Alaska Department of Fish and Game
Division of Wildlife Conservation

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Federal Aid in Wildlife Restoration
Survey-Inventory Management Report
Survey-Inventory Activities
1 July 1993- 30 June 1995

ELK

Mary V Hicks, Editor

LEN RUE JR

Grants W-24-2 & W-24-3
Study 13.0
October 1996

STATE OF ALASKA
Tony Knowles, Governor

DEPARTMENT OF FISH AND GAME
Frank Rue, Commissioner

DIVISION OF WILDLIFE CONSERVATION
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CONTENTS

LOCATION

GAME MANAGEMENT UNIT: 3 (3,000 MI²)

GEOGRAPHICAL 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 previous introductions failed. Lack of monitoring these populations precluded determining the cause of translocation failure.

In 1987 50 elk from Oregon were released on Etolin Island. Thirty-three were Roosevelt elk and 17 were 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 expanded its range. A breeding population is established on Zarembo Island and elk have been reported from Mitkof, 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 Dep 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 is expected to reduce elk carrying capacity. As several decades may be required for the elk population to reach carrying capacity, the division's current plan is to provide total protection for maximum population growth. A bulls-only season would be initiated when the population reaches approximately 250 animals, and a postharvest ratio of 25-30 bulls per 100 cows would be maintained (Alaska Dep of Fish and Game, 1985).

METHODS

We used radiotelemetry to locate individuals and groups, establishing visual sitings when possible. We recorded observations reported to us by other agency personnel and the public. We recorded elk pellet groups while conducting deer pellet group surveys.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

The functional life of radio transmitters affixed to elk was 3 years. The last radiolocation was made August 9, 1994, when 2 animals were located. No radios are transmitting now. Our June 1995 population estimate was 150-200 elk, with 25-35 elk on Zarembo and the balance on Etolin.

Population Composition

No data are available to make a meaningful population composition estimate. Almost every group of Roosevelt elk 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 herd.

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 but one radiocollared cow spent 6 years in the Mt. Shakes area then disappeared. This cow was relocated 2 months later 50 miles north on Farm Island. A ground survey found the cow dead and scavenged by bear.

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

Preferred winter and spring habitat for both subspecies is area below 500 feet adjacent to the coast. Roosevelt elk move higher into the mountains in summer and occasionally have been located above 1,500 feet.

MORTALITY

Harvest

Season and Bag Limit. No open season

Other Mortality

The dead cow found on Farm Island is the only known mortality during this reporting period. Three of the introduced elk were killed by poachers prior to this reporting period. Brown bears, black bears, and gray wolves are on Etolin Island and wolves are found on 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 mi^2; second growth, 2.2 mi^2; nonforest or noncommercial forest, 72.9 mi^2; old growth forest, 124.4 mi^2 (Alaska Dept. of Fish and Game, 1985).

We collected elk and deer pellets on Etolin Island during winter 1994 to study dietary overlap between the 2 species.

CONCLUSIONS AND RECOMMENDATIONS

The Unit 3 elk population is increasing after losses following introduction. Elk are dispersing and have established a breeding herd on Zarembo Island. As elk disperse and the population increases, we should 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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LOCATION

GAME MANAGEMENT UNIT: 8 (5,097[2])

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. Since 1955 hunting has been allowed annually. 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. The introduction of commercial logging in 1975 marked a new management era, with increased vulnerability of elk to hunting resulting from 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 part of Afognak Island was incorporated with the southwestern Afognak area into a single management area regulated by drawing permit hunts. Low bull:cow ratios and concern about effects of hunting during the rut prompted a shorter season and later opening date in 1993-94.

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVES

The management objective is to maintain a population of at least 1000 elk for use by all user groups.

METHODS

One observer in a Piper PA-18 aircraft completed aerial composition counts annually in July-September. Supplemental counts of herds >50 animals were made from color print photographs taken during the surveys. In August 1994 we made a composition count from the ground in the Raspberry Island herd.

Using helicopter darting techniques, we captured 2 elk from the Seal Bay herd in 1993 and equipped them with radiocollars . We made 4-6 yearly flights to locate instrumented elk and to do composition counts.

We collected data on harvest and hunting effort from mandatory hunting reports, field check stations, and periodic monitoring of hunting by boat and aircraft.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size

Aerial composition surveys indicated an increasing trend in the elk population beginning in 1993 (Table 1). The minimum population in 1993 and 1994 was estimated at 950 elk, well above the 760 elk minimum estimate in 1992. Among the 8 herds identified on Afognak Island, all were stable to slightly increasing at the end of this reporting period. Because all herds were not counted each year and because winter conditions the past 2 years were less severe, I suspect the minimum herd size estimates for 1994 are conservative. The Raspberry Island herd increased from an estimated 115 elk in 1992 to 150 elk in 1994.

The Paramanof Peninsula herd, which declined sharply after 1989 (Smith 1996), showed no sign of recovery (Table 1). That herd, only lightly hunted because of difficult access, was estimated at over 300 animals in the mid-1980s. I suspect part of that herd joined the Malina Lakes herd with a closely adjacent range south of Malina Bay.

Population Composition

Calf:cow ratios in 1993 and 1994 were slightly lower (Table 1), which probably reflects increased recruitment into the yearling cohort rather than an actual decline in reproduction. From the air, we cannot always distinguish yearling bulls from cows. We counted 178 calves in 1994, the highest calf count in 5 years. High survival of calves was confirmed in the Raspberry Island herd by a ground composition count on August 8, 1994. We classified 158 elk, including 13 spike bulls. Assuming a 50:50 sex ratio, we estimated 26 yearlings in 1994, close to the 29 calves counted in the herd in 1993.

An increase from 44% bulls in the harvest in 1992 to 68% in 1994 indicated bull:cow ratios improved. Smith (1996) noted both aerial composition counts and harvest composition indicated low bull:cow ratios in 1992. Although aerial composition counts did not show an appreciable increase in bulls in 1994, a composition count from the ground for the Raspberry Island herd indicated an increase. We counted 19 bulls and 99 cows, a bull:cow ratio of 19:100, well above the 1-11 bull:100 cow range for the previous 4 years.

Distribution and Movement

Distribution of the elk herds has been monitored by composition counts and by relocating radiocollared elk beginning in 1986. There are a minimum of 8 separate elk herds on Afognak Island and 1 herd on Raspberry Island. Except for the Paramanof herd, the annual home ranges of each elk herd have been stable with little interchange between herds.

MORTALITY

Harvest

Season and Bag Limits. The open season for resident and nonresident hunters for Raspberry Island was 10 October to 25 November; the bag limit was 1 elk by drawing permit only, with 300 permits to be 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 10 October to 31 October; the bag limit was 1 elk by drawing permit only, with 500 permits to be issued. A second season was scheduled to open by registration permit during November 5-25. The registration permit hunt season dates were altered by emergency order in both 1993/94 and 1994/95.

In 1993/94, in that portion of Afognak Island south and west of a line from the head of Malina Bay to the head of Back Bay, no registration permit season was held.

In 1993/94 the open season for the registration permit hunt for that portion of Afognak Island west of Izhut Bay and south and west of a line from the head of Saposa Bay to Delphin Point and south and east of a line from Delphin Point to the head of Malina Bay and north and east of a line from the head of Malina Bay to the head of Back Bay was November 5-7.

In 1994/95 the open season for the registration permit hunt in that portion of Afognak Island south and west of a line from the head of Malina Bay to the head of Back Bay was November 5-11 and November 19-25.

In 1994-95 the scheduled registration permit hunt was not opened in that portion of Afognak Island north and east of a line from the head of Malina Bay to the head of Back Bay and south and east of a line from Delphin Point to the head of Malina Bay and south and west of a line from the head of Saposa Bay to Delphin Point.

The open season for resident and nonresident hunters in the remainder of Unit 8 was 10 October to 25 November; the bag limit was 1 elk by registration permit only.

Board of Game Actions and Emergency Orders. The Board of Game passed a regulation establishing separate drawing permit hunts for bull and antlerless elk for Raspberry Island for the 1995-96 season. The change was recommended by department staff to improve bull:cow ratios and to increase the number of mature bulls in this herd.

One emergency order was issued in 1993/94 shortening the registration permit hunt to 3 days in part of eastern Afognak Island including the ranges of the Duck Mountain, Portage Lake and Marka Lake elk herds. That emergency order also closed the scheduled registration permit hunt in the southwestern part of Afognak Island when we determined an adequate harvest had been taken during the drawing permit hunt.

Two emergency orders were issued in 1993/94 to alter the scheduled registration permit hunt in southern and eastern Afognak. An emergency order was issued to close the scheduled registration permit hunt for the Duck Mountain, Portage Lake, and Marka Lake herds. That order also set a November 5-11 registration permit hunt for the Malina Lakes herd. A second emergency order was issued to provide an additional season opening during November 19-25, after we determined that severe weather during the first opening had resulted in little harvest.

Hunter Harvest. The annual elk harvest increased from a low of 67 elk in 1992-93 to 87 and 85 elk in 1993/94 and 1994/95, respectively(Table 2). Recent annual harvests were well below the peak of 206 elk killed in 1989-90. The percent of bulls in the harvest increased from a low of 36% in 1991/92 to a high of 68% in 1994/95 (Table 2) . Smith (1996) noted the proportion of bulls in the harvest was in a declining trend in 1992/93. The distribution of the elk harvest among the individual hunts was similar in 1993/94 and 1994/95.

Permit Hunts. The boundaries of the permit hunts were changed in 1993/94. Much of central and eastern Afognak Island, previously administered as a registration permit hunt, was included with southwestern Afognak Island in a drawing permit hunt. In that management area, a registration permit hunt is scheduled following the drawing permit hunt if the allowable harvest is not exceeded in the drawing permit hunt. A reduced area in northwestern Afognak Island remained as a registration permit hunt for the entire October 10 - November 25 season.

In 1993/94, only part of the new drawing/registration hunt area was opened for a registration permit hunt. The central part of Afognak Island which contains the Portage Lake, Duck Mountain, and Marka Lakes herds were opened for a 3-day registration hunt, and the Seal Bay herd of eastern Afognak Island was opened for the entire Nov.5-25 scheduled season. The Malina Lakes herd of southwestern Afognak Island was not opened for the registration permit hunt because harvest goals were met during the drawing hunt.

In 1994/95 the ranges of the Marka Lake, Portage Lake and Duck Mountain herds, accessible by logging roads, were not opened for a registration hunt because of a high risk of overharvest. The Malina Lakes herd was opened for a November 5-11 registration hunt, and it was reopened November 19-25. The Seal Bay herd in eastern Afognak Island was open during the scheduled November 5-25 registration hunt. Unusually windy conditions in October and November 1994 frequently delayed travel by boat and aircraft which resulted in lower than expected harvest. Allowable harvest goals were not reached for most herds.

Hunter Residency and Success. Average hunter success was 18% and 22% for 1993/94 and 1994/95, respectively(Table 3). Residents of Unit 8 harvested more elk than other Alaskan residents each year. The number of hunters in the field increased in 1993/94 but declined to only 383 hunters in 1994-95, the lowest in the past 5 years. The severe winds experienced in 1994/95 were probably responsible for the decline in hunters.

Harvest Chronology. Harvest was highest in the last 2 weeks of October for all 3 areas in 1993/94 and 1994/95 (Table 5).

Transportation Methods. An increasing trend in the harvest by hunters using highway vehicles correlated with continued expansion of logging roads on Afognak Island (Table 5). Aircraft was the predominant method of transportation in 1993/94, but boats were used most often in 1994/95.

Other Mortality

Two of 18 radiocollared female elk died of unknown causes during the 1994-95 winter. Both elk were animals >10 years old. Overwinter mortality was light in the past 2 years.

HABITAT ASSESSMENT

Commercial logging of Sitka spruce(*Picea sitchensis*) on Afognak Island continued to extend to new areas. New logging operations in the Waterfall Bay and eastern Izhut Bay areas during this reporting period enhanced road access to the Seal Bay and Waterfall elk herds. The department continued to review timber harvest plans which private timber owners are required to submit to the Department of Natural Resources. Current laws do not contain provisions for protecting terrestrial wildlife, so reviews are strictly advisory. The long-term effects of logging on elk habitat quality have not been studied on Afognak Island. As second-growth timber matures into a closed canopy, elk carrying capacity could be diminished in the future.

NONREGULATORY MANAGEMENT PROBLEMS/NEEDS

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

CONCLUSIONS AND RECOMMENDATIONS

Since 1992 the elk population has increased to a minimum of 950 elk. All 8 Afognak Island herds and the Raspberry Island herd increased or were stable. The population increase was attributed to improved overwinter survival during the past 2 winters. A declining trend in bull:cow ratios, previously a concern, appears to have been reversed. The harvest increased from a low of 67 elk in 1992 to 87 and 85 elk in 1993 and 1994, respectively. The percent bulls in the harvest increased from a low of 36% in 1991 to 68% bulls in 1994.

The change from a September 1 to an October 10 season opening date was effective in slowing the harvest and may have been a factor in improving the bull:cow ratios. However, the later opening date made weather more a factor determining hunter success. In 1994 extremely high winds seriously restricted hunters' travel in October and November, resulting in lower than expected harvest. With elk herds in an increasing trend, it may be necessary to set an earlier season opening date for the larger elk herds in order to reach harvest objectives.

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 population objectives are met for each herd. The Marka Lake, Duck Mountain and Portage Lake elk herds have become increasingly vulnerable to hunting because of increased road access and reduced

cover. It is possible those herds will soon have to be regulated exclusively by limited drawing permits.

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Table 1. Unit 8 summer aerial elk composition counts and estimated population by herd, 1990-94.

Herd	Regulatory Year	Bulls	Cows	Calves	(%)	Bulls: 100 Cows	Calves: 100 Cows	Total Elk Observed	Estimated Population
Raspberry Island	1990-91	3	97	54	(35)	3	56	154	155-175
	1991-92	10	92	26	(19)	11	28	136	135-150
	1992-93	4	71	26	(26)	6	37	101	115-125
	1993-94	1	104	29	(22)	1	28	134	135-145
	1994-95	19	99	40	(25)	19	40	158	150-160
Seal Bay	1990-91	--	--	41	--	--	--	114	150-200
	1991-92	--	--	--	--	--	--	--	125-150
	1992-93	0	78	20	(20)	0	26	98	125-150
	1993-94	--	--	--	--	--	--	--	130-150
	1994-95	6	51	11	(18)	12	22	62	135-150
Duck Mt.	1990-91	--	--	--	--	--	--	--	125-150
	1991-92	0	23	12	(34)	--	52	35	80-100
	1992-93	2	40	3	(7)	5	8	45	65-100
	1993-94	4	74	24	(24)	5	32	102	110-125
	1994-95	0	60	27	(31)	--	45	87	105-125
Portage Lake	1990-91	--	--	8	--	--	--	23	25-30
	1991-92	--	--	--	--	--	--	--	15-20
	1992-93	1	18	16	(46)	6	90	35	70-80
	1993-94	--	--	--	--	--	--	--	80-90
	1994-95	1	50	6	(11)	2	12	57	70-80
Marka Lake	1990-91	--	--	2	(20)	--	--	10	50-75
	1991-92	1	38	20	(34)	3	53	59	65-75
	1992-93	3	32	8	(19)	9	25	43	50-60
	1993-94	2	60	15	(19)	3	25	77	80-85
	1994-95	1	38	20	(34)	3	53	59	80-85

Table 1. Continued

Herd	Regulatory Year	Bulls	Cows	Calves	(%)	Bulls: 100 Cows	Calves: 100 Cows	Total Elk Observed	Estimated Population
Malina Lake	1990-91	5	89	79	--	--	--	408[A]	400-425
	1991-92	3	130	53	(28)	2	41	186	225-250
	1992-93	0	137	69	(33)	0	50	206	225-250
	1993-94	8	247	55	(18)	3	22	310	300-325
	1994-95	0	218	64	(23)	0	23	282	285-325
Waterfall Lake	1990-91	6	74	27	(25)	8	36	107	125-150
	1991-92	2	68	16	(19)	3	24	86	100-150
	1992-93	3	56	24	(29)	5	43	83	90-100
	1993-94	1	94	24	(20)	1	26	119	125-140
	1994-95	5	77	23	(22)	6	30	105	135-140
Paramanof Penin.	1990-91	11	56	32	(32)	20	57	99	150-200
	1991-92	0	19	5	(21)	0	26	24	100-150
	1992-93	0	0	0	(--)	--	--	0	25-50
	1993-94	0	4	0	(--)	--	--	4	20-50
	1994-95	0	0	0	(--)	--	--	0	20-50
Tonki Cape	1990-91	--	--	--	(--)	--	--	12[B]	15-20
	1991-92	0	1	0	(--)	--	--	1	10-20
	1992-93	1	14	3	(17)	7	21	18	20-25
	1993-94	0	0	0	(--)	--	--	0	20-30
	1994-95	0	0	0	(--)	--	--	0	20-30
Total all herds	1990-91	26	330	137	(28)	8	42	493	1,205-1,500
	1991-92	17	378	148	(27)	4	39	543	700-1,000
	1992-93	15	451	167	(26)	3	37	633	760-850
	1993-94	16	583	147	(20)	3	25	746	950-1,100
	1994-95	36	585	178	(22)	6	30	799	950-1,100

[A] 235 unclassified
[B] unclassified

Table 2. Unit 8 elk harvest data by permit hunt, 1990-94.

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. (Drawing Hunt No. 702-707)	1990-91	60	62	50	50	4	(36)	7	(64)	0	0	11
	1991-92	90	56	56	44	5	(29)	12	(71)	0	0	17
	1992-93	50	50	84	16	2	(50)	2	(50)	0	0	4
	1993-94	70	63	54	46	6	(50)	6	(50)	0	0	12
	1994-95	90	42	73	27	10	(71)	4	(29)	0	0	14
South and East Afognak Is. (Drawing Hunt No. 708-710)	1993-94[A]	335	58	57	43	33	(54)	28	(46)	0	0	61
	1994-95	335	52	68	32	36	(69)	16	(31)	0	0	52
South and East Afognak Is. (Registration Hunt No. 753)	1993-94	392	--[B]	89	11	6	(60)	4	(40)	0	0	10
	1994-95	434	--	88	12	4	(50)	4	(50)	0	0	8
North Afognak Is. (Registration Hunt No. 754)	1993-94	392	--	96	4	3	(75)	1	(25)	0	0	4
	1994-95	434	--	87	13	8	(73)	3	(27)	0	0	11
Total all hunts	1990-91	1335	52	67	33	84	(42)	115	(58)	2	0	201
	1991-92	1135	51	81	19	36	(36)	65	(64)	0	0	101
	1992-93	848	53	83	17	29	(44)	37	(56)	1	0	67
	1993-94	797	56	75	25	48	(55)	39	(45)	0	0	87
	1994-95	859	57	77	23	58	(68)	27	(42)	0	0	85

[A] New boundaries for Afognak Island drawing and registration permits were established for 1993-94.
[B] Registration permit valid for multiple hunts, so % of permittees not hunting in a specific area is not a valid statistic.

Table 3. Unit 8 elk hunter residency and success, 1990-94.

	Successful					Unsuccessful					
Regulatory Year	Local[A] resident	Nonlocal resident	Nonresident	Total	(%)	Local[A] resident	Nonlocal resident	Nonresident	Total	(%)	Total[B] hunters
1990/91	106	91	4	201	(32)	196	214	22	433	(68)	634
1991/92	57	40	4	101	(18)	218	210	26	454	(82)	555
1992/93	35	29	3	67	(17)	147	166	18	331	(83)	398
1993/94	44	42	1	87	(18)	270	127	6	403	(82)	490
1994/95	59	24	2	85	(22)	142	146	7	298	(78)	383

[A] Local means resident of GMU 8.

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

Table 4. Unit 8 elk harvest chronology percent by 15-day period, 1990-94.

Area	Regulatory Year	Harvest periods by percentages										
		9/1-9/15	9/16-9/30	10/1-10/15		10/16-10/31		11/1-11/15		11/16-11/30	12/1-12/15	[illegible]
Raspberry Island	1990-91	--	--	9	(82)	2	(18)	0		--	--	11
	1991-92	--	--	7	(41)	8	(47)	2	(12)	--	--	17
	1992-93	--	--	1	(25)	3	(75)	0		--	--	4
	1993-94	--	--	1	(6)	8	(75)	3	(19)	--	--	12
	1994-95	--	--	2	(14)	6	(43)	5	(36)	1 (7)	--	14
South & East Afognak Island[A]	1993-94	--	--	27	(38)	34	(48)	10	(14)	0	--	71
	1994-95	--	--	20	(33)	33	(55)	5	(8)	2 (4)	--	60
North Afognak Island[a]	1993-94	--	--	0		4	(100)	0		0	--	4
	1994-95	--	--	3	(27)	4	(36)	3	(27)	1 (10)	--	11

[A] New hunt boundaries for Afognak Island hunts were established in 1993-94.

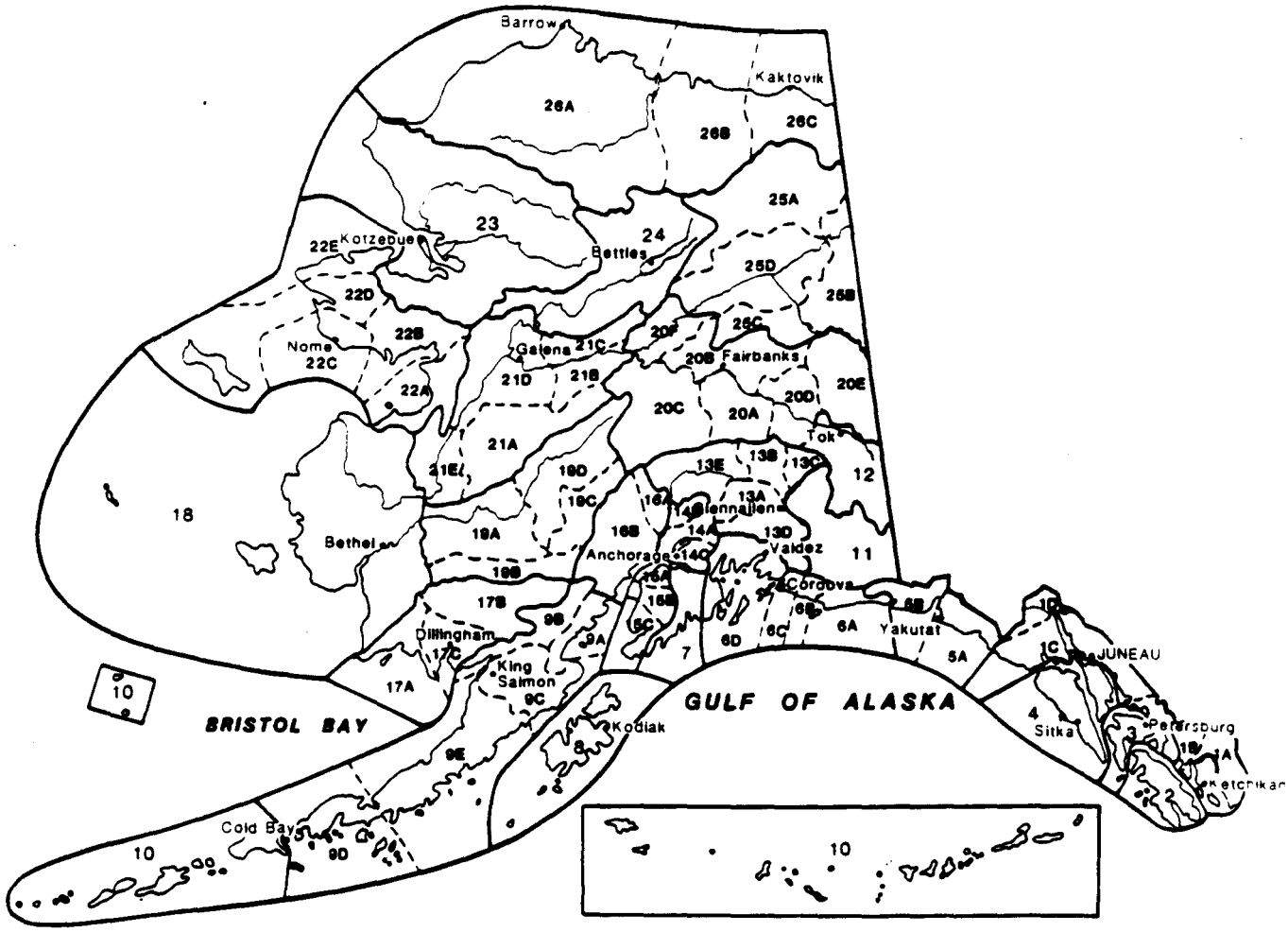
Table 5. Unit 8 elk harvest percent by transport method, 1990-94.

Regulatory Year	Airplane	Boat	ORV	Highway vehicle	Unknown	n
1990/91	86 (43)	69 (34)	1 (T)	15 (7)	30 (15)	201
1991/92	45 (45)	34 (33)	0 (0)	18 (18)	4 (4)	101
1992/93	29 (43)	23 (34)	0 (T)	12 (18)	3 (5)	67
1993/94	38 (45)	31 (36)	0 (0)	16 (19)	0 0	85
1994/95	24 (31)	30 (38)	1 (1)	24 (31)	0 0	78

NOTES

NOTES

Alaska's Game Management Units



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.

LEN RUE JR