Alaska Department of Fish and Game

Division of Wildlife Conservation

Waterfowl Program

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by

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CONTENTS

Introduction..... 1
Waterfowl Harvest and Hunter Activity..... 1
Introduction..... 1
Methods..... 1
Results..... 1
Number of Hunters..... 1
Hunting Activity..... 5
Duck Harvest..... 5
Goose Harvest..... 5
Discussion..... 5
Literature Cited.....12
Dusky Canada Goose Studies.....12
Introduction.....12
Study Area.....14
Projects.....15
Describe Changes in Nest Site Availability & Use15
Nest Density and Fate.....15
Methods.....15
Results.....17
Gosling Production.....21
Methods.....21
Results.....21
Banding and Collaring.....21
Transplant.....21
Methods.....25
Results.....25
Miscellaneous.....25
Literature Cited.....25
Cook Inlet/ Anchorage Canada Goose Project.....29
Introduction.....29
Production and Population Estimates.....30
Methods.....30
Results.....30
Banding.....30
Methods.....30
Results.....34
Habitat Use.....34
Methods.....34
Results.....34
Cook Inlet Duck Banding Report.....36
Introduction.....36
Study Area and Methods.....36
Results.....39
Discussion.....39
Acknowledgments.....40
Literature Cited.....41
Tundra Swan Productivity on the Colville River Delta.....41
Introduction and Methods.....41
Results.....41
Acknowledgements.....41

WATERFOWL PROGRAM PROGRESS REPORT, 1992

Introduction

Changes in federal aid reporting requirements have eliminate production of comprehensive annual reports for programs using federal funds. Consequently, there is no longer a process by which annual project accomplishments are documented. This program progress report is produced to satisfies those reporting needs.

WATERFOWL HARVEST AND HUNTER ACTIVITIES

Introduction

Because of problems associated with the distribution of questionnaires to hunters, the state waterfowl harvest survey was not conducted for the 1991-1992 hunting season. In its absence, the U.S. Fish and Wildlife Service (FWS) mail questionnaire and parts collection surveys were used to estimate hunter activity and harvest in Alaska.

Methods

Survey methods used by the FWS are summarized by Voelzer et al. (1982). Briefly, the FWS categorizes data from their parts collection surveys according to codes listed in Table 1. Data are coded to either specific locations within 11 harvest areas (Fig. 1)., or if the birds were not taken at the specific locations listed in Table 1, then the general harvest area code was assigned; e.g. a duck harvested at Palmer Hay Flats would be coded to the specific harvest area code 1123, while a duck shot on the Kasilof Flats would be coded to the region code 1103 (Cook Inlet) because there is no code for that specific harvest location.

Harvest and hunter activity data in this report are third-quarter estimates, which typically do not vary substantially from final estimates, reported by Martin et al. (1992). These estimates are based solely on duck stamp sales and reflect only the reported fall harvest. Because the distribution of the harvest of ducks by species and geographical region is not estimated by the FWS, no estimate of the regional species composition of the 1991-1992 duck harvest are presented in this report.

Results

Number of Hunters:

Based on the sale of 12,092 federal duck stamps in Alaska, representing a decline of 12% from 1990 (Fig. 2), approximately

Table 1. Summary of the FWS codes used to assign harvest locations in Alaska.

ADF&G Code	FWS Code	ADF&G geographical region (R)and harvest location names	Original FWS "county" name	FWS harvest zone
000	0000	Unknown	Unknown	Unknown
001	0101	North Slope (R)	Arctic Slope	Northwest
002	0301	Seward Peninsula (R)	Seward Peninsula	NW
003	0502	Yukon Valley (R)	Upper Yukon-Kuskokwim	Central
004	0502	Lower Yukon Valley	Upper Yukon-Kuskokwim	C
006	0512	Yukon Flats	Upper Yukon-Kuskokwim	C
005	0702	Central (R)	Fairbanks-Minto	C
079	0722	Eielson AFB	Fairbanks-Minto	C
081	0742	Healy Lake	Fairbanks-Minto	C
070	0752	Delta	Frirbanks-Minto	C
082	0712	Minto Flats	Fairbanks-Minto	C
084	0732	Salchaket Slough	Fairbanks-Minto	C
087	0762	Tok-Northway	Fairbanks-Minto	C
006	0901	Yukon Delta (R)	Yukon-Kuskokwim Delta	NW
007	1103	Cook Inlet (R)	Anchorage-Kenai	Southcentral
115	1153	Chickaloon Flats	Anchorage-Kenai	SC
117	1133	Goose Bay	Anchorage-Kenai	SC
118	1193	Kachemak Bay	Anchorage-Kenai	SC
121	1123	Palmer Hay Flats	Anchorage-Kenai	SC
122	1163	Portage	Anchorage-Kenai	SC
123	1143	Potter's Marsh	Anchorage-Kenai	SC
124	1183	Redoubt Bay	Anchorage-Kenai	SC
125	1113	Susitna Flats	Anchorage-Kenai	SC
126	1173	Trading Bay	Anchorage-Kenai	SC
008	1303	Gulf Coast (R)	Cordova-Copper River	SC
150	1313	Copper River Delta	Cordova-Copper River	SC
151	1333	Prince William Sound	Cordova-Copper River	SC
152	1323	Yakutat area	Cordova-Copper River	SC
009	1503	Southeast Coast (R)	Juneau-Sitka	Southeast
170	1523	Blind Slough	Juneau-Sitka	SE
171	1513	Chilkat River	Juneau-Sitka	SE
172	1543	Duncan Canal	Juneau-Sitka	SE
173	1573	Farragut Bay	Juneau-Sitka	SE
176	1563	Mendenhall Flats	Juneau-Sitka	SE
179	1533	Rocky Pass	Juneau-Sitka	SE
182	1553	St. James Bay	Juneau-Sitka	SE
183	1583	Stikine River Delta	Juneau-Sitka	SE
010	1704	Kodiak (R)	Kodiak Island	Southwest
200	1714	Kalsin Bay	Kodiak Island	SW
011	1904	Alaska Peninsula (R)	Cold Bay-Ak Peninsula	SW
221	1914	Cold Bay	Cold Bay-Ak Peninsula	SW
012	2104	Aleutian Chain (R)	Aleutian-Pribilofs	SW

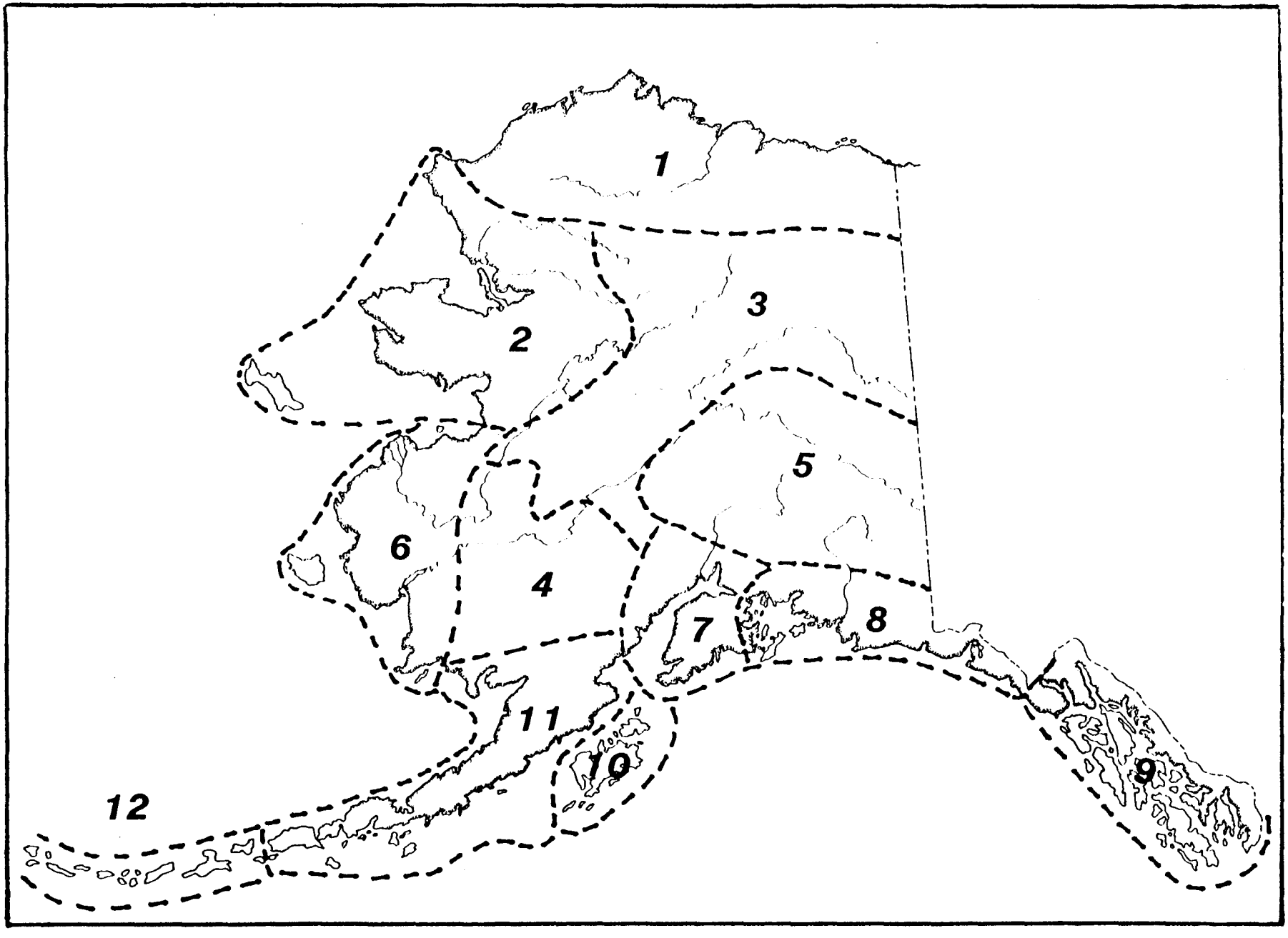

Figure 1. State and U.S. Fish and Wildlife Service waterfowl harvest survey regions.

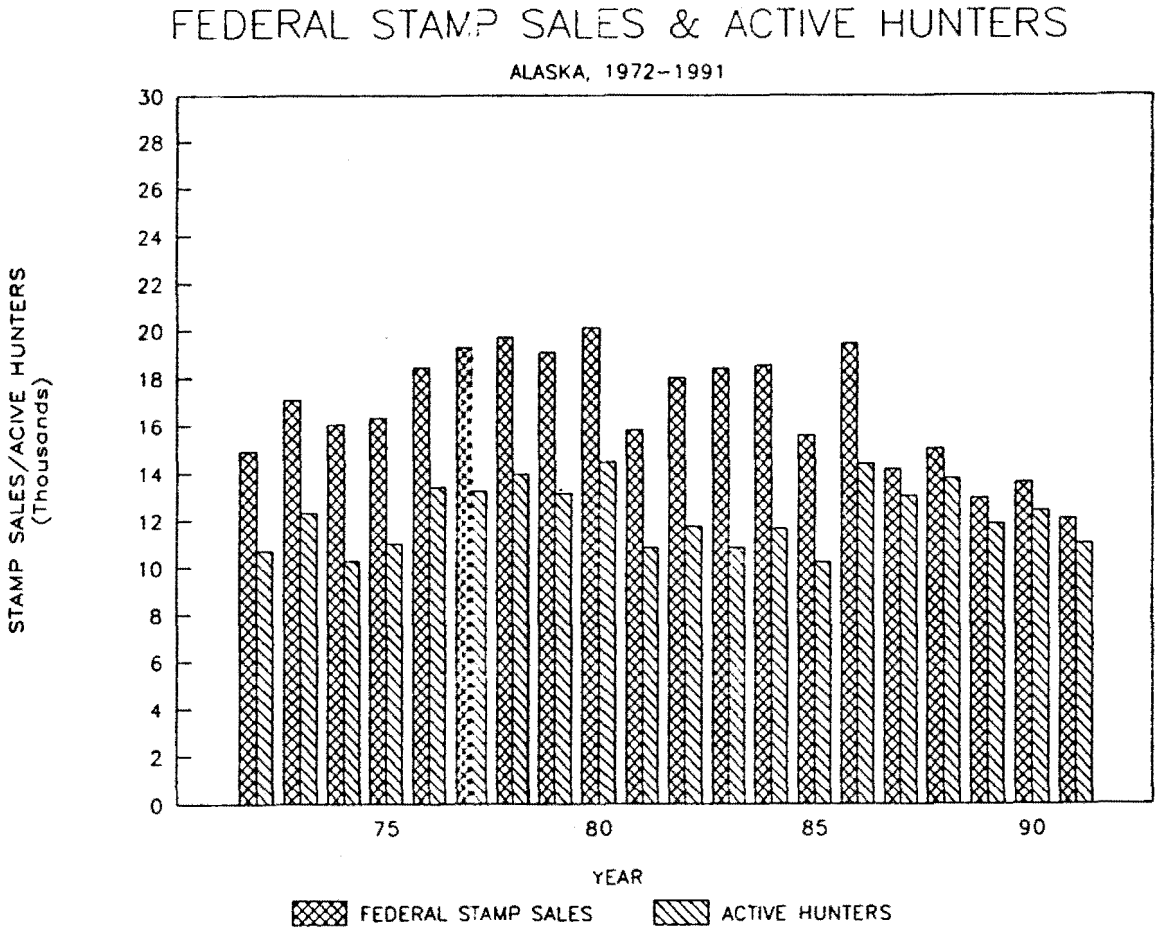

Figure 2. Twenty year trend in federal duck stamp sales and active hunters in Alaska as estimated by the U.S. Fish and Wildlife Service.

8,950 people hunted waterfowl during the 1991-1992 season (Table 2). This estimate, which was adjusted for stamp sales to collectors and inactive hunters, represented a decline of 6.9% from 1990. An estimated 77.4% of the hunters were active in 1991, compared to 76.7 in 1990 (Fig. 2).

Hunting Activity:

Hunters reported hunting an average of 4.3 days during the 1991-1992 season, representing a total of 51,422 waterfowl hunter days (Table 2). This was down 14% from 1990 and down 28% from the FWS 20-year average (Fig. 3).

Duck Harvest. The average harvests per active hunter was 4.7 ducks, compared with a FWS 20-year average of 5.3 ducks/active (Fig. 4). Average daily hunting success was 1.1 ducks/hunter in 1991-92.

The projected harvest for 1991-1992 was 56,870 ducks, of which 56,160 (98.7%) were dabbling and diving ducks and 710 (1.3%) were sea ducks and mergansers. The 1991-92 duck harvest was down nearly 25% from 1990-91 and 35% from the FWS 20-year average (Fig. 5). Based on the FWS parts collection survey sample of 859 wings, mallards (Anas platyrhynchos) were the most important duck, composing about 36% of the harvest. They were followed by green-wing teal (Anas crecca) (18%), American wigeon (Anas americana) (15%), and northern pintail (Anas acuta) (11%).

Goose Harvest. Hunters reported taking an average 0.8 geese/active hunter in 1991, down slightly from 0.9 geese/active hunter in 1990 but well above the 20-year FWS average of 0.6 geese/hunter (Fig. 6).

The calculated 1991 goose harvest was 8,425 (Table 2), up from the 1990 FWS estimate of 5,969 but below the 20-year average of 10,159 (Fig. 7). Based FWS parts collection survey of 85 goose tails, the Canada goose (Branta canadensis) was by far the most common goose harvested by sport hunters (Table 2). This species made up nearly 78% of the harvest, followed by the white-fronted goose (Anser albifrons) (16.5%), and Pacific brant (Branta bernicula) (4.7%). This compares with a 1990 FWS harvest composition of 89% Canadas and 11% white-fronts.

Discussion

Following the national and Pacific Flyway trend, stamp sales and waterfowl harvest continued to decline in Alaska in 1991. While the lack of harvest distribution information for Alaska precluded analysis of hunting pressure and harvest, it is likely that the majority of the sport harvest occurred near human population centers such as Susitna Flats, Palmer Hay Flats, and the Anchorage Coastal Refuge in Cook Inlet, Mendenhall wetlands in southeast Alaska, and Minto Flats near Fairbanks.

Table 2. Summary of Alaska waterfowl hunter activity and harvest from the state survey, 1991-1992.

Total federal duck stamps sold[a]: 12,092

Federal duck stamps sold to potential hunters in Alaska: 11,011

Number of active hunters: 8950 (77.4%)

Calculated statewide fall sport harvest:

Ducks: Dabblers/divers: 56,160; Sea ducks: 710;
Total: 56,870

Geese: Canada: 6,640; white-fronted: 1,388; brant: 397; unknown species:
Total: 8,425

Calculated hunter days: 51,422

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[a] Martin et al. 1992.

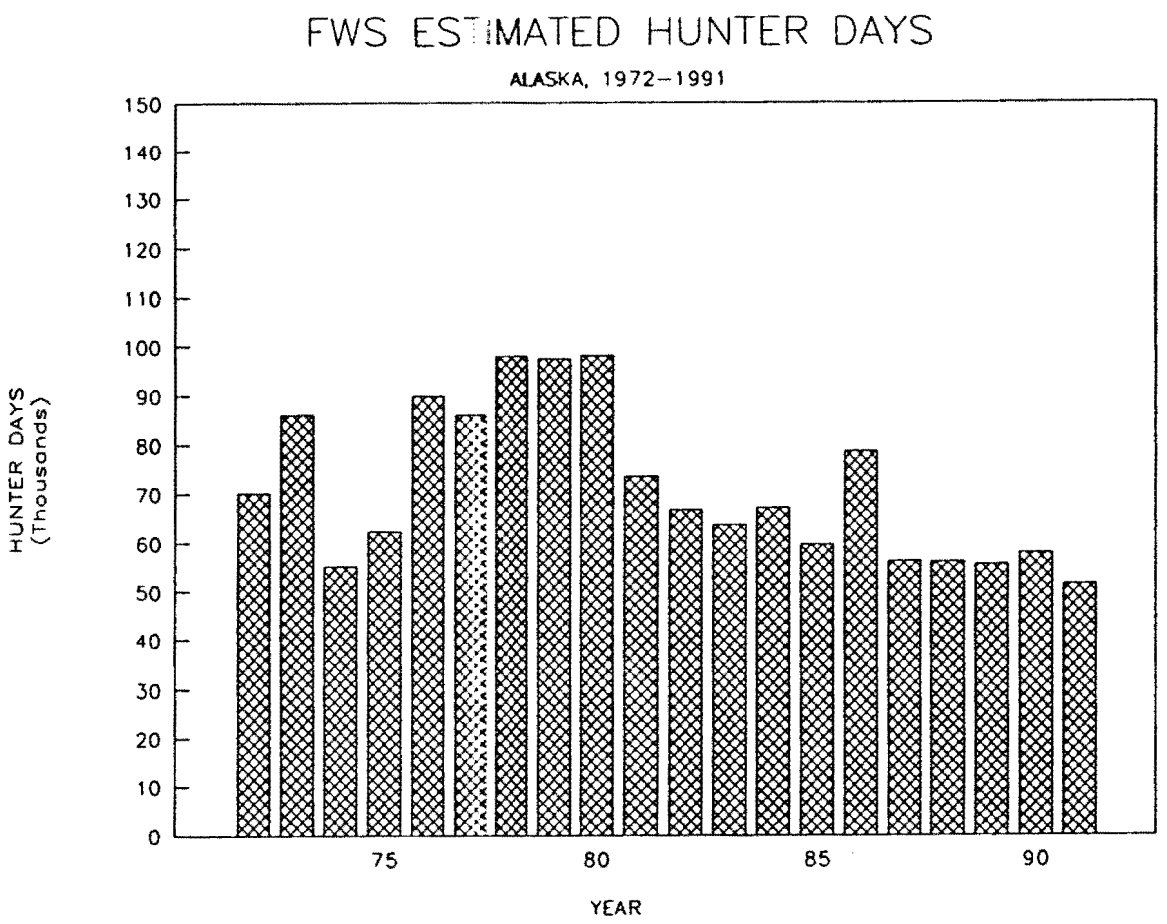

Figure 3. Twenty year (1972–1991) trend in hunter days for Alaska as estimated by the U.S. Fish and Wildlife Service.

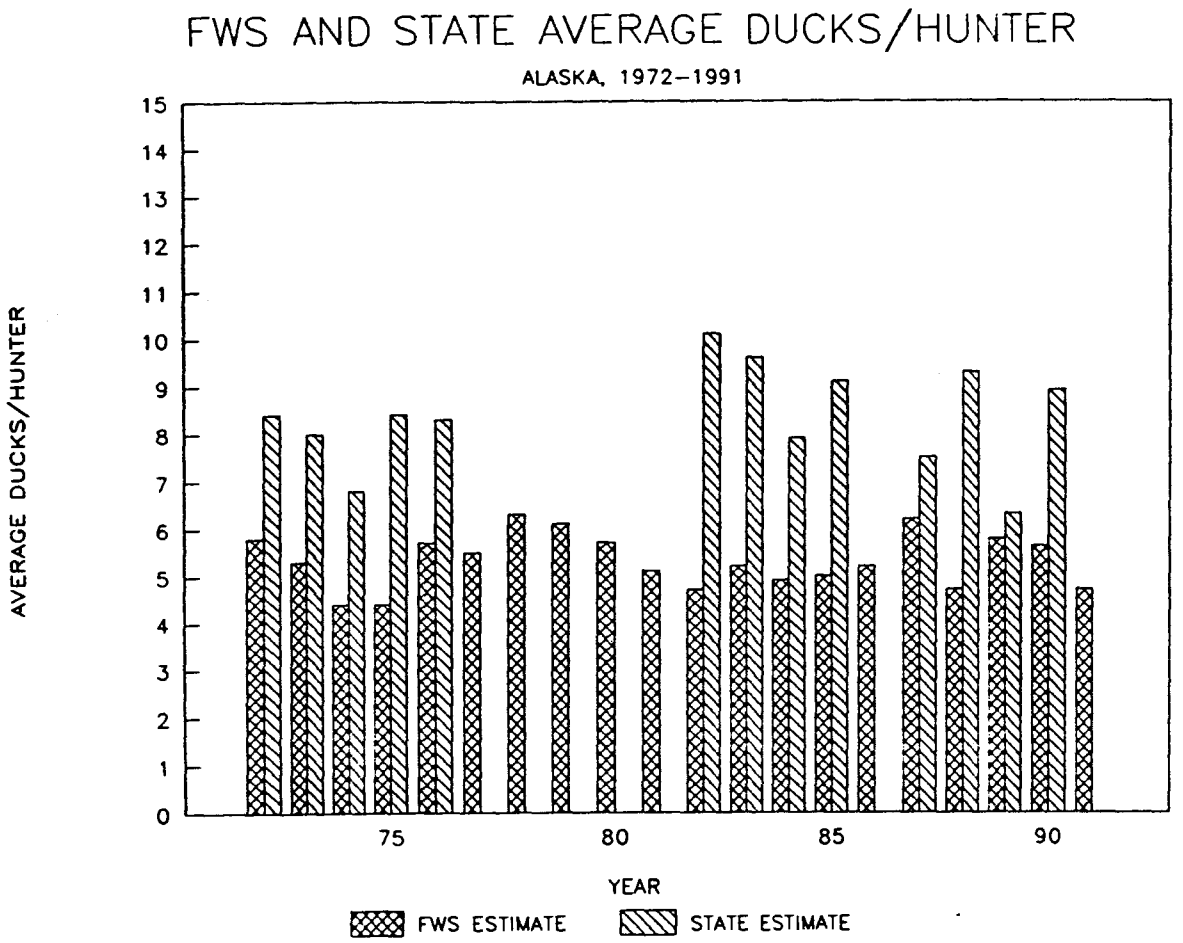

Figure 4. Twenty year (1972-1991) trend in average ducks harvested per hunter in Alaska as estimated by the U.S. Fish and Wildlife Service and State surveys.

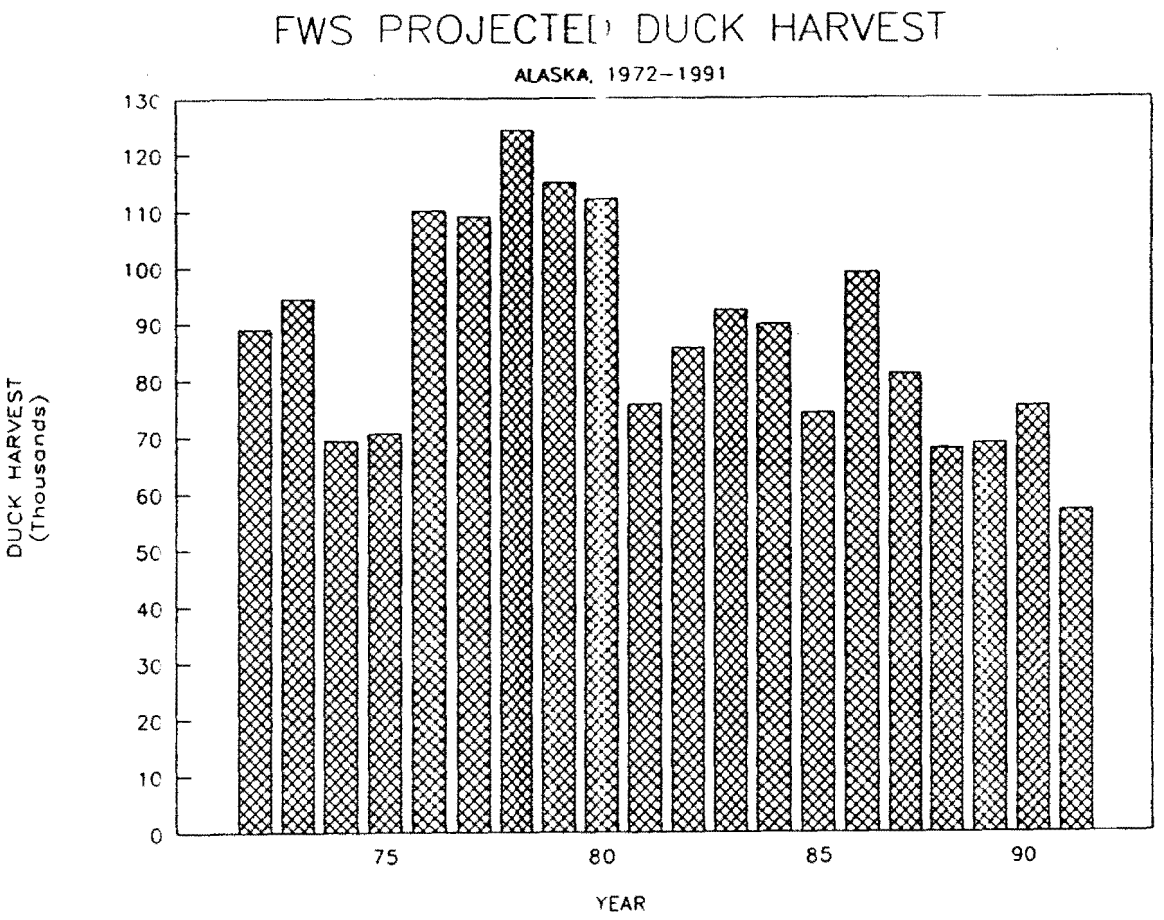

Figure 5. Twenty year (1972-1991) trend in the duck harvest in Alaska as estimated by the U.S. Fish and Wildlife Service.

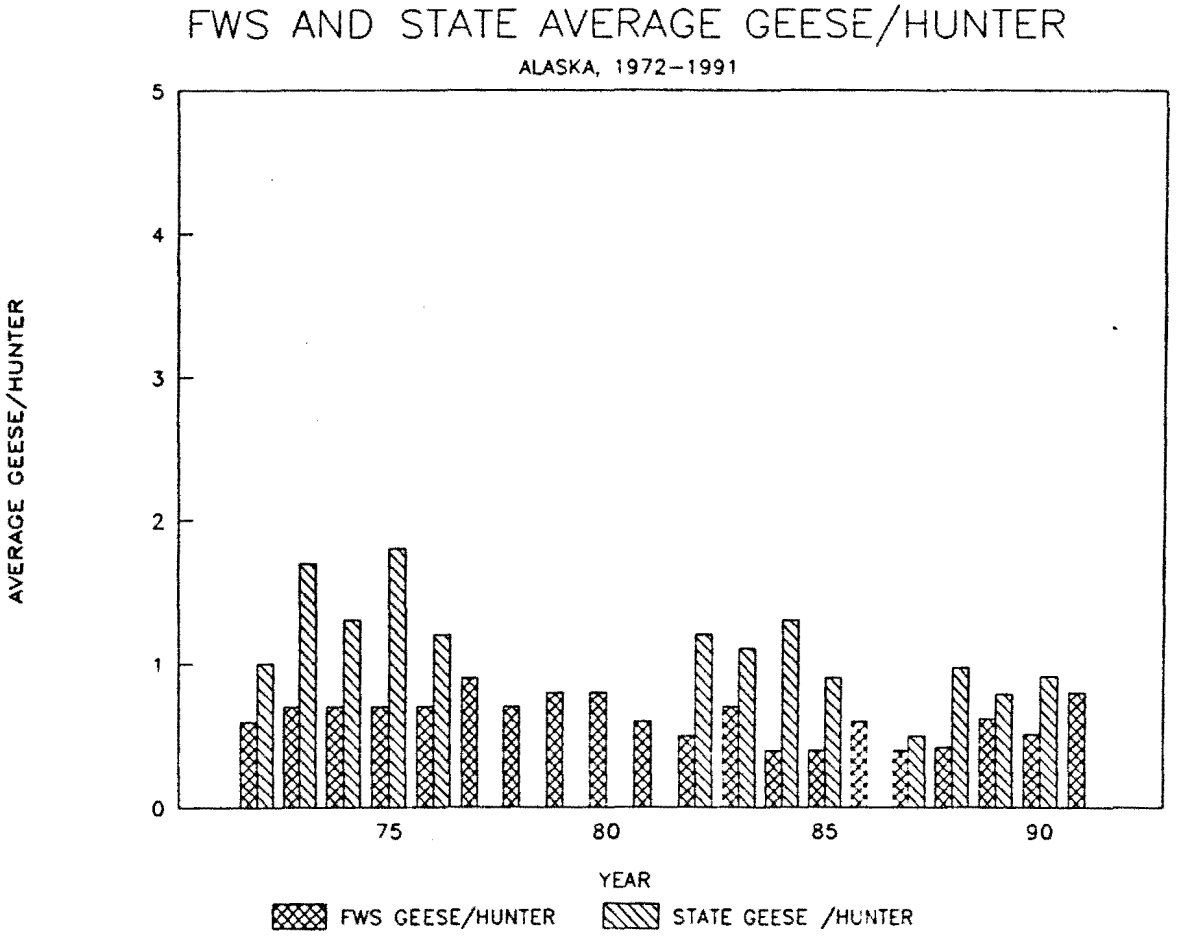

Figure 6. Twenty year (1972-1991) trend in average number of geese harvested per hunter in Alaska as estimated by the State and U.S. Fish and Wildlife Service.

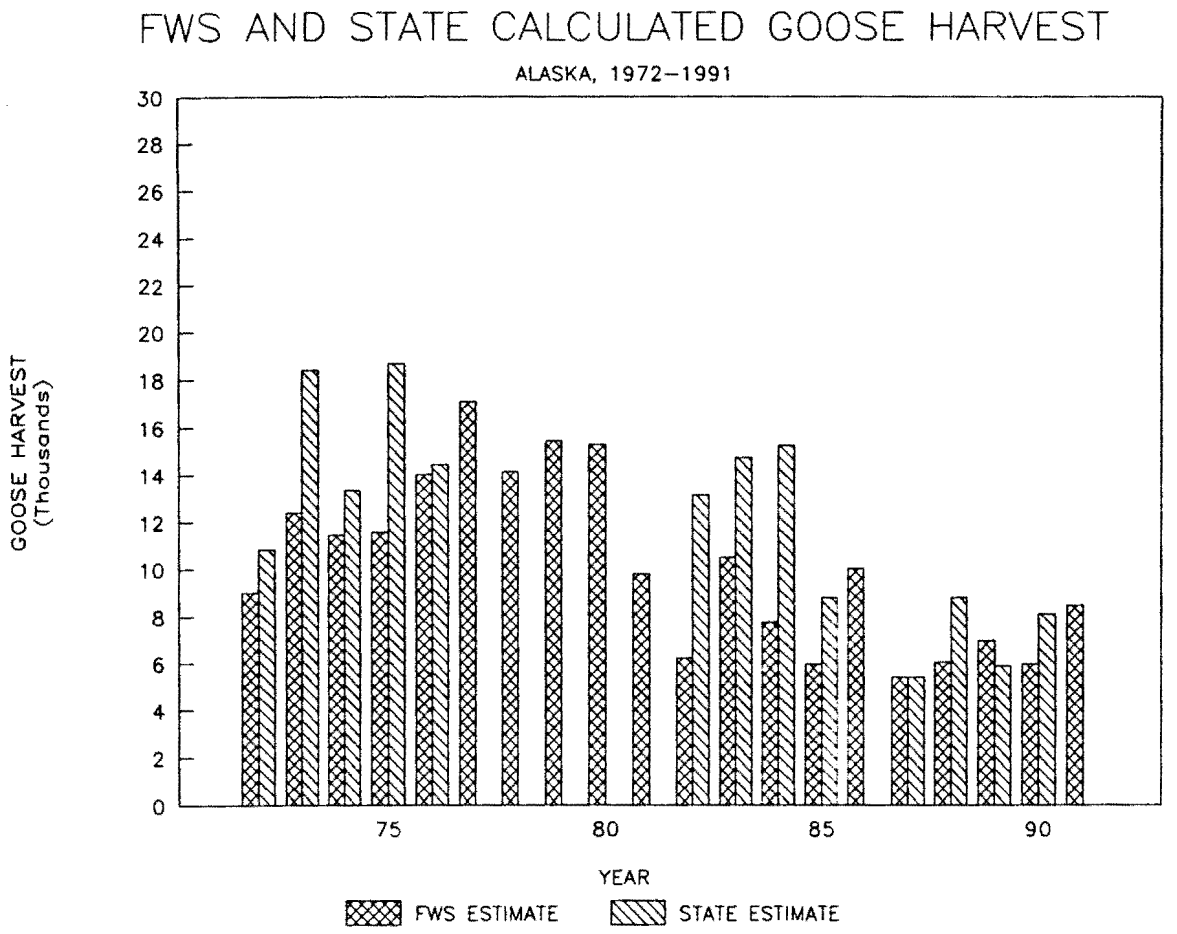

Figure 7. Twenty year (1972-1991) trend in the goose harvest in Alaska as estimated by the State and U.S. Fish and Wildlife Service.

The composition of the duck harvest in 1991 was similar to previous years with mallards, green-wing teal, wigeon, and pintails making up most (82%) of the harvest. However, the decline in numbers of pintails in the harvest since bag and possession limits were restricted in 1985 in response to declining pintail populations across North America indicates that these restrictions have been somewhat effective. Pintails have composed an average of about 13% of the harvest in Alaska since 1985 compared with an average of about 18% in the early 1980's.

Apparent declines in sea duck populations and lack of knowledge about harvest levels has lead to concerns about these birds and actions to protect them. These actions have included the closure of seasons for the spectacled and Steller's eiders and reduction in season length for Harlequin ducks in Prince William Sound. Unfortunately, it appears that the 1991-1992 FWS parts survey provided little information on harvest levels or composition. A statewide harvest of only 710 sea ducks of which most were oldsquaw and mergansers is not likely. Additional survey efforts by the state and FWS will probably be necessary in the future before actual harvest levels and composition can be measured.

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Martin E. M., P. I. Padding, and P. H. Geissler 1992. Preliminary estimates of waterfowl harvest and hunter activity in the United States during the 1991 hunting season. U.S Fish and Wildl. Ser. Admin. Rep. 36pp.

Voelzer, J. F., E. Q. Lauxen, S. L. Rhodes, and K. D. Norman, eds. 1982. Waterfowl status report. 1979. U.S. Fish and Wildl. Ser. Special Sci. Rep. Wildl. 246:1-96. Washington D.C.

DUSKY CANADA GOOSE STUDIES

Introduction

Dusky Canada geese (Brant canadensis occidentalis) are known to nest only on the Copper River Delta and Middleton Island in Alaska and winter primarily in southwestern Washington and the Willamette Valley of Oregon. Until the late 1970's population size, which has ranged from a midwinter index of 7,500-8,000 in 1953 to 28,000 in 1960, was limited by hunting on the wintering grounds. Hunting was responsible for nearly all (95%) of the 45% annual population mortality (Chapman et al. 1969). Band

recoveries indicated that about 70% of this harvest occurred in Oregon; the remaining 30% was about equally split between Washington, British Columbia, and Alaska. Production was typically good, and during the mid-1970's the population increased, despite a heavy annual harvest. Around 1979 production dropped off considerably due to predation (Campbell 1990) and the population began to decline. In response to this decline harvest was restricted by season postponement or closure and bag limit restrictions in 1984. However, the population continued to remain at less than 12,000 geese until 1990 when, for reasons that are not fully understood, predation on the nesting grounds declined and production improved. Mid-winter population estimates in 1992 ranged between 16,500 to 19,000 (Jarvis, 1992).

The Dusky Canada Goose Subcommittee of the Pacific Flyway Study Committee was formed in the early 1970's to set objectives and coordinate management of the dusky goose. In 1985 this subcommittee developed a council-endorsed management plan that established a population objective of 20,000 (i.e., based on a midwinter population index) and recommended guidelines for achieving and maintaining that objective (Pacific Flyway Council 1995). The recommended management procedures in the plan that involve ADF&G are as follows: (1) monitor and describe changes in nest site selection and nest success as related to changes in vegetation; (2) monitor annual nest density and success; (3) conduct annual production surveys and develop fall flight forecasts; (4) mark and band geese annually to monitor population age structure, survival rates, harvest distribution, and support studies on the wintering grounds; and (5) describe and evaluate interactions between habitat change, predator ecology, and production.

Study Area

The Copper River Delta is an approximately 650-km^2 deltaic plain at the mouth of the Copper River on the Gulf of Alaska (Fig. 1). It is bounded on west, north, and east by the Chugach Mountain Range and to the south by the Gulf of Alaska. The area has a typical maritime climate; cool summers, mild winters, and abundant precipitation. Annual precipitation averages 205 cm, including 319 cm of snowfall; annual temperatures average 3.4 C^o, ranging from averages of -5 C^o in January to 12 C^o in July.

The major dusky goose nesting area is the approximately 450-km^2 west Copper River Delta. This area is interlaced with tidal sloughs; glacial streams; and numerous small, shallow, freshwater ponds between drainages. Plant communities are evolving as a result of uplifting of the area by as much as 2 meters during the 1964 Good Friday earthquake (Potyondy et al. 1975). Currently coastal communities are dominated by freshwater sedge (*Carex* spp.) meadows interspersed with dense tall shrub (*Alnus crispa* and *Salix* spp.) stringers along drainages. Stands of tall shrub

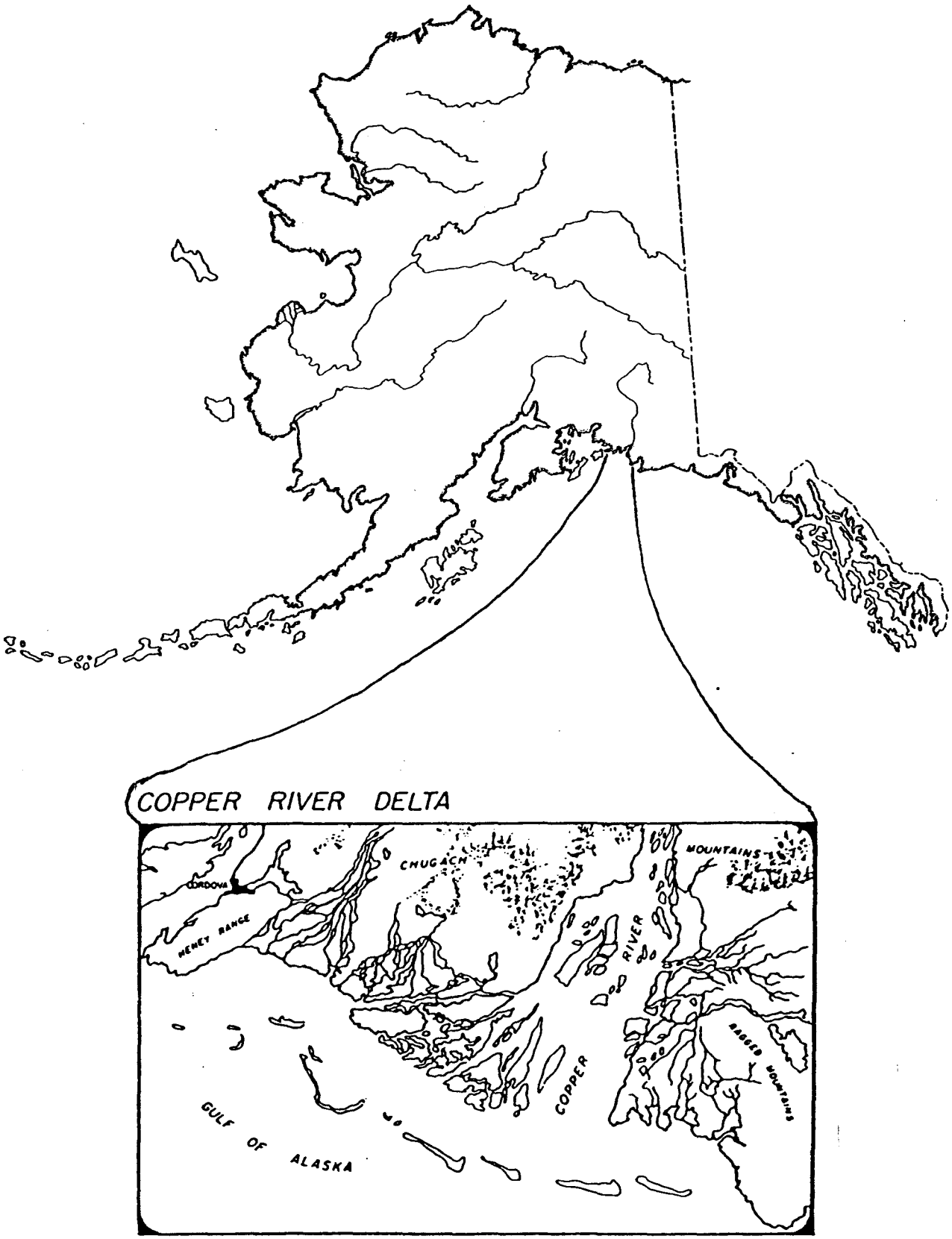

Figure 1. Copper River Delta, Alaska.

and shrub-bog (Myrica gale, Carex spp., and Menyanthes trifoliata) increase in frequency inland from the coast. An Alder, Sitka spruce (Picea sitchensis), and western hemlock (Tsuga heterophylla) community becomes dominant 7-11 km from the coast.

Projects

Monitor and Describe Changes in Nest Site Availability and Selection:

This project was completed in 1988 and a final report entitled "Factors Affecting the Nesting Success of Dusky Canada Geese, Branta canadensis occidentalis, on the Copper River Delta, Alaska" was published in the Canadian Field Naturalist, 104:567-574.

Describe and Evaluate Interactions Between Habitat Change, Predator Ecology, and Production:

This project has been completed and a report entitled "Activities of Brown Bears on the Copper River Delta, Alaska and Their Impacts on Nesting Canada Geese" has been published in the Northwestern Naturalist, 72:92-99.

Monitor Nest Densities and Fate:

Methods. The number and size of study plots used to sample nest densities and fates have varied since they were originally established in 1974 (Campbell and Rothe 1989). Seven plots totaling 2.49 km^2 were sampled twice in 1992 (Fig. 2). Each was extensively sampled immediately after the peak of incubation and again after the peak of hatch. During the first sampling, clutch size and stage of development (i.e., based on egg flotation) were recorded for active nests (Westerkov 1950). To facilitate relocation, all nests were also marked with wands and their location plotted on large-scale (1:330-1:700) maps. Wands were placed at least 50 feet from the nests to minimize the possibility of attracting predators.

During the second visit, the fates of both previously located and newly discovered nests were determined. Nests in which one or more eggs had hatched were considered successful. Attended nests were considered to be incubating, and nest that were unattended and where egg development had ceased were classified as abandoned. Nest destruction was classified as avian, unknown mammal, canid, or bear, when sufficient evidence allowed, using published characteristics of predation (Darrow 1938, Sooter 1946, Rearden 1951) and techniques applicable to the local area that were developed during the project.

Assistance with this project was provided by the Washington Department of Wildlife, Oregon Department of Fish and Wildlife,

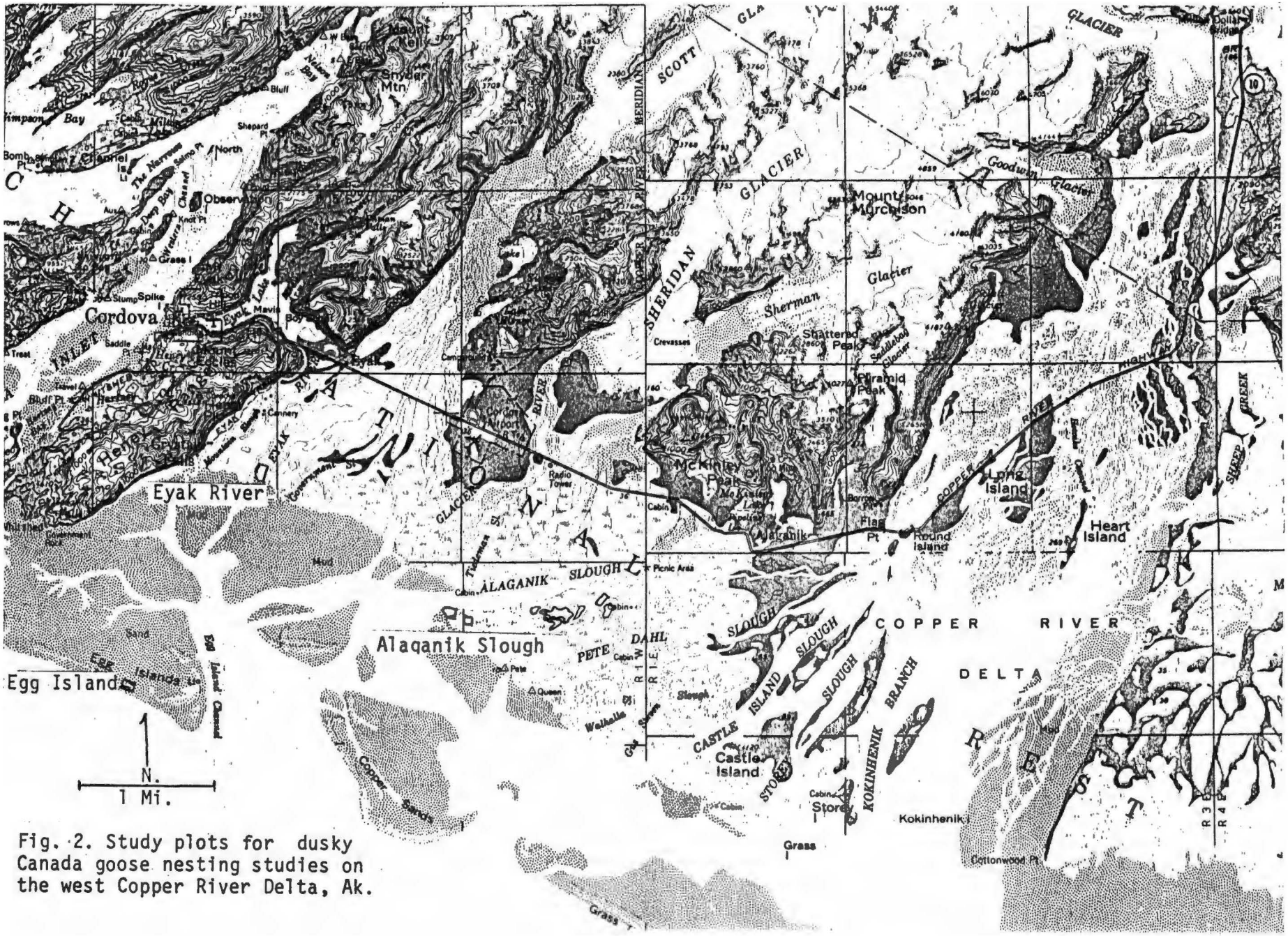

Fig. 2. Study plots for dusky Canada goose nesting studies on the west Copper River Delta, Ak.

U.S. Fish and Wildlife Service (Region 1), and U.S. Forest Service.

Results. Dusky geese were first reported on the Copper River Delta on April 14, 1992. Spring conditions on the nesting grounds were not well documented. Above normal temperatures and below normal precipitation recorded at the Federal Aviation administration Station at the mile 13 airport during April and May suggest that nesting conditions were good however, as a consequence of heavy spring snows, a heavier-than-normal snow pack persisted on parts of the delta until early May.

A total of 96 nests were located on the study plots. With the exception of Egg Island where nest initiation was about a week later, nest initiation was 7-14 days earlier than normal, peaking between 30 April and 3 May (Fig. 3). A secondary nest initiation peak between 12-16 May primarily represented Egg Island. A third peak in nest initiation between 20-30 May probably represents renesting, primarily on Egg Island where nest destruction was high early in the nesting season. The distribution of nests: 26% in tall shrub communities, 38% in low shrub communities, 22% in meadow communities, 9% on levees, and 5% other was typical of an early spring, indicating the availability of preferred habitats (Campbell 1990).

The calculated density of nests was 100/mi^2, up from 1991 and similar to the 1980-91 average of 102.6/mi^2, (Table 1). This density must be used with caution, however, as it likely reflects a high incidence of renesting. On Egg Island and plot 2, where about 30% and 60% of the nests, respectively, had been destroyed by the time incubation had started, the number of nests increased by 75% between the first and second nest search. Clutches were smaller in the additional nest (X = 4.5), typical of renests. Calculated nest density for the mainland plots was 69.1/mi^2, down from 76.5/mi^2 in 1991. The calculated nest density on Egg Island was 246.7 nests per mi^2. Average clutch size for the entire study area was 5.2 $\pm$ 1.0 eggs (Table 1).

While the fate of a relatively large number of nest still under incubation (22%) was not determined, measured nest success was relatively good with over 40% of the nests being successful (Table 2). Since late nests typically have a very high success rate, over all nest success could have been as high as 60%. Avian predators were responsible for a majority of the identifiable nest losses (51.9%), followed by bears (29.6%), Unidentified mammal (7.4%), canid (3.7%), and unknown (7.4%) (Table 2). Unlike previous years, most of the nest destruction by bears occurred on Egg Island where 5 of the 11 destroyed nests were attributed to bears. This was likely the result of one immature bear observed on the island in early-mid May by search and rescue crews.

Contrary to recent trends, predation on adult geese was apparently not a problem during the spring of 1992. A calculated

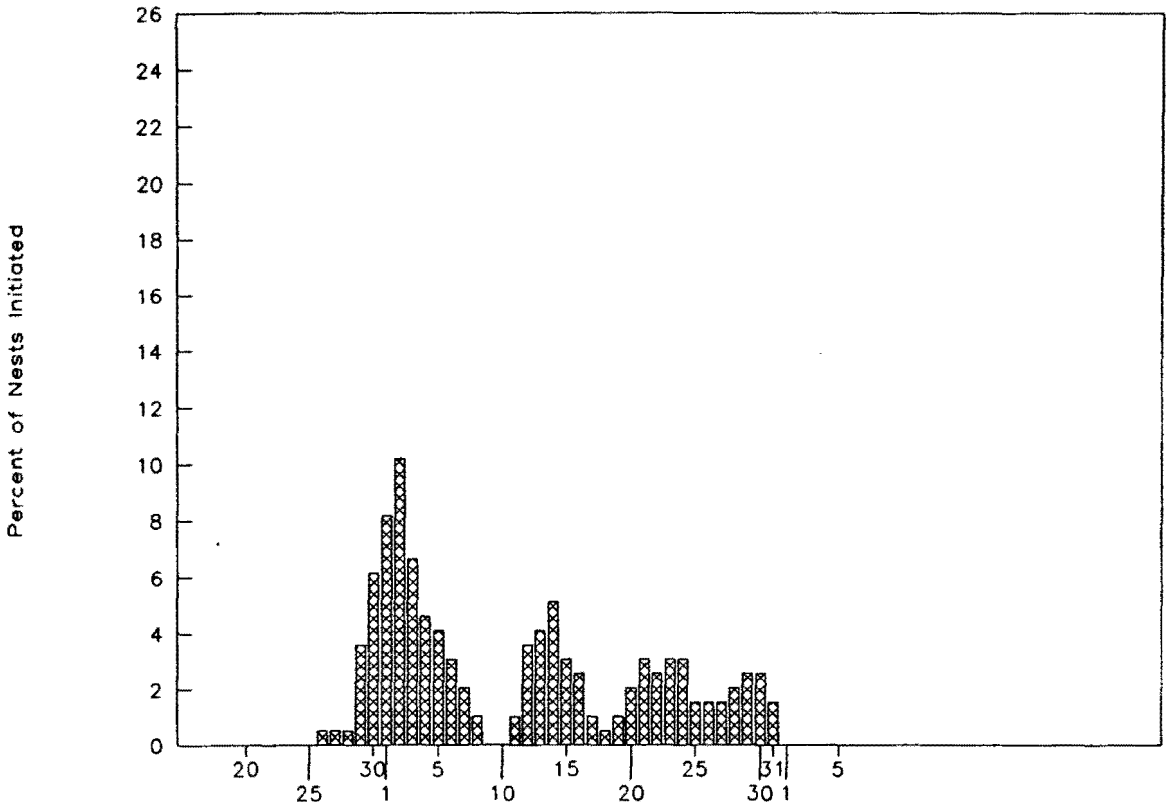

Figure 3. Frequency distribution of nest initiation dates for dusky Canada geese nesting on the Copper River Delta, Alaska in 1992.

Table 1. Dusky Canada goose nest densities, nest success, and average clutch size on the west Copper River Delta, 1959-92.

Year	Nest density nests/mi^2	Nest Success N	Nest Success %	Clutch Size N	Clutch Size $\bar{x}$
1959	105	222	89.2	194	5.6
1964	--	102	82.4	114	4.3
1965	--	221	62.9	140	5.8
1966	--	100	97.0	100	4.8
1967	111	--	--	--	--
1968	--	38	86.8	75	5.1
1969	--	--	--	--	--
1970	--	164	88.2	146	5.4
1971	--	100	76.0	113	3.6
1972	--	116	81.0	92	4.4
1973	--	--	--	48	4.9
1974	--	81	82.7	--	--
1975	179	215	31.6	215	4.8
1976	156	168	--	168	4.8
1977	175	229	79.0	181	5.4
1978	183	390	56.2	--	--
1979	133	409	18.8	338	5.7
1980	108	--	--	152	5.4
1981	--	--	--	28	4.9
1982	102	158	49.2	135	4.8
1983	91	162	51.9	87	5.5
1984	95	161	75.8	123	5.6
1985	97	168	8.9	64	4.4
1986	119	201	11.4	78	4.9
1987	116	196	23.7	121	5.2
1988	116	111	17.3	121	5.2
1989	98	94	4.3	25	5.3
1990	92	88	44.3	50	5.3
1991	95	91	31.9	46	5.4
1992	100	(39)	40.6	41	5.1

Table 2. Fate of dusky Canada goose nests on the west Copper River Delta study area, 1958, 1974-1975, 1982-1991.

Year	No. nests	% Successful	% Abandoned	% Fate unknown	% Destroyed	Type destruction: % Mammal	% Avian	% Flooded	% Unknown
1959[a]	1,162[b]	79.6	1.8	2.0	6.0	0	11.4	88.6	0
1974[c]	81	82.7	2.5	ND[d]	14.8	ND[d]	--[e]	0	ND[d]
1975[c]	215	31.6	3.7	ND[d]	64.6	ND[d]	--[e]	0	ND[d]
1982	158	49.2	1.8	ND[d]	49.0	45.0	33.8	0	21.8
1983	162	51.9	3.7	8.0	35.2	64.8	5.6	0	29.6
1984	161	75.8	3.1	6.2	14.9	62.4	37.6	0	4.0
1985	258	7.0	1.9	10.9	81.0	78.8	18.4	0	2.8
1986	201	11.4	9.0	12.5	67.2	83.7	5.2	0	11.1
1987	213	23.9	14.1	1.0	61.0	45.6	47.3	7.0	0.2
1988	110	17.3	3.6	17.3	61.8	53.3	40.0	6.7	0.1
1989	94	4.3	3.2	14.8	76.6	54.1	45.8	0	0.1
1990	88	44.3	5.7	15.9	34.1	15.0	85.0	0	0.0
1991	91	31.9	6.6	26.4	35.2	7.2	92.9	0	0.0
1992	96	40.6	7.3	24.0	28.1	33.3	51.9	0	14.8

[a] Trainer 1959

[b] Eggs rather than nests

[c] Bromley 1976

[d] Not reported

[e] Percentages not given, but majority of losses attributed to avian predators.

7.3 goose carcasses or kill sites were observed per sq. mi. (Table 3). Birds of prey, most likely Bald eagles based on their abundance, are responsible for most of the losses.

Production Survey:

Methods. A production survey was conducted on 27 July 1992 using a Robinson 22 helicopter. Survey methods varied from those of previous years (Campbell 1988) in that the helicopter provided a slow moving to stationary platform from which visual estimates were made. Since these estimates are thought to be more precise than those made from fixed-winged aircraft plus no biometric support for photo analysis was available, no photo count was made. Consequently, the 1992 production estimate is based on visual counts.

Results. Conditions were acceptable for flying and surveying with moderate light, calm winds, temperature of 60 ^{o}F, and 15-20 miles visibility. A 4,000 ceiling and occasional rain showers dissipated to scattered clouds mid-way through the survey. An estimated 7,633 geese were observed during 5 hours and 30 minutes of flying. Of these, 5,869 were adults and 1,764 were young for an production estimate of 23.1%, up from 21.5% in 1991 and similar to the 1990 estimate of 23.5% (Table 4).

Goose Banding and Collaring:

This project was inactive in 1992. Since the study by biologists from Oregon State University using collar observations to identify population size, age structure, and survival rates was completed in the spring of 1992 and current harvest is too low to provide adequate band returns for population modeling, the Dusky Canada Goose Subcommittee of the Pacific Flyway Technical Committee recommended that geese not be banded this year.

A paper entitled "Neck collar retention in dusky Canada geese" that summarized collar retention for geese marked on the Copper River Delta between 1984-1989 was published in the Vol. 62 of the Journal of Field Ornithology during the 1992 reporting period.

Goose Transplant:

Campbell and Griese (1987) identified establishment of additional breeding populations as a partial solution to the problem of poor production on the Copper River Delta. Middleton Island, which lies approximately 80 miles south-south west of Cordova in the Gulf of Alaska (Fig. 4), was chosen for this purpose in 1987. An abundance of favorable habitat, presence of a small pioneering flock of duskys, absence of mammalian predators, and apparent low density of avian predators all contributed to its selection. Originally, three transplants of goslings with adult guide birds were planned between 1987-89. However, due to the high reproductive success of naturally pioneering birds and apparent poor survival of transplanted goslings, only two transplants took

Table 3. Alternative prey abundance and dusky goose carcass indices for the west Copper River Delta study plots, 1983-92.

Year	Trap hours	Small mammals captured	Abundance index[a]	Goose carcasses and kill sites	Carcasses/ mi2
1983	2,304	31	13.46	3	1.7
1984	1,849	25	13.52	4	2.3
1985	3,000	4	1.33	17	9.8
1986	3,125	2	0.64	34	20.1
1987	1,621	26	16.04	15	8.9
1988	3,015	1	0.33	26	27.1
1989	3,600	1	0.28	16	16.7
1990	1,152	1	0.87	8	8.3
1991	2,100	4	1.90	18	18.8
1992	--	-	--	7	7.3

[a] Number of small mammals captured divided by trap-hours multiplied by 1000.

Table 4. Dusky Canada goose production estimates, 1971-1992.

Year	% Young	Year	% Young
1971	16.2	1982	23.7
1972	10.6	1983	15.0
1973	36.0	1984	18.3
1974	51.4	1985	3.7
1975	17.9	1986	10.7
1976	24.2	1987	9.8
1977	44.3	1988	22.8
1978	24.8	1989	8.6
1979	16.0	1990	23.5
1980	23.7	1991	21.5
1981	17.9	1992	23.1

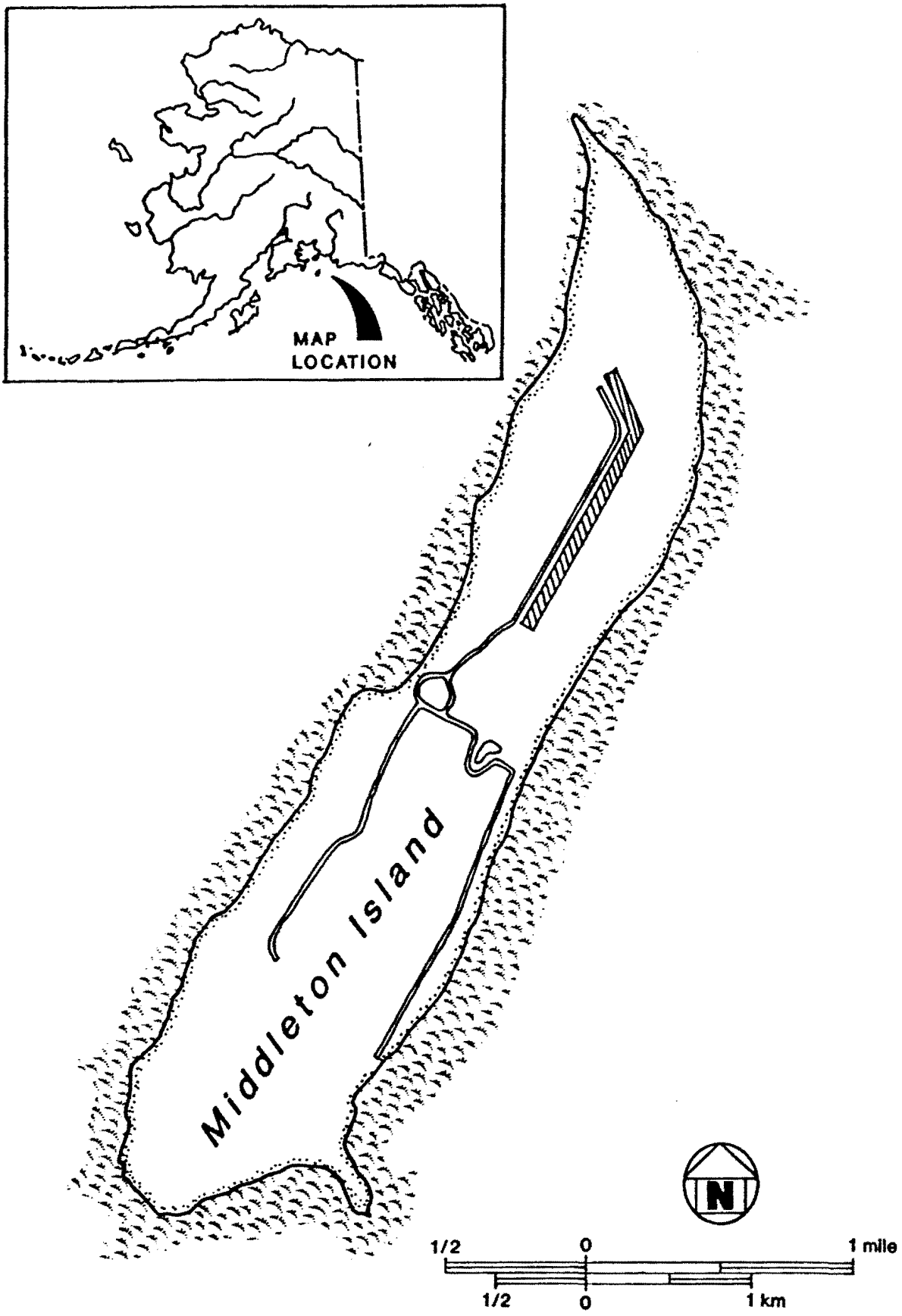

Figure 4. Middleton Island, Alaska.

place. With the cooperation of the Chugach Alaska Corporation, which has permitted access to private lands on the island, the size and reproductive effort of the new population has been monitored since 1988.

Methods. The island was covered by foot on 14-15 July, 1992. Geese were counted, classified as adults or young of the year, and habitats used for brooding and molting noted.

Results. A total of 770 geese were observed, primarily in large (>50) flocks, in salt water along southern portions of the island (Fig. 5). Of the 640 birds that could be aged, 247 were goslings for a production estimate of 38.6%. This was up from the 1991 estimate of 29.5% but still below the production levels noted between 1988-1990 (Table 5).

There continues to be little evidence that the transplanted birds have contributed substantially to the growth of the population on Middleton Island. Only 9 collared geese have been observed on Middleton Island since the first transplant in 1987; 4 in 1988 (M12, M20, M79, M?), 1 in 1989 (M12), 1 in 1990 (M12), 1 in 1991 (M?), and 2 in 1992 (CAA, M12). Birds seen in 1990-1992 were all paired with unmarked mates and, in 1991 and 1992, were with broods. Exchange of birds between the Copper River Delta and Middleton Island was documented in 1992. One of the marked birds (CAA), a male, was originally collared as an after hatching year bird on the Copper River Delta in 1991.

The potential for avian predation on dusky geese continues to be a real concern. The glaucous-winged gull colony is still expanding at an exponential rate and has surpassed an estimated 15,000 breeding birds (Fadely per. comm.). However, the pair of bald eagles, which are known to prey upon goslings (Campbell and Rothe 1990), were not defending their nest or territory and presumably did not successfully nest in 1992.

Miscellaneous:

A bibliography entitled "Dusky Canada goose: an annotated bibliography" was published in cooperation with the U.S. Fish and Wildlife Service during the 1992 reporting period.

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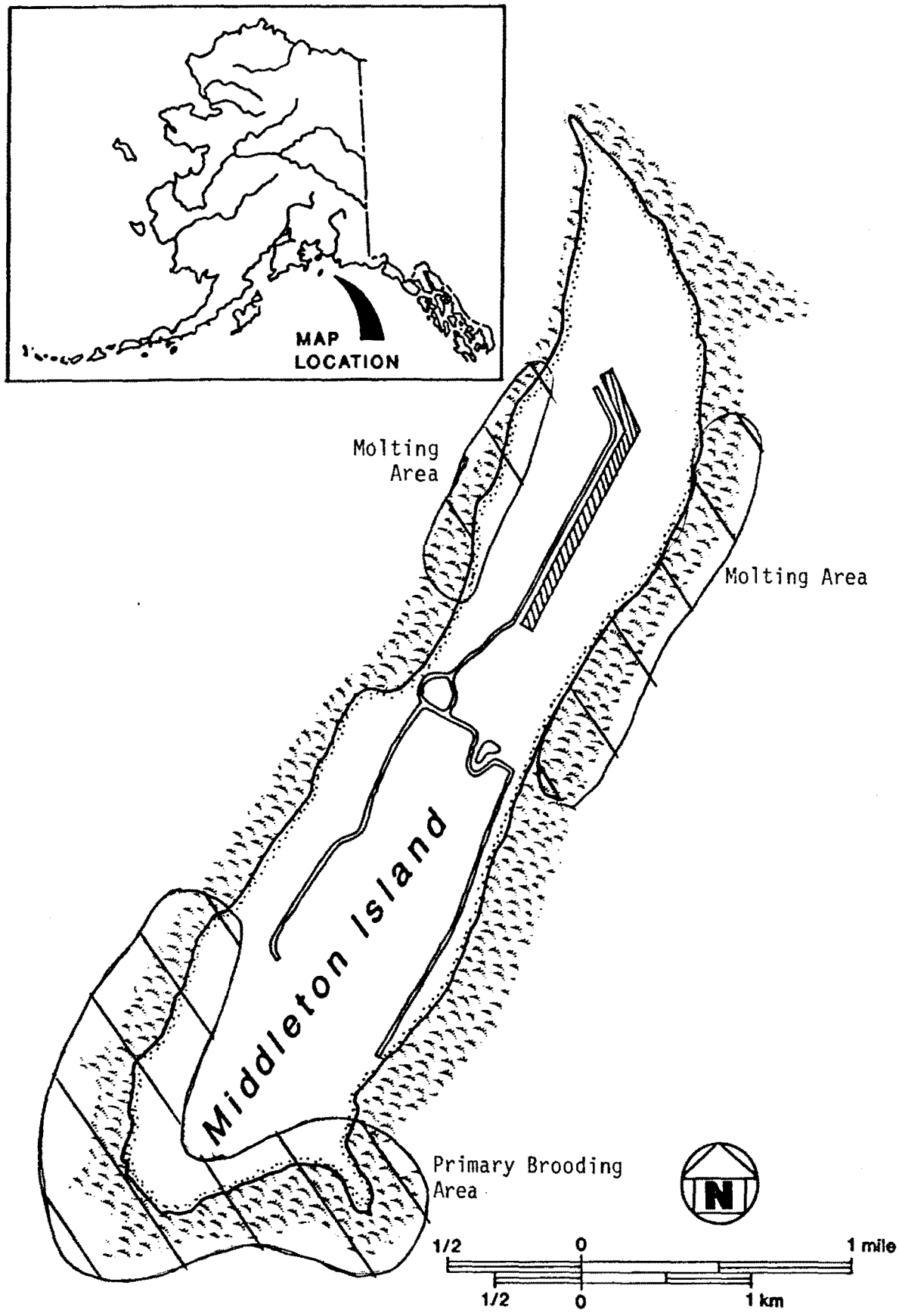

Figure 5. Primary dusky Canada goose brooding and molting areas on Middleton Island, Alaska in 1992.

Table 5. Dusky Canada goose population and estimated production on Middleton Island, Alaska, 1987-1992.

Year	Population	% Young
1987	105[1]	13.6[2]
1988	100+[2]	40+ [2]
1989	150	56.0
1990	335	72.2
1991	355[2]	29.5[2]
1992	770	38.6

[1] Estimate made prior to transplant.

[2] Incomplete survey.

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COOK INLET/ANCHORAGE URBAN CANADA GOOSE PROJECT

Introduction

Substantial numbers of lesser Canada geese (Branta canadensis parvipies) and tule white-fronted geese (Anser albifrons gambelli) nest on coastal wetlands in Cook Inlet. These areas include Redoubt Bay, Susitna Flats, Goose Bay, Palmer Hay Flats, and wetlands around Anchorage. Annual production on these areas was measured during the early 1980's but was discontinued in 1984 when program priorities and funding changed. Recent increases in lesser Canada goose numbers in Cook Inlet and pending liberalization of the white-fronted goose harvest in the Pacific Flyway, have rekindled interest in Cook Inlet geese.

Following a range-wide trend, the increase in Canada goose numbers in Cook Inlet has occurred in association with an apparently substantial increase in the number of geese residing in Anchorage. The extent of the contribution of the urban population to overall flyway numbers is debatable but its high visibility, perceived importance by the public, and potential as a nuisance make it important to goose management. These geese influence zoning and development, public safety, sanitation, and the images of resource managing agencies. Populations, such as those on Lake Washington in Seattle and in Ontario, Canada have become so large that they are a nuisance and require annual reduction and control, both very controversial management actions.

An Anchorage urban Canada goose component was added to the Cook Inlet goose project in 1992 to ascertain the size of the Anchorage Canada goose population, its seasonal distribution within the city, and its annual production and survival rates. Activities completed during the reporting period include production surveys, population counts, banding, and identification of major molting and fall feeding and staging areas.

Production and Population Estimates:

The object of these components is to estimate gosling production and the size of the goose populations in Cook Inlet and Anchorage.

Methods. Coastal wetlands north of the Tuxedni Bay on the west side of the inlet and Chickaloon Flats on the east side of the inlet were surveyed from the air while the urban wetlands and lakes in Anchorage were surveyed from the ground. Aerial surveys involved flying approximately 1/4 mi. interval transects at 100-150 feet altitude and 40-50 mph using a Robinson 22 helicopter. Location, species, total number, and number of young were recorded for all geese observed during the surveys. Production estimates were based on the proportion of young to adults and expressed as percentages.

Results. Aerial surveys were conducted on June 24-27, July 1, and July 6-9 in Anchorage and on July 9,10, and 27 in the remainder of the survey area. An estimated total of 3,994 Canada geese were observed (Table 1), up considerably from early 1980 counts of 1,200-2,000 birds. Conversely, only 128 tule white-fronted geese, nearly all on Susitna Flats, were seen (Table 2), down substantially from the early 1980's (Table 2). However, it is possible that Redoubt Bay, the major known nesting area for tule geese, was surveyed too late and geese had fledged and moved to other areas.

Of the 3,996 Canada geese seen, 1663 or 41.6% were young while 94 or 73.4% of the tule white-fronted geese observed were young. The highest percentage of young (78%) was observed at Taku Lake in south Anchorage for Canada geese (Table 3) and Susitna Flats (72%) for tule geese (Table 1), although sample size was small for tule geese.

Banding:

The object of this component is to band geese to facilitate development of a population survival model based on band recoveries. Also, in 1993, geese will be collared to determine the extend of seasonal movements within Anchorage and Cook Inlet. Assistance with this component was provided by the staff of the Lussac Library and private citizens.

Methods

Molting, flightless geese with young were captured by driving them with a helicopter (Hughes 500) or by foot into portable traps. Unmarked geese were banded with FWS leg bands and the identity of recaptured birds was recorded.

Table 1. Canada geese observed during production surveys in upper Cook Inlet, Alaska, 1980-1981, 1983, and 1992.

	Adult				Young				Total			
Area	1980	1981	1983	1992	1980	1981	1983	1992	1980	1981	1983	1992
Palmer Hay Flats	480	238	433	870	45	120	50	149	525	358	483	1,019
Goose Bay	16	0	0	27	11	0	0	44	27	0	0	71
Chickaloon Flats	47	35	0	0	68	0	0	0	115	35	0	0
Susitna Flats	497	286	6 35	732	676	273	195	849	1,173	559	830	1,581
Trading Bay	0	0	0	2	0	0	0	4	0	0	0	6
Redoubt Bay	1	0	0	2	3	0	0	6	4	0	0	6
Anchorage	40	80	NS[1]	700	40	105	NS	611	80	185	NS	1,311
Totals	1,126	669	1,100	2,333	903	548	300	1,663	2,029	1,217	1,400	3,994

[1] Not surveyed

Table 2. Tule white-fronted geese observed during production surveys in upper Cook Inlet, Alaska, 1980-1983 and 1992.

	Adult					Young					Total				
Area	1980	1981	1982	1983	1992	1980	1981	1982	1983	1992	1980	1981	1982	1983	1992
Palmer Hay Flats	0	0	NS[1]	0	0	0	0	NS	0	0	0	0	0	0	0
Goose Bay	0	0	NS	0	0	0	0	NS	0	0	0	0	0	0	0
Chickaloon	0	0	NS	0	0	0	0	NS	0	0	0	0	0	0	0
Susitna Flats	50	39	25	49	29	68	49	58	74	50	118	103	88	83	99
Trading Bay	0	0	130	0	0	0	0	0	0	0	0	130	0	0	0
Redoubt Bay	1,273	927	801	800	5	146	131	80	20	20	1,419	1,058	881	820	25
Total	1,323	966	826	979	34	214	180	138	94	70	1,537	1,146	964	1,049	114

[1] Not surveyed

Table 3. Numbers and location of Canada geese observed in Anchorage during production surveys in 1992.

Area	Date surveyed	Adult geese	Young geese	% young	Total geese
Potter' Marsh	June 24	37	27	42.2	64
Campbell Ck/ Dimond Blvd.	June 24	10	25	71.4	35
Lussac Library	June 24	35	90	72.0	125
Business Park	June 24	19	0	0	19
Tudor & C St.	June 24	60	137	69.5	197
Cheney Lake	June 26	23	30	56.6	53
Dele Vega Park	June 26	3	0	0	3
Otter Lake	June 27	17	0	0	17
Taku Lake	July 1	10	36	78.3	46
Lake Hood/ Lake Spenard	June 25	414	196	32.1	610
Alaska Pacific University	July 6	17	44	72.1	61
Westchester Lk/ Lagoon	July 6	55	26	32.1	81
Total		700	611	46.6	1,311

Results.

A total of 503 geese, 494 unmarked and 9 previously marked, were captured on Palmer Hay Flats and at the Lussac Library in Anchorage on July 30 and Aug. 1, respectively (Table 4). Of particular interest was the recapture of 3 geese (1137-98177, 1137-98986, 1137-98993) on Palmer Hay Flats that were originally banded as flightless molting adults on Togiak NWR in 1988. Based on the location of their original capture, these geese are Taverner's Canada geese, not B.c. parvipies. Unfortunately, no morphometeric measurements were taken to substantiate this.

Habitat Use:

The object of this component is to identify areas in Anchorage that are important to brooding, molting, and fall staging Canada geese.

Methods. Wetlands in the city of Anchorage were surveyed by foot or vehicle and the number of adult and young geese recorded. The age of goslings were estimated based on feather development.

Results. Unfortunately, due to the timing of project initiation, much of the brooding period had passed before surveys began in 1992. Most of the brood habitat use information is based on the observations of 5-7 week old goslings. Areas important to younger broods will be identified in 1993.

While most of the wetlands in Anchorage are likely important to brooding and molting geese, major concentrations were observed at Lake Hood, Lake Spenard, Cheney Lake, Campbell Lake, Jewel Lake, Westchester Lake and Lagoon, Lussac Library, and the corner of "C" Street and Tudor Road in late June and early July (Table 3). Some movement of broods between areas such as the Lussac Library, Business Park, and "C" Street and Tudor Road or along Campbell and Chester Creeks, was suspected, however the absence of marked individuals in the population precluded substantiation. Obviously, broods moved between Lake Hood and Lake Spenard through the connecting channel. In addition, molting flocks with few or no young in them were observed at Dele Vega Park and old city landfill adjacent to Merrill Field.

Fall feeding and roosting sites were associated with "grasslands" and larger lakes. Major feeding sites included the grass covered landfill adjacent to Merrill Field, open grassy areas at Anchorage International Airport, the softball and soccer fields at Dele Vega Park, and private sod farm on Klatt Road. In addition, many smaller open grassy areas such as city parks, Alaska Pacific University, the military bases, and schools were occasionally use by feeding geese. Major roost sites were at Lake Hood, Spenard Lake, Westchester Lake and Lagoon, Campbell Lake, and, until Sept. 1 when the area opened to waterfowl hunting, the Anchorage Coast Refuge. Canada geese were observed

Table 4. Summary of Canada geese banded in Cook Inlet, Alaska in 1992.

Capture location	Total geese captured	Number of recaptures	Age and Sex[1]			
			AHYM	AHYF	LM	LF
Palmer Hay Flats	340	8	172	160	0	0
Lussac Library	163	1	21	42	37	62
Total	503	9	193	202	37	62

[1] AHYM = Adult male, AHYF = Adult female, LM = Local male or male gosling, LF = Local female or female gosling.

in Anchorage until October 30, although numbers had begun to decline by mid-September.

1992 COOK INLET DUCK BANDING REPORT

Introduction

In 1990, The Alaska Department of Fish and Game (ADF&G) and the U.S. Fish and Wildlife Service (FWS) began a cooperative banding program in Cook Inlet as part of the "5-Year Cooperative Program for Preseason Banding of Mallards and Pintails in the Pacific Flyway" (Rosenberg, 1990). This program is a joint undertaking of the Pacific Flyway states and is an extension of the North American Duck Banding Program. Information from this program is intended to improve our understanding about harvest distribution of breeding ducks and the derivation of the flyway duck harvest. This is the third year of the program.

This report presents ADF&G's results from the 1992 banding efforts. The FWS again banded ducks between the Big Susitna River and the Little Susitna River. A summary of their efforts is presented in Appendix I. Results will be reported by the FWS under separate cover.

Study Area and Methods

Ducks were trapped from August 5 through August 21 on the Susitna Flats, approximately 35 miles WNW of Anchorage (Figure 1). Both target species (mallards and pintails) and non-target species (green-winged teal and greater scaup) were banded. Methods were similar to those reported by Rosenberg (1990, 1991).

Ducks were trapped, banded, and released at Lewis River Slough (LRS), (T14N, R8W, S31). Seven medicine hat traps, one box trap and one net trap were used. All medicine hat traps were assembled on site and baited on July 29. Traps were baited with barley. Bait was placed in and around traps. Where necessary, bait was placed on platforms constructed out of driftwood to make bait more conspicuous. Tops were left off traps and doors were open. Traps were rebaited and placed in operation on August 4. The box trap was operational on 8 August and the net trap was operational on 7 August. Approximate trap locations are presented in Figure 2. Once operational, traps were baited daily with barley.

Traps were placed in water depths from 0-20 cm near or on the shoreline (bare mud) of an open water brackish marsh or tidal ponds. Dominant aquatic vegetation in the vicinity of traps consisted of various mixes of some or all of the following: Scirpus validus, S. paludosus, Hippuris tetraphylla, Carex Lyngbyaei, Zannichellia palustris and Potamogeton filiformis. Carex ramenskii dominated onshore vegetation. Woody debris and driftwood logs were characteristic of the site. Pond bottoms

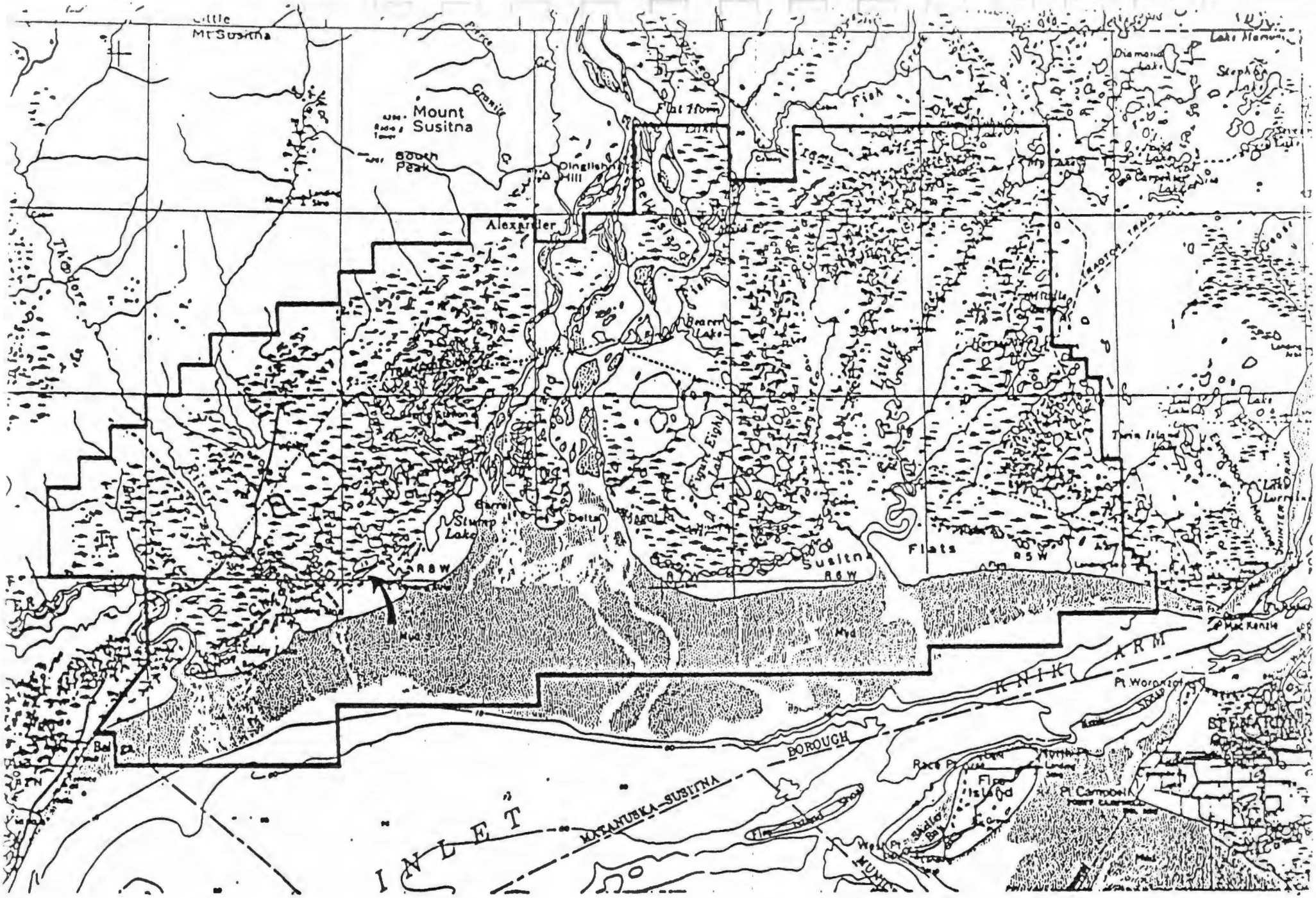

Figure 1. Location of banding site, Susitna Flats State Game Refuge. Arrow points to Lewis River Slough banding site.

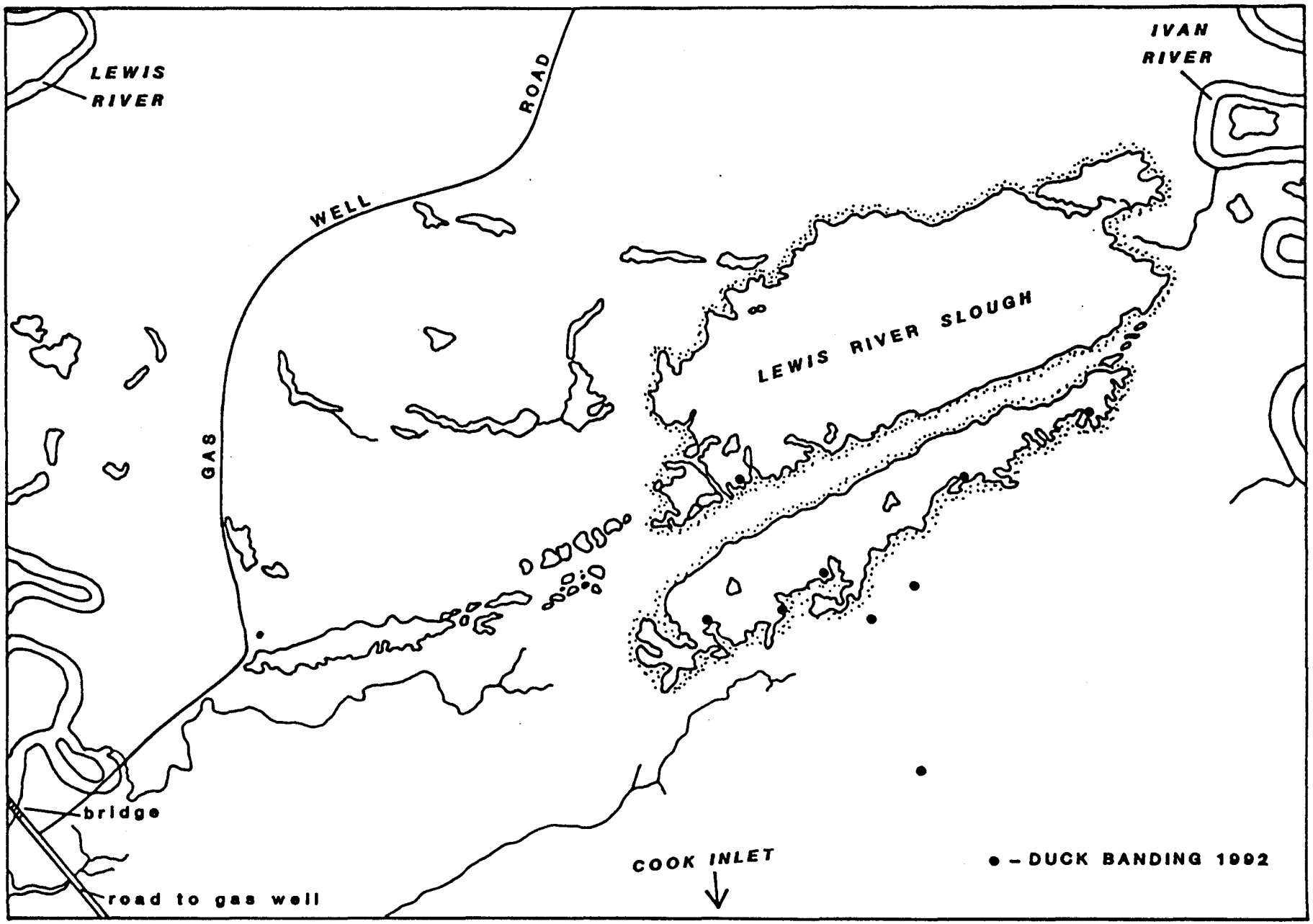

Figure 2. Location of duck traps at Lewis River Slough.

were soft mud. Suspended silt clouded the water column at most trap sites.

Results

Four hundred eighty one (481) ducks were banded. This number was comprised of 40 mallards, 233 pintails, 191 green-winged teal, and 17 greater scaup. The number of ducks banded by sex and age is presented in Table 1.

Table 1. Number of ducks banded at Lewis River Slough by age and sex in 1992.

	GREEN-WINGED TEAL				MALLARD			
	L	HY	AHY	TOTAL	L	HY	AHY	TOTAL
M[1]	1	51	53	105	4	5	8	17
F	0	54	32	86	6	8	7	21
U	0	0	0	0	2	0	0	2
TOTAL	1	105	85	191	12	13	15	40

	GREATER SCAUP				PINTAIL			
	L	HY	AHY	TOTAL	L	HY	AHY	TOTAL
M[1]	7	0	0	7	35	70	1	106
F	8	0	1	9	30	84	12	126
U	1	0	0	1	0	1	0	1
TOTAL	16	0	1	17	65	155	13	233

[1]M = Male, F = Female, U = Unknown, L = Local, HY = Hatching Year, AHY = After Hatching Year.

Pintails were recaptured 709 times, mallards 38 times, green-winged teal 67 times, and scaup were recaptured 14 times. In a total of 119 trap nights, an average of 4.0 new ducks per trap night were captured and banded (Table 2). Including recaptures, an average of 10.0 birds per trap night were captured.

The most new pintails caught in one night was 37, on August 5, following the first night of trapping. The second highest number, 29, was banded on August 17.

No previously banded birds were captured, although on 20 August we captured an adult female pintail banded on the Susitna Flats by the FWS on 16 August 1992. Three pintails died from injuries sustained by traps and several local scaup were killed by herring gulls after separation from the brooding hen as a consequence of trapping.

Discussion

Number of ponds with water and water levels appeared typical for this time of year when compared with the two previous years. Due to dry spring weather and no extreme high tides the flats were drier than normal in early summer, but July and August rains

increased water availability. Nesting occurred later this year than usual due to cold spring weather causing later snow and ice melt.

More birds were banded in 1992 than in either of the two previous years (Table 2). Pintail production appeared good and contributed to increased trapping success. Late spring weather affected age class distribution. In 1992, 28% of all pintails (65) banded were local birds, versus 11% of pintails (13) banded in 1991. The primary trapping pond is an important brood rearing area for pintails. Only one adult male pintail was banded and this low number is consistent with previous years. Adult male pintails may molt migrate after breeding.

Table 2. Total number of ducks banded by species from 1990 - 1992 at Lewis River Slough

Species	1990	1991	1992	Total
Northern pintail	39	114	233	386
Mallard	110	21	40	171
Green-winged teal	16	16	191	223
Blue-winged teal	3	5	0	8
American wigeon	3	0	0	3
Northern shoveler	1	0	0	1
Greater scaup	0	0	17	17
Total	169	157	481	807

The increased catch in 1992 was also a function of more traps. More teal were captured due to traps placed in habitat more desirable to green-winged teal and traps with smaller mesh size were used which prevented teal from escaping. Local teal were not captured. Whether this is a function of little nesting and brood rearing in the immediate area or trap avoidance by hens with broods is uncertain but the former is postulated. Many hatch-year green-winged teal were captured and these presumably migrated in from nearby nesting areas.

This was the first year scaup were observed rearing broods in the vicinity of traps and this accounted for their capture. Mallard production was low as it was in 1991. Mallards and shovelers were the least common of the five species of dabbling ducks frequenting the area. Shovelers are not attracted to traps. Wigeon were common in the area but they too are not attracted to traps. No wigeon broods were seen, but a hen exhibiting brood behavior was present.

Acknowledgments

Many thanks to Bill Sherwood for allowing us the use of his cabin. Greg Balogh of the USFWS provided us with much support and materials. Many thanks to Mark Masteller and Rick Sinnott of ADF&G for their help.

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TUNDRA SWAN PRODUCTIVITY ON THE COLVILLE RIVER DELTA

Introduction and Methods

The Colville River Delta on the Beaufort Sea coast hosts the highest nesting density of Eastern Population tundra swans in Alaska. Annually, about 60 pairs breed in the delta, and over 700 aggregate there during staging in September. Mid-June breeding pair/nest surveys and mid-August production surveys have been flown since 1982 (Tables 1 and 2). Surveys are conducted by the pilot and a front observer in a Cessna 206 at 500-700 ft AGL and 120 knts. Observers count within a 1/2-mile corridor on each side of the aircraft, over the 206-mile course.

Results

Spring phenology and snowmelt are the primary factors affecting annual productivity, but flooding and egg predation by arctic fox (Alopex lagopus) contribute to nest losses. In 1992, regional phenology on the North Slope was generally later than average, but the timing of spring flow in the Colville River and breakup in delta lakes was normal. The number of tundra swan pairs and nests observed from the air were slightly below average, and more grouped swans elevated the total swan count (Table 1). Production was better than expected, with above-average numbers of broods and total cygnets, but average brood size was slightly below the 11-year mean (Table 2). The above-average number of flocks and grouped swans probably reflects inclusion of staging birds in the delayed late-August survey. In 1991, the early September production survey was the latest ever flown, and tallied a record number of flocked swans.

Acknowledgements

Mr. James Helmericks of Golden Plover Air and resident of the Colville Delta has contributed highly valuable advice and insight on the swans of the region, served as pilot and observer on all survey flights, and provided logistical support and hospitality to all participating personnel. Bob Ritchie of Alaska Biological Research, Inc. graciously extended the resources of his firm and biologist Larry Byrne to conduct the production survey in 1992.

Table 1. Composition of tundra swans, potential pairs, and nests on the Colville River Delta, Alaska observed during June aerial surveys.

Year	Total Singles	Singles + Nest	Pairs	Group Swans	Groups	Total Swans	Potential Pairs[a]	Nests[b]
1982[c]	31	17	17	29	6	94	34	28(+23)
1983	58	25	45	101	9	249	70	47(+12)
1984	73	21	48	115	5	284	69	25
1985	61	15	73	68	12	275	88	26
1986	39	16	55	31	4	180	71	27
1987	70	21	46	26	5	188	67	31
1988	62	24	49	32	5	192	73	31
1989	70	19	51	4	1	176	70	25
1990	71	21	40	251	8	402	61	25
1991[d]	--	--	--	--	--	--	--	--
1992	84	20	41	139	14	305	61	24
AVG	61.9	19.9	46.5	79.6	6.9	234.5	66.4	28.9

a Potential pairs = pairs + singles at nests.

b Additional nests found by ground survey in parentheses.

c Fog precluded survey of 15 miles square of Colville River east shore (91 percent coverage).

d No June survey was conducted.