	41	27	0	0	0	0	0	32	(78)	9	(22)	0	41
1998–1999																
Fall 1998	8	3	0	11	0	0	0	0	0	0	8	(73)	3	(27)	0	11
Spring 1999	19	10	0	29	18	0	0	0	0	0	19	(66)	10	(34)	0	29
Total	27	13	0	40	18	0	0	0	0	0	27	(68)	13	(32)	0	40
1999–2000																
Fall 1999	7	2	0	9	0	0	0	0	0	0	7	(78)	2	(22)	0	9
Spring 2000	13	5	0	18	11	0	0	0	0	0	13	(72)	5	(28)	0	18
Total	20	7	0	27	11	0	0	0	0	0	20	(74)	7	(26)	0	27
2000–2001																
Fall 2000	13	3	0	16	0	0	0	0	0	0	13	(81)	3	(19)	0	16
Spring 2001	18	13	0	31	21	0	1	0	0	0	18	(56)	14	(44)	0	32
Total	31	16	0	47	21	0	1	0	0	0	31	(65)	17	(35)	0	48
2001–2002																
Fall 2001	4	5	0	9	0	0	0	0	0	0	4	(44)	5	(56)	0	9
Spring 2002	10	4	0	14	11	0	0	0	0	0	10	(71)	4	(29)	0	14
Total	14	9	0	23	11	0	0	0	0	0	14	(61)	9	(39)	0	23

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						
2002–2003																
Fall 2002	7	2	0	9	0	0	1	0	0	0	7	(70)	3	(30)	0	10
Spring 2003	17	14	0	31	27	0	0	0	0	0	17	(55)	14	(45)	0	31
Total	24	16	0	40	27	0	1	0	0	0	24	(59)	17	(41)	0	41
2003–2004																
Fall 2003	3	2	0	5	0	0	0	0	0	0	3	(60)	2	(40)	0	5
Spring 2004	13	4	0	17	15	0	0	0	0	0	13	(76)	4	(24)	0	17
Total	16	6	0	22	15	0	0	0	0	0	16	(73)	6	(27)	0	22
2004–2005																
Fall 2004	6	3	0	9	0	2	0	0	0	0	8	(73)	3	(27)	0	11
Spring 2005	22	7	0	29	18	0	0	0	0	0	22	(76)	7	(24)	0	29
Total	28	10	0	38	18	2	0	0	0	0	30	(75)	10	(25)	0	40
2005–2006																
Fall 2005	6	6	0	12	0	0	0	0	0	0	6	(50)	6	(50)	0	12
Spring 2006	14	13	0	27	20	0	0	0	0	0	14	(52)	13	(48)	0	27
Total	20	19	0	39	20	0	0	0	0	0	20	(51)	19	(49)	0	39
2006–2007																
Fall 2006	13	4	1	18	0	0	0	0	0	0	13	(76)	4	(24)	1	18
Spring 2007	25	7	0	32	28	0	0	0	0	0	25	(78)	7	(22)	0	32
Total	38	11	1	50	28	0	0	0	0	0	38	(78)	11	(22)	1	50

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

TABLE 2 Total counts[a] of blueberries surveyed at 8 sites in Units 12 and 20E between 25 July and 1 August 2000–2007

			Location/Unit								
Year	Latitude	Longitude	Clearwater (Unit 12)	7 mile (Unit 12)	Pipeline (Unit 12)	RCA (Unit 12)	4 mile (Unit 12)	9 mile (Unit 20E)	Fairplay 1 (Unit 20E)	Fairplay 2 (Unit 20E)	Total
2000	N63°09'	W143°10'	137	3	19	7	55	51	124	46	442
2001	N63°12'	W143° 04'	285	23	278	23	356	400	379	599	2343
2002[b]	N63°15'	W142°27'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2003	N63°23'	W143°47'	806	24	135	220	676	209	667	996	3733
2004	N63°21'	W142°34'	164	19	67	6	burned	152	274	358	1040
2005	N63°24'	W142°28'	630	55	490	238	0	205	199	292	2109
2006	N63°40'	W142°15'	27	56	47	298	15	24	239	87	793
2007	N63°41'	W142°15'	285	7	47	231	46	999	457	125	2197

[a] Sum of all blueberries counted on 5 plots at each sample site.
[b] No surveys were conducted in 2002.

TABLE 3 Unit 12 successful black bear hunter residency, regulatory years 1990–1991 through 2006–2007

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 (4)	27
1994–1995	24 (73)	8 (24)	1 (3)	33
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)	37
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 (30)	23
2002–2003	23 (58)	11 (27)	6 (15)	40
2003–2004	10 (45)	10 (45)	2 (9)	22
2004–2005	22 (58)	13 (34)	3 (8)	38
2005–2006	12 (31)	17 (44)	10 (26)	39
2006–2007	21 (42)	25 (50)	4 (8)	50

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

TABLE 4 Unit 12 black bear harvest chronology percent by month, regulatory years 1990–1991 through 2006–2007

Regulatory year	Harvest chronology percent by 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
2004–2005	3	8	13	0	0	3	53	21	38
2005–2006	0	13	18	0	0	0	36	33	39
2006–2007	2	6	26	0	0	0	44	20	50

TABLE 5 Unit 12 black bear harvest by transport method, regulatory years 1990–1991 through 2006–2007

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 (11)	0 (0)	0 (0)	13 (71)	0 (0)	1 (6)	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)	41
2003–2004	4 (18)	0 (0)	0 (0)	7 (32)	0 (0)	0 (0)	6 (27)	5 (23)	0 (0)	22
2004–2005	3 (8)	0 (0)	0 (0)	12 (32)	0 (0)	0 (0)	16 (42)	7 (18)	0 (0)	38
2005–2006	2 (5)	0 (0)	1 (3)	15 (38)	0 (0)	0 (0)	12 (31)	9 (23)	0 (0)	39
2006–2007	3 (6)	0 (0)	1 (3)	20 (40)	0 (0)	4 (8)	15 (30)	5 (10)	2 (4)	50

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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. Annual black bear harvests averaged 67 during the 1970s, 81 in the 1980s, and 93 in 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 when black bears are presented for sealing. Data obtained at sealing include skull measurements, sex of bears, and 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 Studies (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 within GMU 13 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 liberalized hunting of black bear in areas with an active wolf control program, which includes 13A, 13D, 13C and 13E east of the Alaska Highway. Under this regulation hunters can sell untanned hides and skulls of black bears and take bears from a registered bait station the same day airborne provided they are more than 300 feet from the plane.

Hunter Harvest. The reported harvest of black bears during the 2006–07 season was 124 bears, similar to the prior 5-year average of 122 (range = 87–144) for this reporting period (Table 1). Black bear harvests began increasing in 1994; the 123 average harvest for this reporting period was 56% higher than the 79 bears a year reported between 1979 and 1993. Males composed 73% (n = 91) of the 2006–07 harvest and females 27% (n = 33). Overall, males composed 71% of the harvest during this reporting period. Black bear harvests consisting of 60% or more males meet current management objectives.

Mean skull size for males was 16.5 inches in 2006–07, slightly below the recent 5-year average of 16.8 inches. Mean skull size for females was 15.9 inches in the 2006–07 harvest, slightly above the 5-year mean of 15.5 inches. The average yearly skull size for males has been quite high and stable over the last 15 years (range = 16.5–17.0). This suggests larger males are being maintained in the population, and the increase in harvest is not just attributed to large cub cohorts.

Overall, bears killed in subunit 13D account for 45% of the total Unit 13 harvest, followed by 13E with 37%, 13A with 9%, 13C with 4%, 13B with only 3%, and 1% in unknown subunits.

The defense of life or property (DLP) kill averaged about 1 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 or remain unreported. 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 the Alaska Department of Fish and Game (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 2006 season 38 bears were taken over bait, and the 6-year average for this reporting period was 40 (range = 26–51) bears (Table 1). Clearly, the popularity of bear baiting has increased since 2000, when only 12 were taken. During this report period, baiting accounted for 54% of the spring harvest and 69% of the bears taken over bait were males.

Successful hunters reported taking a bear incidentally while hunting other game only 30 percent of the time during this reporting period. Also, 79% of the successful hunters salvaged some or all of the meat.

Hunter Residency and Success. Nonresidents took 24 (19%) black bears during 2006–07 (Table 2). During the last six years, the black bear take by nonresidents has averaged 26 bears/year. This is an increase of 63% over the 1988–97 average of 16 bears/year. Local residents of Unit 13 harvested 33 (27%) black bears during 2006–07, the highest local harvest ever reported. Local hunters averaged 20 (16%) bears/year in the 5 prior years. The remaining 67 bears (54%) harvested during 2006–07 were taken by nonlocal Alaska residents, who have historically accounted for the largest portion of the Unit 13 black bear harvest, 60% during the past 6 years.

Successful black bear hunters spent an average of 4.2 days in the field both in 2006–07and on average 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. Hunters spent 4.7 days to take a black bear in the spring versus 3.4 in the fall. The increased popularity of hunting over a bait station probably accounts for the higher effort. If a hunter sets out a bait station, it is only logical he will spend more time in the field observing bears coming into the bait station, and perhaps waiting for a better trophy.

Harvest Chronology. During the 2006–07 season, the spring harvest was 81 bears (65%), compared to 43 (35%) in the fall. Harvest chronology is similar for the entire reporting period, on average 60% of the Unit 13 black bear harvest occurred during spring. The spring harvest has exceeded the fall harvest every year since 2000–01. June has had the highest spring harvest since 2005, while September is the most important month during the fall season (Table 3). Harvests in 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. Successful 2006–07 bear hunters reported that highway vehicles (25%) and 4-wheelers (19%) were the most popular methods of transportation (Table 4). Highway vehicles and 4-wheelers have been the most important methods of transportation throughout this reporting period. Aircraft use had declined after 1995 but was relatively stable during this reporting period. The combined importance of highway vehicles, 4-wheelers, 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 over the last 5 years have been high. Interest in bear hunting and bear harvests increased in the late 1990s, primarily due to the growing popularity of spring bear baiting. 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.

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. These data suggest we are not overharvesting local populations. If bears were being overharvested along the road system, immigration by subadults 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.

Harvest data are not currently collected from unsuccessful black bear hunters; thus, we have no way of determining total hunting effort. Black bear hunting has become more popular and 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, 2001–02 to 2006–07

Regulatory	Reported hunter kill							Nonhunting kill[a]			Total kill			
Year	M	(%)	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	F	Unk.	Total
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
2004–05														
Fall 04	35	(69)	16	(31)	0	51		1	1	0	36	17	0	53
Spring 05	63	(74)	22	(26)	0	85		1	0	0	64	22	0	86
Total	98	(72)	38	(28)	0	136	40	2	1	0	100	39	0	139
2005–06														
Fall 05	33	(66)	17	(34)	0	50		0	0	0	33	17	0	50
Spring 06	50	(70)	21	(30)	0	71		0	0	0	50	21	0	71
Total	83	(69)	38	(31)	0	121	38	0	0	0	83	38	0	121
2006–07														
Fall 06	30	(70)	13	(30)	0	43		0	0	1	30	13	1	44
Spring 07	61	(75)	20	(25)	0	81		0	0	0	61	20	0	81
Total	91	(73)	33	(27)	0	124	38	1	0	0	92	33	0	125

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

TABLE 2 Unit 13 black bear successful hunter residency, 2001–02 to 2006–07

Regulatory Year	Local resident	(%)	Other resident	(%)	Nonresident	(%)	Successful hunters[a]
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
2004–05	25	(18)	85	(63)	26	(19)	136
2005–06	23	(19)	69	(57)	29	(24)	121
2006–07	33	(27)	67	(54)	24	(19)	124

[a] Includes residency unknown hunters.

TABLE 3 Unit 13 black bear harvest chronology percent by month, 2001–02 to 2006–07

	Harvest periods												
Regulatory year	July		August		September		October		April		May		June		n^a
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
2004–05	2	(1)	16	(12)	27	(20)	6	(4)	3	(2)	52	(38)	30	(22)	136
2005–06	1	(1)	13	(11)	32	(26)	4	(3)	1	(1)	19	(16)	51	(42)	121
2006–07	3	(2)	15	(12)	20	(16)	5	(4)	0	(0)	28	(23)	53	(43)	124

[a] May include bears with unknown harvest date.

TABLE 4 Unit 13 black bear harvest (percent) by transport method, 2001–02 to 2006–07

Regulatory year	Percent of harvest									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway Vehicle	Walk	Other[a]	*n*
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
2004–05	18 (13)	2 (1)	32 (24)	32 (24)	2 (1)	4 (3)	34 (25)	8 (6)	3 (2)	135
2005–06	22 (18)	1 (1)	24 (20)	31 (26)	1 (1)	1 (1)	27 (22)	13 (11)	1 (1)	121
2006–07	19 (15)	0 (0)	20 (16)	24 (19)	1 (1)	1 (1)	31 (25)	24 (19)	4 (3)	124

[a] Other includes unknown

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

LOCATION

GAME MANAGEMENT UNIT: 14 (6625 mi^2)

GEOGRAPHIC DESCRIPTION: Upper Cook Inlet

BACKGROUND

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 has been to provide the greatest opportunity to participate in hunting black bears. Given the low numbers of moose in Unit 14B there was incentive to reduce the number of black bears to increase moose calf survival. The goals in Unit 14C were to provide an opportunity to hunt black bears under aesthetically pleasing conditions and to provide an opportunity to enjoy black bears by viewing and photography.

MANAGEMENT OBJECTIVES

The management objective has been to maintain a population largely unaffected by human harvest. The human-use objective has been to provide liberal opportunities to hunt black bears with annual total harvests of less than 80 bears with 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 permit from the Alaska Department of Fish

and Game (department) with no more than 2 bait stations allowed per permit. Baiting was not allowed in 14C.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The black bear population in Unit 14 was previously projected as between 530–1080 by Griese (1996). Earlier estimates by Harkness (1990) and Grauvogel (1990) reported a population size of 750–1050. Based on more recent information available from Earl Becker's bear survey work in Unit 16 (unpublished data), we assumed this population was similar or increasing during the reporting period. Unit 14C, which includes the Anchorage area, has numerous black bear complaints from the public. Reports of bear-human conflicts remain low in both 14A and 14B. In Unit 14A it is likely bears previously taken in defense of life or property 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.

MORTALITY

Harvest

Season and Bag Limit. In 2005, the Board of Game raised the black bear limit in Unit 14B from 1 to 3 bears per year. The bag limit remained 1 bear in Unit 14A and 14C. Baiting was allowed by registration permit between 15 April and 15 June in 14A and 14B. Bear hunters desiring to use bait in Unit 14A and 14B were required to successfully complete a bear bait hunting class in order to get a bear bait hunting registration permit from the department.

Board of Game Actions. The Board of Game raised the bag limit in Unit 14B from 1 bear to 3 bears in 2005.

Hunter Harvest. The bear harvest in Unit 14 increased during the 2004–2007 period, compared to previous years (Table 1). During 2004–2007, hunters reported an average annual kill of 166 bears, including an average of 60 (36%) sows. This was a substantial increase from the previous reporting period; however, there was little change in the percent females taken. Nonresident hunters reported an average harvest of 20 bears (Table 6). This was up from an average harvest of 17 reported from 2001–2003. During the last 3 year period, 173 of the black bears harvested in Units 14A and 14B were taken over bait (Tables 2–3). The harvest in Unit 14C averaged 39 during this period (Table 4), up from the average of 35 black bears during the 2001–2004 period.

Baiting Participation. The average number of hunters using bait to hunt bears in Unit 14 during the report period was 214. This was an increase from the previous 3-year average of 147 permit holders (Table 5).

Hunter Residency and Success. Unit 14 residents on average took 85% of the harvest during this reporting period (Table 6).

Harvest Chronology. May produced a lower percentage of the harvest in Unit 14 during the reporting period compared with the 2001–2003 period (40% vs. 46%), with that peak occurring during the second half of the month (Table 7). 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. The largest percentage of hunters in Unit 14 reported using ORV/ATVs as the preferred method to access hunting areas (Table 8). Highway vehicles were reported as the second and airplanes as the third most preferred methods.

Other Mortality

Nonhunting kills for all of Unit 14 totaled 16 bears for 2004–2007.

CONCLUSIONS AND RECOMMENDATIONS

Given current and historic harvest trends, the population of black bears in Unit 14 is likely at the upper end of a range between 500 and 1000 black bears. Budget and time constraints are likely to prevent surveys from being conducted any time soon. Recent black bear surveys in Unit 16 may provide some insight into the Unit 14 population based on similar habitat characteristics in some of the areas.

Human-use objectives were exceeded during this report period. The average annual harvest of 166 bears was higher than the management objective of 80 bears and the average sow harvest of 60 females was greater than the estimated allowable harvest of 30 females. During 2004–2007, the proportion of females in the harvest in Unit 14 was 36%. The trends in female harvest and total harvest did not show a problem with the bear population. These trends should be monitored for undesirable effects on the black bear population. It is possible that the increased harvest may have been a result of increased development and human activity in the unit. While the proportion of females harvested will need to be monitored closely for negative population trends, it is believed that the populations, especially in Unit 14B can withstand higher harvests and some decrease in bear densities.

The expanding human population and encroachment into bear habitat in the unit will likely result in increased conflicts and more bears being killed either in defense of life or property or as legal harvest. It is possible that the reduction in defense of life or property bear mortality was due in part to unit residents becoming more aware of potential bear problems through bear awareness programs promoted by the department, 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, 1997–2006

Regulatory	Reported Harvest					
Year	Male	(%)[a]	Female	(%)[a]	Unk	Total
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	105	73%	38	27%	1	144
2003/04	100	68%	48	32%	1	149
2004/05	118	67%	57	33%	0	175
2005/06	103	62%	64	38%	3	170
2006/07	92	61%	60	39%	1	153

[a]Includes bears of known sex only

TABLE 2 Unit 14A black bear harvest, 2002–2006

Regulatory year	Reported									Estimated unreported kill[c]	Total estimated kill					
	Hunter kill						Nonhunting kill[b]									
	M	F	(%)	Unk.	Total	Baited[a]	M	F	Unk.		M	(%)	F	(%)	Unk.	Total
2002																
Fall 02	16	4	(20)	0	20	0	0	3	0		16	(70)	7	(30)	0	23
Spring 03	38	21	(36)	1	60	42	0	0	1		38	(64)	21	(35)	2	61
Total	54	25	(32)	0	79	38	0	3	0	8	54	(66)	28	(34)	8	90
2003																
Fall 03	21	10	(32)	1	32	0	0	1	0		21	(66)	11	(34)	1	33
Spring 04	36	24	(40)	0	60	36	1	0	0		37	(61)	24	(39)	0	61
Total	57	34	(37)	1	92	30	1	1	0	9	58	(62)	35	(38)	10	103
2004																
Fall 04	21	10	(32)	0	31	0	0	0	0		21	(68)	10	(32)	0	31
Spring 05	44	27	(38)	0	71	46	1	0	0		45	(63)	27	(37)	0	72
Total	65	37	(36)	0	102	46	1	0	0	10	66	(64)	37	(36)	10	113
2005																
Fall 05	11	10	(48)	0	21	0	0	1	0		11	(50)	11	(50)	0	22
Spring 06	40	29	(42)	2	69	46	1	0	0		41	(59)	29	(41)	2	72
Total	51	39	(43)	2	92	46	1	1	0	9	52	(57)	40	(43)	11	103
2006																
Fall 06	13	7	(35)	0	20	0	0	1	0		13	(62)	8	(38)	0	21
Spring 07	32	23	(42)	1	56	40	1	0	1		33	(59)	23	(41)	2	58
Total	45	30	(40)	1	76	40	1	1	1	8	46	(60)	31	(40)	10	97

[a] Bears reported taken over legally established bait stations

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

[c] Assumes approximately 10% of reported harvest

TABLE 3 Unit 14B black bear harvest, 2002–2006

Regulatory year	Reported									Estimated unreported kill[c]	Total estimated kill					
	Hunter kill						Nonhunting kill[b]									
	M	F	(%)	Unk.	Total	Baited[a]	M	F	Unk.		M	(%)	F	(%)	Unk.	Total
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	8	0	0	0		12	(71)	5	(29)	0	17
Total	23	6	(21)	0	29	8	0	0	0	3	23	(79)	6	(21)	3	32
2003																
Fall 03	2	3	(60)	0	5	0	0	1	0		2	(33)	4	(67)	0	6
Spring 04	12	2	(14)	0	14	10	0	0	0		12	(86)	2	(14)	0	14
Total	14	4	(22)	0	18	10	0	1	0	2	14	(74)	5	(26)	2	21
2004																
Fall 04	6	1	(14)	0	7	0	0	0	0		6	(86)	1	(14)	0	7
Spring 05	18	7	(28)	0	25	14	0	0	0		18	(72)	7	(28)	0	25
Total	24	8	(25)	0	32	14	0	0	0	3	24	(75)	8	(25)	3	35
2005																
Fall 05	10	6	(38)	0	16	0	1	0	0		11	(65)	6	(35)	0	17
Spring 06	14	4	(22)	0	18	9	0	0	0		14	(78)	4	(22)	0	18
Total	24	10	(29)	0	34	9	1	0	0	3	25	(71)	10	(29)	3	39
2006																
Fall 06	8	4	(33)	0	12	0	0	1	0		8	(62)	5	(38)	0	13
Spring 07	20	12	(38	0	32	18	0	0	0		20	(63)	12	(37)	0	32
Total	28	16	(36)	0	44	18	0	1	0	4	28	(62)	17	(38)	4	49

[a] Bears reported taken over legally established bait stations

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

[c] Assumes approximately 10% of reported harvest

TABLE 4 Unit 14C black bear harvest, 2002–2006

Regulatory year	Reported									Estimated unreported kill[c]	Total estimated kill					
	Hunter kill						Nonhunting kill[b]									
	M	F	(%)	Unk.	Total	Baited[a]	M	F	Unk.		M	(%)	F	(%)	Unk.	Total
2002																
Fall 02	7	1	(13)	0	8	0	1	0	0		8	(89)	1	(37)	0	9
Spring 03	20	5	(20)	0	25	2	1	0	0		21	(81)	5	(19)	0	26
Total	27	6	(18)	0	33	2	2	0	0	3	29	(83)	6	(17)	3	38
2003																
Fall 03	13	5	(28)	0	18	0	2	1	0		15	(71)	6	(29)	0	21
Spring 04	16	4	(20)	0	20	0	0	0	0		16	(80)	4	(20)	0	20
Total	29	9	(24)	0	38	0	2	1	0	4	31	(74)	11	(26)	4	42
2004																
Fall 04	13	3	(19)	0	16	0	0	0	0		13	(81)	3	(19)	0	16
Spring 05	15	9	(38)	0	24	0	2	0	0		17	(65)	9	(35)	0	26
Total	28	12	(30)	0	40	0	2	0	0	4	30	(71)	12	(29)	4	46
2005																
Fall 05	8	7	(47)	1	16	0	1	2	0		9	(50)	9	(50)	1	19
Spring 06	20	8	(29)	0	28	0	0	0	0		20	(71)	8	(29)	0	28
Total	28	15	(35)	1	44	0	1	2	0	4	29	(63)	17	(37)	5	51
2006																
Fall 06	4	4	(50)	0	8	0	1	0	0		5	(56)	4	(44)	0	9
Spring 07	15	10	(40)	0	25	0	2	0	0		17	(63)	10	(37)	0	27
Total	19	14	(42)	0	33	0	3	0	0	3	22	(61)	14	(39)	3	39

[a] Bears reported taken over legally established bait stations

[b] Includes defense of life or property 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, 1997–2006

Regulatory year	Number of permittees	Number of stations registered	
		SU 14A	SU 14B
1997/98	137	155	40
1998/99	153	162	40
1999/00	140	169	54
2000/01	141	159	43
2001/02	114	135	35
2002/03	158	183	40
2003/04	169	197	40
2004/05	194	201	55
2005/06	223	257	56
2006/07	225	234	83

TABLE 6 Unit 14 black bear successful hunter residency, 1997–2006

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
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
2004/05	144	(85)	4	(2)	21	(13)	169
2005/06	134	(83)	1	(1)	26	(16)	161
2006/07	127	(88)	5	(3)	13	(9)	145

[a] Unit 14 residents

TABLE 7 Unit 14 black bear hunter harvest chronology percent by month, 1997–2006

	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*
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
2004/05	9	7	10	5	0	2	17	25	25	169
2005/06	9	10	9	1	0	1	8	25	36	161
2006/07	7	5	11	3	0	2	11	34	27	145

TABLE 8 Unit 14 black bear harvest percent by transport method, 1997–2006

Regulatory year	Percent of harvest							*n*
	Airplane	Horse	Boat	Snow Machine	ORV/ATV	Highway Vehicle	Other / Unknown	
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
2004/05	15	0	8	0	39	21	17	169
2005/06	14	0	13	0	34	22	18	141
2006/07	18	0	14	0	33	21	14	145

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. BOX 115526
JUNEAU, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 have been reported to 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 415 (this report) since sealing requirements began. During recent years, the bulk of the harvest has 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 that were reported as resident harvest. Reported harvest rates have been increasing for the last several years.

Recently there has been a desire to increase the harvest objective to reduce the bear population in order to support moose management.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

The management goal in Unit 16 is to provide the greatest opportunity to participate in hunting black bears. Beginning in July 2007, an additional management goal will be to reduce the overall population of black bears in the unit which should result in increased moose calf survival.

MANAGEMENT OBJECTIVES

The population objective has been to maintain a population size that appears largely unaffected by human harvest. The human-use objective has been a 3-year average harvest of greater than 270 black bears (45 in 16A, >225 in 16B) with >30% female. Beginning in July 2007, the population objective in the Unit 16 Predator Control Area (16 PCA) will be to use liberalized harvest strategies and control methods to reduce the population to 600 to 800 bears and maintain it afterward at a level that would be largely unaffected by human harvest within the area.

METHODS

Earl Becker conducted a line-transect bear survey of Unit 16B in May of 2007. 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, 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 (maximum of 2 bait stations were allowed per bait permit).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Results of Becker's line-transect survey were 1887.8 black bears for Unit 16B. This is based on a density of 126.7 bears per 1000 km^2 and a total area of 14,895 km^2 of available habitat below 3500 feet elevation. Previous estimates were based on 25–50 black bears/100mi^2 (Griese 1996) using available moose habitat to determine black bear habitat. These produced a similar mid-point estimate to the line transect survey result of 2700 bears for all of 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.

Population Composition

No composition information is available for Unit 16 black bears.

Distribution and Movements

No information is available for 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 between 15 April and 15 June outside of Denali State Park in Unit 16A. The baiting season in Unit 16B was from 15 April–30 June. A

second bear baiting period, from 10 August–15 October, was added covering 16B and the portion of 16A within the liberalized hunting area.

Board of Game Actions and Emergency Orders. During its spring 2006 meeting the Board of Game (BOG) permitted the sale of black bear hides (with claws attached) and skulls from bears harvested in Unit 16B on nonfederal lands. In May of 2006 the BOG met in an emergency meeting to respond to a court judgment against the board and the Alaska Department of Fish and Game (ADF&G; department) in a lawsuit brought by Defenders of Wildlife. At that meeting the board expanded the predator control area to include a portion of 16A. In the new control area, effective 1 September 2006, hunters could sell black bear hides and skulls, a fall bear baiting season was established, and black bears could be taken the same day hunters flew, providing the hunters were at least 300 feet from an airplane when they attempted to take the animal. During the spring 2007 meeting the BOG created a Black Bear Predation Control program for Unit 16 within the 16 PCA. This program, which is set to begin in July 2007, will allow for licensed resident bear hunters to take black bears under a special Black Bear Control Permit issued by the department. With this permit, black bears can be taken over bait or by other methods on the same day the permittee has flown, provided that they are over 300 feet from the airplane. There will be no limit to the number of black bears that can be taken and cubs and sows accompanied by cubs may be taken. Control permittees will be able to have up to 4 registered Black Bear Bait Stations at the same time. They will have the option to sell tanned or untanned hides and skulls of black bears taken with a sale permit issued by the department.

Hunter Harvest. The average annual harvest of black bears during regulatory years (RY) 2004–2006 was 283 animals. This was much greater than the 2001–2003 average of 197. The harvest in RY 2006 was significantly greater than any previous year, with a total of 415 bears taken. Twenty-eight percent of the harvest was female. (Table 1). Most of the increase was from bears harvested in Unit 16B, where there has been an emphasis on reducing the number of bears.

Baiting Participation. The number of bear hunters using bait increased during this report period (Table 4). The proportion of the total harvest that came from spring bears taken over bait also increased in Unit 16A. The proportion of bears taken over bait in Unit 16B decreased during the reporting period (Tables 2 and 3).

Hunter Residency and Success. Compared to the previous report period, local resident success rates remained similar while nonlocal resident success rates increased slightly and nonresident success rates decreased slightly during this period (Table 5).

Harvest Chronology. Late May and June accounted for the majority of this harvest. This coincides with a switch that occurred during the late 1990s from more hunting pressure in the fall to more in the spring baiting season. During this reporting period an average of 65% of hunters took their bears during the late May and June period. (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 a number of nuisance black bears are killed and not reported due to inconvenience and time requirements for reporting. In addition, the 3-bear limit with no closed season probably results in a few bears being taken under the hunting regulations that would otherwise be considered defense of life and property kills. Estimates of nonreported harvested bears (Tables 2 and 3) were adjusted to reflect a higher portion in the total harvest, following the method set out by 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 percentage of females in the average harvest has remained below 30% (Table 1). The human use objectives were met for 16A during this period. The human use objective for 16B met the goals as stated in the previous management report for 2006–2007 of >225 bears. 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 2006 the Board of Game intended to reduce black bear numbers to aid in the moose population recovery. Since black bear harvests were not meeting management objectives the Board of Game implemented a black bear predation control program that will begin July 2007. Future management reports will discuss the effects of those changes.

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TABLE 1 Unit 16 black bear harvest composition, 1997–2006

Regulatory	Reported Harvest					
Year	Male	(%)[a]	Female	(%)[a]	Unk	Total
1997/98	108	(73)	39	(27)	0	147
1998/99	156	(69)	69	(31)	0	225
1999/00	87	(74)	31	(26)	0	118
2000/01	125	(71)	50	(29)	1	176
2001/02	109	(65)	58	(35)	1	168
2002/03	143	(73)	53	(27)	1	197
2003/04	166	(73)	60	(27)	1	227
2004/05	152	(72)	59	(28)	1	213
2005/06	156	(72)	62	(28)	4	222
2006/07	298	(71)	120	(29)	2	420

[a]Includes bears of known sex only

TABLE 2 Unit 16A black bear harvest, 2002–2006

Regulatory year	Reported									Estimated unreported kill[c]	Total estimated kill					
	Hunter kill						Nonhunting kill[b]									
	M	F	(%)	Unk.	Total	Baited[a]	M	F	Unk.		M	(%)	F	(%)	Unk.	Total
2002																
Fall 02	14	12	(46)	0	26	0	1	0	0		15	(56)	12	(44)	0	27
Spring 03	28	14	(33)	0	42	29	0	0	0		28	(67)	14	(33)	0	42
Total	42	26	(38)	0	68	29	1	0	0	7	43	(62)	26	(37)	7	78
2003																
Fall 03	12	8	(40)	0	20	0	1	0	0		13	(62)	8	(38)	0	21
Spring 04	38	15	(28)	0	53	39	0	0	0		38	(72)	15	(27)	0	53
Total	50	23	(32)	0	73	39	1	0	0	7	51	(69)	23	(31)	7	81
2004																
Fall 04	17	5	(22)	0	22	0	1	0	0		18	(78)	5	(22)	0	23
Spring 05	34	20	(37)	0	54	33	0	0	0		34	(63)	20	(30)	0	54
Total	51	25	(33)	0	76	33	1	0	0	8	52	(68)	25	(32)	7	84
2005																
Fall 05	12	5	(29)	1	18	0	0	0	0		12	(67)	5	(33)	1	18
Spring 06	28	12	(30)	0	40	33	0	0	0		28	(70)	12	(30)	0	40
Total	40	17	(30)	1	58	33	0	0	0	6	40	(63)	17	(37)	7	64
2006																
Fall 06	12	9	(43)	0	21	0	0	0	0		12	(67)	9	(43)	0	21
Spring 07	49	23	(32)	0	72	53	0	0	0		49	(68)	23	(32)	0	72
Total	49	25	(34)	0	74	53	0	0	0	7	49	(69)	25	(33)	7	81

[a] Bears reported taken over legally established bait stations

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

[c] Assumes approximately 10% of reported harvest

TABLE 3 Unit 16B black bear harvest, 2002–2006

Regulatory year	Reported									Estimated unreported kill[c]	Total estimated kill					
	Hunter kill						Nonhunting kill[b]									
	M	F	(%)	Unk.	Total	Baited[a]	M	F	Unk.		M	(%)	F	(%)	Unk.	Total
2002																
Fall 02	22	6	(21)	0	28	0	0	0	0		22	(79)	6	(21)	0	29
Spring 03	79	21	(21)	0	100	47	3	0	0		82	(80)	21	(20)	0	103
Total	101	27	(21)	0	128	47	3	0	0	13	104	(79)	27	(21)	13	144
2003																
Fall 03	21	6	(22)	0	27	0	1	0	0		22	(80)	6	(20)	0	30
Spring 04	95	31	(25)	0	126	85	0	0	0		95	(75)	31	(25)	0	126
Total	116	37	(24)	0	153	85	1	0	0	15	117	(76)	37	(24)	15	169
2004																
Fall 04	17	8	(32)	0	25	0	1	0	0		18	(68)	8	(32)	0	26
Spring 05	84	26	(24)	1	111	73	0	0	0		84	(76)	26	(24)	1	111
Total	101	34	(25)	1	136	73	1	0	0	14	102	(67)	34	(23)	15	151
2005																
Fall 05	37	13	(26)	2	52	0	0	0	0		37	(74)	13	(26)	2	52
Spring 06	79	32	(29)	1	112	62	0	0	0		79	(71)	32	(29)	1	112
Total	116	45	(28)	3	164	62	0	0	0	16	116	(66)	45	(25)	19	180
2006																
Fall 06	58	17	(23)	0	75	4	0	0	0		58	(77)	17	(23)	0	75
Spring 07	179	70	(28)	2	251	115	0	0	0		179	(72)	70	(28)	2	251
Total	237	87	(27)	2	326	119	0	0	0	33	237	(73)	87	(27)	35	359

[a] Bears reported taken over legally established bait stations

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

[c] Assumes approximately 10% of reported harvest

TABLE 4 Unit 16 black bear hunter baiting participation, 1988–2006

Regulatory year	Number of permittees	Number of stations registered	
		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	93	80	74
2001/02	124	107	101
2002/03	130	93	107
2003/04	124	99	90
2004/05	130	107	96
2005/06	141	89	117
2006/07	235	146	222

TABLE 5 Unit 16 black bear successful hunter residency, 1997–2006

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
1997/98	3	(2)	100	(68)	44	(30)	147
1998/99	8	(4)	151	(67)	66	(29)	225
1999/00	4	(3)	83	(70)	31	(26)	118
2000/01	6	(3)	131	(75)	39	(22)	176
2001/02	8	(5)	96	(57)	64	(38)	168
2002/03	6	(3)	148	(76)	42	(21)	196
2003/04	6	(3)	143	(63)	78	(34)	227
2004/05	4	(2)	155	(73)	53	(25)	212
2005/06	7	(3)	156	(70)	59	(27)	222
2006/07	11	(3)	282	(68)	122	(29)	415

[a] Unit 16 residents

TABLE 6 Unit 16 black bear hunter harvest chronology percent by month, 1997–2006

Regulatory year	Percent of harvest									
	July - Aug	Sep 1-15	Sep 16-30	Oct	Nov - Mar	Apr	May 1-15	May 16-31	June	*n*
1997/98	12	11	16	1	1	1	2	32	26	146
1998/99	19	33	17	4	<1	0	<1	7	19	223
1999/00	8	13	7	2	<1	0	3	29	39	117
2000/01	18	10	13	<1	0	<1	5	23	30	173
2001/02	15	10	7	1	0	<1	2	19	46	166
2002/03	8	5	13	1	<1	1	8	25	38	191
2003/04	6	8	5	<1	0	2	4	32	42	225
2004/05	7	8	7	<1	0	3	3	35	37	211
2005/06	6	14	9	2	<1	2	8	26	32	222
2006/07	10	7	5	1	0	1	9	32	34	413

TABLE 7 Unit 16 black bear harvest percent by transport method, 1997–2006

Regulatory year	Percent of harvest							
	Airplane	Horse	Boat	Snow Machine	ORV/ATV	Highway Vehicle	Other / Unknown	*n*
1997/98	42	6	23	1	13	11	4	146
1998/99	42	5	19	0	15	12	6	219
1999/00	24	<1	38	2	15	11	9	117
2000/01	37	4	29	<1	11	13	7	174
2001/02	27	0	26	<1	20	20	6	166
2002/03	42	0	26	0	17	9	6	192
2003/04	34	0	32	1	20	5	6	221
2004/05	37	1	32	3	15	8	3	211
2005/06	41	1	28	2	15	11	2	221
2006/07	50	1	19	<1	14	11	4	415

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
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BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007

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 on 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 from and predation by brown bears. There have been no research activities conducted in Unit 17, so we do not have complete understanding of the density, key denning areas, and other aspects of this bear population.

Before 1994 hunters were not required to report or seal black bears harvested in Unit 17 and the Alaska Department of Fish and Game (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 other flights during the past several years suggest black bears might be more common than during previous reporting periods.

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 is 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 fieldworkers 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.

Distribution and Movements

We know little about the overall distribution and movements of black bears in this unit. I suspect that the greatest densities are in the spruce forest habitats along the upper Mulchatna and Nushagak rivers and along the Chichitnok River. Black bears are also occasionally seen along the 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 also occasionally see individual bears and family groups near postcalving aggregations of caribou in June and July. Areas important for denning remain unknown.

MORTALITY

Harvest

Season and Bag Limit.

Unit 17

August 1–May 31	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 that 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 sportfishers along the upper Nushagak River drainages.

During the 2004–05 season hunters in Unit 17 reported harvesting 21 black bears, including 13 males (62%) and eight females (38%). The average total skull size was 18.1" for males and 15.9" for females. Successful hunters spent an average of 3.6 days afield. No hunters killed more than 1 bear. At least some meat was salvaged from 4 bears (19%). Guided hunters took 3 of the 21 bears. Four of the successful nonresident hunters took black bears using big game tags from other species.

During the 2005–06 season hunters in Unit 17 reported harvesting seven black bears, including six males (86%) and one female (14%). The average total skull size was 18.3" for males and skull size for the lone female was 18.0". Successful hunters spent an average of 4.4 days afield. No hunters reported killing more than 1 bear. At least some meat was salvaged from 2 bears (29%). Guided hunters took 5 of the 7 bears. None of the successful nonresident hunters took black bears using big game tags from other species.

During the 2006–07 season hunters in Unit 17 reported harvesting 14 black bears, including 9 males (64%), and 5 females (36%). The average total skull size was 18.6" for males and 17.0" for females. Successful hunters spent an average of 5.9 days afield. No hunters reported killing more than 1 bear. At least some meat was salvaged from 2 bears (14%). Guided hunters took 8 of the 14 bears. At least 5 of the successful nonresident hunters took black bears using big game tags from other species.

Hunter Residency and Success. Nonresidents account for most of the reported black bear harvest in Unit 17. During the 2004–05 season, nonresidents took 95% of the harvested bears reported in the unit, Unit 17 residents didn't report taking any bears, and other Alaska residents took 5%. During the 2005–06 season, nonresidents took 86% of the harvested bears reported in Unit 17, Unit 17 residents took 1 bear (14%), and other Alaska residents did not report killing any bears. During the 2006–07 season, nonresidents took 86% of the bears reported harvested in the unit, Unit 17 residents reported 1 bear (7%) and other Alaska residents reported 1 bear (7%) (Table 3).

Harvest Chronology. One black bear was reported killed in May 2006, and all other 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 an abundant 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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Please cite any information taken from this section, and reference as:

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TABLE 1 Unit 17 black bear harvest, 1994/95–2006/07

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
2004-05	13	8	0	21	0	0	0	0	13	8	0	21
2005-06	6	1	0	7	0	0	0	0	6	1	0	7
2006-07	9	5	0	14	0	0	0	0	9	5	0	14

TABLE 2 Unit 17 black bear harvest by subunit, 1994/95–2003/04

Regulatory Year	Subunit 17A M	17A F	17A Unk	17A Total	17B M	17B F	17B Unk	17B Total	17C M	17C F	17C Unk	17C Total	Unit 17 total M	Unit 17 total F	Unit 17 total Unk	Unit 17 total 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
2004-05	0	0	0	0	11	8	0	19	0	0	0	0	13[a]	8	0	21[a]
2005-06	0	0	0	0	5	1	0	6	1	0	0	1	6	1	0	7
2006-07	0	0	0	0	7	4	0	11	2	1	0	3	9	5	0	14

[a] Includes two male bears, location unknown.

TABLE 3 Unit 17 black bear successful hunter residency, 1994/95–2006/07

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
2004-05	0 (---)	1(5%)	20 (95%)	21
2005-06	1(14%)	0 (---)	6 (86%)	7
2006-07	1 (7%)	1 (7%)	12 (86%)	14

[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, 1994/95–2006-07

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
2004-05	19%	81%	0%	0%	0%	0%	0%	0%	0%	0%	21
2005-06	29%	57%	0%	0%	0%	0%	0%	0%	0%	14%	7
2006-07	14%	86%	0%	0%	0%	0%	0%	0%	0%	0%	14

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

TABLE 5 Unit 17 black bear harvest percentage by transport method, 1994/95–2006/07

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
2004-05	95%	0%	5%	0%	0%	0%	0%	0%	0%	21
2005-06	86%	0%	0%	0%	0%	0%	14%	0%	0%	7
2006-07	93%	0%	0%	0%	0%	0%	7%	0%	0%	14

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. Box 115526
Juneau, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007[1]

LOCATION

GAME MANAGEMENT UNITS: 19, 21A, and 21E (59,756 mi^2 prior to 1 July 2006 and 55,278 mi^2 after that date, when the upper Nowitna River drainage was excluded from Unit 21A).

GEOGRAPHIC DESCRIPTION: Unit 19, all drainages into the Kuskokwim River upstream from a straight line drawn between Lower Kalskag and Paimiut. Unit 21A, the Innoko River drainage upstream from and including the Iditarod River drainage; and the Nowitna River drainage upstream from the confluence of the Little Mud and Nowitna Rivers (beginning 1 July 2006, Unit 21A no longer included the upper Nowitna drainage). Unit 21E, the Yukon River drainage from Paimiut upstream to, but not including, the Blackburn Creek drainage, and the Innoko River drainage downstream from the Iditarod River drainage.

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 good hunting opportunity; however, harvest pressure is low. Harvest pressure is also light in Units 19B and 19C. Overall, reported harvest is low not only because there is no sealing requirement in most of Units 19, 21A and 21E, but also because harvest is low.

In 2001 the department established the Experimental Micro Management Area (EMMA) within a 20-mile radius of McGrath (528 mi^2; Fig. 1). The purpose of the EMMA was to focus predator management around McGrath to provide more moose for subsistence harvest opportunity. This area encompasses the highest density of moose in Unit 19D East (upstream from the Selatna and Black River drainages; Fig. 1) and was established as a treatment area where predator population manipulations and other management actions could be tested. This included capture and removal of black bears.

[1] At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

The black bear intensive management program in Unit 19D is critical for compliance with the Intensive Management Law (AS 16.05.255[e]–[g]) and with regulations 5 AAC 92.106 and 5 AAC 92.108 which identify the Unit 19 moose populations as important for providing high levels of harvest for human consumptive use and set the moose population and harvest objectives. This designation means the Board of Game must consider intensive management of predators if a reduction in moose harvest becomes necessary because of dwindling moose numbers or productivity.

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, methods, harvest demographics, sex ratio of the harvest, and timing and location of harvest are usually provided from sealing certificates. However, sealing was required only in Unit 19D East. In the remainder of Unit 19D sealing is required only for bears taken between 1 January and 31 May if removed from Unit 19, or any untanned hide or skull removed from Alaska. In addition, beginning in regulatory year (RY) 2006 (RY06 = 1 Jul 2006 through 30 Jun 2007), black bear hides or skulls taken from Unit 19A that were intended for sale also needed to be sealed. In Units 21A and 21E sealing was not required unless the hide and/or skull are removed from Alaska. All available harvest data were summarized by regulatory year. Boudreau (2005) estimated black bear population densities based on research conducted by Miller et al. (1997) in other areas. In the EMMA the black bear population was measured using a mark–recapture technique (M. Keech, Alaska Department of Fish and Game [ADF&G], personal communication).

Methods for black bear population estimates are described by Boudreau (2005), and are based on known bear densities (Miller et al. 1997) in similar habitats in other game management units in Interior Alaska.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

Based on Boudreau's (2005) estimates, and subtracting the portion of Unit 21A transferred to Unit 21B, I estimate the black bear population for the entire 55,278-mi^2 management area to be 8300–16,600 black bears, based on overall densities of 15–30 bears/100 mi^2. The population has probably been stable or slowly increasing since 1995, based on local observations.

Population surveys have been conducted only in the EMMA portion of Unit 19D East. However, Boudreau (2005) estimated the entire Unit 19 black bear population to be 7700–9235 bears.

The habitat in Unit 19A is of moderate to high quality and could support approximately 2475–2970 black bears. Unit 19B contains about 5000 mi^2 of good quality bear habitat, with an estimated 1250–1500 bears. Unit 19C has about 3000 mi^2 of good habitat and about 1500 mi^2 of moderate-quality habitat, supporting about 975–1165 bears. Unit 19D contains about 3000–6000 bears in 12,000 mi^2 of high quality habitat.

One hundred two individual black bears were removed from the EMMA in 2003 (n = 75) and 2004 (n = 34 with 7 recaptures). No females with cubs were removed during these 2 years. The pre-removal population in 2003 was estimated at 130 and the post-removal estimate in 2004 was 28 black bears. This represents a 79% removal. A mark–recapture survey was conducted in May 2007 and the EMMA was estimated to have 72 black bears (M. Keech, ADF&G, unpublished data). This is an increase of 157% and the population is now at approximately 55% of the pre-removal estimate.

In Units 21A and 21E, the higher elevation areas are believed to include moderate quality bear habitat, and low elevation areas contain high quality habitat. Unit 21A, has about 7500 mi^2 of high quality habitat and about 3000 mi^2 of moderate quality habitat with a total population estimate of 2325–2775 bears. This is less than the estimate of 3550–4235 bears in the previous report due to the transfer of 4476 mi^2 from Unit 21A to Unit 21B. Unit 21E consists of about 7000 mi^2 of high quality habitat and about 1000 mi^2 of moderate quality habitat, yielding a population estimate for Unit 21E of 1900–2275 black bears.

MORTALITY

Harvest

Hunting Seasons and Bag Limits[a].

Units and Bag Limits	Resident and Nonresident Open Season	Resident and Nonresident Baiting Season
RY04–RY05		
Units 19, 21A, and 21E,		
3 bears	No closed season	15 Apr–30 Jun
Unit 19D East,		
2 additional bears by registration permit	No closed season	15 Apr–30 Jun
RL338		1 Sep–30 Sep

Units and Bag Limits	Resident and Nonresident Open Season	Resident and Nonresident Baiting Season
RY06		
Units 19B, 19C, 21A, and 21E, 3 bears	No closed season	15 Apr–30 Jun
Units 19A and 19D, remainder, 5 bears	No closed season	15 Apr–30 Jun
Unit 19D East, 5 bears	No closed season	15 Apr–30 Jun[b] 1 Sep–30 Sep[b]

[a] Harvest of cubs (in first year of life) or females accompanied by cubs was prohibited in all seasons.
[b] Same day airborne at bait stations was allowed, provided the hunter was at least 300 feet from the airplane.

Control Regulations and Bag Limits[a].

	Residents only	Baiting Season Residents Only
RY06		
Unit 19D black bear control area (EMMA). No limit, but permit required.	1 Aug–30 Jun	1 Aug–30 Jun[b]

[a] Harvest of cubs (in first year of life) or females accompanied by cubs was prohibited in all seasons.
[b] Same day airborne at bait stations was allowed, provided the permittee was at least 300 feet from the airplane.

Alaska Board of Game Actions and Emergency Orders. No regulations were changed for Units 19B, 19C, 21A, or 21E during the report period, and no emergency orders were issued for any units.

At the March 2006 meeting, the board eliminated registration hunt RL338 and increased the bag limit in Units 19A and 19D to 5 bears per year. Also at that meeting, the board legalized same day airborne at bait stations under hunting regulations in the active Unit 19D East wolf control area, provided the hunter was at least 300 feet from the airplane. In May 2006 the board updated the predator control implementation plan for Unit 19D and established a black bear control plan within the EMMA. Under this program, permittees can take an unlimited number of bears and register up to 10 bait stations. As under the hunting regulations, no sows with cubs or cubs are allowed to be taken and a permittee can access bait stations the same day airborne provided they are at least 300 feet from the airplane.

Harvest by Hunters. During RY02–RY06, 183 black bears were sealed from Units 19, 21A, and 21E (Table 1). On average 68% of these bears were males. Thirty-three of these bears were harvested in Unit 19D (where sealing was required for all black bears taken in a portion of the unit) and 70 were sealed in Unit 19B (Table 2) where sealing is not required unless the hide and skull are taken from Alaska. Unit 19B typically has a high percentage of nonresident hunters. Two defense of life or property kills and 3 research kills were reported in RY03, however it is likely that more nuisance bears were killed at fish camps or by local residents and not reported. No black bear control permits were issued in RY06 and no bears have been taken under the bear control regulations.

Hunter Residency and Success. It is difficult to assess hunter residency and success for black bear harvest in Unit 19, 21A, and 21E because in all units except Unit 19D East, sealing was required only for bears transported out of Alaska. However, of the bears that were sealed, 68% were harvested by nonresidents.

Harvest Chronology. There is likely unreported resident harvest of bears during spring and summer months, but overall harvest reporting was greatest in the fall (Table 3). This is primarily due to nonresident hunters who have their bears sealed in order to take the hides and skulls out of Alaska.

Transport Methods. During the past 5 years, 73% of hunters who had their black bears sealed used airplanes as their primary access method. This is consistent with the high number of black bears sealed from Unit 19B, which receives a large amount of nonlocal hunting pressure. Boats are also likely important and probably account for a substantial portion of the unreported harvest taken by local residents.

CONCLUSIONS AND RECOMMENDATIONS

Black bears are common throughout most of the units managed by the McGrath area office. Studies recently completed in the EMMA have indicated that black bears are a significant source of moose calf mortality (M. Keech, ADF&G, personal communication). As a result, hunting regulations were liberalized in both Units 19A and 19D and a control program was established in the EMMA portion of Unit 19D. These actions were taken to increase the harvest of black bears with the intent of improving moose calf survival. Liberal hunting seasons have not resulted in higher harvest however, and there has been an increase in black bear predation on moose calves in recent years as the population of black bears increases within the EMMA. The bear control program has also been unsuccessful to date and no bears have been taken under this program. There is no biological reason to reduce the black bear bag limits in the area; however these liberal regulations have not had a positive effect on moose calf survival. No changes are needed in the regulations at this time; however, if the bear control program continues to be ineffective it should be eliminated to reduce unnecessary administrative burden.

During RY04–RY06, we did not meet our management objective to maintain an annual reported harvest of at least 30 black bears in Unit 19D East as part of the intensive management program. In fact, only 12 total bears were harvested during the entire 3-year reporting period. There are ample opportunities to harvest black bears, including same day airborne over bait, however interest among local hunters is extremely low. Gasoline prices are high ($5.73/gallon in McGrath as of 9 Sep 2007) which may influence hunting activities, but local interest in bear meat is also low. Raw black bear hides are worth approximately $100 and the ability to sell skins has not provided enough of an incentive to encourage higher harvest. Only 4 legal sale tags have been issued since they became available, and to our knowledge none of those hides were sold.

I recommend that sealing continue to be required in Unit 19D East, however the sealing requirement for the remainder of Unit 19D is unnecessary and only adds complexity to the regulations. During the next Board of Game cycle a proposal should be submitted to remove this requirement. It is also recommended that a black bear harvest ticket be created. We cannot provide sealing services throughout our management area, and therefore have no information for

most of the resident harvest. Black bears are an important management species and a harvest ticket would provide extremely valuable information, including effort data, which is currently unavailable.

The management goal for the entire area for the next reporting period will be to provide for the opportunity to harvest black bears. The management objective of 30 bears in Unit 19D East will remain in place while there is a bear control program, however when this program is terminated this high harvest objective should also end.

LITERATURE CITED

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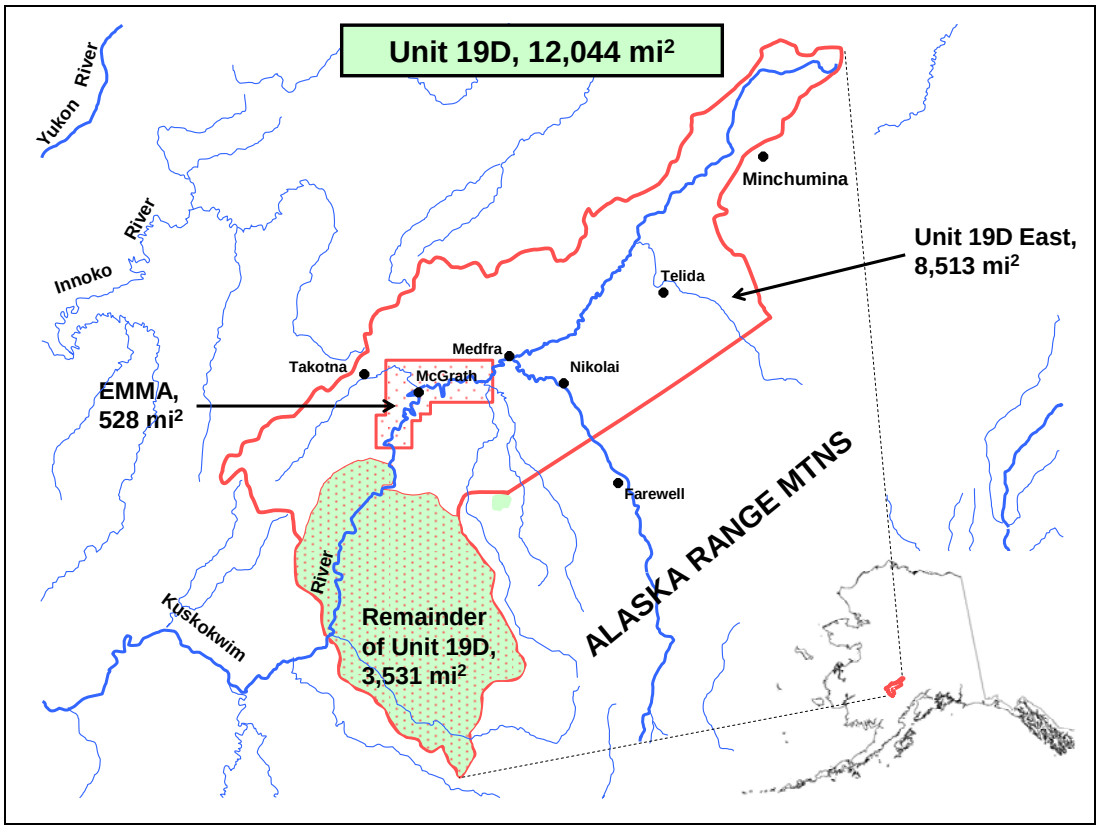

FIGURE 1 Detail area map of Unit 19D

TABLE 1 Black bear harvest in Units 19, 21A and 21E by type of kill[a], regulatory years 2002–2003 through 2006–2007

Regulatory	Hunter kill				Nonhunting kill[b]				Total reported kill				
year	M	F	Unk	Total	M	F	Unk	Total	M	(%)	F	(%)	Total
2002–2003	25	9	0	34	0	0	0	0	25	(74)	9	(26)	34
2003–2004	28	6	0	34	3	1	0	4	31	(82)	7	(18)	38
2004–2005	29	16	0	45	0	0	0	0	29	(64)	16	(36)	45
2005–2006	21	9	0	30	0	0	0	0	21	(70)	9	(30)	30
2006–2007	18	18	0	36	0	0	0	0	18	(50)	18	(50)	36

[a] Sealing was only required in Unit 19D East and in the remainder of Unit 19D for bears taken between 1 January and 31 May if removed from Unit 19, or if the hide was going to be sold.
[b] Includes defense of life or property and research mortalities.

TABLE 2 Reported black bear harvest by unit[a], regulatory years 2002–2003 through 2006–2007

Regulatory	Unit							
year	19A	19B	19C	19D	19 Unknown	21A	21E	Total
2002–2003	2	10	10	10			2	34
2003–2004	2	17	4	11	4			38
2004–2005	14	18	5	3	1	3	1	45
2005–2006	2	11	4	8	1	3	1	30
2006–2007	8	14	5	1	3	3	2	36
Total	28	70	28	33	9	9	6	183

[a] Reporting and sealing was only required in Unit 19D East and in the remainder of Unit 19D for bears taken between 1 January and 31 May if removed from Unit 19, or if the hide was going to be sold. Reporting and sealing was required for all bear hides and skulls removed from the state of Alaska.

TABLE 3 Units 19, 21A, and 21E black bear harvest chronology[a] 2002–2003 through 2006–2007

Regulatory year	Month									
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Unknown	Total
2002–2003	1				1	4	26	2		34
2003–2004			5	2		13	16		2	38
2004–2005			5	1		15	23	1		45
2005–2006		1	2	7		5	14	1		30
2006–2007					3	13	20			36

[a] Sealing was only required in Unit 19D East and in the remainder of Unit 19D for bears taken between 1 January and 31 May if removed from Unit 19, or if the hide was going to be sold.

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. Box 115526
Juneau, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007[1]

LOCATION

GAME MANAGEMENT UNITS: 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 (we estimate there are 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 the Alaska Department of Fish and Game (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 (Hatler 1967). 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. Information about black bear ecology and population dynamics has helped ADF&G ensure that 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.

[1] At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

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 or 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 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 and free clinics 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 have been summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY06 = 1 Jul 2006 through 30 Jun 2007).

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. 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. Black bears usually den after freeze-up in autumn, and denning habitat can be found within most bear home ranges. 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.

Harvest by Hunters. In Unit 20A the annual black bear harvest was relatively stable during RY01–RY03, averaging 43 bears with a range of 35–48 bears (Table 1). The annual harvest decreased during RY04–RY06, averaging 29 bears with a range of 24–34 bears and 53% males.

In Unit 20B the average annual harvest of black bears during RY01–RY03 was 158 bears with a range of 124–190 bears (Table 1). The annual harvest decreased during RY04–RY06, averaging 134 bears with a range of 120–141 bears and 59% males.

In Unit 20C the average annual harvest of black bears during RY01–RY03 was 26 bears with a range of 18–39 bears (Table 1). The annual harvest was similar during RY04–RY06, averaging 32 bears with a range of 24–41 bears and 54% males.

In Unit 20F the average annual harvest of black bears during RY01–RY03 was 31 bears with a range of 26–36 bears (Table 1). The annual harvest decreased during RY04–RY06, averaging 26 bears with a range of 16–40 bears and 69% males.

In all units, the average annual reported harvest from RY01 through RY03 was 258 bears, compared to an average annual reported harvest of 221 bears during RY04–RY06. The decrease in the 3-year mean harvest may be attributed to the low harvest of 189 in RY05, the lowest annual harvest since RY91 (Table 1). 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 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 4–6% in Unit 20A, 11–18% in Unit 20B, 3–5% in Units 20C, and 4–7% in Unit 20F. The harvest rate in Unit 20B has been sustained at the estimated maximum harvest rate of 12% or higher for 14 of the 18 years from RY89 through RY06. This suggests the estimates of maximum harvest rate or density may be inaccurate, or there is immigration into the area from lightly harvested areas.

To further investigate the possibility that black bears are being overharvested in Unit 20B, we investigated age and skull size when available from RY89 through RY06. During times of overharvest, older and larger animals are expected to become scarcer in populations, thus, we would expect skull size and average age to decrease during overexploitation of a population of black bears. On the contrary, in Unit 20B, skull size remained consistent for males (16.6 inches) and females (15.7 inches) from RY89 to RY06 (Table 2), suggesting that on average, hunters are harvesting adult size bears. Therefore, enough bears were making it to adulthood for a consistent harvest of adult sized bears. Similarly, the age data shows a gradual increase in mean age from RY89 through RY06 (Table 3). The mean age of harvested black bears during the 9-year period from RY89 through RY97 was 4.9. The mean age of harvested bears during RY98 through RY06 was 5.7. Bears were 16% older on average during those last 9 years. This is contrary to the expectation of overharvest.

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.

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–RY06 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 RY91 (Table 4). Since RY91, those numbers have steadily decreased, to an average of 434 hunters registering an average of 664 bait stations during RY04–RY06.

Harvest at Bait Stations. The proportion of the harvest that was taken over bait has increased steadily since RY89. During RY89–RY91, 64% of the black bear harvest occurred at bait stations (Table 4). From RY04 through RY06, the average was 81%.

Hunter Residency and Success. During RY04–RY06, most black bear harvest (76%) was by residents of Alaska, and 72% was by local residents of Unit 20 (Table 5). In RY89 nonresidents took about 5% of the black bears taken in the Fairbanks area. Since then, there has been a steady increase in nonresident harvest, and in RY06 nearly 25% of the black harvest was attributed to nonresident hunters. Because only successful hunters were required to report, we have no data on the typical success rates as reported for other species. However, we do have baiting success, or the number of bears taken over bait compared to the number of bait stations registered. This is the best data we have to monitor take per unit effort (success). During the previous 18 years, there was an increasing trend in baiting success from 32% in RY89 to 43% in RY06. Several potential factors may contribute to baiting success. Those factors may include 1) increasing knowledge and experience of bear baiters through time and baiting clinics, 2) increasing number of guided nonresidents taking bears, and 3) an increasing bear population.

Harvest Chronology. From RY04 through RY06, 87% of the harvest occurred during May and June (Table 6), 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 RY04 through RY06, 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 7).

Defense of Life or Property. During RY04 through RY06, only 4 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 anti-hunting 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 evidence of this, despite the fact that most harvest takes place during May and June (Table 6). 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 RY04–RY06 was 59%, which was above the minimum objective of 55%.

Based on the population estimates for individual units, the average annual harvest rates for RY04–RY06 were below the maximum sustainable exploitation rate of 12% in Units 20A (4–6%), 20C (3–5%), and 20F (4–7%). In Unit 20B the average annual harvest rate was 11–18% of the estimated population during RY04–RY06. The harvest rate in Unit 20B has been sustained at the estimated maximum harvest rate of 12% or higher for 14 of the 18 years from RY89 through RY06. This sustained 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 that are replenished by immigration of bears from populations farther from roads. 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 investigated the theoretical overharvest of Unit 20B black bears through age and skull size analysis, and success rates at bait stations. Average skull size remained consistent, age increased slightly, and baiting success increased. Considering these factors, it is highly unlikely that black bears have been overharvested in Unit 20B during the last 18 years.

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 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, we recommend teeth from harvested black bears continue to be processed to provide age structure data. For the next report, we will change the objective of minimizing bear–human conflicts to “maintain a DLP take of less than 10% of the total bear take in Unit 20B.”

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TABLE 1 Units 20A, 20B, 20C, and 20F black bear harvest[a], regulatory years 1989–1990 through 2006–2007

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1989–1990	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
1990–1991	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	21	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
1991–1992	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 (66%)	58	10	179
1992–1993	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 (64%)	101	1	283
1993–1994	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 (54%)	17	1	38	142 (70%)	61	5	208	162 (68%)	78	6	246

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1994–1995	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 (72%)	81	1	287
1995–1996	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
1996–1997	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
1997–1998	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 (58%)	19	1	46	164 (69%)	73	2	239	190 (67%)	92	3	285
1998–1999	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 (56%)	27	0	61	162 (68%)	77	0	239	196 (65%)	104	0	300

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1999–2000	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%)			
2000–2001	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%)			
2001–2002	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%)			
2002–2003	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%)			
2003–2004	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%)			

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2004–2005	20A	3	7	0	10	9	11	0	20	12	18	0	30
	20B	19	9	0	28	54	60	0	114	73	69	0	142
	20C	3	2	0	5	16	20	0	36	19	22	0	41
	20F	2	0	0	2	10	4	0	14	12	4	0	16
	Total	27	18	0	45	89	95	0	184	116	113	0	229
		(60%)				(48%)				(51%)			
2005–2006	20A	0	3	0	3	15	6	0	21	15	9	0	24
	20B	7	6	0	13	68	39	0	107	75	45	0	120
	20C	0	0	0	0	17	7	0	24	17	7	0	24
	20F	0	4	0	4	12	5	0	17	12	9	0	21
	Total	7	13	0	20	112	57	0	169	119	70	0	189
		(35%)				(66%)				(63%)			
2006–2007	20A	2	2	0	4	18	12	0	30	20	14	0	34
	20B	13	4	0	17	76	47	1	124	89	51	1	141
	20C	0	1	0	1	16	14	0	30	16	15	0	31
	20F	1	1	0	2	28	10	0	38	29	11	0	40
	Total	16	8	0	24	138	83	1	222	154	91	1	246
		(67%)				(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 Unit 20B harvested black bear mean skull size[a] regulatory years 1989–1990 through 2006–2007

Regulatory year	Males	*n*	Females	*n*
1989–1990	16.1	65	15.4	28
1990–1991	16.5	93	15.8	52
1991–1992	16.6	60	15.8	36
1992–1993	16.4	99	15.6	59
1993–1994	16.7	90	15.7	44
1994–1995	16.7	123	15.7	55
1995–1996	16.6	117	15.9	45
1996–1997	16.7	106	15.8	67
1997–1998	16.6	112	15.8	49
1998–1999	16.9	95	15.6	52
1999–2000	16.8	87	15.9	62
2000–2001	16.3	97	15.8	78
2001–2002	16.7	63	15.8	61
2002–2003	16.4	109	15.7	80
2003–2004	16.6	96	15.8	66
2004–2005	16.4	73	15.7	69
2005–2006	16.4	75	15.5	45
2006–2007	16.7	89	15.6	51

[a] Skull size equals total length plus zygomatic width in inches.

TABLE 3 Units 20B harvested black bear mean ages, regulatory years 1989–1990 through 2006–2007

Regulatory year	Mean age	*n*[a]
1989–1990	4.1	85
1990–1991	4.7	152
1991–1992	4.7	94
1992–1993	5.4	140
1993–1994	5.1	122
1994–1995	4.0	14
1995–1996	4.6	147
1996–1997	5.8	77
1997–1998	5.1	149
1998–1999	5.7	129
1999–2000	5.8	136
2000–2001	6.5	28
2001–2002	5.9	73
2002–2003	5.6	157
2003–2004	5.7	131
2004–2005	6.2	112
2005–2006	5.3	108
2006–2007	5.2	32

[a] Age data not available for some bears.

TABLE 4 Units 20A, 20B, 20C, and 20F black bear bait station registration and harvest, regulatory years 1989–1990 through 2006–2007

	Baiting		Harvest			Success
Regulatory year	Hunters registering bait stations	Bait stations	Taken over bait (%)	Not taken[a] over bait (%)	Total harvest[b]	Taken over bait divided by hunters registering bait stations (%)
1989–1990	220	314	71 (51)	67 (49)	138	(32)
1990–1991	450	767	175 (70)	76 (30)	251	(39)
1991–1992	615	1154	118 (66)	62 (34)	180	(19)
1992–1993	542	901	176 (64)	100 (36)	276	(32)
1993–1994	575	899	175 (73)	66 (27)	241	(30)
1994–1995	593	958	221 (79)	59 (21)	280	(37)
1995–1996	596	951	190 (73)	69 (27)	259	(32)
1996–1997	n/a	n/a	197 (63)	116 (37)	313	n/a
1997–1998	544	831	217 (76)	68 (24)	285	(40)
1998–1999	597	863	217 (73)	80 (27)	297	(36)
1999–2000	562	798	224 (81)	51 (19)	275	(40)
2000–2001	550	1083	227 (73)	84 (27)	311	(41)
2001–2002	521	819	156 (71)	63 (29)	219	(30)
2002–2003	558	837	235 (77)	71 (23)	306	(42)
2003–2004	512	768	194 (78)	56 (22)	250	(38)
2004–2005	439	681	170 (76)	54 (24)	224	(39)
2005–2006	399	623	159 (85)	27 (15)	186	(40)
2006–2007	463	687	201 (82)	43 (18)	244	(43)

[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 5 Units 20A, 20B, 20C, and 20F successful hunter residency, regulatory years 1989–1990 through 2006–2007

Regulatory year	Residents			Nonresident	Unk	Total successful hunters[b]
	Local[a] (%)	Nonlocal (%)	Total (%)			
1989–1990	127 (91)	5 (4)	132 (95)	7 (5)	1	140
1990–1991	221 (89)	8 (3)	229 (93)	18 (7)	1	248
1991–1992	133 (76)	30 (17)	163 (93)	12 (7)	0	175
1992–1993	234 (85)	14 (5)	248 (90)	27 (9)	12	287
1993–1994	211 (87)	12 (5)	223 (92)	19 (8)	8	250
1994–1995	258 (91)	10 (4)	268 (94)	16 (6)	6	290
1995–1996	226 (87)	19 (7)	245 (95)	14 (5)	0	259
1996–1997	260 (83)	18 (6)	278 (89)	34 (11)	1	313
1997–1998	238 (84)	16 (6)	254 (89)	30 (11)	1	285
1998–1999	231 (78)	11 (4)	242 (82)	54 (18)	1	297
1999–2000	206 (75)	6 (2)	212 (77)	63 (23)	0	275
2000–2001	235 (76)	11 (4)	246 (79)	65 (21)	0	311
2001–2002	166 (76)	14 (6)	180 (82)	39 (18)	0	219
2002–2003	253 (83)	10 (3)	263 (87)	41 (13)	2	306
2003–2004	199 (80)	18 (7)	217 (87)	32 (13)	1	250
2004–2005	152 (68)	10 (4)	162 (72)	63 (28)	0	225
2005–2006	144 (76)	7 (4)	151 (80)	38 (20)	0	189
2006–2007	176 (72)	8 (3)	184 (76)	59 (24)	0	243

[a] Resident of Unit 20.

[b] Excludes data from DLPs that were not taken as a legal harvest.

TABLE 6 Units 20A, 20B, 20C, and 20F black bear harvest chronology by month, regulatory years 2002–2003 through 2006–2007

Unit	Regulatory year	Harvest chronology by month (%)					
		Jul	Aug	Sep	Oct–Apr	May	Jun
20A	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)
	2004–2005	0 (0)	3 (10)	6 (21)	0 (0)	13 (45)	7 (24)
	2005–2006	0 (0)	0 (0)	3 (13)	0 (0)	12 (50)	9 (38)
	2006–2007	1 (3)	0 (0)	3 (9)	0 (0)	15 (45)	14 (42)
20B	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)
	2004–2005	3 (2)	6 (4)	19 (13)	0 (0)	47 (33)	67 (47)
	2005–2006	3 (3)	1 (1)	9 (8)	0 (0)	35 (29)	72 (60)
	2006–2007	4 (3)	2 (1)	11 (8)	0 (0)	43 (30)	81 (57)
20C	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)
	2004–2005	0 (0)	0 (0)	5 (12)	0 (0)	11 (27)	25 (61)
	2005–2006	0 (0)	0 (0)	0 (0)	0 (0)	6 (25)	18 (75)
	2006–2007	0 (0)	0 (0)	1 (3)	0 (0)	4 (13)	26 (84)
20F	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)
	2004–2005	2 (13)	0 (0)	0 (0)	0 (0)	6 (38)	8 (50)
	2005–2006	2 (10)	0 (0)	2 (10)	0 (0)	3 (14)	14 (67)
	2006–2007	0 (0)	1 (3)	1 (3)	0 (0)	12 (30)	26 (65)
	Total (%)	28 (2)	35 (3)	118 (10)	1 (0)	378 (31)	658 (54)

TABLE 7 Units 20A, 20B, 20C, and 20F black bear harvest by transport method, regulatory years 2002–2003 through 2006–2007

Unit	Regulatory year	Harvest by transport method (%)									*n*
		Airplane	Dog/ Horse	Boat	4-wheeler	Snowmachine	Other ORV	Highway vehicle	Walk	Other/ Unk	
20A	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
	2004–2005	5 (17)	0 (0)	13 (45)	6 (21)	0 (0)	0 (0)	2 (7)	2 (7)	1 (3)	29
	2005–2006	5 (21)	0 (0)	11 (46)	7 (29)	0 (0)	0 (0)	0 (0)	1 4)	0 (0)	24
	2006–2007	10 (29)	0 (0)	16 (47)	4 (12)	0 (0)	0 (0)	3 (9)	0 (0)	1 (3)	34
20B	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
	2004–2005	9 (6)	0 (0)	42 (30)	58 (41)	0 (0)	1 (1)	19 (13)	11 (8)	2 (1)	142
	2005–2006	8 (7)	0 (0)	18 (15)	65 (54)	0 (0)	0 (0)	16 (13)	13 (11)	0 (0)	120
	2006–2007	11 (8)	0 (0)	29 (21)	77 (55)	0 (0)	0 (0)	17 (12)	7 (5)	0 (0)	141
20C	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
	2004–2005	9 (22)	0 (0)	22 (54)	5 (12)	0 (0)	1 (2)	2 (5)	1 (2)	1 (2)	41
	2005–2006	4 (17)	0 (0)	19 (79)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	24
	2006–2007	1 (3)	0 (0)	26 (84)	3 (10)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	31
20F	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
	2004–2005	0 (0)	0 (0)	3 (19)	5 (31)	0 (0)	0 (0)	7 (44)	1 (6)	0 (0)	16
	2005–2006	1 (5)	0 (0)	5 (24)	1 (5)	0 (0)	0 (0)	14 (67)	0 (0)	0 (0)	21
	2006–2007	0 (0)	0 (0)	4 (10)	20 (50)	0 (0)	1 (3)	9 (23)	4 (10)	2 (5)	40

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. Box 115526
Juneau, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007[1]

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., RY06 = 1 July 2006–30 June 2007).

[1] At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

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 RY04–RY06 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 RY04–RY06. 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 first obtain 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 RY04–RY06 ranged from a low of 19 in RY06 to a high of 29 in RY04 (Table 1) and did not exceed the Unit 20D combined harvest objective of 50 bears/year. Mean 3-year annual harvest by hunters was 24 bears/year. Most bears taken were males (70%).

Fifty-six percent of black bears killed by hunters during this report period were taken at bait stations, ranging from a low of 11 in RY06 to a high of 17 in RY05. A 3-year mean of 13 bears/year were taken with bait (Table 1).

Nonhunting Mortality. There were 2 defense of life or property nonhunting mortalities reported in RY04 (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% 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 8 to

18 bears/year. The 3-year mean harvest north of the Tanana River was 13 bears/year. This harvest represented an annual estimated take of 2% of the estimated adult population north of the Tanana River.

Hunter Residency. Most black bears killed in Unit 20D were taken by Alaska residents (Table 3).

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 with 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 2006–2007

Regulatory year	Reported															
	Hunter kill							Nonhunting kill[a]			Estimated kill		Total reported and estimated kill			
	M (%)		F (%)		Unk	Total	Baited	M	F	Unk	Unreported	Illegal	M (%)		F (%)		Unk	Total
1994–1995																		
Fall 1994	3	(100)	0	(0)	0	3	0	0	0	0	0	0	3	(100)	0	(0)	0	3
Spring 1995	6	(55)	5	(46)	0	11	6	0	0	0	0	0	6	(55)	5	(46)	0	11
Total	9	(64)	5	(36)	0	14	6	0	0	0	0	0	9	(64)	5	(36)	0	14
1995–1996																		
Fall 1995	3	(75)	1	(25)	0	4	0	0	0	0	0	0	3	(75)	1	(25)	0	4
Spring 1996	10	(67)	5	(33)	0	15	7	1	0	0	0	0	11	(69)	5	(31)	0	16
Total	13	(68)	6	(32)	0	19	7	1	0	0	0	0	14	(70)	6	(30)	0	20
1996–1997																		
Fall 1996	9	(82)	2	(18)	0	11	0	0	0	0	0	0	9	(82)	2	(18)	0	11
Spring 1997	6	(50)	6	(50)	0	12	8	0	0	0	0	0	6	(50)	6	(50)	0	12
Total	15	(65)	8	(35)	0	23	8	0	0	0	0	0	15	(65)	8	(35)	0	23
1997–1998																		
Fall 1997	8	(73)	3	(27)	0	11	0	1	0	0	0	0	9	(75)	3	(25)	0	12
Spring 1998	17	(94)	1	(6)	1	19	15	1	0	0	0	0	18	(95)	1	(5)	1	20
Total	25	(86)	4	(14)	1	30	15	2	0	0	0	0	27	(84)	4	(13)	1	32
1998–1999																		
Fall 1998	7	(70)	3	(30)	0	10	0	0	0	0	0	0	7	(70)	3	(30)	0	10
Spring 1999	6	(50)	6	(50)	0	12	7	0	0	0	0	0	6	(50)	6	(50)	0	12
Total	13	(59)	9	(41)	0	22	7	0	0	0	0	0	13	(59)	9	(41)	0	22
1999–2000																		
Fall 1999	6	(60)	4	(40)	1	11	0	0	0	1	0	0	6	(60)	4	(40)	2	12
Spring 2000	4	(57)	3	(43)	0	7	4	0	0	0	0	0	4	(57)	3	(43)	0	7
Total	10	(59)	7	(41)	1	18	4	0	0	1	0	0	10	(59)	7	(41)	2	19
2000–2001																		
Fall 2000	14	(64)	8	(36)	0	22	0	1	1	0	0	0	15	(63)	9	(38)	0	24
Spring 2001	8	(53)	7	(47)	0	15	11	0	0	0	0	0	8	(53)	7	(47)	0	15
Total	22	(59)	15	(41)	0	37	11	1	1	0	0	0	23	(59)	16	(41)	0	39
2001–2002																		
Fall 2001	5	(63)	3	(38)	0	8	0	0	0	0	0	0	5	(63)	3	(38)	0	8
Spring 2002	8	(57)	6	(43)	0	14	14	0	0	0	0	0	8	(57)	6	(43)	0	14
Total	13	(59)	9	(41)	0	22	14	0	0	0	0	0	13	(59)	9	(41)	0	22

Regulatory year	Reported																	
	Hunter kill							Nonhunting kill[a]			Estimated kill		Total reported and 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	7	0	0	0	0	0	0	5	(71)	2	(29)	0	7
Spring 2003	9	(53)	8	(47)	0	17	14	0	0	0	0	0	9	(53)	8	(47)	0	17
Total	14	(58)	10	(42)	0	24	14	0	0	0	0	0	14	(58)	10	(42)	0	24
2003–2004																		
Fall 2003	3	(75)	1	(25)	0	4	0	0	0	0	0	0	3	(75)	1	(25)	0	4
Spring 2004	6	(50)	6	(50)	0	12	11	0	0	0	0	0	6	(50)	6	(50)	0	12
Total	9	(56)	7	(44)	0	16	11	0	0	0	0	0	9	(56)	7	(44)	0	16
2004–2005																		
Fall 2004	12	(86)	2	(14)	0	14	0	1	0	1	0	0	13	(87)	2	(13)	1	16
Spring 2005	10	(69)	5	(31)	0	15	12	0	0	0	0	0	10	(69)	5	(31)	0	15
Total	22	(76)	7	(24)	0	29	12	1	0	1	0	0	23	(80)	7	(20)	1	31
2005–2006																		
Fall 2005	1	(50)	1	(50)	0	2	0	0	0	0	0	0	1	(50)	1	(50)	0	2
Spring 2006	15	(71)	6	(29)	0	21	17	0	0	0	0	0	15	(71)	6	(29)	0	21
Total	16	(70)	7	(30)	0	23	17	0	0	0	0	0	16	(70)	7	(30)	0	23
2006–2007																		
Fall 2006	3	(43)	4	(57)	0	7	0	0	0	0	0	0	3	(43)	4	(57)	0	7
Spring 2007	9	(75)	3	(25)	0	12	11	0	0	0	0	0	9	(75)	3	(25)	0	12
Total	12	(63)	7	(37)	0	19	11	0	0	0	0	0	12	(63)	7	(37)	0	19

[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 1994–1995 through 2006–2007

Regulatory year	South of Tanana River		North of Tanana River		Unk	*n*
	n	(%)	*n*	(%)		
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	(61)	7	(39)	1	19
2000–2001	15	(48)	16	(58)	1	32
2001–2002	11	(52)	10	(48)	1	22
2002–2003	9	(38)	15	(63)	0	24
2003–2004	9	(56)	7	(44)	0	16
2004–2005	11	(38)	18	(62)	0	29
2005–2006	9	(39)	14	(61)	0	23
2006–2007	11	(58)	8	(42)	0	19

TABLE 3 Unit 20D black bear successful hunter residency, regulatory years 1994–1995 through 2006–2007

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unk	Total successful hunters
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	(67)	5	(28)	1	(5)	1	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
2004–2005	15	(52)	12	(41)	2	(7)		29
2005–2006	7	(30)	16	(70)	0	(0)		23
2006–2007	11	(58)	8	(42)	0	(0)		19

[a] Local residents are residents of Unit 20D.

TABLE 4 Unit 20D black bear harvest chronology percent by month, regulatory years 1994–1995 through 2006–2007

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
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
2004–2005	0	17	31	0	0	0	24	28	29
2005–2006	0	0	9	0	0	0	48	43	23
2006–2007	11	5	21	0	0	0	26	37	19

TABLE 5 Unit 20D black bear harvest percent by transport method, regulatory years 1994–1995 through 2006–2007

Regulatory year	Harvest percent by transport method										
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Other	Unk	*n*
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
2004–2005	10	0	24	31	0	0	24	0	0	10	29
2005–2006	4	4	13	53	0	0	22	4	0	0	23
2006–2007	11	0	21	31	0	0	16	21	0	0	19

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 P.O. Box 115526
Juneau, AK 99811-5526

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2004
To: 30 June 2007[1]

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 50 years in relation to grizzly bear population trends. Black bear numbers were thought to be highest following federal predator control poisoning efforts during 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 and early 2000s, the black bear population in Unit 20E appeared stable. The highest densities are believed to occur in the hardwood habitats near the community of Chicken and along the Yukon River. Extensive fires in 2004 and 2005 will likely result in improved black bear habitat in the future. Historically, interest in black bear hunting in the unit has been low.

[1] At the discretion of the reporting biologist, this unit report may contain data collected outside the report period.

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 of the most recent 3 years.

METHODS

A recent bear population survey was conducted by the Alaska Department of Fish and Game (ADF&G) within a 2002-mi^2 portion of southern Unit 20E using a DNA-based mark–recapture estimate technique (C. Gardner, ADF&G unpublished data, Fairbanks, 2007). 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. 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. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY06 = 1 Jul 2006–30 Jun 2007).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

During RY04–RY05, no surveys were conducted to determine black bear population size or trend. Survey results from the summer 2006 bear survey are still being evaluated and will be presented during the next report cycle. The 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 black bear population is unknown. Several large fires burned in Unit 20E during summer 2004. The effect of wildfires on black bear population trend is not known.

Distribution and Movements

Black bears inhabit 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. During the spring 2006 meeting, the Alaska Board of Game (board) adopted regulations to allow the sale of black bear hides and skulls, and same day airborne hunting of black bears over bait in active predator control areas, including the Upper Yukon–Tanana Predator Control Area in Unit 20E. Also during the spring 2006 meeting, the board expanded the Upper Yukon–Tanana Predator Control Area to include all of Unit 20E. No emergency orders were issued.

Harvest by Hunters. During RY04–RY06 the annual reported harvest ranged from 7 to 28 black bears ($\bar{x}$ = 15 bears) in Unit 20E (Table 1). A total of 45 black bears, including 35 males were killed during this 3-year period. Males made up 78–86% of the harvest ($\bar{x}$ = 81%) during RY04–RY06, meeting the harvest objective of >55% males for all 3 years combined. The previous 5-year average harvest during RY99–RY03 was 13 bears with annual harvests ranging from 50% to 93% males ($\bar{x}$ = 69%).

Hunter Residency and Success. During RY04–RY06, Alaska residents harvested an average of 93% of the black bears taken in Unit 20E (Table 2). Of these, Unit 20E residents took an average of 36% of the harvest. The previous 5-year average for unit resident harvest was 37%. During RY04–RY06, 3 black bears were killed by nonresidents, 7% of the total harvest. From RY99 through RY03, nonresidents killed no black bears during 2 of the 5 years and only 1 bear each year during the other 3 years. No measure of hunter success was available because unsuccessful hunters were not required to report.

Harvest Chronology. During RY04–RY06, 50–71% ($\bar{x}$ = 58%) of the black bear harvest occurred during July–September, primarily in August (Table 3). During the previous 5 years, 46–84% ($\bar{x}$ = 61%) of the harvest took place in fall (Table 3).

Transport Methods. During RY04–RY06, 4-wheelers (52%) and highway vehicles (34%) were the most common modes of transportation used by successful black bear hunters (Table 4). I expect use of 4-wheelers will continue to be prevalent among Unit 20E black bear hunters because of the difficulty of access into the 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 Wildland Fire Management Plan* (Alaska Wildland Fire Coordinating Group 1998) 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 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 the objective of 55% or more males in the harvest ($\bar{x}$ = 81% males) during RY04–RY06. 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 86% of the successful hunters. Current harvest rate likely has little effect on the status and trend of the population. Males composed 80% of the harvest during the past 3 years and skull size remained relatively constant. For the next report period the objective will be clarified to read "Maintain at least 55% males in the harvest during the report period." I recommend no changes in seasons or bag limits.

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TABLE 1 Unit 20E black bear harvest, regulatory years 1999–2000 through 2006–2007

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
1999–2000														
Fall 1999	4	2	0	6	0	0	0	0	0	0	4 (67)	2 (33)	0	6
Spring 2000	4	1	0	5	0	0	0	0	0	0	4 (80)	1 (20)	0	5
Total	8	3	0	11	0	0	0	0	0	0	8 (73)	3 (27)	0	11
2000–2001														
Fall 2000	6	1	0	7	0	0	0	0	0	0	6 (86)	1 (14)	0	7
Spring 2001	7	0	0	7	2	0	0	0	0	0	7 (100)	0 (0)	0	7
Total	13	1	0	14	2	0	0	0	0	0	13 (93)	1 (7)	0	14
2001–2002														
Fall 2001	3	2	1	6	0	0	0	0	0	0	3 (60)	2 (40)	1	6
Spring 2002	4	3	0	7	0	0	0	0	0	0	4 (57)	3 (43)	0	7
Total	7	5	1	13	0	0	0	0	0	0	7 (58)	5 (42)	1	13
2002–2003														
Fall 2002	8	7	0	15	0	0	0	0	0	0	8 (53)	7 (47)	0	15
Spring 2003	1	2	0	3	0	0	0	0	0	0	1 (33)	2 (67)	0	3
Total	9	9	0	18	0	0	0	0	0	0	9 (50)	9 (50)	0	18
2003–2004														
Fall 2003	3	2	0	5	0	0	0	0	0	0	3 (60)	2 (40)	0	5
Spring 2004	2	0	0	2	0	0	0	0	0	0	2 (100)	0 (0)	0	2
Total	5	2	0	7	0	0	0	0	0	0	5 (71)	2 (29)	0	7
2004–2005														
Fall 2004	10	5	0	15	0	0	0	0	0	0	10 (67)	5 (33)	0	15
Spring 2005	12	1	0	13	7	0	0	0	0	0	12 (92)	1 (8)	0	13
Total	22	6	0	28	7	0	0	0	0	0	22 (79)	6 (21)	0	28
2005–2006														
Fall 2005	4	0	1	5	0	0	0	0	0	0	4 (100)	0 (0)	1	5
Spring 2006	3	2	0	5	4	0	0	0	0	0	3 (60)	2 (40)	0	5
Total	7	2	1	10	4	0	0	0	0	0	7 (78)	2 (22)	1	10
2006–2007														
Fall 2006	4	1	0	5	0	0	0	0	0	0	4 (80)	1 (20)	0	5
Spring 2007	2	0	0	2	0	0	0	0	0	0	2 (100)	0 (0)	0	2
Total	6	1	0	7	0	0	0	0	0	0	6 (86)	1 (14)	0	7

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

TABLE 2 Unit 20E successful black bear hunter residency, regulatory years 1999–2000 through 2006–2007

Regulatory year	Unit resident (%)	Other residents (%)	Nonresident (%)	Total successful hunters
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
2004–2005	11 (39)	15 (54)	2 (7)	28
2005–2006	3 (30)	6 (60)	1 (10)	10
2006–2007	2 (29)	5 (71)	0 (0)	7

TABLE 3 Unit 20E black bear harvest chronology percent by month, regulatory years 1999–2000 through 2006–2007

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
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
2004–2005	7	18	29	0	0	4	21	21	28
2005–2006	0	30	20	0	0	0	10	40	10
2006–2007	0	57	14	0	0	0	14	14	7

TABLE 4 Unit 20E black bear harvest (% harvest) by transport method, regulatory years 1999–2000 through 2006–2007

Regulatory year	Transport method (%)									*n*
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	
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
2004–2005	0 (0)	0 (0)	5 (18)	11 (39)	0 (0)	0 (0)	9 (32)	3 (11)	0 (0)	28
2005–2006	0 (0)	0 (0)	0 (0)	6 (60)	0 (0)	0 (0)	4 (40)	0 (0)	0 (0)	10
2006–2007	0 (0)	0 (0)	0 (0)	4 (57)	0 (0)	0 (0)	2 (29)	1 (14)	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.

Photo by Rich Lowell, ADF&G