

Alaska Department of Fish and Game
Division of Wildlife Conservation

Federal Aid in Wildlife Restoration
Survey-Inventory Management Report
1 July 1997 - 30 June 1999

ELK

Mary V Hicks, Editor



Grants W-27-1 & W-27-2
Study 13.0
September 2000

Elk
Management Report
of survey-inventory activities
Federal Aid in Wildlife Restoration
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Please note that population and harvest data in this report are estimates and may be refined at a later date.

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LOCATION

GAME MANAGEMENT UNIT: Unit 3 (3000 mi²)

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

BACKGROUND

Elk (*Cervus elaphus*) are not endemic to Alaska but were successfully introduced onto Afognak Island in the Kodiak Archipelago in 1929. There have been several unsuccessful attempts to introduce elk into Southeast Alaska. All introductions prior to 1987 failed. Lack of monitoring programs precluded our determining causes for these population failures.

In 1987, 50 elk from Oregon were released on Etolin Island. Thirty-three were Roosevelt elk and 17 were the Rocky Mountain subspecies. Initial losses were high and about two-thirds of the animals died within 18 months of release.

The lowest estimated population was reached in mid-1988, and since that time the herd has grown and extended its range. A breeding population is established on Zarembo Island and elk have been reported from Mitkof, Wrangell, Prince of Wales, Deer, Bushy, and Kupreanof Islands.

MANAGEMENT DIRECTION

We have not established management objectives for Unit 3 elk. The Etolin Island winter carrying capacity has been estimated at 900 elk (Alaska Dept. of Fish and Game, 1985). Clearcut logging continues on Etolin and about 30,000 acres are scheduled to be cut by 2080 (USFS, unpubl. data). This will reduce elk carrying capacity. A bull-only drawing permit season was initiated in 1997 when the population reached approximately 250 animals. We will attempt to maintain a postharvest ratio of 25–30 bulls per 100 cows.

METHODS

We flew aerial surveys of Etolin Island to record tracks and visual sightings of individuals and groups of elk. We recorded observations reported to us by other agency personnel and the public. We monitored winter range transects.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The functional life of radio transmitters affixed to elk was 3 years. The last radio relocation was made August 9, 1994, when 2 animals were located. No radios were transmitting during this reporting period. Our population estimate is subjective, based on all information available. Our June, 1999 population estimate was 300–350 elk, with 40–50 elk on Zarembo and the others on Etolin.

Population Composition

No data are available to make a meaningful population composition estimate. Almost every group of Roosevelt elk observed included large and small bulls, cows, and calves (in season). Zarembo Island apparently supports only Rocky Mountain elk, usually found in mixed sex and age groups. Some calves survive each year and are being recruited into the breeding population.

Distribution and Movements

Roosevelt elk have dispersed from their release site but still incorporate this area within their home range. Most Roosevelt elk have stayed within 10 miles of the release site.

After remaining close to the release site for 18 months, Rocky Mountain elk have dispersed widely. A breeding group is established on Zarembo Island. Elk sightings have been reported on several islands in the area.

For both subspecies the area below 500 feet adjacent to the coast is preferred winter and spring habitat. Roosevelt elk move higher into the mountains in summer and occasionally have been located above 1500 feet.

In March 1999 an aerial survey was conducted of Etolin Island to determine if elk were becoming established on the east side of the island. We observed tracks of about 6 elk where the lake between Bessie and Helen peaks drains into Zimovia Strait. No other elk tracks were observed on the east side. Snow conditions were poor on the southwest side of the island, but 11 cows and 1 calf were observed on the beach across from Center Island and an undetermined number of elk tracks were seen in McHenry Inlet.

MORTALITY

Harvest

Season and Bag Limit

Unit 3	Sep 15–Oct 31	1 bull by permit
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Board of Game Actions and Emergency Orders. In October 1998 the Board of Game authorized up to 70 drawing permits to be issued for a September 15 through October 31 season. September 15 through 30 is open for certified bowhunters only. An International Bowhunters Education Program card is required for the bow hunting-only season.

Hunter Harvest. In 1997 we issued 29 permits and 25 permittees hunted and harvested 8 elk (Table 1). During the 1998 season we issued 31 permits; 21 hunters harvested 9 elk.

Hunter Residency and Success. No nonresidents received permits in 1997 and 1 unsuccessful nonresident received a permit in 1998 (Table 2). The percentage of successful hunters was 32% in 1997 and 45% in 1998. Most of the nonlocal hunters were from Prince of Wales Island or Ketchikan, relatively close to the hunt area.

Harvest Chronology. 1997 hunters had the best success in the first and last weeks of the season

(Table 3). In 1998 all but 1 elk was harvested in the first 2 weeks of the season.

Transport Methods. Most successful hunters used boats to access their hunting areas. Etolin Island has 3 lakes that are accessible by floatplane, and some hunters flew into those lakes.

Other Mortality

Brown bears, black bears, and gray wolves are on Etolin Island and wolves inhabit Zarembo Island, but the extent of predation on elk is unknown.

HABITAT

The Etolin Island winter carrying capacity is estimated at 900 elk and consists of the following: clearcut, 2.0 mi²; second growth, 2.2 mi²; nonforest or noncommercial forest, 72.9 mi²; old-growth forest, 124.4 mi² (Alaska Dept. of Fish and Game, 1985).

During early April 1998 and 1999, ADF&G and Forest Service personnel monitored 54 elk winter range transects on Etolin Island. The transects were last monitored in 1991. Results of the monitoring indicate elk use (as measured in fecal pellets per plot) doubled from 1991 to 1998, while deer use decreased by half in 1998 and by more than one third in 1999. Most of the plots still had 1–50% *Vaccinium* cover and did not appear to be heavily impacted by elk, except in some concentrated bedding areas on small hilltops. Two 15' x 15' habitat exclosures were constructed in McHenry Anchorage to monitor forb use by elk and deer.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 3 elk population is increasing after losses following introduction. Elk are dispersing and have established a breeding population on Zarembo Island. As elk disperse and the population increases, it will be important to continue monitoring efforts. Results of the dietary study should be scrutinized to see if browse species are utilized at a rate potentially harmful to the native deer population.

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Table 1 Unit 3 elk data, 1997–98

Regulatory year	Permits issued	Number did not hunt		Unk.	Percent Did not hunt	Number of successful hunters	Percent successful hunters	Males	(%)	Females	Total harvest
1997/98	29	4	0		(14)	8	(53)	8	(100)	0	8
1998/99	31	10	1		(33)	9	(43)	9	(100)	0	9

Table 2 Unit 3 elk hunter residency and success, 1997–98

Regulatory year	Successful					Unsuccessful					Total hunters
	Local ^a resident	NonLocal resident	Non- resident	Total	(%)	Local ^a resident	Nonlocal resident	Non- resident	Total	(%)	
1997/98	3	5	0	8	(32)	7	10	0	17	(68)	25
1998/99	2	7	0	9	(45)	1	9	1	11	(55)	20

^a Residents of Petersburg, Wrangell, and Kake.

Table 3 Unit 3 elk harvest chronology, 1997–98

Regulatory year	15–21 Sep	22–30 Sep	1–7 Oct	8–14 Oct	15–21 Oct	22–31 Oct
1997/98	N/A	N/A	3	0	2	3
1998/99	N/A	N/A	5	3	1	0

Table 4 Unit 3 elk harvest percent by transport methods, 1997–98

Regulatory year	Percent of harvest						Total Harvest
	<u>Airplane</u>		<u>Boat</u>		<u>Other</u>		
	<i>n</i>	(%)	<i>n</i>	(%)	<i>n</i>	(%)	
1997/98	1	(13)	7	(67)	0	0	8
1998/99	2	(22)	7	(78)	0	0	9

LOCATION

GAME MANAGEMENT UNIT: 8 (5097 mi²)

GEOGRAPHICAL DESCRIPTION: Kodiak and Adjacent Islands

BACKGROUND

The Roosevelt elk population in Unit 8 originated from a release of 8 animals near Litnik Bay on Afognak Island in 1929 (Batchelor 1965). The population was estimated at more than 200 elk by 1948, and the first hunt occurred in 1950. Hunting has been allowed annually since 1955. The population peaked at 1200–1500 by 1965, with 9 separate herds on Afognak Island and 1 herd on nearby Raspberry Island. A series of severe winters caused extensive mortality, reducing the population to an estimated 450 elk by 1972 (Burris and McKnight 1973). The herd recovered to near the previous high by the 1980s and has since undergone minor fluctuations correlated with winter severity.

Relative accessibility of each elk herd to hunters strongly influenced management strategies. In the 1960s many 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 that herd to hunting in 1968 (Alexander et al. 1968). Drawing permit hunts 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 1975 marked a new management era, with increased vulnerability of elk to hunting from logging road access and loss of security cover. By the mid-1980s shorter seasons were necessary in east-central Afognak Island where logging was concentrated. Beginning with the 1993–94 season, the road-accessible eastern and central part of Afognak Island was 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.

In 1999 the department initiated a cooperative research project with the Rocky Mountain Elk Foundation, Washington Division of Wildlife, and Olympic National Park. This project was designed to investigate the degree of genetic diversity between the Unit 8 elk and the parent herd in western Washington. Investigation of herd fidelity on Afognak and Raspberry Islands was another aspect of the project.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

Maintain a population of at least 1000 elk for use by all user groups.

METHODS

Each year we attempt to use 1 observer in a Piper PA-18 (Super Cub) aircraft to conduct an aerial composition count of each herd between July and September. Supplemental counts of

herds >50 animals are made from color print photographs taken during the survey. In August 1994, 1995, and 1996, we also conducted a composition count from the ground in the Raspberry Island herd.

We used helicopter darting techniques to capture 16 female elk on 23 and 24 June 1999, and we equipped them with radio collars (12 VHF and 4 GPS). We made 4–8 flights each year to relocate instrumented elk.

We collected data on harvest and hunting effort from mandatory hunting reports, from field checkstations and periodic monitoring of hunting activity by boat and aircraft. Antler measurements and genetic samples (ear tissue) were provided voluntarily by successful hunters and researchers in Unit 8 and western Washington.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Aerial composition surveys indicated a notable decrease in the elk population in 1999 (Table 1). The minimum population on Raspberry and Afognak Islands in 1999 was estimated at 880 elk, well below the 1220 elk minimum estimate in the previous 5 years. Among the 8 herds identified on Afognak Island, the Marka Lake and Afognak Lake herds were stable to slightly increasing, while all others declined. Much of the decline was attributable to severe winter conditions and delayed spring green-up in 1998/99. During that same period, an estimated 50% of the Sitka black-tailed deer in the unit succumbed to winter mortality.

Elk in the Raspberry Island and Malina Lake herds had the greatest declines, losing about 50% of the elk observed in 1996/97. Part of the decline could have been due to movement of some members of these herds to the adjacent Afognak Lake and Marka Lake herds. The Paramanof Peninsula herd, which declined precipitously after 1989 (Smith 1996), showed no sign of recovery, and we now assume that it has been incorporated into the Marka Lake herd.

The Tonki Cape herd has shown little or no growth despite complete protection for since 1993/94. It may be that bear predation and illegal harvest are sufficiently high to prevent this small herd from population growth.

Population Composition

Obtaining bull:cow ratios continued to be problematic during this reporting period. Aerial composition data are often suspect due to the difficulty distinguishing spike bulls in velvet from cows. The data we did collect indicated that the bull:cow ratios on Raspberry Island increased substantially in 1998/99 (Table 1).

Calf percentages in the population were 19% in 1999/2000, down from a 4-year average (1994/95–1997/98) of 23%. We did not conduct ground surveys on Raspberry Island during this reporting period.

Distribution and Movement

Distribution of the elk herds has been monitored by composition counts, hunter and logger reports, and by relocating radiocollared elk since 1986. There are at least 8 separate herds on Afognak Island and 1 herd on Raspberry Island. In July 1999 we had 24 active radio collars in the population, distributed among all of the herds except Tonki Cape.

Before 1998 the annual home ranges of most of the elk herds were relatively stable with little interchange between herds. Recent data indicate considerable mixing of herds and changes in traditional use areas during the winter and early spring. We suspect many of these changes are because of significant alteration to winter ranges by commercial logging operations and/or increased severity of winter/early spring weather. Hopefully recovery and analysis of movement data from the GPS collars deployed in 1999 will help in determining the extent and possible causes of these changes.

MORTALITY

Harvest

Seasons and Bag Limits. There were 2 open seasons for resident and nonresident hunters for Raspberry Island. During the 1 October to 22 October season, the bag limit was 1 bull elk by drawing permit only with up to 100 permits issued. During the 23 October–30 November season, the bag limit was 1 antlerless elk with up to 200 permits issued.

The open season for resident and nonresident hunters in that portion of Afognak Island west of Tonki Bay and west of a line from the head of Tonki Bay to Pillar Cape and south and east of a line from the head of Discoverer Bay to the head of Malina Bay and south of Malina Bay was 25 September–22 October; the bag limit was 1 elk by drawing permit, with up to 500 permits issued.

The open season for resident and nonresident hunters for the remainder of Unit 8 was 25 September–30 November; the bag limit was 1 elk by registration permit.

That portion of Afognak Island east of Tonki Bay and east of a line from the head of Tonki Bay to Pillar Cape was closed to elk hunting.

Board of Game Actions and Emergency Orders. In March 1997 the board made several changes to the elk seasons. Twenty-four days were added to the Afognak hunt by changing the opening date from 10 October to 25 September, eliminating the 1–4 November closure between drawing and registration hunts for southern Afognak and changing the closure date from 25 to 30 November. These modifications were based on department recommendations to increase the elk harvest to take advantage of increasing herd sizes. The board also changed the hunting regulations on the Seal Bay herd so that it was included in the northwest Afognak registration hunt. The Raspberry season was changed from 10 October to 25 November to 1 October–30 November. This change was used to add additional periods to the antlerless hunt, better distributing the hunting pressure and minimizing problems with too many hunters afield during the antlerless hunt.

We issued an emergency order, effective 22 October 1997, reducing the length of the registration hunt on south and east Afognak Island. Approximately 70% of the allowable harvest was taken in the drawing permit hunt, and it was anticipated that harvest would be excessive if the registration permit hunt continued to its scheduled November 30 closure.

Favorable elk distribution and improved access by a new logging road to the head of Paramanof Bay allowed hunters on northwest Afognak Island to reach the harvest quota a month before the scheduled end of the hunting season in 1998. In response to this success, the department issued an emergency order closing a portion of the registration hunt area (Afognak Island, north and west of a line from the head of Malina Bay to Delphin Point) on Thursday, October 22, 1998.

In 1998 the Federal Subsistence Board opened a subsistence elk hunt from 1–25 September on Kodiak National Wildlife Refuge lands on northwestern Afognak, within the traditional range of the Waterfall elk herd. In 1999 the season was liberalized to extend through 30 November. Hunters were limited to Unit 8 residents, and access was limited to marine waters only.

Hunter Harvest. The annual elk harvest increased in each of the past 5 years from a low of 85 elk in 1994/95 to 181 elk in 1998/99 (Table 2). Recent annual harvests remained well below the peak of 206 elk killed in 1989/90. The percent bulls in the harvest declined to 52% in 1998/99 from a 59% average for the previous 5 years (Table 2). Smith (1996) noted the proportion of bulls in the harvest was in a declining trend before 1992/93, and Smith and Van Daele (1998) noted an increase in the bull proportion from 1992/93 to 1994/95. The distribution of the elk harvest among the individual hunts varied considerably from one year to the next, reflecting the vagaries in weather, access options, and elk distribution.

Permit Hunts. The number of drawing permits available for the Raspberry Island and south and east Afognak Island elk hunts remained constant during this reporting period at 146 and 500, respectively (Table 2). The number of registration permits, which were valid for both north Afognak and the late season in south and east Afognak, increased to 593 in 1998/99 from an average of 458 in the previous 5 years.

Hunter Residency and Success. Average hunter success was 29% in 1997/98 and 31% in 1998/99 (Table 3). Residents of Unit 8 accounted for an average of 51% of the hunters afield from 1994/95 to 1998/99, and they consistently harvested more elk than other Alaskan residents and nonresidents combined. The number of hunters in the field increased to 622 in 1998/99 from an average of 491 in the previous 5 years.

Harvest Chronology. Lengthening the elk season to include the last week of September and first 10 days of October dramatically altered the harvest chronology patterns. Previously, harvest was highest in the last 2 weeks of October for all 3 areas in most years (Table 4). After the change, most of the elk were harvested in the first 20 days of the season.

Transportation Methods. Aircraft and boats are the predominate methods of transportation for elk hunters in Unit 8. (Table 5). Use of highway vehicles is dependent on the level of logging activity and the vehicle-use policies of landowners and the logging companies. An increase in 4-wheeler activity on Raspberry Island prompted local residents to propose a ban on their use on that island. The Board of Game failed to adopt the proposal during their March 1999 meeting but

requested the Kodiak Advisory Committee develop a task force to investigate the concerns and possible solutions.

Other Mortality

Five radiocollared female elk died, and 3 radios ceased functioning during this reporting period. Reasons for the mortalities were undetermined, but 1 carcass was found in a bear cache near the logging camp on Kazakof Bay. Hunters killed 2 additional radiocollared females in the fall of 1999. The decreasing trend in elk numbers indicates that overwinter mortality has been heavy the past 2 years.

HABITAT

Assessment

Commercial logging of Sitka spruce (*Picea sitchensis*) on Afognak Island continued to extend to new areas. Logging operations in the Waterfall Bay, Marka Lake, Laura Lake and eastern Izhut Bay areas during this reporting period enhanced road access to the Marka Lake, Seal Bay, and Waterfall elk herds. The department continued to review timber harvest plans that private timber owners are required to submit to the 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 land managers have expressed a desire to work with the department to investigate long-term effects of logging on elk habitat on Afognak Island and develop cost-effective methods to improve the quality of elk habitat.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

Increasing vulnerability of elk is the major management concern in Unit 8 because of logging and road construction. Hunters' efficiency in harvesting elk in logged drainages continued to increase, requiring close monitoring and frequent in-season closures for individual herds.

Genetic diversity has been a lingering concern for both hunters and managers of Unit 8 elk. Notably small, and often broken, antlers were cited as possible byproducts of inbreeding. Preliminary analysis of antler measurements seems to confirm that Unit 8 elk do have significantly smaller antlers than elk in the parent herd in western Washington. However, preliminary analysis of genetic data indicates that the Unit 8 elk are at least as genetically diverse as those sampled from the parent herd. This indicates that inbreeding may not be a serious concern, and that some other agent may cause antler abnormalities. We will continue to analyze these data and publish the results as soon as possible. We will also consider investigating the role of nutrient and mineral availability in antler development on Raspberry and Afognak Islands.

CONCLUSIONS AND RECOMMENDATIONS

Throughout most of the 1990s, the elk population in Unit 8 continued to increase and reached a minimum of 1400 elk. Survey data were lacking in 1998, but anecdotal evidence suggested that winter mortality during 1997/98 curtailed that increasing trend. The winter of 1998/99 had obvious detrimental effects on the population; by fall of 1999 the minimum population was down to 880 elk. The Malina Lake and the Raspberry Island herds had the most dramatic declines, probably due to winter mortality and emigration. The harvest continually increased from a low of

85 elk in 1994/95 to 181 elk in 1998/99. The percent bulls in the harvest has exceeded 50% for each of the past 5 years. The change from a 10 October to a 25 September opening date was effective in better distributing the harvest and reaching harvest objectives.

Steadily improving access by an enlarging logging road system will continue to be a major consideration on Afognak. Although hunters tended to cluster near the most accessible elk herds adjacent to the road system and in the southwestern Afognak Island area, the current regulatory system continued to allow managers adequate flexibility in responding to population changes and harvest of individual herds. As road access improves, smaller management areas will be required to assure that population objectives for each herd are met. Logging roads now transect or border the ranges of all of the Afognak Island elk herds except the outer Tonki Cape herd. The Marka Lake, Waterfall, Duck Mountain, and Portage Lake elk herds have become increasingly vulnerable to hunting because of increased road access and reduced cover. It is likely that those herds will soon have to be regulated exclusively by drawing permits.

Elk hunters were affected by the imposition of land-use fees on Afognak Island in August 1999. Many hunters were upset that the department did not warn them of the fees before distributing drawing hunt applications. There was also some confusion about landownership and public access easements. We worked with our Habitat Division in Anchorage and with the Afognak Native Corporation to produce a map for hunters. We intend to continue our discussions with the Native Corporations this winter to clarify land-use issues and inform hunters prior to the 2000-01 season.

Elk management will be further complicated by the Federal Subsistence Board's action establishing elk as a customary and traditional resource for all residents of the Kodiak archipelago. We can anticipate liberalized seasons on the Waterfall Lake herd, which seasonally occupies portions of the Kodiak National Wildlife Refuge. Close coordination with Refuge staff and with the Federal Regional Council will be necessary to prevent overharvest.

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Table 1 Unit 8 summer aerial elk composition counts and estimated population by herd, 1994/95–1999/2000

Herd	Regulatory Year	Bulls	Cows	Calves (%)	Bulls: 100 Cows	Calves: 100 Cows	Elk Observed	Estimated Population
Raspberry Island	1994/95	19	99	40 (25)	19	40	158	150-160
	1995/96	25	120	47 (25)	21	39	192	190-200
	1996/97	42	138	27 (13)	30	20	207	210-220
	1997/98	22	96	44 (27)	23	46	162	210-220
	1998/99	17	87	-- --	20	--	104	210-220
	1999/2000	20	37	21 (27)	54	57	78	80-100
Seal Bay	1994/95	6	45	11 (18)	12	22	62	135-150
	1995/96	9	14	2 (8)	64	14	25	140-160
	1996/97	--	--	-- --	--	--	--	170-180
	1997/98	--	--	-- --	--	--	--	170-180
	1998/99	--	--	-- --	--	--	--	170-180
	1999/2000	--	34 ^a	3 (8)	--	--	37	90-110
Duck Mt.	1994/95	0	60	27 (31)	--	45	87	105-125
	1995/96	2	54	17 (23)	4	31	73	120-130
	1996/97	--	--	8 (24)	--	--	33	130-140
	1997/98	2	--	-- --	--	--	2	130-140
	1998/99	--	--	-- --	--	--	--	130-140
	1999/2000	--	--	-- --	--	--	--	90-110
Portage Lake	1994/95	1	50	6 (11)	2	12	57	70-80
	1995/96	--	--	-- --	--	--	--	65-75
	1996/97	3	55	17 (23)	5	31	75	75-85
	1997/98	--	--	-- --	--	--	--	75-85
	1998/99	--	--	-- --	--	--	--	75-85
	1999/2000	--	30 ^a	9 (23)	--	--	39	60-80
Marka Lake	1994/95	5	36	7 (15)	14	19	48	80-85
	1995/96	3	81	24 (22)	4	30	108	110-120
	1996/97	--	--	17 (22)	--	--	78	120-130
	1997/98	--	--	-- --	--	--	--	120-130
	1998/99	--	--	-- --	--	--	--	120-130
	1999/2000	--	93 ^a	6 (6)	--	--	99	120-130

Table 1 Continued

Herd	Regulatory Year	Bulls	Cows	Calves (%)	Bulls: 100 Cows	Calves: 100 Cows	Elk Observed	Estimated Population
Malina Lake	1994/95 ^b	0	218	64 (23)	0	23	282	285-325
	1995/96	14	205	79 (27)	7	39	298	290-310
	1996/97	4	259	64 (20)	2	25	327	335-345
	1997/98	12	221	65 (22)	5	29	298	335-345
	1998/99	--	--	-- (--)	--	--	--	335-345
	1999/2000	--	136 ^a	19 (12)	--	--	155	160-180
Afognak Lake	1994/95 ^b	0	46	9 (16)	0	20	55	----
	1995/96	2	83	20 (19)	2	24	105	110-120
	1996/97	--	--	-- (--)	--	--	--	125-135
	1997/98	4	--	-- (--)	--	--	4	125-135
	1998/99	--	--	-- (--)	--	--	--	125-135
	1999/2000	--	71 ^a	30 (30)	--	--	101	130-150
Waterfall Lake	1994/95	5	77	23 (22)	6	30	105	135-140
	1995/96	12	122	26 (16)	9	21	160	165-175
	1996/97	7	79	31 (26)	9	39	117	175-185
	1997/98	2	110	35 (22)	2	32	147	175-185
	1998/99	--	--	-- (--)	--	--	--	175-185
	1999/2000	--	64 ^a	22 (34)	--	--	86	130-170
Tonki Cape	1994/95	0	0	0 (--)	--	--	0	20-30
	1995/96	1	27	6 (18)	4	22	34	30-40
	1996/97	1	23	4 (14)	4	17	28	30-40
	1997/98	2	21	6 (21)	10	29	29	30-40
	1998/99	--	--	-- (--)	--	--	--	30-40
	1999/2000	--	--	-- --	--	--	--	20-30
Total all herds	1994/95	36	585	178 (22)	6	30	799	950-1100
	1995/96	75	715	221 (22)	10	31	1011	1250-1300
	1996/97	57	554	168 (22)	10	30	779	1300-1400
	1997/98	53	498	174 (24)	11	35	725	1300-1400
	1998/99	17	87	-- (--)	20	--	104	1300-1400
	1999/2000	--	485	110 (19)	--	--	595	880-1060

^a Includes all adults, not differentiated by sex.^b Afognak Lake delineated as a separate herd.

Table 2 Unit 8 elk harvest data by permit hunt, 1994/95–1998/99

Hunt Area/No.	Regulatory Year	Permits issued	Percent did not hunt	Percent unsuccessful hunters	Percent successful hunters	Bulls (%)	Cows (%)	Unk.	Illegal unreported	Total harvest
Raspberry Is.	1994/95	90	42	73	27	10 (71)	4 (29)	0	0	14
(Drawing Hunt	1995/96	73	52	69	31	4 (36)	7 (64)	0	0	11
No. 702-709)	1996/97	195	56	63	37	12 (39)	19 (61)	0	0	31
	1997/98	146	47	62	38	8 (28)	21 (72)	0	0	29
	1998/99	146	45	60	40	10 (39)	22 (61)	0	0	32
South and East	1994/95	335	52	68	32	36 (69)	16 (31)	0	0	52
Afognak Is.	1995/96	335	44	68	32	39 (66)	20 (34)	0	0	59
(Drawing Hunt	1996/97	450	52	67	33	44 (63)	26 (37)	0	0	70
712,714,716,718)	1997/98	500	49	61	39	59 (60)	39 (40)	0	0	98
	1998/99	500	54	69	31	28 (42)	39 (58)	0	0	67
South and East	1994/95	434	--	88	12	4 (50)	4 (50)	0	0	8
Afognak Is.	1995/96	403	--	87	13	8 (47)	8 (47)	1	0	17
(Registration Hunt	1996/97	513	--	88	12	12 (52)	11 (48)	0	0	23
No. 753)	1997/98	549	--	93	7	4 (67)	2 (33)	0	0	6
	1998/99	593	--	83	17	21 (58)	15 (42)	0	0	36
North Afognak Is.	1994/95	434	--	87	13	8 (73)	3 (27)	0	0	11
(Registration Hunt	1995/96	403	--	87	13	5 (56)	4 (44)	0	0	9
No. 754)	1996/97	513	--	91	9	9 (82)	2 (18)	0	0	11
	1997/98	549	--	73	27	31 (72)	12 (28)	0	0	43
	1998/99	593	--	62	38	36 (78)	10 (22)	0	0	46
Total all hunts	1994/95	859	57	77	23	58 (68)	27 (32)	0	0	85
	1995/96	811	47	75	25	56 (58)	39 (41)	1	0	96
	1996/97	1158	47	77	23	77 (57)	58 (43)	0	0	135
	1997/98	1209	51	69	31	101 (58)	73 (42)	0	0	174
	1998/99	1239	47	77	23	95 (52)	86 (48)	0	0	181

Table 3 Unit 8 elk hunter residency and success, 1994/95–1998/99

Regulatory Year	Successful					Unsuccessful					Total hunters ^b
	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	Local ^a resident	Nonlocal resident	Nonresident	Total	(%)	
1994/95	59	24	2	85	(22)	142	146	7	298	(78)	383
1995/96	66	29	1	96	(23)	156	150	12	320	(77)	416
1996/97	73	55	7	135	(23)	241	198	25	465	(78)	600
1997/98	107	63	6	176	(31)	168	203	20	391	(69)	567
1998/99	97	78	6	181	(29)	204	218	19	441	(71)	622

^a Local means resident of Unit 8.

^b Hunters participating in more than one permit hunt were tallied for each hunt

Table 4 Unit 8 elk harvest chronology percent by 10-day period, 1994/95–1998/99

Area	Regulatory Year	Harvest periods by percentages							n
		21–30 Sep	1–10 Oct	11–20 Oct	21–31 Oct	1–10 Nov	11–20 Nov	21–30 Nov	
Raspberry Island	1994/95	--	--	2 (14)	6 (43)	5 (36)	1 (7)	--	14
	1995/96 ^a	--	--	2 (18)	2 (18)	2 (18)	55 (45)	--	11
	1996/97	--	--	5 (16)	5 (16)	12 (39)	8 (26)	1 (3)	31
	1997/98	--	7 (24)	--	3 (10)	7 (24)	11 (38)	1 (3)	29
	1998/99	--	8 (25)	2 (6)	3 (9)	7 (22)	7 (22)	5 (16)	32
South & East	1994/95	--	--	20 (33)	33 (55)	5 (8)	2 (4)	--	60
	1995/96 ^a	--	--	21 (28)	46 (61)	6 (8)	3 (4)	--	76
	1996/97	--	--	59 (63)	29 (31)	5 (5)	--	--	93
	1997/98	26 (25)	52 (50)	19 (18)	7 (7)	--	--	--	104
	1998/99	14 (14)	35 (34)	16 (16)	13 (13)	14 (14)	3 (3)	8 (8)	103
North Afognak Island	1994/95	--	--	3 (27)	4 (36)	3 (27)	1 (10)	--	11
	1995/96 ^a	--	--	4 (44)	5 (56)	--	--	--	9
	1996/97	--	3 (27)	1 (1)	4 (36)	3 (27)	--	--	11
	1997/98	7 (16)	12 (28)	6 (14)	9 (21)	4 (9)	5 (12)	--	43
	1998/99	18 (39)	17 (37)	7 (15)	2 (4)	--	2 (4)	--	46

^a 1995–96 harvest chronology extrapolated

Table 5 Unit 8 elk harvest percent by transport method, 1994/95–1998/99

Regulatory Year	Airplane	Horse	Boat	ORV	Highway vehicle	Unknown	<i>n</i>
1994/95	24 (31)	0	30 (38)	1 (1)	24 (31)	0 0	78
1995/96	31 (32)	0	35 (36)	0 (–)	30 (31)	1 (1)	97
1996/97	44 (33)	0	56 (42)	2 (2)	33 (24)	0 (–)	135
1997/98	68 (39)	0	70 (40)	2 (1)	36 (20)	0 (–)	176
1998/99	82 (45)	0	65 (36)	1 (1)	31 (17)	1 (1)	181

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. Seventy-five percent of the funds for this report are from Federal Aid.



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