Elk
Management Report
of survey-inventory activities
1 July 2007–30 June 2009

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

Funded through
Federal Aid in Wildlife Restoration
Grants W-33-6 and W-33-7, Project 13.0
2010 Set

STATE OF ALASKA
Sean Parnell, Governor

DEPARTMENT OF FISH AND GAME
Cora Campbell, Commissioner

DIVISION OF WILDLIFE CONSERVATION
Corey Rossi, Director

For a copy of this report please direct requests to our publications specialist:

Publications Specialist
ADF&G, Wildlife Conservation
P.O. Box 115526
Juneau, AK 99811-5526
(907) 465-4176
dfg.dwc.publications@alaska.gov

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

Cover Photo: An adult cow elk captured and radiocollared by ADF&G biologists south of McHenry Anchorage, Etolin Island, in late winter 2009. The GPS radio collar attached to this elk will provide 2 years of information on the animal's daily and seasonal movement patterns, home range size, habitat selection, and survival.

ELK
Management Report
of survey-inventory activities
1 July 2007–30 June 2009

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

Funded through
Federal Aid in Wildlife Restoration
Grants W-33-6 and W-33-7, Project 13.0
2010 Set

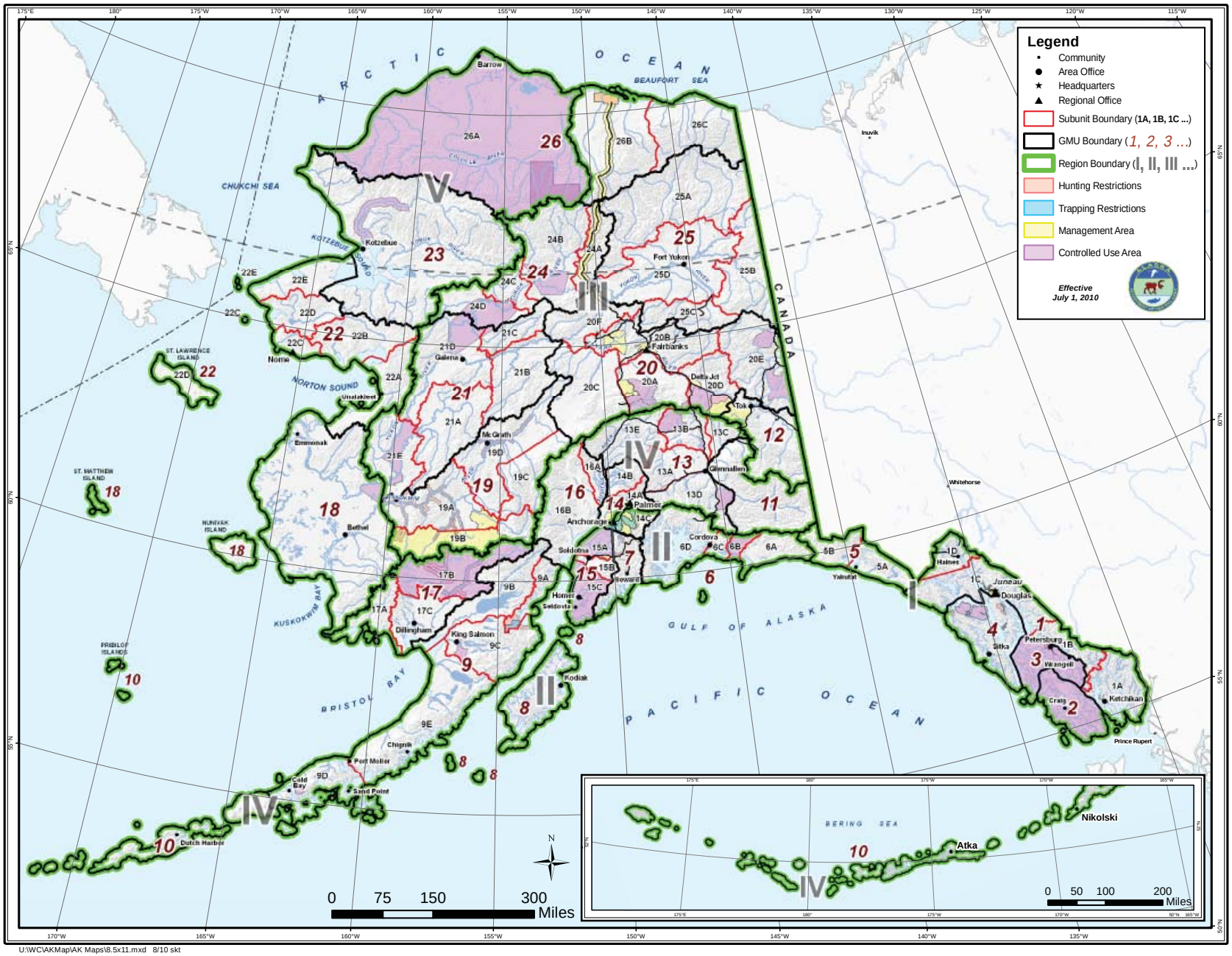
If this report is used in its entirety, please reference as: Alaska Department of Fish and Game. 2010. Elk management report of survey-inventory activities 1 July 2007–30 June 2009. P Harper, editor. Juneau, Alaska.

Please note that this report was released as a complete set in 2011, but is part of the 2010 set of species management reports. We encourage referencing this report as a 2010 report to maintain understanding of when reports were written and ease of locating this particular set of reports.

ELK MANAGEMENT REPORT

From: 1 July 2007
To: 30 June 2009

TABLE OF CONTENTS



U:\WC\AKMap\AK Maps\8.5x11.mxd 8/10 skt

WILDLIFE

MANAGEMENT REPORT

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

ELK MANAGEMENT REPORT

From: 1 July 2007
To: 30 June 2009

LOCATION

GAME MANAGEMENT UNIT: 3 (3,000 mi^2)

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

BACKGROUND

Elk (*Cervus elaphus*) are not endemic to Alaska but were successfully introduced onto Afognak Island in the Kodiak Archipelago in 1929. Prior to 1987, there were 6 unsuccessful attempts to introduce elk into Southeast Alaska (Burris and McKnight 1973). Lack of monitoring programs precluded our determining why those attempts failed.

In 1985 the Alaska Legislature passed a law that required the introduction of 50 elk to Etolin Island. In spring of 1987, 33 Roosevelt elk (*C. e. roosevelti*) from Jewell Meadows Wildlife Management Area and 17 Rocky Mountain elk (*C. e. nelsoni*) from the Elkhorn Wildlife Management Area in Oregon were translocated to Southeast Alaska. Roosevelt elk were released at Dewey Anchorage on the southwest side of Etolin Island, and Rocky Mountain elk were released just north of Johnson Cove on the northwest shore of Etolin Island.

Initial losses were high, and about two-thirds of the elk died from predation, starvation, and accidents within 18 months of release. Following initial losses, the population stabilized, eventually began increasing, and today seems to be permanently established and thriving. In recent years the elk population has continued to increase and extend its range. A breeding population is now established on Zarembo Island, and members of the public have reported observing elk on Mitkof, Wrangell, Prince of Wales, Deer, Bushy, Shrubby, and Kupreanof Islands and on portions of the Unit 1A and 1B mainland. Elk numbers in Unit 3 on islands other than Etolin and Zarembo are believed to be low.

HUMAN USE HISTORY

Unit 3 elk have been hunted for food and trophies since 1997.

Regulation History

The Alaska Department of Fish and Game initially planned, in 1987, to manage the elk population with the goal of allowing a limited elk hunt when the population reached 250 elk and could sustain a harvest of 20 bulls. In 1993, in an effort to restrict the introduced elk to Etolin Island and prevent their dispersal to other islands, the BOG authorized an open season, either-sex

elk hunt in Unit 3 off of Etolin Island. During the same board meeting, this decision was reconsidered and reversed.

It was determined that the introduced elk had reached the population level for hunting by 1996. In October of that year, the BOG established a bull-only elk season in Unit 3. The board authorized the department to issue up to 30 elk drawing permits for a 1–31 October bull-only season with a 1-bull bag limit. The board also decided the introduced elk didn't qualify for hunting for customary and traditional use.

The Alaska Legislature passed House Bill 59 in 1996 which stated the following: "The department may donate 4 elk harvest permits each year for elk from the Etolin Island herd for competitive auctions or raffles. The donations may be made only to nonprofit corporations based in the state that are established to promote fish and game management of hunted species, transplantation of species, and use of fish and game populations for hunting and fishing, subject to the terms of a memorandum of understanding developed by the department."

In 1997, the first year of elk hunting in Southeast Alaska, ADF&G issued a total of 29 elk permits, including 27 drawing permits and 2 public raffle permits. In 1998, we issued 31 elk drawing permits. One auction/raffle permit was issued in 1998. In 1999 one raffle permit was issued, and 2 were issued in 2000.

In fall 1998 the BOG authorized increasing the number of drawing permits from 30 to 70 and added a 2-week period (15–30 September) for archery-only hunting. An International Bowhunters Education Program (IBEP) certification card is required to participate in the archery-only season.

In fall 2000 the BOG increased the number of drawing permits from 70 to 120 and extended the archery-only season by 2 weeks (1–30 September). To forestall the dispersal of elk and the establishment of elk herds off of Etolin and Zarembo Islands, the BOG established boundaries for the Unit 3 permit hunt area and authorized an either-sex elk hunt from 1 August through 31 December in Units 1, 2, and the remainder of Unit 3 outside of the drawing area.

In fall of 2002 the BOG split the DE320 elk drawing permit hunt into separate archery (DE318) and rifle (DE322) permit hunts and authorized the department to issue a combined total of up to 300 permits.

In fall 2004 the BOG adopted several changes to the structure of the Unit 3 elk hunt. The DE322 rifle hunt, which had encompassed the entire month of October, was split into 2 separate drawing permit hunts, each 2 weeks long. The DE321 rifle season now runs the first 2 weeks of October, while the DE323 rifle season runs the second 2 weeks of October. The BOG also authorized a late-season registration elk hunt (RE325) in Unit 3, which allows permit holders to harvest bull elk within the boundaries of the drawing hunt area during the last 2 weeks of November.

In 2005, prior to the start of the late-November RE325 elk registration hunt, an emergency order was issued closing the Zarembo Island portion of the hunt area. Based on a previous population estimate, a harvest quota of 10 bulls was established for Zarembo Island. Six bulls were harvested on Zarembo during the September and October drawing permit hunts and managers felt the 4 bulls remaining in the quota were insufficient to allow for an open registration permit

hunt. Given such a small allowable harvest, opening the registration elk hunt in this area would have run the risk of overharvest, which would have been detrimental to the long-term stability of the population. Etolin Island and the smaller associated islands also part of the RE325 hunt area were allowed to open as scheduled.

In early 2006, the Southeast Regional Advisory Council (RAC) deliberated companion proposals to establish both a Federal Customary and Traditional use determination for elk in Unit 3 (WP06-11a) and a federal hunting season (WP06-11b). After lengthy deliberations, the RAC voted unanimously to "Take No Action" on these proposals, and the Federal Subsistence Board voted to accept the RAC's recommendation.

In the aftermath of the 2005 emergency closure of the elk season on Zarembo island and prior to the start of the 2006 season a decision was made not to reopen the elk season on Zarembo Island until the population and bull:cow ratio increases.

Historical harvest patterns

Fall weather can influence elk movement patterns and hunter effort and success. Although harvest chronology varies somewhat from year to year, from 1997 through 2006 the largest percentage of the overall harvest occurred during the first and third weeks of the October rifle season. Following the initial season opening, elk typically retreat to the more inaccessible portions of Etolin and Zarembo. Hunters are aided somewhat later in the season when the elk typically return to low elevation winter range along the coast.

Historical harvest locations

From 1997 to 2006, a total of 1,344 drawing and registration permits were issued, 639 hunters harvested 111 elk, including 79 from Etolin Island and 32 from Zarembo Island. Of the 79 elk harvested on Etolin Island, 13 were killed in Wildlife Analysis Area (WAA) 1901 on the north half of the island and 66 were killed in WAA 1910 on the south half of the island.

In fall 2000, the board authorized an either-sex elk hunt from 1 August through 31 December in Units 1, 2, and the remainder of Unit 3. In 2004 we received the first ever hunter report of an elk having been harvested outside the boundaries of the Unit 3 drawing permit area. This report involved the harvest of a cow elk on Shrubby Island in WAA 1906. In 2005 we received hunter reports of an additional 4 cow elk having been harvested on Shrubby Island; however, the kill locations were not verified.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES:

The Draft Southeast Alaska Elk Management Plan (ADF&G 1999) established management recommendations for Unit 3 elk. These include:

- Manage Unit 3 elk for hunting opportunity.
- Maintain elk populations on Etolin and Zarembo islands below estimated carrying capacity.
- Limit dispersal of Etolin and Zarembo elk to adjoining islands and the mainland.
- Attempt to maintain a postharvest ratio of 25–30 bulls per 100 cows.

METHODS

We periodically fly aerial surveys of Etolin Island to record tracks in the snow, and visual sightings of individuals and groups of elk. However, due to densely forested terrain and uncertainties about elk sightability, we conduct aerial elk surveys only opportunistically and not on a regular schedule. Observations reported by other agency personnel and the public are also recorded. Elk and deer pellet counts on winter range are periodically conducted to assess relative density. Incisors are collected from harvested elk and sent to a lab for aging. Successful hunters are asked to submit a photo of their elk's antlers.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

A precise population estimate is not available for Unit 3 elk. Annual differences in survey coverage and uncertainties about the sightability of elk during aerial surveys make it difficult to accurately estimate abundance. Variables that influence survey results include sporadic distributions of elk over relatively large areas, thick canopy cover, dense vegetation and poor elk sightability. Our June 2003 population estimate was largely subjective, but based on a 2000 population modeling exercise, what little information is available from aerial surveys, and anecdotal reports from hunters, we estimated Unit 3 had 350–450 elk, with 75–100 on Zarembo and the balance on Etolin. Recently, however, the estimated population of elk on Zarembo Island has been revised downward based on aerial counts associated with recent radiocollaring efforts. We now believe the Zarembo Island elk herd contains no more than 40 animals. The 2000 post-parturition modeling prediction for Etolin Island was approximately 350 elk; however, at the time, our actual population was probably much lower because the estimate does not include factors such as predation, dispersal, competition with deer, etc. Based on these modeling predictions, we estimated that at the time a reasonable upper limit for the elk population on Etolin and Zarembo combined was approximately 450 animals. However, based on aerial counts associated with recent radiocollaring efforts, the elk population on Etolin Island may also be lower than previously estimated. The Etolin Island winter carrying capacity is estimated to be from 900 to 1,300 elk (David Person, ADF&G biologist, 2000, ADF&G elk technical committee oral presentation).

Population Composition

No data are available to make meaningful elk population composition estimates for Etolin or Zarembo Islands. On Etolin elk are usually found in groups of mixed sex and age. During aerial surveys, almost every large group of elk observed on Etolin Island included large and small bulls, cows, and calves. Zarembo Island was originally thought to support two separate elk herds. However, information gained during aerial surveys and from radiotelemetry suggests that there is one main herd of elk on the island which regularly fragments into smaller groups during the winter and spring months. In 2005, due to the relatively high harvest of bulls, the elk season on Zarembo was closed early by emergency order. In 2006 concerns about the island's low elk population and low bull:cow ratio prompted the area biologist to not open the elk season on Zarembo Island. The elk season on Zarembo remained closed throughout the report period and will remain closed until the population increases.

Distribution and Movements

Observations throughout the area are evidence that Roosevelt elk have dispersed, but many remained within 10 miles of their release site. The other subspecies of introduced elk, Rocky Mountain elk, remained close to their release site for 18 months and then dispersed widely. It is likely that Rocky Mountain elk have intermixed with Roosevelt elk, at least on Etolin. A breeding group, thought to be Rocky Mountain elk, is now established on Zarembo Island, and elk have been reported on several surrounding islands in the area.

For both subspecies the area below 500 feet adjacent to the coast is preferred winter and early spring habitat. Wintering areas are typically associated with gradual rather than steep beaches which tend to have more sedges and grasses above the mean high tide line. Elk on both Etolin and Zarembo appear to favor these areas which appear to dictate suitable overwintering areas. During the late-spring and summer months, where such habitat is available to them, elk tend to move inland to high elevation subalpine and alpine habitat. On southern Etolin, during the summer months, elk tend to congregate in subalpine and alpine habitat on Mount Etolin and Mount Shakes where elk have been observed above 3,000 feet.

MORTALITY

Harvest

During the report period the following season and bag limit regulations applied to elk hunting in Unit 3, Etolin Island and smaller associated islands in the area bounded by a line beginning at the intersection of Stikine Strait and Clarence Strait, running southeast following the midline of Clarence Strait, down to its intersection with Ernest Sound, then northeast following the midline of Ernest Sound, excluding the Niblack Islands, to its intersection with Zimovia Strait, then northwest following the western shoreline of Zimovia Strait to its intersection with Chichagof Passage, then west along the midline of Chichagof Passage to its intersection with Stikine Strait, then southwest along the midline of Stikine Strait, back to the point of origin.

Season and bag limit	Resident and Nonresident hunters
1 bull by drawing permit only, by bow and arrow only	1 Sep–30 Sep (General hunt only)
or	
1 bull by drawing permit only	1 Oct–15 Oct (General hunt only)
or	
1 bull by drawing permit only	16 Oct–31 Oct (General hunt only)
or	
1 bull by registration permit only	15 Nov–30 Nov (General hunt only)
Remainder of Unit 3	
1 elk	1 Aug–31 Dec

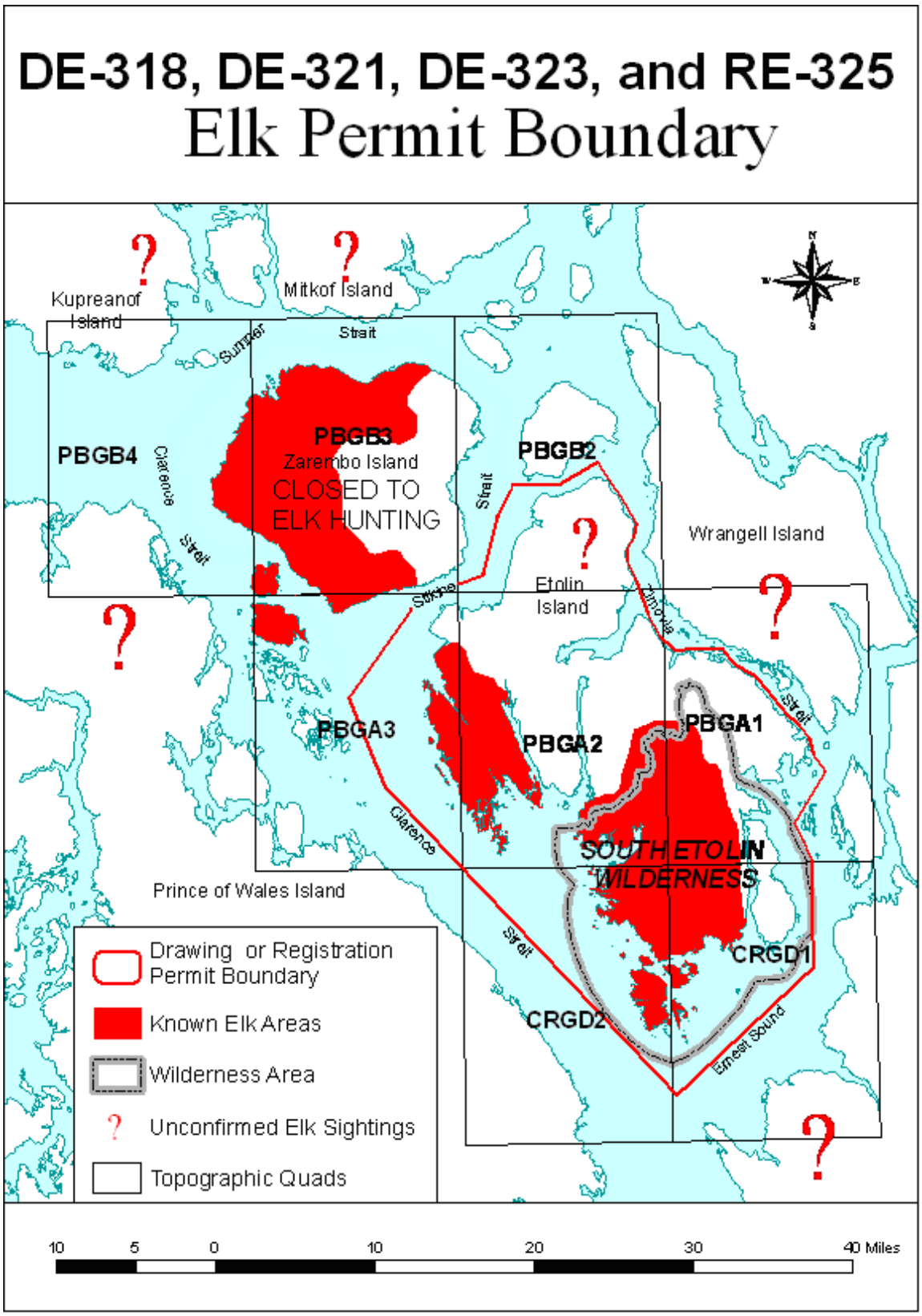


FIGURE 1 Elk hunting permit boundaries, with overlay of USGS map sections (e.g., PBGB4)

Board of Game Action and Emergency Orders. The Board of Game took no actions regarding elk hunting in Unit 3 during the report period.

Due to concerns about declining harvest and success rates in recent years, a decision was made in 2007 to reduce the number of available drawing permits for the October draw hunts from 175 to 125 permits.

Following the 2005 emergency closure of the elk season on Zarembo Island, a decision was made not to reopen the elk season on Zarembo in 2007 and 2008 due to concerns about low elk numbers and low bull:cow ratios on the island.

Hunter Harvest. In 2007, 6 elk were harvested in Unit 3, well below the preceding 10-year average of 11 elk annually. We issued 25 archery-only and 100 rifle season drawing permits for elk hunting in Unit 3. Forty-nine of those who obtained drawing permits hunted; they harvested 4 elk. In addition to drawing permits, we issued 83 registration permits for the RE325 elk hunt in November. A total of 35 permittees hunted and harvested 2 elk, making the total harvest for all drawing and permit hunts 6 elk (Table 1). We received no reports of elk having been harvested during the general season hunt outside the boundaries of the Unit 3 drawing permit area. The elk harvest data for each individual Unit 3 elk hunt that occurred during the report period are shown in Table 2.

In 2008 just 2 elk were harvested in Unit 3. We issued 25 archery-only and 99 rifle season drawing permits. Forty-eight permittees hunted and 2 elk were taken, 1 during the September archery-only season, and another during the early October rifle season hunt. In addition to drawing permits, we issued 46 registration permits for the RE325 elk hunt in November. A total of 20 permittees hunted; however, no elk were harvested. We received no reports of elk being harvested outside the drawing permit area during the 2008 general season hunt. The harvest of 2 elk in 2008 represents the second lowest annual harvest in Unit 3 since elk hunting was first authorized in 1997, and was well below the preceding 11-year average of 11 elk annually.

Hunter Residency and Success. One nonresident received an elk drawing permit in 2007 and 2 nonresidents received drawing permits in 2008, all of whom hunted. In 2007 nonlocal residents represented the largest group of both successful and unsuccessful hunters. In 2007 nonlocal and local residents accounted for 83 and 17%, respectively, of the annual harvest. In 2008, nonlocal residents represented the largest group of hunters. Of the 2 elk harvested in 2008, both were taken by local residents (Table 3). The success rate for permit holders who actually hunted was 7% in 2007 and 3% in 2008. Most nonlocal resident hunters were from communities in Southeast Alaska, relatively close to the hunt area.

Harvest Chronology. In 2007 hunters had the best success during the third week of October, when 50% of the harvest occurred (Table 4). The remainder of the 2007 elk harvest was evenly distributed, with the first week of September, the first week of October and the fourth week of November each providing 17% of the harvest. One elk was taken during the second week of the November 15–30 registration permit hunt. No harvest occurred during the last 3 weeks of the archery-only hunt in September, nor was any harvest reported during the first week of the

November 15–30 registration permit hunt. In 2008, the Unit 3 elk harvest was the second lowest since hunting was first authorized in 1997. Just 2 elk were harvested that year, 1 by an archery hunter during the second week of the September season and the second by a rifle hunter during the second week of October.

Harvest in Particular Areas (WAAs). In 2007, 6 elk were killed in three Unit 3 WAAs. WAAs 1901 and 1905 each provided 17% of the harvest and 1910 provided 67% of the harvest. Just 2 elk were killed in 2008 and both were harvested in WAA 1910.

Guided Hunter Harvest. No guides are currently offering guided elk hunts in the unit. The Unit 3 elk hunt is logistically challenging and is considered an extremely difficult hunt. These factors, combined with the relatively low success rate and limitations on the number of Guide Use Areas each guide may use, have prevented guides from offering guided elk hunts.

Transport Methods. During the report period, all 8 successful elk hunters reported using boats to access their hunt areas (Table 5).

Other Mortality

Brown bears, black bears, and gray wolves occur on Etolin Island. Wolves and a relatively small number of black bears are found on Zarembo Island. The extent of predation on elk is not known, but fieldwork conducted by ADF&G staff indicates that wolves are a major predator. Some poaching of the introduced elk has been documented in the past and likely continues to occur.

Following several consecutive years with mild winter weather, much of Southeast Alaska experienced record snowfall during the winter of 2006–2007, followed by well above average snowfall in 2007–2008 and 2008–2009. It is likely, therefore, that elk in Unit 3 experienced increased mortality as a result of three consecutive winters with heavy snowfall in the central panhandle region of Southeast Alaska.

RESEARCH

In 2008 the department initiated a pilot project to assess the feasibility of capturing and radiocollaring a small number of elk on Etolin and Zarembo Islands. The primary objectives of the collaring effort are to: (1) delineate summer and winter ranges of elk; (2) identify calving and rutting areas; (3) identify habitats important to elk; and (4) to facilitate locating herds for minimum population estimates and composition counts.

Using standard helicopter darting techniques, 2 cow elk (1 on Zarembo and 1 on Etolin Island) were successfully radiocollared in early spring 2008. Each elk was fitted a numbered visual collar and a remote-download GPS collar (Telonics Inc. of Mesa, Arizona) programmed to collect a location every 4 hours over a 2-year period.

In spring 2009, an additional 5 cow elk were successfully captured and radiocollared on southern Etolin Island, bringing the total number of collared elk in Unit 3 to 7. One of these animals, a cow captured in emaciated condition near McHenry Anchorage on Etolin Island in late March 2009 was found dead three weeks later. Although the cause of death could not be determined, it is suspected that the animal died of malnutrition. A tooth cementum analysis determined that the

animal was 17 years of age at the time of its death. From spring 2008 to 30 June 2009 over 7,000 successful relocations were obtained from the 6 surviving radiocollared elk. A detailed analysis of elk relocation points will take place once we have obtained a full year of data from all radiocollared elk. Elk research results will be reported in an annual progress report and will be summarized in the next elk management report.

HABITAT

Assessment

Clearcut logging continues on Etolin and about 30,000 acres are scheduled to be cut by 2080 (U.S.D.A. Forest Service, unpublished data). Over the long term this will reduce the island's elk carrying capacity. Prior to the Unit 3 elk introduction, the Etolin Island winter carrying capacity was estimated to be 856 elk and consisted of the following: clearcut, 2.0 mi^2; second growth, 2.2 mi^2; nonforest or noncommercial forest, 72.9 mi^2; old-growth forest, 124.4 mi^2 (ADF&G 1985).

As part of the Navy Timber Sale, the U.S. Forest Service plans to harvest approximately 72.8 million board feet of old-growth forest from up to approximately 5,435 acres of federal land on northern Etolin Island in one or more timber sale offerings (U.S.D.A. Forest Service 2009). As part of the proposed action, up to an additional 8.1 miles of permanent and 8.8 miles of temporary road would be constructed on Etolin. Although little elk use has been documented within the boundaries of the Navy project area, proposed clearcut logging may influence the distribution of elk and provide some benefit to elk over the short term. Elk 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 elk habitat. Precommercial thinning and pruning of second-growth stands can extend the short-term benefits to elk, but the long-term effects of logging will be detrimental. Over the long term, the island's carrying capacity for elk is expected to decline.

Enhancement

No habitat enhancement projects specifically intended to benefit elk 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 on Etolin and Zarembo islands. This improves elk habitat in the short term by reducing canopy cover, which permits sunlight to reach the forest floor and increases the production of understory forage plants. These benefits are relatively short-lived, approximately 20–25 years, after which time canopy closure again results in loss of understory vegetation. The long-term effects of clearcut logging will be detrimental to elk populations.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

The potential for disease and parasite transmission from exotics to endemic wildlife has long been a concern of wildlife biologists. Prior to transport to Alaska, transplanted elk were tested for disease and treated for parasites. However, required quarantine periods and disease testing do not always detect infected animals. From 2005 to 2007 hunters were asked to submit the heads from elk harvested in Unit 3 as part of a statewide testing program to monitor ungulates for the possible appearance of Chronic Wasting Disease (CWD) in Alaska. Samples from 9 Unit 3 elk were submitted for analysis all of which tested negative for CWD.

ADF&G remains concerned about the potential negative effect that an increasing elk population may have on native Sitka black-tailed deer. Research is needed to evaluate the extent of interspecific competition between introduced elk and native Sitka black-tailed deer. Elk may affect deer populations directly through physical displacement or indirectly by competition for food or by altered predator–prey dynamics. Research has shown the diets of deer and elk overlap to a high degree, suggesting potential for interspecific competition (Kirchhoff and Larsen 1998). Introduced elk have dispersed from Etolin to other islands and established a breeding population on at least one other island. Should elk become widely distributed throughout Southeast Alaska, a reduction in deer numbers is to be anticipated. Also, native moose populations have been increasing in Unit 3 over the past decade, and moose now occur on both Etolin and Zarembo Islands. This moose expansion may also affect deer.

Despite initial radiocollaring and monitoring efforts in the years immediately following the 1987 elk introduction, little is currently known about the ecology and habitat relationships of Unit 3 elk. Research initiated in 2008 will help to identify seasonal movement patterns, provide information on summer and winter ranges, calving and rutting areas, and identify habitats important to Unit 3 elk. Having a sample of radiocollared elk will also facilitate locating herds for minimum population estimates and composition counts. Additional research is needed to develop reliable methods of inventorying Southeast Alaska elk populations so that population size and trend can be evaluated.

CONCLUSIONS AND RECOMMENDATIONS

Despite initial losses following introduction, the Unit 3 elk population appears to be increasing. Elk are dispersing and have established a breeding population on Zarembo Island. Following the initial 1997 release of elk on Etolin Island, 1 radiocollared elk was found dead on Farm Island at the mouth of the Stikine River. This represents the only verified movement of elk outside the Etolin and Zarembo island complex. Nonetheless, we continue to receive unverified reports of elk sightings outside the Etolin and Zarembo Island complex, some of which appear credible. Elk sightings have been reported from Wrangell, Mitkof, Kupreanof, Prince of Wales, Bushy and Shrubby Islands, and from portions of the Unit 1B mainland. While elk have reportedly been harvested on Shrubby Island the kill locations were not verified, and possibility exists that these animals were killed illegally on neighboring Zarembo Island. As elk disperse and the population increases, it will be important to monitor their numbers and distribution.

The harvest of just 1 elk in 2006 and 2 elk in 2008 represent the lowest annual harvests since Unit 3 elk hunting was first authorized in 1997. The reasons for the exceptionally low harvest those years are difficult to explain. Because of the relatively high harvest of 6 bulls, the Zarembo Island elk season was closed by emergency order in 2005. The season remained closed on Zarembo during 2006, 2007, and 2008 due to low bull:cow ratios and a low population estimate, leaving only Etolin and the smaller associated islands open to elk hunting during those years. The season closure on Zarembo, therefore, may be at least practically responsible for the relatively low harvest in 2006 and during the current report period.

Following several consecutive years with mild winter weather, much of Southeast Alaska experienced record snowfall during the winter of 2006–2007 (NOAA 2010), followed by well above average snowfall during the winters of 2007–2008 and 2008–2009 (NRCS 2010). It is

likely, therefore, that Unit 3 elk experienced increased mortality as a result of three consecutive winters with heavy snowfall in the central panhandle region of Southeast Alaska.

During the report period the department initiated elk research in Unit 3. Initial efforts during late-winter and early spring of 2008 involved capturing and radiocollaring 2 elk, 1 on Etolin and 1 on Zarembo Islands. Additional efforts in spring of 2009 resulted in the capture and radiocollaring of 5 additional elk on Etolin Island. The primary objectives of the collaring effort are to: (1) delineate summer and winter ranges of elk; (2) identify calving and rutting areas; (3) identify habitats important to elk; and (4) to facilitate locating herds for minimum population estimates and composition counts. The results of these research efforts will be reported on in the next elk management report.

Based on aerial counts associated with recent radiocollaring efforts, the estimated elk population on Zarembo Island has been revised downward. It may also be necessary to revise the Etolin elk population estimate downward based on findings associated with elk research efforts in 2008 and 2009. Additional research is needed to develop reliable methods of inventorying Southeast Alaska elk populations so that population size and trend can be evaluated.

LITERATURE CITED

ALASKA DEPARTMENT OF FISH AND GAME. 1985. Biological feasibility of transplanting elk in Southeast Alaska. 19pp.

ALASKA DEPARTMENT OF FISH AND GAME. 1999. Draft Southeast Alaska Elk Management Plan. Alaska Department of Fish and Game, Division of Wildlife Conservation. Juneau, Alaska 9pp.

BURRIS, O. E. AND D. E. MCKNIGHT. 1973. Game transplants in Alaska. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration, Game Technical Bulletin No. 4. Project W-17-R. Juneau. 57pp.

KIRCHHOFF, M. D. AND D. N. LARSEN. 1998. Dietary overlap between native Sitka black-tailed deer and introduced elk in Southeast Alaska. Journal of Wildlife Management 62(1):236-242.

NOAA (National Oceanic and Atmospheric Administration). 2010. National Weather Service, AK. Alaska Climate Database. http://pajk.arh.noaa.gov/cliMap/climap.php (Accessed January 2010)

NRCS (Natural Resources Conservation Service). 2010. Mountain Snowpack Maps for Alaska. http://www.wcc.nrcs.usda.gov/cgibin/ak_snow.pl?state=alaska (Accessed April 2010)

U.S.D.A. FOREST SERVICE. 2009. Navy Timber Sale: Record of Decision. Tongass National Forest, R10-MB-632a. Wrangell Ranger District, Region 10. Wrangell, Alaska. 24pp.

PREPARED BY:

Richard E. Lowell
Wildlife Biologist III

SUBMITTED BY:

Neil Barten
Regional Management Coordinator

Please cite any information taken from this section, and reference as:

LOWELL, R. E. 2010. Unit 3 elk management report. Pages 1–17 in P. Harper, editor. Elk management report of survey and inventory activities 1 July 2007–30 June 2009. Alaska Department of Fish and Game. Project 13.0. Juneau, Alaska.

TABLE 1 Unit 3 elk harvest data for all permit hunts only, regulatory years 1997 through 2006

Regulatory year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Harvest							Total Permit harvest [b]
					Bulls	(%)	Cows	(%)	Unk	(%)	Illegal	
1997	29	14	68	32	8	(100)	0	(0)	0	(0)	0	8
1998	30	34	53	47	9	(100)	0	(0)	0	(0)	0	9
1999	71	18	71	29	16	(100)	0	(0)	0	(0)	0	16
2000	72	18	86	14	8	(100)	0	(0)	0	(0)	0	8
2001	123	43	72	28	19	(100)	0	(0)	0	(0)	0	19
2002	123	27	85	15	13	(100)	0	(0)	0	(0)	0	13
2003	159	37	92	8	8	(100)	0	(0)	0	(0)	0	8
2004	156	40	87	13	12	(100)	0	(0)	0	(0)	0	12
2005[a]	310	55	88	13	17	(100)	0	(0)	0	(0)	0	17
2006	272	51	99	1	1	(100)	0	(0)	0	(0)	0	1
2007	210	59	93	7	6	(100)	0	(0)	0	(0)	0	6
2008	171	58	97	3	2	(100)	0	(0)	0	(0)	0	2

[a] First year of registration permit hunt RE325

[b] Does not include elk reportedly harvested outside the drawing hunt boundaries during the general season hunt.

TABLE 2 Unit 3 elk harvest data by hunt number, regulatory years 2005 through 2006.

Hunt Nr	Regulatory Year	Permits issued	Percent did not hunt	Percent successful hunters	Percent unsuccessful hunters	Bulls	(%)	Cows	(%)	Unk	Illegal/ unreported	Total harvest
DE318	2005	25	38	11	89	2	(100)	0	(0)	0	0	2
Drawing	2006	25	36	6	94	1	(100)	0	(0)	0	0	1
Archery-only	2007	25	52	8	92	1	(100)	0	(0)	0	0	1
	2008	25	60	10	90	1	(100)	0	(0)	0	0	1
DE321	2005	75	57	39	61	12	(100)	0	(0)	0	0	12
Drawing	2006	75	41	0	100	0	(0)	0	(0)	0	0	0
	2007	50	62	5	95	1	(100)	0	(0)	0	0	1
	2008	49	52	4	96	1	(100)	0	(0)	0	0	1
DE323	2005	75	57	6	94	2	(100)	0	(0)	0	0	2
Drawing	2006	75	47	0	100	0	(0)	0	(0)	0	0	0
	2007	50	64	11	89	2	(100)	0	(0)	0	0	2
	2008	50	70	0	100	0	(0)	0	(0)	0	0	0
RE235	2005	133	53	2	98	1	(100)	0	(0)	0	0	1
Registration	2006	93	63	0	100	0	(0)	0	(0)	0	0	0
	2007	83	57	6	94	2	(100)	0	(0)	0	0	2
	2008	46	51	0	100	0	(0)	0	(0)	0	0	0
SE323	2005	2	50	0	100	0	(0)	0	(0)	0	0	0
Governor's	2006	1	100	0	0	0	(0)	0	(0)	0	0	0
permits	2007	0	0	0	0	0	(0)	0	(0)	0	0	0
	2008	0	0	0	0	0	(0)	0	(0)	0	0	0
General Hunt;	2005	NA	NA	NA	NA	0	(0)	4	(100)	0	0	4
(outside drawing	2006	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
permit area)	2007	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
	2008	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
Total all hunts	2005	310	55	13	87	17	(81)	4	(19)	0	0	21
	2006	269	51	1	99	1	(100)	0	(0)	0	0	1
	2007	208	59	7	93	6	(100)	0	(0)	0	0	6
	2008	170	59	3	97	2	(100)	0	(0)	0	0	2

TABLE 3 Unit 3 elk hunter residency and success for all permit hunts only, regulatory years 1997 through 2006[a]

	Unsuccessful					Successful					
Regulatory year	Local[b] resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
1997	7	10	0	17	(68)	3	5	0	8	(32)	25
1998	1	9	1	11	(55)	2	7	0	9	(45)	20
1999	8	34	0	42	(72)	7	9	0	16	(28)	58
2000	13	38	0	51	(86)	4	4	0	8	(14)	59
2001	18	31	1	50	(72)	4	15		19	(28)	69
2002	25	49	1	75	(85)	8	5	0	13	(15)	88
2003	36	54	0	90	(92)	4	4	0	8	(8)	98
2004	27	55	0	82	(87)	2	10	0	12	(13)	94
2005[c]	45	70	3	118	(87)	8	9	0	17	(13)	135
2006[c]	65	61	3	129	(99)	0	0	1	1	(1)	130
2007	35	40	3	78	(93)	1	5	0	6	(7)	84
2008	24	40	2	66	(97)	2	0	0	2	(3)	68

[a] Data are not available for hunters who harvested elk outside the drawing hunt boundaries during the general season hunt.
[b] Residents of Petersburg, Wrangell, and Kake.
[c] Includes both drawing and registration permit hunts.

TABLE 4 Unit 3 elk harvest chronology percent by harvest period for all permit hunts only, regulatory years 1997 through 2006[a]

Regulatory year	Harvest period 9/1–9/7	9/8–9/14	9/15–9/21	9/22–9/30	10/1–10/7	10/8–10/14	10/15–10/21	10/22–10/31	11/15–11/21	11/22–11/30	n
1997	N/A	N/A	N/A	N/A	38	0	24	38	NA	NA	8
1998	N/A	N/A	N/A	N/A	56	22	22	0	NA	NA	9
1999	N/A	N/A	0	0	43	12	26	19	NA	NA	16
2000	N/A	N/A	12	0	25	25	25	13	NA	NA	8
2001	0	0	5	0	42	16	37	0	NA	NA	19
2002	0	0	8	0	31	23	15	23	NA	NA	13
2003	0	0	0	0	38	0	12	50	NA	NA	8
2004	8	8	0	0	34	8	8	34	NA	NA	12
2005	12	6	0	0	41	12	12	12	0	6	17
2006	100	0	0	0	0	0	0	0	0	0	1
2007	17	0	0	0	17	0	50	0	0	17	6
2008	0	50	0	0	0	50	0	0	0	0	2

[a] Chronology data are not available for elk harvested outside the drawing hunt boundaries during the general season hunt.

TABLE 5 Unit 3 elk harvest percent by transport method for all permit hunts only, regulatory years 1997 through 2006 [a]

Regulatory year	Harvest percent by transport method								n
	Airplane	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Unk	
1997	13	75	0	0	0	0	0	13	8
1998	22	78	0	0	0	0	0	0	9
1999	0	100	0	0	0	0	0	0	16
2000	25	62	13	0	0	0	0	0	8
2001	32	68	0	0	0	0	0	0	19
2002	23	77	0	0	0	0	0	0	13
2003	0	88	12	0	0	0	0	0	8
2004	33	59	8	0	0	0	0	0	12
2005	6	94	0	0	0	0	0	0	17
2006	100	0	0	0	0	0	0	0	1
2007	0	100	0	0	0	0	0	0	6
2008	0	100	0	0	0	0	0	0	2

[a] Transport method data are not available for elk harvested outside the drawing hunt boundaries during the general season hunt.

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

ELK MANAGEMENT REPORT

From: 1 July 2007
To: 30 June 2009

LOCATION

GAME MANAGEMENT UNIT: 8 (5,097 mi^2)

GEOGRAPHICAL DESCRIPTION: Kodiak and adjacent islands

BACKGROUND

On 29 June 1925, the Territorial Governor approved a program to transplant Roosevelt elk to the Kodiak–Afognak island group. Under a goat-elk exchange program with the state of Washington, eight elk calves (3 males and 5 females) were captured from the Ho Valley on the Olympic Peninsula and shipped from Port Angeles, Washington, in 1928. These calves spent their first year at the Agriculture Experiment Station at Kalsin Bay, on Kodiak Island. Because of concerns about competition with cattle on Kodiak Island, the elk were released in 1929 near Litnik on Afognak Island (Batchelor 1965).

By 1948 the population had grown to more than 200 elk, thanks in part to virgin habitat, protection by local residents, and minimal predation. The first hunt occurred in 1950 and hunting has been allowed annually since 1955. The population was estimated at 1,200–1,500 by 1965, with nine separate herds on Afognak Island and one on nearby Raspberry Island. A series of severe winters ending in 1972 caused extensive mortality and reduced the population to about 450 (Burris and McKnight 1973). The herd recovered to a high of 1,400 by the late 1980s and remained relatively stable through the 1990s with minor fluctuations correlated with winter severity. A harsh winter in 1998–99 severely impacted ungulate populations on the archipelago, and elk herds on western Afognak and Raspberry islands declined precipitously (Van Daele 2000). As a result of the winter mortality, overall populations fell below the management objective of 1,000.

The relative difficulty of hunters to access each elk herd strongly influences management strategies. In the 1960s many Afognak herds were only lightly harvested, despite a 153-day season and a 2-elk bag limit; however, excessive harvest of the highly accessible Raspberry Island herd prompted managers to recommend closing the hunting season on that herd in 1968 (Alexander et al. 1968). Drawing and registration permit hunts with harvest quotas regulated by emergency order closures characterized management strategies for the most accessible herds of southwestern Afognak Island and Raspberry Island from the mid 1970s to the late 1980s. Initiation of commercial logging in 1977 marked a new management era, with increased vulnerability of elk to hunting because of logging road access and loss of cover. By the mid 1980s, shorter seasons had to be imposed in east-central Afognak Island, where logging was

concentrated. Beginning with the 1993–94 season, the road-accessible eastern and central parts of Afognak Island were incorporated with the southwestern Afognak areas into a single management area regulated by staggered drawing permit hunts, followed by a registration hunt. North Afognak was included in a registration hunt, while the elk on Raspberry Island were subject to staggered drawing hunts.

Starting in 2003–04, Afognak Island was divided into three drawing hunt areas. These areas were designed to address concerns associated with newly imposed access fees on private lands, decreased bull and calf percentages in the Malina/Afognak lakes, and unclear hunt boundaries. Each area was opened for drawing hunts 25 September–22 October, and if harvest targets were not met for individual herds, the area was reopened as a registration hunt.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

The management objective is to maintain a population of 1,000 elk for use by all user groups.

METHODS

Each year we attempt an aerial composition count of each herd between July and September. We also opportunistically conduct winter surveys to identify wintering areas and to refine population estimates of herds.

We used helicopter darting techniques to capture elk and deploy VHF and GPS radio-transmitters to monitor herd movements. Routine radiotracking flights were made throughout this reporting period, and aerial telemetry of collared elk assisted in finding herds for composition counts in the fall.

We collected data on harvest and hunting effort from mandatory hunting reports and periodic monitoring of hunting activity by aircraft.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Aerial composition surveys indicated a decreasing elk population in Unit 8 during this reporting period (Table 1). The elk population on Raspberry and Afognak Islands was estimated to include 829 animals in 2007–08 and 640 in 2008–09. During the previous five years (2002–03 through 2006–07) population estimates ranged from 865–960 elk ($\bar{x}$ = 877). The overall trend of the elk herds have been decreasing each year since 2005–06, with the most significant declines occurring in the herds on western Afognak Island.

During the fall of 2004, residents of the city of Port Lions on northern Kodiak Island observed 2 bull elk by the city airport. Months later, 2 bull elk were legally harvested on Kodiak Island in the Hidden Basin area. There were no confirmed reports of elk on Shuyak, Whale, or Kodiak islands during this reporting period.

Population Composition

Obtaining bull:cow and calf:cow ratios continued to be problematic during this reporting period. Aerial composition data are often suspect due to the difficulty of distinguishing spike bulls in velvet from cows and of counting calf groups in thick cover. The overall calf percentage in the population was 17% in 2008–09; the annual mean for the 5 years prior to this reporting period (2002–03 through 2006–07) was 15.2%. The overall ratio of calves:100 cows in the population was 19 in 2008–09; the annual mean for the 5 years prior to this reporting period (2002–03 through 2006–07) was 20.4. No calf data were collected in 2007–08 (Table 1).

Distribution and Movement

Elk herd distribution as monitored by composition counts, hunter and logger reports, and radio-telemetry relocations indicated there are at least 7 separate herds on Afognak Island and 1 on Raspberry Island. In May 2008 we captured 16 females, deploying VHF radio collars on 12 and GPS radio collars on 2 others. Two elk died during the capture operation. By June 2009 we had 11 active radio collars in the population, distributed among most of the herds.

The Paramanof Peninsula herd, which declined precipitously after 1989 (Smith 1994), showed no sign of recovery, and we now assume that it has been incorporated into the Marka herd. We also saw a great deal of interchange between elk in the Marka and Waterfall herds and between the Afognak Lake and Malina herds, suggesting that these groups may no longer be following historic patterns and herd fidelity may be less than previously noted.

MORTALITY

Harvest

Season and Bag Limits	Resident and Nonresident Open Seasons
Unit 8, Raspberry Island:	
1 bull by drawing permit; up to 100 permits will be issued	1 October–22 October
1 anterless elk; up to 200 permits will be issued	23 October–30 November
Unit 8, Southwest Afognak, that portion of Afognak Island and adjacent islands south and west of a line from the head of Back Bay to Hatchery Peak, to the head of Malina Bay:	
1 bull elk by drawing permit only; up to 500 permits will be issued	25 September–9 October
1 anterless elk by drawing permit; up to 500 permits will be issued	8 October–22 October
1 elk by registration permit only	23 October–30 November

Season and Bag Limits	Resident and Nonresident Open Seasons
Unit 8, Eastern Afognak, that portion of Afognak Island east of the main logging road (1100 road) from the Danger Bay logging camp north to its terminus at Discoverer Bay	
1 elk by drawing permit only; up to 500 permits may be issued	25 September–22 October
1 elk by registration permit only	23 October–30 November
Remainder of Unit 8:	
1 elk by drawing permit only; up to 500 permits may be issued	25 September–22 October
1 elk by registration permit only	23 October–30 November

A federal subsistence elk hunt, open to all Unit 8 residents, occurred 15 September–30 November on Kodiak National Wildlife Refuge lands on northwestern Afognak.

Board of Game Actions and Emergency Orders: During its March 2007 meeting, the Board of Game did not pass a proposal from the U.S. Fish and Wildlife Service to drastically liberalize elk regulations on Kodiak Island. The proposal was intended to minimize the chance that elk could become established on Kodiak, but the board felt that the chances of successful colonization were low under current regulations and the opportunity for illegal harvest would be enhanced by passage of the regulation. Deliberations on this proposal indicated the state would neither encourage nor prevent establishment of elk on Kodiak. However, the U.S. Fish and Wildlife Service clearly stated it is opposed to any elk becoming established on Kodiak National Wildlife Refuge.

During the March 2009 meeting, the Board of Game did not pass a proposal to establish an early archery-only season on Raspberry Island elk.

Prior to each hunting season, we analyzed survey results and estimated herd sizes to derive harvest limits for each herd. These limits were usually based on a 10–15% of population harvest rate, with modifications to accommodate population trends and the sex ratio of the harvest. We issued emergency orders closing the ranges of the herds to hunting when the individual harvest limits were reached.

In 2007, we issued an emergency order on 22 October that closed elk hunting on the eastern portion of registration hunt RE755 south of a line from the head of Kazakof Bay to the head of Saposa Bay on Afognak Island.

In 2008 we issued three emergency orders. The first took effect 22 October, closing the portion of RE755 south of a line from the head of the northwest arm of Kitoi Bay to the mouth of Upper

Portage Lake and east of the main north-south (1100) road. On 7 November we issued a second emergency order, closing the portion of RE755 north and east of a line from Back Bay to the head of Malina Bay. The third emergency order took effect 14 November, closing the remaining open areas to elk hunting within hunt RE755.

Hunter Harvest: The annual elk harvest during this reporting period was comparable to the annual mean of 92.0 killed in the previous 5 years (2002–03 through 2006–07), with 81 elk killed in 2007–08 and 95 in 2008–09 (Table 2). The percentage of bulls in the harvest increased above the average of the previous 5 years (64.6%) during 2007–08 (70%), but declined precipitously in 2008–09 (42%; Table 2).

Since the inception of the federal subsistence hunt in 1998–99, only 1 elk has been harvested (one female in 2003–04). No elk were killed in that hunt during this report period.

Permit Hunts: Drawing permits on Raspberry Island were increased from 80 to 100 in 2008–09 while we retained the same number of drawing permits for Afognak Island. During this reporting period over half of the permittees did not hunt (51% in 2007–08; 56% in 2008–09), continuing the patterned observed during the previous 5 years ($\bar{x}$ = 52.4%; Table 2). Registration permit hunts started after the drawing hunts for all hunt areas except Raspberry Island, and the number of registration permits decreased from a 4-year average of 326.0 (2003–04 through 2006–07) to 289 in 2007–08 and 229 in 2008–09 (Table 2).

Hunter Residency and Success: Overall elk hunter success was 22% in 2007–08 and 28% in 2008–09; comparable to the average of the previous 5 years ($\bar{x}$ = 26.0%; Table 3). Most elk hunters were residents of Unit 8, with local residents 54% of all hunters in 2007–08 and 60% in 2008–09, up from the annual mean during the previous 5 years (51.0%; Table 3). The number of hunters afield was 374 in 2007–08 and 328 in 2008–09, comparable to the average of the previous 5 years (349.0).

Harvest Chronology: During this reporting period, most of the elk harvested in the drawing and registration hunts were taken in the first week of each season (Table 4). Prior to 2004, most of the harvest occurred during the early part of the registration permit season that opened 25 September.

Transportation Methods: Aircraft and boats were the predominant methods of transportation for elk hunters in Unit 8 (Table 5). Use of highway vehicles depended on the level of logging activity and the vehicle use policies of the logging companies and the landowners. It was difficult to track the harvest by highway vehicle because hunters typically recorded the transportation they used to arrive on Afognak on their permit rather than the transportation used to hunt.

Other Mortality

Documenting mortality from sources other than hunting is seldom possible because of the remote setting of Afognak and Raspberry islands. Predation by brown bears undoubtedly occurs, but it is probably not common. We received reports of 7 elk that possibly died of winter-kill in 2008–09

from residents of Afognak and bear hunters. The winters of 2007–08 and 2008–09 were particularly harsh on the deer and elk populations on Afognak and Raspberry islands. We estimate that wounding loss and illegal harvest contribute additional mortality equivalent to 15% of the reported harvest.

HABITAT ASSESSMENT

Commercial logging of Sitka spruce (*Picea sitchensis*) on Afognak Island continued during this reporting period. Timber harvesting expanded somewhat in the Marka Creek drainage, Duck Mountain, Afognak Bay, and east of Paramanof Bay. The Alaska Department of Fish and Game (ADF&G) continued to review timber harvest plans that private timber owners were required to submit to the Alaska Department of Natural Resources. Current laws do not contain provisions for protecting terrestrial wildlife, so the reviews are strictly advisory.

Representatives from logging companies and Native corporation land managers have expressed a desire to work with ADF&G to investigate the long-term effects of logging on elk habitat quality on Afognak Island and develop cost-effective methods to improve elk habitat. We have been working closely with Afognak Native Corporation to identify areas that are suitable for habitat enhancement to benefit wildlife. We also have embarked on a cooperative research project with Rocky Mountain Elk Foundation, Kodiak Brown Bear Trust, Afognak Native Corporation, and the Kodiak National Wildlife Refuge to deploy additional VHF and GPS radio collars on elk and to refine our knowledge of critical habitats for these species on Afognak.

Several nongovernmental organizations, including the American Land Conservancy, Kodiak Brown Bear Habitat and Maintenance Trust and the Rocky Mountain Elk Foundation finalized purchase of 4,400 acres owned by local Native corporations in the vicinity of Perenosa Bay in 2005. The bay was considered a highly desired habitat conservation target for recovering fish and wildlife populations injured by the *Exxon Valdez* oil spill in 1989. These lands will be managed by the Alaska Department of Natural Resources as part of the state park system. This action supplemented a similar purchase in November 1998, when $74 million *of Exxon Valdez* settlement funds were used to acquire more than 41,000 acres of land on northern Afognak Island from Afognak Joint Venture.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Active logging and road construction on Afognak continued throughout this reporting period. These activities altered elk habitat and provided improved access for hunters who were shareholders of local Native corporations. In recent years, cooperation with landowners and logging operators has improved tremendously, and we have been able to work with them to minimize adverse impacts on wildlife and seek ways to improve elk habitat on regenerating timber lands. Afognak Native Corporation maintained a security patrol to assure compliance with access restrictions on private lands. Security staff routinely shared wildlife and hunter information with us, thereby providing a better understanding of the situation on Afognak.

Fixed-winged aircraft seem to have little direct impact on the elk, but helicopters typically prompt flight responses from both individuals and groups. In April of 2002, a memorandum of agreement among ADF&G, U.S. Fish and Wildlife Service, and U.S. Coast Guard regarding flight operations over the Kodiak Archipelago was finalized. This agreement has spurred further

cooperation between the Coast Guard and the department to minimize elk and other wildlife species disturbances from helicopter flight operations, and flight crews were given annual wildlife safety briefings by ADF&G staff during this reporting period.

In 2003 the department began investigating the incidence of chronic wasting disease (CWD) in elk and deer on the Kodiak Archipelago. Deer and elk hunters were asked to voluntarily submit the heads of harvested animals for analysis. We have sampled 1,398 deer and 81 elk as part of this project, and all were found to be negative for CWD (2003 – 128 deer, 8 elk; 2004 – 394 deer, 16 elk; 2005 – 402 deer, 21 elk; 2006 – 192 deer, 10 elk; 2007 – 185 deer, 13 elk; 2008 – 97 deer, 13 elk). We are also working with the only commercial elk rancher on Kodiak to assure that his animals do not have contact with wild animals.

CONCLUSIONS AND RECOMMENDATIONS

Throughout the 1980s and 1990s, the elk population in Unit 8 continued to increase to at least 1,400 animals. Winter mortality during 1997–98 and 1998–99 curtailed that trend. During the first half of 2000 the population rebounded, but remained below 1,000 elk. Harsh winters in 2006–07, 2007–08 and 2008–09 reversed that trend and the estimated population size declined to 640 elk in 2008–09, the lowest level since the late 1970s. Substantial reductions in permits and harvest targets will be necessary to rebuild the population to desired levels.

Dramatic changes in the habitat, access, and land management practices on Afognak during the past 30 years has made management of elk and other big game on the island challenging. Timber management practices have the capability of either destroying elk habitat or enriching it, so cooperation with land managers and a thorough understanding of the elk and their habitat is crucial. One of the highest priorities for our elk management program in the near future should be to develop a formal, long-term, cooperative big game research and management program with all land managers on Afognak. We suggest that the initial focus of this program be on elk and timber management, but anticipate eventually expanding into research on deer and brown bear populations. Such research will enhance our understanding of how to effectively manage these populations, and they will help Native corporations pursue land use practices that both encourage timber regeneration and provide subsistence resources for their shareholders.

To address these concerns and better manage the elk resource, we recommend the following:

- Manage the Raspberry Island elk herd to encourage growth of the herd to a maximum of 150 elk with a higher proportion of large bulls. In the past 40 years population data have shown three distinct peaks (1965, 1987, and 1997) in which the herd reached a maximum of 220 animals before suffering catastrophic declines. This suggests the island can support no more than 200 elk at a time.
- Manage Afognak Island elk hunting entirely by time-specific drawing permits, followed by registration permits if surplus elk are available.
- Work closely with Native and federal land managers to coordinate elk management objectives and harvest strategies.
- Foster and improve relationships and cooperative research agreements among the state, the Kodiak National Wildlife Refuge and Native landowners.

- Work closely with Native land managers to devise methods of improving elk habitat while recognizing economic goals of the corporations.
- Maintain at least three active radio collars in each major elk herd (≥100 animals) and two in each minor herd (<100 animals).
- Use data from GPS and VHF radio collars to refine our knowledge of elk habitat use.

LITERATURE CITED

ALEXANDER, J., W. GRIFFIN, AND H. WOOD. 1968. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Project Report. Project W-15-R-2 and 3, Work Plan Q. Elk Studies. Juneau. 5 pp.

BATCHELOR, R. F. 1965. The Roosevelt elk in Alaska—its ecology and management. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Project Report. Project W-6-R-S, Work Plan D. Juneau. 37 pp.

BURRIS, O. E., AND D. E. MCKNIGHT. 1973. Game transplants in Alaska. Alaska Department of Fish and Game. Bulletin Nr 4. Juneau. 57 pp.

SMITH, R. B. 1994. Elk survey-inventory management report, 1 July 1991–30 June 1993. M. V. Hicks, editor. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Program. Projects W-23-5 and W-24-1, Study 13.0. Juneau. 16 pp.

SMITH, R. B. 1996. Pages 4–15 in Elk survey-inventory management report, 1 July 1993–30 June 1995. M. V. Hicks, editor. Alaska Department of Fish and Game. Federal Aid in Wildlife Restoration Grants W-24-2 and W-24-3, Study 13.0. Juneau.

SMITH, R. B., AND L. J. VAN DAELE. 1998. Elk survey-inventory management report, 1 July 1995–30 June 1997. M. V. Hicks, editor. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Program. Projects W-24-4 and W-24-5 Study 13.0. Juneau. 19 pp.

VAN DAELE, L. J. 2000. Elk survey-inventory management report, 1 July 1997–30 June 1999. M. V. Hicks, editor. Alaska Department of Fish and Game, Federal Aid in Wildlife Restoration Program. Projects W-27-1 and W-27-2. 22 pp.

PREPARED BY:

Lawrence J. Van Daele
Wildlife Biologist III

John R. Crye
Wildlife Biologist I

SUBMITTED BY:

Gino Del Frate
Management Coordinator

VAN DAELE, L. 2010. Unit 8 elk management report. Pages 18–34 in P. Harper, editor. Elk management report of survey and inventory activities 1 July 2007–30 June 2009. Alaska Department of Fish and Game. Project 13.0. Juneau, Alaska.

TABLE 1 Unit 8 aerial elk composition counts and estimated population by herd, 2002–03 through 2008–09

Herd	Regulatory year	Classified elk						Total elk observed	Estimated population
		Bulls	Cows	Calves	(%)	Bulls: 100 cows	Calves: 100 cows		
Raspberry Island	2002–03	0	58	13	(18)	0	22	71	80
	2003–04	0	58	18	(24)	0	31	76	90
	2004–05	9	50	15	(20)	18	30	74	100
	2005–06	14	64	15	(16)	22	23	93	100
	2006–07	19	62	11	(12)	31	18	92	100
	2007–08	--	--	--	--	--	--	0	90
	2008–09	6	41	14	(23)	15	34	61	85
Seal Bay	2002–03	--	--	--	--	--	--	--	75
	2003–04	--	--	--	--	--	--	--	80
	2004–05	--	--	--	--	--	--	--	80
	2005–06	0	26	8	(24)	0	31	34	100
	2006–07	--	--	--	--	--	--	--	100
	2007–08	--	--	--	--	--	--	--	90
	2008–09	2	51	12	(18)	4	24	65	80
Duck Mountain	2002–03	0	35	12	(26)	0	34	47	125
	2003–04	--	--	--	--	--	--	--	70
	2004–05	0	48	12	(20)	0	25	60	120
	2005–06	--	--	--	--	--	--	--	120
	2006–07	1	3	2	(33)	33	67	6	100
	2007–08	--	--	--	--	--	--	--	90
	2008–09	3	58	13	(18)	5	22	74	70
Portage Lake	2002–03	--	35[a]	18	(35)	--	--	53	60
	2003–04	1	11	2	(14)	9	18	14	60
	2004–05	--	--	--	--	--	--	--	60
	2005–06	--	--	--	--	--	--	--	60
	2006–07	1	10	0	(0)	10	0	11	80
	2007–08	--	--	--	--	--	--	--	72
	2008–09	4	58	0	(0)	7	0	62	70

TABLE 1 continued

Herd	Regulatory year	Classified elk						Total elk observed	Estimated population
		Bulls	Cows	Calves	(%)	Bulls: 100 cows	Calves: 100 cows		
Marka	2002–03	--	102[a]	54	(35)	--	--	156	200
	2003–04	--	212[a]	--	--	--	--	212	255
	2004–05	25	87	29	(21)	29	33	141	180
	2005–06	7	81	19	(18)	9	23	107	180
	2006–07	--	60 [a]	--	--	--	--	60	150
	2007–08	--	--	--	--	--	--	26	135
	2008–09	--	45[a]	--	--	--	--	45	110
Malina Lake	2002–03	10	86	7	(7)	12	8	103	135
	2003–04	0	95	37	(28)	0	39	132	160
	2004–05	14	90	11	(10)	16	12	115	170
	2005–06	26	140	22	(12)	19	16	188	220
	2006–07	15	121	14	(9)	12	12	150	210
	2007–08	--	--	--	--	--	--	--	190
	2008–09	3	74	25	(25)	4	34	102	150
Waterfall	2002–03	6	30	4	(10)	20	13	40	50
	2003–04	--	82	36	(31)	--	44	118	120
	2004–05	--	93[a]	--	--	--	--	93	150
	2005–06	--	43	6	(12)	--	14	49	150
	2006–07	6	13	--	--	46	--	19	150
	2007–08	--	--	--	--	--	--	63	135
	2008–09	3	7	0	(0)	43	0	10	50
Tonki Cape	2002–03	10	3	0	(0)	333	0	13	25
	2003–04	--	--	--	--	--	--	--	30
	2004–05	3	0	0	(0)	--	0	3	30
	2005–06	--	--	--	--	--	--	--	30
	2006–07	--	--	--	--	--	--	--	30
	2007–08	--	--	--	--	--	--	--	27
	2008–09	--	--	--	--	--	--	--	25

TABLE 1 continued

Herd	Regulatory year	Classified elk						Total elk observed	Estimated population
		Bulls	Cows	Calves	(%)	Bulls: 100 cows	Calves: 100 cows		
Total all herds	2002–03	26	407	121	(22)	6	30	554	750
	2003–04	1	458	93	(17)	0	20	552	865
	2004–05	51	368	67	(14)	14	18	486	890
	2005–06	47	354	70	(15)	13	20	471	960
	2006–07	42	269	27	(8)	16	10	338	920
	2007–08	--	--	--	--	--	--	89	829
	2008–09	21	334	64	(17)	6	19	419	640

[a] Includes all adults, not differentiated by sex.

TABLE 2 Unit 8 elk harvest data by permit hunt, 2002–03 through 2008–09

Hunt Area/Number	Regulatory Year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Bulls	(%)	Cows	(%)	Unk.	Illegal/ unreported	Total harvest
Raspberry Is.	2002–03	10	50	60	40	2	(100)	0	(0)	0	0	2
(Drawing Hunts	2003–04	60	61	73	27	5	(71)	2	(29)	0	0	7
DE 702–706)	2004–05	80	58	69	31	8	(80)	2	(20)	0	0	10
	2005–06	80	50	78	22	4	(44)	5	(56)	0	0	9
	2006–07	80	61	77	23	6	(86)	1	(14)	0	0	7
	2007–08	80	55	80	20	3	(43)	4	(57)	0	0	7
	2008–09	100	33	73	27	8	(67)	4	(33)	0	3	15
SW Afognak Is.	2002–03[a]	--	--	--	--	--	--	--	--	--	--	--
(Drawing Hunts	2003–04	115	56	71	29	2	(15)	11	(85)	0	0	13
DE 711 & 713)	2004–05	115	55	88	12	1	(17)	5	(83)	0	1	7
	2005–06	115	62	64	36	3	(20)	12	(80)	1	0	16
	2006–07	115	76	78	22	1	(17)	5	(83)	0	0	6
	2007–08	115	63	88	12	3	(60)	2	(40)	0	0	5
	2008–09	115	75	79	21	1	(14)	5	(86)	0	1	7
Remainder of Unit 8	2002–03[a]	--	--	--	--	--	--	--	--	--	--	--
(Drawing Hunts	2003–04	150	55	68	32	14	(78)	4	(22)	0	0	18
DE 715 & 717)	2004–05	122	50	64	36	17	(81)	4	(19)	1	0	22
	2005–06	138	55	55	45	19	(70)	8	(30)	0	1	28
	2006–07	139	59	66	34	17	(89)	2	(11)	0	0	19
	2007–08	150	60	75	25	14	(93)	1	(7)	0	0	15
	2008–09	150	54	78	22	9	(60)	6	(40)	0	0	15
East Afognak	2002–03[a]	--	--	--	--	--	--	--	--	--	--	--
(Drawing Hunts	2003–04	150	58	73	27	7	(50)	7	(50)	0	0	14
DE 721 & 723)	2004–05	150	66	71	29	8	(57)	6	(43)	0	1	15
	2005–06	150	62	74	26	12	(86)	2	(14)	0	0	14
	2006–07	150	60	71	29	12	(71)	5	(29)	0	0	17
	2007–08	148	59	63	37	12	(55)	10	(45)	0	0	22
	2008–09	151	64	65	35	11	(58)	8	(42)	0	0	19

TABLE 2 continued

Hunt Area/Number	Regulatory Year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Bulls	(%)	Cows	(%)	Unk.	Illegal/ unreported	Total harvest
Remainder of Unit 8	2002–03[a]	--	--	--	--	--	--	--	--	--	--	--
(Registration Hunt	2003–04	222	50	75	25	22	(81)	5	(19)	0	0	27
RE 755)	2004–05	378	45	80	20	29	(71)	12	(29)	0	0	41
	2005–06	320	47	69	31	30	(60)	20	(40)	1	0	51
	2006–07	384	42	75	25	34	(61)	22	(39)	0	0	56
	2007–08	289	38	82	18	25	(78)	7	(22)	0	0	32
	2008–09	229	42	71	29	9	(24)	29	(76)	0	1	39
Federal	2002–03[b]	--	--	--	--	--	--	--	--	--	--	0
Subsistence	2003–04	14	70	67	33	0	0	1	(100)	0	0	1
	2004–05	14	67	100	0	0	0	0	0	0	0	0
	2005–06	15	50	100	0	0	0	0	0	0	0	0
	2006–07	12	43	100	0	0	0	0	0	0	0	0
	2007–08	6	20	100	0	0	0	0	0	0	0	0
	2008–09	3	33	100	0	0	0	0	0	0	0	0
Total all hunts	2002–03	651	47	81	19	41	(66)	21	(34)	0	0	62
	2003–04[a]	711	55	72	28	50	(63)	30	(37)	0	0	80
	2004–05	859	52	78	22	63	(68)	29	(32)	1	2	95
	2005–06	818	54	68	32	68	(59)	47	(41)	2	1	118
	2006–07	880	54	73	27	70	(67)	35	(33)	0	0	105
	2007–08	788	51	78	22	57	(70)	24	(30)	0	0	81
	2008–09	748	56	73	27	38	(42)	52	(58)	0	5	95

[a] New hunt regulations, numbers and boundaries inaugurated in 2003-04 – area specific data for Afognak hunts prior to that season not comparable to other years
[b] No permit data available

TABLE 3 Unit 8 elk hunter residency and success, 2002–03 through 2008–09

Regulatory Year	Successful					Unsuccessful					Total hunters[c]
	Local[a] resident	Nonlocal resident	Nonresident	Total[b]	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	
2002–03	34	24	4	62	(20)	135	106	13	254	(80)	316
2003–04	47	29	4	80	(28)	92	102	13	207	(72)	287
2004–05	52	34	6	92	(23)	154	138	9	301	(77)	393
2005–06	67	39	9	115	(32)	128	103	10	241	(68)	356
2006–07	56	41	8	105	(27)	148	130	10	288	(73)	393
2007–08	49	24	8	81	(22)	152	125	16	293	(78)	374
2008–09	60	26	4	90	(28)	135	89	14	238	(72)	328

[a] "Local resident" includes hunters who live in GMU 8.

[b] Totals do not include illegal/unreported and unknown harvest data

[c] Hunters participating in more than one permit hunt were tallied for each hunt.

TABLE 4 Unit 8 elk harvest chronology by 10-day period (percent in parentheses), 2002–03 through 2008–09

Area	Regulatory Year	Harvest periods (percent)							*n*
		21–30 Sep	1–10 Oct	11–20 Oct	21–31 Oct	1–10 Nov	11–20 Nov	21–30 Nov	
Raspberry Island	2002–03	0 (0)	1 (50)	1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	2
	2003–04	0 (0)	2 (29)	3 (43)	0 (0)	2 (29)	0 (0)	0 (0)	7
	2004–05	0 (0)	3 (30)	5 (50)	0 (0)	0 (0)	1 (10)	1 (10)	10
	2005–06	0 (0)	3 (38)	2 (25)	0 (0)	0 (0)	3 (38)	0 (0)	8
	2006–07	0 (0)	4 (57)	2 (29)	0 (0)	0 (0)	1 (14)	0 (0)	7
	2007–08	0 (0)	3 (43)	0 (0)	2 (29)	0 (0)	0 (0)	2 (29)	7
	2008–09	0 (0)	6 (50)	1 (8)	3 (25)	0 (0)	2 (17)	0 (0)	12
Afognak Island	2002–03	11 (17)	14 (22)	20 (32)	6 (10)	9 (14)	3 (5)	0 (0)	63
	2003–04	12 (17)	12 (17)	21 (29)	10 (14)	9 (12)	9 (12)	0 (0)	73
	2004–05	12 (15)	15 (18)	14 (17)	15 (18)	12 (15)	9 (11)	5 (6)	82
	2005–06	22 (21)	17 (16)	15 (14)	19 (18)	14 (13)	7 (7)	12 (11)	106
	2006–07	20 (21)	7 (7)	13 (13)	23 (24)	7 (7)	16 (16)	12 (12)	98
	2007–08	23 (31)	9 (12)	10 (14)	12 (16)	7 (9)	10 (14)	3 (4)	74
	2008–09	14 (18)	12 (15)	15 (19)	20 (26)	15 (19)	2 (3)	0 (0)	78

TABLE 5 Unit 8 elk harvest by transport method (percent in parentheses), 2002–03 through 2008–09

Regulatory Year	Airplane	Horse	Boat	ORV	Highway vehicle	Unknown	*n*
2002–03	20 (32)	0 (--)	11 (18)	0 (--)	12 (19)	19 (31)	62
2003–04	25 (31)	0 (--)	25 (31)	2 (3)	24 (30)	4 (5)	80
2004–05	30 (33)	2 (2)	36 (39)	1 (1)	21 (23)	2 (2)	92
2005–06	39 (34)	0 (--)	50 (43)	0 (--)	26 (23)	0 (0)	115
2006–07	38 (36)	0 (--)	35 (33)	0 (--)	28 (27)	4 (4)	105
2007–08	32 (40)	0 (--)	28 (34)	0 (--)	20 (25)	1 (0)	81
2008–09	22 (24)	0 (--)	41 (46)	1 (1)	25 (28)	1 (1)	90

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition and archery equipment. The Federal Aid program allots funds back to states through a formula based on each state's geographic area and number of paid hunting license holders. Alaska receives a maximum 5% of revenues collected each year. The Alaska Department of Fish and Game uses federal aid funds to help restore, conserve and manage wild birds and mammals to benefit the public. These funds are also used to educate hunters to develop the skills, knowledge and attitudes for responsible hunting.