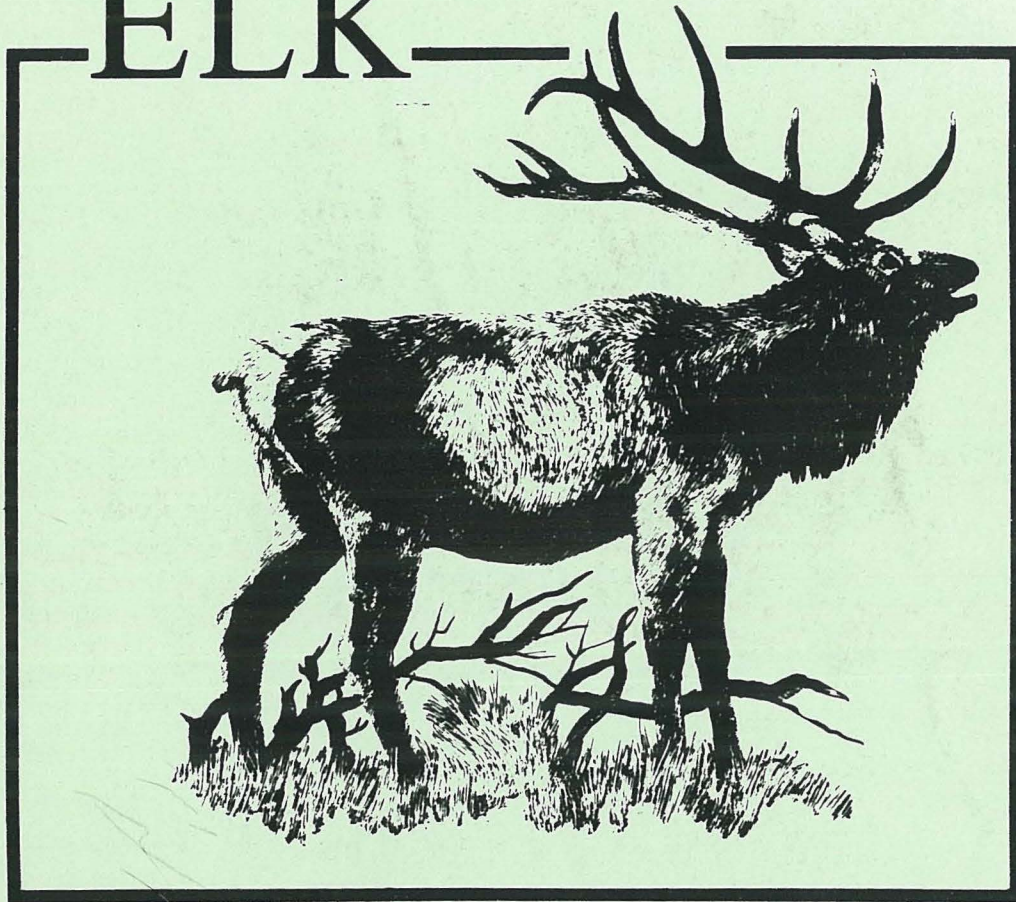


Alaska Department of Fish and Game
Division of Wildlife Conservation
Federal Aid in Wildlife Restoration
Annual Report of Survey-Inventory Activities
1 July 1988-30 June 1989

—ELK—



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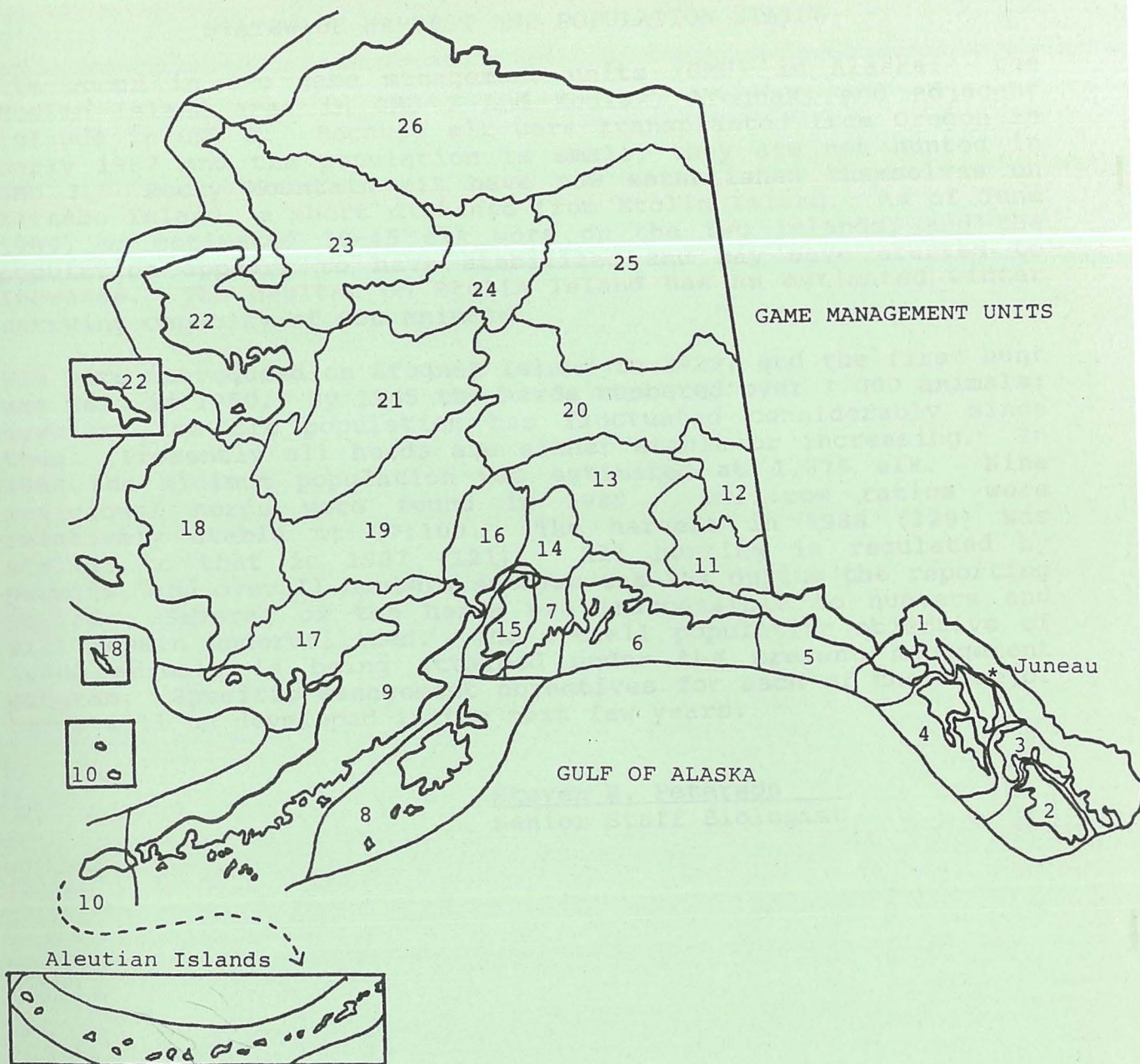
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ARCTIC OCEAN



STATEWIDE HARVEST AND POPULATION STATUS

Elk occur in two game management units (GMU) in Alaska: the Etolin Island area in GMU 3 and Kodiak, Afognak, and adjacent islands in GMU 8. Because elk were transplanted from Oregon in early 1987 and the population is small, they are not hunted in GMU 3. Rocky Mountain elk have now established themselves on Zarembo Island, a short distance from Etolin Island. As of June 1989, an estimated 30-45 elk were on the two islands, and the population appears to have stabilized and may have started to increase. The habitat on Etolin Island has an estimated winter carrying capacity of 900 animals.

Elk were introduced on Afognak Island in 1929, and the first hunt was held in 1950. By 1965 the herds numbered over 1,000 animals; however, the elk population has fluctuated considerably since then. Presently all herds are either stable or increasing. In 1988 the minimum population was estimated at 1,375 elk. Nine individual herds were found in 1989. Bull:cow ratios were relatively stable at 17:100. The harvest in 1988 (129) was similar to that in 1987 (121). All hunting is regulated by permits, and overall hunters success was 25% during the reporting period. Several of the herds are inaccessible to hunters and will remain underutilized. The overall population objective of 1,000 animals is being attained under the present management program. Specific management objectives for each of the 6 major herds will be developed in the next few years.

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STUDY AREA

GAME MANAGEMENT UNIT: 3 (3,600 mi²)

GEOGRAPHICAL DESCRIPTION: Islands of the Petersburg, Wrangell, and Kake areas

BACKGROUND

Elk 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 previous introductions failed, but lack of monitoring precluded determining the cause of failure.

In 1927 six Roosevelt elk calves were released on Kruzof Island near Sitka. One calf died, and the remaining five were returned to Sitka and held over the winter. In April they were returned to Kruzof, where one female was later mistakenly shot for a deer. The Alaska Game Commission reported that "from the very first these animals have shown a tendency to wander and to break up into small groups, until it is impossible to secure an accurate check on them" (Burris and McKnight 1973).

In June 1962 the U.S. Forest Service (USFS) and the Alaska Department of Fish and Game (ADF&G) cooperatively attempted to introduce elk onto Gravina Island near Ketchikan. A group of 11 calves was captured on Afognak and Raspberry Islands and moved to Gravina Island, where the elk were penned. Eight survivors were released after about 3 months of captivity. These hand-reared calves were subsequently shot by a homesteader for repeated damage to his garden (Burris and McKnight 1973).

A bill was introduced and passed during the 1985 state legislative session directing the Department to transplant not less than 30 nor more than 150 Roosevelt elk onto Zarembo Island or another suitable location in Southeast Alaska. A companion bill appropriated \$50,000 for this project (ADF&G 1985). An Environmental Assessment (EA) was required, because all potential release sites were in the Tongass National Forest. The EA process required public hearings that were held in several communities in Southeast Alaska in 1985. An interagency task force consisting of ADF&G and USFS biologists assessed the biological implications of the project. Etolin Island was chosen as the release site after careful consideration of 9 evaluation criteria (Young 1986).

Elk from Alaska were specifically excluded by the bill as a source for the transplant, so other sources were sought. The Oregon Department of Fish and Wildlife (ODFW) offered to trade 30 Roosevelt elk for 15 mountain goats. After this trade had been completed, additional elk were made available by Oregon in a complex trade arrangement involving other states.

Starting in January 1987, a total of 50 elk were moved from Oregon to Etolin Island and released (Table 1). The elk were moved in 3 shipments; the last release was completed on 15 March 1987. Thirty-three Roosevelt elk, in 2 shipments from the Jewel Meadows Elk Refuge, were released on southern Etolin Island at Dewey Anchorage. This fulfilled the requirements of the State law. Each animal was fitted with a wide, yellow visual collar that had a black identifying number or letter code; 15 were also fitted with a radio collar.

The 3rd shipment of 17 Rocky Mountain elk was moved from eastern Oregon and released at a site on the northwest side of Etolin Island. Rocky Mountain elk were used, because additional Roosevelt elk had not been available. The release site was just north of Johnson Cove and inside Marsh Island. Thirteen of these were fitted with radio collars, and all had blue visual collars with contrasting yellow number or letter codes to provide individual identification.

The radio transmitters in both groups were equipped with a sensor that changed the transmission rate from approximately 75 to 140 pulses per minute if the radio remained stationary for 6 or more hours. This normally means the animal is dead.

During the 1.5 years following the releases, 52 aerial radio-telemetry surveys were conducted to determine individual locations, monitor individual and group movements, and locate dead elk. Precise locations were made for elk transmitting radio signals in the "mortality mode". A thorough investigation of each mortality was made when possible. A cooperative ADFG and USFS field project was conducted during June 1988 to determine the feasibility of using ground surveillance to assess sex and age composition.

The elk population declined until approximately May 1988. Less than half of the transplanted animals survived until June 1988. Although the mortality rate declined after August 1987, there was still a net loss; i.e., fewer elk appeared to survive in June 1988 than the number released.

The June 1988 ground survey located 9 adult Roosevelt elk and 3 yearlings; 2 additional adult bulls were subsequently observed. As of June 1988, there were at least 11 elk surviving from the introduction and 3 surviving young were born on the island in 1987. Elk without collars were considered to have been born on the island, because their size and body conformation indicated they were yearlings. A subsequent helicopter survey to locate a dead bull indicated there may be 3 or 4 more elk than had been located in the June survey.

Of the 17 Rocky Mountain elk released, only six were located in the June 1988 survey. No unidentified elk were seen. Four of the 17 radio-collared elk were alive at that time.

As of June 1988, the minimum combined elk population was 20, of which 17 were from the original introduction. This means that at least 34% of the Oregon animals survived the first 18 months after the introduction.

The June 1988 ground survey of the Roosevelt elk herd located 2 adult males, 2 yearling males, 6 adult females, and 1 yearling female. Another adult female was located on the southeast side of Etolin Island by radio, but it was not seen. A private pilot photographed this cow with 2 adult bulls in late June 1988, and all three had collars, indicating they were from the introduction. It is highly improbable that the 2 adult males were from the group of 8 adults that had been observed on the west side of Etolin Island the previous week. This radio-collared female moved from the release site shortly after the release and has since been located in the vicinity where photographed.

Of the 6 Rocky Mountain elk located during the June 1988 survey, there was 1 adult bull and 5 adult cows; all were transplanted animals. Although two of the radio-collared cows had been radio-located, they were not observed. No tracks or other evidence indicated any more Rocky Mountain elk had been born on the island.

All the Roosevelt elk were released on the beach at the southern end of Etolin Island near Dewey Anchorage. Radio locations showed a gradual move by one cow. She settled on Brownson Island, which is narrowly separated from Etolin Island by Canoe Pass, about eight miles east of the release site. The July photograph discussed above showed that at least 2 bulls were with her.

Radio and visual locations indicated that the rest of the Roosevelt herd moved northwest to the area of McHenry Anchorage, about 4-5 miles from the release site. Except for 1 instance, the Rocky Mountain elk have always been located within 4 miles of the spot where they were released.

POPULATION OBJECTIVES

There are no Federal Aid objectives for elk in Unit 3. The Etolin Island winter carrying capacity has been estimated to be approximately 900 elk (ADF&G 1985). Clearcut logging is scheduled to continue, and this is expected to reduce the carrying capacity. As several decades may be required for the elk population to reach carrying capacity, the Division's current objective is to provide total protection for maximum population growth. A bulls-only season would be initiated when the population reached approximately 250 animals, and a post-harvesting ratio of 25-30 bulls : 100 cows would be maintained (ADF&G 1985).

METHODS

Five aerial radiotelemetry surveys were flown to determine individual elk locations and monitor individual and group movements. Reports from fishermen, loggers, and other members of the public were recorded. An on-the-ground survey to monitor calf production and survival was planned for July 1989.

RESULTS AND DISCUSSION

Population Status and Trend

No natural mortality was noted during the 1988-89 reporting period. The last known natural mortality occurred in May 1988. Based on the radiotelemetry data and reports from the public, it appears that the population has stabilized, and perhaps it has begun to increase slightly.

Rocky Mountain elk have now established themselves on Zarembo Island. Radiotelemetry data indicated there were 2 adult cows on the island. One fisherman reported watching a 5-point bull for an extended time on Zarembo Island. The bull did not have a collar, indicating it was not one of the elk originally animals released. Repeated sightings of the 2 cows with the 2 calves indicates total population of five on this island. One unconfirmed report of a spike bull was also received.

Population Size:

The best available estimate as of 30 June 1989, indicates a total population of between 30 and 45 elk. This estimate includes the five currently known to be on Zarembo.

Population Composition:

Automatic cameras placed by members of the public recorded calves of the year, but total numbers could not be determined. Ten of the original cows released have functioning radio collars and are alive. Reports from the public of bulls observed at several locations indicate that some of the calves born on the island have survived. Presumably, all elk without visual collars have been born since the introduction. No quantitative data are available.

Distribution and Movements:

There has been a gradual dispersal away from the release site by most of the Roosevelt elk. Radio locations show that the Roosevelt elk utilize lower-elevation areas (i.e., the beach to about 800 feet) from the release site at Dewey Anchorage north and west to McHenry Inlet. The one cow that moved east to Brownson Island is gradually shifting to the north; it was last

observed at the north end of Brownson Island. No other major shifts by the Roosevelt elk have been noted.

After remaining close to the release site during the 1st year and a half, the Rocky Mountain elk have dispersed widely. One group of five was observed regularly at the fish hatchery located on the east shore of Burnett Inlet, about 10 airline miles east of the release site. Two cows and at least 1 bull moved from Etolin to Zarembo Islands, involving a swim across at least 2 miles of salt water. These 2 cows have wandered over most of the island but now appear to be staying close to the center of the island (Fig. 1).

For both subspecies, the beach fringe area is the preferred habitat in the spring and early summer. Later in the summer and fall, they range farther from the beach, although they have not been found above an estimated elevation of 800 feet. They again move to the lower elevation and appear to stay close to the beach in winter.

Mortality

Season and Bag Limit:

There is no open season.

Human-induced Mortality:

The only known mortality was 2 Roosevelt bulls that had moved from the release site to Brownson Island. These bulls were killed by a poacher in early December.

Natural Mortality:

No natural mortality was recorded for the reporting period. The last known natural death occurred in May 1988 (Table 2).

Habitat Assessment

The winter carrying capacity of Etolin Island has been estimated to be approximately 900 elk. Winter range consists of the following: clearcut, 2 mi²; second growth, 2.2 mi²; nonforest or noncommercial forest, 72.9 mi²; old-growth forest, 124.4 mi² (ADF&G 1985). To date, the elk have remained close to the shoreline and are concentrating on mixed grass and sedge areas just above the high tide line. This area includes the spruce-hemlock forest and associated shrubby understory.

On Zarembo Island the elk have often been observed in close association to the logging clearcuts. During the winter the radiolocations were close to the shoreline, but then they moved to near the center of the island in the early summer. Those Rocky Mountain elk still on Etolin Island have not moved into the logged area to the east of the release site.

CONCLUSIONS AND RECOMMENDATIONS

The population now appears to have stabilized and may have actually started to increase. The survival of the radio-equipped animals during this period is encouraging. Continued monitoring by radio and on the ground is essential. Should nonlethal predator management become feasible, it should be utilized for the few years necessary to allow the elk to become fully established. Additional Roosevelt elk from the original source would also hasten the buildup of the herd, even with the inevitable high early mortality.

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Table 1. Unit 3 Elk population as introduced, 1987.

	Sex	Adult	Sub-adult	Total	W/radio	Release date	Release site
<u>C. e. roosevelti</u>	Male	2	7	9	3	01/19/87	Dewey Anchorage
	Female	11	1	12	7		
	Subtotal	13	8	21	10		
	Male	0	0	0	0	02/03/87	Dewey Anchorage
	Female	12	0	12	5		
	Subtotal	12	0	12	5		
<u>C. e. nelsoni</u>	Male	0	5	5	2	03/15/87	North of Johnson Cove
	Female	7	5	12	11		
	Subtotal	7	10	17	13		
Combined Total		32	18	50	28		

Table 2. Unit 3 elk mortality, 19 January 1987 - 30 June 1988.

Date ¹	Subspecies	Sex	Age ²	No. Days ³	Cause of Death
03/10/87	<u>C. e. roosevelti</u>	F	Adult	36	Eaten by wolves ⁴
03/10/87	<u>C. e. roosevelti</u>	F	Adult	51	Twisted gut
03/12/87	<u>C. e. roosevelti</u>	F	Adult	38	Wolf kill
03/26/87	<u>C. e. nelsoni</u>	F	Calf	11	Accident ⁵
03/27/87	<u>C. e. roosevelti</u>	F	Adult	53	Accident ⁶
04/08/87	<u>C. e. nelsoni</u>	M	Calf	24	Malnutrition
04/08/87	<u>C. e. nelsoni</u>	F	Calf	24	Eaten by bear
04/18/87	<u>C. e. roosevelti</u>	F	Adult	90	Eaten by wolves ⁴
05/12/87	<u>C. e. roosevelti</u>	M	Sub-adult	114	Wolf kill
06/03/87	<u>C. e. nelsoni</u>	F	Adult	106	Malnutrition
06/30/87	<u>C. e. nelsoni</u>	F	Calf	106	Wolf kill
07/17/87	<u>C. e. roosevelti</u>	F	Adult	163	Eaten by wolves ⁴
07/18/87	<u>C. e. nelsoni</u>	F	Adult	124	Accident ⁷
07/27/87	<u>C. e. nelsoni</u>	M	Sub-adult	133	Unknown ⁴
08/03/87	<u>C. e. nelsoni</u>	F	Sub-adult	140	Unknown
08/10/87	<u>C. e. nelsoni</u>	F	Adult	147	Unknown
02/07/88	<u>C. e. roosevelti</u>	M	Sub-adult	385	Unknown ⁸
04/06/88	<u>C. e. roosevelti</u>	M	Adult	444	Wolf kill

Notes:

1. Approximate date of death
2. Estimated age
3. Number of days from release to death
4. Probable wolf kill
5. Fall from cliff, broken neck
6. Entangled in woody debris in creek
7. Collision with log, broken neck
8. Radio signal missing

STUDY AREA

GAME MANAGEMENT UNIT: 8 (8,750 mi²)

GEOGRAPHICAL DESCRIPTION: Kodiak, Afognak, and adjacent islands

BACKGROUND

The history of the introduction and recent management of elk in Unit 8 was previously discussed by Smith (1988). The population was estimated at a minimum of 1375 elk in 1988, nearly a historic high. The annual harvests within the past 5 years have ranged from 271 elk in 1984 to 120 elk in 1987. Hunter demand usually exceeds the harvestable surplus, except on northwestern Afognak where access is relatively difficult. Commercial logging and subsequent habitat modification on Afognak have important implications for long-term elk management. Little is known about the relationship of forest regeneration to elk population status on Afognak and nearby islands.

POPULATION OBJECTIVES

To maintain a minimum population of at least 1,000 elk for all user groups. Maintain harvests of elk within sustainable-yield levels of the elk population.

METHODS

Aerial sex and age composition counts were conducted in July and August on Afognak and Raspberry Islands. Periodic relocations of radio-collared elk provided information on movements and seasonal habitat use. Harvest statistics were compiled from mandatory harvest reports. Lower jaws from harvested elk were collected for aging. A field check station and periodic flights were used to monitor hunting activity.

RESULTS AND DISCUSSION

Population Status and Trend

The elk population has been increasing since the early 1970's.

Population Size:

Summer sex and age composition counts provided an index to the sizes of elk herds. The preseason population was estimated at 1,375-1,580 elk (Table 1), an increase from the 1,175-1,415 elk estimated in the previous reporting period.

Population Composition:

Aerial composition surveys were conducted for 14.3 hours in July and August 1988. The overall calf:cow ratio was 26:100 in 1988, nearly identical to that recorded in 1987 but well below the ratios for 1984-86 (Table 2). Eastern Afognak Island (Hunt No. 750) had the highest calf:cow ratio (34:100), and northwestern Afognak Island (Hunt No. 752) had the lowest calf:cow ratio (17:100).

The ratio of 17 bulls:100 cows recorded in 1988 was closely comparable to that of previous years (Table 2). Because bulls are often in small isolated groups until the September rut, they were probably underrepresented in the July and August surveys.

Distribution and Movements:

A minimum of 9 individual elk herds were found in 1989: eight on Afognak Island and one on Raspberry Island. Aerial telemetry of 7 adult female elk captured in 1986 indicated that 4 herds inhabit eastern Afognak Island. Three of the 4 herds on eastern Afognak Island occur in drainages where extensive logging has occurred since 1975. There are at least 5 separate elk herds on Afognak Island west of Kazakof and Discoverer Bays.

Mortality

Seasons and Bag Limit:

The open season for resident and nonresident hunters on Raspberry Island is 1 October to 15 November. The bag limit is 1 elk by drawing permit only. Up to 300 permits will be issued. The open season for resident and nonresident hunters on that portion of Afognak Island west and south of a line from the head of Malina Bay to the head of Back Bay is 1 October to 15 November. The bag limit is 1 elk by drawing permit only; up to 325 permits will be issued.

The open season for resident and nonresident hunters in that portion of Afognak Island northeast of a line from the head of Kozok Bay to Delphin Point in Perenosa Bay is 15 September to 31 October. The bag limit is 1 elk by registration permit only. The open season for the remainder of Unit 8 is 1 September to 15 December. The bag limit is 1 elk by registration permit only.

Human-induced Mortality:

The 1988 harvest was 129 elk, similar to the 121 elk killed the previous season (Table 3). Bulls were 72% of the known-sex harvest in 1988, an increase from 61% in 1987.

Harvests increased in 2 hunting areas (eastern Afognak and southwestern Afognak Island) and declined in 2 areas (Raspberry and northwestern Afognak Islands) (Table 4). The incidence of

yearling elk jaws declined from 38% (22/58) in 1987 to 29% (20/69) in 1988.

Hunter Residency and Success. Local residents took 50% of the harvest in 1988, compared with 52% in 1987 (Table 5). Overall hunter success was 25%, lower than the 27% success rate recorded in 1987. Hunter success was highest in southwestern Afognak (34%) and lowest in eastern Afognak (18%) (Table 4).

Harvest Chronology. October was the peak harvest month, with 72% of the total reported harvest (Table 6). On Raspberry Island the harvest ranged from 2 to 10 elk for each of the 6 to 10 day hunting periods.

Permit Hunts. All elk hunting in Unit 8 was regulated by permit. Drawing hunts were administered for Raspberry and southwestern Afognak Islands. Eastern Afognak and northwestern Afognak were managed by registration permit hunts. The number of permits issued increased from 1210 in 1987 to 1267 in 1988. The number of hunters afield increased from 417 in 1987 to 498 in 1988, but it remained below the record of 620 hunters afield in 1986.

Transport Methods. Aircraft (57%) and boats (40%) were the predominant methods used for transportation by successful elk hunters in 1988 (Table 7).

Natural Mortality:

Natural mortality was apparently low during the reporting period. The composition count sample in 1988 was the largest recorded during the past 5 years (Table 3). The estimated minimum population increased from 1175 in 1987 to 1375 in 1988.

Habitat Assessment

Data on slope, aspect, elevation and vegetation type for approximately 100 relocations of 7 radio-collared elk have been collected since 1986. Preliminary analysis of those data indicates that elk favor mature spruce over other habitat types. Active logging, including mature spruce, continued on eastern Afognak Island. The long-term impacts of logging on elk is a relationship that has not been adequately studied in Unit 8.

Game Board Action and Emergency Orders

Regulatory actions on elk prior to 1988 were previously reviewed by Smith (1987). The Department staff recommended more liberal hunting regulations for the southwestern and eastern Afognak Island hunts for 1989. The Board of Game responded by adopting a regulation that added 1 month to the season on eastern Afognak Island. Elk numbers in this hunt area continued their recovery from an apparent decline in the early 1980's. The Board also adopted a regulation for southwestern Afognak Island, allowing the combination of a drawing permit hunt (1 Sept-10 Oct),

followed by a registration permit hunt (15 Oct-15 Dec). Hunter participation was lower than expected in 1987 and 1988, and overwinter survival of elk was good, thus prompting Department staff to recommend returning to a registration permit hunt to increase the harvest in 1989. The registration hunt for southwestern Afognak Island was eliminated after 1986, when 46 elk were killed in an accidental fall that may have been caused by high hunter density.

CONCLUSIONS AND RECOMMENDATIONS

The elk population continued a generally increasing trend, because of low natural mortality and relatively low harvest, approaching the previous historical high level recorded in the mid- to late 1960's. Herds on western Afognak Island may be near or exceeding estimated habitat carrying capacity. Herds on eastern Afognak Island appear to be somewhat below carrying capacity.

More liberal regulations adopted for the 1989 hunting season should arrest the population increase in the southwestern Afognak Island. A longer season for eastern Afognak Island should permit a modest increase in harvest, while allowing continued growth in those herds. Herds in northwestern Afognak Island will remain lightly hunted because of difficult hunter access.

Two logging corporations are presently active on Afognak Island, where Sitka spruce is near the western limit of its range, and long-term effects of logging on elk are unknown there. Further investigation of elk-habitat relationships is desirable. A draft Memorandum of Understanding intended to further coordination between the Department and one of the timber harvest companies was signed in the fall of 1989.

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Table 1. Elk population status by hunt area in Unit 8, 1988.

	Hunt No. 702 Raspberry Is.	Hunt No. 751 SW Afognak	Hunt No. 750 E Afognak	Hunt No. 752 NW Afognak	Total
Elk observed	164	452	146	421 ^a	1,183
Estimated population	200-230	475-500	250-300	450-550	1,375-1,580
% calves	19%	21%	24%	17%	Mean = 19%

^a Includes estimate of 1 large herd.

Table 2. Elk composition counts for 1984-88 and by hunt area in Unit 8 for 1988.

Year	Males	Males: 100 females	Females	Calves	Calves: 100 females	Total
1984	70	14:100	506	185	36:100	761
1985	59	7:100	792	264	33:100	1,115
1986	100	14:100	728	265	36:100	1,093
1987	106	16:100	684	183	27:100	973
1988	83	17:100	872	228	26:100	1,183
<u>Hunt Area No. (1988)</u>						
702-Raspberry Island	8	6:100	130	26	20:100	164
751-SW Afognak Island	35	11:100	321	96	30:100	452
750-E. Afognak Island	7	7:100	104	35	34:100	146
752-NW Afognak Island	33	8:100	317	71	17:100	421

Table 3. Annual harvests for 1984-88 and by hunt area in Unit 8 for 1988.

Year	Harvest				Illegal	Total
	Reported			Total		
	M	F	Unk			
1984	151	113	7	271	--	271
1985	136	62	0	198	2 males	200
1986	111	48	10	169	2 males	171
1987	69	45	6	120	1 male	121
1988	86	33	5	124	1m,1f,3unk	129
<u>Hunt Area (1988)</u>						
702-707						
Raspberry Island	17	13	0	30		
750-E. Afognak Island						
	15	4	0	19		
708-709						
SW Afognak Island	31	2	1	34		
752-NW Afognak Island						
	23	14	4	41		

Table 4. Elk harvest data by permit hunt in Unit 8, 1984-88.

Hunt No.	Year	Permits issued	Did not hunt	Unsuccessful hunters	hunter hunters	Percent Successful success	Bulls	hunter Cows	Unk	Tota l
702-707 (Rasp- berry Island)	1984 ^a	221	--	30	62	67%	27	28	7	62
	1985 ^a	420	176	48	35	42%	24	12	0	36
	1986 ^b	300	159	44	55	56%	30	25	0	55
	1987 ^b	200	107	55	33	38%	19	14	0	33
	1988 ^b	230	114	79	30	28%	17	13	0	30
708-709 (South- western Afognak)	1984 ^a	221	--	38	37	49%	26	11	0	37
	1985 ^a	420	176	73	51	41%	35	17	0	52
	1986 ^c	1013	394	84	57	40%	47	4	6	57
	1987 ^b	225	179	24	15	38%	12	3	0	15
	1988 ^b	300	187	66	34	34%	31	2	1	34
750 (Eastern Afognak)	1984 ^d	1585	755	583	172	23%	98	74	0	172
	1985 ^d	1396	676	564	112	17%	79	33	0	112
	1986 ^c	1013	394	103	5	5%	3	1	1	5
	1987 ^e	785	432	84	12	13%	8	3	1	12
	1988 ^e	737	344	86	19	18%	15	4	0	19
752 (North- western Afognak)	1986 ^c	1013	394	195	51	21%	30	18	3	51
	1987 ^e	785	432	134	61	31%	31	25	5	61
	1988 ^e	737	344	138	41	23%	23	14	4	41

^a Registration hunt with permits valid for Hunt No. 702 and 751.

^b Drawing hunt.

^c Permits valid for Hunt No. 750, 751 and 752.

^d Hunt No. 750 and 752 were not separated.

^e Permits valid for Hunt No. 750 and 752.

Table 5. Elk hunter residency and success in Unit 8, 1984-88.

	Successful				Unsuccessful				
	# Local res. (%)	Nonlocal res. (%)	Nonres (%)	Total	# Local res. (%)	Nonlocal res. (%)	Nonres (%)	Total	
1984	153 (58%)	107 (41%)	4 (1%)	264	487 (97%) ^a		17 (3%)	504	
1985	126 (64%)	62 (31%)	10 (5%)	198	535 (97%) ^a		15 (3%)	550	
1986	108 (64%)	54 (32%)	6 (4%)	168	400 (92%) ^a		26 (6%)	436	
1987	57 (52%)	46 (42%)	7 (6%)	110	122 (41%)	159 (54%)	16 (5%)	297	
1988	62 (50%)	54 (44%)	8 (6%)	124	149 (40%)	202 (55%)	18 (5%)	369	

^a Local plus nonlocal hunters.

Table 6. Elk harvest chronology in Unit 8, 1985-88.

Year	Aug. (%)		Sept. (%)		Oct. (%)		Nov. (%)		Dec. (%)	
1985	10	(5%)	99	(51%)	39	(20%)	33	(17%)	13	(7%)
1986	0	--	22	(22%)	59	(59%)	19	(19%)	0	--
1987	0	--	16	(13%)	71	(59%)	27	(23%)	6	(5%)
1988	0	--	11	(9%)	89	(72%)	21	(17%)	3	(2%)

Table 7. Method of transport for successful elk hunters in Unit 8, 1984-88.

Year	Airplane (%)		Boat (%)		ORV (%)		Highway vehicle (%)	
1984	119	(47%)	105	(42%)	0	--	27	(11%)
1985	94	(49%)	98	(51%)	0	--	0	--
1986	57	(39%)	90	(61%)	0	--	1	(1%)
1987	61	(58%)	41	(39%)	2	(2%)	2	(2%)
1988	65	(57%)	46	(40%)	2	(2%)	1	(1%)

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