Species Management Report, ADF&G/DWC/SMR-2012-2

Elk management report of survey-inventory activities, 1 July 2009–30 June 2011

Patricia Harper, editor

2012

Alaska Department of Fish and Game Division of Wildlife Conservation

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

Many of the activities referenced in this report were funded in part by the Federal Aid in Wildlife Restoration Program, Grants W-33-8 and W-33-9, Project 9.0.

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Harper, P., editor. 2012. Elk management report of survey-inventory activities 1 July 2009–30 June 2011. Species Management Report ADF&G/DWC/SMR-2012-2, Alaska Department of Fish and Game, Juneau, Alaska.

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Cover Photo: Adult cow elk captured and radiotagged on Etolin Island in August 2011 as part of ADF&G's ongoing elk research activities in Unit 3. ©2011 ADF&G/Photo by Richard E. Lowell.

ELK MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

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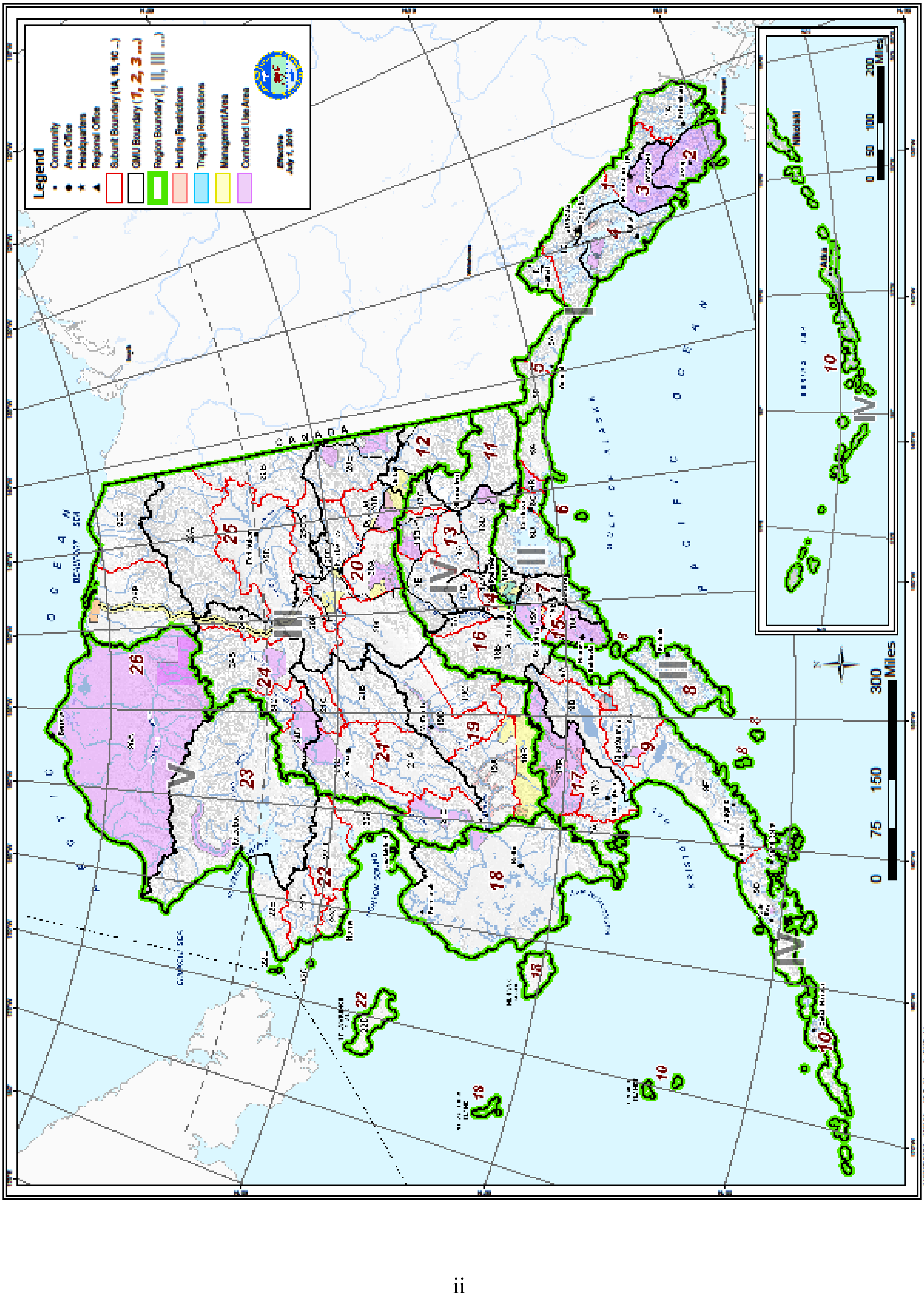
Legend
Community
Area Office
Headquarters
Regional Office
Subunit Boundary (1A, 1B, 1C...)
GMU Boundary (1, 2, 3 ...)
Region Boundary (I, II, III ...)
Hunting Restrictions
Trapping Restrictions
Management Area
Controlled Use Area
Effective
July 1, 2010
CANADA
PACIFIC OCEAN
GULF OF ALASKA
0 75 150 300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

WILDLIFE

MANAGEMENT REPORT

Alaska Department of Fish and Game
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ELK MANAGEMENT REPORT

From: 1 July 2009
To: 30 June 2011

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, Paul 2009). 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.

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 1996, it was determined that the introduced elk had reached the population level for hunting and the BOG established a bull-only elk season in Unit 3.

HUMAN USE HISTORY

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

Regulation History

In 1996, the Board of Game established a bull only elk season in Unit 3, when it was determined that the introduced population had reached a level that could sustain a harvest. Thirty draw permits for bull elk were issued in 1997, the first year of the hunt. Over the next few Board cycles, changes were made to the elk permit hunt, including an increase in permit numbers from 30 (1996), to 70 (1998), and finally to 120 (2000). Additionally a separate archery-only hunt was established in 1998.

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. Six bulls were harvested on Zarembo during the September and October drawing permit hunts and managers felt there were an insufficient number of bulls remaining in the quota to allow for an open registration permit hunt. 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. Zarembo Island has not had an elk hunt since that time and remained closed to elk hunting during this report period.

Historical harvest patterns

Fall weather can influence elk movement patterns and hunter effort and success. Although harvest chronology varies somewhat from year to year, the 1st and 3rd weeks of October seem to contain the majority of the harvest in most years. This makes sense as the September season is archery only, and only in October can hunters begin to use rifles to hunt elk in this area. 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 2010, a total of 2057 drawing and registration permits were issued, 1036 hunters harvested 131 elk, including 99 from Etolin Island and 32 from Zarembo Island. Of the 99 elk harvested on Etolin Island, 15 were killed in Wildlife Analysis Area (WAA) 1901 on the north half of the island and 84 were killed in WAA 1910 on the south half of the island .

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. No general season elk harvest was reported during this report period.

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. We have however been able to obtain herd composition data by conducting aerial surveys in the July of alpine areas where elk have congregated. 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. In 2000 the elk population on Etolin was probably lower than the 350 estimated by a post-parturition model because factors such as predation, dispersal, and interspecific competition with deer were not considered. In June 2003 we estimated Unit 3 had 350–450 elk with 75-100 on Zarembo and the rest on Etolin (ADF&G 2004). However, new data from radio collaring efforts and aerial surveys conducted since 2008 has resulted in an estimate of no more than 40 animals on Zarembo. 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).

To date, the greatest number of elk observed on Zarembo Island occurred on 16 August 2004 when a single herd comprised of 36 individuals was observed south of Baht Harbor. Despite numerous attempts to locate, capture and radiocollar additional elk on Zarembo in both 2009 and 2010, few elk were observed and none were successfully captured and radiocollared. There exists concern that the Zarembo elk population may have further declined, moved to a different part of the island, or that some elk may have moved off the island. The greatest number of elk observed on Etolin Island occurred on 13 July 2010 when 163 elk were observed in 3 individual herds in the vicinity of Mount Etolin and Mount Shakes. However, we were not able to get composition on all of these animals. An unknown number of elk are also known to inhabit the western portion of Etolin Island in the vicinity of Johnson Cove, Three Way Passage and Rocky Bay. A current subjective estimate of the unitwide elk population is approximately 250–350 animals, with more than three-quarters of those on Etolin, and the remainder on Zarembo.

Population Composition

An aerial survey of southern Etolin Island on 15 August 2010 yielded a total count of 91 elk in 1 herd comprised of 13 bulls, 59 cows, and 19 claves yielding a bull:cow ratio of 22:100 and a calf:cow ratio of 32:100. 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.

No data are available to make meaningful elk population composition estimates for Zarembo Island. Zarembo Island was originally thought to support 2 separate elk herds. However, information gained during aerial surveys and from a single cow elk radiocollared from 2008–2010 suggests that there is 1 main herd on the island which fragments into smaller groups during the winter and spring months.

Distribution and Movements

GPS data from radio-collared elk have provided us with valuable insight into the seasonal habitat use patterns for elk in Unit 3. For both subspecies of elk present in this unit, the area below 150 meters adjacent to the coast is preferred winter and early spring habitat. Wintering areas are typically associated with gradual slope beaches that tend to have more sedges and grasses above the mean high tide line than do steep rocky beaches. Elk on both Etolin and Zarembo appear to favor these areas as 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

Harvest data were summarized by regulatory year (RY), which begins 1 July and ends 30 June (e.g. RY 09 = 1 July 2009–30 June 2010). During the report period the following season and bag limit regulations applied to elk hunting in Unit 3.

On Etolin Island and the smaller associated islands located within the elk drawing and registration permit boundary (Fig. 1), the season dates and bag limit are as follows:

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)

In the remainder of Unit 3, outside the drawing and registration permit hunt boundary, the season extends from 1 August–31 December with 1 elk bag limit.

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

Hunter Harvest. In RY09, 6 elk were harvested in Unit 3, well below the preceding 10-year annual average of 10 elk. We issued 25 archery-only and 100 rifle season drawing permits for elk hunting in Unit 3 (Table 2). Forty-nine of those who obtained drawing permits hunted; they harvested 5 elk. In addition to drawing permits, we issued 24 registration permits for the RE325 elk hunt in November. A total of 11 permittees hunted and harvested 1 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 RY10, 6 elk were harvested in Unit 3. We issued 25 archery-only and 100 rifle season drawing permits. Twenty-four permittees hunted and 5 elk were taken. In addition to drawing permits, we issued 55 registration permits for the RE325 elk hunt in November. A total of 28 permittees hunted and harvested 1 elk. We received no reports of elk being harvested outside the drawing permit area during the RY10 general season hunt.

Hunter Residency and Success. Five nonresidents received an elk drawing permit in RY09; two hunted. . Two nonresidents received elk drawing permits in RY10; neither hunted. In both RY09 and RY10 nonlocal residents represented the largest group of both successful and unsuccessful hunters. All 12 of the elk harvested during the report period were taken by nonlocal residents (Table 3). The success rate for permit holders who actually hunted was 10% in RY09 and 12% in RY10. Most nonlocal resident hunters were from communities in Southeast Alaska, relatively close to the hunt area.

Harvest Chronology. In RY09 a total of 6 elk were taken and hunters had the best success during the first week of September and the third week of October, each with 33% of the annual harvest (Table 4). The remainder of the RY09 elk harvest was evenly distributed between the first week of October and the fourth week of November each providing 17% of the harvest. In RY10, a total of 6 elk were taken and hunters had the best success during the first week of October when 67% of the harvest occurred. The remainder of the RY10 harvest was evenly distributed between the first week of September and the third week of October, each providing 17% of the harvest. In RY10 no elk were taken during the late-November registration permit hunt.

Harvest in Particular Areas (WAAs). In RY09, all 6 of the elk killed were taken in WAA 1910. In RY10, 6 elk were killed in 2 Unit 3 WAAs. WAAs 1901 provided 17% of the harvest and 1910 provided 83% of the harvest.

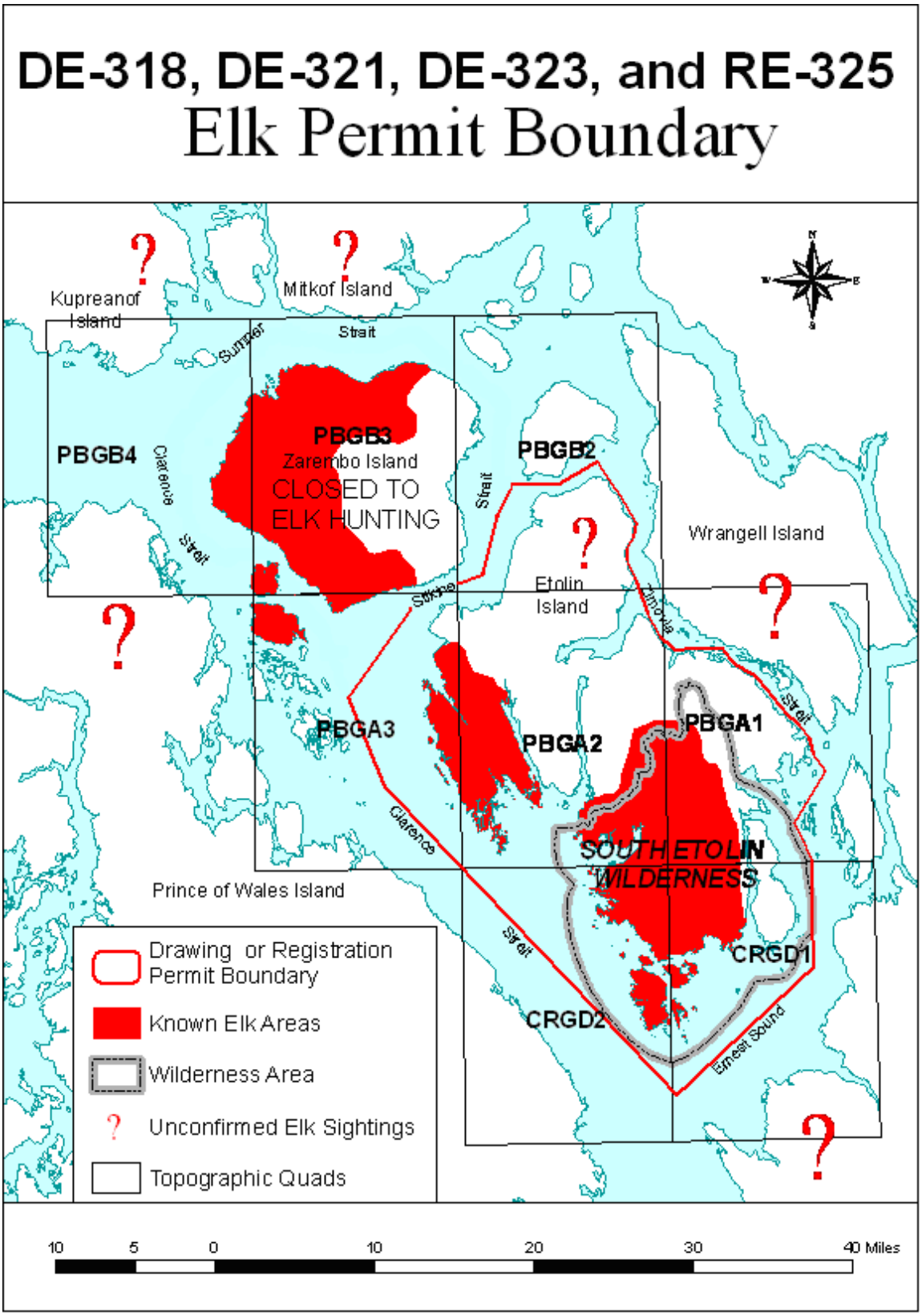

Figure 1. Elk hunting permit boundaries, with overlay of USGS map sections (e.g., PBGB4).

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. In RY09, 67% of successful elk hunters reported using boats to access their hunt areas, while 33% used aircraft. In RY10, half of the successful hunters reported using boats and half reported using aircraft 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.

RESEARCH

During this report period, we continued with the elk research project that was initiated in 2008. In spring 2009, a total of 5 elk were captured and radio collared on Etolin Island, bringing the number of collared elk to 7. Attempts to collar additional elk during spring 2010 were unsuccessful. 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.

From 2008 to 2011, over 27,000 successful locations were collected from a total of 6 GPS-collared elk, 1 on Zarembo Island and 5 on Etolin Island. The number of successful GPS locations for an individual collared elk ranged from 4,434 to 5,289 over a 2-year period.

We used ArcGIS software to conduct a preliminary analysis of available GPS location data to calculate home range sizes (100% convex polygon) for the 6 radiocollared elk for which we possessed $\geq$ 1 full year of GPS location data. Sample size included 5 cow elk collared on Etolin Island and 1 cow elk collared on Zarembo Island. On Etolin Island, where the number of successful GPS locations for 5 individual elk ranged from 2,349 to 5,289, total home range size ranged from 85.5 to 135.7 km^2 (median = 92.7 km^2). The 1 collared elk on Zarembo had a home ranges size of 285 km^2, based on 4,434 successful relocations.

Because most GMU 3 elk reside within the South Etolin Wilderness where helicopter landings are heavily regulated, our capture efforts on southern Etolin from 2008 to early 2011 were largely restricted to state tidelands (below mean high tide) and a relatively small state in-holding at McHenry Anchorage. In August 2011 the department received approval of a Minimum Requirements Decision Guide authorizing a limited number of elk research-related helicopter landings within the South Etolin Wilderness. The ability to land helicopters within the South Etolin Wilderness is expected to increase elk capture and collaring success significantly in 2011.

Complete analysis of GPS data to characterize habitat use by collared elk will not be conducted until the sample size of collared elk has been increased and additional data have been

downloaded from GPS collars. Elk research results will be reported in a federal aid research project report and will be summarized in the next elk management report.

HABITAT

Assessment

Clearcut logging continues on Etolin and 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 habitat: 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.

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.

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. If elk become widely distributed throughout Southeast Alaska, deer and elk may compete for resources and deer populations could decline as a result. 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 range extension may also affect deer and elk populations.

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

We continue to receive unverified reports of elk sightings outside the Etolin and Zarembo Island complex, some of which appear credible. As elk disperse and the population increases, it will be important to monitor their numbers and distribution.

During the report period the department continued elk research efforts in Unit 3. Our understanding of the elk movement patterns and habitat use has been greatly enhanced through these efforts. Additionally, we have been able to use the collared animals to locate elk groups for minimal counts as well as herd composition data. 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.

We recommend additional research to develop reliable methods of inventorying Southeast Alaska elk populations so that population size and trend can be evaluated. This data is essential for optimal management of this species.

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

Lowell, R. E. 2012. Unit 3 elk management report. Pages 1–16 *in* Harper, P., editor. Elk management report of survey and inventory activities 1 July 2009–30 June 2011, Species Management Report ADF&G/DWC/SMR-2012-2. Alaska Department of Fish and Game, Juneau, Alaska.

Table 1. Unit 3 elk harvest data for all permit hunts only, regulatory years 1999 through 2010.

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	8
1998	31	32	55	45	9	-100	0	0	0	0	9
1999	71	18	71	29	16	(100)	0	(0)	0	0	16
2000	72	18	86	14	8	(100)	0	(0)	0	0	8
2001	123	43	72	28	19	(100)	0	(0)	0	0	19
2002	123	27	85	15	13	(100)	0	(0)	0	0	13
2003	159	37	92	8	8	(100)	0	(0)	0	0	8
2004	156	40	87	13	12	(100)	0	(0)	0	0	12
2005[a]	310	55	88	13	17	(100)	0	(0)	0	0	17
2006	272	51	99	1	1	(100)	0	(0)	0	0	1
2007	210	59	93	7	6	(100)	0	(0)	0	0	6
2008	171	58	97	3	2	(100)	0	(0)	0	0	2
2009	149	60	90	10	6	(100)	0	(0)	0	0	6
2010	181	71	88	12	6	(100)	0	(0)	0	0	6

[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 2010.

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
	2009	25	56	18	82	2	(100)	0	(0)	0	0	2
	2010	25	72	14	86	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
	2009	50	68	13	88	2	(100)	0	(0)	0	0	2
	2010	50	82	40	60	4	(100)	0	(0)	0	0	4
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
	2009	50	56	5	95	1	(100)	0	(0)	0	0	1
	2010	50	88	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
	2009	24	54	9	91	1	(100)	0	(0)	0	0	1
	2010	55	47	4	96	1	(100)	0	(0)	0	0	1
SE318, SE320	2005	2	50	0	100	0	(0)	0	(0)	0	0	0
and SE323	2006	1	100	0	0	0	(0)	0	(0)	0	0	0
Governor’s	2007	0	0	0	0	0	(0)	0	(0)	0	0	0
permits	2008	0	0	0	0	0	(0)	0	(0)	0	0	0
	2009	0	0	0	0	0	(0)	0	(0)	0	0	0

	2010	1	0	0	100	0	(0)	0	(0)	0	0	0
General Hunt; (outside drawing permit area)	2005	NA	NA	NA	NA	0	(0)	4	(100)	0	0	4
	2006	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
	2007	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
	2008	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
	2009	NA	NA	NA	NA	0	(0)	0	(0)	0	0	0
	2010	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
	2009	149	60	10	90	6	(100)	0	(0)	0	0	6
	2010	181	71	12	88	6	(100)	0	(0)	0	0	6

Table 3. Unit 3 elk hunter residency and success for all permit hunts only, regulatory years 1999 through 20010[a].

	Unsuccessful					Successful					
Regulatory year	Local[b] resident	Nonlocal resident	Nonresident	Total	(%)	Local resident	Nonlocal resident	Nonresident	Total	(%)	Total hunters
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
2009	13	39	2	54	(90)	0	6	0	6	(10)	60
2010	14	32	0	46	(88)	0	6	0	6	(12)	52

[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 1999 through 2010[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
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
2009	33	0	0	0	17	0	33	0	0	17	0
2010	17	0	0	0	67	0	0	17	0	0	6

[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 1999 through 2010 [a].

Regulatory year	Harvest percent by transport method								n
	Airplane	Boat	3- or 4-wheeler	Snowmachine	ORV	Highway vehicle	Walk	Unk	
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
2009	33	67	0	0	0	0	0	0	6
2010	50	50	0	0	0	0	0	0	6

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

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 2009
To: 30 June 2011

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. In 1928, under a goat-elk exchange program with the state of Washington, 8 elk calves (3 males and 5 females) were captured from the Ho Valley on the Olympic Peninsula and shipped from Port Angeles, Washington. 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 9 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 to hunters of accessing 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 3 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.

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 sampled 1,398 deer and 81 elk as part of this project, and all were found to be negative for CWD.

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 600 animals in 2009–10 and 610 in 2010–11. During the previous 5 years (2004–05 through 2008–09) population estimates ranged from 640–960 elk ($\bar{x}$ = 848). The elk herds declined from 2005–06 to 2009-10, probably due to a combination of high winter mortality and harvest pressure.

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 18% in 2009–10 and 20% in 2010–11; the annual mean for the 5 years prior to this reporting period (2004–05 through 2008–09) was 13.0%. The overall ratio of calves:100 cows in the population was 26 in 2010–11; the annual mean for the 5 years prior to this reporting period (2004–05 through 2008–09) was 16.8. These data, however, may be biased downward because yearling (spike) bulls are easily misidentified as cows during aerial composition counts. 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 were at least 7 separate herds on Afognak Island and 1 on Raspberry Island. In June 2011 we captured 14 adult female and 1 young adult male elk on Afognak and Raspberry islands, and deployed 14 VHF radio collars on the captured females. No elk died during the operation.

Elk in the Duck Mountain herd began making unusual movements into the Delphin Bay area starting in the winter of 2009–10, coincident with increased logging activity on Duck Mountain. 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;	25 September–9 October

up to 500 permits will be issued	
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: 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 2009, 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 (Danger) Bay to the head of Izhut Bay on Afognak Island to protect the Duck Mountain herd from overharvest.

In 2010 we issued an emergency order on 22 October, closing the portion of RE755 south of a line from the head of Kazakof (Danger) Bay to the head of Saposa Bay to all elk hunting, and closing the remainder of hunt RE755 to the harvest of antlered elk.

Hunter Harvest: The annual elk harvest during this reporting period was 40 in 2009–10 and 28 in 2010–11; the annual mean was 98.8 killed over the previous 5 years (2004–05 through 2008–09)

(Table 2). The percentage of bulls in the harvest decreased below the average of the previous 5 years (61.2%); during 2009–10 (44%) and 2010–11 (46%; Table 2).

Since the inception of the federal subsistence hunt in 1998–99, only 2 elk have been harvested (one female in 2003–04 and one female in 2010–11).

Permit Hunts: Drawing permits on Raspberry Island and Afognak Island were drastically decreased during this report period due to the decreasing trend of most of the elk herds. During this reporting period over half of the permittees did not hunt (53% in 2009–10; 59% in 2010–11), continuing the pattern observed during the previous 5 years ($\bar{x}$ = 53.4%; 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 320.0 (2004–05 through 2008–09) to 254 in 2009–10 and 229 in 2010–11 (Table 2).

Hunter Residency and Success: Overall elk hunter success was 16% in 2009–10 and 14% in 2010–11; a decrease from the average of the previous 5 years ($\bar{x}$ = 26.0%; Table 3). Most elk hunters were residents of Unit 8, with local residents accounting for 53% of all hunters in 2009–10 and in 2010–11, closely tracking the annual mean during the previous 5 years (54.0%; Table 3). The number of hunters afield was 244 in 2009–10 and 197 in 2010–11, a considerable decrease from the average of the previous 5 years (368.8).

Harvest Chronology: During this reporting period, the largest weekly periods of the elk harvest 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 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 no reports of elk that died of winter-kill during this reporting period. The winters of 2009–10 and 2010–11 were relatively mild and appeared to be easy on the deer and elk populations on Afognak and Raspberry islands. We estimate that on the average 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 and a representative of ADF&G Habitat Division made monthly on-site inspections of logging activities throughout the summer months of this reporting period. 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 continue to work with ADF&G to explore ways 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, and during this reporting period Koncor and Koniag have expressed interest in working with us.

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 ensure 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.

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 continuation of 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 3 active radio collars in each major elk herd ($\geq$100 animals) and 2 in each minor herd (<100 animals).
- Use data from GPS and VHF radio collars to refine our knowledge of elk habitat use.

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Van Daele, L. J., and J. R. Crye. 2012. Unit 8 elk management report. Pages 17–32 *in* Harper, P., editor. Elk management report of survey and inventory activities 1 July 2009–30 June 2011, Species Management Report ADF&G/DWC/SMR-2012-2. Alaska Department of Fish and Game, Juneau, Alaska.

Table 1. Unit 8 aerial elk composition counts and estimated population by herd, 2004–05 through 2010–11.

Herd	Regulatory year	Classified elk						Total elk observed	Estimated population
		Bulls	Cows	Calves	(%)	Bulls: 100 cows	Calves: 100 cows		
Raspberry Island	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
	2009-10	7	37	13	(23)	19	35	57	75
	2010-11	10	47	11	(16)	21	23	68	85
Seal Bay	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
	2009-10	--	--	--	--	--	--	25	100
	2010-11	--	24	11	(31)	--	46	35	100
Duck Mountain	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
	2009-10	--	--	--	--	--	--	25	80
	2010-11	1	15	1	(6)	7	7	17	80
Portage Lake	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
	2009-10	--	--	--	--	--	--	6	70
	2010-11	--	--	--	--	--	--	85	50

Table 1 continued.

Herd	Regulatory year	Classified elk						Total elk observed	Estimated population
		Bulls	Cows	Calves	(%)	Bulls: 100 cows	Calves: 100 cows		
Marka	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
	2009-10	--	--	--	--	--	--	70	75
	2010-11	1	89	25	(22)	1	28	115	125
Malina Lake	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
	2009-10	5	78	15	(15)	6	19	98	125
	2010-11	4	75	17	(17)	5	23	96	110
Waterfall	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
	2009-10	--	--	--	--	--	--	--	50
	2010-11	--	--	--	--	--	--	30	35
Tonki Cape	2004–05	3	0	0	(0)	--	0	3	30
	2005–06	--	--	--	--	--	--	--	30
	2006–07	--	--	--	--	--	--	--	30
	2007–08	--	--	--	--	--	--	--	27
	2008–09	--	--	--	--	--	--	--	25
	2009-10	--	--	--	--	--	--	--	25
	2010-11	--	--	--	--	--	--	--	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	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	830
	2008–09	21	334	64	(15)	6	19	419	640
	2009-10	12	115	28	(18)	10	24	155	600
	2010-11	16	250	65	(20)	6	26	331	610

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

Table 2. Unit 8 elk harvest data by permit hunt, 2004–05 through 2010–11.

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.	2004–05	80	58	69	31	8	(80)	2	(20)	0	0	10
(Drawing Hunts	2005–06	80	50	78	22	4	(44)	5	(56)	0	0	9
DE 702–706)	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
	2009-10	50	50	64	36	6	(67)	3	(33)	0	0	9
	2010-11	36	56	63	37	3	(50)	3	(50)	0	0	6
SW Afognak Is.	2004–05	115	55	88	12	1	(17)	5	(83)	0	1	7
(Drawing Hunts	2005–06	115	62	64	36	3	(20)	12	(80)	1	0	16
DE 711 & 713)	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	(17)	5	(83)	0	1	7
	2009-10	85	62	78	22	3	(43)	4	(57)	0	0	7
	2010-11	85	75	86	14	2	(67)	1	(33)	0	0	3
Remainder of Unit 8	2004–05	122	50	64	36	17	(81)	4	(19)	1	0	22
(Drawing Hunts	2005–06	138	55	55	45	19	(70)	8	(30)	0	1	28
DE 715 & 717)	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
	2009-10	70	63	83	17	1	(25)	3	(75)	0	0	4
	2010-11	70	58	79	21	4	(67)	2	(33)	0	0	6
East Afognak	2004–05	150	66	71	29	8	(57)	6	(43)	0	1	15
(Drawing Hunts	2005–06	150	62	74	26	12	(86)	2	(14)	0	0	14
DE 721 & 723)	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
	2009-10	70	58	76	24	2	(29)	5	(71)	0	0	7
	2010-11	70	78	67	33	4	(80)	1	(20)	0	0	5

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 (Registration Hunt 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
	2009-10	254	46	91	9	5	(42)	7	(58)	1	0	13
	2010-11	229	48	94	6	0	0	7	(100)	0	0	7
Federal Subsistence	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
	2009-10	0	0	0	0	0	0	0	0	0	0	0
	2010-11	1	0	0	100	0	0	1	(100)	0	0	1
Total all hunts	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
	2009-10	529	53	84	16	17	(44)	22	(56)	1	0	40
	2010-11	491	59	86	14	13	(46)	15	(54)	0	0	28

Table 3. Unit 8 elk hunter residency and success, 2004–05 through 2010–11.

Regulatory Year	Successful					Unsuccessful					Total hunters[c]
	Local[a] resident	Nonlocal resident	Nonresident	Total[b]	(%)	Local[a] resident	Nonlocal resident	Nonresident	Total	(%)	
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
2009-10	22	15	2	39	(16)	107	91	7	205	(84)	244
2010-11	23	2	3	28	(14)	82	82	5	169	(86)	197

[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), 2004–05 through 2010–11.

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	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
	2009-10	0 (0)	3 (33)	3 (33)	3 (33)	0 (0)	0 (0)	0 (0)	9
	2010-11	0 (0)	2 (33)	1 (17)	2 (33)	0 (0)	1 (17)	0 (0)	6
Afognak Island	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
	2009-10	8 (27)	6 (20)	4 (13)	5 (17)	2 (7)	3 (10)	2 (7)	30
	2010-11	7 (32)	2 (9)	6 (27)	0 (0)	2 (9)	3 (14)	2 (9)	22

Table 5. Unit 8 elk harvest by transport method (percent in parentheses), 2004–05 through 2010–11.

Regulatory Year	Airplane	Horse	Boat	ORV	Highway vehicle	Unknown	*n*
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
2009-10	17 (44)	0 (--)	15 (38)	0 (--)	7 (18)	0 0	39
2010-11	4 (14)	0 (--)	14 (50)	0 (--)	10 (36)	0 0	28


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