Species Management Report ADF&G/DWC/SMR-2014-5

Black Bear Management Report of Survey-Inventory Activities, 1 July 2010–30 June 2013

Patricia Harper and Laura A. McCarthy, editors

2014 Set

Alaska Department of Fish and Game Division of Wildlife Conservation

Species Management Report ADF&G/DWC/SMR-2014-5

Black Bear Management Report of Survey-Inventory Activities, 1 July 2010–30 June 2013

Alaska Department of Fish and Game
Division of Wildlife Conservation
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Juneau, Alaska 99811-5526

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Species management reports provide information about species that are hunted or trapped and management actions, goals, and recommendations for those species. Detailed information is prepared for each species every two or three years, depending on the species, by the area management biologist for game management units in their areas. Reports are not produced for species that are not managed for hunting or trapping or for areas where there is no current or anticipated activity. The individual unit reports are compiled in this statewide report. Unit reports are reviewed and approved for publication by regional management coordinators.

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Cover Photo: A trailcam on Prince of Wales Island captures the image of a female black bear, with red identification ear tags, emerging from her den in spring. The trailcam was used as part of a research project to evaluate black bear habitat use, movements, denning ecology, and resource selection.

BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

Page

Black bear range map ii

Alaska game management regions, units, and subunits map iii

Chapter 1: Unit 1A – Unit 1 south of Lemesurier Point, including drainages into Behm Canal and excluding drainages into Ernest Sound ..... 1-1 through 1-20

Chapter 2: Unit 1B – Southeast Alaska mainland from Cape Fanshaw to Lemesurier Pt… 2-1 through 2-14

Chapter 3: Unit 1C – Southeast Alaska mainland between Cape Fanshaw and the latitude of Eldred Rock, including Berners Bay and Sullivan Island, excluding drainages into Faragut Bay ..... 3-1 through 3-17

Chapter 4: Unit 1D – Southeast Alaska mainland north of Eldred Rock, excluding Sullivan Island and the drainages of Berners Bay ..... 4-1 through 4-16

Chapter 5: Unit 2 – Prince of Wales Island and adjacent islands south of Sumner Strait and west of Kashevarof Passage ..... 5-1 through 5-26

Chapter 6: Unit 3 – Islands of Petersburg, Kake, and Wrangell areas ..... 6-1 through 6-26

Chapter 7: Unit 5 – Cape Fairweather to Icy Bay, eastern Gulf of Alaska coast ..... 7-1 through 7-12

Chapter 8: Unit 6 – Prince William Sound and the northern Gulf of Alaska coast ..... 8-1 through 8-16

Chapter 9: Units 7 and 15 – Kenai Peninsula ..... 9-1 through 9-8

Chapter 10: Unit 11 – Wrangell Mountains ..... 10-1 through 10-7

Chapter 11: Unit 12 – Upper Tanana and White River drainages ..... 11-1 through 11-13

Chapter 12: Unit 13 – Nelchina Basin ..... 12-1 through 12-8

Chapter 13: Unit 14A and 14B — Upper Cook Inlet ..... 13-1 through 13-11

Chapter 14: Unit 14C – Municipality of Anchorage ..... 14-1 through 14-10

Chapter 15: Unit 16 — West side of Cook Inlet ..... 15-1 through 15-12

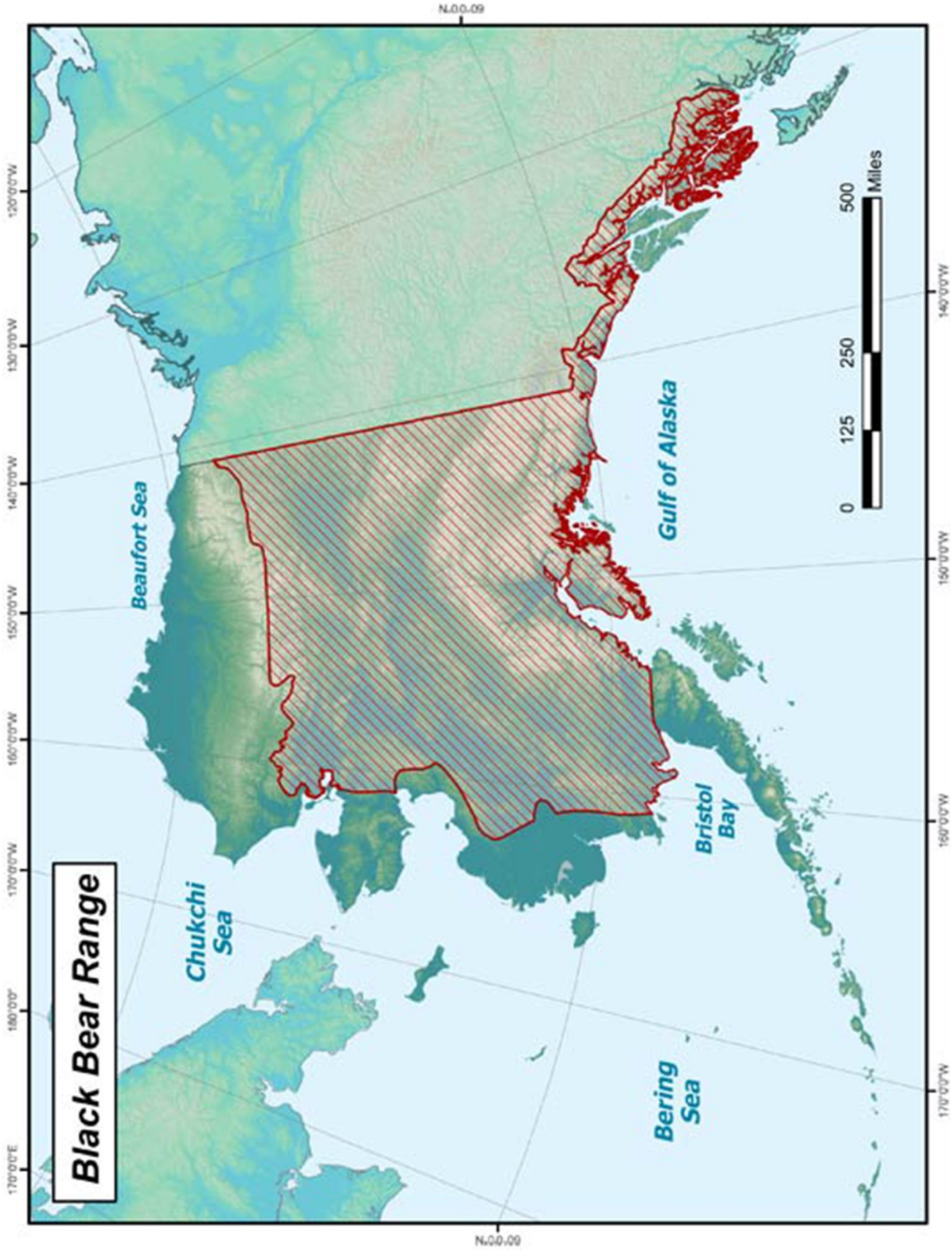
Chapter 16: Unit 17 — Northern Bristol Bay ..... 16-1 through 16-9

Chapter 17: Unit 19, 21A, and 21E — All drainages of the Kuskokwim River upstream from the village of Lower Kalskag; Yukon River drainage from Paimiut upstream to, but not including, the Blackburn Creek drainage; the entire Innoko River drainage; and the Nowitna River drainage upstream from the confluence of the Little Mud and Nowitna Rivers. ..... 17-1 through 17-12

Chapter 18: Units 20A, 20B, 20C, and 20F — Central–Lower Tanana and middle Yukon River drainages ..... 18-1 through 18-15

Chapter 19: Unit 20D — Central Tanana Valley near Delta Junction ..... 19-1 through 19-8

Chapter 20: Unit 20E — 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 ..... 20-1 through 20-9


Black Bear Range
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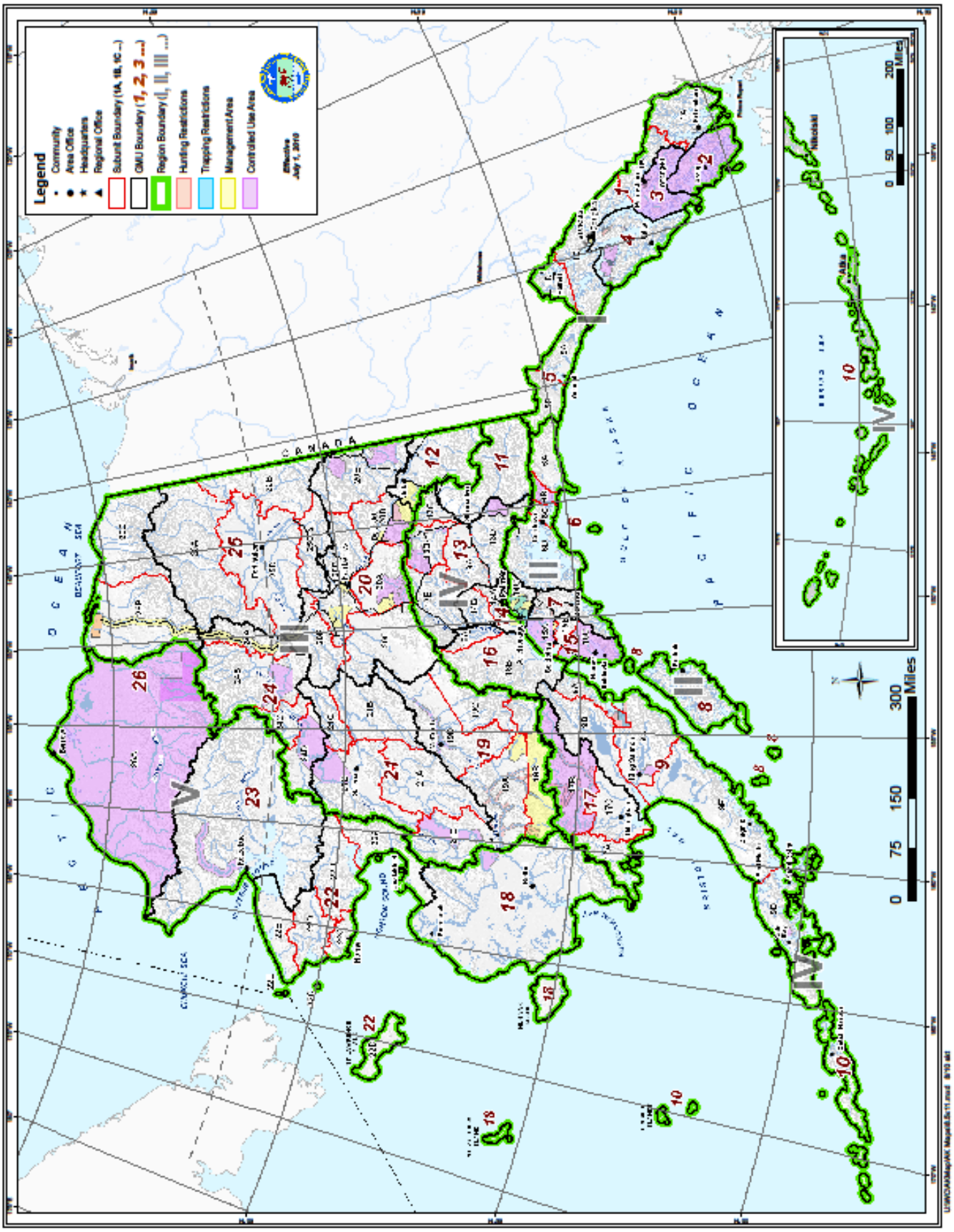
Legend
Community
Area Office
Headquarters
Regional Office
Subunit Boundary (1A, 1B, 1C ...)
GMU Boundary (1, 2, 3 ...)
Region Boundary (I, II, III ...)
Hunting Restrictions
Trapping Restrictions
Management Area
Controlled Use Area
Effective July 1, 2010
CANADA
PACIFIC OCEAN
Miles
0 75 150 300
0 50 100 200
Nikolski
Atka

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JUNEAU, AK 99811-5526

CHAPTER 1: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: Unit 1A (5,300 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 succession 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 1,600 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 refuge from harvest near the city, allowing the bear population to sustain high densities in this area. At the same time, the high human density in the area and differing attitudes toward responsible garbage handling results in 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. From sealing we gather information about successful hunts and collect biological data from hunter's bears. Until 2009, hunters have not been required to obtain a hunt registration permit or harvest report for black bears; thus, effort data for unsuccessful hunters has been unavailable. The Board of Game (BOG) passed a proposal at its 2008 meeting that requires all black bear hunters to obtain a harvest ticket and associated harvest report prior to hunting. Harvest reports will provide the department with effort data from successful, as well as unsuccessful hunters. Up until now, we have only been able to collect information on hunt effort for successful hunters from sealing data. Information from all hunters should shed additional light on the state of bear populations. We can also use hunter contact information from the reports to survey hunters about other aspects of bear hunting. As was expected, the first few years of this new regulation have been a huge learning curve for hunters. Compliance during this reporting period (RY2010-2012) has been spotty and harvest ticket data has not always aligned with bear sealing data. As hunters and license vendors get used to this new regulation, compliance will improve and we should begin collecting meaningful data during the next reporting period.

Seasons and bag limits.

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 and resident bag limits were the same until 1990, when the nonresident limit was reduced to 1 bear per year. There has been a major change in the bear hunting regulations in Southeast Alaska (Units 1–3) during this reporting period. Beginning with RY2012, all unguided nonresidents are required to draw a tag. The Unit 1A draw hunt for unguided nonresidents (DL 016) runs 1 September to 30 June. The Department issued 75 tags, respectively for RY2012, 2013 and 2014. This reduced hunting opportunity for unguided nonresidents is reflected in the lower recent harvest totals (Table 1). Black bear seasons and bag limits remain unchanged for Alaska residents and nonresidents accompanied by a registered guide.

Baiting

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. This was a compromise for hunters at a time when bear baiting faced opposition across the state. The salvage rule and bear baiting in general continue to be contentious issues, with proposals for and against these regulations coming before the BOG each cycle.

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 this reporting period an average of 73 bears were harvested each year with a range of 57–85 (Table 1). The reduced harvest of RY2012 is a direct result of the new draw hunt that limited unguided nonresident hunters.

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 pattern of nonresident harvest remained steady through 2007 and has been declining since with a low of 32% in RY2012 (Table 2). 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 to a bear immediately after it is harvested. The costs of hunting for nonresidents, including a nonresident big game hunting license ($85), nonresident big game locking tag ($225–$300), and expensive transportation, do not seem to limit the interest of nonresident hunters who pursue black bears in Unit 1A. However, starting in RY2012 nonresidents are limited by the number of draw tags the department makes available each year.

Boats historically have been the favored mode of transport by Unit 1A bear hunters, with highway vehicles 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 before harvesting a bear. Consequently, approximately 74% of the Unit 1A annual bear harvest occurs during spring (April–June) (Table 3).

Prior to the recent drawing permit requirement fluctuations in annual harvest were more linked to human activity (such as logging and associated road building) and weather during hunting seasons than to changes in bear abundance. The harvest increase in the 1990s may have been linked to an increase in hunting effort by residents and nonresidents alike and may also have been associated with renewed logging in some areas. Logging activity not only opens up more areas to hunting by providing good access, it also brings 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 this reporting period, vehicles accounted for only 14% of the hunter transport, though this is slightly higher than the 10–year average of 8% (Table 4).

Some logging roads historically open to hunters are being closed as part of an 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 (USDA 2009). Many of the roads being closed are not connected to Ketchikan's main road system and require the use of a boat to access them before offloading a truck or 4-wheeler to drive to the hunting area.

By state regulation, starting in 1996, the edible meat from spring black bears must be salvaged for human consumption, but the meat from fall bears does not require salvaging. Many hunters

find meat from spring bears very palatable, whereas hunters rarely consider fall bears taken in Southeast Alaska edible because of the salmon component in the bears' diet.

Historical harvest locations

Hunters harvest bears throughout the unit, although the highest harvests continue to come from Wildlife Analysis Areas (WAAs) 406 (Carroll Inlet), 407 (George Inlet and the Ward Cove–Harriet Hunt Lake road), and 510 (northwest Revilla Island). On the mainland, WAA 822 (Boca De Quadra) also contributes 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. Most defense of life or property (DLP) and reported vehicle collisions occur in WAA 408 along the Ketchikan road system (Table 6).

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 Wildlife Troopers (AWT) 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 in recent years.

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 to track and cite offenders and to make it usable between multiple agencies. This has helped 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.

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 appropriate 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 other 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. A 3:1 sex ratio in favor of more males in the harvest has been suggested to be a sustainable yield from a healthy bear population (Bunnell and Tait 1980).

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 (Montana) for age determination.

Harvest data are organized by regulatory year (RY). A regulatory year runs from 1 July through 30 June (e.g., RY10 = 1 July 2010–30 June 2013).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Information obtained during sealing cannot be used directly to measure population trends. Although 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. Black bear research along the southern Southeast mainland and associated islands is needed to identify population parameters, so that we might better assess population trends and current bear 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 (1995) calculated a slightly higher density of 1.5 bears/mi^2 for most of the forested islands and mainland, and lower densities for the mainland and unproductive island habitats.

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. Managers are optimistic that with the new drawing hunt in place for unguided nonresidents, hunters will place more value on black bear hunting opportunities and focus on larger, more mature bears.

Distribution and Movements

Black bears are thought to be more numerous on the islands of Unit 1A than on the mainland, however, population estimates for Unit 1A black bears are not available.

Black colored pelage is most common and occurs throughout the bears' range. The cinnamon color phase occurs 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 white pelage, have been reported in extreme southern mainland portions of the unit along the Portland Canal but to date none have been harvested.

MORTALITY

Harvest

Season	Bag limit
1 September–30 June	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 September–30 June	Nonresident hunters using registered guides: 1 bear
1 September–30 June (DL016)	Nonresident hunters not using registered guides: 1 bear by drawing permit only.

Game Board Action and Emergency Orders: At the 2010 meeting, in response to unsustainable black bear harvests in some parts of Southeast Alaska the BOG established draw hunts for all nonresident black bear hunters not using registered guides. The justification for these hunts can

be found in Board of Game Direction on Black Bear Guide Allocations and Harvests in Southeast Alaska (ADFG 2011).

We issued no emergency orders affecting black bears in Unit 1A during this report period.

Hunter harvest. Hunters harvested 78, 85, and 57 bears during 2010, 2011, and 2012 seasons respectively. The most recent 3-year average ($\bar{x}$ = 73 bears) was slightly lower than the previous 7-year average ($\bar{x}$ = 79 bears) and lower than the previous 3-year reporting period (RY2007–2009) average of 88 bears (Table 1).

Miller (1990) suggested it would be more important to monitor the number of females in the harvest rather 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 81% of the harvest has been male bears. The 3-year average male harvest for this reporting period is 82% (Table 1).

The average male skull size during this report period was 17.9 inches. We continue to meet our management objective of 17.5-inch average for male bears during the spring harvest. The skull size data for all seasons shows only a slight variation between yearly and spring-only male skull size. Female skull size average for this reporting period was 16.2 inches and has remained virtually identical to the previous 7-year average of 16.1 inches (range 15.8 inches–16.6 inches) (Table 5).

The annual average number of successful hunters during this report period (73) was slightly lower than the previous 7-year average of 79 (range 48–102). The number of successful hunters in 2006 (102) is the historic record. The following season, 2007 holds the record for hunter days with 276. Days in the field per successful hunter during this reporting period has remained stable for the past 10 years (range 2.3–2.6) (Table 5).

Hunter residency and success. The nonresident harvest of black bears in Unit 1A has varied historically but the current 10-year trend is that non-residents harvest on average, 44% of the bears in the unit (Bethune 2011). During the 2010, 2011 and 2012 seasons, 38%, 35% and 32% respectfully, of successful hunters were nonresidents. Managers believe this downward trend in nonresident harvest could be linked to the draw hunt implementation and the increased interest in hunting the adjacent Prince of Wales Island bears. Alaska residents not living in Unit 1A (nonlocal) historically harvest only approximately 5% of the bears in this area. During this report period, nonlocal residents harvested just 7% of Unit 1A bears. However, 2011 did have the highest nonlocal harvest of the past decade, with 10 nonlocal hunters accounting for 12% of the harvest (Table 2).

Harvest chronology during report period. Unit 1A bears are most visible and accessible during the spring, when they are on the beaches feeding on sedges and grasses. The hides are also most prime during this same period. During this report period, May continued to be the most popular month for Unit 1A harvest (44%), followed by June (26%) and September (24%). The May trend during the past 3 years is down slightly from the previous 7-year average of 52% (Table 3).

Bait stations. Bear baiting has never been popular in Unit 1A. Only 2–5 bait permits are issued annually and bears are just sporadically harvested using this method. During the 3 years of this report period only 6 bears were reported killed in Unit 1A using bait (Table 1).

Hunting with dogs. Hunting bears with dogs in Unit 1A requires a permit. Hunting with dogs 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 as popular in Unit 1A as in some other nearby Units such as 2 and 3, but most that are conducted are sold as part of combination or add on hunts. Only 4 guides operated black bear hunts in Unit 1A during this reporting period. During the past 3 years, guides have conducted an average of 6 successful hunts (range 5–8) in Unit 1A. The 10-year average is also 6 guided bears per year (ADFG WinfoNet). The highest harvest by guided hunters on record for Unit 1A was during the 1999 and 2002 seasons, when 14 guided clients took bears during each of these years.

Transport methods. Boats continue to be the most popular mode of transportation used by all types of bear hunters in Unit 1A. During this reporting period 78% of successful hunters used boats to access hunting areas in Unit 1A. This is the lowest percentage of hunters using a boat to black bear hunt for the past decade. The use of highway vehicles in 2011 and 2012 (12% and 26% respectively) were some of the highest uses of highway vehicles on record (Table 4). The high use of vehicles in 2012 is likely an effect of the draw hunt. With fewer nonresidents hunting the unit a higher percentage of locals harvested bears in the Unit (Table 2).

Other mortality

Wounding loss. Wounding loss may be a significant source of mortality for Unit 1A 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 additional bears while hunting but were unable to determine if they hit the animal. Nonresident hunters probably wound more animals than residents because of unfamiliarity with local conditions and vegetation, distance, and bear behavior. Based on reports from hunters, guides and collared bears in Unit 2 (Porter and Bethune unpublished), managers estimate wounding losses up to 25%.

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 was removed in 2006 and 2007. Additional state land units are in the planning phase in the center of Gravina Island and will be clear cut by end of 2017. The Forest Service has prepared several timber sales targeting most of the remaining large timber on the central and northern portions of Gravina Island. However, most of the remaining Federal timber sales are

included in the new Federal road less areas and consequently will not be cut unless exceptions are made through congress for individual timber sales. Collectively, these timber sales target some of the most important (to black bear and deer) old-growth areas. With better access due to road building we anticipate more hunters and consequently an increase in black bear harvest.

During this reporting period, large timber operations have been conducted on Sealaska Corporation land on the Cleveland Peninsula, resulting in the loss of important habitat for black bears, deer and mountain goats. These clearcut logging operations are currently on-going and will finish late 2015.

Second-growth stands at many previously logged Revilla Island sites are now reaching the closed canopy stem-exclusion stage, and we expect forest productivity to decline and result in lower bear densities. New clearcut areas will provide abundant forage for black bears resulting in more bears in the next 10–20 years. After that period we expect bear numbers to decline as forest regrowth reaches the stem exclusion stage.

Enhancement

No habitat enhancement projects specifically meant 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 even with precommercial thinning will eventually be detrimental to black bear populations.

NONREGULATORY MANAGEMENT PROBLEMS AND NEEDS

Non-hunting issues. Margaret Creek, located on Revilla Island approximately 20 miles north of Ketchikan, is a contentious area. There is an improved U.S. Forest Service trail leading to an existing fish weir and recently improved view platform, providing 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 in past years. Signs are now posted and a Forest Supervisor's order closed the immediate area around the bear viewing platform and access trail to the discharge of firearms. At the 2010 Board of Game meeting following extensive public discussion regarding bear viewing and appropriate buffer zones near this established bear-viewing site, bear hunting regulations were changed. Starting in September 2010, it became illegal to hunt bears one quarter mile either side of Margaret Creek from salt water upstream to Margaret Lake. This now provides a buffer between bear viewers and bear hunters and seems to have reduced user conflict.

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 who escorts tourists from the dock to the viewing site.

Urban bear management activities. Household garbage, bird feeders, pet foods, and small livestock such as chickens continue to attract bears to urban locations. We are working with the police departments, city managers, and AWT to provide educational material on how to reduce bear encounters by residents of Unit 1A. Combined, AWT, Ketchikan Police Department, and the Ketchikan ADF&G office currently receive 200–500 calls annually (down from 800–1000 calls previously) 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 and this seems to be helping in some areas. 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 near town were either captured and relocated or killed. Prior to that dump closure an average of 2–8 bears per year were killed each year in Ketchikan. Since 1997, an average of 10 bears (range 5–20) have been killed annually. Residents continue to provide opportunities for bears to access human foods and are currently 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 frustrated local residents. A total of 11 bears were killed under DLP/nuisance situations across the entire unit during this report period, which is similar to the last report period when 13 were listed as DLP/nuisance bear kills (Table 1). We continue to educate the public about proper garbage handling to prevent bears from becoming food conditioned and reduce the public safety issues and needless killing of bears.

CONCLUSIONS AND RECOMMENDATIONS

Black bears are an important big game species in Southeast Alaska, and the Unit 1A harvest continues to be important for both residents and nonresidents.

The 2012 season saw a reduction in the black bear harvest due to the new unguided nonresident draw hunt (DL016). This is likely indicative of future harvests until mangers believe there are additional surpluses of bears and can increase the number of permits. When the draw hunt was implemented, managers were concerned about unsustainable harvests on nearby Prince of Wales Island. Units 1 and 3 were included in the draw partially due to fears that if those units were left as a general hunt there would be a significant shift in hunter effort to these neighboring units. Unit 1A was historically not as popular a black bear hunt area as nearby Unit 2. Consequently, leftover Unit 1A permits have been available on a first come, first served basis over-the-counter for those hunters who did not draw Unit 2 and are still looking for alternative black bear hunting opportunities in Southeast Alaska.

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.

As local bear viewing interest continues to grow with commercial tourism, we will undoubtedly be faced with allocation issues related to both human safety and bear preservation, requiring

compromise by hunters and wildlife watchers. Urban bears continue to occupy staff time, although we are making some headway in this arena, and public education efforts continue. The only effective way to address this issue is to involve city decision makers so the responsibility of managing bear attractants is placed on each member of the community.

As logging continues and large tracts of previously logged habitat rapidly convert to second growth forest, hunters will lose the visibility to locate bears in these areas that previously allowed successful spot and stalk hunting for black bears. We also anticipate reductions in Unit 1A bear numbers due to habitat changes, and consequently we expect fewer bears available for harvest. Research is needed to better identify and understand the life history and demographics of Unit 1A black bears.

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Table 1. Unit 1A black bear harvest, RY2003–2012.

Regulatory year	Reported									Total estimated kill[c]					
	Hunter kill					Nonhunting kill[a]									
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	M	(%)	F	(%)	Unk	Total
2003															
Fall 2003	6	8	0	14	0	2	0	0	2	8	(50)	8	(50)	0	16
Spring 2004	32	8	0	40	1	1	0	0	1	33	(80)	8	(20)	0	41
Total	38	16	0	54	1	3	0	0	3	41	(72)	16	(28)	0	57
2004															
Fall 2004	12	7	0	19	0	1	1	0	1	13	(62)	8	(38)	0	21
Spring 2005	24	5	0	29	1	2	0	0	2	26	(84)	5	(16)	0	31
Total	36	13	0	48	1	3	1	0	4	39	(75)	13	(25)	0	52
2005															
Fall 2005	13	13	0	26	0	2	0	0	2	15	(54)	13	(46)	0	28
Spring 2006	53	8	0	61	0	1	1	0	2	54	(89)	9	(11)	0	63
Total	66	21	0	87	0	3	1	0	4	69	(76)	22	(24)	0	91
2006															
Fall 2006	17	8	0	25	0	0	1	0	1	17	(65)	9	(35)	0	26
Spring 2007	70	7	0	77	0	0	1	0	1	70	(90)	8	(10)	0	78
Total	87	15	0	102	0	0	2	0	2	87	(84)	17	(16)	0	104
2007															
Fall 2007	18	8	0	26	0	6	2	0	8	24	(71)	10	(29)	0	34
Spring 2008	61	14	0	75	1	0	0	0	0	61	(81)	14	(19)	0	75
Total	79	22	0	101	1	6	2	0	8	85	(78)	24	(22)	0	109
2008															
Fall 2008	16	5	0	21	0	2	1	0	3	18	(75)	6	(25)	0	24
Spring 2009	59	5	0	64	0	1	0	0	1	60	(92)	5	(8)	0	65
Total	75	10	0	85	0	3	1	0	4	78	(88)	11	(12)	0	89

Table continues next page

Table 1. continued.

Regulatory year	Reported													
	Hunter kill					Nonhunting kill[a]				Total estimated kill[c]				
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	M	(%)	F	(%)	Unk	Total
2009															
Fall 2009	12	6	0	18	0	0	0	0	0	12	(67)	6	(33)	0	18
Spring 2010	52	7	0	59	0	1	0	0	1	53	(88)	7	(12)	0	60
Total	64	13	0	77	0	1	0	0	1	65	(83)	13	(17)	0	78
2010															
Fall 2010	17	6	0	23	0	0	0	0	0	17	(74)	6	(26)	0	23
Spring 2011	49	6	0	55	1	0	0	0	0	49	(89)	6	(11)	0	55
Total	66	12	0	78	1	0	0	0	0	66	(85)	12	(15)	0	78
2011															
Fall 2011	14	5	0	19	0	0	5	0	5	14	(58)	10	(42)	0	24
Spring 2012	54	12	0	66	4	1	0	0	1	55	(82)	12	(18)	0	67
Total	68	17	0	85	4	1	5	0	6	69	(76)	22	(24)	0	91
2012															
Fall 2012	11	4	2	17	0	3	2	0	5	14	(64)	6	(36)	2	22
Spring 2013	35	5	0	40	1	0	0	0	0	35	(88)	5	(12)	0	40
Total	46	9	2	57	1	3	2	0	5	49	(79)	11	(18)	2	62

[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 total

Table 2. Unit 1A residency of successful black bear hunters, RY2003–2012.

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total
2003	24	(45)	4	(7)	26	(48)	54
2004	21	(44)	3	(6)	24	(50)	48
2005	41	(47)	1	(1)	45	(52)	87
2006	51	(50)	3	(3)	48	(47)	102
2007	43	(43)	4	(4)	54	(53)	101
2008	44	(52)	7	(8)	34	(40)	85
2009	42	(55)	1	(1)	34	(44)	77
2010	46	(59)	2	(3)	30	(38)	78
2011	45	(53)	10	(12)	30	(35)	85
2012	36	(63)	3	(5)	18	(32)	57
Average	39	(51)	4	(5)	34	(44)	77

[a] Local hunters are those hunters that reside in Unit 1A.

Table 3. Unit 1A black bear hunter harvest chronology by month[a], RY2003–2012.

Regulatory year	Harvest periods												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
2003	13	(24)	1	(2)	0	(0)	1	(2)	30	(55)	9	(17)	54
2004	16	(33)	3	(6)	0	(0)	1	(2)	23	(48)	5	(11)	48
2005	23	(26)	3	(4)	0	(0)	2	(2)	39	(45)	20	(23)	87
2006	22	(21)	2	(2)	1	(1)	1	(1)	56	(55)	20	(20)	102
2007	23	(23)	1	(1)	2[b]	(2)	3	(3)	55	(54)	17	(17)	101
2008	20	(24)	1	(1)	0	(0)	6	(7)	42	(49)	16	(19)	85
2009	16	(20)	2	(3)	0	(0)	2	(3)	44	(57)	13	(17)	77
2010	20	(25)	3	(4)	0	(0)	4	(5)	35	(45)	16	(21)	78
2011	18	(21)	1	(1)	0	(0)	1	(1)	36	(43)	29	(34)	85
2012	14	(24)	2	(3)	1	(2)	1	(2)	26	(46)	13	(23)	57
Average	19	(24)	2	(2)	0	(0)	2	(2)	39	(51)	16	(21)	77

[a] Does not include bears killed during closed season.
[b]Includes one December kill.

Table 4. Unit 1A transportation methods use in harvesting black bears, RY2003–2012.

	Transport												
Regulatory year	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	ORV	(%)	Unk	(%)	*n*
2003	2	(4)	48	(88)	2	(4)	1	(2)	1	(2)	0	(0)	54
2004	1	(2)	45	(94)	2	(4)	0	(0)	0	(0)	0	(0)	48
2005	0	(0)	81	(93)	5	(6)	1	(1)	0	(0)	0	(0)	87
2006	1	(1)	89	(87)	4	(4)	4	(4)	4	(4)	0	(0)	102
2007	0	(0)	88	(87)	7	(7)	4	(4)	1	(1)	1	(1)	101
2008	0	(0)	81	(96)	2	(2)	2	(2)	0	(0)	0	(0)	85
2009	3	(4)	63	(81)	7	(9)	2	(3)	2	(3)	0	(0)	77
2010	1	(1)	67	(86)	6	(8)	3	(4)	1	(1)	0	(0)	78
2011	2	(2)	64	(76)	10	(12)	5	(6)	2	(2)	2	(2)	85
2012	0	(0)	40	(70)	15	(26)	0	(0)	2	(4)	0	(0)	57
Average	1	(1)	67	(87)	6	(8)	2	(3)	1	(1)	0	(0)	77

Table 5. Unit 1A successful black bear hunter effort, mean skull size, and mean age, RY2003–2012

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[c]	Male	n[c]	Female	n[c]
2003											
Fall 2003	32	14	2.3	18.4	6	16.2	8	9.0	6	6.0	6
Spring 2004	108	40	2.7	18.3	32	15.8	8	9.9	32	5.5	8
Total/Average	140	54	2.6	$\bar{x}$ =18.4	38	$\bar{x}$ =16.0	16	$\bar{x}$ =9.8	38	$\bar{x}$ =5.7	14
2004											
Fall 2004	57	19	3.0	18.7	12	15.6	8	8.5	10	5.1	7
Spring 2005	69	29	2.4	18.9	23	16.2	5	11.5	24	11.3	4
Total/Average	126	48	2.6	$\bar{x}$ =18.8	35	$\bar{x}$ =15.8	13	$\bar{x}$ =10.6	34	$\bar{x}$ =7.4	11
2005											
Fall 2005	46	26	1.8	17.4	12	15.7	13	7.5	13	7.9	13
Spring 2006	161	61	2.6	18.7	52	16.5	8	10.3	51	11.1	8
Total/Average	207	87	2.4	$\bar{x}$ =18.5	64	$\bar{x}$ =16.0	21	$\bar{x}$ =9.7	64	$\bar{x}$ =9.1	21
2006											
Fall 2006	50	25	2.0	16.9	17	15.8	8	7.2	17	9.7	7
Spring 2007	197	77	2.6	18.5	68	16.7	7	10.8	68	15.3	6
Total/Average	247	102	2.4	$\bar{x}$ =18.2	85	$\bar{x}$ =16.2	15	$\bar{x}$ =10.1	85	$\bar{x}$ =12.3	13
2007											
Fall 2007	48	26	1.8	17.5	19	16.1	8	7.2	17	12.1	8
Spring 2008	228	75	3.0	18.1	60	16.4	14	9.9	58	12.4	14
Total/Average	276	101	2.7	$\bar{x}$ =18.0	79	$\bar{x}$ =16.3	22	$\bar{x}$ =9.3	75	$\bar{x}$ =12.3	22
2008											
Fall 2008	58	21	2.8	17.2	16	16.1	5	7.8	15	7.8	4
Spring 2009	151	64	2.4	18.1	58	16.2	5	8.1	58	12.2	5
Total/Average	209	85	2.5	$\bar{x}$ =17.9	74	$\bar{x}$ =16.1	10	$\bar{x}$ =8.0	73	$\bar{x}$ =10.2	9

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[c]	Average age (years)[b]: Male	n[c]	Average age (years)[b]: Female	n[c]
2009											
Fall 2009	46	18	2.6	17.2	12	16.0	6	7.3	12	8.0	6
Spring 2009	150	59	2.5	18.1	52	15.8	7	10.9	51	14.3	7
Total/Average	196	77	2.5	$\bar{x}$ =17.9	64	$\bar{x}$ =15.9	13	$\bar{x}$ =10.2	63	$\bar{x}$ =11.4	13
2010											
Fall 2010	42	23	1.8	17.0	16	16.1	6	7.0	16	11.8	5
Spring 2011	140	55	2.5	17.9	48	15.9	5	8.9	46	10.4	5
Total/Average	182	78	2.3	$\bar{x}$ =17.7	64	$\bar{x}$ =16.0	11	$\bar{x}$ =8.4	62	$\bar{x}$ =11.1	10
2011											
Fall 2011	37	19	1.9	17.2	14	15.6	5	6.7	14	8.6	5
Spring 2012	178	65	2.7	18.1	52	16.5	11	9.7	49	9.9	11
Total/Average	215	84	2.6	$\bar{x}$ =17.9	66	$\bar{x}$ =16.2	16	$\bar{x}$ =9.0	63	$\bar{x}$ =9.5	16
2012											
Fall 2012	26	17	1.5	17.6	11	16.5	4	--	--	--	--
Spring 2013	112	40	2.8	18.1	33	16.7	5	--	--	--	--
Total/Average	138	57	2.4	$\bar{x}$ =18.0	44	$\bar{x}$ =16.6	9	--	--	--	--

[a] Skull sizes equal length plus zygomatic width.

[b] Bear ages for 2012 not available, results still pending from lab at time of printing.

[c] *n* represents sample size. Totals included may not equal other tables due to damaged skulls or missing teeth at sealing.

Table 6. Unit 1A black bear harvest by Wildlife Analysis Area (WAA), RY2003–2012

WAA	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
0101	1	2	1	2	4	5	2	6	7	6
0303					1					
0404	2	1	2	5	8	3	3			2
0405	1	1		3	1	3	5	1		1
0406	8	9	18	24	20	17	18	23	18	11
0407	8	7	12	13	9	6	8	15	17	19
0408				3	2		1	1	2	
0509	4	4	7	3	4	6	4	3	6	2
0510	13	8	25	10	29	12	11	14	17	9
0511	1	1			1				2	
0612		1				1				
0613	1	1	1	2	5	6	3		3	1
0614	1			1						
0715	1		2	5	2	4	3	2	4	
0716		1	3	1	1	2	1		1	2
0717				1	1	1	1	1	2	
0718										
0719	1			1	1		1		1	
0820	4	3	2	2	1	1	1	1	1	
0822	2	7	12	20	8	12	9	4	2	1
0823	3		1					2		3
0824	1	2	1	6	2	5	2	4		
0825	2				1			1		
0826		1			1		3			

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CHAPTER 2: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: Unit 1B (3,000 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 3,000 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 post logging with canopy closure, and second-growth forests provide little habitat for bears. Pre-commercial 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. Prior to 2009, hunters were not required to obtain a hunt registration permit or harvest ticket for black bear; thus, effort data for unsuccessful hunters had previously been unavailable and information on hunt effort was available only for successful hunters. At its Region I meeting in November 2008 the Board of Game passed a regulation requiring black bear hunters in Units 1–7, 11–17, 19D and 20 to obtain a black bear harvest ticket prior to hunting.

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 one has requested a permit to hunt bears with dogs in 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.

Because it was concerned about wounding loss, the Board of Game at its Region I meeting in November 2004 passed a regulation requiring a wounded black or brown bear to count against the bag limit of the hunter for the regulatory year.

Historical harvest patterns

Because of difficult access to most areas and a low human population, the annual harvest in the unit has remained relatively stable at low levels, averaging 8 bears per year from 1973 to 1979, 15 bears per year in the 1980s, 17 bears per year in the 1990s and 17 bears per year from 2000 to 2009. The 30 bears killed during the 2001–2002 regulatory year represent the highest recorded annual harvest. Although 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

From 1973 to 2009 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 for 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 we 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. 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. Although 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 1,230 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 small proportion of bears taken by hunters from the Farragut Bay, Stikine River, and Eastern Passage areas have cinnamon pelage. Although there have been a few unverified reports of glacier bear sightings in the unit, no glacier bears have been noted in the harvest. No Kermode 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 studies conducted 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

RY 2011

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

RY 2012

Season	Bag Limit

1 September–30 June	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 September–30 June	Bag Limit Nonresident hunters with guide: 1 bear
1 September–30 June	Bag Limit Nonresident hunters without guide: 1 bear by drawing permit only (DL017)

Board of Game Action and Emergency Orders. Recent declines in harvests, following a long-term trend of increasing harvests, raised department concerns about whether black bear harvests were being managed at sustainable levels in Southeast Alaska. This, along with concerns expressed by agency biologists, big game guides, hunters, and members of the general public about what appeared to be fewer bears in parts of the region, prompted the department and others to seek regulatory action at the Alaska Board of Game meeting in November 2010 on black bear harvests. At the meeting, the board adopted a proposal submitted by the Alaska Professional Hunters Association (APHA) requiring non-resident black bear hunters who do not enlist the services of a registered hunting guide to obtain a drawing permit before hunting black bears in Units 1–3. APHA's contention was that whereas the guides were held to a limited number of hunts by the United States Forest Service, no such limit on hunter effort existed for independent unguided nonresident hunters and those enlisting the services of transporters or outfitters.

During testimony on APHA's proposal, the board asked the department to provide estimates of bear numbers and densities for specific geographical areas that were believed to constitute discrete black bear management areas. In response, the department identified 10 discrete management areas in Units 1–3, and provided estimates of bear numbers and densities within each bear management area.

After reviewing population and density data, the board asked the department to use regulatory years 2007–2009 as base years for analyzing black bear harvest data. Using the mean annual black bear harvests by residents, and guided and unguided nonresident hunters during regulatory years 2007–2009, the department allocated harvests between guided and unguided nonresident hunters and established the numbers of unguided nonresident draw permits to be made available within each of the 10 established geographic bear management areas. Of the 10 established bear management areas, 6 are located in Unit 1, and 1 encompasses subunit 1B.

As a result of the board's action, starting in RY12 non-resident black bear hunters who do not employ the services of a registered guide are required to possess a drawing permit prior to hunting black bears in Units 1–3. By adjusting the numbers of drawing permits issued, the department now has the ability to control the numbers of bears taken by unguided nonresident hunters. At the same time, registered guides are expected to limit their harvests of black bears, to the mean annual harvests they experienced during regulatory years 2007–2009. In addition, guides are also expected to limit their harvests geographically, based on the distribution of their previous harvests within the 10 individual black bear management areas during the regulatory 2007–2009 base years.

Implementation of the new regulation was delayed until the start of RY 2012, in order to afford hunters and guides with preexisting hunt arrangements enough time to adjust to and comply with the new regulation.

We issued no emergency orders during this report period.

Hunter Harvest. The Unit 1B black bear harvest has remained relatively stable at low levels since about 1980. The level of harvest during the most recent 5-year period (RY05–RY09) decreased slightly (7%) from the preceding 5-year period (RY00–RY04). Hunter harvest in Unit 1B ranged from 12 to 16 bears annually during this report period and during all 3 years was below the preceding 10-year (RY00–RY09) average harvest of 17 bears annually (Table 1).

Beginning in RY12, non-resident black bear hunters who did not employ the services of a registered big game guide were required to possess a drawing permit (DL017) prior to hunting black bears in the unit. In 2012, a total of 27 permits were issued, 19 people hunted and 4 bears were killed for a success rate of 21 percent (Table 2).

Males made up 75%, 88%, and 73% of the kill in regulatory years 2010, 2011, and 2012, respectively. During the report period the average male skull size was 18.0, ranging from 17.2 in 2010 to 18.2 each in 2011 and 2012. While the average male skull size was slightly below the management objective of 17.5 in 2010, it was well above the objective in 2011 and 2012 (Table 3). The average age of harvested males during the report period was 9.5 years, which was below the preceding 5 year average (RY05–09) of 11.4 years (Table 4). The male-to-female harvest ratio during this report period was nearly 4:1, slightly above the management goal of 3:1.

Hunter Residency and Success. Although the ratio varies annually, during this report period nonresident hunters took approximately 65% of the total harvest, local residents took about 28%, and nonlocal Alaska hunters took 7% of the bears harvested in the unit (Table 5). The percentage of the overall harvest taken by local residents increased slightly during this report period while that of nonresidents and nonlocal residents decreased slightly.

Harvest Chronology. During this report period, 67–80% of the overall harvest occurred during the spring season, with 42–53% of all bears killed in May (Table 6).

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, Brown Cove and Muddy River, LeConte Bay, Stikine River, Eastern Passage, Blake Channel, Bradfield Canal, and 1 WAA on Cleveland Peninsula. WAAs in the Farragut Bay, Bradfield Canal, Dry Bay and Thomas Bay areas produce 59% of the unitwide harvest. WAA 1603, the Dry Bay/Thomas Bay area, once again accounted for a disproportionately high percentage (26%) of the unitwide harvest.

Bait Stations. We issued no permits to operate bait stations in the unit during 2010 or 2011. In 2012, 3 nonresidents were issued permits to operate up to 2 bait stations each, and 1 bear was taken over bait.

Hunting with Dogs. No one requested a permit to hunt bears with dogs in the unit.

Guided Hunter Harvest. Over the last 10 years (RY00–RY09), the percentage of the unitwide harvest taken by guided nonresidents averaged 42%. During the most recent 5-year period (RY05–RY09), guided hunters accounted for 32% of the unit wide harvest, compared to 51% during the preceding 5-year period (RY00–RY04). During this report period 33% of the successful nonresident hunters used a guide, while 16% used other commercial services, such as boat rental, for transportation to and from the field.

Transport Methods. During the report period, all successful hunters reported using a boat to access black bear hunting areas (Table 7). 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 non-hunting 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. Although the amount of wounding loss is possibly significant, we have no information on how much occurs in the unit.

HABITAT

Assessment

Timber harvest continues to pose the most serious threat to black bear habitat in the unit. Post logging 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.

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 pre-commercial thinning and pruning has been performed in some young second-growth stands in the Thomas Bay area. This effort provides a secondary benefit to wildlife 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 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. Although small settlements exist on the Point Agassiz Peninsula and on Farm Island, 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

In recent years, declining black bear harvests across much of the region have led to concerns about potential overharvest. The Unit 1B black bear harvest, however, has remained relatively stable at low levels. The average annually harvest of 14 bears per year during the report period, was only slightly below the average annual harvest of 16 bears per year during the preceding 5-year period (RY05–RY09). While the average male skull size was slightly below the 17.5 inch management objective in 2010, at 18.2 inches it was well above the objective in both 2011 and 2012. The male-to-female harvest ratio during the report period was nearly 4:1, slightly above the management goal of 3:1.

One effort to address declining harvest trends in some units is the new requirement that non-resident black bear hunters who do not employ the services of a registered guide possess a drawing permit prior to hunting black bears in Units 1–3. By adjusting the numbers of drawing permits issued, the department now has the ability to control the number and distribution of bears taken by unguided nonresident hunters. At the same time, registered guides will be expected to limit their harvests of black bears both numerically and geographically, to the mean annual harvests they experienced during regulatory years 2007–2009.

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: 1) identify possible correlations between sealing data and population trends; and 2) provide a better understanding of the short- and long-term impacts of clearcut logging on black bear populations. 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.

No management or regulatory changes are recommended at this time.

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Table 1. Unit 1B black bear harvest, 1999–2012.

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
Fall 07	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0
Spring 08	19	0	0	0	19	0	0	0	0	19	100	0	0	0	19
Total	19	0	0	0	19	0	0	0	0	19	100	0	0	0	19

Fall 08	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0
Spring 09	18	4	18	0	22	1	0	0	0	18	82	4	18	0	22
Total	18	4	18	0	22	1	0	0	0	18	82	4	18	0	22
Fall 09	0	0	0	0	0	NA	0	0	0	0	0	0	0	0	0
Spring 10	13	2	13	0	15	0	0	0	0	13	87	2	13	0	15
Total	13	2	13	0	15	0	0	0	0	13	87	2	13	0	15
Fall 10	3	1	25	0	4	NA	0	0	0	3	75	1	25	0	4
Spring 11	6	2	25	0	8	0	0	0	0	6	75	2	25	0	8
Total	9	3	25	0	12	0	0	0	0	9	75	3	25	0	12
Fall 11	3	1	25	0	4	NA	0	0	0	3	75	1	25	0	4
Spring 12	11	1	8	0	12	0	0	0	0	11	92	1	8	0	12
Total	14	2	13	0	16	0	0	0	0	14	88	2	13	0	16
Fall 12	2	1	33	0	3	NA	0	0	0	2	67	1	33	0	3
Spring 13	9	3	25	0	12	1	0	0	0	9	75	3	25	0	12
Total	11	4	36	0	15	1	0	0	0	11	73	4	27	0	15

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

Table 2. Unit 1B black bear harvest data for nonresident drawing permit hunt DL017, 2012.

Hunt Nr	Regulatory Year	Permits issued	Percent did not hunt	Percent successful hunters	Percent unsuccessful hunters	Males	(%)	Females	(%)	Unk	Total harvest
DL017	2012	27	27	21	79	4	(100)	0	(0)	0	4

Table 3. Unit 1B black bear mean skull size[a], 1995–2012.

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
2007–2008	18.2	19	NA	0
2008–2009	18.7	18	16.0	4
2009–2010	18.3	12	16.7	2
2010–2011	17.2	8	16.5	4
2011–2012	18.2	14	16.3	2
2012–2013	18.2	11	17.2	4

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

Table 4. Unit 1B harvested black bear mean age, 1999–2012.

Regulatory year	Males	*n*	Females	*N*
1999–2000	8.75	8	7	1
2000–2001	10.2	20	10.5	2
2001–2002	9.6	22	8.8	6
2002–2003	10.7	15	13.0	3
2003–2004	7.3	7	NA	0
2004–2005	9.9	9	8.0	2
2005–2006	11.6	7	28	1
2006–2007	13.1	18	NA	0
2007–2008	10.5	17	NA	0
2008–2009	10.4	18	7.5	4
2009–2010	11.2	13	16.5	2
2010–2011	8.1	7	4.5	2
2011–2012	11.3	14	19.5	2
2012–2013	9.2	11	10.3	4

Table 5. Unit 1B successful black bear hunter residency, 1995–2012.

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
2007–2008	7	37	1	5	11	58	19
2008–2009	6	27	2	9	14	64	22
2009–2010	1	7	2	13	12	80	15
2010–2011	2	17	1	8	9	75	12
2011–2012	3	19	2	13	11	69	16
2012–2013	7	47	0	0	8	53	15

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

Table 6. Unit 1B black bear harvest chronology by percent, 1995–2012.

Regulatory	Month						
Year	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
2007–2008	0	0	0	11	84	5	19
2008–2009	0	0	0	0	82	18	22
2009–2010	0	0	0	7	87	7	15
2010–2011	25	8	0	0	42	25	12
2011–2012	25	0	0	6	50	19	16
2012–2013	13	7	0	7	53	20	15

Table 7. Unit 1B black bear harvest in percent by transport method, 1995–2012.

Regulatory			Highway			
year	Airplane	Boat	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
2007–2008	0	95	0	5	0	19
2008–2009	0	100	0	0	0	22
2009–2010	0	100	0	0	0	15
2010–2011	0	100	0	0	0	12
2011–2012	0	100	0	0	0	16
2012–2013	0	100	0	0	0	15

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CHAPTER 3: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 1C (7,600 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 post logging) 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 1,300 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.

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, wetlands, small forest openings, subalpine meadows, and disturbed areas such as avalanche chutes, and clearcuts. Major vegetative foods include grasses and sedges, skunk cabbage, devil's club, horsetail, 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 energy reserves prior to den-up.

Mainland black bears share ranges with brown bears, especially in major river valleys such as the Taku River, and Berners Bay. 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 human related 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. Hunting effort information for unsuccessful hunters was not available before 2009, and it may take a couple more years to ensure all black bear hunters are aware of the requirement and have tickets prior to hunting. As in past reports, we have information for successful hunts, and now, limited information for unsuccessful hunters.

Regulatory history

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

Historical harvest patterns

The harvest percentage by residency status did not change significantly through the 1990s. Beginning in the early 2000s, the resident black bear harvest began to decline, and the nonresident harvest began to increase. 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 metal big game locking 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 40 years, with a mean of 47 in the 1970s, 73 in the 1980s, and 96 bears in the 1990s. The annual harvest peaked in 2000 at 152 bears. Approximately 80% of the harvest has occurred in the spring season, with males outnumbering females in the harvest about 3 to 1. There are differences, though slight, in the sex ratio of the harvest in spring vs. fall, with the fall harvest having a higher percent of female bears. This is probably due to females with yearlings rejecting them by the fall season, thereby being alone and legal for harvest.

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 1). 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 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 one of the greatest management problems 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. 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 expenditure of effort and resources. 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).

Along with the sporadic killing of urban bears, Douglas area staff also trapped and moved bears 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 overly effective, as many problem animals returned to former urban neighborhoods and habits, and moving bears is expensive in terms of transportation costs and staff time. However, a small number of the black bears moved from downtown Juneau remained in remote areas where they were released.

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 (from harvested bears) 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.

Harvested bears are not representative of the population as a whole, but rather a measure of hunter selectivity. Thus, changes in skull size and age may have more to do with hunter demographics and selectivity than with changes in the bear population structure. Also, several scenarios could lead to changes in these indices, and without population information we have no way of determining what is causing the change. If the average skull size or age of bears declines, this could be because fewer older bears are available, or because the bear population is productive and 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 changes in skull size and age data.

Region I staff engaged in multiple discussions about black bear management and management objectives in Region I during this report period, focusing on the decreasing harvest in several areas of Region I, and the changing successful hunter demographics (resident vs. nonresident). As an attempt to curb an increasing and unsustainable harvest of black bears the Alaska Board of Game (BOG), during its 2010 meeting, implemented a regulation requiring unguided nonresident hunters to acquire a registered guide or have a draw permit to hunt black bears in Units 1-3. Implementation of the regulation began 1 July 2012.

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. We checked all bears for tattoos or ear tags, an indication that ADF&G personnel captured the bear previously. We collected a premolar from each bear and sent it 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. Although 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 1,950 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 2 of the main sets of biological data. The department uses these data as 2 sets of indices of the status of the black bear populations. Even with variability in skull size and age there have been no significant changes in the data we have collected over the past 3 report periods, so based on these data, we don't have reason to suspect that the unit wide population has changed significantly. The harvest during the first 2 years of this report period was higher than the last 2 years of the previous period; and the harvest during this report period was substantially lower the third year than the first 2 (Table 2).

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 female bears teaching their cubs to feed on refuse, and seeking safety from adult male bears in congested areas. It gives the impression that bears are increasing because they are more persistent and visible. The cubs' learned behavior does lead to periodic generational increases 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

Black bears are present throughout the mainland and on most islands in Unit 1C. The larger mainland river drainages harbor brown bears that likely displace black bears from some locations. The distances black bears move in and around the unit is generally unknown, except in the areas adjacent to 2 proposed mining sites: the Alaska Juneau Mine (AJ Mine) in the Sheep Creek valley just southeast of Juneau and the Kensington mine just north of Berners Bay. Home ranges for black bears were estimated at both of these sites using radio collared 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). Urban bear home range estimates were calculated using GPS equipped radio-collar data from captured bears. The mean home range size was 12 km^2 (n=4, range 5 km^2- 23 km^2) (ADFG, Unpublished data). 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 reports of glacier colored bears on the Juneau road system, and 1 glacier bear was taken in the unit during the report period; 26 cinnamon, 274 black, and 2 unknown color phase make up the overall Unit 1C harvest for the report period.

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. Prior to the 2010 Alaska Board of Game (BOG) department staff were involved in many discussions on how to reduce an unsustainable harvest of black bears in Southeast Alaska. The public and registered guides submitted multiple proposals during the 2010 BOG meeting. Ultimately the BOG implemented a regulation requiring unguided non-residents to obtain a registered guide or have a draw permit to hunt black

bears in Units 1-3 (ADF&G 2011, unpublished). The regulation became effective on July 1, 2012; and appeared to catch many non-resident hunters off guard. Like many new regulations we anticipate a lag effect before hunters fully understand the change for unguided non-residents. Undersubscribed permits (left over draw permits) were made available on a first come first serve basis. We issued no emergency orders relating to black bears in Unit 1C during this report period.

Hunter Harvest. Hunters reported killing 103, 99, and 73 bears in regulatory years 2010, 2011, and 2012, respectively (Table 2). The mean annual harvest of 92 bears is just slightly lower than the mean of 94 bears from the previous report period. Males were 83%, 80%, and 82% of the harvest over the report period, exceeding the management objective of 75% in each year. Average skull size for male bears during the report period was 17.7, exceeding the management objective of 17.5 and similar to the 17.8 inches reported in the previous report period. The mean age of male bears remained the same at 8.8 years compared to 8.9 years during the previous report period (Table 3). The majority of bears harvested had black pelage, although 1 glacier bear was taken by a hunter in 2010. Successful hunters spent an average of 3.0 days afield (Table 3), same as the 3.1 days of effort spent per successful hunter during the previous report period.

Since implementation of the regulation requiring hunters to return black bear harvest ticket reports, gaining reliable data from returned harvest reports remains problematic. Unlike registration permit holders, harvest ticket holders face no penalty for failing to report unsuccessful black bear hunting activity (successful hunters must still have bears sealed by the department). During this report period, harvest ticket information indicates that 556 ticket holders hunted black bear in Unit 1C. Two hundred and twenty-one (50%) hunters reported being successful, although sealing data (required process) indicate 275 bears were harvested. According to harvest ticket data, successful hunters took 3.6 days to harvest a black bear (compared to the 3.1 days reported on sealing certificates), and unsuccessful hunters spent 3.9 days hunting. Nevertheless, during this report period it appears that hunters have acquired the habit of returning harvest tickets at the end of the season. The number of hunters reporting hunt location data in this report period was 519 of 556 ticket holders, a significant increase over the 37 of the last report period. Implementation of the harvest ticket requirement will enable managers to obtain information for unsuccessful hunters. This added data will allow biologists to compute catch per unit effort data for all hunters, and help identify areas where black bear population dynamics are changing. Staff noted many non-resident hunters were unfamiliar with the new drawing permit requirement for unguided black bear hunting during RY12.

Hunter Residency and Success. Local unit residents took 53% of all black bears during the report period; nonresident hunters took 40%; and nonlocal Alaskans took 7% (Table 4). Local resident hunters took 145 bears during the report period, up slightly from 133 bears reported in 2007–2009. Nonresident hunters took fewer bears during the current report period (111) compared to the previous period (124) but the bear harvest remains relatively high for this group of hunters. The nonlocal resident harvest was 19 bears, down slightly from the previous report of 24 bears. There is substantial variability in the total number of bears taken by all demographic groups over the last 10 years. Harvest for all groups likely depends more on the availability of bears rather than effort. Although we do not have empirical data to monitor effort, anecdotal information and conversations with hunters do not suggest fewer hunters are pursuing black bears today than in the recent past.

Harvest Chronology. During the report period, 79% of bears taken were killed in the spring season (Table 5). The spring harvest component is identical to the harvest reported in the previous period. May represents the month with the highest black bear harvest in Unit 1C at 66%. The spring season, specifically the month of May, has historically produced the highest harvest of bears. This is due to the hunters' interest in taking a bear with a prime pelt. Bear pelts are prime if the animal is taken shortly after den emergence; black bears are known to emerge in the largest numbers in early to mid-May.

Harvest in Particular Areas (WAAs). The harvest during this report period was again concentrated in the handful of WAAs that produced most of the bears in the preceding 2 report periods. These areas are centered on the south end of the Chilkat Range (2304–2306) and the area between Snettisham and Cape Fanshaw (2823–2927) (Table 1). The WAAs adjoining the Juneau urban area (2515, 2515, 2517) also produce several bears annually which is likely due to access provided by the Juneau road system.

Transport Methods. Boats continued to be the dominate means of transport to the field, used by 73% of successful hunters during the report period (Table 6). 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 an opportunity to pursue 1 or more bears. Modes of transportation for successful black bear hunters vary slightly year-to-year but hunters using boats have consistently been the highest percentage of users.

Other Mortality.

During this report period, ADF&G, and private citizens killed 3, 10, and 5 bears during 2010, 2011, and 2012 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. Law enforcement agencies did not kill any bears during the report period.

HABITAT

Assessment

The most critical impacts to habitat in this unit will resort from a number of proposed developments in Unit 1C. The proposed 400-acre golf course on north Douglas Island continues to be discussed, and 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. A pioneer road was constructed to Cascade Point during the report period with plans to extend the road up Lynn Canal to the Katzehin River delta moving Juneau's road connection closer to the Haines and Klondike highways. Increased highway traffic, increased access to the area by recreational users, and interactions between bears and refuse at the newly developed areas could affect the bear population in that area. In the past, logging has been a concern. Although several areas have been logged in the past, no active logging is occurring in the unit at present. There are long term plans to continue logging in some previously cut areas

(i.e., Chilkat Range), and to log new areas in southern portions of the unit but it does not appear logging is as economically attractive as it once was in the unit.

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, and radio, including an annual program in the spring we use to prepare the community for seasonal bear activity. These types of department announcements serve to remind the community of the value of having bears in the area, and the need to manage refuse responsibly.

Staff participated in neighborhood meetings in areas with high levels of urban bear activity, and several outdoor safety programs (e.g., Kid Safe) each year to reinforce proper refuse management, and appropriate behavior in bear habitat. In addition, staff presented a Fireside Chat program at the Mendenhall Glacier Visitors Center about urban bears in Juneau. Much of the information for the program was collected from 5 radio-collared female black bears. Presenting tangible information to the public, such as hourly locations of bears, is a powerful tool to help people acquire a sense of ownership in the local bear resource, and to reinforce the need for proper refuse management.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 1C bear harvest continued to increase initially during the report period, peaking at 103 bears in 2010. During the remainder of the period (2010–2012) the harvest was slightly lower than the levels during the last reporting period. Hunters continue to voice concerns that they are seeing fewer bears, at least in the southern portion of Unit 1C. The black bear harvests from southern portions of Unit 1C (Tracy Arm-Cape Fanshaw) are lower than in the past. It is unclear if this trend will continue, and if it does, what that means about bear numbers. Similar declines in harvest and the number of bears seen are being reported in Unit 2 (Prince of Wales Island) and portions of Unit 3. The Alaska BOG passed a regulation requiring unguided non-residents to have a draw permit or registered guide to hunt black bears in an attempt to curb an unsustainable harvest in Units 1-3. 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 the means of the previous report period. Although skull size is a measurement we monitor as an indicator of overall population health, skull size measurements may not be sensitive enough to detect changes until they become very pronounced. The continued stable age structure of the harvest and hunter effort give us some comfort as managers that the black bear population may not have changed significantly.

We will continue to monitor the bear harvest through sealing requirements while gathering more specific information on kill locations and hunter effort. The harvest ticket requirement will provide needed unsuccessful hunter data to anticipate areas of concern with black bear harvest.

We will continue to work with the CBJ and other communities in Unit 1C to refine current refuse management practices and to identify alternatives that serve to reduce human and black bear conflicts.

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Table 1. Unit 1C black bear mortality from all Wildlife Analysis Areas (WAA), regulatory years 2003 through 2012.

	Regulatory year										
WAA	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
2202	0	1	0	2	1	1	1	0	0	0	6
2203	1	1	2	1	0	0	0	0	1	3	9
2304	6	3	7	9	10	6	3	5	6	3	58
2305	6	1	3	9	17	4	5	7	5	3	60
2306	13	8	12	11	12	3	11	13	11	16	110
2307	3	0	4	7	4	9	2	7	11	4	51
2408	0	1	0	0	2	2	8	2	3	0	18
2409	1	0	0	1	2	2	3	3	7	1	20
2410	3	1	0	2	0	0	0	0	1	0	7
2411	0	0	1	0	0	0	1	0	0	0	2
2412	0	0	1	0	0	0	0	0	0	0	1
2413	0	0	0	0	0	2	0	0	0	0	2
2514	5	0	2	10	8	2	4	12	8	6	57
2515	6	5	9	5	8	7	6	6	11	5	68
2516	0	0	0	0	0	0	0	0	0	0	0
2517	5	3	6	11	4	8	8	4	4	6	59
2518	0	1	5	2	2	5	1	2	6	2	26
2519	2	0	2	2	6	3	0	1	3	2	21
2722	1	3	1	0	9	4	1	4	2	3	28
2823	11	8	12	11	5	5	1	6	10	5	74
2824	6	3	2	4	3	3	3	1	1	0	26
2825	5	7	6	6	10	9	8	5	4	3	63
2926	3	15	31	20	12	14	9	15	10	9	138
2927	2	7	16	15	10	7	12	17	7	11	104
Total	79	68	122	128	125	96	87	110	111	82	1008

Table 2. Unit 1C black bear harvest and other mortality, regulatory years 2003 through 2012.

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	0	19
Spring 2004	51	8	0	59	NA	1	0	0	1	52	(87)	8	(13)	0	0	60
Total	58	14	0	72	NA	6	1	0	7	64	(81)	15	(19)	0	0	79
2004–2005																
Fall 2004	7	2	0	9	NA	0	4	0	4	7	(54)	6	(46)	0	(0)	13
Spring 2005	52	2	0	54	NA	0	1	0	1	52	(95)	3	(5)	0	(0)	55
Total	59	4	0	63	NA	0	5	0	5	59	(87)	9	(13)	0	(0)	68
2005–2006																
Fall 2005	16	11	0	27	NA	5	2	2	9	21	(58)	13	(36)	2	(6)	36
Spring 2006	79	5	0	84	NA	0	2	0	2	79	(92)	7	(8)	0	(0)	86
Total	95	16	0	111	NA	5	4	2	11	100	(82)	20	(16)	2	(2)	122
2006–2007																
Fall 2006	19	9	0	28	NA	5	5	2	12	24	(60)	14	(35)	2	(5)	40
Spring 2007	80	8	0	88	NA	0	0	0	0	80	(91)	8	(9)	0	(0)	88
Total	99	17	0	116	NA	5	5	2	12	104	(81)	22	(17)	2	(2)	128
2007–2008																
Fall 2007	20	7	0	27	NA	4	1	1	6	24	(73)	8	(24)	1	(3)	33
Spring 2008	83	7	0	90	NA	1	1	0	2	84	(91)	8	(9)	0	(0)	92
Total	103	14	0	117	NA	5	2	1	8	108	(86)	16	(13)	1	(1)	125

Table 2. continued.

Regulatory year	Reported														
	Hunter kill					Nonhunting kill				Total estimated kill					
	M	F	Unk	Total	Baited	M	F	Unk	Total	M	(%)	F	(%)	Unk	(%)	Total
2008–2009																
Fall 2008	14	7	0	21	NA	4	2	1	7	18	(64)	9	(32)	1	(4)	28
Spring 2009	55	11	0	66	NA	2	1	0	3	57	(83)	12	(17)	0	(0)	69
Total	69	18	0	87	NA	6	3	1	10	75	(77)	21	(22)	1	(1)	97
2009–2010																
Fall 2009	8	5	0	13	NA	7	1	1	9	15	(68)	6	(27)	1	(5)	22
Spring 2010	53	11	0	64	NA	0	1	0	1	53	(82)	12	(18)	0	(0)	65
Total	61	16	0	77	NA	7	2	1	10	68	(78)	18	(21)	1	(1)	87
2010-2011																
Fall 2010	13	6	0	19	NA	3	1	2	6	16	(64)	7	(28)	2	(8)	25
Spring 2011	73	11	0	84	NA	0	0	1	1	73	(86)	11	(13)	1	(1)	85
Total	86	17	0	103	NA	3	1	3	7	89	(81)	18	(16)	3	(3)	110
2011-2012																
Fall 2011	13	7	0	20	NA	4	6	0	10	17	(57)	13	(43)	0	(0)	30
Spring 2012	66	13	0	79	NA	1	0	1	2	67	(83)	13	(16)	1	(1)	81
Total	79	20	0	99	NA	5	6	1	12	84	(76)	26	(23)	1	(1)	111
2012-2013																
Fall 2012	13	5	0	18	NA	4	2	2	8	17	(65)	7	(27)	2	(8)	26
Spring 2013	47	8	0	55	NA	0	0	1	1	47	(84)	8	(14)	1	(2)	56
Total	60	13	0	73	NA	4	2	3	9	64	(78)	15	(18)	3	(4)	82

Table 3. Unit 1C successful black bear hunter effort, mean skull size, and mean age, regulatory years 2003 through 2012.

Regulatory year	Successful hunter effort			Mean skull size (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	*n*	Female	*n*	Male	*n*	Female	*n*
2003–2004											
Fall 2003	33	13	2.5	17.5	6	15.9	6	5.1	11	9.0	7
Spring 2004	187	59	3.2	17.8	50	15.9	8	8.7	52	8.3	8
Total	220	72	3.1	17.8	56	15.9	14	8.1	63	8.6	15
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
2007–2008											
Fall 2007	78	27	2.9	16.5	20	15.6	7	6.3	20	8.3	6
Spring 2008	251	90	2.8	17.9	81	15.0	7	9.7	82	5.7	7
Total	329	117	2.8	17.6	101	15.3	14	9.0	102	6.9	13

Table 3. continued.

Regulatory year	Successful hunter effort			Mean skull size (inches)				Average age (years)			
	Total days	Nr hunters	Mean days per hunter	Male	*n*	Female	*n*	Male	*n*	Female	*n*
2008–2009											
Fall 2008	53	21	2.5	17.3	14	15.0	7	7.2	14	7.4	7
Spring 2009	157	66	2.4	18.0	54	15.5	11	9.3	54	8.5	11
Total	210	87	2.4	17.9	68	15.3	18	8.9	68	8.1	18
2009–2010											
Fall 2009	31	13	2.4	17.6	6	16.4	5	9.9	8	11.8	5
Spring 2010	200	64	3.1	17.8	53	15.7	11	8.5	53	9.6	11
Total	231	77	3.0	17.8	59	15.9	16	8.7	61	10.3	16
2010-2011											
Fall 2010	78	19	4.1	18.1	13	15.0	6	9.2	13	9.6	5
Spring 2011	267	84	3.2	17.9	73	15.6	11	8.6	71	8.6	11
Total	345	103	3.3	18.0	86	15.4	17	8.7	84	8.9	16
2011-2012											
Fall 2011	58	20	2.9	16.8	13	13.7	7	8.4	13	8.8	5
Spring 2012	270	79	3.4	17.7	66	16.0	13	9.1	60	9.0	12
Total	328	99	3.3	17.5	79	15.1	20	9.0	73	8.9	17
2012-2013											
Fall 2012	57	18	3.2	16.8	13	16.0	5	7.0	13	11.6	5
Spring 2013	125	55	2.3	17.8	47	11.5	8	9.0	47	11.9	8
Total	182	73	2.5	17.5	60	13.2	13	8.6	60	11.8	13

Table 4. Unit 1C black bear successful hunter residency, regulatory years 2003 through 2012.

Regulatory year	Local resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unknown residency	(%)	Total
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
2007–2008	55	(47)	12	(10)	50	(43)	0	(0)	117
2008–2009	41	(47)	3	(4)	43	(49)	0	(0)	87
2009–2010	37	(48)	9	(12)	31	(40)	0	(0)	77
2010-2011	48	(46)	9	(9)	46	(45)	0	(0)	103
2011-2012	53	(54)	4	(4)	42	(42)	0	(0)	99
2012-2013	44	(60)	6	(8)	23	(32)	0	(0)	73

Table 5. Unit 1C black bear harvest chronology by month, regulatory years 2003 through 2012.

Regulatory year	Harvest periods												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
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
2007–2008	21	(18)	5	(4)	1	(1)	14	(12)	65	(56)	11	(9)	117
2008–2009	16	(18)	5	(6)	0	(0)	2	(2)	59	(68)	5	(6)	87
2009–2010	10	(13)	2	(3)	1	(1)	4	(5)	58	(75)	2	(3)	77
2010-2011	15	(14)	4	(4)	0	(0)	6	(6)	70	(68)	8	(8)	103
2011-2012	18	(18)	2	(2)	0	(0)	4	(4)	63	(64)	12	(12)	99
2012-2013	15	(20)	3	(4)	0	(0)	2	(3)	48	(66)	5	(7)	73

Table 6. Unit 1C black bear harvest percent by transport method, regulatory years 2003 through 2012.

Regulatory year	Transport												
	Highway												
	Air	(%)	Boat	(%)	vehicle	(%)	Walk	(%)	Other	(%)	Unk	(%)	*n*
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
2007–2008	5	(4)	89	(76)	17	(15)	5	(4)	1	(1)	0	(0)	117
2008–2009	0	(0)	67	(77)	14	(16)	5	(6)	1	(1)	0	(0)	87
2009–2010	0	(0)	63	(82)	9	(12)	3	(4)	2	(2)	0	(0)	77
2010-2011	5	(5)	72	(70)	21	(20)	2	(2)	3	(3)	0	(0)	103
2011-2012	1	(1)	73	(74)	19	(19)	6	(6)	0	(0)	0	(0)	99
2012-2013	1	(1)	56	(77)	9	(12)	9	(12)	3	(4)	0	(0)	73

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CHAPTER 4: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 1D (2,854 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

The majority of Unit 1D is held in public ownership and lands accessible to hunting include 447 mi^2 owned by the state (Alaska Department of Natural Resources 2002), with a majority of the remaining lands owned by the federal government and administered by the Bureau of Land Management, the Tongass National Forest, and the National Park Service. The Alaska Chilkat Bald Eagle Preserve contains 75 mi^2 along the Chilkat, Chilkoot, and Klehini Rivers. Unit 1D contains an estimated 1041 mi^2 of forested habitat (Homer et al. 2004) and several large river systems that provide excellent habitat for black bears. Anadromous salmon streams within the unit include the Chilkat River and its major tributaries, the Klehini, Tsirku, Little Salmon, Kelsall, and Takhin Rivers. The Chilkoot and Ferebee Rivers 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 populations.

Openings in the forest canopy, wetlands, subalpine meadows, and disturbed areas such as avalanche chutes and clearcuts, are important foraging areas for black bears. Black bear diets range from primarily vegetarian during the spring of the year to mostly carnivorous during the salmon runs. Major herbaceous 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 and mountain goat kids. During summer and fall, bears consume large quantities of fish to accumulate fat reserves for winter hibernation. 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 be 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 timber harvest in the past. The

current Haines State Forest timber base consists of 65 mi^2 of forested habitat and the annual allowable cut is approximately 5.88 million board feet (Alaska Department of Natural Resources 2002). 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 plants as conifer canopies close and light cannot penetrate to the forest floor. Second-growth stands lack the forage base of earlier successional stages, and they lack large hollow trees and root masses important for denning. An increase in the number of logging roads in Unit 1D has brought 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 human access and decreased forage.

HUMAN USE HISTORY

Hunting of black bears has a long history in Unit 1D. Sealing of black bears was first required in 1973. Because hunters were 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. Using dogs to hunt 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. As a result of 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 Alaska Board of Game (BOG) limited baiting in Southeast Alaska to the spring period 15 April–15 June. In 2002, the BOG fielded a proposal to prohibit black bear baiting in Unit 1D. As a result the BOG closed a portion of the unit within 1 mile of the major Haines roads. The issues discussed by the BOG included the attraction of brown bears to the bait stations, and the close proximity of bait stations to human development contributing to the conditioning of bears to human garbage. A 5-mile closure was considered but the board determined 1 mile to be more appropriate.

Historical harvest patterns

The Unit 1D average annual harvest has increased over the last 4 decades. Although there continues to be variation in the harvest between years, mean black bear harvest has stabilized during the past 2 decades. During the 1970s, average annual harvest was around 18 bears, in the 1980s it increased to 26 bears, in the 1990s it continued to increase to an average of 33 bears per year, and over the past decade has remained near this level with the annual harvest averaging 32 bears. Within each decade, no other clear trends have been apparent, as harvest varies greatly from year to year. For the periods 2001–2003, 2004–2006 and 2007–2009 the average numbers of bears harvested annually were 27, 35, and 31 bears, respectively (Crupi 2011). The mean annual harvest for this report period (2010–2012) was 36 black bears.

Local residents have typically accounted for about three-quarters of the annual harvest and this reporting period was no exception. Nonresidents typically take about 20% of the black bears harvested, however that declined to 15% during this reporting period, with no bears taken by nonresidents during 2012. The drastic decrease between years is most likely a direct result of a decision made during the 2010 Alaska Board of Game (BOG) to require non-resident black bear hunters in Units 1-3 to have a registered guide or a draw permit starting in 2012. 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 37% of successful black bear hunters used highway vehicles and the same percentage used boats.

Male bears constituted an average of 79% of the harvest during the 10-year period 2000–2009; the 2010–2012 male harvest was 71%. During this report period local resident hunters harvested 29% female bears, substantially more than the nonresident female bear harvest of 4%, and nonlocal residents at 3%. Unit 1D residents are limited to harvesting black bears, mountain goats, and Tier II moose as subsistence food sources in the immediate area. Local residents are less selective of male versus female black bears and mountain goats when harvesting animals for food.

A relatively high percentage of bears harvested in Unit 1D have been killed over bait in recent years. During 1995–1997, 39% of the harvest was killed over bait (Barten 1999). During this report period, the percentage of black bears taken over bait was 33%, indicating that bear baiting remains a popular and successful method of taking Unit 1D black bears. During the late 1980s and early 1990s, an average of 64% of the harvest occurred in the spring. However, during the mid-1990s, spring harvest averaged 86% of the annual hunter kill. In the last report period, spring harvest remained high at 80% (Crupi 2011). During this report period the spring harvest increased to 87% of the overall black bear harvest. As reported here previously, 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 affected the long-term seasonal black bear harvest.

Historical harvest locations

The majority of the Unit 1D black bear harvest has been taken in 2 WAAs, 4302 (along the Haines Highway and Chilkat and Klehini Rivers) and 4303 (the Kelsall River and Upper Chilkat River). To a lesser extent, WAA 4405 and 4407, which includes Lutak Inlet, Taiya Inlet, and lands surrounding Skagway are also used. Because 4302 and 4303 are relatively accessible by highway vehicles and boats, many hunters use these areas for bear hunting, as well as to 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 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 nature or show a consistent long term trend 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 harvest ratio of males to females as a management objective 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, or from the variability in harvest any given year.

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. We collected a premolar from most bears and sent it 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 other Southeast Alaska mainland areas, possibly due to inter-specific competition with brown bears. ADF&G estimated 275 black bears in Unit 1D in 1990, an average of 1.3 bears per forested mi^2, however this density was based on an estimate of 210 mi^2 of forest habitat which is only 20% of that currently identified using Landsat imagery (Homer et al. 2004). Nevertheless this estimate of the total population seems

realistic suggesting the density of black bears in 1D is less than 1.3 bears per forested mi^2. Peacock et al. (2011) estimated an average density of 3.9 black bears per mi^2 elsewhere in Southeast Alaska, which applied to Unit 1D would yield a population of more than 4,000 black bears. Because black bear habitat in the unit overlaps with brown bear habitat such a high population is unlikely because of resource partitioning between these 2 species. Without studies designed to derive direct estimates of black bear numbers, it is extremely difficult to estimate the population in this unit.

Population composition

The majority of black bears sealed in Unit 1D during 2010–2012 exhibited the most common pelage color, black (66%). Over the past 2 decades, 31% of the black bears harvested in Unit 1D exhibited cinnamon pelage, although this designation is somewhat subjective and may depend on the experience of the sealing agent. No glacier-colored bears were reported in the harvest during this report period.

During this report period (2010–2012), 29% of the bears harvested were females, slightly above 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. In January 2013, a proposal to shorten the black bear baiting season in Unit 1D was brought to the BOG in response to concerns of brown bears being taken over bait. The proposal failed and the black bear baiting season in Unit 1D remained the same (April 15– June 15). We issued no Emergency Orders for Unit 1D black bear seasons.

Hunter Harvest. Hunters reported killing 37, 51, and 17 black bears in regulatory years 2010, 2011 and 2012, respectively. This equated to an average annual hunter harvest of 35 bears, which was slightly higher than the previous report period harvest (Crupi 2011) of 30 bears per year. Regulatory year (RY) 2012 represented the lowest black bear harvest in a decade (Table 1). The ratio of males to females (2.5:1) for the entire report period was lower than ideal management objectives (Table 1). We do not know the reason for the high female harvest in 2011 (n=18).

Hunter Residency and Success. Local resident hunters take the majority of black bears in Unit 1D (range 67%–88%), and primarily use the bears for meat. The percentage of bears taken by nonresidents during this report period was 15%, less than the percentage of bears taken by nonresidents since 2003 (22%; Table 2). RY10 represented the highest harvest of bears by nonresidents (9) in this report period, though less than the harvest of 15 bears in RY05 which

was the highest nonresident harvest in the previous 7 years. Non-resident harvest was zero in RY12 and is most likely a reflection of the unguided non-resident regulation implemented by the BOG requiring a draw permit or registered guide to hunt black bear.

Harvest Chronology. Spring months account for most Unit 1D harvest with 84–97% of the harvest reported during this season. Fall months (September and October) accounted for 10% of the harvest during this report period (Table 3). As noted above, most local bear hunters, who took 75% of the annual harvest, hunt for meat, and spring bears, are preferred over fall bears because they are believed to be more palatable.

Transport Methods. Most successful black bear hunters used boats (36%) or highway vehicles (44%) during the report period (Table 4). Unit 1D's river valleys and logging roads provide ready access to suitable black bear habitat making these 2 modes of transportation the most popular for bear hunters. The use of off-road vehicles by successful hunters decreased slightly from 13% (2007–2009) to 11% in this report period. Only 9% of hunters reported "by foot" as their means of transportation, similar to the last reporting period.

Hunter Effort. Since 2003, hunter effort in mean days per hunter has varied annually (range 2.4–4.9) and days of effort reported during this report period were about average (Table 5). Data indicate that 3.6 days were required per hunter to harvest a black bear during this report period (Table 6). Although not a significant relationship, the general trend between bear harvest and hunter effort indicates that in years when more effort is invested to harvest a bear, more bears are harvested.

Harvest in Particular Areas (WAAs). Approximately 35% of the black bear mortality came from along the Haines Highway and the lower Chilkat River, WAA 4302 (Table 7). Another 37% came from the upper Chilkat River (WAA 4303), and about 16% originated from the Chilkoot and Ferebee watersheds (WAA 4405). This report 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. Black bear baiting in Unit 1D provides hunters an opportunity to harvest, improves the hunter's ability to be selective with shot placement, and possibly reduces the taking of females and/or sows with cubs. Information related to bear baiting had previously been unavailable; therefore we will briefly discuss bear baiting trends over the past decade.

Over the past 10 years, an average of 7 hunters registered 26 bait stations annually in Unit 1D. During this same period, 113 black bears have been reportedly harvested over bait, an average of 11 bears per year. That is approximately 1/3 of the 327 total black bears killed in Unit 1D over this time. The average age of black bears killed over bait was 8.3 years compared to 8.0 years of age for all black bears killed. Male bears account for 84% (95) of those killed over bait. Total black bear harvest in Unit 1D (RY00–RY09) does not appear to be significantly different with respect to sex selection with male harvest at 79% (257). Nonresidents accounted for 25% (28) of the black bears harvested over bait and this group harvested 93% (26) males. Residents harvested 75% (85) of the black bears harvested over bait with male bears accounting for 81% (69) of the harvest. During this report period (RY10–RY12), 35 bears (33%, n=105) were harvested at bait stations, near the long-term average of 11 bears per year.

Local Alaska Wildlife Troopers (AWT) and other unit residents have expressed concern that hunters may be harvesting brown bears at or near black bear bait stations. Furthermore, some residents are very 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. During the report period, no one requested a permit to hunt bears with dogs in the unit.

Guided Hunter Harvest. Nonresident hunters took 16 (15%) of the black bears during the report period (Table 2), similar to the last report period when nonresidents took 17 (19%) of the bears harvested. Of the successful nonresident hunters, 12 (75%) hired a guide to assist in their hunt, compared to 7 (41%) during the last report period. Over the past decade an average of 4.3 black bears were taken annually by guided nonresident hunters. Nonresident hunters prior to RY12 were not required to have a registered guide while hunting black bears in Alaska but many chose to pursue black bears in combined species hunts (i.e., brown bear, mountain goats) where a guide is required, and therefore were accompanied by a guide on their black bear hunt as well. No non-residents hunted black bear in RY12, which is possibly a reflection of the BOG proposal passed requiring unguided nonresidents to have a draw permit or registered guide starting 1 July 2012.

Other Mortality

During 2010–2012, 2 black bears were killed as agency kills (i.e. ADFG or AWT) most likely for public safety reasons, and 1 bear was killed via vehicle collision. No black bears were killed in Defense of Life and Property (DLP) during this report period and only 1 black bear was killed by DLP in the previous report period.

HABITAT

Assessment

Residential and commercial development is the single most important habitat consideration for Unit 1D black bears. Even in small communities, people move into traditional black bear habitat. This displaces bears and increases the number of bear/human conflicts. Logging and subsequent forest succession continues to have an effect on black bear habitat in Unit 1D. It appears that in some areas isostatic rebound is raising riparian habitat and possibly decreasing available moose browse, which could result in smaller moose populations and a decreased prey base for black and brown bears. The extent to which these factors affect Unit 1D black bears is unknown.

Enhancement

We performed no habitat enhancement work during this report 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, burial and export. Garbage disposal in Unit 1D has historically been problematic. Rather than pay the fees for refuse collection, some residents accumulate garbage on their property in sheds or garages, until they haul it to a disposal facility. These stockpiles attract bears. Also, several landowners in Haines grow fruit trees, particularly apples and cherries, and raise livestock. These attractants, as well as garbage, increase bear/human conflicts and often result in unnecessary DLP kills.

The amount of information about black (and brown) bears that we dispense to the public has increased and has elicited positive responses. Wildlife staff has suggested bear deterrent techniques and deterrent devices (Critter Gitter© and electric fences) that have been deployed in Haines. We will continue to work with Unit 1D residents to alleviate bear/human conflicts.

CONCLUSIONS AND RECOMMENDATIONS

During the report period, regulatory years 2010–2012, the black bear harvest was composed of 71% male and 29% female bears, slightly higher in relation to the management objective of a 3:1 male to female harvest ratio. The 3-year mean male skull size of 17.0 inches met the management objective of 17.0 inches. We will continue to monitor this parameter to ensure we are meeting management goals. The number of bears taken over bait in this report period appears to be consistent with the last report period and continues to be a good tool for ensuring subsistence needs are met. 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 making us concerned about possible overharvest in a limited number of locations. Implementation of a regulation, at the direction of the Alaska BOG, requiring unguided nonresident hunters in Units 1-3 to possess a draw permit began in 1 July 2012. Surprisingly, no nonresidents hunted black bears in RY12, which could be because unguided nonresident hunters were caught unaware of this change or there was in fact no desire by nonresidents to hunt black bears in Unit 1D. A limited number of undersubscribed draw permits were available on a first come first serve basis for nonresidents that chose not to acquire a guide. 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.

To more accurately gauge the availability of black bears we need to obtain effort data from both successful and unsuccessful hunters. Beginning in RY09 all hunters are now required to obtain harvest tickets that include a harvest report designed to capture this information. With the change to a harvest ticket and new reporting requirements it has taken the public time to adapt. During this reporting period we continued to see discrepancies with harvest ticket data and data collected from bear sealing data. In bear sealing, which is required in a majority of the state, ADF&G staff or sealing officers personally obtain information from successful hunters about the harvest. During this reporting period 105 black bears were harvested and sealed in Unit 1D. However, harvest ticket data from the same timeframe suggests only 84 black bears were harvested, a 20% difference. Additional public education about the necessity of submitting harvest ticket reports in addition to sealing bears will ensure ADF&G get the best data possible for species we are unable to survey.

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

We will use continued public education and outreach to reduce the number of black bears taken in DLP and to provide Unit 1D residents with nonlethal options to address conflicts with black bears.

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Table 1. Unit 1D black bear mortality, regulatory years 2003 through 2012.

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
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
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
2007																	
Fall 2007	5	0	0	5	0	0	0	0	0	0	5	(100)	0	(100)	0	(0)	5
Spring 2008	23	5	0	28	16	1	0	0	1	0	24	(83)	5	(17)	0	(0)	29
Total	28	5	0	33	16	1	0	0	0	0	29	(85)	5	(15)	0	(0)	34

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
2008																	
Fall 2008	8	3	0	11	0	0	0	0	0	0	8	(73)	3	(27)	0	(0)	11
Spring 2009	22	5	0	27	13	0	0	0	0	0	22	(82)	5	(19)	0	(0)	27
Total	30	8	0	38	13	0	0	0	0	0	30	(79)	8	(21)	0	(0)	38
2009																	
Fall 2009	1	1	0	2	0	0	1	0	1	0	1	(33)	2	(67)	0	(0)	3
Spring 2010	16	2	0	18	5	0	0	0	0	0	16	(89)	2	(11)	0	(0)	18
Total	17	3	0	20	5	0	1	0	1	0	17	(81)	4	(19)	0	(0)	21
2010																	
Fall 2010	0	1	0	1	0	1	0	0	1	0	1	(50)	1	(50)	0	(0)	2
Spring 2011	30	6	0	36	20	0	0	0	0	0	30	(83)	6	(17)	0	(0)	36
Total	30	7	0	37	20	1	0	0	1	0	31	(82)	7	(18)	0	(0)	38
2011																	
Fall 2011	2	6	0	8	0	0	1	1	2	0	2	(20)	7	(70)	1	(10)	10
Spring 2012	31	12	0	43	6	0	0	0	0	0	31	(72)	12	(28)	0	(0)	43
Total	33	18	0	51	6	0	1	1	2	0	33	(62)	19	(36)	1	(2)	53
2012																	
Fall 2012	2	0	0	2	0	0	0	0	0	0	2	(100)	0	(0)	0	(0)	2
Spring 2013	10	5	0	15	9	0	0	0	0	0	10	(67)	5	(33)	0	(0)	15
Total	12	5	0	17	9	0	0	0	0	0	12	(71)	5	(29)	0	(0)	17

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

Table 2. Unit 1D black bear successful hunter residency, regulatory years 2003 through 2012.

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Nonresident Guided[c]	(%)[d]	Unknown[b] residency	(%)	Total
2003	15	(75)	1	(5)	4	(20)	4	(19)	0	(0)	20
2004	19	(76)	2	(8)	4	(16)	3	(13)	0	(0)	25
2005	25	(57)	4	(9)	15	(34)	12	(28)	0	(0)	44
2006	26	(74)	2	(6)	7	(20)	5	(14)	0	(0)	35
2007	26	(77)	2	(6)	5	(15)	2	(6)	1	(3)	34
2008	24	(63)	5	(13)	9	(24)	3	(8)	0	(0)	38
2009	14	(67)	3	(14)	3	(14)	2	(10)	1	(5)	21
2010	25	(66)	3	(8)	9	(24)	8	(21)	1	(3)	38
2011	39	(74)	5	(9)	7	(13)	4	(8)	2	(4)	53
2012	15	(88)	2	(12)	0	(0)	0	(0)	0	(0)	17

[a] Local hunters are those hunters that reside in Unit 1D.

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

[c] Number of nonresident kills in previous column that were taken by nonresident hunters who were guided.

[d] Percentage of total bears harvested by guided nonresident hunters.

Table 3. Unit 1D black bear harvest chronology by month, regulatory years 2003 through 2012.

Regulatory year	Month												
	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*[a]
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
2007	4	(12)	1	(3)	0	(0)	0	(0)	17	(50)	12	(35)	34
2008	10	(26)	1	(3)	0	(0)	1	(3)	17	(45)	9	(24)	38
2009	0	(0)	2	(10)	0	(0)	1	(5)	13	(65)	4	(20)	20
2010	0	(0)	1	(3)	0	(0)	0	(0)	22	(59)	14	(38)	37
2011	4	(8)	4	(8)	0	(0)	0	(0)	26	(51)	17	(33)	51
2012	1	(6)	1	(6)	0	(0)	0	(0)	4	(24)	11	(65)	17

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

Table 4. Unit 1D black bear mortality percent by transport method, regulatory years 2003 through 2012.

Regulatory year	Transport												
	Highway vehicle	(%)	Boat	(%)	Walk	(%)	Plane	(%)	Other[a]	(%)	Unk[b]	(%)	*n*
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	(18)	20	(45)	5	(11)	1	(2)	8	(18)	2	(5)	44
2006	11	(31)	11	(31)	4	(11)	0	(0)	9	(26)	0	(0)	35
2007	8	(24)	13	(38)	5	(15)	1	(3)	6	(18)	1	(3)	34
2008	22	(58)	9	(24)	3	(8)	0	(0)	4	(11)	0	(0)	38
2009	7	(33)	10	(48)	1	(5)	0	(0)	2	(10)	1	(5)	21
2010	15	(39)	18	(47)	1	(3)	0	(0)	3	(8)	1	(3)	38
2011	23	(43)	15	(28)	6	(11)	0	(0)	7	(13)	2	(4)	53
2012	8	(47)	5	(29)	2	(12)	0	(0)	2	(12)	0	(0)	17

[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 2003 through 2012. 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*
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
2007											
Fall 2007	26	5	5.2	15.5	5	0.0	0	4.4	5	0.0	0
Spring 2008	81	28	2.9	17.3	21	15.69	5	6.3	24	9.0	5
Total	107	33	3.2	16.9	26	15.69	5	6.0	29	9.0	5

Table continues next page

Table 5. continued.

Regulatory year	Total days	Hunter Effort: Nr hunters	Hunter Effort: Mean days per hunter	Mean skull size[a] (inches): Male	*n*	Female	*n*	Average age (years)[b]: Male	*n*	Female	*n*
2008											
Fall 2008	32	11	2.9	15.7	7	15.67	3	4.4	8	16.0	3
Spring 2009	123	27	4.6	16.9	21	15.91	4	7.7	22	10.8	5
Total	155	38	4.1	16.6	28	15.81	7	6.8	30	12.75	8
2009											
Fall 2009	2	2	1.0	16.2	1	15.54	2	4.0	1	6.5	2
Spring 2010	45	18	2.5	17.4	16	15.04	2	6.7	16	5.5	2
Total	47	20	2.4	17.4	17	15.29	4	6.5	17	6.0	4
2010											
Fall 2010	5	1	5	0.0	1	16.7	1	0.0	1	7.0	1
Spring 2011	122	36	3.4	17.4	30	15.4	6	8.0	30	6.8	6
Total	127	37	3.4	17.4	31	15.6	7	8.0	31	6.9	7
2011											
Fall 2011	10	8	1.3	17.7	2	14.0	7	14.5	2	11.4	7
Spring 2012	159	43	3.7	16.8	31	14.4	12	7.4	31	7.3	12
Total	169	51	3.3	16.8	33	14.2	19	7.8	33	8.7	19
2012											
Fall 2012	6	2	3	17.4	2	0.0	0	7.0	2	0.0	0
Spring 2013	73	15	4.9	16.8	10	15.6	5	0.0	0	0.0	0
Total	79	17	4.6	16.9	12	15.6	5	7.0	2	0.0	0

[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 years 2001–2012.

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*
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
2007–2009											
Total	309	91	3.4	16.9	71	15.6	16	6.4	76	10.1	17
2010-2012											
Total	375	105	3.6	17.0	76	15.1	31	7.8	74	8.5	28

[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 2003 through 2012.

Regulatory year	WAA							Total
	4302	4303	4304	4405	4406	4407	4408	
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
2007	13	15	0	3	1	2	0	34
2008	20	13	0	1	0	3	1	38
2009	9	10	0	0	0	2	0	21
2010	15	17	0	5	0	1	0	38
2011	14	17	0	11	5	5	1	53
2012	9	6	0	1	0	1	0	17

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

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CHAPTER 5: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 2 (3,600 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 capable of supporting a large number of bears. The large average skull sizes of Unit 2 bears compared to other Southeast Alaska bears also suggest that Unit 2 is extremely productive black bear habitat.

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 and 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, some bears are efficient predators of Sitka black-tailed deer fawns during a short vulnerable period in late May and June. 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). Fecundity may also be impacted if food supplies have been poor during the previous summer and the female has not accumulated adequate energy reserves. 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). Age of first reproduction for females on Prince of Wales tends to be skewed toward older bears ages 5-7 (Porter and Bethune unpublished data).

Although there are abundant healthy and productive habitats, more clearcut logging has occurred in Unit 2 than in other Southeast Alaska (Southeast) black bear area. Counting national forest

and private lands, the Alaska Department of Fish and Game (ADF&G) estimates about 475 mi^2 of forested black bear habitat in Unit 2 has been cut during the past 65 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 2,500 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 finish, as required by the 1997 Tongass Land Management Plan (TLMP, USFS 1997). The recently enacted Access Travel Management Plan (ATM) by the USFS will close 150 miles of road to highway vehicles and convert an additional 222 miles from highway vehicle use to off highway vehicle (OHV) use only (USDA 2009). As a result of more than 40 years of large-scale clearcut logging, habitat changes continue to occur. 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 lead to the decline of 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).

Logging activity peaked in the 1980's and early 1990's before declining to lower levels, but has seen a resurgence recently. The 2009 Logjam Timber sale produced 73 million board feet of lumber from clear-cutting 3,400 acres of old-growth habitat. The US Forest Service released a Record of Decision for another large-scale sale called the Big Thorne Timber sale in summer 2013. This sale, which is currently delayed, will allow for an additional 120 million board feet of lumber from approximately 6,000 acres of old growth forest. In addition, the Sealaska lands act recently passed by Congress transfers 70,000 acres of Tongass National forest to Sealaska Corporation. Of this, 68,400 acres, or 107 mi^2 of additional old-growth habitat is available for clear-cut logging.

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. In addition, ADF&G staff has conducted an extensive black bear life history research project on POW Island. Results from this project are currently being analyzed.

Regulatory history

Statewide sealing of black bears began in 1973. Since then we have been able to get data on hunter effort during the sealing process, but only for those hunters who were successful. However, a proposal passed at the 2008 Board of Game (BOG) meeting now requires all black bear hunters to obtain a harvest ticket/report prior to hunting allowing us to obtain catch per unit effort data from "all" hunters for specific locations they have hunted. The contact information we receive from these harvest tickets will also allow us to survey hunters for additional hunter effort information. As expected, the first few years of this new regulation have presented hunters with a huge learning curve. Compliance during this reporting period (2010-2012) has been spotty and harvest ticket data has not always aligned with bear sealing data. As hunters and license vendors get used to this new regulation, compliance will improve and we should begin collecting meaningful data during the next reporting period.

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 or glacier bear. Nonresident and resident bag limits were the same until 1990, when the nonresident limit was reduced to 1 bear per year. There has been a major change in the bear hunting regulations in Southeast Alaska (Units 1–3) during this reporting period. Beginning with RY2012, all unguided nonresidents are required to draw a tag. Unit 2 has been split into 2 seasons. The fall season (DL027) runs 1 September through 31 December. The spring season (DL028) is 1 January through 30 June. This reduced opportunity for unguided nonresidents is reflected in the harvest totals (Table 1). Seasons and bag limits remain unchanged for residents and nonresidents hunting with a registered guide.

Baiting

In 1982 it became legal to bait black bears year-round. However, in 1988, the Board of Game limited baiting in Southeast Alaska to the 15 April–15 June period. This was the same year that ADF&G records began to accurately document the number of bait permits issued. Beginning in fall 1996, hunters were required to salvage the edible meat of all spring black bears killed in Southeast Alaska during 1 January–31 May. This was a compromise for hunters at a time when baiting was under great public scrutiny. The salvage rule and bear baiting in general continue to be contentious issues, with proposals for and against these regulations coming before the BOG each cycle.

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 most hunters interested in this method have been 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 disturbance 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. During the last 2 reporting periods, only 1 local resident has applied for a permit. Approximately 1–4 bears are harvested with dogs each year, which is a small portion of the overall bear harvest. 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 (Bethune 2011). During 2003–2007 the average increased to 431 bears annually. Harvest peaked in 2005 at nearly 500 bears (Table 1) and has declined alarmingly since. Black bear harvest by nonresidents in Unit 2 steadily increased during the past 25 years and topped out at 89% during

2006 and 2007. During the past 10-year period, Alaska residents living in Unit 2 accounted for 6% and nonlocal residents another 9% of the harvest, with the remaining 85% going to nonresidents (Table 2). A draw hunt for unguided nonresidents instituted in RY2012 will likely reduce this percentage; in RY2012 nonresidents accounted for 65% of the harvest. Most nonresidents do not use a registered guide when black bear hunting in this unit, but guided hunts are increasing. Nonresident hunters must purchase a locking tag ($225–$300) to affix to each bear harvested. During the past 10 years, males have accounted for about 73% of the harvest and 74% of the total harvest has occurred during spring (Tables 1 and 3).

With the extensive road system, numerous lodges and bed and breakfasts, vehicle and skiff rentals available, POW is a very popular and economical hunt for the do-it-yourself hunter wanting to experience Alaska. Although we do not have comparable hunter effort data, field observations from staff, harvests and anecdotal reports of lower bookings from lodges indicate fewer hunters came to POW during the previous reporting period. Economic recession, fuel prices or lower bear populations are all potential reasons for this apparent decline. However, it appears that hunter participation increased during this reporting period leading up to the implementation of the limited draw hunt in RY 2012. It is likely that hunters came to POW in RY 2010 and 2011 knowing their chances to hunt POW in the future would be limited.

Until 1985 Unit 2 bear hunters used airplane, boat, and highway transportation in relatively equal amounts (Bethune 2011). 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 43% of the transportation used by successful Unit 2 hunters while boats accounted for 53% (Table 4). Even boat-based hunters are using the extensive road system to access multiple waterways on a typical hunt. New highway improvement and paving projects continue to improve access on Prince of Wales. Paving was completed along the main 30 Road from the Naukati Junction to Coffman Cove during the summer of 2009. The pavement from Hollis to Klawock is currently being improved and road improvements and paving from the Coffman Cove Junction north toward Whale Pass commenced in 2013 and continue. These projects have improved hunter access to the island but will be countered somewhat by diminishing road access due to road closures associated with the Forest Service's Access Travel Management Plan.

Historical harvest locations

Historically, Wildlife Analysis Areas (WAAs) 1214, 1317 and 1422 account for approximately one-third of the annual harvest (Table 5). WAA 1422, which includes Tuxekan and El Capitan passages on west POW, offers easy road access. WAA 1317 (the area south and west of Hollis) provides easy boat access into the 12-mile Arm area. WAA 1214 includes the popular Polk and McKenzie Inlet regions. Additional WAAs that have received notable hunting pressure more recently include 1420 (Ratz Harbor to Coffman Cove on the east side of POW), WAA 1318 which encompasses the area around the communities of Craig and Klawock, POW's primary population center and which affords hunters easy road access, and 1530 (Whale Pass and Exchange Cove on the northeast corner of the island) (Figure 1). Many of these areas also offer good boat access from saltwater along protected bays and passages.

Several popular WAA's experienced significant declines in harvest beginning in approximately 2008–2009, most notably WAA 1107 (Hydaburg area), 1210 (Moira Sound), 1211

(Cholmondeley Sound), 1317 (12-Mile Arm), 1319 (North Thorne), and 1422 (Tuxekan/El Cap) (Table 5).

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.

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 average skull size as a possible indication of changes in the population's age structure.

Skull size has been used in the past as a management tool. It was assumed that average skull size trends may indicate changes in population size and composition, and provide some measure of the sustainability of the harvest. It was postulated that 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 also indicate a reduction in the proportion of younger bears in the population. However, Person (Wildlife Biologist, ADF&G, Ketchikan, personal communication) conducted a rigorous analysis of the Unit 2 black bear harvest data from 1999-2007 and concluded that none of the biological parameters we measure such as harvest numbers, proportion of females in the harvest, skull size or age were sensitive enough indicators to predict impacts to the population. He did note that high numbers of bears killed in Major Harvest Units (MHU) 13–15 (Fig. 1) may have reduced the median age of bears in that segment of the harvested population and that it appeared there were fewer large bears proportionally in the harvested male population in those MHU's. Intense harvest may reduce the number of big bears and increase the proportion of younger animals in a population. Nonetheless, Person concluded that it was unclear from the data analyzed that any of the indicators used, pointed to an actual population decline. Person noted that skull size, age and proportion of females in the population has at least as much to do with hunter selectivity as any characteristic of 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.

Sex ratio is a 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 other 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 (Porter 2008).

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 Wildlife Troopers (AWT) 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 licensed big game guides. A premolar is also collected at the time of sealing and sent to Matson's Laboratory in Montana for age determination. During this report period, tissue and/or hair samples were also collected from harvested bears for genetic work and stable isotope diet analysis.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Precise population estimates are not available for black bears in Unit 2, though estimates can be made using known densities from other studies. We use information obtained during sealing to try to measure population trends. 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, but in the absence of accompanying demographic data, correlations between these measures and harvest sustainability are difficult to discern. Recently conducted research on POW will provide the department with a better understanding of black bears. Some of the results such as adult survival rates, fecundity, harvest rate and habitat use will help us better model bear populations in Unit 2.

Population Size

No black bear population studies have been completed 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 produced 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 (1995) derived a population estimate of 5,400 bears for the unit. In calculating this estimate, Larsen assumed bear densities were not homogenous across the landscape.

In 2000, ADF&G supported a study on a 400-mi^2 northern portion of Kuiu Island located in Unit 3 that used tetracycline biomarker mark-recapture technique to estimate black bear density. This study area was comprised of the most productive forest habitat on the island and included several major salmon producing streams and rivers. The research came up with a calculated density estimate of 3.9 bears/mi^2 (95% CI 1.8–5.6 bears/mi^2) (Peacock 2004). This high 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 and habitat types, the results may be more applicable to Unit 2 bear populations than studies done elsewhere. Using Peacock's estimate of 3.9 bears/mi^2 gives a population estimate of 14,040 bears in Unit 2. We know this estimate is likely too high, as it assumes that the entire Unit is comprised of the highest quality black bear habitat available. Indeed some areas in Unit 2, such as the southern MHUs are mostly muskeg scrub and low volume forest with few major salmon streams. We also know some areas such as Heceta and other western islands likely have few if any bears. Therefore a better, more conservative approach is to use the lower end of Peacock's 95% Confidence interval (1.8 bears/mi^2), which gives an estimate of 6,480 bears. We currently estimate the Unit 2 black bear population to be lower than that as the population appears to be depressed from highs seen in the 1990's and early 2000's. Plausible reasons for this decline include overharvest coupled with loss of habitat due to extensive logging in the unit over the past 50 years.

Current Research

During this and the previous reporting periods the department conducted 2 projects to help answer some of the questions surrounding the recent black bear population declines on POW. In 2008 we initiated a DNA mark-recapture pilot study in the central portion of Prince of Wales Island in an attempt to calculate harvest rate. We intensified efforts during the summer of 2009 and completed the project in 2010. This project used noninvasive breakaway single-capture noose snares equipped with barbed wire (Beier et al. 2005), and also short barbed wire fences to capture hair from live bears. Bears were considered marked if we obtained a genetic signature from hair samples. Recaptures were obtained from harvested bears during subsequent hunting seasons using tissue collected during the sealing process. This method gave a harvest rate of 9.2% (95% CI 0.034-0.188). Unfortunately, large number of tissue samples from harvested bears from 2008–2010 may have been compromised or lost. New techniques for collecting wolf DNA using scented hair boards is showing promise for use in future black bear density studies (Person and Larsen 2013).

In 2009 we began a comprehensive demographics, life history and movement patterns research project. Its objectives were to describe home range and movement patterns, and evaluate bear vulnerability to harvest along streams and roads. Bears were captured with modified Aldrich foot snares in elevated M-15 bucket sets and then were equipped with Gen IV GPS or VHF radio collars. Blood, tissue samples and morphometric data were collected at time of capture. Final reports will describe home range by gender, and will describe den sites and habitat selection using resource selection functions. This study is now complete and in the analysis and writing phase. We hope this project will help corroborate our hair snare work and previous bear research in Southeast. In addition, bear GPS collar locations data are being overlain with fawn mortality locations to derive better estimates of fawn predation by bears. (unpublished, Sophie Gilbert, Graduate Student, University of Alaska Fairbanks).

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 provides a better indicator of harvest sustainability and population well-being than it does of the ratio of males to females in the population. This is because many hunters select the largest bear they can find, and tend to harvest males at a rate higher than they occur in the population. We suspect the harvest of female bears increased over time as hunters had a harder time finding large male bears, thus they would take a large female bear. A decreasing trend in the male-to-female harvest ratio could signal a decline in the segment of the population made up of older, larger males.

Distribution and Movements

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 Kermode (white) bears, which occur infrequently in nearby British Columbia and occasionally along the mainland of Southeast Alaska.

MORTALITY

Harvest

Season	Bag limit
1 September–30 June	Resident hunters: 2 bears, not more than 1 of which may be a blue or glacier bear
1 September–30 June	Nonresident hunters using registered guides: 1 bear
1 September–31 December (DL027)	Nonresident hunters not using registered guides: 1 bear by drawing permit only.
1 January–30 June (DL028)	Nonresident hunters not using registered guides: 1 bear by drawing permit only.

Board of Game Action and Emergency Orders. At its 2010 meeting the BOG extended the Southern Southeast Controlled Use Area effective dates from 1 September–30 September to 1 September–31 October. This was in response to hunters switching effort from September to October. The CUA sunset on 31 October 2012 and was not reauthorized by the BOG.

At the 2010 meeting, in response to unsustainable black bear harvests in some parts of Southeast Alaska, the BOG established draw hunts for all nonresident black bear hunters not using registered guides. The justification for these hunts can be found in Board of Game Direction on Black Bear Guide Allocations and Harvests in Southeast Alaska (ADFG 2011).

We issued no emergency orders affecting black bears in Unit 2 during this report period.

Hunter Harvest. The 2010–2012 average harvest was 242 bears/year. The harvest has been trending downward since the peak harvest of 486 bears in 2005 (Table 1). Harvest numbers during this reporting period need to be viewed with the understanding that 2 different management approaches were employed during this reporting period. During RY2010 and RY2011 the hunt was a general open hunt, but changed to a draw hunt for unguided nonresidents

for the RY2012 season. The average of 242 bears/year during this report period includes harvests of 256 and 319 during 2010 and 2011 respectively, and 152 under newly established drawing hunt regulations in 2012. 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 Larsen's population estimate of 5,400 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 population estimate. We believe the recent high harvests have not been sustainable and that the bear population has been reduced markedly the last several years. Therefore, the simulation model of 14.2% harvest being sustainable on POW may be too high, or we may be over-estimating bear density.

We are likely also beginning to see the effects of reduced carrying capacity for bears in the Unit as extensive tracts of clearcuts grow into sterile, stem-excluded second growth forests. Other factors that managers must consider are wounding loss and illegal kills. Fifty percent additional mortality in 2005 (which the department suspects may be reasonable on POW based on radio collared bears) would bring the harvest to nearly 750 bears, which is very close to the simulation model's number of 767 bears as the maximum sustainable harvest for that year.

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 1989). The mean age of harvested Unit 2 bears has remained fairly constant during the past 10 years (2003–2012), with males averaging 6.5 years (range 6.0–7.3) and females 9.3 years (range 8.6–10.1) (Table 6). Males harvested in the fall are always younger on average than bears harvested in the spring. For example, the average age for males in fall 2007 was the lowest on record at 3.8 years (Table 6). The pattern is similar for female harvest in spring versus 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. The average age of male bears taken during this report period was 6.5 years (data based only on RY2010 and RY2011 as RY2012 data is not yet available).

We have failed to meet our management objective of 19.1 inch mean spring male skull size during all 3 years of this reporting period; 2010 ($\bar{x}$ =18.6), 2011 ($\bar{x}$ = 18.4) and 2012 ($\bar{x}$ = 18.8). However, the overall annual mean male skull size did exceed the management goal of 18.0 inches every year during this reporting period. We will continue to monitor the harvest for trends in age and skull size in the data. During the previous reporting period (RY2007–2009) hunters took 63, 27 and 7 bears with skull sizes ≥20 inches (average 32). During this reporting period hunters took 29, 44 and 26 ≥20 inch bears (average 33). Occasionally Unit 2 male bears also exceed the total 21-inch skull measurement, qualifying them for the Boone and Crocket record book. During this report period, 14 bears reached ≥21 inches. This is nearly identical to the 13 bears from 2007–2009 that met this criteria, but is markedly contrasted to the peak years of 2004–2006 when 24, 26 and 28 bears respectively reached this mark. Although managing Unit 2 for trophy black bears is not necessarily a specific management objective, we hope that the limited draw hunt will create a high quality hunt where hunters, if they choose to be selective, have a reasonable chance at a 20+ inch bear.

A sex ratio of 3 males to 1 female bear in the harvest (or 75% male harvest) is thought to be sustainable over the long term. This objective was met during RY2011 and RY2102, but not in RY2010. The overall average was 2.9:1 ratio for this reporting period or 74% male harvest. The average sex ratio of the harvest during the past 10 years (2003–2012) has been just below management objectives at 2.7:1 (range 2.3:1–3.7:1) and has been above 3:1 during 3 of those 10 years. The 3.7:1 (79% male) ratio observed during RY 2012 is one of the highest we have on record for Unit 2. Managers are optimistic that the implementation of a draw hunt for nonguided nonresidents is making hunters more selective.

We believe it is important to consider harvest by watershed and other site-specific locations in order to track potential localized overharvest and to evaluate our population estimate, which is currently based on available habitat in Unit 2 as a whole. Consequently, we looked at the Unit 2 harvest at smaller scale areas as well as unit wide. The unit is divided into major harvest units (MHUs), which in turn are composed of Wildlife Analysis Areas (WAAs). During this reporting period (RY2010–2012) MHU 1200 showed a sharp rising trend in percentage of females harvested. In MHU 15 the percentage was trending down slightly and in MHU's 1100, 1300, and 1400 the trend was sharply down. Compared to the last decade (2003–2012) the percent female harvest has been stable in MHU 1100 and 1500 and trending down in MHU's 1200, 1300 and 1400. When looking at total harvest of females during this reporting period, MHU 1200 is trending up but MHU's 1100, 1300, 1400 and 1500 are trending down sharply. Over the past decade (2003–2012) the total female harvest is trending down in all 5 MHU's. All trends were calculated using linear regression (Table 7 and Figure 1).

During this report period only 1 hound hunter registered to hunt with dogs. One bear was taken using hounds during this reporting period. This houndsman has assisted Fish and Game staff with bear captures using his tracking dogs and has also assisted several hunters to find and dispatch wounded and hard to locate bears.

Hunter Residency and Success. Nonresident hunters continue to harvest more bears in Unit 2 than local and nonlocal Alaska residents combined. Prior to the 1990's, nonresidents represented less than 50% of the Unit 2 bear harvest. During this report period, nonresidents took 80% of the reported harvest, while Unit 2 residents and nonlocal Alaska residents took 7% and 13% of the remaining harvest, respectively (Table 2). The discrepancy is even more pronounced looking at the 10-year average (2003–2012) with nonresidents taking 85% of the bears. The residency of successful hunters has shifted dramatically over the past 20 years. During the 1990's Alaska residents accounted for 37% of the harvest, compared to just 15% over the past decade (Table 2).

Reasons for this shift are most likely due to an increasing interest by non-Alaskans to hunt bears in Unit 2, and a change in demographics of Alaskans living in Unit 2. Most strikingly, the Unit 2 human population has changed in the past 20 years with the closure of many logging camps and overall reductions in timber-related activities. During the past 50 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. This may explain some of the reduced resident harvest.

Hunter effort has varied widely during this reporting period. Hunters logged 960 days afield during 2010, well below the peak of 1,677 days in 2005. Effort spiked in 2011 to 1,409 hunter days, most likely a function of a last push by hunters to hunt Unit 2 before the draw hunt was instituted. As a result of the first draw hunts in 2012, hunter days dropped to 504, the lowest managers have seen since the mid 1980's. The days-per-bear has remained constant at approximately 3.6 hunter days of effort per harvested bear over the past decade (range 3.3-4.4) (Table 6).

Harvest Chronology. Most Unit 2 bears are taken in the spring with May consistently ranking as the peak harvest month. The May bear harvest averaged 53% of the annual harvest during this reporting period, consistent with the previous 7-year average of 55%. Historically, the month of September was consistently the second highest harvest month, but with the implementation of the Southern Southeast Islands Controlled Use Area in RY2009 and draw hunt in RY2012, it has dropped off considerably. Currently June is the second highest-ranking bear harvest month (Table 3).

Harvest in particular Major Harvest Areas (MHU). Major Harvest Unit (MHU) 1300 accounted for the largest portion of the total harvest in Unit 2 for this reporting period with 31%. MHU's 1200, 1400 and 1500 were similar for this reporting period at 19%, 19% and 20%, respectively. This reflects the pattern of the previous 7 years (2003–2009) of MHU 1300 accounting for 30% of the harvest while MHU's 1200, 1400 and 1500 ranking 2nd through 4th with 23%, 20% and 18% respectively. MHU 1300 is the most road accessible area of Prince of Wales Island, which leads to intense harvest pressure.

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 (April 15–June 30). During the past 10 years, we have issued permits for an average of 101 bait site locations each year (range 54–157). During the 2005 season we issued permits for 157 sites, the most on record for a single year in Unit 2. However, even with the overall number of bait registration permits issued in the unit, the reported harvest over bait has historically accounted for only a small percentage of the total Unit 2 bear harvest. During this report period 2010–2012, hunters reported taking 20, 26 and 11 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 permit holder 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 posted site permit back to the department at the end of the hunting season. This printed bait site permit includes hunting license numbers from other visitors if they used another hunter's registered bait site. Hunters harvesting bears over bait each season in Unit 2 are traditionally nonresidents and typically use archery equipment to harvest a bear. Beginning spring 2010, hunters have been required by state regulation to provide exact GPS coordinates of their bait station prior to registration. This proposal was submitted by the Alaska Wildlife Troopers (AWT) to address the need for troopers to be able to locate bear baiting sites. Bear baiting permits come with a number of conditions associated with them, including requirements that they be placed away from roads and residences for public safety, and that the sites be cleaned up after the season ends. In order

for AWT to check bait sites for permit compliance, troopers need to be able to locate the sites in a safe and efficient manner. Prior to this regulation, troopers often spent hours looking for a single site. By requiring GPS locations, AWT has been able to use the waypoints to quickly and efficiently check sites for compliance and helping ensure bear baiting is conducted in a safe and responsible manner. This in turn should reduce threats of bear baiting opportunities being eliminated by voter initiatives.

Guided Hunter Harvest. Nonresidents accompanied by a licensed big game guide are allowed to harvest 1 bear. During this report period 8 guides were registered to hunt in Unit 2. 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 to use Federal Lands. 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 mirrored the harvest pattern seen in recent years, peaking in 2005 when 75 guided hunters harvested bears. During this reporting period, guided hunters took 49, 40 and 61 black bears respectively. This represents 19%, 12% and 39% of the harvest. The 39% guided harvest in RY2012 is a direct result of the black bear hunt going to a draw hunt. Except for RY2012, the average going back to RY2003 has been 14% guided harvest. Historically, 2–4 licensed big game guides have operated in Unit 2 annually. From 1990-1997 only 2 bears a year on average were taken by guided hunters, but in 1998 Unit 2 saw significant guided activity. Fifteen bears were taken on guided hunts that year and guided kills steadily increased to the peak in 2005.

The use of transporters to access hunting areas, especially by nonresidents, has been an issue of concern during this and previous report periods. Transporters are not limited by the State of Alaska or USFS to a set number of transported bear hunts (unlike registered guides who are permitted for a set number of bear hunts), so they can take as many clients on as they can handle, and that can equate to a high number of dead bears. The unregulated transporter issue is partly responsible for the large increase in bear harvest since the mid 1990s and the associated concerns we now have with bear conservation in Unit 2. Transporters are not legally allowed to influence where hunters go to hunt, nor can they assist hunters in locating or stalking game, or help clients care for trophies. There is concern that these regulations are frequently abused; that many transporters are operating similar to big game guides. The USFS is currently evaluating these activities and may eventually change its special use permit system to provide better transporter 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. The Forest Service is also looking at ways to bring transporters under the permit umbrella similar to guides and other permitted users. Although the Forest Service permit system is focused on addressing crowding issues, this mandatory reporting would also provide a way to monitor changes across all of the Tongass National Forest.

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 additional bears while hunting. Nonresident hunters probably wound more animals than residents because of unfamiliarity with local habitat conditions and vegetation, shot distance and placement, and basic bear behavior after the shot is

fired. Information from radio collared bears indicates a wounding rate near 25%. Although there is little other supportive data, managers believe the wounding loss on POW may actually be much higher, perhaps even as high as 50% of the annual harvest.

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. We suspect that bears killed at logging camps and in the many small Unit 2 communities have historically gone unreported due to the nature of DLP kills and the necessity of filling out paperwork and turning the bear over to the state. ADF&G is making a greater effort to build relationships with enforcement officials to foster better documentation and data collection in the future. Several bears are also killed in vehicle collisions each year along new stretches 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. Post logging increases in berry production, primarily *Vaccinium* spp., may contribute to short-term bear population growth. This new forage source will be lost as the canopy closes, as will habitat diversity associated with old-growth forests. We are also concerned with the loss of denning structures associated with the loss of trees. Logging removes valuable den trees. Bears do continue to use dens in stumps, but these structures will decay over time. 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 silviculture 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 barrier to most animals for approximately 20–25 years, after which canopy closure again results in loss of understory plants. The long-term effects of extensive clearcut logging will be detrimental to black bear populations in this unit. We may very well have reached the peak of bear suitability in Unit 2 as most of the areas previously clearcut are now reaching the closed canopy stage of forest succession. Several proposed large federal timber sales along with some state timber sale offerings will further reduce long term bear carrying capacity in Unit 2.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Nuisance Bear Problems. Historical records are inaccurate regarding the number of bears killed while getting into garbage or other human attractants in Unit 2. We receive only 1–2 DLP reports from POW each year. Since 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 rather than surrender it to authorities.

Until recently open landfills near many communities lured bears near people, and consequently, created generations of food-conditioned bears. A recent effort by the Alaska Department of Environmental Conservation to bring landfill managers into compliance with state regulations has resulted in fewer refuse attractions for Unit 2 bears. The city of Thorne Bay closed 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 steadily increased to record levels in 2005. Now that Unit 2 is under a draw permit for nonguided nonresidents, managers should be able to stabilize the annual bear harvest and bring it down to more sustainable levels. The data that has been collected to estimate the harvest rate of bears in the central WAAs on POW, as well as present research efforts aimed at providing some basic demographics, life history and movement pattern information about POW bears will greatly enhance our understanding of this important animal on POW to better address future management needs.

The general age trend of male and female bears in the harvest appears to be stable, but we have failed to meet our management objective of 19.1 inches mean spring male skull size during all 3 years of this reporting period

Unit 2 hunters would benefit from an educational video with information on identifying mature male bears in the field and that at the same time outlines 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 along the road system make up a large portion of the total bear harvest in the unit. Based on available literature, data collected, and crude density estimates, we believe the harvests during the mid 2000's exceeded sustainable levels. Regulatory changes such as the Southern Southeast Islands Controlled Use Area and a draw hunt for nonguided nonresidents have been implemented to address these concerns and appear to be effectively bringing harvests back within sustainable levels. Anecdotally, hunters and guides have reported a higher quality hunt post draw implementation, with less crowded hunting conditions and more bears available.

As logging continues, and large tracts of previously logged habitat rapidly convert to second-growth forest, we anticipate reductions in the carrying capacity for Unit 2 bears.

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Table 1. Unit 2 black bear harvest, RY 2003-2012.

Regulatory year	Reported													
	Hunter kill					Nonhunting kill[a]				Total estimated kill[c]				
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	M	(%)	F	(%)	Unk	Total
2003															
Fall 2003	65	49	0	114	0	0	2	0	2	65	(56)	51	(44)	0	116
Spring 2004	275	46	0	321	35	3	0	0	3	278	(86)	46	(14)	0	324
Total	340	95	0	435	35	3	2	0	5	343	(80)	97	(20)	0	440
2004															
Fall 2004	48	66	0	114	0	0	0	0	0	48	(42)	66	(58)	0	114
Spring 2005	296	61	0	357	30	0	0	0	0	296	(83)	61	(17)	0	357
Total	344	127	0	471	30	0	0	0	0	344	(73)	127	(27)	0	471
2005															
Fall 2005	71	53	0	124	0	0	0	0	0	71	(57)	53	(43)	0	124
Spring 2006	268	94	0	362	46	0	0	0	0	268	(74)	94	(26)	0	362
Total	339	147	0	486	46	0	0	0	0	339	(70)	147	(30)	0	486
2006															
Fall 2006	44	37	0	81	0	0	0	0	0	44	(54)	37	(46)	0	81
Spring 2007	240	72	0	312	37	0	0	0	0	240	(74)	72	(23)	0	312
Total	284	109	0	393	37	0	0	0	0	284	(70)	109	(28)	0	393
2007															
Fall 2007	47	58	0	105	3	0	0	0	0	47	(45)	58	(55)	0	105
Spring 2008	205	53	0	258	31	0	0	0	0	205	(79)	53	(21)	0	258
Total	252	111	0	363	31	0	0	0	0	252	(69)	111	(31)	0	363
2008															
Fall 2008	64	59	0	123	0	1	0	0	1	65	(52)	59	(48)	0	124
Spring 2009	176	27	0	203	24	0	0	0	0	176	(87)	27	(13)	0	203
Total	240	86	0	326	24	1	0	0	1	241	(74)	86	(26)	0	327

Table continues next page

Table 1. continued.

Regulatory year	Reported													
	Hunter kill					Nonhunting kill[a]				Total estimated kill[c]				
	M	F	Unk	Total	Baited[b]	M	F	Unk	Total	M	(%)	F	(%)	Unk	Total
2009															
Fall 2009	26	32	3	61	0	2	0	0	2	28	(46)	32	(53)	3	63
Spring 2010	145	36	0	181	8	1	0	0	1	146	(80)	36	(20)	0	182
Total	171	68	3	242	8	3	0	0	3	174	(72)	68	(28)	3	245
2010															
Fall 2010	27	24	0	51	0	3	0	0	3	30	(56)	24	(44)	0	54
Spring 2011	151	54	0	205	20	0	1	1	2	151	(73)	55	(27)	0	206
Total	178	78	0	256	20	3	1	1	5	181	(70)	79	(30)	0	260
2011															
Fall 2011	25	21	0	46	0	1	0	0	1	26	(55)	21	(45)	0	47
Spring 2012	219	54	0	273	26	0	0	2	2	219	(80)	54	(20)	2	275
Total	244	75	0	319	26	1	0	2	3	245	(77)	75	(23)	2	322
2012															
Fall 2012	19	14	0	33	0	5	0	0	5	24	(63)	14	(37)	0	38
Spring 2013	100	19	0	119	11	0	0	0	0	100	(84)	19	(16)	0	119
Total	119	33	0	152	11	5	0	0	5	124	(79)	33	(21)	0	157

[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 total

Table 2. Unit 2 residency of successful black bear hunters, RY 2003-2012.

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total
2003	28	(7)	24	(5)	383	(88)	435
2004	28	(6)	42	(9)	401	(85)	471
2005	20	(4)	41	(8)	425	(87)	486
2006	18	(5)	26	(7)	349	(89)	393
2007	17	(5)	22	(6)	324	(89)	363
2008	22	(7)	24	(7)	280	(86)	326
2009	22	(9)	25	(10)	195	(81)	242
2010	14	(5)	28	(11)	214	(84)	256
2011	19	(6)	33	(10)	267	(84)	319
2012	19	(13)	34	(22)	99	(65)	152
Average	21	(6)	30	(9)	294	(85)	344

[a] Local hunters are those hunters that reside in Unit 2.

Table 3. Unit 2 black bear hunter harvest chronology by month[a], RY 2003-2012

Regulatory	Harvest periods												
year	Sep	(%)	Oct	(%)	Nov	(%)	Apr	(%)	May	(%)	Jun	(%)	*n*
2003	99	(24)	13	(3)	2	(<1)	21	(5)	265	(60)	35	(8)	435
2004	99	(21)	11	(2)	4	(1)	37	(8)	278	(59)	42	(9)	471
2005	110	(23)	12	(2)	2	(<1)	18	(4)	276	(57)	68	(14)	486
2006	95	(24)	11	(3)	4	(1)	3	(1)	223	(57)	57	(15)	393
2007	94	(26)	9	(2)	2	(<1)	10	(3)	184	(51)	64	(18)	363
2008	104	(32)	13	(4)	6	(2)	7	(2)	133	(41)	63	(19)	326
2009	30	(13)	25	(10)	3	(1)	5	(2)	139	(58)	37	(15)	242
2010	31	(12)	16	(6)	4	(2)	6	(2)	132	(52)	67	(26)	256
2011	35	(11)	8	(3)	3	(1)	2	(<1)	168	(53)	103	(32)	319
2012	17	(11)	11	(7)	5	(3)	5	(3)	82	(54)	32	(21)	152
Average	71	(20)	13	(4)	4	(1)	11	(3)	188	(55)	57	(17)	344

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

Table 4. Unit 2 transportation methods use in harvesting black bears, RY 2003-2012.

	Transport												
Regulatory year	Air	(%)	Boat	(%)	Highway vehicle	(%)	Walk	(%)	ORV	(%)	Unk	(%)	*n*
2003	11	(1)	231	(54)	185	(43)	7	(0)	1	(0)	0	(0)	435
2004	6	(1)	235	(50)	228	(48)	0	(0)	0	(0)	3	(<1)	471
2005	5	(1)	258	(53)	219	(45)	4	(1)	0	(0)	0	(0)	486
2006	12	(3)	181	(46)	200	(51)	0	(0)	0	(0)	0	(0)	393
2007	3	<1	186	(51)	163	(45)	10	(3)	1	<1	0	(0)	363
2008	7	(2)	140	(43)	165	(51)	11	(3)	3	<1	0	(0)	326
2009	1	<1	129	(53)	90	(37)	8	(3)	1	<1	13	(5)	242
2010	13	(5)	141	(55)	88	(34)	10	(4)	3	(1)	1	(<1)	256
2011	4	(1)	197	(62)	108	(34)	10	(3)	0	(0)	0	(0)	319
2012	4	(2)	109	(72)	33	(22)	6	(4)	0	(0)	0	(0)	152
Average	7	(2)	181	(53)	148	(43)	7	(2)	1	(<1)	2	(<1)	344

Table 5. Unit 2 black bear harvest from the most heavily harvested wildlife analysis areas (WAA), RY 2003-2012.

WAA	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	$\bar{x}$
1107	16	37	35	23	28	14	5	10	17	7	**19**
1210	26	10	24	12	12	6	3	8	11	8	**12**
1211	20	35	32	28	18	8	3	6	4	5	**16**
1213	9	16	21	7	8	11	6	1	2	4	**9**
1214	37	38	55	21	27	37	31	28	35	19	**33**
1315	24	13	12	16	18	13	15	14	18	9	**15**
1316	3	3	1	3	4	8	2	2	2	1	**3**
1317	34	37	32	36	28	26	14	14	30	1	**25**
1318	25	11	13	16	19	16	13	17	25	3	**16**
1319	21	24	36	22	27	22	10	8	11	5	**19**
1332	0	15	14	19	18	12	15	13	14	5	**13**
1420	16	24	29	23	11	18	14	26	15	14	**19**
1421	11	10	8	11	8	9	8	5	7	3	**8**
1422	50	62	60	46	49	43	23	22	28	16	**40**
1526	26	22	12	19	10	9	9	12	17	15	**15**
1527	16	5	10	12	12	5	6	12	14	1	**9**
1529	10	19	19	21	13	10	9	12	14	3	**13**
1530	17	16	13	13	8	17	10	3	10	4	**11**
1531	4	9	6	4	8	4	0	4	0	0	**4**

Table 6. Unit 2 successful black bear hunter effort, mean skull size, and mean age, RY 2003-2012.

Regulatory year	Hunter effort: Total days	Hunter effort: Nr hunters	Hunter effort: Mean days per hunter	Mean skull size[a] (inches): Male	Mean skull size[a] (inches): n[d]	Mean skull size[a] (inches): Female	Mean skull size[a] (inches): n	Average age (years)[bc]: Male	Average age (years)[bc]: n	Average age (years)[bc]: Female	Average age (years)[bc]: n
2003											
Fall 2003	355	114	3.1	17.5	65	16.6	46	4.8	64	9.0	49
Spring 2004	1142	320	3.6	19.4	272	17.2	44	7.9	271	10.2	43
Total/Average	1497	435	$\bar{x}$ =3.4	$\bar{x}$ =19.0	337	$\bar{x}$ =16.9	90	$\bar{x}$ =7.3	335	$\bar{x}$ =9.5	92
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	$\bar{x}$ =3.5	$\bar{x}$ =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	$\bar{x}$ =3.5	$\bar{x}$ =18.0	325	$\bar{x}$ =16.9	138	$\bar{x}$ =6.0	330	$\bar{x}$ =8.6	141
2006											
Fall 2006	267	81	3.3	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
2007											
Fall 2007	323	104	3.1	16.7	46	16.8	57	3.8	46	8.7	55
Spring 2008	967	255	3.8	18.9	201	17.2	52	7.3	191	10.8	50
Total/Average	1,290	359	$\bar{x}$ =3.6	$\bar{x}$ =18.5	247	$\bar{x}$ =17.0	109	$\bar{x}$ =6.6	237	$\bar{x}$ =9.7	105
2008											
Fall 2008	331	120	2.8	17.3	56	16.8	53	5.0	54	9.5	50
Spring 2009	767	203	3.8	18.9	166	17.3	26	7.0	151	11.3	22
Total/Average	1,098	323	$\bar{x}$ =3.4	$\bar{x}$ =18.5	222	$\bar{x}$ =17.0	79	$\bar{x}$ =6.5	205	$\bar{x}$ =10.0	72

Table continued next page

Table 6. 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*
2009											
Fall 2009	160	53	3.0	17.6	25	16.6	28	5.2	19	8.5	25
Spring 2009	630	177	3.6	18.9	146	16.8	34	7.0	120	11.1	29
Total/Average	790	230	$\bar{x}$ =3.4	$\bar{x}$ =18.7	171	$\bar{x}$ =16.7	62	$\bar{x}$ =6.8	139	$\bar{x}$ =9.9	54
2010											
Fall 2010	168	51	3.3	17.2	27	16.5	23	5.9	20	8.8	18
Spring 2011	792	205	3.9	18.6	150	17.0	52	6.4	146	10.5	49
Total/Average	960	256	$\bar{x}$ =3.8	$\bar{x}$ =18.4	177	$\bar{x}$ =16.8	75	$\bar{x}$ =6.3	166	$\bar{x}$ =10.1	67
2011											
Fall 2011	126	46	2.7	16.9	25	16.5	19	4.1	24	9.1	21
Spring 2012	1283	273	4.7	18.4	215	17.0	53	6.0	207	8.3	51
Total/Average	1409	319	$\bar{x}$ =4.4	$\bar{x}$ =18.2	240	$\bar{x}$ =16.8	72	$\bar{x}$ =6.6	231	$\bar{x}$ =8.6	72
2012											
Fall 2012	78	33	2.4	17.8	19	16.3	14	--	--	--	--
Spring 2013	426	119	3.6	18.8	100	16.7	19	--	--	--	--
Total/Average	504	152	$\bar{x}$ =3.3	$\bar{x}$ =18.6	119	$\bar{x}$ =16.5	33	--	--	--	--

[a] Skull sizes equal length plus zygomatic width.

[b] Bear ages for 2012 not available, results still returning from lab at time of printing.

[c] *n* represents sample size. Totals may not equal other tables due to some bears not being aged and/or damaged skulls at sealing.

Table 7. Unit 2 black bear harvest by major harvest unit (MHU), RY 2003-2012.

	MHU 1100			MHU 1200			MHU 1300			MHU 1400			MHU 1500		
Year	Female	Total	% Fem.	Female	Total	% Fem.	Female	Total	% Fem.	Female	Total	% Fem.	Female	Total	% Fem.
2003	4	48	8	17	102	17	31	122	25	21	77	27	22	83	27
2004	7	51	14	24	109	22	31	124	25	34	96	35	30	85	35
2005	13	47	28	45	136	33	39	128	30	28	95	29	22	72	31
2006	7	32	22	16	81	20	44	119	37	19	80	24	22	78	28
2007	10	39	26	21	65	32	36	122	30	22	68	32	22	61	36
2008	4	26	15	19	67	28	26	100	26	20	70	29	17	51	33
2009	2	18	11	4	47	9	27	79	34	14	44	32	17	39	44
2010	8	25	32	4	46	9	20	76	26	24	55	44	19	55	35
2011	7	33	21	11	56	20	28	110	25	10	50	20	17	62	27
2012	1	19	5	10	38	26	3	36	8	10	33	30	9	31	29
Ave.	6	34	18	17	75	23	29	102	28	20	67	30	20	62	32

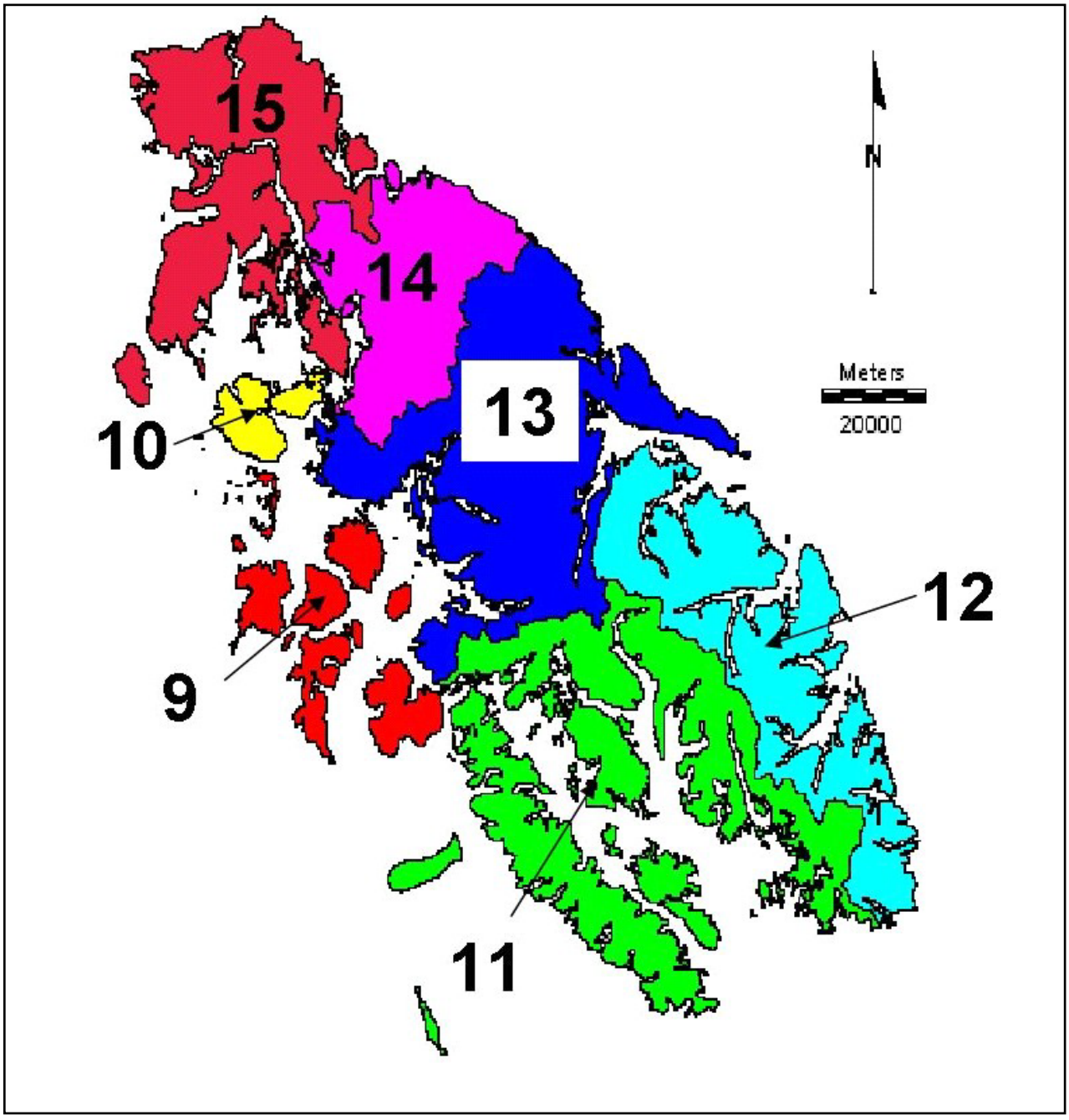

Figure 1. Unit 2 Major Harvest Units (MHUs, XX00s).

Alaska Department of Fish and Game
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JUNEAU, AK 99811-5526

CHAPTER 6: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 3 (3,000 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 also 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 3, 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 3,000 mi^2 of terrestrial habitat in Unit 3, about 1,500 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, harvest records and anecdotal evidence indicate that the unit's black bear population has declined over the last decade (RY00–RY09). We now believe the population has stabilized at moderate levels.

Regulation History

Sealing of black bears was first required in 1973. Prior to 2009, hunters were not required to obtain a hunt harvest ticket or registration permit for black bear; thus, effort data for unsuccessful hunters had previously been unavailable and information on hunt effort was available only for successful hunters.

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 (board) 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 one has requested a permit to hunt bears with dogs in 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 established a harvest guideline of 120 bears annually for nonresidents on Kuiu Island. In 2001, the first year it was 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.

Due to concerns about wounding loss, at its Region I meeting in November 2004 the board passed a regulation requiring a wounded black or brown bear to count against the bag limit of the hunter for the regulatory year in Units 1–4. At its statewide meeting in February 2004, the board passed a regulation allowing the sale of handicraft articles made from the fur of black bears.

At its Region I meeting in November 2008 the board passed a regulation requiring black bear hunters in Units 1–7, 11–17, 19D and 20 to obtain a black bear harvest ticket prior to hunting.

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 2000–2001 regulatory year the Unit 3 harvest was 309 bears, with 165 (53%) of those taken on Kuiu Island. From 2000 to 2009, approximately 73–85% of the annual harvest occurred 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 increased 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 unitwide black bear harvest from 1990 to 1999. 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. Over the last decade (RY00–RY09), the percentage of the unitwide harvest from Kuiu decreased to 50%, while the percentage of the harvest from Kupreanof increased to 43%, and the percentage from Mitkof Island decreased to 4%. The percentage of the unitwide harvest from the remainder of the Unit 3 islands has remained stable at 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 the skull size data 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.

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), a population estimation study conducted on northern Kuiu Island (Peacock 2004), harvest sealing records, anecdotal public reports, and observations by ADF&G staff.

Population Size

Except for the 2000 and 2002 estimates for northern Kuiu Island, precise population estimates have never been available for black bears in the unit. Because the northern Kuiu population estimates were derived from studies conducted in 2000–2002 they may no longer be applicable. This is because changes in habitat post logging on Kuiu can greatly influence the ability of this habitat to support forage that is conducive to high bear densities. Also, the harvest of black bears during the past 10 years on Kuiu may have been above a sustainable level, and some evidence suggests black bear numbers on Kuiu have declined significantly since the late 1990s. 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.

Information collected during sealing cannot be used to measure population trends. Prior to the 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 3,340 black bears in Unit 3 in 1990 based on an estimate of 2,220 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, although black bears occur on Zarembo Island, their numbers remain very low. Bear densities are also relatively low on Etolin and other islands south of Sumner Strait. Density is believed to be 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 small 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.

A declining harvest trend since 2000 combined with anecdotal reports of fewer bear sightings by hunters and guides suggests that the Unit 3 black bear population has decreased during the last decade (RY00–RY09).

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 changes in 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.

In addition to seeing fewer bears in general, in recent years hunters and guides have reported seeing relatively few sows accompanied by cubs, particularly on Kuiu Island. It is therefore possible that low recruitment may be partially responsible for the suspected decline in the Unit 3 black bear population.

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

RY 2010 and 2011

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

RY 2012

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

1 September–30 June	Bag Limit Kuiu Island: Nonresident hunters without guide: 1 bear by drawing permit only (DL029)
1 September–30 June	Bag Limit Kupreanof Island: Nonresident hunters without guide: 1 bear by drawing permit only (DL030)
1 September–30 June	Bag Limit Unit 3 remainder: Nonresident hunters without guide: 1 bear by drawing permit only (DL031)

Game Board Action and Emergency Orders. In order to address the relatively high harvest of female bears during the fall season, in November 2008 the Board of Game created a controlled use area prohibiting the use of motorized land vehicles for black bear hunting in Units 2 and 3 during the month of September, with the exception of transportation directly to and from public transportation facilities and boat launches. In RY11 the Unit 3 controlled use area was modified to include only Kupreanof, Mitkof, and Wrangell islands. In RY12 the regulation was allowed to "sunset" in Unit 3.

Recent declines in harvests, following a long-term trend of increasing harvests, raised department concerns about whether black bear harvests were being managed at sustainable levels in Southeast Alaska. This, along with concerns expressed by agency biologists, big game guides, hunters, and members of the general public about what appeared to be fewer bears in parts of the region, prompted the department and others to seek regulatory action at the Alaska Board of Game meeting in November 2010 on black bear harvests. At the meeting, the board adopted a proposal submitted by the Alaska Professional Hunters Association (APHA) requiring non-resident black bear hunters who do not enlist the services of a registered hunting guide to obtain a drawing permit before hunting black bears in Units 1–3. APHA's contention was that whereas the guides were held to a limited number of hunts by the United States Forest Service, there was no such limit on hunter effort existed for independent unguided nonresident hunters and those enlisting the services of transporters or outfitters.

During testimony on APHA's proposal, the board asked the department to provide estimates of bear numbers and densities for specific geographical areas that were believed to constitute discrete black bear management areas. In response, the department identified 10 discrete management areas in Units 1–3, and provided estimates of bear numbers and densities within each bear management area.

After reviewing population and density data, the board asked the department to use regulatory years 2007–2009 as base years for analyzing black bear harvest data. Using the mean annual black bear harvests by residents, and guided and unguided nonresident hunters during regulatory

years 2007–2009, the department allocated harvests between guided and unguided nonresident hunters and established the numbers of unguided nonresident draw permits to be made available within each of the 10 established geographic black bear management areas. Three of the 10 bear management areas are located in Unit 3; they are Kuiu Island, Kupreanof Island and the remainder of unit 3.

As a result of the board's action, starting in RY12 non-resident black bear hunters who do not employ the services of a registered guide are required to possess a drawing permit prior to hunting black bears in Units 1–3. By adjusting the numbers of drawing permits issued, the department now has the ability to control the numbers of bears taken by unguided nonresident hunters. At the same time, registered guides are also are expected to limit their harvests of black bears, to the mean annual harvests they experienced during regulatory years 2007–2009. In addition, guides will also be expected to limit their harvests geographically based on each of their previous harvest distributions within the 10 individual black bear management areas during the regulatory 2007–2009 base years.

Implementation of the new regulation was delayed until the start of RY 2012, in order to afford hunters and guides with preexisting hunt arrangements enough time to adjust to and comply with the new regulation.

We issued no emergency orders during this report period.

Hunter Harvest. Unit 3 hunter harvests ranged from 177 to 185 bears annually during this report period (Table 1). The average annual harvest of 181 bears annually during this report period was well below the preceding 10-year average (RY00–RY09) of 229 bears annually. The 177 bears killed by hunters in RY10 represent the second lowest annual harvest since the 1992–1993 season. (Table 1)

Beginning in RY12, non-resident black bear hunters who do not employ the services of a registered big game guide are required to possess a drawing permits prior to hunting black bears in the unit. Three separate unguided nonresident drawing permit areas have been established in Unit 3, including Kuiu Island (DL029), Kupreanof Island (DL030), and the Remainder of Unit 3 (DL031). In 2012, a total of 40 permits were issued for Kuiu, 28 people hunted and 15 bears were killed for a success rate of 54 percent. A total of 83 permits were issued for Kupreanof, 59 people hunted and 30 bears were killed for a success rate of 51 percent. A total of 21 permits were issued for the remainder of Unit 3, 17 people hunted and 5 bears were killed for a success rate of 29 percent (Table 2).

Males made up 79%, 78% and 84% of the Unit 3 harvest in 2010, 2011 and 2012, respectively. In RY08–09 the average male skull size fell below the management objective and began a declining trend that continued into the current report period. During this report period, the average male skull size ranged from 17.8 inches to 18.1 inches, well below the management objective of 18.5 inches (Table 3). The average age of harvested males during the report period was 7.1 years, which was below the preceding 5-year average (RY05–09) of 8.0 years (Table 4). The male to female ratio during this report period was over 4:1—above the management objective of 3:1.

Harvest in Particular Areas. Harvest occurred in 22 individual Unit 3 Wildlife Analysis Areas (WAAs) during this report period. Of the 544 bears harvested, 45% were taken from 6 WAAs on Kuiu Island, and 42% were taken from 9 WAAs on Kupreanof Island. WAA 5012 alone, on northern Kuiu Island, accounted for 16% of the total unit wide harvest. Combined, the harvest from 6 other Unit 3 WAAs, including those on Mitkof, Wrangell, Etolin, and Woronkofski, Rynda and Greys Islands, accounted for just 13% of the unit wide harvest (Table 6).

Hunter Residency and Success. Although the percentage varies annually, during this report period nonresidents took approximately 76% of the bears harvested in the unit, nonlocal Alaskans took about 13%, and local residents about 11% (Table 8).

Harvest Chronology. During this report period, 83–86% of the overall harvest occurred during the spring season, with 54–59% of all bears killed in May (Table 9).

Bait Stations. A total of 14 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. Seven permittees requested authorization to establish 2 bait stations, and 7 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 2010, 6 individuals were authorized to establish 10 bait stations. In 2011, 4 individuals were issued permits to establish 6 bait stations. In 2012, 6 individuals were issued permits to establish 10 bait stations.

Guided Hunter Harvest. During the report period, harvest by guided nonresident hunters accounted for 37% of the overall harvest. Guided nonresidents accounted for 40% of the harvest in 2010, 30% in 2011, and 43% in 2012.

Transport Methods. Hunter transportation is primarily by boat, highway vehicle and airplane, respectively (Table 10). During this report period the unitwide percentage of hunters using highway vehicles to access hunt areas increased from the previous 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.

Although the amount of wounding loss is possibly significant, little information is currently available on how much is occurring in the unit. Between spring 2001 and fall 2004 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 failed to recover 13 (21%) of 63 black bears struck and wounded. 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. Although 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.

During this report period, timber harvest occurred on, Kupreanof, Mitkof, Zarembo, and Wrangell Islands. Timber harvest is planned or already scheduled for additional sale areas on Etolin, Kupreanof, Kuiu, Mitkof, Zarembo, 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. 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, before 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/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 killed in the unit under defense of life and property (DLP) regulations. 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. It is unclear if these mortalities are the result of DLPs or other legal or illegal harvests, but 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

In recent years, declining black bear harvests across much of the region, including Unit 3, have led to concerns about potential overharvest. The Unit 3 black bear harvest steadily declined from 232 bears in 2006 to 169 in 2009, the lowest unitwide harvest since 1992–93. The average annual harvest of 181 bears during this report period was well below the preceding 10-year average (RY00–RY09) of 229 bears annually. In addition to the declining harvest, declining trends in both the average skull size and age of males harvested annually since RY08 further heighten concerns about black bear management in the unit. The average male skull size, which began a declining trend in RY08–09, continued to decline during the report period. The average male skull size during the report period was 18.0 inches, well below the preceding 10-year average (RY00–09) of 18.5 inches. The average age of harvested males was 7.1 years, also below the preceding 10-year average (RY00–09) of 7.6 years. The male-to-female harvest ratio during the report period was 4:1, slightly above the management goal of 3:1.

The reason for the declining trends in harvest, average male skull size and average male age remain unknown and are cause for concern. The decreasing harvest trend, combined with anecdotal reports from big game guides, hunters and agency biologists suggest that over the last decade black bear populations have declined on some Unit 3 islands. Guides report seeing fewer bears in general, and fewer sows accompanied by cubs in particular. The exact cause of the suspected population decline remains unclear and could be due to one or more contributing factors. Those factors may include overharvest, climatic or environmental changes, or reductions in carrying capacity resulting from clearcut logging. Guides and agency biologists have also noted that a high percentage of wolf scats examined on Kuiu Island contain the remains of black bears suggesting that predation by wolves may be contributing to the suspected decline in the unit's black bear populations.

One effort to address declining harvest trends is the new requirement that non-resident black bear hunters who do not employ the services of a registered guide possess a drawing permit prior to hunting black bears in Units 1–3. By adjusting the numbers of drawing permits issued, the department will now have the ability to control the number and distribution of bears taken by unguided nonresident hunters. At the same time, registered guides will be expected to limit their harvests of black bears both numerically and geographically, to the mean annual harvests they experienced during regulatory years 2007–2009.

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 Kuiu and Kupreanof Islands. Research is also needed to: 1) identify possible correlations between sealing data and population trends; 2) provide a better understanding of the short- and long-term impacts of clearcut logging on black bear populations; and 3) establish some estimate of black bear mortality as a result of wounding loss.

Although no additional management or regulatory changes are recommended at this time, in light of the unit's declining harvest trend and suspected population decline, we will continue to monitor the harvest and sealing data closely and adjust harvest quotas as necessary. In the absence of precise population estimates, ensuring that black bear populations are managed within sustainable harvest limits will remain a formidable challenge for wildlife managers.

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Table 1. Unit 3 black bear harvest, 1999–2012.

	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
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

	Hunter kill						Nonhunting kill[a]			Total estimated kill					
	M	F	(%)	Unk.	Total	Over bait	M	F	Unk.	M	(%)	F	(%)	Unk.	Total
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
Fall 07	18	15	45	0	33	0	0	0	0	18	56	15	45	0	33
Spring 08	161	31	16	0	192	1	0	0	0	161	84	31	16	0	192
Total	179	46	20	0	225	1	0	0	0	179	80	46	20	0	225
Fall 08	24	18	43	0	42	0	0	0	0	24	57	18	43	0	42
Spring 09	141	24	15	0	165	2	0	0	0	141	85	24	15	0	165
Total	165	42	20	0	207	2	0	0	0	165	80	42	20	0	207
Fall 09	21	14	40	0	35	0	0	0	0	21	60	14	40	0	35
Spring 10	113	21	16	0	134	2	0	0	0	113	84	21	16	0	134
Total	134	35	21	0	169	2	0	0	0	134	79	35	21	0	169
Fall 10	17	11	(39)	0	28	0	1	0	0	18	(62)	11	(38)	0	29
Spring 11	123	26	(17)	0	149	3	0	0	0	123	(83)	26	(17)	0	149
Total	140	37	(21)	0	177	3	1	0	0	141	(79)	37	(21)	0	178
Fall 11	17	12	(41)	1	30	0	1	0	1	18	(60)	12	(40)	2	32
Spring 12	127	28	(18)	0	155	2	0	0	0	127	(82)	28	(18)	0	155
Total	144	40	(22)	1	185	2	1	0	1	145	(78)	40	(22)	2	187
Fall 12	21	9	(30)	0	30	0	0	0	0	21	(70)	9	(30)	0	30
Spring 13	132	20	(13)	0	152	0	0	0	0	132	(87)	20	(13)	0	152
Total	153	29	(16)	0	182	0	0	0	0	153	(84)	29	(16)	0	182

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

Table 2. Unit 3 black bear harvest data by nonresident drawing hunt number, 2012.

Hunt Nr	Regulatory Year	Permits issued	Did not hunt	Percent successful hunters	Number failing to report	Males	(%)	Females	(%)	Unk	Total harvest
DL029 Kuiu Island Drawing	2012	40	9	54	3	14	(93)	1	(7)	0	15
DL030 Kupreanof Island Drawing	2012	83[a]	18	51	6	27	(90)	3	(10)	0	30
DL031 Unit 3 Remainder Drawing	2012	21[b]	4	29	0	5	(100)	0	(0)	0	5
Total all hunts	2012	144	31	48	9	46	(92)	4	(8)	0	50

[a] Excludes 1 unguided nonresident that hunted Kupreanof Island unsuccessfully with the wrong permit (GL000)

[b] Excludes 1 unguided nonresident that hunted Mitkof Island unsuccessfully with the wrong permit (GL000)

Table 3. Unit 3 harvested black bear mean skull size[a], 1998–2012.

Regulatory year	Males	*n*	Females	*n*
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
2007–2008	18.6	177	16.7	44
2008–2009	18.3	162	17.0	42
2009–2010	18.3	130	16.7	35
2010–2011	18.1	139	16.7	35
2011–2012	17.8	141	16.5	39
2012–2013	18.0	146	16.7	29

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

Table 4. Unit 3 harvested black bear mean age, 1998–2012.

Regulatory year	Males	*n*	Females	*n*
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
2007–2008	8.3	172	9.2	44
2008–2009	7.6	163	11.0	42
2009–2010	7.6	127	10.0	33
2010–2011	7.3	136	10.3	34
2011–2012	6.5	132	10.4	39
2012–2013	7.4	147	12.4	25

Table 5. Unit 3 harvested black bear mean days hunted per successful hunter, 1998–2012[a].

Regulatory year	Total days	Total hunters	Total harvest	Average days hunted
1998–1999	892	292	292	3.1
1999–2000	871	282	287	3.1
2000–2001	930	309	309	3.0
2001–2002	964	286	286	3.4
2002–2003	775	228	228	3.4
2003–2004	682	207	207	3.3
2004–2005	651	195	198	3.3
2005–2006	696	223	228	3.1
2006–2007	751	227	232	3.2
2007–2008	728	221	225	3.2
2008–2009	671	201	207	3.2
2009–2010	610	164	169	3.6
2010–2011	566	174	177	3.2
2011–2012	681	182	185	3.7
2012–2013	592	177	182	3.3

[a] Totals do not include DLP.

Table 6. Unit 3 black bear hunter harvest by island and density, 1998–2012.

	Kupreanof 1090 mi^2				**Kuiu** 746 mi^2				**Mitkof** 211 mi^2			
		Percent	Average mi^2/ bear kill			Percent	Average mi^2/ bear kill			Percent	Average mi^2/ bear kill	
Regulatory year	Kill	of Unit 3	Male	Female	Kill	of Unit 3	Male	Female	Kill	of Unit 3	Male	Female
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
2007	84	37	17	55	130	58	7	31	4	2	53	No females
2008	88	43	15	68	96	46	9	44	15	7	30	26
2009	73	43	20	57	76	45	12	57	13	8	19	106
2010	66	37	22	68	87	49	10	57	5	3	53	211
2011	88	48	16	57	75	41	13	47	10	5	23	211
2012	74	41	18	91	81	45	11	68	4	2	70	211

Table 7. Unit 3 black bear mean male skull size[a] and percent of harvest by major island and season, 2001–2012.

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

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

Table 7. 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. continued.

		2007				2008				2009			
Island	Season	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*
Kupreanof	Fall	6	67	18.4	6	10	53	16.2	10	6	40	17.4	6
	Spring	58	77	18.5	58	62	90	18.2	60	48	83	18.1	46
	Total	64	76	18.5	64	72	82	17.9	70	54	74	18.0	52
Kuiu	Fall	11	48	18.2	11	12	63	18.6	11	8	73	18.1	8
	Spring	95	89	18.9	93	67	87	18.6	67	55	85	18.8	55
	Total	106	82	18.8	104	79	82	18.6	78	63	83	18.7	63
Mitkof	Fall	1	100	NA	1	1	33	NA	1	5	83	17.2	4
	Spring	3	100	17.1	3	6	50	17.7	6	6	86	17.0	6
	Total	4	100	16.0	4	7	47	17.7	7	11	85	17.1	10

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

Table 7. continued.

		2010				2011				2012			
Island	Season	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*	Nr males	(%)	Average	*n*
Kupreanof	Fall	5	(42)	18.5	5	7	(50)	15.2	7	8	(89)	18.0	7
	Spring	45	(83)	17.8	44	61	(84)	17.8	60	54	(83)	17.9	52
	Total	50	(76)	17.8	49	68	(77)	17.6	66	62	(83)	17.9	59
Kuiu	Fall	11	(85)	18.9	11	6	(60)	16.8	6	12	(71)	17.9	11
	Spring	62	(85)	18.4	62	52	(81)	18.3	52	58	(90)	18.5	55
	Total	73	(85)	18.5	73	59	(80)	18.2	58	70	(86)	18.4	66
Mitkof	Fall	1	(100)	NA	1	3	(75)	18.8	2	1	33	NA	1
	Spring	3	(75)	17.7	3	6	(100)	18.1	6	4	(80)	17.3	4
	Total	4	(80)	17.9	4	9	(90)	18.2	8	5	(63)	17.4	5

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

Table 8. Unit 3 black bear successful hunter residency, 1998–2012.

Regulatory year	Local resident[a]	(%)	Nonlocal resident	(%)	Nonresident	(%)	Total successful hunters
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
2007–2008	17	8	28	13	177	80	222
2008–2009	19	9	23	11	159	79	201
2009–2010	14	9	23	14	127	77	164
2010–2011	11	6	22	12	144	81	174
2011–2012	18	10	22	12	142	78	182
2012–2013	30	17	24	13	125	70	179

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

Table 9. Unit 3 black bear harvest chronology by percent, 1998–2012.

Regulatory year	Month									
	September	October	November	December	March	April	May	June	July	*n*
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
2007–2008	13	1	0	0	0	10	60	16	0	225
2008–2009	18	2	0	0	0	8	59	13	0	207
2009–2010	15	6	0	0	0	11	55	14	0	169
2010–2011	12	3	0	0	0	10	57	18	0	177
2011–2012	15	2	0	0	0	4	54	25	0	185
2012–2013	14	2	0	0	0	10	59	15	0	182

Table 10. Unit 3 black bear harvest, in percent by transport method, 1998–2012

Regulatory year	Airplane	Boat	3-4 wheeler	Snowmachine	Off-road vehicle	Highway vehicle	Foot	Unknown	*n*
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
2007–2008	4	87	0	0	0	8	0	0	225
2008–2009	4	91	0	0	0	3	1	0	207
2009–2010	2	79	2	0	0	14	1	2	169
2010–2011	5	76	4	0	1	14	1	0	177
2011–2012	4	79	0	0	0	15	2	0	185
2012–2013	3	82	0	0	3	11	1	0	182

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CHAPTER 7: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 5 (5,800 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 forage 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 (Barten 2008a). 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. Managers estimate there are 522 brown bears in Unit 5A (ADFG 1993, unpublished data), and they likely displace black bears from lower elevations.

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. Although some of these areas produce abundant berries that black bears can feed on, much of the clearcut habitat seems to be growing up into thick stands of small conifers that prohibit other types of forage from growing. These areas provide little in the way of food for black bears.

HUMAN USE HISTORY

Black bears have long been hunted in Unit 5, but reliable harvest data is only available from 1973 when sealing became a requirement. Prior to 2009, hunters only needed a hunting license to take black bears in Southeast, Alaska. Beginning in 2009 however, hunters were required to obtain a harvest ticket prior to hunting black bears in Units 1-5. Data from harvest ticket reports will allow us to quantify both successful and unsuccessful hunting effort.

Regulatory history

Since statehood, black bear hunting season has been 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 residents until 1990, when the nonresident limit was reduced to 1 bear per year. Using dogs to hunt 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 in Unit 5. 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, then decreased to 19 bears annually in the 1990's. 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 Alaska residents were prohibited from hunting moose. It may be that many nonlocal hunters chose to hunt black bears rather than abandon their Yakutat area hunting trip entirely. Moose regulations in subsequent years reinstated a nonresident general season.

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 percentage of glacier bears in the harvest averaged 11% of the black bears taken in Unit 5 between 2000 and 2009. During this report period 32% of the black bear harvest was glacier color phase bears (Table 1). Unit 5A is one of the few areas where hunters target glacier bears.

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 being the impetus for hunting black bears in Unit 5. Aircraft and boats are the two predominant means of transport for Unit 5 black bear hunters, regularly accounting for more than 90% of reported hunts.

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

The Department of Fish and Game (Department) and Alaska Wildlife Troopers (AWT) 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. The harvest during this report period was substantially lower (28 bears) than previous periods (Table 1). Eight bears were taken in 2010, 13 bears were taken in 2011, and 7 bears in 2012. Mean total skull size for male bears was slightly lower than the previous report period (17.0 vs. 17.6), but did meet the management goal. A 3:1 male to female harvest ratio continued to be maintained, with 75% males in the harvest during the report period. Although the percentage of males in the harvest decreased from the previous report, 75% equals the management goal, which is intended to ensure a reproductively sound population by maintaining female bears in the population. The mean age of male and female bears was 7.2 and 7.8 years, respectively. The mean age for male bears in the report period is approximately 1 year younger than the previous report period (8.5 years). The female mean age also decreased, substantially, from approximately 11 years of age during the previous report period (2007–2009) to 7.8 years during the current period. The female age calculation is based on a small sample size (7) of harvested female bears; female bear ages ranged from 4 to 23 years during the report period. Because of the small number of bears aged a single, older animal can skew the age structure of the harvest towards older bears; so caution should be used interpreting the mean age structure of a single year's harvest when so few bears are sampled.

Population size

No population studies have been conducted on black bear in Unit 5. 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. Barten (2008b) provided an estimate of 600 black bears in Unit 5. This estimate is based loosely on black bear densities of 1.4 mi^2 bears in western Washington State (Poelker and Hartwell 1973). We believe minimum densities in mainland Southeast Alaska are slightly higher than the numbers found in the Washington study area. Although the 1.5 mi^2 density is used in Unit 1C, it probably is too high for the number of Unit 5 black bears due to their displacement from some habitats by brown bears. Additional black bear population research is needed to better estimate black bear densities and the overall population in Unit 5.

Population composition

Our management objective of a 3:1 male to female harvest ratio is aimed at keeping harvest of female bears to a minimum. We lack reliable information on the composition of the bear population, but use the harvest sex ratio as an indirect index of the availability of male bears in

the population. We interpret an increase in the female harvest as an indication of fewer large male bears available to hunters. The current high percentage of male bears in the harvest suggests there are plenty of male bears in the population.

Glacier bears occur more frequently in Unit 5 than in other management unit 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 and Unit 5A has black bears distributed throughout the unit. Brown bears are also abundant throughout the unit and they displace black bears from many non-mountainous locales. Because of this displacement, most black bear harvest and sightings are along the coast or in foothills and mountainous areas within the subunit. Managers are increasingly interested in the distribution of black bears in Unit 5 because of a growing interest in black bear hunting across Southeast Alaska. For many years the number of black bear hunters and the bear harvest in Unit 5 has been consistent but with harvest decreasing, and hunters reporting seeing fewer bears in other areas of Southeast, Alaska, Unit 5 may be an area that sees an increase in black bear hunter effort and likely an increased harvest. Harvest location information is collected when the department seals hides and skulls. Collecting location information helps us to better understand the distribution of black bears in Unit 5 and to identify areas where access may make bears more vulnerable to harvest.

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 nearby.

MORTALITY

Harvest

Season	Bag Limits
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 Actions and Emergency Orders. The Alaska Board of Game took no actions concerning Unit 5 black bears during the report period. We issued no Emergency Orders for the Unit 5 black bear season during the report period.

Hunter Effort and Harvest. Black bear harvests ranged from 7 to 13 during 2010–2012, averaging 9 per regulatory year (Table 1), a decrease of 7 bears annually over the previous report period. Seven female bears were harvested compared to 21 males during the report period, yielding 75% males. This is a high male:female harvest sex ratio, and is the same as our management goal of 3:1. Nine bears, or approximately 32% of the harvest during this reporting period, were glacier bears (Table 1).

Effort expended by successful hunters per bear killed was 3.6 days compared to the previous 10-year mean of 3.3 days. Hunter effort for all groups (local resident, Alaska resident and nonresident) decreased by a day or more per successful hunter (Table 2). Based on the return of harvest ticket information, 71 ticket holders hunted in Unit 5 during report period. Twenty-three (32%) hunters reported success. Successful hunters took approximately 4.5 days to harvest a black bear, and unsuccessful hunters spent 5.7 days hunting. One frustrating aspect of the new harvest ticket report is that only 6 of 33 ticket holders recorded hunt location information beyond a GMU level. Unlike registration permits, there is no penalty for failing to report black bear hunting activity if unsuccessful, although it is required (successful hunters must still have bears sealed by the department).

Hunter Residency and Success. Unlike previous reports where resident hunters harvested the majority of black bears in Unit 5, nonresident hunters took 50% of the harvest during this report period. Unit residents took 36% of the bears, and nonlocal Alaska residents harvested 14% of the bears (Table 2).

Harvest Chronology. Historically, most Unit 5 black bears have been harvested during the spring. The trend continued through this report period, with 27 of 28 bears taken in spring (Table 1). The reason for the concentrated spring harvest has to do with black bear accessibility and perceived palatability. In spring black bears forage along beaches or hillsides that are visible from beaches and accessible by boat, allowing hunters to hunt large areas fairly easily. In the fall however, bears are much harder to find and access because they are foraging on fish streams bordered by dense vegetation, or they are in mountainous terrain that is difficult to access. Many black bear hunters in Southeast avoid taking fall bears because of concern about the palatability of bears that may have been feeding on salmon. This may be a valid concern about bears found in areas with salmon streams, but many black bears feed in high elevation meadows in the fall and provide excellent table fare.

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 3). The area near Yakutat Bay (WAA's 4506 and 4508) always accounts for a large portion of the harvest and did again during this report period, with 71% of the harvest coming from that area. Hunters can easily access this area from small skiffs, and are never far from protected waters. They can scan miles of shoreline or hillside from a moving boat, increasing their chances of finding a bear. Another area in which hunters consistently harvest black bears is the foothills of the Brabazon Mountains (WAA 4503). During the report period, 11% 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. The Russell Fjord and Nunatak Fjord areas (WAA 4505) represented 7% of the harvest for the reporting period. Those areas also provide hunting opportunity for boat-based black bear hunts.

Bait Stations. Although baiting is legal during the Unit 5 spring season, very few hunters use bait. No black bear baiting permits were issued for Unit 5 during the report period.

Guided Hunter Harvest. Guided hunters accounted for 9 of 28 bears harvested, or 32% of the total during the report period (Table 4). During the previous report period guided hunters took

24% 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. The decrease in hunters using registered guides or other commercial services may be linked to an overall downturn in the national economy. Anecdotal information from guides suggests bookings are generally down across Southeast Alaska.

Transport Methods and Commercial Services Used. Boats were the predominant transport means for successful Unit 5 black bear hunters (Table 2), with 64% of the hunters using this mode of transport. Twenty five percent of hunters used airplanes to access hunting areas, and 11% of hunters used a highway vehicle (Table 2). Commercial services were used by 10 (36%) of the 28 successful hunters; 9 of these used a commercial guide and none used commercial services for transportation to the field (Table 4).

Other mortality

We do not have records of any Defense of Life or Property (DLP) kills, road kills, or illegal kills for black bears during the report period.

HABITAT

Assessment

Concerns about habitat alterations center on 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.

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 alerting ADF&G. 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 3 years of this report period. Our objective for male skull size was met in 2011 but not in 2010 and 2012. Although the number of black bears harvested from this unit is not large, continued monitoring is necessary to determine appropriate management strategies for black bears in Unit 5. Managers are concerned with black bear populations in multiple locations in Southeast Alaska because of decreasing harvest and anecdotal information from big game hunting guides and recreational hunters who are seeing fewer bears. The cause of the decrease in harvest is unknown. Unit 5, however, is an area where managers do not have concerns about the black bear population. Nevertheless, trends in harvest parameters should be examined regularly for indications of possible conservation concerns.

This is the first full report period that black bear harvest tickets are required to hunt black bears in Unit 5. Over time unsuccessful hunter data can be used to monitor trends in hunter effort, location, and access. The information will provide greater insight into the status of black bear populations and help us select appropriate strategies for future management. A comparison of the sealing data to the harvest ticket associated data demonstrates a lack of correspondance between

sealing and harvest ticket information; sealing records show 28 bears harvested during the report period and harvest ticket reporting indicates only 23 harvested bears. This suggests information recorded on harvest ticket reports should be carefully scrutinized for errors. Staff should ensure the information is accurate when hunters are present if possible and remind those hunters sealing bears that they also need to return their harvest ticket report.

Staff is collecting DNA samples from black bears harvested in Unit 5. These samples will be used to analyze the genetics of bears with different pelage coloration. Samples are also being collected in other areas of the region in hopes of identifying genetic distribution and diversity of black bears in Southeast Alaska.

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Table 1. Unit 5 black bear harvest, 2003 through 2012.

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	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								
	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				
	Total	22	18	4	0	17.5	16	8.9	17	15.9	4	11.0	4	21	1
2007	Fall	3	2	1	0	--	0			--	0				
	Spring	19	16	3	0	17.7	16			15.9	4				
	Total	14	13	1	0	17.6	12	7.8	13	14.8	1	0	4	12	2
2008	Fall	-	-	-	0	--	0			--	0				
	Spring	14	13	1	0	17.6	12			14.8	1				
	Total	13	11	2	0	17.6	11	8.5	10	15.8	2	12.0	2	11	2
2009	Fall	0	0	0	0	--	0			--	0				
	Spring	13	11	2	0	17.6	11			15.8	2				
	Total	8	7	1	0`	16.9	8	6.3	8	15.4	1	5	1	6	2
2010	Fall	0	0	0	0	0	0	0	0	0	0	0	0		
	Spring	8	7	1	0	16.9	8	6.3	8	15.4	1	5	1		

Table 1. 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	13	10	3	0	17.8	9	9.7	9	15.7	3	11	3	9	4
2011 Fall	1	1	0	0	17.3	1	9.7	1	0	0	0	0		
Spring	12	9	3	0	17.8	8	10.3	8	15.7	3	11	3		
Total	7	4	3	0	16.2	4	5.5	4	15.1	3	7.3	3	4	3
2012 Fall	0	0	0	0	0	0	0	0	0	0	0	0		
Spring	7	4	3	0	16.2	4	5.5	4	15.1	3	7.3	3		
2003–2009	117	105	12	0	17.6	97	9.1	86	15.7	10	11.6	15	105	12
2010–2012	28	21	7	0	17.0	21	7.2	21	15.4	7	7.8	7	19	9

Table 2. Unit 5 residency, mean days hunted, and transportation used by successful black bear hunters, 2003 through 2012.

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
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
2007	10	2.5	5	3.4	7	3.7	22	3.1	2	15	1	3	1	0
2008	8	2.1	1	2.0	5	4.2	14	2.9	1	13	0	0	0	0
2009	6	2.2	2	1.5	5	3.4	13	2.5	2	8	1	2	0	0
2010	2	1.0	1	2.0	5	4.4	8	3.3	4	4	0	1	0	0
2011	6	1.3	1	6.0	6	6.0	13	3.7	3	9	0	1	0	0
2012	2	3.5	2	5.5	3	2.7	7	3.7	0	5	0	1	0	0
2003–2009 Mean	7.1	2.6	2.5	2.9	7.1	4.5	16.7	3.6	1.7	11.3	1.6	2.0	.3	0
2010–2012 Mean	3.3	1.9	1.3	2.9	4.3	4.4	9.3	3.6	2.3	6.0	0	1.0	.3	0

Table 3. Unit 5A black bear harvest from all Wildlife Analysis Areas (WAA), regulatory years 2003 through 2012.

	Regulatory year										
WAA	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
2101	2	0	1	0	1	1	1	1	0	0	7
2102	3	0	0	2	0	1	0	0	0	1	7
4503	5	3	8	1	5	1	1	0	3	0	27
4504	0	1	0	0	0	0	0	0	0	0	1
4505	5	0	2	3	2	0	2	1	1	0	16
4506	4	3	4	11	10	9	5	1	4	2	53
4508	0	1	5	4	4	2	4	4	5	4	33
4607	0	0	0	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	1	0	1
TOTAL	19	8	20	21	22	14	13	7	14	7	145

Table 4. Unit 5 commercial services used by successful black bear hunters, 2003 through 2012.

Regulatory year	Unit residents		Other AK residents		Nonresidents		Total use			
	No	Yes	No	Yes	No	Yes	No	Yes	Transport	Registered guide
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
2007	10	0	1	4	3	4	14	8	2	6
2008	8	0	1	0	2	3	11	3	0	3
2009	3	3	1	1	2	3	6	7	1	3
2010	2	0	1	0	1	4	4	4	0	4
2011	5	1	0	1	3	2	8	4	0	3
2012	2	0	2	0	1	2	5	2	0	2
2003–2009 Mean	6.7	.4	1.5	1.2	2.0	3.6	9.0	7.8	1.4	4.4
2010–2012 Mean	3	.3	1.0	.3	1.6	2.7	5.7	3.3	0	3.0

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CHAPTER 8: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

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, except on 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 500, 230, and 300 bears/1,000 km^2 in western PWS, eastern PWS, and along the NGC, respectively. Other density estimates for good habitat in PWS have ranged from 400 to 10,000 bears/1,000 km^2 (Grauvogel 1967; McIlroy 1970; Modafferi 1982). Harvest data and incidental observations by guides, charters, and local hunters indicated that distribution and general abundance increased throughout Unit 6 during the 1990s to a high level, possibly in response to new salmon hatcheries coming online during the 1980s. None of these estimates, however, were obtained by methods considered reliable for estimating bear population size or density. Since the early 2000s, stakeholders have expressed concern that the population is declining throughout the western PWS.

Black bears in Unit 6 primarily eat vegetation in the early spring. Especially important foraging areas are those that contain early emergent vegetation, including coastal sedge meadows and avalanche shoots. Major foods include grasses, sedges, skunk cabbage, and horsetail. Diets shift as the summer progresses and bears consume more fish, particularly salmon of any available species. Berries are also very important in the summer and fall. Meat from terrestrial animals probably comprises comparatively little of the diet of bears in PWS.

Weather conditions can lead to fluctuations in food abundance which affect black bear populations in Unit 6. Reduced food availability can impact the age of first reproduction, pregnancy rates (if fall resources are insufficient), and cub mortality. Competition and predation by brown bears also may influence the distribution and abundance of black bears. The highest density of black bears occurs in western PWS where very few brown bears are present.

Black bears exhibit sexual segregation during the spring (Modafferi 1982). Modafferi (1982) found that 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, though in Alaska it was a secondary correlate to Julian date.

Harvest monitoring began in 1973 with mandatory sealing of hides. Before this requirement, annual harvest estimates ranged from "practically nil" (Robards 1954) to more than 100 during 1965 and 1966 (McIlroy 1970). Sealing records indicated an average annual take of 103 bears from 1973 (when sealing records begin) to 1980, 206 from 1981 to 1990, 267 during 1991–2000, and 519 from 2001 to 2010. The Anton Anderson Memorial Tunnel (Whittier road) opened to highway vehicles in June 2000, which has allowed easier access for 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.

Hunting pressure may affect local populations. McIlroy (1970) reported declining harvest and hunter success, and increasing hunter-days per harvested bear, indicating 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. Concern over the increase in black bear harvest in PWS has led to a series of regulatory actions starting in 2003, including season date changes, limitations on bear baiting, and the prohibition of shooting from a boat. The management objective, prior to this reporting cycle, of 200 bears in the harvest has been regularly exceeded since 1985. In fact harvest has been double (5 years) or triple (7 years) the harvest objective every year since 2001. The majority of this harvest (75–90%) comes from the western portion of 6D. Additionally, the percentage of females in the harvest in 6D has exceeded management objectives since 2006.

The average skull size of males in 6D has been below 17 inches in all but two years since 2005. Crowley (2011) reported that mean male skull size exhibited a decreasing trend with increasing harvest density in Unit 6D. The relationship was stronger from 2005 to 2009 than during the previous two 5-year periods, suggesting that harvest was increasingly impacting age of bears harvested.

MANAGEMENT OBJECTIVES

The management objective for Unit 6 black bears is to maintain a black bear population that will sustain a 3-year average annual harvest of 350–400 bears composed of less than 30% females and with a minimum male average skull size of 17 inches.

METHODS

Information was gathered regarding the population status of black bears from sealing certificates, harvest ticket reports, conversations with stakeholders, and opportunistic observations of black bears during other wildlife surveys. Harvest data are summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY12 = 1 July 2012–30 June 2013).

Hides and skulls were sealed for all black bears in the reported harvest. 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 representing watersheds, islands, or island groups. Illegal kills are included when known and unreported kills are estimated. Unreported harvest included wounding loss and bears taken by hunters and not sealed (unknown illegal kills). Tooth samples have been collected periodically since sealing began but consistently since RY04 from bears harvested in Unit 6D to determine age. Teeth were also examined to determine the feasibility of female reproductive history reconstruction (Coy and Garshelis 1992). Harvest ticket data have been available since 2010 and can be used to evaluate effort.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

There are currently no techniques for population estimation that are achievable within our budget constraints. Stakeholder reports consistently indicate that black bears in western PWS have become more difficult to find for everything from wildlife viewing to hunting. However, it is unclear if this is a result of fewer conspicuous bears (the bears have become educated about beach hunters) or if the numbers are truly down. Numerous stakeholders have expressed concern about the effects of the severe winter of RY11 and the late spring of RY12. Anecdotal reports suggest that cub survival may have been very poor for both years.

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 10 September–10 June. The bag limit was 1 bear in Unit 6.

Board of Game Actions and Emergency Orders. The Board of Game made no regulatory changes regarding black bears in Unit 6 during this reporting period.

Hunter Harvest. Total harvest in Unit 6 grew at an average rate of about 12% annually from RY98 (303 bears) to RY07 (674 bears) when the harvest peaked. Since RY07, harvest has declined at an average rate of about 10% annually. Harvest in RY10, RY11, and RY12 was 550, 510 bears, and 396 bears respectively (Table 1). Harvest in the latter two years may have been affected by weather conditions. RY11 was a 100-year weather event exceeding records for snowfall and retention. While snowfall in RY12 was not nearly as significant as in the previous year, spring was late in RY12. Spring conditions significantly influence the phenology of forage plants, which in turn may influence the distribution of bears and whether or not become available to hunters.

Most of the bear harvest (80–90% since RY98) in Unit 6 is from PWS (Unit 6D). For RY10, RY11, and RY12, the harvest was 82%, 91%, and 87%, respectively, from Unit 6D. Areas of PWS that are closest to Whittier experience the highest harvest pressure (Fig. 1). This is true for many other species. Harvest densities are calculated as bears harvested per kilometer using population zones that were used by Modafferi (1978) for density calculations. Two zones show the most dramatic increase in the late 1990s, Ester/Eaglek and Passage/Whittier. Harvest data relative to population abundance must be interpreted with caution on a fine scale because areas

may receive harvest pressure that is disproportionate to resource availability. However, even before the effort for bears in PWS increased, bears were thought to be considerably more abundant in western PWS. Harvests during this reporting period declined in all subunits (Table 1) but most notably in Unit 6D.

Sex composition of the harvest varies between subunits (Table 1). Unit 6A has the lowest proportional harvest of females with less than 15% females taken in all of the last 20 years. The percent of females in the harvest during RY10, RY11, and RY12 was 11%, 9% and 10% respectively. The highly selective nature of this harvest is likely due to nearly all participants using guides and the distance and expense relative to hunting that area. Unit 6B experiences very little hunting pressure, especially since the closure of the Copper River Highway at Mile 34 in 2011. As a result, the percent take of females is highly volatile. In most years the percent take of females is 25% or lower. In RY10, 27% females were taken (n = 11). In RY11, 17% females were taken (n = 6). In RY12, 50% females were taken (n = 4). Unit 6C experiences higher harvest pressure due to its proximity to Cordova and presence of the Copper River Highway. The 20-year average (RY89-RY09) percent of females in the harvest is 25%. The 10-year average (RY99-RY09) is 27%. Percent take of females in RY10, RY11, and RY12 was 35%, 36%, and 33% respectively. The percent of females in the harvest in Unit 6D has also increased (Fig. 2). While the 20-year average was 25% as in Unit 6C, the 10-year average was higher with 29% females taken. RY10 had 31% females in the harvest. RY11 and RY12 had the two highest values for percent females taken, with 41% and 46%, respectively. Harvest in Unit 6D is 10 times higher than the other subunits and therefore percentage results are least likely to be affected by sample size. Percentage of females in the harvest in Unit 6D has exceeded management objectives since RY06.

Mean skull size among males harvested varied from 16.89 to 17.19 inches for each of the last 5 years (Table 2). The largest skulls (RY10 average = 18.13 inches) came from Unit 6A, and the smallest (RY08 average = 16.58 inches) was from Unit 6C. In most years, Unit 6D had the lowest mean skull size compared with other subunits.

Average ages from male bears in Unit 6D for each regulatory year in this reporting period ranged from 6.5 to 7.5 years old. The average age of females is considerably higher, ranging from 7.5 to 10.5 for each regulatory year. Since RY11, all collected teeth have been aged. Although teeth have been collected from Unit 6D bears since RY07, only a 30% sample of each year has been aged. However, these teeth have been retained and will be aged at a later date. Reproductive histories were constructed for some years between RY04 and RY09. However PWS black bears did not appear to experience enough dietary fluctuation to lay deterministic annuli relative to parturition.

Hunter Residency. Nonresident hunters killed the majority of bears harvested in Unit 6A every year and in Unit 6B in all but one year (Table 3). Unit 6C harvest is distributed relatively evenly among all user groups. In most years, nonlocal residents and Unit 6 residents harvest similar numbers to each other. Nonlocal residents took more than 55% of the harvested bears in Unit 6D each year. Nonresident hunters took 31% or more of harvested bears in all years. Residency of successful hunters in all areas did not change significantly over the past 5 years (Table 3).

Harvest Chronology. The majority of the harvest in all areas occurs in the spring (Table 4). In Unit 6C, the highest amount of fall harvest was 35% of the total. In Unit 6D in most years fall harvest was about 10% of the total harvest. Harvest of females is highest in the fall, in some years and some areas, it exceeds 50%. Most fall harvest occurs in early September.

Most bears were taken in May during this reporting period (Table 4) and during the past 5 years. In RY11 and RY12 harvest in early June increased notably. A higher percentage of harvest (35% and 36%, respectively, for Unit 6D and 36% and 22%, respectively, for Unit 6C) was taken in early June. In both areas these were the highest percentages observed in early June. For Unit 6D, harvest was highest even compared with years when the season closed 30 June rather than the current of 10 June. This may be related to late and persistent snow related to the winter of RY11 when records were broken for snow depth and retention. RY12 was also characterized by a late spring although it may not have been significant compared to other years.

Transport Methods. Most successful hunters used boats for transportation during the past 3 years (Table 5). Airplanes provided most of the transportation in Units 6A and 6B. Highway vehicles were used in Unit 6B until 2011, when a bridge of the Copper River Highway failed. The road accessing much of Unit 6B has been impassable since that time and harvest reflects that change. Highway vehicles are most commonly used in Unit 6C. Boats were the primary means of transportation used in Unit 6D.

Hunter Effort. Harvest tickets have been required since RY09. Based on these data, effort in Unit 6D was highest in RY10 with about 970 hunters reporting pursuing black bears. Reported effort in RY12 was the lowest in this 4-year period, with 588 hunters reporting hunting black bears. Comparing data between harvest ticket reports of hunting activity and sealing data shows success rates of between 52% and 66% annually. The average number of days hunted by successful hunters was between 3and 4 for the last 17 years.

Less than 20% of all harvested bears were taken over bait. Black bear baiting is most popular in Unit 6C, where stations are used for taking less than 30% of harvested bears. In Unit 6D, where most black bear harvest occurs, less than 16% of harvested bears are taken over bait. Black bear baiting is seen by some as a technique that can lead to more selective harvest. In some regulatory years the harvest of females was lower among baiters than non-baiters ("spot and stalk") but it some years it was higher and some it was the same.

CONCLUSIONS AND RECOMMENDATIONS

Black bear populations and harvest in Units 6A–6C were at acceptable levels. No changes or management actions are recommended in these subunits. Management objectives were adjusted for Unit 6D during this reporting period to reflect the desire to reduce harvest in Unit 6D.

Population estimation techniques are being developed that may help to understand exploitation rates, particularly on a local level. These techniques will most likely utilize genetic mark/recapture techniques, including hair snares and biopsy darts. There is currently insufficient funding for this work to occur on the necessary scale and in PWS.

Collection of teeth from harvested bears to determine age structure in the harvest will continue. Genetics data will be collected from archived samples as well as from newly sealed bears. It

continues to be difficult to relate harvest data to population size. Education efforts to increase reporting compliance should continue.

Harvests have steadily declined, and while this may be related to regulatory action the population may also be declining. Since there is no population estimate, we do not know the exploitation rate on the population and whether or not it is sustainable. Additionally, if the population is truly depressed as stakeholders suggest, it may not be resilient against extreme environmental events. One example of such an event would be the severe winter of RY11, the effects of which are not yet fully understood.

As the effects of severe weather become more apparent, it may be necessary to pursue more aggressive means of reducing harvest. Season dates may be used to reduce harvest, particularly the harvest of females. While the percent harvest of females is highest in the fall, the overall number of animals taken is far less than in the spring. Early cessation of the spring hunt could be the most effective option. The establishment of a registration hunt may also be necessary to track harvest more accurately and promptly and close the season if an objective is met.

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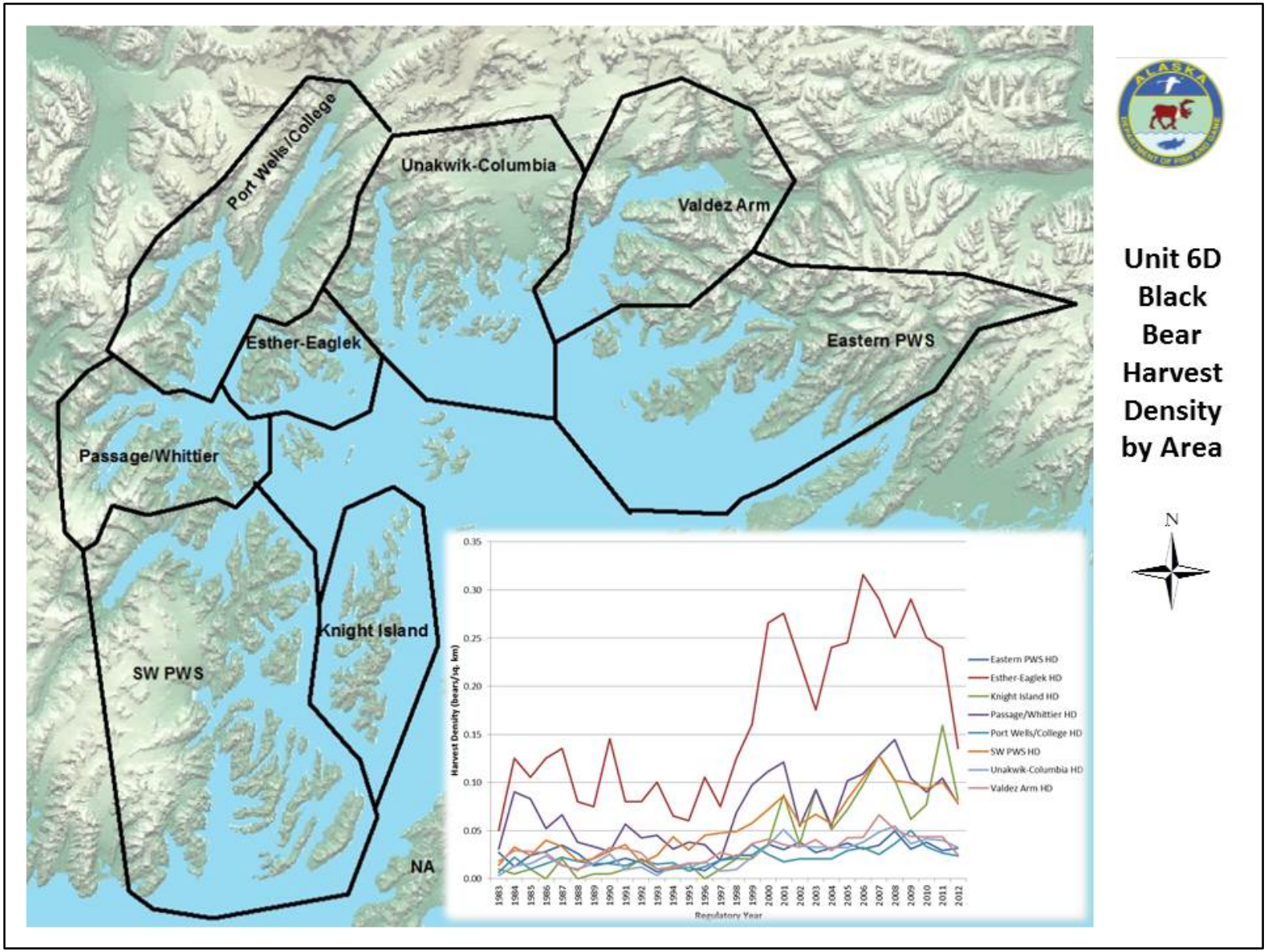

Figure 1. Harvest density RY83–RY12.

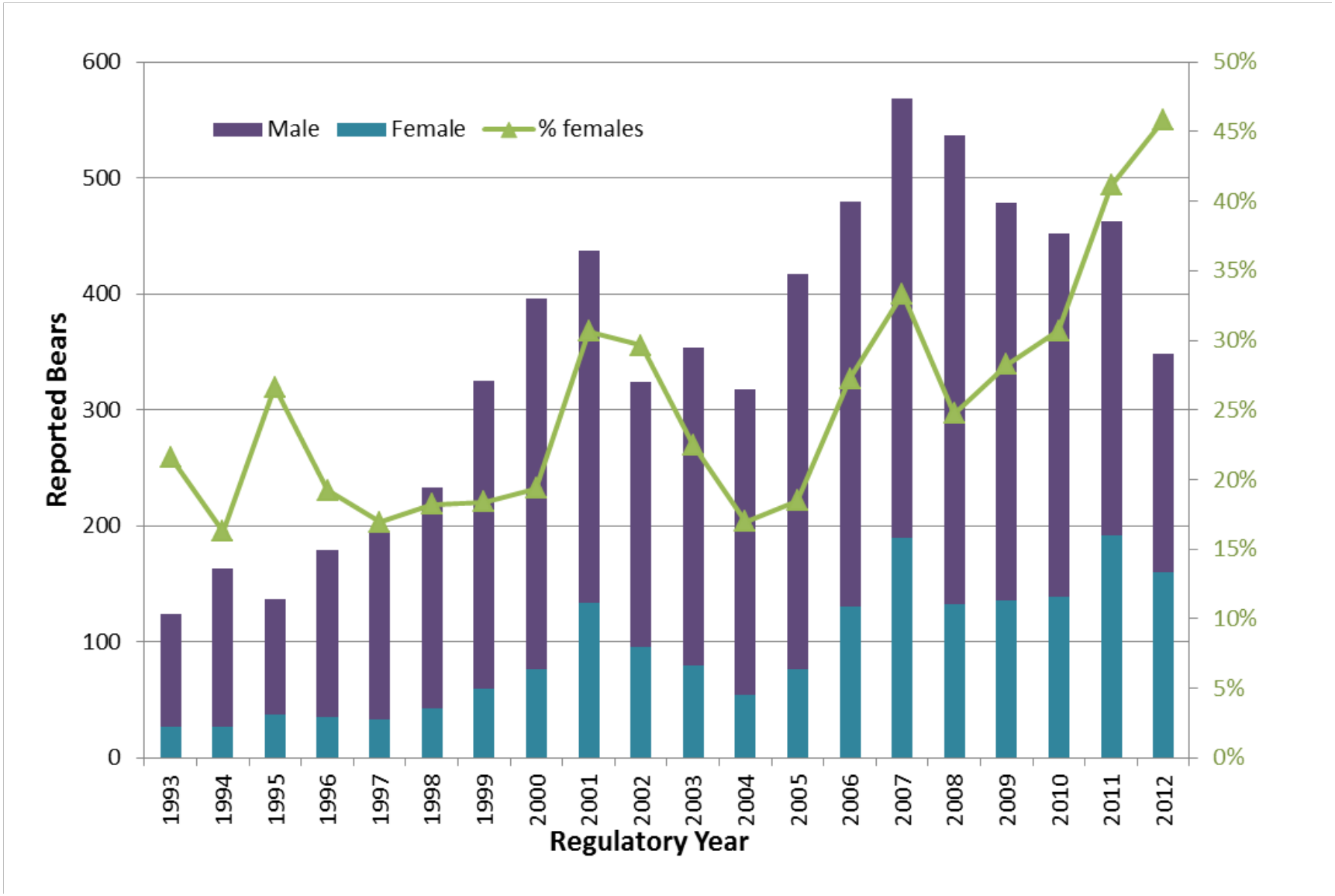

Figure 2. Unit 6D black bear harvest and percent take of females, RY08–RY12.

Table 1. Unit 6 black bear harvest, RY08–RY12.

Subunit/ Date	Reported																
	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill					
	M	F	(% F)	Unk	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%	F	(%)	Unk	Total
6A/Fall 08	16	3	(16)	0	19	0	0	0	0	2	0	16	(84)	3	(16)	2	21
Spring 09	21	3	(13)	0	24	13	0	0	0	3	0	21	(88)	3	(13)	3	27
6A/Total	37	6	(14)	0	43	13	0	0	0	5	0	37	(86)	6	(14)	5	48
6A/Fall 09	1	3	(75)	0	4	0	0	0	0	0	0	1	(25)	3	(75)	0	4
Spring 10	33	3	(8)	0	36	21	0	0	0	4	0	33	(92)	3	(8)	4	40
6A/Total	34	6	(15)	0	40	21	0	0	0	5	0	34	(85)	6	(15)	5	45
6A/Fall 10	3	0	(0)	0	3	0	0	0	0	0	0	3	(100)	0	(0)	0	3
Spring 11	29	4	(12)	0	33	17	0	0	0	4	0	29	(88)	4	(12)	4	37
6A/Total	32	4	(11)	0	36	17	0	0	0	4	0	32	(89)	4	(11)	4	40
6A/Fall 11	5	1	(17)	0	6	0	0	0	0	1	0	5	(83)	1	(17)	1	7
Spring 12	5	0	(0)	0	5	0	0	0	0	1	0	5	(100)	0	(0)	1	6
6A/Total	10	1	(9)	0	11	0	0	0	0	1	0	10	(91)	1	(9)	1	12
6A/Fall 12	3	0	(0)	0	3	0	0	0	0	0	0	3	(100)	0	(0)	0	3
Spring 13	6	1	(14)	0	7	0	0	0	0	1	0	6	(86)	1	(14)	1	8
6A/Total	9	1	(10)	0	10	0	0	0	0	1	0	9	(90)	1	(10)	1	11
6B/Fall 08	1	1	(50)	0	2	0	0	0	0	0	0	1	(50)	1	(50)	0	2
Spring 09	6	3	(33)	0	9	0	0	0	0	1	0	6	(67)	3	(33)	1	10
6B/Total	7	4	(36)	0	11	0	0	0	0	1	0	7	(64)	4	(36)	1	12
6B/Fall 09	2	0	(0)	0	2	0	0	0	0	0	0	2	(100)	0	(0)	0	2
Spring 10	8	0	(0)	0	8	0	0	0	0	1	0	8	(100)	0	(0)	1	9
6B/Total	10	0	(0)	0	10	0	0	0	0	1	0	10	(100)	0	(0)	1	11
6B/Fall 10	2	0	(0)	0	2	0	0	0	0	0	0	2	(100)	0	(0)	0	2
Spring 11	6	3	(33)	0	9	0	0	0	0	1	0	6	(67)	3	(33)	1	10
6B/Total	8	3	(27)	0	11	0	0	0	0	1	0	8	(73)	3	(27)	1	12
6B/Fall 11	1	0	(0)	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	1
Spring 12	1	0	(0)	0	1	0	0	0	0	0	0	1	(100)	0	(0)	0	1
6B/Total	2	0	(0)	0	2	0	0	0	0	0	0	2	(100)	0	(0)	0	2

Table 1. continued.

Subunit/ Date	Reported																	
	Hunter kill						Nonhunting kill			Estimated kill		Total estimated kill						
	M	F	(% F)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total	
6B/Fall 12	2	1	(33)	0	3	0	0	0	0	0	0	2	(67)	1	(33)	0	3	
Spring 13	3	0	(0)	0	3	0	0	0	0	0	0	3	(100)	0	(0)	0	3	
6B/Total	5	1	(17)	0	6	0	0	0	0	1	0	5	(83)	1	(17)	1	7	
6C/Fall 08	4	0	(0)	0	4	0	0	0	0	0	0	4	(100)	0	(0)	0	4	
Spring 09	22	6	(21)	0	28	4	2	0	0	3	0	24	(80)	6	(20)	3	33	
6C/Total	26	6	(19)	0	32	4	2	0	0	4	0	28	(82)	6	(18)	4	38	
6C/Fall 09	9	3	(25)	1	13	0	2	2	0	2	0	11	(69)	5	(31)	3	19	
Spring 10	22	9	(29)	0	31	9	0	0	0	4	0	22	(71)	9	(29)	4	35	
6C/Total	31	12	(28)	1	44	9	2	2	0	5	0	33	(70)	14	(30)	6	53	
6C/Fall 10	4	3	(43)	0	7	0	0	0	0	1	0	4	(57)	3	(43)	1	8	
Spring 11	29	14	(33)	0	43	8	0	0	0	5	0	29	(67)	14	(33)	5	48	
6C/Total	33	17	(34)	0	50	8	0	0	0	6	0	33	(66)	17	(34)	6	56	
6C/Fall 11	3	1	(25)	0	4	0	1	1	0	0	0	4	(67)	2	(33)	0	6	
Spring 12	17	10	(37)	0	27	7	0	0	0	3	0	17	(63)	10	(37)	3	30	
6C/Total	20	11	(35)	0	31	7	1	1	0	4	0	21	(64)	12	(36)	4	37	
6C/Fall 12	3	4	(57)	0	7	0	0	0	0	1	0	3	(43)	4	(57)	1	8	
Spring 13	21	8	(28)	0	29	7	0	0	0	3	0	21	(72)	8	(28)	3	32	
6C/Total	24	12	(33)	0	36	7	0	0	0	4	0	24	(67)	12	(33)	4	40	
6D/Fall 08	85	43	(34)	0	128	0	2	0	1	15	0	87	(67)	43	(33)	16	146	
Spring 09	317	89	(22)	0	406	54	0	1	0	49	0	317	(78)	90	(22)	49	456	
6D/Total	402	132	(25)	0	534	54	2	1	1	64	0	404	(75)	133	(25)	65	602	
6D/Fall 09	27	25	(48)	1	53	0	0	2	0	6	0	27	(50)	27	(50)	7	61	
Spring 10	315	109	(26)	2	426	67	0	0	0	51	0	315	(74)	109	(26)	53	477	
6D/Total	342	134	(28)	3	479	67	0	2	0	57	0	342	(72)	136	(28)	60	538	
6D/Fall 10	17	25	(60)	0	42	0	0	0	0	5	0	17	(40)	25	(60)	5	47	
Spring 11	296	114	(28)	1	411	67	0	0	0	49	0	296	(72)	114	(28)	50	460	
6D/Total	313	139	(31)	0	452	67	0	0	0	54	0	313	(69)	139	(31)	54	507	

Table 1. continued.

Subunit/ Date	Reported									Estimated kill		Total estimated kill					
	Hunter kill						Nonhunting kill										
	M	F	(% F)	Unk.	Total	Over bait	M	F	Unk.	Unreported	Illegal	M	(%)	F	(%)	Unk.	Total
6D/Fall 11	28	21	(43)	0	49	0	0	0	3	6	0	28	(57)	21	(43)	9	58
Spring 12	243	171	(41)	1	415	33	0	0	0	50	0	243	(59)	171	(41)	51	465
6D/Total	271	192	(41)	1	464	33	0	0	3	56	0	271	(59)	192	(41)	60	523
6D/Fall 12	15	20	(57)	0	35	0	0	0	0	4	0	15	(43)	20	(57)	4	39
Spring 13	170	138	(45)	1	309	27	0	0	0	37	0	170	(55)	138	(45)	38	346
6D/Total	188	159	(46)	0	347	27	0	0	0	41	0	188	(54)	159	(46)	41	388
Fall 08	106	47	(31)	0	153	0	2	0	1	18	1	108	(70)	47	(30)	20	175
Spring 09	366	101	(22)	0	467	71	2	1	0	56	13	368	(78)	102	(22)	69	539
Total	472	148	(24)	0	620	71	4	1	1	74	14	476	(76)	149	(24)	89	714
Unit 6/Total																	
Fall 09	39	31	(44)	2	72	0	2	4	0	9	2	41	(54)	35	(46)	13	89
Spring 10	378	121	(24)	2	501	97	0	0	0	60	7	378	(76)	121	(24)	69	568
Total	417	152	(27)	4	573	97	2	4	0	69	9	419	(73)	156	(27)	82	657
Unit 6/Total																	
Fall 10	26	28	(52)	0	54	0	0	0	0	6	1	26	(48)	28	(52)	7	61
Spring 11	360	135	(27)	1	496	92	0	0	0	60	9	360	(73)	135	(27)	70	565
Total	386	163	(30)	1	550	92	0	0	0	66	10	386	(70)	163	(30)	77	626
Unit 6/Total																	
Fall 11	37	23	(38)	0	60	0	1	1	3	7	1	38	(61)	24	(39)	11	73
Spring 12	266	181	(40)	1	448	40	0	0	0	54	12	266	(60)	181	(40)	67	514
Total	303	204	(40)	1	508	40	1	1	3	61	13	304	(60)	205	(40)	78	587
Unit 6/Total																	
Fall 12	23	25	(52)	0	48	0	0	0	0	6	1	23	(48)	25	(52)	7	55
Spring 13	203	148	(42)	1	352	34	0	0	0	42	10	203	(58)	148	(42)	53	404
Total	226	173	(43)	1	400	34	0	0	0	48	11	226	(56)	173	(43)	60	459

Table 2. Unit 6 black bear harvest mean skull size (length + width), RY08–RY12, and mean age (years) in Unit 6D only.

	Regulatory	Males				Females			
Subunit	Year	Skull (in)	*N*	Age	*n*	Skull (in)	*n*	Age	*n*
6A	RY08	17.88	36			15.64	6		
	RY09	17.88	34			16.04	6		
	RY10	18.13	29			16.14	4		
	RY11	17.69	9			17.63	1		
	RY12	18.12	9			16.75	1		
6B	RY08	17.89	7			16.14	4		
	RY09	17.63	9				0		
	RY10	18.53	8			15.25	3		
	RY11	18.47	2				0		
	RY12	18.18	5			14.19	1		
6C	RY08	16.58	26			15.22	6		
	RY09	17.06	32			15.65	12		
	RY10	16.59	33			15.88	16		
	RY11	17.22	21			15.89	11		
	RY12	17.11	24			15.94	12		
6D	RY08	16.80	391	6.5	61	15.85	129	8.8	30
	RY09	17.11	332	7.3	91	15.57	128	7.5	34
	RY10	16.92	307	7.0	187	15.48	131	7.9	80
	RY11	16.98	268	7.5	176	15.87	187	10.4	105
	RY12	16.91	182	7.2	145	15.74	153	10.5	113
Unit 6	RY08	16.89	460			15.82	145		
Total	RY09	17.19	407			15.59	146		
	RY10	17.01	377			15.53	154		
	RY11	17.02	300			15.88	199		
	RY12	17.01	220			15.75	167		

Table 3. Unit 6 black bear successful hunter residency, RY08–RY12.

Subunit	Regulatory Year	Unit 6 resident Nr	(%)	Nonlocal AK resident Nr	(%)	Nonresident Nr	(%)	Total successful hunters [a]
6A	RY08	1	(2)	9	(21)	33	(77)	43
	RY09	0	(0)	4	(10)	36	(90)	40
	RY10	0	(0)	5	(14)	31	(86)	36
	RY11	0	(0)	1	(9)	10	(91)	11
	RY12	1	(10)	1	(10)	8	(80)	10
6B	RY08	2	(18)	2	(18)	7	(64)	11
	RY09	0	(0)	6	(60)	4	(40)	10
	RY10	2	(18)	4	(36)	5	(45)	11
	RY11	1	(50)	0	(0)	1	(50)	2
	RY12	2	(33)	0	(0)	4	(67)	6
6C	RY08	11	(34)	9	(28)	12	(38)	32
	RY09	15	(34)	20	(45)	9	(20)	44
	RY10	21	(42)	12	(24)	17	(34)	50
	RY11	12	(39)	11	(35)	8	(26)	31
	RY12	13	(36)	16	(44)	7	(19)	36
6D	RY08	26	(5)	307	(57)	201	(38)	534
	RY09	31	(6)	282	(59)	166	(35)	479
	RY10	35	(8)	265	(58)	153	(34)	453
	RY11	22	(5)	299	(64)	143	(31)	464
	RY12	19	(5)	193	(55)	135	(39)	348
Unit 6 Total	RY08	40	(6)	327	(53)	253	(41)	620
	RY09	46	(8)	312	(54)	215	(38)	573
	RY10	58	(11)	286	(52)	206	(37)	550
	RY11	35	(7)	311	(61)	162	(32)	508
	RY12	35	(9)	210	(53)	154	(39)	400

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

Table 4. Unit 6 black bear harvest chronology percent by harvest period, RY08–RY12.

		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	RY08	16	7	7	0	0	0	16	37	2	0	43
	RY09	3	0	0	0	0	3	40	28	20	0	40
	RY10	3	3	0	0	0	0	42	33	17	0	36
	RY11	9	27	18	0	0	0	18	27	0	0	11
	RY12	10	0	10	0	0	0	20	40	0	10	10
6B	RY08	0	18	0	0	0	9	45	27	0	0	11
	RY09	0	0	10	10	0	0	40	30	10	0	10
	RY10	0	9	0	0	0	0	36	45	0	0	11
	RY11	0	50	0	0	0	0	0	50	0	0	2
	RY12	33	0	0	0	0	0	17	33	0	0	6
6C	RY08	0	6	6	0	0	3	21	47	12	0	34
	RY09	9	15	6	4	0	0	13	38	15	0	48
	RY10	6	4	2	0	0	0	20	59	8	0	50
	RY11	0	6	9	3	0	0	6	30	36	9	33
	RY12	11	3	6	0	0	0	3	56	22	0	36
6D	RY08	17	5	1	0	0	0	10	50	16	0	536
	RY09	7	3	1	0	0	0	7	62	19	0	481
	RY10	5	2	3	0	0	0	19	53	18	0	453
	RY11	7	2	1	0	0	1	4	49	35	0	467
	RY12	6	3	1	0	0	0	7	46	36	1	345
Unit 6	RY08	16	6	2	0	0	0	11	49	15	0	624
Total	RY09	6	4	2	1	0	1	10	57	19	0	579
	RY10	5	2	2	0	0	0	21	52	17	0	550
	RY11	7	3	2	0	0	1	5	47	34	1	513
	RY12	7	3	2	0	0	0	7	46	34	1	397

[a] Includes non-hunting mortality and harvest from closed months. Less than 2 bears are taken in any year in months not included above.

Table 5. Unit 6 black bear harvest percent by transport method, RY08–RY12.

		Percent of harvest							
Subunit	Regulatory year	Airplane	Horse	Boat	3- or 4-wheeler	Snow-machine	Highway Vehicle	Unknown	*n*
6A	RY08	63	0	14	23	0	0	0	43
	RY09	33	0	12	43	0	0	12	40
	RY10	47	0	6	39	0	0	8	36
	RY11	91	0	0	0	0	0	9	11
	RY12	100	0	0	0	0	0	0	10
6B	RY08	55	9	9	0	9	9	9	11
	RY09	30	0	20	10	10	30	0	10
	RY10	45	0	9	0	0	45	0	11
	RY11	50	0	0	0	0	50	0	2
	RY12	50	0	17	0	0	33	0	6
6C	RY08	9	0	9	26	0	47	9	34
	RY09	2	0	10	17	0	63	8	48
	RY10	6	0	10	29	0	47	8	51
	RY11	3	0	24	24	3	27	18	33
	RY12	3	0	19	8	0	67	3	36
6D	RY08	2	0	90	4	0	2	2	538
	RY09	2	0	87	4	0	2	5	481
	RY10	2	0	91	4	0	2	1	453
	RY11	0	0	94	1	0	2	2	467
	RY12	1	0	93	2	1	3	1	349
Unit 6 Total	RY08	8	0	79	7	0	4	2	626
	RY09	5	0	74	6	0	7	6	579
	RY10	6	0	76	8	0	7	2	551
	RY11	3	0	87	3	0	4	3	513
	RY12	4	0	83	1	0	9	1	401

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CHAPTER 9: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

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

GEOGRAPHIC DESCRIPTION: Kenai Peninsula

BACKGROUND

Black bear densities in Unit 15A were estimated at 205 bears/1,000 km^2 within the 1947 burn and 265/1,000 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, 1989), food habits (Smith 1984), habitat (Schwartz and Franzmann 1991), dispersal (Schwartz and Franzmann 1992), and denning (Schwartz et al. 1987).

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

Provide the opportunity to hunt black bears using seasons and bag limits to regulate the take so as not to 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) density estimates of 205 bears/1,000 km^2 and 265/1,000 km^2 from Unit 15A, both of which underestimated certain cohorts due to the limitations of their technique, and assumed higher densities along the southern outer coast, we estimate more than 4,000 black bears throughout Units 7 and 15.

Distribution and Movements

The distribution and abundance of devil's club (*Oplopanax horridus*) and other berry producing plants such as blueberries (*Vaccinium sp.),* crowberries (*Empetrum nigrum*), and currents (*Ribes sp.)* are an important factor affecting distribution and movements of black bears as the fruit is an important food source (Schwartz and Franzmann 1991, McLellan 2011). Devil's club may be negatively affected by spruce beetle infestation when more light penetrates to the forest floor after the removal of the canopy. Other berry producing plants however, may be positively affected. Black bears appear in greater densities along the southern outer coast, probably due to high berry abundance and healthy salmon runs coupled with lower 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. From 1994 to 2008, the bag limit was 2 bears per regulatory year (1 bear July 1 – December 31, and 1 bear January 1– June 30). In 2009 the bag limit was changed to 2 bears for residents (no season restriction), and 1 bear for nonresidents. In 2010, the bag limit was further liberalized to 3 bears per regulatory year for both residents and nonresidents north of Bradley River, Bradley Lake, and Kachemak Creek, however nonresidents are limited to 1 bear south of these boundaries.

A permit is required to establish a bear baiting station. Hunting black bears with the use of bait is allowed except in the following locations: Resurrection Creek and its tributaries in Unit 7; within one mile of a house, school, business, developed recreational facility, campground, or permanent dwelling; within one quarter mile of publicly maintained roads or trails, the Alaska Railroad, or along the Kenai (including Kenai Lake), 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. The season was April 15 – June 15 from 1988 through the spring of 2009. In the spring of 2010, the season was further liberalized to April 15–June 30. Starting in spring of 2013 it became legal to take bears same day airborne at bait stations.

Board of Game Action and Emergency Orders. In the spring of 2012, the Board of Game passed regulations to allow same day airborne for black bears taken at bait stations and to allow guides to operate up to 10 bait stations.

Hunter Harvest. During the most recent 3-year period, the average harvest of females was 39% of the total harvest. As such, female harvest is near our maximum harvest objective of 40%. The 5-year average annual harvest, RY08–RY12, was 576 bears (Table 1). An annual average of 73 black bears were reported taken with the use of bait during the previous 5 years (Table 2). The major portion of black bear harvest occurs south of Kachemak Bay (Fig. 1). Since the increase in harvest limits, only 2 to 5 individuals per year have taken 3 bears in units 7 and 15. On average, 28 individuals per year take 2 or more bears. Sixty-five percent of these hunters take 1 or more females.

Hunter Residency and Success. The percentage of successful hunters that are Peninsula residents has increased in recent years, which may be a product of more local hunters focusing on black bears. The percentage of successful hunters who are nonresidents was relatively stable between 30% and 31% (Table 3), but decreased to 27% in 2012.

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

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 in Kachemak Bay and around the outer coast in the southern part of the Kenai Peninsula. Hunters using highway vehicles represented the second most used transportation type.

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 likely because black bear is an alternative meat source to other big game animals and there is a lengthy hunting season and liberal bag limit. The department will continue to assess the sustainability of the harvest by monitoring the percentage of females in the harvest, skull size trends, and anecdotal assessments while flying surveys for other species, and by working to develop measures of biological productivity. We have been within our management objective using the current seasons and bag limits.

Although we have been within our management objectives, we have noticed high harvests recently. Anecdotal reports from hunters and community members suggest a decrease in the number of bears in the southern portion of Kachemak Bay. These reports combined with the high proportion of females in the harvest suggest that we may soon need to restrict the harvest in this portion of Unit 15C. We believe this area has been able to support the high harvest in recent years since most hunters only harvest animals within a short distance of the shoreline. This likely leaves a portion of the population unaffected by the majority of the harvest, creating source-sink dynamics for this area. Bears are still commonly seen during fall surveys for mountain goats in the alpine areas. Unfortunately, a good comparison of numbers between years is not possible due to how goat surveys are currently flown (3-year area rotation). If it is determined that restriction of the harvest is needed, we will identify various options (which will likely include returning to a 2 bear bag limit with only one bear allowed in spring and one in the fall, adjusting the season length, or possibly restricting the bag limit to one female per year) and present them to advisory committees and the Board of Game. We have discussed the need to gather data that would improve our understanding of the impacts current harvest rates have on black bear population dynamics in this area. There have been no funds however, committed to black bear research south of Kachemak Bay at this time.

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Table 1. Black bear harvest by season in Units 7, 15A, 15B, and 15C, 2008–2013.

Regulatory		Fall				Spring				Fall + Spring			
year	Unit	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2008-09	7	84	30		114	109	39		148	193	69		262
	15A	16	11	1	28	23	14		37	39	25	1	65
	15B	21	17		38	6	3	1	10	27	20	1	48
	15C	48	25		73	113	40		153	161	65		226
	Totals[a]	169	83	2	254	251	96	1	348	420	179	3	602
2009-10	7	46	33		79	89	29	1	119	135	62	1	198
	15A	15	10		25	38	19		57	53	29		82
	15B	25	19		44	8	2		10	33	21		54
	15C	79	35		114	132	38	1	171	211	73	1	285
	Totals	165	97		262	267	88	2	357	432	185	2	619
2010-11	7	47	26		73	92	33	1	126	139	59	1	199
	15A	9	5		14	43	32		75	52	37		89
	15B	11	8		19		1		1	11	9		20
	15C	76	68		144	113	68		181	189	136		325
	Totals	143	107		250	248	134	1	383	391	241	1	633
2011-12	7	45	40		85	68	45		113	113	85		198
	15A	7	9		16	20	14		34	27	23		50
	15B	10	12		22	3	2		5	13	14		27
	15C	52	38		90	147	71		218	199	109		308
	Totals	114	99		213	238	132		370	352	231		583
2012-13	7	28	27		55	58	30	1	89	86	57	1	144
	15A	8	3		11	17	13		30	25	16		41
	15B	16	9		25					16	9		25
	15C	39	23	1	63	101	65	1	167	140	88	5[b]	233
	Totals	91	62	1	154	176	108	2	286	267	170	3	443

[a] Includes one unknown sex bear taken from an unknown location in Unit 15 in the fall.

[b] Includes 3 bears with unknown kill dates.

Table 2. Number of registered bait stations and baiting harvest in Units 7, 15A, 15B, and 15C, 2008–2013.

Spring	Unit 7		Unit 15A		Unit 15B		Unit 15C		Units 7&15	
Year	# stations	Harvest	# stations	Harvest	# stations	Harvest	# stations	Harvest	# stations	Harvest
2009	136	54	89	27	12	3	25	7	262	91
2010	137	44	91	36	11	3	21	7	260	90
2011	166	49	100	48	11	0	36	8	313	105
2012	132	25	126	19	3	2	41	6	302	52
2013	130	12	125	11	3	0	45	2	303	25

Table 3. Black bear harvest by residency in Units 7 and 15, 2008–2013.

Regulatory	Residents									Total successful
year	Local[a]	(%)	Nonlocal	(%)	Total	(%)	Nonresident	(%)	Unk	hunters[b]
2008–09	190	(32)	220	(37)	410	(69)	181	(30)	11	602
2009–10	236	(38)	182	(29)	418	(67)	189	(31)	12	619
2010-11	274	(43)	160	(25)	434	(68)	193	(30)	6	633
2011-12	250	(43)	149	(26)	399	(69)	181	(31)	3	583
2012-13	231	(52)	89	(20)	320	(72)	119	(27)	4	443

[a]Local residents are residents of the Kenai Peninsula.
[b]Includes nonsport mortality.

Table 4. Black bear harvest chronology in Units 7 and 15, 2008–2013 by percentage.

Regulatory year	July	Aug.	Sep.	Oct.	Nov.	Dec	Jan	Apr.	May	June	unk	Total harvest
2008-09	4.2	14	19.3	3	0.2	0	0	0.3	38	19.1	1.8	602
2009-10	3.1	13.9	20.2	3.6	0.3	0	0	0.8	39	17.3	1.6	619
2010-11	2.1	8.37	22.3	6.6	0	0.2	0.2	0.9	39	20.4	0	633
2011-12	1.7	12.3	19.2	3.3	0	0	0	1.2	38	24.2	0	583
2012-13	1.8	12.2	14	6.5	0.2	0	0	0.9	39	24.8	0.9	443

Table 5 Black bear harvest percentage by transportation method in Units 7 and 15, 2008–2013.

Regulatory year	Airplane	Dog/ Horse	Boat	ATV	Snow-machine	Other ORV	Highway Vehicle	Walk	Other/ Unk	Total harvest
2008-09	5.3	1.3	47.5	7.1	0.2	0.0	25.1	11.6	1.8	602
2009-10	5.3	1.6	48.6	6.3	0.0	0.6	23.9	7.8	5.8	619
2010-11	7.7	0.6	46.0	7.9	0.0	0.9	19.6	15.2	2.1	633
2011-12	3.4	1.5	53.7	8.6	0.2	0.0	20.2	11.5	0.9	583
2012-13	7.2	0.7	50.6	8.1	0.0	0.5	18.3	12.4	2.3	443

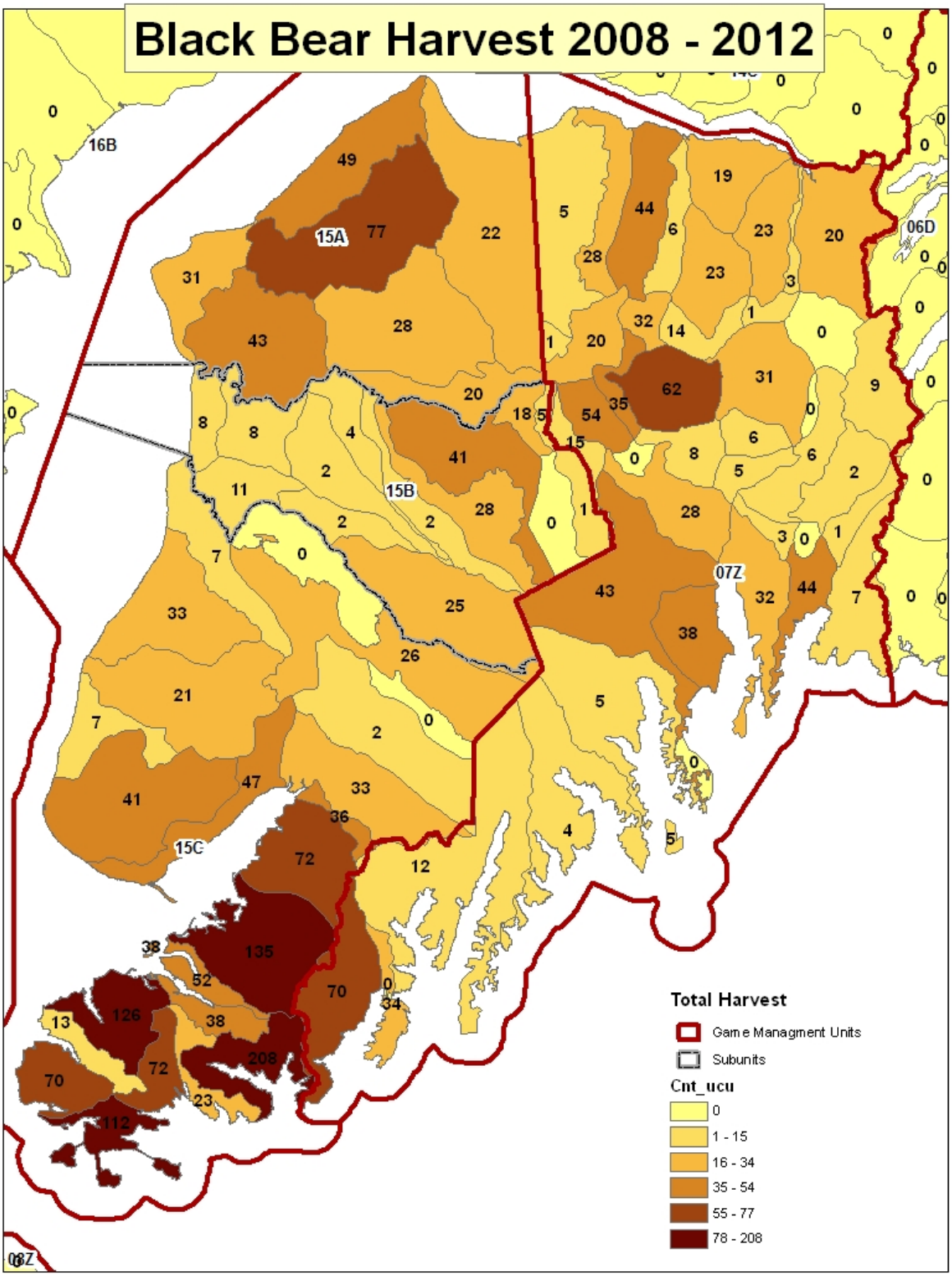

Figure 1. Black bear harvest density by UCU in Units 7 and 15, 2008–2012.

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CHAPTER 10: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 11 (12,785 mi^2)

GEOGRAPHIC DESCRIPTION: Wrangell Mountains

BACKGROUND

Much of Game Management Unit 11 is under federal ownership by the National Park Service. Hunting occurs on preserve lands and some of the remaining state and private ownership lands. In addition much of the unit is rugged, remote, and difficult to access. 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) black bears per year during the 1980s to an average harvest of 17 (range = 10–31) during the 2000s.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

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

METHODS

We monitored the black bear harvest by interviewing successful hunters when black bears are presented for sealing. We measured skulls of sealed bears, and determined sex of bears.

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 biologists estimated 100–200 black bears/1,000 km^2 in the McCarthy area during 2001 (Judy Putera, Wrangell St. Elias National Park biologist, personal communication, 2013). 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.

Alaska Board of Game Actions and Emergency Orders. In March 2011 the Alaska Board of Game passed regulations allowing guides to establish up to 10 bait stations in total combined with assistant guides, and allowing hunters that have been airborne to take black bears at a bait station the same day, as long as they are at least 300 feet from the airplane at the time of taking in Units 11 and 13. These regulations went into effect in spring 2012. Also in March 2011, the board passed regulations eliminating the black bear sealing requirement in Units 11 and 13, becoming effective 1 July 2011.

Harvest by Hunters. Hunters reported taking 8 black bears during the 2012–2013 season, a 68% decrease over the prior 4 years average take of 25 (range = 20–23) (Table 1). This decline in harvest can likely be attributed to a late spring in 2013. A late spring can contribute to a delay in emergence of new vegetation, which can impact the distribution of bears, and hunter success. Also, remaining snow likely made the installation of bait stations more difficult. The number of registered bait stations declined from 16 in 2011 to 6 in 2012, possibly because of the late spring, combined with a decline in the number of guides registering baits that year. Males composed 74% of the harvest during this 3-year reporting period, compared to 69% during the previous reporting period. Of the black bears sealed since 1973, males have composed 72% (range = 25–100%) of the Unit 11 bear harvest. The mean skull size for males taken in 2012 was 17.4 inches, above the 40-year mean of 16.7 inches.

Hunter Residency and Success. Nonresident hunters have taken 26% (range = 13–32%) of the Unit 11 black bear harvest (mean = 6 bears/year) during the last 5 years (Table 2). Between 1973 and 2012, the nonresident harvest averaged 4 bears per year (range = 0–18), or 26% of the harvest. Most nonresidents reported using a guide and usually harvested a bear during the fall while hunting other big game species, such as Dall sheep. The percent of black bears in the harvest taken by local residents has varied between years but averaged 19% (4 bears) a year during the last 5 years. Successful bear hunters spent an average of 3 days hunting during the 2012–2013 season, similar to the previous 5-year average of 3.6 days.

Since 2011 there has been no mandatory sealing requirement for black bears in Unit 11. In 2010, the last year of black bear sealing, 88% of successful hunters reported hunting specifically for black bears. The remainder reported taking a bear incidentally to other hunting activities. Past black bear sealing data suggests that bear-baiting activity fluctuates considerably between years. From 2000 to 2009 an annual average of 6 black bears (range = 0–14) were reported harvested over bait in Unit 11. Records indicate that 4 black bears were harvested over bait in regulatory year (RY) 2010 (regulatory year begins 1 July and ends 30 June, e.g., RY10 = 1 July 2010–30 June 2011) and 3 harvested over bait in RY11 (Table 1).

Data from bear sealing certificates indicates 90% of successful hunters were specifically hunting black bears during this reporting period. The remainder reported taking a bear incidentally to other hunting activities.

Harvest Chronology. May, June, and August are important months for harvesting black bears in Unit 11 (Table 3). Since 1973, 54% of the black bear harvest has occurred during the fall season. More recent harvest chronology data shows that between 1993 and 2010 spring harvests exceeded fall harvests due to the increased interest in spring bear baiting. During the last 5 years on average, 9 (41%) bears have been taken in the fall and 13 (59%) bears have been taken in the spring. The spring black bear harvest equaled or exceeded the fall harvest each year during this reporting period, with the exception of 2012.

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 with locals.

Other Mortality

No bears were reported taken by nonhunting methods. Hunters taking a bear under defense of life or property (DLP) conditions are required to turn over the hide and skull to the Alaska Department of Fish and Game. No bears were taken under the DLP regulation in Unit 11 during this reporting period. 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. It may actually keep problem bears away from communities and keep DLP kills down. Males continue to predominate in the harvest. 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. Federal National Park Service 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 park to all hunting. As a result, most of the harvest is along the road system. No changes in season length or bag limits are recommended.

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Table 1. Unit 11 black bear harvest, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory	Reported hunter kill							Nonhunting kill[b]			Total kill			
year	M	(%)	F	(%)	Unk	Total	Over bait[c]	M	F	Unk	M	F	Unk	Total
2008														
Fall 2008	5	(71)	2	(29)	0	7		1	0	0	6	2	0	8
Spring 2009	12	(80)	3	(20)	0	15		0	0	0	12	3	0	15
Total	17	(77)	5	(23)	0	22	11	1	0	0	18	5	0	23
2009														
Fall 2009	5	(38)	8	(62)	0	13		0	0	0	5	8	0	13
Spring 2010	14	(78)	4	(20)	0	18		0	0	0	14	4	0	18
Total	19	(61)	12	(39)	0	31	12	0	0	0	19	12	0	31
2010														
Fall 2010	7	(78)	2	(22)	0	9		0	0	0	7	2	0	9
Spring 2011	14	(78)	4	(22)	0	18		0	0	0	14	4	0	18
Total	21	(78)	6	(22)	0	27	4	0	0	0	21	6	0	27
2011														
Fall 2011	8	(67)	4	(33)	0	12		0	0	0	8	4	0	12
Spring 2012	4	(57)	3	(43)	1	8		0	0	0	4	3	1	8
Total	12	(63)	7	(37)	1	20	3	0	0	0	12	7	1	20
2012														
Fall 2012	4	(100)	0	(0)	0	4		0	0	0	4	0	0	4
Spring 2013	3	(75)	1	(25)	0	4		0	0	0	3	1	0	4
Total	7	(88)	1	(12)	0	8		0	0	0	7	1	0	8

[a] Regulatory year (RY) begins 1 July and ends 30 June, e.g., RY08 = 1 July 2008–30 June 2009.
[b] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.
[c] Beginning RY11, sealing not required in Unit 11 and Unit 13, bears taken over bait not recorded on harvest tickets.

Table 2. Unit 11 black bear successful hunter residency, Southcentral Alaska, regulatory years[a] 2008–2012[b].

Regulatory year	Local[c] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
2008	7	(32)	10	(45)	5	(23)	22
2009	6	(19)	15	(48)	10	(32)	31
2010	4	(15)	17	(63)	6	(22)	27
2011	0	(0)	14	(70)	6	(30)	20
2012	4	(50)	3	(38)	1	(13)	8

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.
[b] Adjusted for multiple harvests by individual hunters.
[c] Resident of Unit 11 or National Park Service subsistence community for Wrangell-St. Elias National Park and Preserve.

Table 3. Unit 11 black bear harvest chronology by month, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory year	Harvest periods (%)														
	Jul		Aug		Sep		Oct		Apr		May		Jun		*n*
2008	0	(0)	4	(18)	3	(14)	0	(0)	0	(0)	8	(36)	7	(32)	22
2009	0	(0)	11	(35)	2	(6)	0	(0)	0	(0)	9	(29)	9	(29)	31
2010	1	(4)	4	(15)	3	(11)	1	(4)	0	(0)	14	(52)	4	(15)	27
2011	1	(5)	10	(50)	1	(5)	0	(0)	0	(0)	1	(5)	7	(35)	20
2012	0	(0)	2	(25)	2	(25)	0	(0)	0	(0)	2	(25)	2	(25)	8

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.

Table 4. Unit 11 black bear harvest by transport method, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory year	Harvest by transport method (%)								
	Airplane	Horse	Boat	ATV[b]	Snowmachine	Highway vehicle	Walk	Unk	*n*
2008	2 (9)	0 (0)	9 (41)	4 (18)	0 (0)	3 (14)	4 (18)	0 (0)	22
2009	3 (10)	1 (3)	6 (19)	3 (10)	0 (0)	8 (26)	7 (23)	3 (10)	31
2010	4 (15)	0 (0)	10 (37)	3 (11)	0 (0)	6 (22)	4 (15)	0 (0)	27
2011	2 (10)	1 (5)	3 (15)	0 (0)	0 (0)	2 (10)	11 (55)	1 (5)	20
2012	0 (0)	1 (13)	1 (13)	1 (13)	0 (0)	3 (38)	2 (25)	0 (0)	8

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.

[b] ATV = all-terrain vehicle.

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CHAPTER 11: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013[1]

LOCATION

GAME MANAGEMENT UNIT: 12 (10,107 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

Harvest was estimated using mandatory harvest reports. To increase the reporting rate, reminder letters were sent to hunters who did not initially report. Data obtained from the reports was used to determine total harvest, hunter residency, success rates, harvest chronology, and transportation used. Additional harvest data, including skull size, salvage of meat, and bait use, was collected during the optional process of sealing harvested bears. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY12 = 1 July 2012–30 June 2013). Hunters were required to register all black bear bait stations and the distribution of bait stations and harvest were monitored.

Blueberry abundance has been monitored at 5 permanent blueberry sample areas in Unit 12 and 3 sample areas in adjacent Unit 20E since 2000. Sample sites were selected for the presence of blueberry plants in a variety of habitat types, aspects, elevations, and slopes. Annual rainfall and temperature was 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 in late July and early August of 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 RY10–RY12 no population surveys were conducted in Unit 12 to determine the black bear population size and trend. However, I estimated the RY10–RY12 Unit 12 black bear population at 700–1,000 bears based on limited radiotelemetry data collected in Unit 12 (Kelleyhouse 1990), and on density estimates in Unit 20A of 12–18 black bears/100 mi^2 (46–67/1,000 km^2; Hechtel 1991) and 12–19 black bears/100 mi^2 (46–75/1,000 km^2; C. Gardner, ADF&G unpublished data, Fairbanks). Both density estimates in Unit 20A excluded cubs of the year.

No major climatic anomalies or habitat alterations occurred in Unit 12 during RY10–RY12. Wildfires occurred on 28 mi^2 and 112 mi^2 in Unit 12 during 2010 and 2013 respectively. Some bears may have been displaced from the burned areas but due to the small size of the fires, 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 RY10–RY12, 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), similar to other black bear populations in Interior Alaska (Miller 1987).

Distribution and Movements

Black bears are distributed throughout the forested areas that include 4,396 mi^2 (11,386 km^2) of Unit 12 based on LANDFIRE™ (2009; http://www.landfire.gov/) vegetation classifications using the 2001 Landsat™ imagery (ADF&G, unpublished data, Fairbanks). 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. Observations by members of the public as well as information gathered incidental to other fieldwork suggested black bear use of the area was subsequently 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, 2010, and 2013, wildfires burned 434 mi^2, 28 mi^2, and 112 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. Starting in RY09 the Board of Game (board) required hunters to possess harvest tickets for black bears in all units where black bear sealing was required, including Unit 12. Beginning in RY10, the board classified black bears as furbearers as well as big game. Although the board did not open black bear trapping seasons, this furbearer classification and other regulatory changes allowed hunters to legally sell black bear hides and parts, except gall bladders. The board subsequently amended these regulations so that sale of black bear meat remained illegal in RY10. The sealing requirement in Unit 12 was eliminated in RY10, except for bears removed from Alaska or sold, and salvage requirements for black bears harvested during 1 June–31 December were changed to allow hunters to salvage either the hide or meat with no requirement to salvage the skull. Also beginning in RY10, sealed black bear hides and skulls taken under a hunting license were allowed to be sold. The board also increased the maximum number of bait stations allowed to be registered by guides from 2 to 10 beginning in spring 2011. In March 2012 the board approved same-day-airborne take of black bears at bait stations in Unit 12, provided the black bear is at the bait station and that the hunter is at least 300 feet from the airplane.

No emergency orders were issued during RY10–RY12.

Harvest by Hunters. During RY10–RY12, 98–139 hunters ($\bar{x}$ = 118) reported taking 36–43 black bears ($\bar{x}$ = 40) annually in Unit 12 (Table 1). Estimated harvest rate was 4–6% of the adult population, 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 42 bears during RY04–RY12. Males composed 62–86% of the

harvest ($\bar{x}$ = 74%) during RY10–RY12 (Table 1), meeting the harvest objective of >55% males for all 3 years.

During RY10–RY12, 57% of harvested bears were sealed, and the average skull size of sealed males was 16.9 inches (n = 47), slightly higher than the RY07–RY09 average of 16.6 inches. 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 bears.

Beginning in RY10, information on black bear harvest over bait is only available from the optional process of sealing harvested bears. During RY10–RY12, 63% of spring-harvested sealed bears were taken over bait. This compares to an average of 72% and 75% spring-harvest over bait during RY07–RY09 and RY04–RY06 respectively. The use of bait stations by successful hunters increased substantially in RY01. During RY89 and RY91, 45% of the spring harvest was taken over bait (5–8 bears).

Circumstantial evidence indicates that berry abundance may affect bear harvest. During years of poor berry production, bears may travel more in search of berries and/or may be more attracted to hunter-killed moose or caribou or other human foods (Gardner 2002). These behaviors increase the vulnerability of bears to hunters. Low blueberry abundance in fall 2006 and 2012 (Table 2) coincided with high fall harvest of black bears. However black bear harvest in Unit 12 was again high in 2008 when blueberries were relatively abundant. In 2010 when blueberries were again abundant, 1 black bear was killed in defense of life or property and numerous black bear incidents were reported in communities and campsites along the road system in Units 12 and 20E.

Hunter Residency and Success. The overall success rate of 33% during RY10–RY12 was higher than the 28% reported in RY09, the first year harvest tickets were issued for black bears in Unit 12 (Table 3). Success rates among Alaska residents (33%) and nonresidents (39%) were similar. Alaska residents harvested 86–90% ($\bar{x}$ = 88%) of the black bears taken in Unit 12, and during RY10–RY11 76% of Alaska resident hunters who had their bear(s) sealed reported salvaging at least some meat (there is incomplete data on meat salvage for RY12). Unit 12 residents took an average of 42% of the harvest, which is similar to the previous 5-year average of 42%. During RY10–RY12, nonresidents took an average of 4.7 black bears per year. With the exception of RY05 and RY08, nonresident harvest has been stable since RY95 and has averaged 5.2 black bears per year. Guided nonresidents harvested 71% of the bears killed by nonresidents during RY10–RY12.

During RY10–RY12, successful hunters spent an average of 4.8 days afield annually hunting black bears compared to 2.8 days during RY07–RY09 and 4.7 days during RY04–RY06. 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 an increase in the number of hunters satisfied with harvesting only 1 bear. During RY10–RY12 an average of 8.4% of hunters took >1 bear compared to 15.5% during RY95–RY00, and 28.0% during RY90–RY94.

Harvest Chronology. During RY10–RY12 the average percent of the harvest taken during the spring was 75%, greater than the averages of 66% in RY07–RY09 and 70% in RY04–RY06 (Table 4). In RY12 only 7% of the black bear harvest occurred during May due to prolonged winter conditions with deep snow persisting through the month.

Transport Methods. During RY10–RY12, 4-wheelers (27%) and highway vehicles (35%) continued to be the most common modes of transportation used by successful black bear hunters (Table 5). The use of boats (11%) and off-road vehicles (5%) increased compared to previous reporting periods.

Other Mortality

There are 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%. Additional natural mortality also occurred among radiocollared adult black bears. Other than hunting, human influence on bear survival in Unit 12 appears to be minimal.

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, 28 mi^2, and 112 mi^2 in Unit 12 during 2004, 2010, and 2013 respectively, likely improving habitat quality for black bears in the area.

Enhancement

The implementation of the Alaska Interagency Wildland Fire Management Plan (Alaska Wildland Fire Coordinating Group 1998) and the 1990, 2004, 2010, and 2013 wildfires are expected to enhance black bear habitat over the long term in Unit 12. Extensive areas within Unit 12 are currently climax black spruce forest, which 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

We met the management objective of 55% or more males in the harvest ($\bar{x}$ = 74% males) during RY10–RY12. Black bears in Unit 12 were hunted primarily in the spring by local and nonlocal Alaska residents. Average male skull size was 16.9 inches and has remained consistent since 1980. Black bear meat continues to be 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 above sustainable levels. No changes in seasons, bag limits, or management goals and objectives are recommended at this time.

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Table 1. Unit 12 black bear harvest, regulatory years[a] 1995 through 2012.

Regulatory year	Reported: Hunter kill M	F	Unk	Total	Baited[c]	Nonhunting kill[b] M	F	Unk	Estimated kill: Unreported	Illegal	Total reported and estimated kill: M (%)	F (%)	Unk	Total
1995														
Fall 1995	5	3	0	8	0	0	0	0	0	0	5 (63)	3 (38)	0	8
Spring 1996	17	6	0	23	11	0	0	0	0	0	17 (74)	6 (26)	0	23
Total	22	9	0	31	11	0	0	0	0	0	22 (71)	9 (29)	0	31
1996														
Fall 1996	21	2	0	23	0	0	1	0	0	0	21 (88)	3 (13)	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														
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														
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 (33)	0	40
1999														
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														
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														
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
2002														
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

Regulatory year	Reported: Hunter kill M	F	Unk	Total	Baited[c]	Nonhunting kill[b] M	F	Unk	Estimated kill: Unreported	Illegal	Total reported and estimated kill: M (%)	F (%)	Unk	Total
2003														
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														
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														
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														
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
2007														
Fall 2007	9	3	0	12	0	0	0	0	0	0	9 (75)	3 (25)	0	12
Spring 2008	22	12	0	34	25	0	0	0	0	0	22 (65)	12 (35)	0	34
Total	31	15	0	46	25	0	0	0	0	0	31 (67)	15 (33)	0	46
2008														
Fall 2008	13	8	0	21	0	0	1	0	0	0	13 (59)	9 (41)	0	22
Spring 2009	25	11	0	36	25	0	0	0	0	0	25 (69)	11 (31)	0	36
Total	38	19	0	57	25	0	1	0	0	0	38 (67)	20 (34)	0	58
2009														
Fall 2009	4	6	0	10	0	0	0	0	0	0	4 (40)	6 (60)	0	10
Spring 2010	12	5	0	17	10	0	0	0	0	0	12 (71)	5 (29)	0	17
Total	16	11	0	27	10	0	0	0	0	0	16 (59)	11 (41)	0	27
2010														
Fall 2010	6	0	0	6	0	1	0	0	0	0	7 (100)	0 (0)	0	7
Spring 2011	24	5	0	29	6	0	0	0	0	0	24 (83)	5 (17)	0	29
Total	30	5	0	35	6	1	0	0	0	0	31 (86)	5 (14)	0	36

Regulatory year	Reported: Hunter kill M	F	Unk	Total	Baited[c]	Nonhunting kill[b] M	F	Unk	Estimated kill: Unreported	Illegal	Total reported and estimated kill: M (%)	F (%)	Unk	Total
2011														
Fall 2011	6	1	1	8	0	0	1	0	0	0	6 (75)	2 (25)	1	9
Spring 2012	24	9	0	33	15	0	0	0	0	0	24 (73)	9 (27)	0	33
Total	30	10	1	41	15	0	1	0	0	0	30 (73)	11 (27)	1	42
2012														
Fall 2012	9	7	0	16	0	0	0	1	0	0	9 (56)	7 (44)	1	17
Spring 2013	17	9	0	26	10	0	0	0	0	0	17 (65)	9 (35)	0	26
Total	26	16	0	42	10	0	0	1	0	0	26 (62)	16 (38)	1	43

[a] Regulatory year (RY) begins 1 July and ends 30 June (e.g., RY95 = 1 July 1995 through 30 June 1996).
[b] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.
[c] Sealing requirements eliminated in RY10, and baiting information is available only from sealed bears. Baited bears for RY10–RY12 are a minimum count.

Table 2. Total counts[a] of blueberries surveyed at 8 sites in Units 12 and 20E between 25 July and 15 August 2000–2012[b].

	Location/Unit								
Year	Clearwater (Unit 12) N63°09′ W143°10′	7 mile (Unit 12) N63°12′ W143°04′	Pipeline (Unit 12) N63°15′ W142°27′	RCA (Unit 12) N63°23′ W143°47′	4 mile (Unit 12) N63°21′ W142°34′	9 mile (Unit 20E) N63°24′ W142°28′	Fairplay 1 (Unit 20E) N63°40′ W142°15′	Fairplay 2 (Unit 20E) N63°41′ W142°15′	Total
2000	137	3	19	7	55	51	124	46	442
2001	285	23	278	23	356	400	379	599	2,343
2003	806	24	135	220	676	209	667	996	3,733
2004	164	19	67	6	burned	152	274	358	1,040
2005	630	55	490	238	0	205	199	292	2,109
2006	27	56	47	298	15	24	239	87	793
2007	285	7	47	231	46	999	457	125	2,197
2008	375	31	112	93	352	394	453	269	2,079
2009	447	13	119	167	433	344	382	418	2,323
2010	203	26	157	42	705	189	507	167	1,996
2011	437	45	73	97	770	61	164	56	1,703
2012	186	8	1	9	541	17	n/a	14	776

[a] Sum of all blueberries counted on 5 plots at each sample site.
[b] No surveys were conducted in 2002 or 2013.

Table 3. Unit 12 black bear hunter residency and success, regulatory years[a] 1990 through 2012.

	Successful					Unsuccessful[b]						
Regulatory year	Unit resident	Other resident	Nonresident	Total	(%)	Unit resident	Other resident	Nonresident	Unk	Total	(%)	Total hunters
1990	15	7	2	24								
1991	10	8	0	18								
1992	26	8	1	35								
1993	21	5	1	27								
1994	26	7	1	34								
1995	18	9	4	31								
1996	32	7	5	44								
1997	30	6	5	41								
1998	25	12	3	40								
1999	18	6	3	27								
2000	30	12	5	47								
2001	12	4	7	23								
2002	23	11	6	40								
2003	10	10	2	22								
2004	22	13	3	38								
2005	12	17	10	39								
2006	21	25	4	50								
2007	27	15	4	46								
2008	20	23	14	57								
2009	11	12	4	27	(28)	28	39	3	0	70	(72)	97
2010	15	16	4	35	(36)	27	32	4	0	63	(64)	98
2011	14	23	4	41	(35)	30	40	6	0	76	(65)	117
2012	21	15	6	42	(30)	39	46	12	0	97	(70)	139

[a] Regulatory year (RY) begins 1 July and ends 30 June (e.g., RY90 = 1 July 1990–30 June 1991).
[b] Mandatory harvest report cards required beginning in RY09.

Table 4. Unit 12 black bear harvest chronology percent by month, regulatory years[a] 1990 through 2012.

Regulatory	Harvest chronology percent by month								
year	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1990	0	4	21	0	0	0	54	21	24
1991	0	6	6	0	0	0	41	47	17
1992	3	11	20	0	0	3	46	17	35
1993	0	7	7	0	0	0	41	44	27
1994	7	7	10	0	0	0	33	43	34
1995	7	10	10	0	0	0	38	34	29
1996	9	7	36	0	0	0	39	9	44
1997	5	0	5	0	0	0	71	20	41
1998	0	8	20	0	0	0	58	15	40
1999	0	15	19	0	0	0	33	33	27
2000	4	11	19	0	0	2	43	21	47
2001	9	9	17	4	0	0	35	26	23
2002	0	5	18	0	0	2	48	27	40
2003	0	14	9	0	0	0	54	23	22
2004	3	8	13	0	0	3	53	21	38
2005	0	13	18	0	0	0	36	33	39
2006	2	6	26	0	0	0	44	20	50
2007	0	20	7	0	0	0	40	33	46
2008	0	14	23	0	0	0	28	35	57
2009	0	15	15	7	0	0	41	22	27
2010	3	0	14	0	0	0	46	37	35
2011	2	12	5	0	0	2	42	37	41
2012	0	14	24	0	0	0	7	55	42

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 1990 = 1 July 1990–30 June 1991).

Table 5. Unit 12 black bear harvest by transport method, regulatory years[a] 1990 through 2012.

Regulatory year	Harvest by transport method (%)									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	*n*
1990	1 (4)	1 (4)	2 (8)	3 (13)	0 (0)	0 (0)	12 (50)	0 (0)	5 (21)	24
1991	1 (6)	0 (0)	1 (6)	2 (11)	0 (0)	0 (0)	13 (71)	0 (0)	1 (6)	18
1992	3 (9)	0 (0)	4 (11)	7 (20)	0 (0)	2 (6)	16 (46)	1 (3)	2 (6)	35
1993	1 (4)	0 (0)	1 (4)	9 (36)	0 (0)	1 (4)	11 (44)	1 (4)	1 (4)	25
1994	2 (6)	1 (3)	3 (9)	7 (21)	0 (0)	1 (3)	12 (35)	7 (21)	1 (3)	34
1995	2 (7)	1 (3)	1 (3)	4 (14)	0 (0)	0 (0)	16 (55)	5 (17)	0 (0)	29
1996	5 (11)	1 (2)	2 (5)	8 (18)	0 (0)	0 (0)	19 (43)	6 (14)	3 (7)	44
1997	0 (0)	0 (0)	2 (5)	10 (24)	0 (0)	0 (0)	22 (54)	7 (17)	0 (0)	41
1998	3 (8)	2 (5)	2 (5)	2 (5)	0 (0)	0 (0)	19 (48)	12 (30)	0 (0)	40
1999	5 (19)	1 (4)	1 (4)	6 (22)	0 (0)	0 (0)	11 (41)	3 (11)	0 (0)	27
2000	1 (2)	0 (0)	3 (6)	14 (30)	1 (2)	0 (0)	20 (43)	8 (17)	0 (0)	47
2001	1 (4)	0 (0)	0 (0)	6 (26)	0 (0)	0 (0)	10 (43)	5 (22)	1 (4)	23
2002	3 (8)	0 (0)	1 (2)	19 (48)	0 (0)	0 (0)	8 (20)	7 (17)	2 (5)	40
2003	4 (18)	0 (0)	0 (0)	7 (32)	0 (0)	0 (0)	6 (27)	5 (23)	0 (0)	22
2004	3 (8)	0 (0)	0 (0)	12 (32)	0 (0)	0 (0)	16 (42)	7 (18)	0 (0)	38
2005	2 (5)	0 (0)	1 (3)	15 (38)	0 (0)	0 (0)	12 (31)	9 (23)	0 (0)	39
2006	3 (6)	0 (0)	1 (3)	20 (40)	0 (0)	4 (8)	15 (30)	5 (10)	2 (4)	50
2007	3 (6)	0 (0)	1 (2)	9 (20)	0 (0)	0 (0)	28 (61)	4 (9)	1 (2)	46
2008	9 (16)	1 (2)	2 (4)	26 (45)	0 (0)	0 (0)	8 (14)	11 (19)	0 (0)	57
2009	1 (4)	0 (0)	2 (7)	5 (19)	0 (0)	0 (0)	14 (52)	3 (11)	2 (7)	27
2010	2 (6)	0 (0)	5 (14)	8 (23)	0 (0)	3 (9)	13 (37)	4 (11)	0 (0)	35
2011	1 (2)	2 (5)	4 (10)	10 (25)	0 (0)	1 (2)	14 (34)	9 (22)	0 (0)	41
2012	3 (7)	1 (2)	4 (10)	14 (33)	0 (0)	2 (5)	14 (33)	4 (10)	0 (0)	42

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 1990 = 1 July 1990–30 June 1991).

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CHAPTER 12: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 13 (23,367 mi^2)

GEOGRAPHIC DESCRIPTION: Nelchina Basin

BACKGROUND

Black bears are numerous in portions of Unit 13 with suitable forest habitat. Harvest data have been available since 1973, when the sealing of black bears became mandatory. Black bear harvests averaged 67 per year during the 1970s, 81 in the 1980s, and 93 in the 1990s. During the 2000s the average yearly black bear harvest in Unit 13 increased to 132. 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 GOAL

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

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, hunting methods, transportation used, and effort.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

A black bear population estimate was conducted in 1985 along a portion of the upper Susitna River in conjunction with the Susitna Hydroelectric Project (Miller 1987). Results indicated a density estimate of 90 black bears/1,000 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 Subunits 13D and 13E, and to a lesser extent in Subunit 13C. A population estimate for Unit 13 has not been attempted because density estimates for bears in more favorable or typical forested habitat within the unit 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.

Alaska Board of Game Actions and Emergency Orders. In March 2011 the Board of Game passed regulations allowing guides to establish up to 10 bait stations in total combined with assistant guides, and allowing hunters that have been airborne to take black bears at a bait station the same day, as long as they are at least 300 feet from the airplane at the time of taking in Units 11 and 13. These regulations went into effect in spring 2012. Also in March 2011, the board passed regulations eliminating the black bear sealing requirement in Units 11 and 13, becoming effective 1 July 2011.

Harvest by Hunters. The reported harvest of black bears during the 2012–2013 season was 118 bears, a decrease from the 145 black bears harvested during the 2011–2012 season, and the record harvest of 196 bears during the 2010–2011 season (Table 1). This decline follows the reduced harvest observed in Unit 11. The decline in harvest during the 2011–2012 season can likely be attributed to a late spring. A late spring can cause a delay in emergence of new vegetation, which can impact the distribution of bears, and hunter success. Also, remaining snow likely made the installation of bait stations more difficult. The average harvest of 153 per year for this reporting period was slightly less than the average of 165 bears per year reported taken during the previous 3 years. Males composed 77% (n = 108) of the 2011–2012 harvest and 68% (n = 80) of the 2012–2013 harvest. Overall, males composed 69% of the harvest during this reporting period.

Mean skull size for males was 17.0 inches in 2012–2013, slightly larger than the previous reporting period average of 16.7 inches. Mean skull size for females was 15.7 inches in the 2012–2013 harvest, unchanged from the previous reporting period average of 15.7 inches. The average yearly skull size for males has been 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.

During this reporting period, bears harvested in Subunit 13D accounted for 43% of the total Unit 13 harvest, followed by Subunit 13E with 38%, Subunit 13A with 9%, Subunit 13C with 6%, and Subunit 13B with only 3%, and 1% in unknown subunits.

The defense of life or property (DLP) kill averaged 2 bears per year during 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 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. During this reporting period an average of 141 (range 118–153) black bear bait stations were registered in Unit 13, compared to an average of 122 (range 110–145) the previous reporting period. Starting the 2011 season, guides were allowed to register up to 10 baiting stations per guide use area. The number of registered baiting stations did increase from 118 in 2010 to 153 in 2011. However, the reported number of black bears harvested over bait decreased from 72 in 2010 to 34 during the 2011 season. This decline in reported harvest over bait can likely be explained by a regulation change that eliminated the black bear sealing requirement during the 2011 season. This regulation change resulted in a loss of bear baiting data. While hunters were still required to possess a black bear harvest ticket, and submit a harvest report, bear baiting data were not captured on the harvest report.

Hunter Residency and Success. Nonresidents took 22 (19%) black bears during 2012–2013 (Table 2). During this reporting period, the black bear take by nonresidents averaged 34 bears per year. This figure is slightly higher than the previous 10-year average of 27. Local residents of Unit 13 harvested 17 (14%) black bears during 2012–2013. The average local resident harvest was 26 during this reporting period, identical to the previous 10-year average. The remaining 79 bears (67%) harvested during 2012–2013 were taken by nonlocal Alaskan residents, who have historically accounted for the largest portion of the Unit 13 black bear harvest. During this reporting period the average nonlocal resident harvest was 93, an increase from the previous 10-year average of 81.

Successful black bear hunters spent an average of 6.0 days in the field in 2012–2013 and 4.3 days during this reporting period. Over the past 5 years, hunters averaged 3.8 days to take a black bear in the spring versus 4.1 in the fall. The increased popularity of hunting over a bait station may account for the higher effort.

Harvest Chronology. During the 2012–2013 season, the spring harvest was 59 bears (50%), compared to 58 (50%) in the fall. The 2012–2013 harvest chronology was a departure from the previous 5 years when 66% of the Unit 13 black bear harvest occurred during spring. The spring harvest has exceeded the fall harvest every year since 2000–2001. Most years June had the highest spring harvest. September is the most important month during the fall season (Table 3). Harvests in July and August have also 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 the bears were nuisance bears.

Transport Methods. Successful 2012–2013 bear hunters reported highway vehicles (23%) and 4-wheelers (22%) as the most popular methods of transportation (Table 4). Aircraft use has declined since 1995, but was the fourth most used transportation method during this reporting period, behind the use of boats. 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. Subunits 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 impact prime black bear habitat (Schwartz and Franzmann 1991). 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

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 13D and 13E. 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 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.

Black bear hunting has become more popular and this trend is expected to continue as hunters seek alternative big game hunting opportunities. There has been a trend of increasing competition, shorter hunting seasons, and increased hunting interest on 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. Prior to the use of harvest

tickets, this information was collected only from successful hunters. In the future, effort data may help further our understanding of harvest as it relates to hunting effort. No changes to season length or bag limits are recommended at this time. We do recommend establishing a management objective of no more than 40% females in the Unit 13 combined harvest over a 3-year period.

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Table 1. Unit 13 black bear harvest, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory	Reported hunter kill							Nonhunting kill[b]			Total kill			
year	M	(%)	F	(%)	Unk	Total	Over bait[c]	M	F	Unk	M	F	Unk	Total
2008														
Fall 2008	59	(69)	26	(31)	0	85		0	1	0	59	27	0	86
Spring 2009	65	(63)	38	(37)	0	103		0	0	0	65	38	0	103
Total	124	(66)	64	(34)	0	188	70	0	1	0	124	65	0	189
2009														
Fall 2009	23	(48)	25	(52)	1	49		2	1	0	25	26	1	52
Spring 2010	79	(69)	35	(31)	0	114		1	0	0	80	35	0	115
Total	102	(63)	60	(37)	1	163	73	3	1	0	105	61	1	167
2010														
Fall 2010	36	(54)	31	(46)	0	67		2	1	0	38	32	0	70
Spring 2011	91	(71)	38	(29)	0	129		1	0	0	92	38	0	130
Total	127	(65)	69	(35)	0	196	72	3	1	0	130	70	0	200
2011														
Fall 2011	30	(68)	14	(32)	2	46		0	0	0	30	14	2	46
Spring 2012	78	(81)	18	(19)	3	99		0	0	0	78	18	3	99
Total	108	(77)	32	(23)	5	145	34	0	0	0	108	32	5	145
2012														
Fall 2012	38	(66)	20	(34)	0	58		1	0	0	39	20	0	59
Spring 2013	41	(69)	18	(31)	0	59		1	0	0	42	18	0	60
Total	80	(68)	38	(32)	0	118		2	0	0	82	38	0	120

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.

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

[c] No sealing requirement for black bears after 2011, no harvest over bait data available for bears not sealed.

Table 2. Unit 13 black bear successful hunter residency, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory year	Local resident	(%)	Other resident	(%)	Nonresident	(%)	Successful hunters[b]
2008	41	(22)	109	(58)	38	(20)	188
2009	29	(18)	116	(71)	18	(11)	163
2010	32	(16)	106	(54)	58	(29)	196
2011	29	(20)	93	(64)	23	(16)	145
2012	17	(14)	79	(67)	22	(19)	118

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.
[b] Includes hunters with unknown residency.

Table 3. Unit 13 black bear harvest chronology (percent) by month, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory year	Harvest chronology by month (%)													
	Jul		Aug		Sep		Oct		Apr		May		Jun		n[b]
2008	6	(3)	30	(16)	44	(23)	5	(3)	0	(0)	43	(23)	60	(32)	188
2009	7	(4)	14	(9)	23	(14)	5	(3)	0	(0)	55	(34)	59	(36)	163
2010	5	(3)	20	(10)	34	(17)	8	(4)	0	(0)	49	(25)	80	(41)	196
2011	3	(2)	13	(9)	27	(19)	3	(2)	1	(1)	39	(27)	59	(41)	145
2012	6	(5)	16	(14)	32	(27)	4	(3)	0	(0)	9	(8)	50	(43)	117

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.
[b] May include bears with unknown harvest date.

Table 4. Unit 13 black bear harvest (percent) by transport method, Southcentral Alaska, regulatory years[a] 2008–2012.

Regulatory year	Harvest by transport method (%)									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV[b]	Highway vehicle	Walk	Unknown	*n*
2008	24 (13)	0 (0)	28 (15)	38 (20)	0 (0)	4 (2)	58 (31)	31 (17)	4 (2)	187
2009	8 (5)	1 (1)	38 (23)	43 (26)	0 (0)	7 (4)	43 (26)	13 (8)	10 (6)	163
2010	26 (13)	1 (1)	39 (20)	52 (27)	0 (0)	1 (1)	46 (23)	17 (9)	14 (7)	196
2011	12 (8)	0 (0)	24 (17)	35 (24)	2 (1)	6 (4)	47 (32)	15 (10)	4 (3)	145
2012	21 (18)	2 (2)	20 (17)	26 (22)	0 (0)	7 (6)	27 (23)	7 (6)	8 (7)	118

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2008 = 1 July 2008–30 June 2009.
[b] ORV = off-road vehicle.

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CHAPTER 13: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNITS: 14A and 14B (4,713 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 females. McDonough (2002) reported that the population likely remained at between 500 and 1,000 bears for all of Unit 14.

Prior to RY10 management goals and objectives were based on all 3 subunits of Unit 14. Annual harvests and the number of females was 80 bears annually and no more than 14 sows for Unit 14A and no more than 8 sows each for Units 14B & C. Between RY73 and RY10 the annual harvest exceeded 80 bears 29 of the 37 years. As recommended in the most recent previous management report (Peltier 2011), the management objective was changed from no more than 30% females in all of the Unit 14 harvest to no more than 40% females in the Unit 14A and 14B combined harvest for a 3-year period.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Since 1976 the management goal in Units 14A and 14B has been to provide the greatest opportunity possible to participate in hunting black bears. Given the lower numbers of moose in Unit 14B there has been an incentive to reduce the number of black bears to increase moose calf survival.

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 while ensuring that the percentage of females in the harvest does not exceed 40% in any 3-year period.

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 with no more than 2 bait stations allowed per permit. Harvest data were organized and analyzed by regulatory year (RY). A regulatory year runs 1 July through 30 June (e.g., RY10 = 1 July 2010–30 June 2011).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The black bear population in Unit 14 was previously estimated as 530–1,080 by Griese (1996). Earlier estimates by Harkness (1990) and Grauvogel (1990) reported a population size of 750–1,050. Based on distance sampling models available from Earl Becker's bear survey work in Unit 16 (unpublished data), and harvest data trends, we believe the population was similar to those previous estimates or increasing during both this and the preceding reporting periods (Peltier 2008).

MORTALITY

Harvest

Season and Bag Limit. During this reporting period there was no closed season in Units 14A and 14B. In RY10 the bag limit was 1 black bear in Unit 14A, and 3 bears per year in Unit 14B. The limit was raised to 3 bears in Unit 14A in RY11; the limit was left at 3 bears for Unit 14B. Baiting was allowed by registration permit. Bear hunters wanting to use bait in Units 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. In the spring of 2011 the Board of Game increased the bag limit for black bears in Unit 14A from 1 bear per year to 3 bears per year, and eliminated the need for sealing black bears in Unit 14B; both regulations became effective in RY12. In the same meeting, the board allowed guides and their assistant guides to establish up to 10 bait stations in total for both Units. The board also allowed hunters who have been airborne to take black bears at the bait station the same day they have flown, provided they are at least 300 feet from the airplane at the time of the taking; these regulations were expedited through the Department of Law and took effect in the spring of 2012.

Hunter Harvest. Black bear take was down slightly and the percentage of females in the harvest increased slightly during this reporting period (Tables 1 and 2). The average annual combined total black bear take for 14A and 14B decreased from 142 bears RY07–RY09 to 129 bears during this period. The percentage of females in the harvest increased from 40% (RY07–RY09 average) to 41%. The percentage of black bears taken over bait cannot be compared between the periods because that information was obtained through sealing and sealing is no longer required for bears harvested in Unit 14B.

Baiting Participation. Bear baiting participation decreased during this reporting period. The number of permittees per year averaged 209 compared to 280 during RY07–RY09 (Table 3). The total number of registered bait stations declined as well.

Hunter Residency and Success. Unit 14 residents on average took 80% of the harvest during this reporting period. Nonresident hunters reported an average annual harvest of 20 bears, an increase from an average annual harvest of 14 reported for RY07–RY09 (Table 4). Because both units have a multi-bear bag limit, success rates reflect the residency status of the hunter sealing each bear, and not the overall residency of all successful hunters (hunters may have harvested more than one bear in a regulatory year).

Harvest Chronology. Most black bears harvested in Units 14A and 14B are taken in the last 2 weeks of May and in the month of June (Table 5). The percentage of bears taken during the month of September increased during this reporting period. It is assumed that this change in the number of black bears taken in the fall reflect that hunters already in the field are taking bears during the fall moose hunting season as well as hunter motivation to take black bears.

Transport Methods. Most hunters used all-terrain (ATV) or off-road (ORV) vehicles as their primary mode of transportation (Table 6). Unit Highway vehicle was the second most common means of transportation and hunters heading into the field on foot the third. It is assumed that many of the hunters that reported taking bears on foot were probably hunting bears near their homes or seasonal cabins. Black bears taken in this manner may partially explain why few nuisance bears are reported in these Units, and why few bears are killed in defense of life or property (DLP).

Other Mortality

Nonhunting kills for Units 14A and 14B totaled 2 bears for RY10–RY12. This is a marked decrease from the 10 bears taken during the previous reporting period. There are few reports of bear-human conflicts in Units 14A and 14B, and the number of bears taken under the Defense of Life and Property Law is low. It is generally thought that problem bears are taken by licensed bear hunters during summer months, when nuisance bear activity tends to occur, and they are reported as part of the general season harvest. It is also possible that the reduction in defense of life or property bear mortality was partially due to unit residents becoming more aware of potential bear problems through bear awareness programs promoted by the department, various federal agencies, and community groups like the Bear Necessities Coalition of Talkeetna (Kavalok 2005).

CONCLUSIONS AND RECOMMENDATIONS

It is difficult to derive an accurate estimate of the black bear population in Units 14A and 14B. Difficulties in surveying black bear habitat, budget, and time constraints are likely to hinder completion of surveys in the near future. Line transect work by Becker in Units 16 and 13 may provide valuable insight into how to calculate a more robust population estimate for Unit 14.

Trends in bear harvest should continue to be monitored for indicators of undesirable effects on the black bear population. Based on our current analysis, black bear populations, especially in Subunit 14B, can withstand higher harvest rates, and a decrease in black bear densities may be desirable in Unit 14B to reduce black bear predation on moose calves.

The expanding human population and its encroachment into bear habitat in the Units 14A and 14B are expected to result in more bear-human conflicts and more bears being killed. Because of

the potential for increased bear-human conflicts in Unit 14, the department should continue providing the public information and how to coexist with bears.

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While this unit report was actually published in 2016, it is part of the set of 2014 unit species management reports, so we suggest citing the report as a 2014 report to maintain its relationship to the other 2014 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

Table 1. Unit 14A black bear harvest, regulatory years[a] 2007 through 2012.

Regulatory year	Reported									Estimated unreported kill[d]	Total estimated kill					
	Hunter kill						Nonhunting kill[c]									
	M	F	(%)	Unk	Total	Baited[b]	M	F	Unk		M	(%)	F	(%)	Unk	Total
2007																
Fall 07	13	12	(48)	0	25	0	1	0	0	2	14	(54)	12	(46)	2	28
Spring 08	39	27	(41)	0	66	38	0	0	0	7	39	(59)	27	(41)	7	73
Total	52	39	(40)	0	91	38	1	0	0	9	53	(58)	39	(42)	9	101
2008																
Fall 08	22	12	(35)	0	34	0	1	2	0	3	23	(62)	14	(38)	3	40
Spring 09	33	28	(46)	0	61	42	1	0	0	6	34	(55)	28	(45)	6	68
Total	55	40	(42)	0	95	42	2	2	0	9	57	(58)	42	(42)	9	108
2009																
Fall 09	7	10	(59)	0	17	0	2	1	0	2	9	(45)	11	(55)	2	22
Spring 10	44	31	(41)	0	75	58	0	0	0	8	44	(59)	31	(41)	8	83
Total	51	41	(45)	0	92	58	2	1	0	10	53	(57)	42	(43)	10	105
2010																
Fall 10	33	13	(28)	0	46	0	0	0	0	5	33	(72)	13	(28)	5	51
Spring 11	29	30	(51)	0	59	32	0	0	0	6	29	(49)	30	(51)	6	65
Total	62	43	(41)	0	105	32	0	0	0	11	62	(59)	43	(41)	11	116
2011																
Fall 11	18	14	(44)	0	32	0	0	1	0	3	18	(55)	15	(45)	3	36
Spring 12	29	19	(40)	0	48	25	0	0	0	5	29	(60)	19	(40)	5	53
Total	47	33	(42)	0	80	25	0	1	0	8	47	(58)	34	(42)	8	89
2012																
Fall 12	7	8	(53)	0	15	0	0	0	0	2	7	(47)	8	(53)	2	17
Spring 13	26	17	(40)	0	43	28	0	0	0	4	26	(60)	17	(40)	4	47
Total	33	25	(43)	0	58	28	0	0	0	6	33	(57)	25	(43)	6	64

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Bears reported taken over legally established bait stations.
[c] Includes defense of life or property kills, illegal kills, and other known human-caused accidental mortality.
[d] Assumes approximately 10% of reported harvest.

Table 2. Unit 14B black bear harvest, regulatory years[a] 2007 through 2012.

Regulatory year	Reported									Estimated unreported kill[d]	Total estimated kill					
	Hunter kill						Nonhunting kill[c]									
	M	F	(%)	Unk	Total	Baited[b]	M	F	Unk		M	(%)	F	(%)	Unk	Total
2007																
Fall 07	6	3	(33)	0	9	0	0	0	0	1	6	(67)	3	(33)	1	10
Spring 08	17	8	(32)	0	25	14	2	0	0	2	19	(70)	8	(30)	2	29
Total	23	11	(32)	0	34	14	2	0	0	3	25	(69)	11	(31)	3	39
2008																
Fall 08	6	5	(45)	1	12	0	0	0	0	1	6	(55)	5	(45)	2	13
Spring 09	13	10	(43)	0	23	11	0	0	0	2	13	(56)	10	(43)	2	25
Total	19	15	(44)	0	34	11	0	0	0	3	19	(56)	15	(44)	3	37
2009																
Fall 09	4	4	(50)	0	8	0	0	0	0	1	4	(50)	4	(50)	1	9
Spring 10	19	3	(14)	0	22	18	0	0	0	2	19	(86)	3	(14)	2	24
Total	23	7	(23)	0	30	18	0	0	0	3	23	(77)	7	(23)	3	33
2010																
Fall 10	19	9	(32)	0	28	0	0	0	0	3	19	(68)	9	(32)	3	31
Spring 11	16	8	(33)	0	24	9	0	0	0	2	16	(67)	8	(33)	2	26
Total	35	17	(33)	0	52	9	0	0	0	5	35	(67)	17	(33)	5	57
2011[e]																
Fall 11	8	9	(53)	1	18	-	0	0	1	2	8	(47)	9	(53)	4	21
Spring 12	4	9	(69)	0	13	-	0	0	0	1	4	(31)	9	(69)	1	14
Total	12	18	(60)	1	31	-	0	0	1	3	12	(40)	18	(60)	5	35
2012[e]																
Fall 12	6	0	(0)	0	6	-	0	0	0	1	6	(100)	0	(0)	1	7
Spring 13	4	4	(50)	0	8	-	0	0	0	1	4	(50)	4	(50)	1	9
Total	10	4	(29)	0	14	-	0	0	0	1	10	(71)	4	(29)	1	15

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Bears reported taken over legally established bait stations.
[c] Includes defense of life or property kills, illegal kills, and other known human-caused accidental mortality.
[d] Assumes approximately 10% of reported harvest.
[e] Sealing of black bear hides and skulls was not required as of RY11.

Table 3. Unit 14 black bear hunter baiting participation, regulatory years[a] 2003 through 2012.

Regulatory year	Number of permittees	Number of stations registered	
		Unit 14A	Unit 14B
2003	169	197	40
2004	194	201	55
2005	223	257	56
2006	237	234	83
2007	228	234	83
2008	311	309	91
2009	301	293	95
2010	270	266	80
2011	154	173	45
2012	202	222	52

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

Table 4. Unit 14 reported successful hunter residency, regulatory years[a] 2003 through 2012, by black bear harvested.

Regulatory year	Local[b] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters[c]
2003	90	(83)	2	(2)	16	(15)	108
2004	118	(88)	5	(4)	10	(8)	133
2005	110	(89)	0	(0)	13	(11)	123
2006	104	(90)	4	(3)	8	(7)	116
2007	105	(84)	3	(2)	17	(14)	125
2008	109	(85)	1	(1)	18	(14)	128
2009	114	(92)	1	(1)	7	(6)	122
2010	126	(81)	4	(3)	26	(16)	156
2011	82	(74)	5	(5)	24	(21)	111
2012	62	(86)	1	(1)	9	(13)	72

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Unit 14 residents.
[c] The total number of successful hunters may include hunters who are counted more than once because the hunter took more than one black bear

Table 5. Unit 14 black bear reported hunter harvest chronology percent by month, regulatory years[a] 2003 through 2012.

	Percent of harvest									
Regulatory year	Jul–Aug	Sep 1–15	Sep 16–30	Oct	Nov–Mar	Apr	May 1–15	May 16–31	Jun	*n*
2003	14	5	12	2	1	0	7	32	28	107
2004	11	5	8	5	0	2	14	27	30	132
2005	11	9	9	0	0	2	4	23	43	123
2006	9	5	11	1	0	2	8	34	30	115
2007	16	6	4	1	0	1	5	26	41	125
2008	24	6	5	1	0	1	6	19	38	130
2009	8	3	4	0	1	0	6	27	50	119
2010	17	14	15	2	0	1	6	17	28	156
2011	19	11	14	1	0	0	2	11	42	110
2012	15	10	1	3	0	0	1	11	59	72

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

Table 6. Unit 14 black bear harvest percent by reported transport method, regulatory years[a] 2003 through 2012.

Regulatory year	Percent of harvest								
	Airplane	Horse	Boat	Snow Machine	ORV/ATV	Highway Vehicle	Foot	Other / Unknown	*n*
2003	8	3	7	1	45	14	21	0	108
2004	9	0	10	0	50	17	14	0	132
2005	9	0	11	0	44	20	16	0	122
2006	16	0	12	0	40	20	13	0	116
2007	11	0	14	0	45	14	15	1	125
2008	8	0	16	0	42	20	13	1	126
2009	9	3	10	0	54	11	14	0	117
2010	10	1	14	0	40	13	19	3	156
2011	19	5	9	0	44	14	9	0	110
2012	8	0	8	0	55	15	10	4	72

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

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CHAPTER 14: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

GAME MANAGEMENT UNIT: 14C (1,961 mi^2)

GEOGRAPHIC DESCRIPTION: Municipality of Anchorage

BACKGROUND

Unit 14C, which consists of the Municipality of Anchorage (MOA), is a mosaic of wildlife habitat and human development. Most of the MOA is characterized by large tracts of natural lands, including Chugach State Park, Chugach National Forest, the Anchorage Coastal Wildlife Refuge, and Joint Base Elmendorf-Richardson (an 84,000 acre military base). Even the highly developed portions of the MOA support wildlife habitat in vegetated greenbelts, stream corridors and large municipal parks. As a result, bears occupy most areas of Unit 14C; however, the Unit 14C black bear population is affected by habitat fragmentation, urbanization, and associated human activities. These factors have contributed to human-black bear conflicts and other interactions with humans. Most of these conflicts are caused by negligent storage of garbage, birdseed, and pet/livestock food. Management of black bears in Unit 14C involves a combination of population management through regulated hunting, public education on bear safety and responsible living and recreating in bear country, participation in land management decisions affecting bear habitat, and responses to human-bear conflicts.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

Since 1976 the management goals in Unit 14C have been to provide an opportunity to hunt black bears under aesthetically pleasing conditions and to provide an opportunity to enjoy black bears through 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 42 bears, with the annual sow harvest not exceeding 8 sows in Unit 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. Incidental harvest and amount of meat salvage were noted on the sealing reports. Hunting over bait for black bears is not allowed in Unit 14C.

Harvest data were summarized by regulatory year (RY). A regulatory year runs 1 July through 30 June (e.g., RY12 = 1 July 2012–30 June 2013).

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The population estimate for black bears in Unit 14 has ranged from 530–1,080 (Griese 1996) to 750–1,050 (Grauvogel 1990, Harkness 1990). Currently, we estimate the black bear population in Unit 14C at 250 to 350 bears. This estimate is based on black bear density calculated for an area with habitat similar to that in Unit 14C (Miller 1987). High levels of harvest over the last several years suggest that our current population estimate is most likely a minimum population number, and black bears may be slightly more numerous than 350 individuals in Unit 14C. However, there has been no direct measure of population size for this subunit.

MORTALITY

Harvest

Season and Bag Limit. Black bear harvest was permitted year-round in the Remainder of Unit 14C, the day after Labor Day through June 15 in upper Eagle River valley, and from the day after Labor Day through May 31 in the Eklutna Lake and Chugach State Park Management Areas and in the lower Eagle River valley. The bag limit was 1 bear per year. Harvesting black bears over bait is prohibited in Unit 14C.

Board of Game Actions. There were no Board of Game actions during the reporting period concerning black bears in Unit 14C.

Hunter Harvest. Annual black bear harvest in Unit 14C decreased slightly during the RY10–RY12 period, compared to the previous reporting period (Table 1). During RY10–RY12, hunters harvested an average of 45 bears each year, including an average of 18 (42%) sows each year (considered a high percentage of females in a harvest). This was less than the previous reporting period (52 bears per year); however, there was little change in the percent females taken. During the reporting period, hunter kills accounted for 70% of the annual black bear mortality in Unit 14C (Table 2).

Hunter Residency and Success. Resident hunters comprised on average 81% of the annual harvest while nonresident hunters made up 19% of the harvest during this reporting period (Table 3). Additionally, local residents averaged 67% of the annual resident harvest compared to nonlocal residents (33%) from RY10-RY12 (Table 3).

Harvest Chronology. During previous reporting periods, most black bears in Unit 14C were harvested during the spring season (month of May), with peak harvest occurring in the latter half of May. However, during RY10–RY12, harvest was similar in both the spring and fall (September and October) seasons (31% and 27% of total harvest, respectively, Table 4). Few

black bears are harvested during July and August, when only the Remainder of Unit 14C is open to black bear hunting.

Transport Methods. Most hunters in Unit 14C used highway vehicles to access hunting areas. Airplanes were the second most frequently used transportation type (Table 5).

Other Mortality

Nonhunting kills for Unit 14C totaled 45 bears for this reporting period, which was 19% of total reported mortality. The highest reported number of nonhunting kills was 19 bears in 2010. While the majority of nonhunting mortality is attributed to defense of life and property, the number of vehicle-bear collisions in the urban environment of Anchorage is also high (1-6 bears per year during the reporting period). In addition, we estimate approximately 4 black bears are killed and not reported annually; however, this number may be higher.

CONCLUSIONS AND RECOMMENDATIONS

Human-use objectives were exceeded during this report period. The average annual harvest of 45 bears was higher than the management objective of 42 bears and the average sow harvest of 18 females was greater than the estimated allowable harvest of 8 females. During RY10–RY12, the proportion of females harvested in Unit 14C was 41%. Recent studies suggest that black bears can be sustainably harvested at higher rates than previously recommended, and that black bear populations can recover from short periods of overharvest (Mace and Chilton-Radandt 2011); however, the recent high rates of harvest coupled with a high percentage of females in the harvest suggest that we are most likely harvesting at a rate that cannot be sustained for an extended duration. These high rates of harvest may ultimately lead to a decrease in the black bear population and therefore need to be followed closely. Unfortunately, we have no data concerning black bear population numbers, vital rates or population dynamics for Unit 14C. Furthermore, we do not fully understand the movements of bears between the urban/wilderness interface. It is difficult to evaluate population level effects through harvest numbers alone. We recommend initiating the collection of age data on harvested individuals to begin to better evaluate the type of harvest occurring in Unit 14C and as an additional metric to potentially evaluate impacts of harvest on the black bear population.

As previously mentioned, the majority of bear-human conflicts in Unit 14C are related to improper storage of garbage and pet/livestock food, as well as unsecured livestock (i.e. chickens). Food conditioning of individual bears often results in defense of life or property kills. In addition, social reactions to mauling events can increase the number of bears killed in a given year. For example, in 2008, three brown bear maulings occurred in the municipality, which coincided with a record high mortality rate for black bears.

In an effort to better understand factors contributing to conflicts in Unit 14C, Alaska Department of Fish and Game (ADF&G) staff from research, education, and management began a collaborative project in 2012 using new technology (video cameras mounted on GPS collars) to study urban bears. Four collars were deployed on black bears in 2012, two were deployed in 2013, and more may be deployed in the future. Goals for this research include: determining fine scale diet and resource use; determining the factors impacting bear calls to the department in late summer and early fall; investigating the effect of natural and anthropogenic food on urban bear

movements; engaging teachers and students in bear research; and using GPS and video data to educate the public about bears. Analysis of the data is still underway.

In 2002, ADF&G staff created the Anchorage Bear Committee, which brings together representatives from local, state, and federal agencies to help address urban bear issues. ADF&G has also conducted two detailed public opinion surveys to learn more about Anchorage residents' attitudes toward wildlife (Responsive Management 2010), and engaged other agencies and the public in an urban bear management plan. In 2008, ADF&G organized the Anchorage Bear Education Group to coordinate educational and outreach efforts among agencies. The Education Group has developed web pages, brochures, bear safety presentations and videos, bear awareness seminars, bear-resistant trash container demonstrations, bear-themed coloring books, and other educational activities and products to promote safe activities, minimize food conditioning of bears, and encourage land management practices compatible with bear conservation and public safety. During the 2011-2012 school year, education staff conducted approximately 240 wildlife safety presentations to a total of 11,000 students in Anchorage. During the 2012-2013 school year, education staff conducted approximately 200 wildlife safety presentations to a total of 9,000 students in Anchorage.

Education about and enforcement of state wildlife regulations are critical to reducing bear-human conflicts in Unit 14C. We recommend that ADF&G continue to educate the public about bear safety and how to avoid human-bear conflicts in our neighborhoods.

Due to the lack of population specific data on black bears in Unit 14C, we recommend the following changes to the management objectives for the unit:

- Mitigate human-black bear conflicts in urban areas through education, research, and management activities to promote public safety.

- Provide liberal opportunities to hunt black bears with an annual harvest comprised of no more than 40% females.

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Table 1. Unit 14C black bear harvest composition, regulatory years 2003–2012.

Regulatory	Reported Harvest					
Year	Male	(%)[a]	Female	(%)[a]	Unk	Total
2003	27	77%	8	23%	0	35
2004	25	69%	11	31%	0	36
2005	25	66%	13	34%	0	38
2006	16	53%	14	47%	0	30
2007	30	61%	19	39%	0	49
2008	40	62%	25	38%	0	65
2009	30	73%	11	27%	0	41
2010	29	64%	16	36%	0	45
2011	30	61%	19	39%	0	49
2012	20	50%	20	50%	1	41

[a]Includes bears of known sex only.

Table 2. Unit 14C black bear harvest, regulatory years 2008–2012.

Regulatory year	Reported								Estimated unreported kill[c]	Total estimated kill					
	Hunter kill					Nonhunting kill[b]									
	M	F	(%)	Unk.	Total	M	F	Unk.		M	(%)	F	(%)	Unk.	Total
2008															
Fall 08	14	13	(48)	0	27	5	1	7		19	(58)	14	(42)	7	40
Spring 09	26	12	(32)	0	38	1	1	1		27	(66)	13	(32)	1	41
Total	40	25	(38)	0	65	6	2	8	6	46	(53)	27	(31)	14	87
2009															
Fall 09	5	3	(38)	0	8	4	4	1		9	(53)	7	(42)	1	17
Spring 10	25	8	(24)	0	33	4	1	0		29	(76)	9	(24)	0	38
Total	30	11	(27)	0	41	8	5	1	4	38	(64)	16	(27)	5	59
2010															
Fall 10	11	5	(31)	0	16	4	2	8		15	(68)	7	(32)	8	30
Spring 11	18	11	(38)	0	29	2	3	1		20	(59)	14	(41)	1	35
Total	29	16	(36)	0	45	6	5	9	4	35	(63)	21	(37)	13	69
2011															
Fall 11	9	8	(47)	0	17	5	1	4		14	(61)	9	(39)	4	27
Spring 12	21	11	(34)	0	32	1	1	0		22	(65)	12	(35)	0	34
Total	30	19	(39)	0	49	6	2	4	4	36	(63)	21	(37)	8	65
2012															
Fall 12	12	12	(50)	0	24	7	2	1		19	(58)	14	(42)	1	34
Spring 13	8	8	(50)	1	17	2	1	0		10	(53)	9	(47)	0	19
Total	20	20	(50)	1	41	9	3	1	4	29	(51)	23	(40)	5	57

[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 14C black bear successful hunter residency, regulatory years 2003–2012.

Regulatory year	Local[a] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
2003	14	(40)	14	(40)	7	(20)	35
2004	22	(61)	5	(14)	9	(25)	36
2005	20	(53)	6	(16)	12	(32)	38
2006	13	(43)	12	(40)	5	(17)	30
2007	24	(49)	14	(29)	11	(22)	49
2008	36	(55)	20	(31)	9	(14)	65
2009	26	(63)	11	(27)	4	(10)	41
2010	29	(64)	9	(20)	7	(16)	45
2011	27	(55)	17	(35)	5	(10)	49
2012	18	(44)	10	(24)	13	(32)	41

[a] Unit 14C residents.

Table 4. Unit 14C black bear hunter harvest chronology percent by month, regulatory years 2003–2012.

	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*
2003	3	14	9	17	0	3	26	20	9	35
2004	3	14	17	6	0	3	31	19	8	36
2005	5	13	8	5	0	0	21	34	13	38
2006	0	3	10	10	0	3	23	37	13	30
2007	2	8	6	4	0	2	16	49	12	49
2008	18	5	17	2	0	0	17	26	15	65
2009	5	5	7	2	0	2	12	44	20	41
2010	13	13	2	9	0	0	18	31	18	45
2011	10	10	8	6	0	0	4	35	24	49
2012	22	0	29	5	2	0	2	27	7	41

Table 5. Unit 14C black bear harvest percent by transport method, regulatory years 2003–2012.

	Percent of harvest							
Regulatory year	Airplane	Horse	Boat	Snow Machine	ORV/ATV	Highway Vehicle	Other / Unknown	*n*
2003	31	0	11	0	3	29	26	35
2004	36	0	3	0	3	33	25	36
2005	29	0	18	0	0	26	26	38
2006	30	0	20	0	3	27	20	30
2007	35	0	8	0	8	35	14	49
2008	29	0	9	0	6	20	35	65
2009	34	0	7	0	2	32	24	41
2010	18	0	2	0	7	36	36	45
2011	33	0	12	0	4	39	12	49
2012	34	0	0	0	7	44	15	41

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CHAPTER 15: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

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

GEOGRAPHIC DESCRIPTION: West Side of Cook Inlet

BACKGROUND

Harvest levels in unit 16B were flat and averaged less than 100 bears between 1974 and 2004. Harvest in Unit 16A was 40 bears annually during the same 30 year period; however, there was a steady increase in the harvest, from 13 bears in 1974 to 74 bears in 2004. This was likely the result of improved access and increased use of all-terrain vehicles (ATVs). Black bear harvests fluctuate with fall berry crops (Faro 1990), the length of moose season, and travel conditions (i.e., snow cover and consistency) during late spring (Harkness 1993). Since the 1990s the chronology of the black bear harvest has shifted from a predominantly fall harvest to a spring harvest due to new baiting opportunity and increased interest in hunting black bears.

Black bear population estimation is problematic due to the large expanse of the unit and the heavy vegetation that makes sighting bears during surveys difficult. Preliminary information from line-transect surveys (Quang and Becker 1999) conducted during the spring of 2000 and 2001 in the northern section of Unit 16 produced an estimate of 29.3 black bears/100mi^2. Applying that density unit wide resulted in an estimate of about 2700 bears (McDonough 2002. Previous estimates based on 25-50 black bears/100mi^2 (Griese 1996), produced a similar mid-point estimate as the line transect survey results of 2700 bears for Unit 16. The previous range estimate of 1825-3650 black bears (Griese 1996, Griese 1999) covers the potential variation in the habitat quality throughout the unit. However, previous reports (Griese 1996, Griese 1999) failed to include the Unit 16A contribution, thereby underestimating the Unit 16 black bear population at 2100.

Poor moose calf recruitment during the 2000s had prevented Unit 16B from reaching management objectives for the moose population. The black bear population is a major predator on spring moose calves. The moose population experienced a substantial decline in the 1990s after several deep snow winters (i.e., 1999–2000 and 2000–2001). A study initiated in 2005 confirmed that poor calf recruitment was preventing the recovery of the moose population and that survival of calves to 5 months of age (November 1) was low, despite high levels of calf production and relatively good calf body weights (Lou Bender, Alaska Department of Fish and Game [ADF&G] wildlife biologist Palmer, unpublished data). Predation on moose calves was found to be the primary cause of low calf survival, and black bear predation was thought to account for a significant portion of the calf mortality. A predator control program has been

initiated on non-federal land in the unit to reduce the number of predators in Unit 16, including black bears, and thereby increase moose calf survival. Black bear seasons, bag limits, and restrictions on bear baiting were liberalized in 2007 to increase bear harvests. By 2009 black bears could also be taken through snaring.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

The management goal for Unit 16 is to provide the greatest opportunity to participate in hunting black bears and to reduce the overall population of black bears in the unit in order to increase moose calf survival.

MANAGEMENT OBJECTIVES

The population objective for the Unit 16 Predator Control Area (Unit 16 PCA), which consists of all non-federally owned land in Unit 16B and the western half of Unit 16A, is to use liberalized harvest strategies and control methods to reduce the population to 600–800 black bears and to maintain that level through sustainable harvests. The management objective for the remainder of Unit 16 is to maintain a black bear population at a population size that is largely unaffected by human harvests.

METHODS

Department staff monitored the black bear harvest by sealing skulls and hides of bears taken by hunters. Data were recorded on each bear sealed, including sex and skull size, the date and location of kill, and the number of days the hunter spent in the field. Hair, tissue, and a premolar were collected for future analyses. Hunters also reported if the harvest was incidental, if the bear was taken over bait, and if any meat was salvaged. Harvest data were analyzed by regulatory year (RY). A regulatory year begins 1 July and ends 30 June (e.g., RY10 = 1 July 2010–30 June 2011).

Hunters using bait were required to get a permit and register bait sites with the department (a maximum of 2 bait stations were allowed per bait permit). In the Unit 16 PCA, predator control permits were issued that allowed participants to register a total of 4 bait stations. Beginning in RY09 predator control snaring permits were issued authorizing permit holders to use snares to take black bears.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

In 2007 Becker conducted line transects surveys of 16B. Reevaluation of the assumptions regarding the independence of bear observations led to a new density estimate of 187.3 black bears per 1,000 km^2 within the available habitat below 3,500 feet in the Subunit16B-North and Subunit 16B-Middle study areas. Extrapolating that density to the entire unit produced an estimate of 3,200 to 3,800 black bears in all of Unit 16B at the time of the survey, and this is the most current estimate of the population size.

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 Subunit 16B was 15 April through 30 June. People who possessed a predator control program permit were allowed to take an unlimited number of bears, including cubs, and sows with cubs, and to bait bears from 15 April to 15 October. Beginning in RY09 black bear snaring permits were issued to people who completed a department training course.

Board of Game Actions and Emergency Orders. During it March 2011 meeting the Board of Game decided to allow guides, combined with assistant guides, to establish up to 10 bait stations in total. It also decided to allow hunters to take black bears from bait stations the same day they have been airborne provided they were at least 300 feet from the airplane at the time of the taking. Both of these regulations went into effect during the spring of 2012.

Hunter Harvest. There was a slight decrease in the average annual harvest during this reporting period (431for the RY10–RY12 period) compared with 482 for RY07–RY09; Table 1). Within the reporting period, the harvest dropped from a high of 673 black bears in RY10 to 241 bears in RY12. Harvest in RY12 was less than 1/3 the harvest in RY10 in both Units 16A & 16B (Tables 2 and 3). Initial efforts by sportsmen's groups to increase the harvest of black bears in the predator control area have been reduced, and, in general, interest and motivation to participate in the predator control program has waned. Interest in snaring black bears has waned as well, reflected in decreasing take using this method, from 72 in RY10, 24 in RY 11, to 8 in RY12. The percent of females in the harvest increased from 34% in RY07 – RY09 to 37% in this reporting period.

Baiting Participation. The number of people using bait decreased during this report period compared to RY07–RY09 (Table 4). The total number of bait stations, however, increased during the RY10–RY12 period. This may be due in part to the regulation change that allows guides to have up to 10 bait stations.

Hunter Residency and Success. Success rates and the proportion of resident and nonresident hunters during RY10–RY12 were similar to the previous report period (Table 5).

Harvest Chronology. Typically, most black bears harvested are taken in the last 2 weeks of May and the month of June (Table 6); although in recent years there has been an increase in the number of black bears taken in the fall. This harvest coincides with the increase in moose hunting opportunities in Subunit 16B that has been building over the past few years.

Transport Methods. The majority of bear hunters used aircraft and boats to reach hunt areas in Unit 16, although all-terrain vehicle (ATV) use is common where there is access (Table 7). There has been little change in this pattern during the past 10 years.

Other Mortality

Nonhunting kills represented a minor portion of the total reported mortality. However, we suspect that a few nuisance black bears are killed each year and are not reported due to the inconveniences associated with reporting. In addition, some of the bears involved in bear–human conflicts are probably taken by licensed hunters and reported in the general season harvest due to the liberal seasons and bag limits. There were minimal reports of problem bears during this reporting period.

CONCLUSIONS AND RECOMMENDATIONS

Black bears in Unit 16 continue to be managed on a sustainable basis, but with also with a goal of reducing black bear predation on moose calves to increase the moose population. Under general harvest regulations black bear hunters continue to have ample harvest opportunities throughout Unit 16, and will retain those opportunities after the black bear population is reduced to the management goal of 600 to 800 bears.

The black bear population should be monitored into the future through periodic surveys and harvest data in order to determine if management goals have been met for this species, to evaluate the effectiveness of black bear reduction techniques, and to evaluate how manipulating the black bear population size and predation affects moose population recovery.

Black bear demographic studies should be initiated in Unit 16 to determine the reproductive parameters of the black bear population. Ultimately this will lead to a greater understanding of the resiliency of the black bear populations to the impacts of predator control, and the amount of effort required on the part of the public and the department to effectively manipulate the black bear and moose populations in the unit.

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While this unit report was actually published in 2016, it is part of the set of 2014 unit species management reports, so we suggest citing the report as a 2014 report to maintain its relationship to the other 2014 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

Table 1. Unit 16 black bear harvest composition, regulatory years[a] 2003 through 2012.

Regulatory	Reported harvest[b]					
year	Male	(%)[c]	Female	(%)[c]	Unk	Total
2003	166	(73)	60	(27)	1	227
2004	152	(72)	59	(28)	1	212
2005	156	(72)	62	(28)	4	222
2006	298	(71)	119	(29)	2	419
2007	333	(66)	165	(33)	1	499
2008	315	(62)	194	(38)	4	513
2009	296	(67)	138	(32)	1	435
2010	397	(59)	276	(41)	0	673
2011	255	(67)	123	(33)	0	378
2012	156	(65)	85	(35)	0	241

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Includes bears taken under predator control.
[c] Includes bears of known sex only.

Table 2. Subunit 16A black bear harvest, regulatory years[a] 2008 through 2012.

Regulatory year	Reported									Estimated unreported kill[e]	Total estimated kill					
	Hunter kill[b]						Nonhunting kill[d]									
	M	F	(%)	Unk	Total	Baited[c]	M	F	Unk		M	(%)	F	(%)	Unk	Total
2008																
Fall 08	15	9	(38)	0	24	0	0	1	0	2	15	(60)	10	(40)	2	27
Spring 09	53	39	(42)	0	92	52	1	0	0	9	54	(57)	39	(43)	9	102
Total	68	48	(41)	0	116	52	1	1	0	11	69	(59)	49	(41)	11	129
2009																
Fall 09	13	7	(35)	0	20	0	0	0	0	2	13	(65)	7	(35)	2	22
Spring 10	46	34	(43)	0	80	43	0	0	0	8	46	(58)	34	(42)	8	88
Total	59	41	(41)	0	100	43	0	0	0	10	59	(59)	41	(41)	10	110
2010																
Fall 10	38	34	(47)	0	72	2	0	0	0	7	38	(53)	34	(47)	5	77
Spring 11	33	17	(34)	0	50	30	0	0	0	5	33	(66)	17	(34)	7	57
Total	71	51	(42)	0	122	32	0	0	0	12	71	(58)	51	(42)	12	134
2011																
Fall 11	13	5	(28)	0	18	3	0	0	0	2	13	(72)	5	(28)	2	20
Spring 12	33	18	(35)	0	51	26	0	0	0	5	33	(65)	18	(35)	5	56
Total	46	23	(33)	0	69	29	0	0	0	7	46	(67)	23	(33)	7	76
2012																
Fall 11	9	5	(36)	0	14	2	0	0	0	1	9	(64)	5	(36)	1	15
Spring 12	17	10	(37)	0	27	18	0	0	0	3	17	(63)	10	(37)	3	30
Total	26	15	(37)	0	41	20	0	0	0	4	26	(63)	15	(37)	4	45

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Includes bears taken by hunters and predator control permittees.
[c] Bears reported taken over legally established bait stations.
[c] Includes defense of life or property kills, illegal kills, and other known human-caused accidental mortality.
[e] Assumes approximately 10% of reported harvest.

Table 3. Unit 16B black bear harvest, regulatory years[a] 2008 through 2012.

Regulatory year	Reported									Estimated unreported kill[e]	Total estimated kill					
	Hunter kill[b]						Nonhunting kill[d]									
	M	F	(%)	Unk	Total	Baited[c]	M	F	Unk		M	(%)	F	(%)	Unk	Total
2008																
Fall 08	60	39	(39)	2	101	18	0	0	0		60	(61)	39	(39)	2	101
Spring 09	187	107	(36)	2	296	127	0	0	1		187	(64)	107	(36)	3	297
Total	247	146	(37)	4	397	145	0	0	1	40	247	(63)	146	(37)	45	438
2009																
Fall 09	81	39	(33)	0	120	20	0	0	0		81	(67)	39	(33)	0	120
Spring 10	216	99	(31)	0	315	136	0	0	0		216	(69)	99	(31)	0	315
Total	297	138	(32)	0	435	156	0	0	0	44	297	(68)	138	(32)	44	479
2010																
Fall 10	160	129	(45)	0	289	5	3	0	0		163	(56)	129	(44)	0	292
Spring 11	166	96	(37)	0	262	112	0	0	0		166	(63)	96	(37)	0	262
Total	326	225	(41)	0	551	117	3	0	0	55	329	(59)	225	(41)	55	609
2011																
Fall 11	58	27	(32)	0	85	11	0	0	0		58	(68)	27	(32)	0	85
Spring 12	151	73	(33)	0	224	80	0	0	0		151	(67)	73	(33)	0	224
Total	209	100	(32)	0	309	91	0	0	0	31	209	(68)	100	(32)	31	340
2012																
Fall 12	49	14	(22)	0	63	5	1	0	0		50	(78)	14	(22)	0	64
Spring 13	81	56	(41)	0	137	55	0	0	0		81	(59)	56	(41)	0	137
Total	130	70	(35)	0	200	60	0	0	0	20	130	(65)	70	(35)	20	220

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Includes bears taken by hunters and predator control permittees.
[c] Bears reported taken over legally established bait stations.
[d] Includes defense of life or property kills, illegal kills, and other known human-caused accidental mortality.
[e] Assumes approximately 10% of reported harvest.

Table 4. Unit 16 black bear hunter baiting participation, regulatory years[a] 2003 through 2012.

Regulatory year	Number of permittees	Number of stations registered	
		Unit 16A	Unit 16B
2003	124	99	90
2004	130	107	96
2005	141	89	117
2006	235	146	222
2007	255	135	120
2008	287	144	143
2009	317	201	360
2010	243	163	256
2011	189	186	170
2012	195	174	196

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

Table 5. Unit 16 black bear successful hunter residency, regulatory years[a] 2003 through 2012.

Regulatory year	Local[b] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Successful hunters
2003	6	(3)	143	(63)	78	(34)	227
2004	4	(2)	155	(73)	53	(25)	212
2005	7	(3)	156	(70)	59	(27)	222
2006	11	(3)	282	(68)	122	(29)	415
2007	7	(1)	365	(73)	127	(26)	499
2008	14	(3)	403	(79)	94	(18)	511
2009	21	(5)	313	(71)	103	(24)	437
2010	13	(2)	431	(78)	108	(20)	552
2011	7	(2)	231	(75)	73	(23)	311
2012	4	(2)	150	(74)	49	(24)	203

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Unit 16 residents.

Table 6. Unit 16 black bear hunter harvest chronology percent by month, regulatory years[a] 2003 through 2012.

Regulatory year	Percent of harvest									
	Jul–Aug	Sep 1–15	Sep 16–30	Oct	Nov–Mar	Apr	May 1–15	May 16–31	Jun	*n*
2003	6	8	5	<1	0	2	4	32	42	225
2004	7	8	7	<1	0	3	3	35	37	211
2005	6	14	9	2	<1	2	8	26	32	222
2006	10	7	5	1	0	1	9	32	34	413
2007	9	3	3	3	<1	3	3	28	48	499
2008	14	4	5	1	<1	1	4	24	47	512
2009	17	6	3	1	0	1	3	29	39	437
2010	26	13	9	5	<1	1	1	12	33	552
2011	19	4	3	2	0	4	2	11	55	311
2012	24	4	2	1	0	3	4	13	48	203

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

Table 7. Unit 16 black bear harvest percent by transport method, regulatory years[a] 2003 through 2012.

Regulatory year	Percent of harvest							*n*
	Airplane	Horse	Boat	Snow machine	ORV/ATV	Highway Vehicle	Other / Unknown	
2003	34	0	32	1	20	5	6	221
2004	37	1	32	3	15	8	3	211
2005	41	1	28	2	15	11	2	221
2006	50	1	19	<1	14	11	4	415
2007	51	1	21	1	12	7	7	498
2008	55	1	17	2	13	7	5	511
2009	35	1	23	1	13	16	11	437
2010	48	1	15	1	19	9	7	552
2011	52	1	17	2	17	6	5	311
2012	58	1	12	1	14	9	5	203

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

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CHAPTER 16: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013

LOCATION

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

GEOGRAPHIC DESCRIPTION: Northern Bristol Bay

BACKGROUND

Black bears inhabit some of the forested areas of Unit 17 and are most visible during the fall while they forage on berries along open hillsides in Units 17B and 17C. Black bears are less common along salmon streams and near human settlements, primarily because of displacement by brown bears, which could include predatory events on black bears. No research activities have been conducted on black bears in Unit 17, so we do not have complete understanding of the density, habitat use, key denning areas, or 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 (ADF&G) 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. Since that time, however, the sealing process has allowed us to collect these kinds of data as seen in the tables in this report.

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 harvested in this unit, whether taken while hunting or killed in defense of life or property (DLP) 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 on bears seen during caribou and moose surveys. Reports from fieldworkers are also used to evaluate bear population trends. All hunt data in this report is tallied by regulatory year (RY), (RY = 1 July through 30 June; e.g., RY10 = 1 July 2010 through 30 June 2011)

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

No Closed Season	Residents:	3 bears per year
	Nonresidents:	3 bears per year

Board of Game Actions and Emergency Orders. During its spring 2013 meeting the board passed a department proposal to increase the bag limit for black bears to 3 per year with no closed season. This applied to resident and nonresident hunters alike. This season change was implemented to align the season in Unit 17 with that of adjacent areas. There were no emergency orders issued by the department associated with black bear management during this report period.

Human-Induced Mortality. Before 1994 no sealing or reporting requirements existed 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. At that time, local residents

expressed concerns of overharvest by hunters and sportfishers along the upper Nushagak River drainages.

During RY10, hunters in Unit 17 reported harvesting 7 black bears, including 5 males (71%) and 2 females (29%; Table 1). All 7 were taken in Unit 17B, and were harvested by guided nonresident hunters (Tables 2 and 3). All were taken during the fall season (Table 4), very likely as part of a combination hunt with other species such as moose, caribou and brown bear. The average total skull size for males was 17.4 inches (n = 4) and 15.8 inches for females (n = 2). Successful hunters spent an average of 5.3 days afield, and all used aircraft for transportation to their hunting area (Table 5).

During RY11 hunters in Unit 17 reported harvesting 12 black bears, including 10 males (83%) and 2 females (17%). Eleven bears were taken in Unit 17B and one in 17C. Seven of the bears were taken by guided nonresident hunters, while the other 5 were taken by Alaskan residents, including 2 taken by a single hunter. One of the males was of cinnamon color, which is fairly unusual in this area. The total skull size for males was 17.7 inches (n = 10); it was 16.4 inches for females (n = 2). Successful hunters spent an average of 5.3 days afield, although 2 of the hunters accounted for 15 and 14 days afield, which inflated the average. Nine of the 12 hunters used aircraft to access their hunt area, while 3 used a boat.

During RY12 hunters in Unit 17 reported harvesting only 3 black bears, all of which were males. Two were taken in Unit 17C and 1 in 17B. Guided nonresident hunters took 2 of the bears, while 1 was taken by an unguided nonresident hunter. The total skull size was 18.8 inches (n = 3). Successful hunters spent an average of 3.3 days afield, and all used a different source of transportation to the field: boat, aircraft, or snowmachine. One bear was taken during the spring season, which was the only spring bear harvested this entire report period.

Hunter Residency and Success. Nonresidents typically account for most of the reported black bear harvest in Unit 17. During RY10, nonresidents took all 100% of the harvested bears reported in the unit. During RY11, nonresidents took 7 (58%) of the harvested bears reported in Unit 17, Unit 17 residents took 1, and other Alaska residents took 4. During the RY12 season, nonresidents took 100% of the bears reported harvested in the unit (Table 3).

Harvest Chronology. Twenty one of the 22 black bears reported harvested in Unit 17 during this reporting period were killed during the fall (Table 4).

Transport Methods. Seventeen of the successful black bear hunters during this reporting period used airplanes for access, 4 used boats, and 1 used a snowmachine (Table 5).

Other Mortality

We do not collect data on other causes of 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

Although the black bear harvest has been on a downward trend since we began sealing bears in 1994, we believe that is mostly related to a decline in hunting pressure rather than a change in bear density. During the mid-1990s the Mulchatna caribou herd was substantially higher than today, leading to high numbers of caribou hunters who, once on the landscape, chose to harvest black bears when given the opportunity. Today, the low caribou numbers attract substantially fewer hunters and the black bear harvest reflects this lower effort. The recent season and bag limit change to 3 bears and no closed season will only take effect in July of 2013, thus we will not be able to gauge the impact of that action until the next reporting period. No changes in the present hunting regulations for black bears in Game Management Unit 17 are recommended at this time.

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While this unit report was actually published in 2016, it is part of the set of 2014 unit species management reports, so we suggest citing the report as a 2014 report to maintain its relationship to the other 2014 unit reports.

Product names used in this publication are included for completeness but do not constitute product endorsement.

Table 1. Unit 17 black bear harvest, regulatory years[a] 1994–2012.

Regulatory year	Hunter kill				Nonhunting kill				Total reported kill			
	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
1994	6	7	0	13	0	0	0	0	6	7	0	13
1995	13	5	0	18	0	0	0	0	13	5	0	18
1996	19	6	1	26	0	0	0	0	19	6	1	26
1997	12	6	0	18	0	0	0	0	12	6	0	18
1998	17	12	0	29	0	0	0	0	17	12	0	29
1999	16	4	0	20	0	0	0	0	16	4	0	20
2000	8	2	0	10	0	0	0	0	8	2	0	10
2001	8	1	1	10	0	0	0	0	8	1	1	10
2002	4	4	0	8	0	0	0	0	4	4	0	8
2003	7	6	0	13	0	0	0	0	7	6	0	13
2004	13	8	0	21	0	0	0	0	13	8	0	21
2005	6	1	0	7	0	0	0	0	6	1	0	7
2006	9	5	0	14	0	0	0	0	9	5	0	14
2007	4	1	0	5	0	0	0	0	4	1	0	5
2008	1	4	1	6	0	0	0	0	1	4	1	6
2009	2	3	0	5	0	0	0	0	2	3	0	5
2010	5	2	0	7	0	0	0	0	5	2	0	7
2011	10	2	0	12	0	0	0	0	10	2	0	12
2012	3	0	0	3	0	0	0	0	3	0	0	3

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

Table 2. Unit 17 black bear harvest by subunit, regulatory years[a] 1994–2012.

Regulatory year	Subunit 17A				17B				17C				Unit 17 total			
	M	F	Unk	Total	M	F	Unk	Total	M	F	Unk	Total	M	F	Unk	Total
1994	0	0	0	0	6	7	0	13	0	0	0	0	6	7	0	13
1995	0	0	0	0	12	4	0	16	1	1	0	2	13	5	0	18
1996	0	0	0	0	18	6	1	25	1	0	0	1	19	6	1	26
1997	0	0	0	0	10	5	0	15	2	1	0	3	12	6	0	18
1998	0	0	0	0	16	12	0	28	1	0	0	1	17	12	0	29
1999	0	0	0	0	14	4	0	18	2	0	0	2	16	4	0	20
2000	0	0	0	0	8	2	0	10	0	0	0	0	8	2	0	10
2001	0	0	0	0	7	1	1	9	1	0	0	1	8	1	1	10
2002	0	0	0	0	4	4	0	8	0	0	0	0	4	4	0	8
2003	0	0	0	0	7	6	0	13	0	0	0	0	7	6	0	13
2004	0	0	0	0	11	8	0	19	0	0	0	0	13[b]	8	0	21[b]
2005	0	0	0	0	5	1	0	6	1	0	0	1	6	1	0	7
2006	0	0	0	0	7	4	0	11	2	1	0	3	9	5	0	14
2007	0	0	0	0	2	1	0	3	2	0	0	2	4	1	0	5
2008	0	0	0	0	1	4	1	6	0	0	0	0	1	4	1	6
2009	0	0	0	0	2	3	0	5	0	0	0	0	2	3	0	5
2010	0	0	0	0	5	2	0	7	0	0	0	0	5	2	0	7
2011	0	0	0	0	9	2	0	11	1	0	0	1	10	2	0	12
2012	0	0	0	0	1	0	0	1	2	0	0	2	3	0	0	3

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Includes 2 male bears, location unknown.

Table 3. Unit 17 black bear successful hunter residency, regulatory years[a] 1994–2012.

Regulatory year	Residents				Nonresident	(%)	Total successful hunters[c]
	Local[b]	(%)	Nonlocal	(%)			
1994	0	(0)	2	(15)	11	(85)	13
1995	1	(6)	4	(22)	13	(72)	18
1996	0	(0)	4	(15)	22	(85)	26
1997	0	(0)	2	(11)	16	(89)	18
1998	0	(0)	3	(10)	26	(90)	29
1999	0	(0)	0	(0)	20	(100)	20
2000	0	(0)	2	(20)	8	(80)	10
2001	0	(0)	3	(30)	7	(70)	10
2002	0	(0)	1	(13)	7	(87)	8
2003	0	(0)	2	(15)	11	(85)	13
2004	0	(0)	1	(5)	20	(95)	21
2005	1	(14)	0	(0)	6	(86)	7
2006	1	(7)	1	(7)	12	(86)	14
2007	2	(40)	1	(20)	2	(40)	5
2008	0	(0)	0	(0)	6	(100)	6
2009	0	(0)	1	(20)	4	(80)	5
2010	0	(0)	0	(0)	7	(100)	7
2011	1	(8)	4	(33)	7	(58)	12
2012	0	(0)	0	(0)	3	(100)	3

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] Residents of Unit 17.
[c] 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, regulatory years[a] 1994–2012.

Regulatory year	Month of harvest (%)										
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	*n*
1994[b]	46	39	15	0	0	0	0	0	0	0	13
1995[b]	33	67	0	0	0	0	0	0	0	0	18
1996[b]	42	58	0	0	0	0	0	0	0	0	26
1997[b]	33	67	0	0	0	0	0	0	0	0	18
1998	10	90	0	0	0	0	0	0	0	0	29
1999	15	85	0	0	0	0	0	0	0	0	20
2000	20	70	10	0	0	0	0	0	0	0	10
2001	30	70	0	0	0	0	0	0	0	0	10
2002	38	62	0	0	0	0	0	0	0	0	8
2003	31	69	0	0	0	0	0	0	0	0	13
2004	19	81	0	0	0	0	0	0	0	0	21
2005	29	57	0	0	0	0	0	0	0	14	7
2006	14	86	0	0	0	0	0	0	0	0	14
2007	20	60	20	0	0	0	0	0	0	0	5
2008	0	100	0	0	0	0	0	0	0	0	6
2009	0	100	0	0	0	0	0	0	0	0	5
2010	0	100	0	0	0	0	0	0	0	0	7
2011	17	83	0	0	0	0	0	0	0	0	12
2012	0	67	0	0	0	0	0	0	33	0	3

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.
[b] 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, regulatory years[a] 1994–95 through 2012–13.

Regulatory year	Percent (%) of harvest									(*n*)
	Airplane	Horse	Boat	ATV	Snowmachine	ORV	Highway vehicle	Walk	Unknown	
1994	39	0	54	0	0	0	0	8	0	13
1995	78	22	0	0	0	0	0	0	0	18
1996	81	19	0	0	0	0	0	0	0	26
1997	89	0	0	0	0	0	0	11	0	18
1998	72	0	28	0	0	0	0	0	0	29
1999	85	0	10	5	0	0	0	0	0	20
2000	70	0	30	0	0	0	0	0	0	10
2001	100	0	0	0	0	0	0	0	0	10
2002	100	0	0	0	0	0	0	0	0	8
2003	100	0	0	0	0	0	0	0	0	13
2004	95	0	5	0	0	0	0	0	0	21
2005	86	0	0	0	0	0	14	0	0	7
2006	93	0	0	0	0	0	7	0	0	14
2007	40	0	40	20	0	0	0	0	0	5
2008	100	0	0	0	0	0	0	0	0	6
2009	80	0	20	0	0	0	0	0	0	5
2010	100	0	0	0	0	0	0	0	0	7
2011	75	0	25	0	0	0	0	0	0	12
2012	33	0	33	0	33	0	0	0	0	3

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2012 = 1 July 2012–30 June 2013.

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CHAPTER 17: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013[1]

LOCATION

GAME MANAGEMENT UNITS: 19, 21A, and 21E (55,278 mi^2)

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. 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 provide good hunting opportunity, however harvest pressure is low. Harvest pressure is also light in the Alaska Range in Units 19B and 19C. Reported harvest is low in part because only bears which are sent out of state untanned and bears intended for sale are required to be sealed.

In 2001 the department established the experimental micromanagement area (EMMA) surrounding McGrath (528 mi^2, Fig. 1). The purpose of this area was to focus predator management around McGrath to provide more moose for subsistence harvest opportunity. This area, renamed the bear control focus area (BCFA), encompasses the highest density of moose in Unit 19D East (the Kuskokwim River drainage upstream from the Selatna and Black River drainages; Fig. 1) and was established as a treatment area where predator population manipulations could be tested. This included capture and removal of black bears in 2003 and 2004 by department personnel and public bear control during regulatory years (RY) 2006–2013 (RY begins 1 July and ends 30 June, e.g., RY13 = 1 July 2013–30 June 2014).

In RY12 a 534 mi^2 BCFA was also added to the Unit 19A intensive management plan (Fig. 2). This area was created based on research from McGrath which documented an improvement in moose calf survival following bear removals (Keech 2012). Bear removals were initiated in May 2013 and are scheduled for one more season in May 2014.

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

MANAGEMENT DIRECTION

MANAGEMENT GOAL

Units 19, 21A, and 21E

- Provide for the opportunity to harvest 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

Black bear harvest data in the McGrath management area are limited. Bear harvest data are typically provided from sealing certificates; however sealing was required only in Unit 19D until RY10. Sealing was also required throughout the entire area for any untanned bear hides or skulls removed from Alaska as well as for those bears intended for sale. Beginning in RY09, harvest tickets were required before hunting black bears in Unit 19D. Finally all bears taken as part of a predator control program were also sealed. Using all available data, we summarized information related to black bear harvest by regulatory year.

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. In the Unit 19D BCFA, the black bear population has been measured using a mark-recapture technique (Keech 2012). In the Unit 19A BCFA, a removal estimator was used to develop an estimate of bear numbers (T. Paragi and B. Taras, memorandum 26 November 2014, Alaska Department of Fish and Game, Fairbanks).

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 in RY06, the black bear population for the entire 55,278 mi^2 management area is estimated to be 8,300–16,600 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.

Peirce (2008) estimated Unit 21A to have 2,325–2,775 black bears and Boudreau (2005) estimated 1,900–2,275 black bears in Unit 21E.

Population surveys have been conducted only in the BCFA portions of Units 19A and Unit 19D. However, Boudreau (2005) estimated the entire Unit 19 black bear population to be 7,700–9,235 bears and further separated this estimate as 2,475–2,970 black bears in Unit 19A, 1,250–1,500 in Unit 19B, 975–1,165 in Unit 19C, and 3,000–6,000 in Unit 19D.

The department translocated 102 black bears from the Unit 19D BCFA in 2003 (n = 67 independent bears + 8 dependent juveniles) and 2004 (n = 26 independents + 8 dependents; 7 of these bears were recaptured from 2003). The pre-removal population in 2003 was estimated at 96

independent black bears and the post-removal estimate in 2004 was 4 independent black bears. This represents an approximately 96% removal. A mark-recapture survey was conducted in May 2007 and the bear control focus area was estimated to have 70 independent black bears (Keech et al. 2011). This survey was again conducted in May 2010 with an estimate of 123 independent black bears in BCFA (Keech 2012). Black bear numbers were higher than pre-control levels 6 years after removal was completed.

In May 2013 the department removed 84 independent black bears from the Unit 19A BCFA. Eight females with cubs of the year were also located, but not removed. Four of these females had 3 cubs, 2 had 4 cubs, and 2 had 2 cubs. First-year cub survival appeared to be very poor and no females with yearling cubs were observed. Results from the removal estimate suggest there were 94 (SE = 1.9; 95% CI = 92, 102) independent bears within BCFA. This removal represents an approximately 89% removal (84 of 94) in year one.

MORTALITY

Harvest

Hunting Seasons and Bag Limits.

Units and Bag Limits	Resident and Nonresident Open Season	Resident and Nonresident Baiting Season
RY10–RY12		
Units 19B, 19C, 21A, and 21E 3 bears.	No closed season	15 Apr–30 Jun
Unit 19D East 5 bears.	No closed season	15 Apr–30 Jun 1 Sep–30 Sep
Units 19A and 19D, remainder 5 bears.	No closed season	15 Apr–30 Jun

Harvest of cubs (in first year of life) or females accompanied by cubs was prohibited in all hunting seasons. Same-day-airborne hunting was allowed at registered bait stations, provided the hunter was at least 300 feet from the airplane and sale of hides (with claws attached) and skulls was permitted. A harvest ticket was required to hunt black bears in Unit 19D.

Unit 19D East Bear Predation Control Regulations and Bag Limits.

Units and Bag Limits	Residents-Only Open Season	Residents-Only Baiting Season
RY10–RY12		
Unit 19D bear control focus area. No limit, but permit required.	1 Jul–30 Jun	1 Jul–30 Jun

The public bear control program in Unit 19D East began in RY06 and bear predation control regulations prohibited the harvest of cubs (in first year of life) or females accompanied by cubs through RY08. In RY09 this prohibition was lifted. In addition, in RY09 permittees were also

allowed to take black bears same-day-airborne provided they were at least 300 feet from the airplane, including at bait stations. Sale of untanned hides (with claws attached) and skulls was permitted under control regulations beginning in RY06. In RY09, permittees could also sell tanned hides (with claws attached). Bucket-style foot snares were permitted in RY09 beginning on 15 April 2010. The Unit 19D public bear control program ended in RY13 on 30 June 2014.

Alaska Board of Game Actions and Emergency Orders. No emergency orders were issued for any units in this area during the report period (RY10–RY12). Since RY03 the Board of Game (board) has made several major changes to black bear regulations, as listed below.

RY03 — The board increased the hunting bag limit from 3 to 5 bears in Unit 19D upstream from the Selatna and Black rivers, but the additional 2 bears required a registration permit (RL338).

RY04 and *RY05* — No changes.

RY06 Hunting Changes — The board eliminated registration permit hunt RL338 in Unit 19D, expanded the 5-bear bag limit to all of Unit 19D under general season hunting regulations and increased the Unit 19A general season bag limit to 5 bears. The board legalized same-day-airborne black bear hunting at bait stations in the Unit 19A and Unit 19D East wolf control areas, provided hunters were at least 300 feet from the airplane and allowed snowmachines to be used to position hunters to select individual bears for harvest. Sale of untanned black bear hides (with claws attached) and skulls of bears taken by hunting or by predation control in active predation control areas (including wolf control areas) was allowed after sealing.

RY06 Predation Control Changes — The predation control implementation plan for Unit 19D was updated to establish a black (and brown) bear predation control plan within BCFA, allowing predation control permittees to take an unlimited number of black bears and register up to 10 bait stations. However, no females with cubs or cubs were allowed to be taken under predation control. Same-day-airborne access was allowed at bait stations, provided permittees were at least 300 feet from the airplane.

RY07 and RY08 — No changes.

RY09 Hunting Changes — The board passed regulations that required a harvest ticket prior to hunting black bear in Unit 19D. The board also allowed resident hunters to use artificial light at den sites during 15 October–30 April in order to take black bears from dens in many units, including Units 19A and 19D East and required salvage of meat resulting from this activity. The prohibition on taking cubs and females with cubs was also lifted for this traditional-use activity in case a female with cubs was encountered. The Department of Law clarified that taking bears from dens had not been previously prohibited, just the taking of cubs and females with cubs and the use of artificial light.

RY09 Predation Control Changes — The board clarified that brown bears or black bears taken under a predation control permit in Unit 19D did not count against the statewide bag limit in other units of the state. The predation control implementation plan for Unit 19D was updated to allow permittees to take any bear, including cubs and females with cubs; same-day-airborne provided permittees were at least 300 feet from the airplane; use of bucket-style foot snares; and expanded legal sale of tanned hides as well as untanned hides.

RY10 Hunting Changes — In January 2010 the board classified black bears as furbearers as well as big game. Although the board did not open a black bear trapping season, this furbearer classification and other regulatory changes allows hunters to legally sell black bear hides and parts of bears, except gall bladders. The board subsequently amended this regulation so that sale of black bear meat remained illegal. Effective April 2011, regulations allowed registered guides in many units, including Units 19, 21A and 21E, to register up to 10 bait stations at a time and to personally, or through licensed class-A assistant or assistant guides, establish and maintain up to 10 bait stations simultaneously, provided that a signed guide-client agreement is used for each hunter that uses any of the sites. The board also eliminated the sealing requirements in Unit 19D and changed salvage requirements to require hunters to salvage either the hide or meat with no requirement to salvage the skull. Sealing requirements remained in place for any black bear hides or skulls sold or removed from Alaska.

RY11 — No changes.

RY12 Predation Control Changes — The intensive management plan for Unit 19A was updated to include a 534 mi^2 BCFA. Within this small area the department was authorized by the board to lethally remove bears with the use of fixed-wing aircraft and helicopters.

RY13 — No changes.

RY14 Predation Control Changes — The intensive management plan for Unit 19A was updated and reauthorized for 6 years, including bear removals from within BCFA if moose densities fall below 1.2 moose/mi^2 within BCFA. The intensive management plan for Unit 19D was also updated and reauthorized for 6 years. Amendments to the plan included elimination of public bear control beginning in RY14 and the addition of department-conducted bear control if moose densities fall below 1.2 moose/mi^2 within BCFA.

Harvest by Hunters. During RY08–RY12, 209 black bears were taken by hunters in Units 19, 21A, and 21E (Table 1). On average 63% of these bears were males. Thirty-nine of these bears were harvested in Unit 19D (where sealing or a harvest ticket was required). Most reported harvest of black bears by hunters, however, comes from Units 19B and 19C (Table 2) where sealing was not required unless the hide and skull were taken out of Alaska. Units 19B and Unit 19C have a high percentage of nonresident hunters who seal bears to transport them home. During RY08–RY12 a small number of defense of life or property kills were reported. It is likely however that more nuisance bears were killed at fish camps or by local residents and not reported.

Harvest by Bear Control. Interest in black bear control permits increased substantially in RY09 once foot-snaring became a legal method of take under bear predation control regulations. Forty-two predation control permits were issued (ML301); however, only 6 bears were taken by 4 permittees. Participation has remained low and overall this program has been ineffective at reducing predation on moose calves.

In May 2013, 84 black bears were removed from the Unit 19A BCFA as part of a department-conducted bear control program. A second year of removals will be conducted in May 2014.

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

Transport Methods. During RY08–RY12, 73% of hunters who reported their black bear harvest used airplanes as their primary access method. Boats are also an important means of transportation and are used for much of the harvest of black bears by local residents.

CONCLUSIONS AND RECOMMENDATIONS

Black bears are common throughout the McGrath management area. Studies recently completed in the McGrath BCFA indicated that black bears are a significant source of moose calf mortality in Unit 19D East (Keech et al. 2011). As a result, hunting regulations were liberalized in Units 19A and 19D and a black bear predation control program was established in the Unit 19A and 19D BCFAs. These actions were taken to increase harvest of black bears with the intent of improving moose calf survival.

Liberal hunting seasons have not resulted in higher harvest. In all units 21 hunters took 2 bears, while only 2 hunters took 3 bears and no hunters took 4 or 5 bears during RY08–RY12. Most black bear harvest in Units 19A and 19D was opportunistic and current bag limits appeared to be sufficient to allow hunters to take as many black bears as they want. While no changes to bag limits or seasons are needed, aligning the seasons could be considered to simplify regulations for hunters.

The Unit 19D public bear predation control program through RY13 has had limited success. Prior to RY09, no bears were taken under this program. Foot-snaring began in spring 2010 (RY09). Whereas this generated a large amount of interest from the public, both participation and take (n = 6 bears) were low. Although there may be a steep learning curve for the first few years, several hurdles exist that may prevent this program from becoming successful enough to reduce predation on moose calves. Bear snaring is both time-consuming and expensive, and the incentive to harvest a large numbers of bears is low. Predation control trappers quickly become saturated with bear meat after only 1 or 2 bears, and hides taken in midsummer are of poor quality.

Department-conducted bear control has proven to be much more successful. In both Units 19A and Unit 19D the department removed a large percentage of the bears using aircraft and helicopters in a relatively short time (about 2 weeks). Using department aircraft we also distributed all the black bear meat to Unit 19A villages. The meat was well cared for and well received in local villages. This was a highly successful aspect of this project and generated a tremendous amount of local support. These efforts are extremely expensive and future bear control programs will be highly dependent upon supplemental funding. Additionally, these programs required a high level of support from regional staff. The Unit 19A program drew staff from multiple offices and had a large impact on other survey activities.

During RY08–RY12 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 (Table 2). There were ample opportunities to harvest black bears, including same-day-airborne,

liberal hunting bag limits, as well as foot-snaring with a control permit; however, participation among local residents was low. Gasoline prices were high ($7.46/gallon in McGrath as of 20 May 2014) and daily trap checks required for foot-snaring were time-consuming. Local interest in bear meat varies and raw black bear hides are worth only approximately $100. These factors combined are likely reasons harvest remained low.

Public bear control will end 30 June 2014. As we were not able to harvest 30 bears with hunting and public bear control, it is unlikely we will be able to harvest 30 black bears per year through hunting alone. The Units 19A and 19D intensive management plans were reauthorized by the board at the February 2014 Region III meeting. Part of these plans recommended department-conducted bear control if moose densities fall below 1.2 moose/mi^2 in either BCFA. Therefore the objective to maintain an annual reported harvest of at least 30 black bears in Unit 19D East will be dropped and replaced with the following activity:

MANAGEMENT ACTIVITY

- To remain proactive and ensure moose densities do not fall too low, a 1- to 2-year department-conducted bear control effort may be conducted if a geospatial population estimator (GSPE) point in either the Unit 19A or Unit 19D BCFA indicates the density is <1.2 moose/mi^2 and 2-year average twinning rates are >20%. All GSPE surveys will be designed to achieve precision of at least ±20% at the 90% confidence interval, but actual precision will vary with survey conditions and funding.

The harvest ticket used in Unit 19D worked well and in RY10 hunters needed to seal black bears only if they wanted to sell the hide or remove the hide and/or skull from Alaska. Local hunters seemed to like this system, and we continued to receive important harvest data from Unit 19D.

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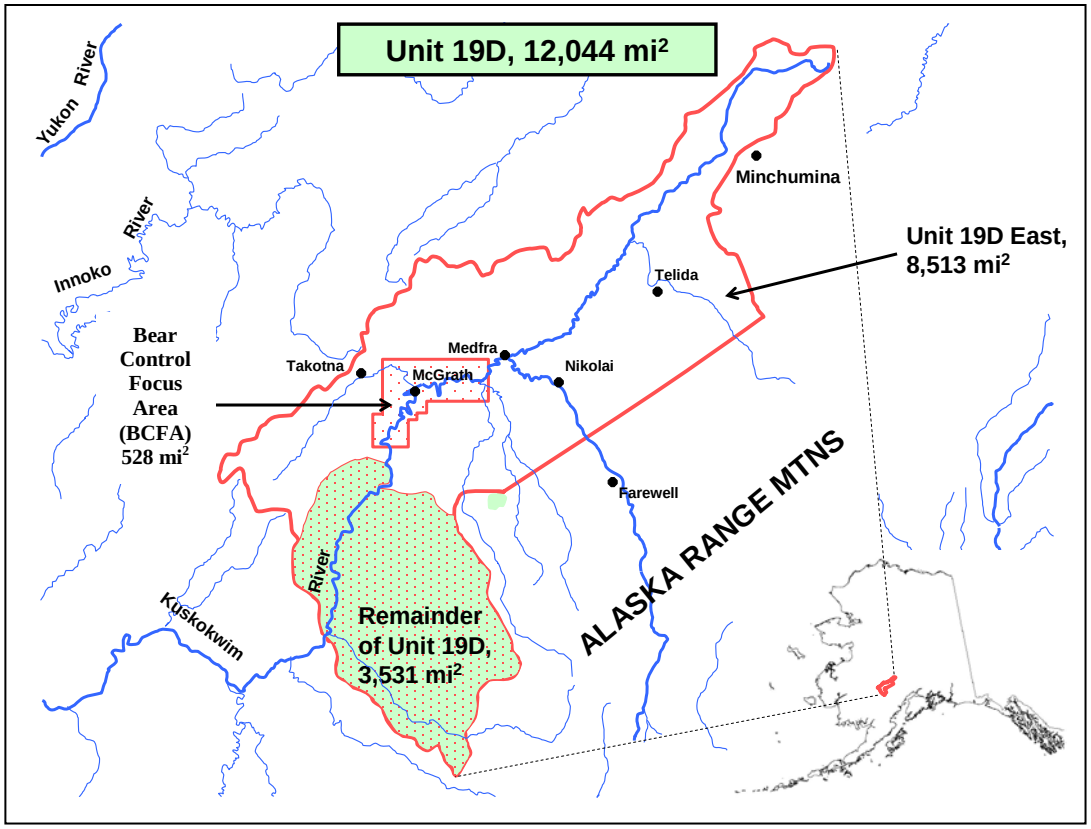

Figure 1. Detail area map of Unit 19D.

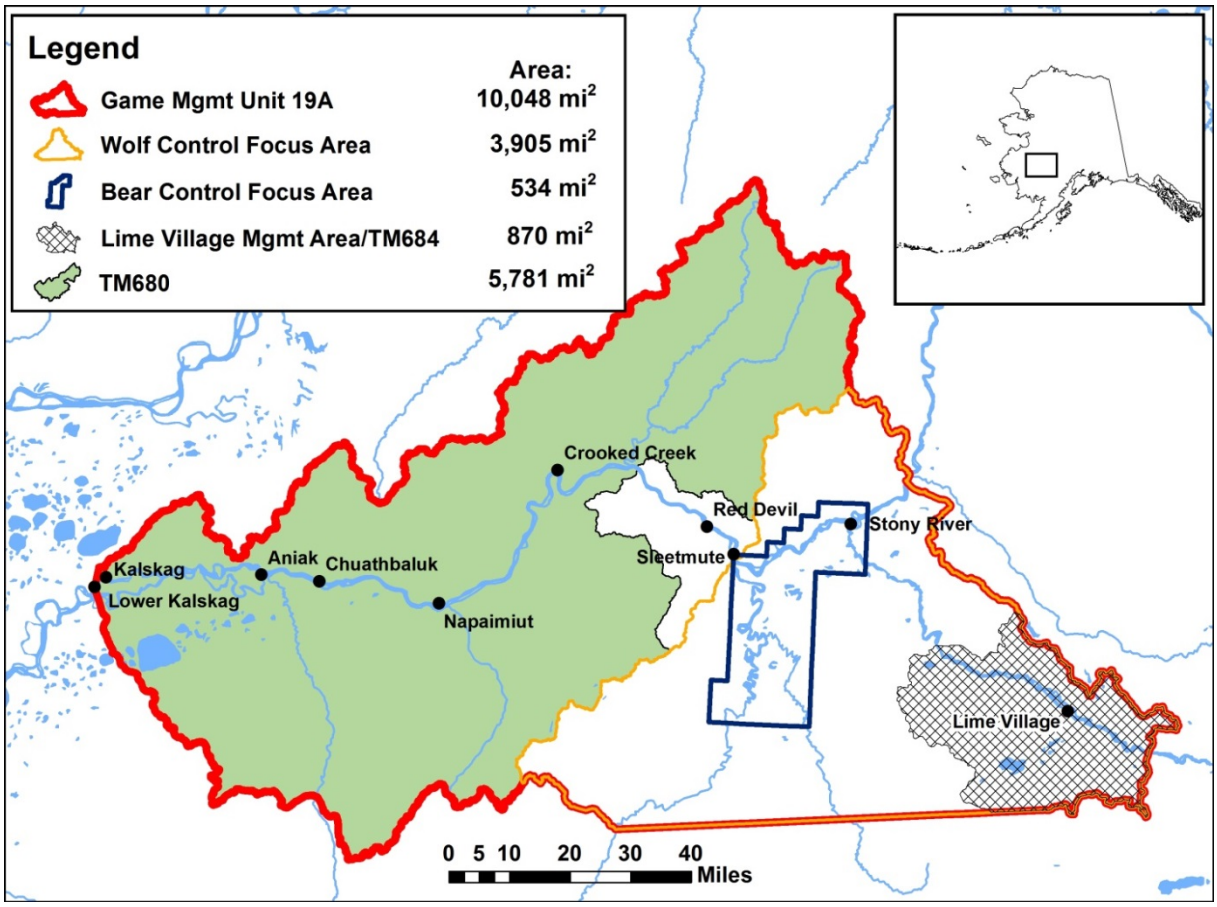

Figure 2. Unit 19A, the wolf control focus area (WCFA), the bear control focus area (BCFA), the Lime Village management area (LVMA), and Tier II moose hunts (TM680 and TM684).

Table 1. Reported black bear harvest in Units 19, 21A and 21E by type of kill, regulatory years[a] 2008–2012[b].

Regulatory	Hunter kill				Nonhunting kill				Total reported kill				
year	M	F	Unk	Total	M	F	Unk	Total	M	(%)	F	(%)	Total
2008	37	21	0	58	0	0	0	0	37	(64)	21	(36)	58
2009	40	19	0	59	5	1	0	6	45	(69)	20	(31)	65
2010	29	18	0	47	1	2	0	3	30	(60)	20	(40)	50
2011	15	8	1	24	1	1	0	2	16	(64)	9	(36)	26
2012	10	11	0	21	38	45	1	84	48	(46)	56	(54)	105

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2008 = 1 July 2008–30 June 2009).
[b] Sealing was required in RY08 and RY09 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. Sealing was required for all bears if the hide or skull was going to be sold and for any untanned hides and skulls removed from the state of Alaska. Beginning in RY09 a harvest ticket was required for black bears taken in 19D in lieu of sealing, if the untanned hides and skulls remained in Alaska.

Table 2. Reported black bear harvest by unit[a], regulatory years[b] 2008–2012[c].

Regulatory	Unit							
year	19A	19B	19C	19D	19 Unknown	21A	21E	Total
2008	14	21	13	8	0	1	1	58
2009	15	18	15	11	0	3	3	65
2010	10	5	14	14	0	3	4	50
2011	3	3	11	6	0	2	1	26
2012	86	8	7	0	0	1	3	105
Total	128	55	60	39	0	10	12	304
Avg/Year	26	11	12	8	0	2	2	61

[a] Sealing was required in RY08 and RY09 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. Sealing was required for all bears if the hide or skull was going to be sold and for any untanned hides and skulls removed from the state of Alaska. Beginning in RY09 a harvest ticket was required for black bears taken in 19D in lieu of sealing, if the untanned hides and skulls remained in Alaska.
[b] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2008 = 1 July 2008–30 June 2009).
[c] Includes bears taken under defense of life or property regulations and those taken during predation control.

Table 3. Units 19, 21A, and 21E black bear harvest chronology[a], regulatory years[b] 2008–2012[c].

Regulatory year	Month										
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Unk/other	Total
2008	0	0	3	5	0	24	26	0	0	0	58
2009	0	0	8	4	0	21	30	0	1	0	65
2010	0	0	6	6	4	13	21	0	0	0	50
2011	0	1	1	2	4	6	12	0	0	0	26
2012	0	0	84	0	0	4	15	0	0	1	105

[a] Sealing was only required in RY08 and RY09 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. Sealing was required for all bears if the hide or skull was going to be sold and for any untanned hides and skulls removed from the state of Alaska. Beginning in RY09 a harvest ticket was required for black bears taken in Unit 19D in lieu of sealing requirements.

[b] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2008 = 1 July 2008–30 June 2009).

[c] Includes bears taken under defense of life or property regulations and those taken during predation control.

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CHAPTER 18: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013[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 2,900–4,600 black bears in the 4 units discussed in this report; however, only a few studies of black bear ecology or population dynamics have been completed in Interior Alaska. In 2010, Gardner et al. (2012) conducted a black bear density estimate in the central Tanana Flats of Unit 20A. During 2003–2007, population estimates of black bears in Unit 19D near McGrath were part of a larger study of moose, predation and predator removal (Keech et. al. 2011). A population estimate was also conducted in 2010 in the Yukon Flats near Beaver (J. Caikoski, ADF&G, unpublished data, Fairbanks, 2010). 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 that 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. Because of the size of the Fairbanks human population, interest in hunting black bears is high, especially during spring. Information we obtain 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.

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

- Protect human life and property in human-bear interactions.

MANAGEMENT OBJECTIVES

Sex ratio of the harvest is a key indicator of appropriate levels of harvest used for management in these units; therefore, management objectives call for a minimum percentage of males in the harvest.

- Maintain a black bear population that sustains a harvest of at least 55% males in the combined harvests for the most recent 3 years in all units.

- Maintain the defense of life or property (DLP) take of less than 10% of the total bear take in Unit 20B.

METHODS

We collected annual harvest data from sealing reports and harvest tickets of black bears killed by hunters and DLP. Prior to regulatory year (RY) 2009 (regulatory year begins 1 July and ends 30 June, e.g., RY09 = 1 July 2009–30 June 2010), sealing was the only reporting requirement for black bears in Units 20A, 20B, 20C, and 20F. During RY10–RY12, hunters in Units 20A, 20C, and 20F reported harvest using harvest ticket reports. Hunters in Unit 20B reported using harvest tickets as well as having harvested bears sealed. 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. Harvest tickets included data on days hunted, whether a bear was harvested, kill date, sex, location, commercial services used, and transportation. We recorded the distribution of bears killed using uniform coding units. During sealing, we collected premolars and sent them to Matson's Laboratory (Milltown, Montana) for sectioning and age determination. To determine if we met management objectives in each unit, we calculated the percentage of males harvested by dividing known-sex males by all known-sex bears harvested. This allowed us to conservatively determine if we were meeting the objectives.

Since RY89, hunters have been required to register bait stations before hunting black bears over bait in spring. We also prepared hunter information leaflets and held free clinics to summarize black bear baiting regulations and encourage hunters to harvest males instead of females.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Current estimates for the number of black bears in the central and lower Tanana River and middle Yukon River drainages included 600–850 bears in the Tanana Flats in Unit 20A, 950–1,500 bears in Unit 20B, 780–1,250 in the portion of Unit 20C outside Denali National Park, and 600–950 in Unit 20F. We based our population estimates on Gardner et al.'s (2012) density estimate of 12–19 black bears/100 mi^2 (46–75/1,000 km^2), excluding cubs of the year, inhabiting the Tanana Flats study area. This estimate is similar to Hechtel's (1991) estimate in the same area. This density is also similar to the estimate of 18 bears/100 mi^2 in a portion of Unit 19D near McGrath (Keech et al. 2011), but is much lower than the 40 bears/100 mi^2 estimated to inhabit the portion of Unit 25D near the village of Beaver (J. Caikoski, unpublished data). We applied Gardner et al.'s (2012) density estimate to the estimated amount of suitable black bear habitat in

each unit. Based on estimates by Gardner et al., Keech et al., and Caikoski, it is likely that the black bear populations in Units 20A, 20B, 20C, and 20F are near the upper end of our estimated ranges.

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. 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 is restricted to 15 April–30 June. The taking of cubs (first year of life) and females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders**.** No changes were made by the Board of Game during RY10–RY12. The Board of Game made major changes to black bear regulations during RY07–RY09. In March 2008, the board added a requirement for hunters in many units, including Unit 20, to be in possession of a black bear harvest ticket. In January 2010, the board classified black bears as furbearers as well as big game. Although the board did not open a black bear trapping season, this furbearer classification and other regulatory changes have allowed hunters to legally sell black bear hides and parts, except gall bladders. In March 2010 the board eliminated sealing requirements in Unit 20 (except in Unit 20B) for black bear hides and skulls that remain in the state. Hides sent out of state for tanning continue to require sealing. The board also changed the salvage requirement for black bears harvested 1 June–31 December by allowing hunters in Unit 20B to salvage the skull and either the hide or meat, and allowing hunters in the remainder of Unit 20 to salvage either the hide or meat with no requirement to salvage the skull. The board also increased the maximum number of bait stations registered by guides from 2 to 10, beginning in spring 2011.

Prior to 2009, nonresident military personnel stationed in Alaska could hunt on military lands without a hunting license or the $225 nonresident metal locking black bear tag. The legislature amended Alaska Statute (AS) 16.05.340, effective 1 January 2009, to require these nonresident military hunters who hunted on any land in Alaska (including military lands) to purchase a

nonresident military hunting license at the resident-hunter rate of $25.00. These nonresident military personnel continue to be exempt from purchasing a black bear metal locking tag.

Harvest by Hunters. In Unit 20A the average annual black bear harvest during RY10–RY12 was 30 bears with a range of 28–34 bears and 63% male (Table 1). This is slightly lower than the average annual harvest of 32 bears during RY05–RY09.

In Unit 20B the average annual harvest of black bears during RY10–RY12 was 114 bears with a range of 96–133 bears and 71% males (Table 1). This is lower than the average annual harvest of 133 bears during RY05–RY09.

In Unit 20C the average annual harvest of black bears during RY10–RY12 was 29 bears with a range of 27–32 bears and 78% males (Table 1). This is lower than the average annual harvest of 35 bears during RY05–RY09.

In Unit 20F the average annual harvest of black bears during RY10–RY12 was 35 bears with a range of 28–45 bears and 73% known to be males (Table 1). This is slightly lower than the average annual harvest of 36 bears during RY05–RY09.

In all units combined, the average annual reported harvest during RY10–RY12 was 208 bears, compared to an average annual reported harvest of 237 bears during RY05–RY09 (Table 1). The range during RY05–RY12 was 185–276. Several factors may contribute to the variability in harvest, 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 unit and the mean harvest during RY10–RY12, we estimated the harvest rate to be 3.5–5% in Unit 20A, 7.6–12% in Unit 20B, 2.3–3.7% in Units 20C, and 3.6–5.8% in Unit 20F. The harvest rate in Unit 20B has been estimated at or above the estimated maximum harvest rate many times over the last decade.

To further rule out the possibility that black bears were overharvested in Unit 20B, we examined age and skull size of bears harvested during RY89–RY12. During times of overharvest, older and larger animals are expected to become scarcer in populations, thus, skull size and average age is expected to decrease over time. In RY07–RY09 the average skull size was 16.0 inches for males and 15.6 for females compared to 16.1 for males and 15.8 for females during RY10–RY12 (Table 2). The average skull size during RY07–RY12 suggests that hunters continued to harvest adult bears despite sustained high harvests. Therefore, enough bears lived to adulthood for a consistent harvest of adult bears. Similarly, data from RY89 to RY09 show no decrease in mean age of harvested bears. The mean age of harvested black bears during RY89–RY97 was 4.9 (Seaton 2008) compared to 5.2 during RY10–RY12 (Table 3). This trend is contrary to the expectation that if the population is overharvested, age and skull size would decrease over time.

Distribution of Harvest. Most black bear harvest occurred at bait stations during the spring baiting season within the road-accessible portions of Unit 20B. The density of bait stations decreased with distance from Fairbanks and the road system. Some hunters intentionally

travelled farther from the road system and farther from Fairbanks to hunt black bears, possibly to avoid crowding by other hunters and to find better hunting.

Registration of Bait Stations. Black bear baiting is limited to the spring season (15 April–30 June), and hunters using baits were limited to 2 bait stations, and were required to register bait stations prior to set-up and post a sign at bait stations that included their hunting license number.

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 1,154 bait stations in RY91 (Seaton 2008). Those numbers have steadily decreased to an average of 468 hunters registering an average of 684 bait stations during RY05–RY12 (Table 4). During years of high military deployment, such as RY05 and RY10, the number of registered bait stations was noticeably lower than other years.

Harvest at Bait Stations. A large proportion of the black bear harvest continues to be taken over bait stations. During RY89–RY91, 64% of black bear harvest occurred at bait stations (Seaton 2008). The average was 77% during RY05–RY09 (Table 4). Since RY09, when sealing was not required for all black bears taken in Units 20A, 20C and 20F, the data were not collected on whether harvested bears were taken over a bait station. Based on historical records and the number of bait stations registered, it is likely the same. In Unit 20B, 75% of the black bear harvest was taken over black bear bait stations during RY10–RY12.

Hunter Residency and Success. During RY10–RY12, most black bears (83%) were taken by residents of Alaska, with 74% by local residents of Unit 20 (Table 5).

Harvest tickets and reports were required beginning in RY09, so we do not yet have a long-term data set to compare trends in the area. In RY09 harvest report data showed that the success rate was 15% for hunters in Unit 20A, 19% in Unit 20B, 29% in Unit 20C, and 51% in Unit 20F. A total of 154 hunters reported hunting in Unit 20A, 543 in Unit 20B, 66 in Unit 20C, and 63 in Unit 20F. During RY10–RY12, 20% of hunters took bears in Unit 20A, 16% in Unit 20B, 29% in Unit 20C, and 48% in Unit 20F. An average of 153 hunters reported hunting annually in Unit 20A, 515 in Unit 20B, 81 in Unit 20C, and 73 in Unit 20F. Data from harvest ticket reports do not match sealing data in Unit 20B where both reporting methods were required. In RY10, 82 bears were reported on harvest tickets and 114 were sealed. In RY11, 98 bears were reported on harvest tickets and 133 were sealed. In RY12, 74 were reported on harvest tickets and 97 were sealed. During RY10–RY12, 26% of the bears that were sealed were not reported on harvest tickets.

Harvest Chronology. During RY10–RY12, 83% of the harvest occurred during May and June (Table 6), which coincides with emergence from dens 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. During RY10–RY12, the most common methods of transportation used (in descending order) by successful black bear hunters were 4-wheelers, boats, highway vehicles, and airplanes (Table 7).

Defense of Life or Property. During RY10–RY12, 4 black bears were recorded as taken under DLP provisions. Only 1 of these bears was taken in Unit 20B. 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). It is also likely that the elevated harvest of spring black bears around Fairbanks has decreased nuisance-problem bears in and around the urban areas. A ballot initiative in November 2004 failed to outlaw bear baiting in Alaska. The practice in Alaska will probably continue to receive close scrutiny; however it proves to be an important tool for harvesting black bears in flat, forested areas.

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 RY10–RY12 was 71%, which was above the minimum objective of 55%.

Based on the population estimates for individual units, the average annual harvest rates for RY10–RY12 were at or below the maximum sustainable exploitation rate of 12% in Units 20A (5–7%), 20B (8–12%), 20C (4–6%), and 20F (6–10%). The harvest rate in Unit 20B has been sustained at the estimated maximum harvest rate of 12% or higher for 16 of the 21 years during RY89–RY09. This sustained high harvest rate suggests that estimates of maximum harvest rate were inaccurate, immigration from adjacent units was high, or our population estimate was lower than the true population.

The population estimates for RY10–RY12 were adjusted to more closely represent densities found by Gardner et al. (2012) and Keech et al. (2011), therefore they are likely more representative of the true population than previous management reports. However, the extrapolated density estimate from 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 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, average age has not decreased, and harvest was consistent. Considering these factors, it is highly unlikely that black bears have been overharvested in Unit 20B during the last 24 years.

We met our objective of maintaining a DLP take of less than 10% of the total bear take in Unit 20B. Only 1 DLP bear was harvested in Unit 20B during RY10–RY12, representing a fraction of the total harvest. 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.

With the requirement for hunters to report hunting effort via harvest ticket reports in Units 20A, 20C, and 20F, and to report hunting effort via harvest tickets and sealing in Unit 20B, we are adjusting to the data received by the department. Although days hunted and number of unsuccessful hunters is important data, the accuracy of harvest reported via harvest ticket reports is in question. In Unit 20B there was a 28% difference between the number of bears sealed and the number reported on harvest tickets during RY10–RY12. During the next report it is likely that we will be able to apply a correction factor based on these data to apply to the units where sealing is not required.

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Table 1. Units 20A, 20B, 20C, and 20F black bear harvest[a], regulatory years[b] 2005–2012.

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2005	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
	(% M)	(35)				(66)				(63)			
2006	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
	(% M)	(67)				(62)				(63)			
2007	20A	3	2	0	5	21	7	0	28	24	9	0	33
	20B	8	2	0	10	72	44	0	116	80	46	0	126
	20C	3	3	0	6	26	19	0	45	29	22	0	51
	20F	0	1	0	1	19	8	1	28	19	9	1	29
	Total	14	8	0	22	138	78	1	217	152	86	1	239
	(% M)	(64)				(64)				(64)			
2008	20A	8	11	0	19	21	4	0	25	29	15	0	44
	20B	24	9	0	33	74	44	0	118	98	53	0	151
	20C	2	2	0	4	24	12	0	36	26	14	0	40
	20F	3	1	0	4	29	7	1	37	32	8	1	41
	Total	37	23	0	60	148	67	1	216	185	90	1	276
	(% M)	(62)				(69)				(67)			
2009	20A	3	2	0	5	14	6	0	20	17	8	0	25
	20B	15	7	0	22	72	35	0	107	87	42	0	129
	20C	7	1	1	9	9	11	1	21	16	12	2	30
	20F	3	1	0	4	33	12	0	45	36	13	0	49
	Total	28	11	1	40	128	64	1	193	156	75	2	233
	(% M)	(70)				(67)				(68)			

Regulatory		Fall				Spring				Annual total			
year	Area	Male	Female	Unk	Total	Male	Female	Unk	Total	Male	Female	Unk	Total
2010	20A	3	0	0	3	15	10	0	25	18	10	0	28
	20B	12	3	0	15	83	15	0	98	95	18	0	113
	20C	5	0	0	5	19	7	1	27	24	7	1	32
	20F	3	0	0	3	22	3	0	25	25	3	0	28
	Total	23	3	0	26	139	35	1	175	162	38	1	201
	(% M)	(88)				(79)				(81)			
2011	20A	3	5	0	8	16	7	3	26	19	12	3	34
	20B	24	7	0	31	58	44	0	102	82	51	0	133
	20C	2	0	0	2	18	5	2	25	20	5	2	27
	20F	1	6	1	8	26	11	0	37	27	17	1	45
	Total	30	18	1	49	118	67	5	190	148	85	6	239
	(% M)	(61)				(62)				(62)			
2012	20A	3	4	0	7	15	6	0	21	18	10	0	28
	20B	11	6	0	17	56	23	0	79	67	29	0	96
	20C	2	1	0	3	20	6	0	26	22	7	0	29
	20F	2	3	0	5	21	5	1	27	23	8	1	32
	Total	18	14	0	32	112	40	1	153	130	54	1	185
	(% M)	(56)				(73)				(70)			

[a] Includes defense of life or property kills. Parentheses indicate percentage of bears of known sex that were male. Data for 1989–1992 from counts of sealing certificates.

[b] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).

Table 2. Unit 20B harvested black bear mean skull size[a] regulatory years[b] 2005–2012.

Regulatory year	Males	*n*	Females	*n*
2005	16.4	75	15.5	45
2006	16.7	89	15.6	51
2007	15.9	80	15.8	45
2008	16.4	96	15.9	55
2009	15.8	88	15.0	41
2010	16.7	95	16.2	19
2011	16.6	82	15.5	51
2012	15.0	68	15.7	29

[a] Skull size equals total length plus zygomatic width in inches.
[b] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).

Table 3. Unit 20B harvested black bear mean ages, regulatory years[a] 2005–2012.

Regulatory year	Mean age	*n*[b]
2005	5.3	108
2006	5.2	32
2007	5.0	39
2008	5.0	200
2009	5.0	30
2010	4.5	79
2011	6.0	101
2012	5.0	8

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Age data not available for some bears.

Table 4. Units 20A, 20B, 20C, and 20F black bear bait station registration and harvest, regulatory years[a] 2005–2012.

	Baiting		Harvest			Success
Regulatory year	Hunters registering bait stations	Bait stations	Taken over bait (%)	Not taken[b] over bait (%)	Total harvest[c]	Taken over bait divided by hunters registering bait stations (%)
2005	399	623	159 (85)	27 (15)	186	(40)
2006	463	687	201 (82)	43 (18)	244	(43)
2007	468	676	196 (82)	42 (18)	238	(42)
2008	463	668	184 (68)	87 (32)	271	(40)
2009	556	788	165 (71)	68 (29)	233	(30)
2010[d]	479	538				
2011[d]	468	767				
2012[d]	445	725				

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Not taken over bait harvest includes bears taken outside of the baiting season.
[c] Total harvest does not include harvest for which it was not known if baits were used.
[d] Prior to regulatory year 2009, sealing was the only reporting requirement for Units 20A, 20B, 20C, and 20F. During regulatory years 2010–2012, hunters in Units 20A, 20C, and 20F reported bear harvest using harvest tickets, but sealing was still required for black bear hides and skulls sent out of state. Hunters in Unit 20B reported harvest using harvest tickets and by having their harvested bear(s) sealed.

Table 5. Units 20A, 20B, 20C, and 20F successful hunter residency, regulatory years[a] 2005–2012.

Regulatory year	Residents			Nonresident	Unk	Total successful hunters[c]
	Local[b] (%)	Nonlocal (%)	Total (%)			
2005	144 (76)	7 (4)	151 (80)	38 (20)	0	189
2006	176 (72)	8 (3)	184 (76)	59 (24)	0	243
2007	174 (73)	11 (5)	185 (77)	54 (23)	0	239
2008	208 (77)	11 (4)	219 (81)	53 (20)	0	272
2009	184 (81)	14 (6)	198 (87)	28 (12)	0	226
2010	126 (74)	14 (8)	140 (82)	26 (15)	4	170
2011	161 (78)	15 (7)	176 (85)	24 (12)	7	207
2012	118 (71)	17 (10)	135 (81)	29 (17)	3	167

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).
[b] Resident of Unit 20.
[c] Excludes data from defense of life or property kills that were not taken as a legal harvest.

Table 6. Units 20A, 20B, 20C, and 20F black bear harvest chronology by month, regulatory years[a] 2005–2012.

Unit	Regulatory year	Harvest chronology by month (%)											
		Jul		Aug		Sep		Oct–Apr		May		Jun	
20A	2005	0	(0)	0	(0)	3	(13)	0	(0)	12	(50)	9	(38)
	2006	1	(3)	0	(0)	3	(9)	0	(0)	15	(45)	14	(42)
	2007	1	(3)	1	(3)	4	(12)	0	(0)	9	(26)	19	(56)
	2008	1	(2)	6	(14)	11	(26)	0	(0)	14	(33)	11	(26)
	2009	0	(0)	1	(4)	4	(16)	0	(0)	10	(40)	10	(40)
	2010	0	(0)	0	(0)	3	(12)	0	(0)	7	(28)	15	(60)
	2011	0	(0)	1	(3)	7	(20)	0	(0)	11	(31)	16	(46)
	2012	0	(0)	1	(4)	6	(21)	0	(0)	1	(4)	20	(71)
20B	2005	3	(3)	1	(1)	9	(8)	0	(0)	35	(29)	72	(60)
	2006	4	(3)	2	(1)	11	(8)	0	(0)	43	(31)	81	(57)
	2007	2	(2)	3	(2)	5	(4)	0	(0)	30	(24)	86	(68)
	2008	3	(2)	6	(4)	22	(15)	0	(0)	33	(22)	85	(57)
	2009	1	(1)	1	(1)	19	(15)	1	(1)	53	(41)	54	(42)
	2010	2	(2)	4	(4)	9	(8)	0	(0)	46	(41)	52	(46)
	2011	5	(4)	5	(4)	20	(15)	1	(1)	32	(24)	70	(53)
	2012	0	(0)	3	(3)	14	(15)	0	(0)	9	(10)	70	(73)
20C	2005	0	(0)	0	(0)	0	(0)	0	(0)	6	(25)	18	(75)
	2006	0	(0)	0	(0)	1	(3)	0	(0)	4	(13)	26	(84)
	2007	3	(6)	0	(0)	3	(6)	0	(0)	11	(22)	33	(66)
	2008	0	(0)	1	(3)	2	(5)	1	(3)	11	(28)	25	(63)
	2009	1	(3)	1	(3)	5	(17)	0	(0)	13	(43)	10	(33)
	2010	1	(3)	0	(0)	2	(6)	2	(6)	4	(13)	23	(72)
	2011	0	(0)	1	(4)	1	(4)	0	(0)	7	(26)	18	(67)
	2012	0	(0)	1	(3)	2	(7)	0	(0)	0	(0)	27	(90)
20F	2005	2	(10)	0	(0)	2	(10)	0	(0)	3	(14)	14	(67)
	2006	0	(0)	1	(3)	1	(3)	0	(0)	12	(30)	26	(65)
	2007	1	(3)	0	(0)	0	(0)	0	(0)	6	(21)	22	(76)
	2008	1	(2)	1	(2)	2	(5)	0	(0)	19	(46)	18	(44)
	2009	0	(0)	1	(2)	3	(6)	0	(0)	25	(52)	19	(40)
	2010	1	(4)	0	(0)	2	(7)	0	(0)	5	(18)	20	(71)
	2011	3	(7)	1	(2)	4	(10)	1	(2)	9	(21)	25	(58)
	2012	0	(0)	0	(0)	5	(16)	0	(0)	0	(0)	27	(84)

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).

Table 7. Units 20A, 20B, 20C, and 20F black bear harvest by transport method, regulatory years[a] 2005–2012.

		Harvest by transport method (%)									
Unit	Regulatory year	Airplane	Dog/ Horse	Boat	4-wheeler	Snowmachine	Other ORV	Highway vehicle	Walk	Other/Unk	*n*
20A	2005	5 (21)	0 (0)	11 (46)	7 (29)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	24
	2006	10 (29)	0 (0)	16 (47)	4 (12)	0 (0)	0 (0)	3 (9)	0 (0)	1 (3)	34
	2007	11 (33)	1 (3)	14 (42)	4 (12)	0 (0)	0 (0)	2 (6)	1 (3)	0 (0)	33
	2008	12 (30)	1 (3)	14 (35)	9 (23)	0 (0)	0 (0)	0 (0)	3 (8)	1 (3)	40
	2009	6 (29)	0 (0)	8 (38)	6 (29)	0 (0)	0 (0)	1 (5)	0 (0)	0 (0)	21
	2010	3 (11)	0 (0)	12 (43)	2 (7)	0 (0)	2 (7)	3 (11)	0 (0)	6 (21)	28
	2011	11 (31)	0 (0)	10 (29)	8 (23)	0 (0)	1 (3)	4 (11)	0 (0)	1 (3)	35
	2012	8 (29)	0 (0)	8 (29)	8 (29)	0 (0)	4 (14)	0 (0)	0 (0)	0 (0)	28
20B	2005	8 (7)	0 (0)	18 (15)	65 (54)	0 (0)	0 (0)	16 (13)	13 (11)	0 (0)	120
	2006	11 (8)	0 (0)	29 (21)	77 (55)	0 (0)	0 (0)	17 (12)	7 (5)	0 (0)	141
	2007	8 (6)	0 (0)	20 (16)	59 (47)	1 (1)	2 (1)	28 (22)	8 (6)	0 (0)	126
	2008	6 (4)	1 (1)	26 (17)	84 (56)	0 (0)	2 (2)	24 (16)	7 (5)	0 (0)	150
	2009	16 (13)	0 (0)	23 (18)	53 (42)	0 (0)	2 (2)	17 (14)	14 (11)	0 (0)	125
	2010	1 (1)	0 (0)	31 (27)	56 (49)	0 (0)	1 (1)	18 (16)	7 (6)	0 (0)	114
	2011	5 (4)	0 (0)	26 (20)	63 (48)	0 (0)	2 (2)	33 (25)	2 (2)	0 (0)	131
	2012	2 (2)	0 (0)	28 (29)	47 (49)	0 (0)	0 (0)	16 (17)	3 (3)	0 (0)	96
20C	2005	4 (17)	0 (0)	19 (79)	0 (0)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	24
	2006	1 (3)	0 (0)	26 (84)	3 (10)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3)	31
	2007	8 (16)	0 (0)	37 (73)	3 (6)	0 (0)	0 (0)	1 (2)	2 (4)	0 (0)	51
	2008	6 (15)	0 (0)	28 (70)	0 (0)	0 (0)	0 (0)	2 (5)	4 (10)	0 (0)	40
	2009	6 (21)	0 (0)	12 (43)	5 (18)	0 (0)	2 (7)	0 (0)	3 (11)	0 (0)	28
	2010	14 (44)	0 (0)	14 (44)	3 (9)	0 (0)	0 (0)	0 (0)	1 (3)	0 (0)	32
	2011	13 (46)	0 (0)	11 (39)	1 (4)	0 (0)	0 (0)	0 (0)	2 (7)	1 (4)	28
	2012	13 (39)	0 (0)	14 (42)	1 (3)	0 (0)	2 (6)	3 (9)	0 (0)	0 (0)	33
20F	2005	1 (5)	0 (0)	5 (24)	1 (5)	0 (0)	0 (0)	14 (67)	0 (0)	0 (0)	21
	2006	0 (0)	0 (0)	4 (10)	20 (50)	0 (0)	1 (3)	9 (23)	4 (10)	2 (5)	40
	2007	0 (0)	0 (0)	6 (21)	10 (34)	0 (0)	0 (0)	11 (38)	2 (7)	0 (0)	29
	2008	0 (0)	0 (0)	7 (17)	14 (34)	0 (0)	0 (0)	16 (39)	4 (10)	0 (0)	41
	2009	1 (2)	0 (0)	8 (16)	17 (35)	0 (0)	0 (0)	20 (41)	3 (6)	0 (0)	49
	2010	1 (4)	0 (0)	8 (29)	7 (25)	0 (0)	1 (4)	9 (32)	2 (7)	0 (0)	28
	2011	0 (0)	0 (0)	12 (26)	11 (24)	0 (0)	1 (2)	15 (33)	2 (4)	5 (11)	46
	2012	0 (0)	0 (0)	6 (19)	18 (56)	0 (0)	0 (0)	6 (19)	2 (6)	0 (0)	32

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2005 = 1 July 2005–30 June 2006).

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CHAPTER 19: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013[1]

LOCATION

GAME MANAGEMENT UNIT: 20D (5,637 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.

In 2009 the Alaska Board of Game (board) passed a regulation that required black bear hunters in many units, including Unit 20D, to possess a black bear harvest ticket when hunting black bears. Beginning in regulatory year (RY) 2010 (regulatory year begins 1 July and ends 30 June, e.g., RY10 = 1 July 2010–30 June 2011), the board classified black bears as furbearers as well as big game. Although the board did not open black bear trapping seasons, this furbearer classification and other regulatory changes allowed hunters to legally sell black bear hides and parts, except gall bladders. The board subsequently amended these regulations so that sale of black bear meat remained illegal in RY10. Further RY10 regulatory changes in many units, including Unit 20D, eliminated sealing requirements, except for bears removed from Alaska or sold, and changed salvage requirement for black bears harvested during 1 June–31 December to allow hunters to salvage either the hide or meat with no requirement to salvage the skull. The board also increased the maximum number of bait stations allowed to be registered by guides from 2 to 10 and designated this regulation to take effect in spring 2011.

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.

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

MANAGEMENT OBJECTIVE

- Manage for a sustained yield of black bears with harvest not to exceed 15 black bears/year south of the Tanana River and 35 black bears/year north of the Tanana River.

METHODS

Harvest of black bear by hunters during the general season was monitored by requiring hunters to acquire black bear harvest tickets and report hunting activities that included the location hunted, how long they hunted, their mode of transportation, whether they killed a bear(s), where and when they killed a bear(s), the sex of bear(s) killed, and the type of weapon used to kill a bear(s). We also collected harvest data through sealing of bears killed by hunters. Data collected during sealing of each harvested black bear included harvest date, how long they hunted, mode of transportation, sex, color phase, total skull length and zygomatic width, whether the meat was salvaged, hunter name and address, and location of harvest within Uniform Coding Units (UCU). UCUs are small, defined areas within Unit 20D bounded by watersheds or physiographic landscape features. Other mortalities of black bears, including take in defense of life or property (DLP), were monitored by sealing the hides and skulls of bears killed. Data collected from bears killed in DLP included date of kill, location of kill, and sex of the bear. In addition, anyone killing a black bear in DLP is required to complete and submit a Defense of Life or Property Report form to the Alaska Department of Fish and Game (ADF&G). Data were summarized by regulatory year. One reminder letter was sent to holders of harvest tickets who did not report.

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, DuBois (1993) estimated a population of approximately 750 adult black bears in Unit 20D. DuBois also estimated that approximately 525 bears were present north of the Tanana River and 225 bears lived south of the Tanana River.

Distribution and Movements

Black bears are distributed throughout the bogs, riparian areas, spruce and mixed forest, and subalpine shrub of Unit 20D. They also utilize alpine habitat but are not year-round residents. No information was available concerning movements.

MORTALITY

Harvest

Season and Bag Limit. There was no closed season on black bears in Unit 20D during RY10–RY12. The bag limit was 3 bears/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 ADF&G. Guides using bait were allowed to register up to 10 stations.

Alaska Board of Game Actions and Emergency Orders. The 2010 board decision to increase the maximum number of bait stations allowed to be registered by guides from 2 to 10 went into

regulation in spring 2011. In 2012 the board passed a regulation allowing same-day-airborne take of black bears at bait stations, provided the black bear is at the bait station and that the hunter is at least 300 feet from the airplane. No emergency orders were issued during RY10–RY12.

Harvest by Hunters. Reported black bear harvest by hunters during RY10–RY12 ranged from a low of 16 in RY10 to a high of 22 in RY12 (Table 1) and did not exceed the Unit 20D combined harvest objective of 50 bears/year. Mean 3-year annual harvest by hunters was 20 bears/year. Sixty-three percent of the bears taken were males.

Twenty-nine percent of black bears killed by hunters during RY10–RY12 were taken at bait stations, ranging from 5 bears in RY10 and RY12 to 7 in RY11. A 3-year mean of 6 bears/year were taken with bait (Table 1).

Nonhunting Mortality. There were 3 DLP nonhunting mortalities reported during RY10–RY12 (Table 1).

Harvest Locations. The Unit 20D harvest objective not to exceed 15 bears/year south of the Tanana River was met during RY10–RY12 (Table 2). The southern Unit 20D harvest ranged from 4 to 10 bears/year. The 3-year mean harvest south of the Tanana River was 6 bears/year. This represented an estimated annual harvest of 3% of the estimated adult population south of the Tanana River.

Unit 20D harvest objective not to exceed 35 bears/year north of the Tanana River was met during RY10–RY12 (Table 2). The reported harvest north of the Tanana River ranged from 11 to 14 bears/year. The 3-year mean harvest north of the Tanana River was 12 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). Based on reported harvest, the average annual number of local resident successful hunters during the reporting period was 8, and the average annual number of nonlocal resident hunters was 10.

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 were boats and highway vehicles (Table 5). This is a shift from the previous reporting period (RY07–RY09) when 3- or 4-wheelers were the most used means of transportation for successful black bear hunters. One hunter in RY11 and 1 hunter in RY12 reported using an airboat.

NONREGULATORY MANAGEMENT ISSUES

Bear Presence/Nuisance Bear Concerns

The Delta area office receives calls from the public about bear presence and nuisance bear concerns. We responded to a minimum of 6 calls. Three calls were addressed through telephone communication, and another 3 calls were addressed with site visits. During the telephone and site visit responses, we assisted with identifying attractants, suggested bear deterrent techniques,

interpreted bear behavior, and managed the presence of people to provide black bears the opportunity to leave an area.

CONCLUSIONS AND RECOMMENDATIONS

Harvest levels currently reported on black bears in Unit 20D are sustainable. This conclusion is supported by data indicating static harvest since 1994 (DuBois 2011). In addition, anecdotal information from local residents and hunters in Unit 20D during RY10–RY12 indicated that black bears were numerous throughout the area. Harvest levels during RY10–RY12 met management objectives. Based on this collective information, no changes in harvest regulations or management are recommended at this time.

During RY10–RY12, 3 black bears were killed in DLP. This is the most DLP black bear kills reported in Unit 20D since RY04–RY05. The DLP incidents are of interest, but I have no analysis of the increase in reports at this time. One of the incidents resulted in a human fatality. This incident was investigated by ADF&G biologists (R. Shideler and D. Bruning, 2014, unpublished data). All useful information about minimizing or avoiding bear-human conflicts gained from review and investigation of the DLP incidents will be provided to the public.

We continued to work to provide the public with information on reducing bear-human conflicts. This was accomplished by direct communication with concerned or interested individuals and by distribution of agency educational materials. I suggest that prompt response to calls about concerns of bear presence and showing demonstrated interest when communicating with the public about nuisance bear issues are successful methods in reducing conflicts between black bears and people. Some members of the local community have responded positively to public education and outreach and have taken action to reduce black bear attractants and to increase their understanding of bear behavior.

DNA can be used to estimate bear populations and densities. Consideration should be given to developing a coordinated effort between Region III Division of Wildlife Conservation Research and Management staff in using DNA techniques to estimate black bear populations and densities in Unit 20D.

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Table 1. Unit 20D black bear harvest, regulatory years[a] 2007–2012.

Regulatory year	Reported																	
	Hunter kill							Nonhunting kill[b]			Estimated kill		Total reported and estimated kill					
	M	(%)	F	(%)	Unk	Total	Baited	M	F	Unk	Unreported	Illegal	M	(%)	F	(%)	Unk	Total
2007																		
Fall 2007	1		3		0	4		0	0	0	0	0	1	(25)	3	(75)	0	4
Spring 2008	7		3		0	10	6	0	0	0	0	0	7	(70)	3	(30)	0	10
Total	8		6		0	14	6	0	0	0	0	0	8	(57)	6	(43)	0	14
2008																		
Fall 2008	6		3		0	9		0	0	0	0	0	6	(67)	3	(33)	0	9
Spring 2009	5		7		0	12	6	0	0	0	0	0	5	(42)	7	(58)	0	12
Total	11		10		0	21	6	0	0	0	0	0	11	(52)	10	(48)	0	21
2009																		
Fall 2009	4	(36)	7	(64)	0	11		0	0	0	0	0	4	(36)	7	(64)	0	11
Spring 2010	4	(57)	3	(43)	4	11	0	0	0	0	0	0	4	(57)	3	(43)	4	11
Total	8	(44)	10	(56)	4	22	0	0	0	0	0	0	8	(44)	10	(56)	4	22
2010																		
Fall 2010	3	(100)	0	(0)	0	3		0	0	0	0	0	3	(100)	0		0	3
Spring 2011	6	(46)	5	(39)	2[c]	13	5	0	0	0	0	0	6	(55)	5	(45)	2[c]	13
Total	9	(56)	5	(31)	2[c]	16	5	0	0	0	0	0	9	(64)	5	(36)	2[c]	16
2011																		
Fall 2011	3	(50)	3	(50)	0	6		0	0	0	0	0	3	(50)	3	(50)	0	6
Spring 2012	9	(60)	6	(40)	0	15	7	1	0	1	0	0	10	(63)	6	(37)	1	17
Total	12	(57)	9	(43)	0	21	7	1	0	1	0	0	13	(59)	9	(41)	1	23
2012																		
Fall 2012	6	(75)	2	(25)	0	8		1	0	0	0	0	7	(78)	2	(22)	0	9
Spring 2013	10	(77)	3	(23)	1	14	5	0	0	0	0	0	10	(77)	3	(23)	1	14
Total	16	(76)	5	(24)	1	22	5	1	0	0	0	0	17	(77)	5	(23)	1	23

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2007 = 1 July 2007–30 June 2008).
[b] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.
[c] Includes 1 reported bear harvest with unknown date of kill.

Table 2. Unit 20D reported black bear harvest locations, regulatory years[a] 2007–2012.

Regulatory year	South of Tanana River		North of Tanana River		Unk	*n*
	n	(%)	*n*	(%)		
2007	5	(36)	9	(64)	0	14
2008	14	(67)	7	(33)	0	21
2009	12	(71)	5	(29)	1	18
2010	4	(27)	11	(73)	1	16
2011	4	(22)	14	(78)	3	21
2012	10	(48)	11	(52)	1	22

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2007 = 1 July 2007–30 June 2008).

Table 3. Unit 20D black bear successful hunter residency, regulatory years[a] 2007–2012.

Regulatory year	Local[b] resident	(%)	Nonlocal resident	(%)	Nonresident	(%)	Unk	Total successful hunters
2007	9	(64)	4	(29)	1	(7)	0	14
2008	12	(57)	7	(33)	2	(10)	0	21
2009	7	(39)	10	(56)	1	(6)	0	18
2010	9	(56)	6	(38)	1	(6)	0	16
2011	8	(40)	12	(60)	0		1	21
2012	7	(32)	12	(54)	3	(14)	0	22

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2007 = 1 July 2007–30 June 2008).
[b] Local residents are residents of Unit 20D.

Table 4. Unit 20D black bear harvest chronology percent by month, regulatory years[a] 2007–2012.

Regulatory year	Harvest chronology percent by month								
	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
2007	0	14	14	0	0	0	29	43	14
2008	10	14	19	0	0	0	14	43	21
2009	6	17	39	0	0	0	11	28	18
2010	7	7	13	0	0	7	33	33	16[b]
2011	0	19	10	0	0	0	24	48	21
2012	0	5	36	5	0	0	5	50	22

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2007 = 1 July 2007–30 June 2008).
[b] Date of kill was unknown for 1 harvested bear.

Table 5. Unit 20D black bear harvest percent by transport method, regulatory years[a] 2007–2012.

Regulatory year	Harvest percent by transport method										
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Other	Unk	*n*
2007	7	7	29	36	0	0	7	7	7	0	14
2008	5	0	14	24	0	0	24	33	0	0	21
2009	17	6	22	28	0	0	11	17	0	0	18
2010	0	0	38	19	0	0	44	0	0	0	16
2011	0	0	43	14	0	0	24	14	5[b]	0	21
2012	9	0	23	23	0	0	26	14	5[b]	0	22

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 2007 = 1 July 2007–30 June 2008).
[b] Airboat.

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CHAPTER 20: BLACK BEAR MANAGEMENT REPORT

From: 1 July 2010
To: 30 June 2013[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 have fluctuated since at least 1960 in relation to grizzly bear population trends (Kelleyhouse 1990). 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 forest to reach maturity, 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 have resulted in improved black bear habitat in large portions of Unit 20E. Historically, interest in black bear hunting in the unit has been low.

MANAGEMENT DIRECTION

MANAGEMENT GOALS

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

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

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

MANAGEMENT OBJECTIVE

- Maintain at least 55% males in the harvest during the report period.

METHODS

Harvest was estimated using mandatory harvest report cards. To increase the reporting rate, reminder letters were sent to hunters who did not initially report. Data obtained from the reports were used to determine total harvest, hunter residency, success rates, harvest chronology, and transportation used. Additional harvest data, including skull size, salvage of meat, and bait use, were collected during the optional process of sealing harvested bears. Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g., RY12 = 1 July 2012–30 June 2013). Hunters were required to register all black bear bait stations and the distribution of bait stations and harvest were monitored.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

During RY10–RY12, no surveys were conducted to determine black bear population size or trend. The Unit 20E black bear population was estimated at 1,200–1,800 bears. This population estimate was based on limited radiotelemetry data collected in adjacent Unit 12 (Kelleyhouse 1990), and on density estimates in Unit 20A of 12–18 black bears/100 mi^2 (46–67/1,000 km^2; Hechtel 1991) and 12–19 black bears/100 mi^2 (46–75/1,000 km^2; C. Gardner, ADF&G unpublished data, Fairbanks). Both density estimates in Unit 20A excluded cubs of the year.

The composition of the Unit 20E black bear population is unknown. In 2004 and 2005, approximately 1,875 mi^2 (4,856 km^2) of black bear habitat burned within, or adjacent to, Unit 20E. The effect of wildfires on black bear population trend in Unit 20E is unknown.

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 in the first year of life and females accompanied by cubs was prohibited.

Alaska Board of Game Actions and Emergency Orders. Starting in RY09 the board required hunters to possess harvest tickets for black bears in all units where black bear sealing was required, including Unit 20E. The sealing requirement in Unit 20E was eliminated in RY10, except for bears removed from Alaska or sold, and salvage requirements for black bears harvested during 1 June–31 December were changed to allow hunters to salvage either the hide or meat with no requirement to salvage the skull. Also beginning in RY10, sealed black bear hides and skulls taken under a hunting license were allowed to be sold. The board also increased the maximum number of bait stations allowed to be registered by guides from 2 to 10 beginning

in spring 2011. In March 2012 the board approved same-day-airborne take of black bears at bait stations in Unit 20E, provided the black bear is at the bait station and that the hunter is at least 300 feet from the airplane.

No emergency orders were issued during RY10–RY12.

Harvest by Hunters. During RY10–RY12, 59–91 hunters ($\bar{x}$ = 75) reported taking 16–38 black bears ($\bar{x}$ = 24) annually in Unit 20E (Table 1). Estimated harvest rate was 1–2% of the adult population, but without detailed population estimates the precise harvest rate is unknown. A total of 71 black bears, including 49 males, were killed during this 3-year period, and a record high harvest of 38 bears in RY11. Males made up 69–76% of the harvest ($\bar{x}$ = 71%) during RY10–RY12, meeting the harvest objective of >55% males for all 3 years. The average harvest during RY02–RY09 was 15 bears, ranging 56–86% males ($\bar{x}$ = 73%). During RY10–RY12, 53% of harvested bears were sealed, and the average skull size of sealed males (17.0 in, n = 26) was slightly higher than the RY95–RY00 average (16.4 in). Similar skull sizes and the high percentage of males in the harvest suggest that human-induced mortality had minimal effects on this population.

Beginning in RY10, information on black bears harvested over bait is only available from the optional process of sealing harvested bears. During RY10–RY12, 62% of spring-harvested sealed bears were taken over bait. This compares to an average of 41% and 55% spring-harvest over bait during RY07–RY09 and RY04–RY06 respectively.

Hunter Residency and Success. The overall success rate of 31% during RY10–RY12 was higher than the 23% reported in RY09, the first year harvest tickets were issued for black bears in Unit 20E (Table 2). Success rates among Alaska residents (30%) and nonresidents (37%) were similar. During RY10–RY12, Alaska residents harvested an average of 90% of the black bears taken in Unit 20E, and 81% of Alaska resident hunters who had their bears sealed reported salvaging at least some meat. Unit 20E residents took an average of 23% of the harvest, same as the previous 5-year average of 23%. During RY10–RY12, 7 black bears were killed by nonresidents; 10% of the total harvest. This was higher than the previous 5-year average of 7% of the total harvest, and a record high 6 black bears were harvested by nonresidents in RY12. Spring 2013 was the first time that grizzly bears were allowed to be harvested over bait in Unit 20E; this resulted in an increased interest in guided nonresident bear hunts over bait and led to a higher harvest of black bears by nonresidents.

Harvest Chronology. During RY10–RY12 an average of 45% and 55% of the black bear harvest occurred during fall (August and September) and spring (May and June), respectively (Table 3). In RY12, only 6% of the black bear harvest occurred during May, likely due to prolonged winter conditions with deep snow persisting through the month. During RY02–RY09, 47–74% ($\bar{x}$ = 59%) of the harvest took place in fall.

Transport Methods. During RY10–RY12, 4-wheelers (30%) and highway vehicles (42%) were the most common modes of transportation used by successful black bear hunters (Table 4). Use of 4-wheelers will likely continue to be prevalent among Unit 20E black bear hunters because of the abundance of ATV trails in the area.

HABITAT

Assessment

Black bear habitat is extensive in Unit 20E. Only treeless habitat, generally above elevations of 4,000 feet, is not black bear habitat. Blueberries, crowberries, and cranberries are widely available, and bearberries are available in a few areas. Extensive 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. During 2004–2005 and 2009–2013, approximately 1,875 mi^2 (4,856 km^2) and 81 mi^2 (210 km^2) of Unit 20E burned respectively, which has improved usable habitat for black bears in the area. Also, 3 prescribed burns were ignited during 1997–1999, affecting 148 mi^2 (383 km^2) of black bear habitat. Revegetation by preferred plant species in burned areas provides better forage for black bears than is available in mature forests of black or white spruce.

CONCLUSIONS AND RECOMMENDATIONS

We met the management objective of 55% or more males in the harvest ($\bar{x}$ = 71% males) during RY10–RY12. Black bears in Unit 20E were lightly harvested and were hunted both during the fall and spring primarily by nonlocal Alaska residents. Highway vehicles and 4-wheelers were used by 74% of successful hunters. The low harvest rate of predominantly male bears likely had little effect on the status and trend of the population, and skull size of sealed bears remained relatively constant. No changes in seasons, bag limits, or management goals and objectives are recommended at this time.

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Table 1. Unit 20E black bear harvest, regulatory years[a] 2006–2012.

Regulatory year	Reported								Estimated kill		Total reported and estimated kill			
	Hunter kill					Nonhunting kill[b]								
	M	F	Unk	Total	Baited[c]	M	F	Unk	Unreported	Illegal	M (%)	F (%)	Unk	Total[d]
2006														
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
2007														
Fall 2007	4	1	0	5	0	0	0	0	0	0	4 (80)	1 (20)	0	5
Spring 2008	3	2	0	5	2	0	0	0	0	0	3 (60)	2 (40)	0	5
Total	7	3	0	10	2	0	0	0	0	0	7 (70)	3 (30)	0	10
2008														
Fall 2008	9	2	0	11	0	0	0	0	0	0	9 (82)	2 (18)	0	11
Spring 2009	3	1	0	4	2	0	0	0	0	0	3 (75)	1 (25)	0	4
Total	12	3	0	15	2	0	0	0	0	0	12 (80)	3 (20)	0	15
2009														
Fall 2008	6	4	0	10	0	0	0	0	0	0	6 (60)	4 (40)	0	10
Spring 2009	8	0	0	8	3	0	0	0	0	0	8 (100)	0 (0)	0	8
Total	14	4	0	18	3	0	0	0	0	0	14 (78)	4 (22)	0	18
2010														
Fall 2010	4	0	0	4	0	0	0	0	0	0	4 (100)	0 (0)	0	4
Spring 2011	7	5	0	12	1	0	0	0	0	0	7 (58)	5 (42)	0	12
Total	11	5	0	16	1	0	0	0	0	0	11 (69)	5 (31)	0	16
2011														
Fall 2011	11	6	0	17	0	0	1	2	0	0	11 (61)	7 (39)	2	20
Spring 2012	14	4	0	18	6	0	0	0	0	0	14 (78)	4 (22)	0	18
Total	25	10	0	35	6	0	1	2	0	0	25 (69)	11 (31)	2	38
2012														
Fall 2012	7	3	0	10	0	0	0	0	0	0	7 (70)	3 (0)	0	10
Spring 2013	6	1	0	7	6	0	0	0	0	0	6 (86)	1 (14)	0	7
Total	13	4	0	17	6	0	0	0	0	0	13 (76)	4 (25)	0	17

[a] Regulatory year (RY) begins 1 July and ends 30 June (e.g., RY06 = 1 July 2006–30 June 2007).
[b] Includes defense of life or property kills, research mortalities, and other known human-caused accidental mortality.
[c] Sealing requirements eliminated in RY10, and baiting information is available only from sealed bears. Baited bears for RY10–RY12 are a minimum count.
[d] Includes animals with an unknown date of kill.

Table 2. Unit 20E black bear hunter residency and success, regulatory years[a] 1999–2012.

	Successful					Unsuccessful[b]					
Regulatory year	Unit 20E resident	Other resident	Nonresident	Total	(%)	Unit 20E resident	Other resident	Nonresident	Unk	Total	(%)	Total hunters
1999	4	6	0	10								
2000	6	10	0	16								
2001	8	3	0	11								
2002	8	13	1	22								
2003	1	7	0	8								
2004	11	15	2	28								
2005	3	6	1	10								
2006	2	5	0	7								
2007	3	7	0	10								
2008	1	12	2	15								
2009	5	11	2	18	(23)	19	38	2	0	59	(77)	77
2010	7	9	0	16	(27)	10	32	1	0	43	(73)	59
2011	9	26	1	36	(40)	16	30	6	3	55	(60)	91
2012	0	11	6	17	(22)	10	44	5	0	59	(78)	76

[a] Regulatory year (RY) begins 1 July and ends 30 June (e.g., RY99 = 1 July 1999–30 June 2000).
[b] Mandatory harvest report cards required beginning in RY09.

Table 3. Unit 20E black bear harvest chronology percent by month, regulatory years[a] 1999–2012.

Regulatory	Harvest chronology percent by month								
year	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	*n*
1999	0	0	60	0	0	0	10	30	10
2000	13	0	44	0	0	0	37	6	16
2001	0	27	18	0	0	0	9	46	11
2002	5	18	45	0	0	0	23	9	22
2003	0	25	37	0	0	0	38	0	8
2004	7	18	29	0	0	4	21	21	28
2005	0	30	20	0	0	0	10	40	10
2006	0	57	14	0	0	0	14	14	7
2007	0	30	20	0	0	0	30	20	10
2008	0	53	21	0	0	0	13	13	15
2009	0	28	28	0	0	0	44	0	18
2010	0	13	13	0	0	0	44	30	16
2011	0	29	20	0	0	0	11	40	35
2012	0	18	41	0	0	0	6	35	17

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 1999 = 1 July 1999–30 June 2000).

Table 4. Unit 20E black bear harvest by transport method, regulatory years[a] 1999–2012.

Regulatory year	Harvest by transport method (%)									
	Airplane	Horse	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walking	Unknown	*n*
1999	0 (0)	0 (0)	4 (40)	2 (20)	0 (0)	0 (0)	3 (30)	1 (10)	0 (0)	10
2000	1 (6)	0 (0)	3 (19)	6 (38)	0 (0)	0 (0)	5 (31)	1 (6)	0 (0)	16
2001	0 (0)	0 (0)	3 (27)	2 (18)	0 (0)	0 (0)	2 (18)	4 (37)	0 (0)	11
2002	1 (5)	0 (0)	0 (0)	7 (32)	0 (0)	0 (0)	12 (54)	2 (9)	0 (0)	22
2003	0 (0)	0 (0)	1 (13)	4 (50)	0 (0)	0 (0)	2 (25)	1 (12)	0 (0)	8
2004	0 (0)	0 (0)	5 (18)	11 (39)	0 (0)	0 (0)	9 (32)	3 (11)	0 (0)	28
2005	0 (0)	0 (0)	0 (0)	6 (60)	0 (0)	0 (0)	4 (40)	0 (0)	0 (0)	10
2006	0 (0)	0 (0)	0 (0)	4 (57)	0 (0)	0 (0)	2 (29)	1 (14)	0 (0)	7
2007	0 (0)	0 (0)	2 (20)	4 (40)	0 (0)	0 (0)	3 (30)	1 (10)	0 (0)	10
2008	2 (13)	0 (0)	3 (20)	4 (27)	0 (0)	1 (7)	5 (33)	0 (0)	0 (0)	15
2009	0 (0)	0 (0)	4 (22)	8 (44)	0 (0)	0 (0)	5 (28)	1 (6)	0 (0)	18
2010	1 (6)	0 (0)	2 (13)	5 (31)	0 (0)	0 (0)	6 (37)	2 (13)	0 (0)	16
2011	2 (6)	0 (0)	4 (11)	11 (30)	0 (0)	0 (0)	17 (47)	2 (6)	0 (0)	36
2012	0 (0)	0 (0)	3 (18)	5 (29)	0 (0)	0 (0)	7 (41)	2 (12)	0 (0)	17

[a] Regulatory year begins 1 July and ends 30 June (e.g., regulatory year 1999 = 1 July 1999–30 June 2000).


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