ALASKA DEPARTMENT OF FISH AND GAME

JUNEAU, ALASKA

STATE OF ALASKA
Bill Sheffield, Governor

DEPARTMENT OF FISH AND GAME
Don W. Collinsworth, Commissioner

DIVISION OF GAME
W. Lewis Pamplin, Jr., Director
Robert A. Hinman, Deputy Director

ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES

PART XIII. WATERFOWL

Bruce H. Campbell
and
Thomas C. Rothe

Volume XV

Federal Aid in Wildlife Restoration

Project W-22-3, Job 11.0

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CONTENTS

1983-1984

ALASKA WATERFOWL REGULATIONS SUMMARY - SEASONS AND LIMITS

AREA	NORTHERN	GULF COAST	SOUTHEAST	KODIAK & ALEUTIANS
State Game Management Units	11-13 & 17-26	5-7, 9, 14-16 & Unimak Island	1-4	8 & 10 (except Unimak Island)
Open Seasons	Sept. 1-Dec. 16	Sept. 1-Dec. 16	Sept. 1-Dec. 16	Oct. 8-Jan. 22

	LIMIT BAG	POSS.	LIMIT BAG	POSS.	LIMIT BAG	POSS.	LIMIT BAG	POSS.
Ducks	10	30	8	24	7	21	7	21
Sea Ducks[a] & Mergansers	15	30	15	30	15	30	15	30
Geese[b]	6	12	6	12	6	12	6	12
Emperor Geese	6	12	6	12	6	12	6	12
Brant	4	8	4	8	4	8	4	8
Snipe	8	16	8	16	8	16	8	16
Crane	2	4	2	4	2	4	2	4

[a] Sea Ducks: Eiders, Scoters, Old Squaw, Harlequin.

[b] No more than 4 daily, 8 in possession may be Canada and/or white-fronted geese, except that:

In Units 1-9, 14-16, and 18, no more than 2 daily, 4 in possession may be white-fronted geese,
In Units 9(E) and 18, no more than 2 daily, 4 in possession may be Canada geese,
In Unit 10, except on Unimak Island, the taking of Canada geese is prohibited,
In Unit 1(C), the taking of snow geese is prohibited.

(a) WEAPONS: Waterfowl may be taken with a shotgun (not larger than 10 guage) or bow and arrow, but not rifle or pistol.

(b) PLUGS: Shotguns must be plugged to a 3-shell capacity or less for waterfowl hunting.

(c) CONVEYANCES: Hunting is not permitted from an aircraft, motor driven vehicle, air boat, jet boat, or propellor driven boat, which the motor of such has not been completely shut off and its progress therefrom has ceased.

(d) POSSESSION: No state tagging requirements, see Federal Regulations.

(e) TRANSPORTATION: Waterfowl may be plucked in the field but one fully feathered wing or the head must remain attached while being transported.

(f) SHOOTING HOURS: One half hour before sunrise to sunset.

(g) STAMPS: No person 16 or more years of age ay take waterfowl unless he carries a current validated Federal migratory bird hunting stamp (Duck Stamp) on his person.

SUMMARY OF FEDERAL REGULATIONS

In addition to State Regulations, these Federal rules apply to the taking, possession, transportation and storage of migratory game birds:

Restrictions. No person shall take migratory game birds:
- -from a sink box (a low floating device, having a depression affording the hunter a means of concealment beneath the surface of the water).
- -By the use or aid of live decoys.
- -Using records or tapes of migratory bird calls, or sounds, or electrically amplified imitations of bird calls.
- -By the aid of baiting (placing feed such as corn, wheat, salt or other feed to constitute a lure or enticement). Hunters should be aware that a baited area is considered to be baited for 10 days after the removal of bait, and it is not necessary for the hunter to know an area is baited to be in violation.

Field Possession Limit. No person shall possess more than one daily bag limit while in the field, or while returning from the field to one's car , hunt camp, etc.

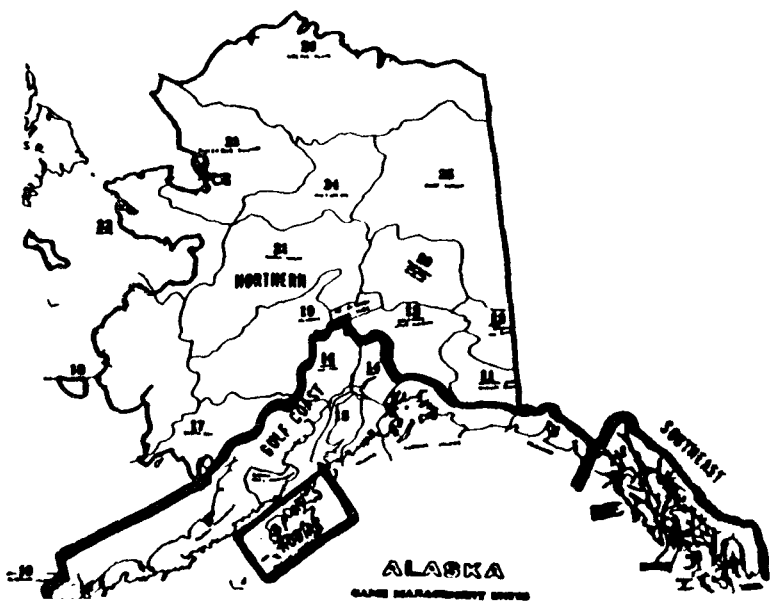
Possession of Live Birds. Crippled birds must be immediately killed.

Transportation. No person shall import during any one week beginning on Sunday more than (1) 25 doves and 10 pigeons from any foreign country and (2) 10 ducks and 5 geese from any foreign country except Canada and Mexico may not exceed Canadian or Mexican export limits and these vary from province to province and from state to state. In addition, one fully feathered wing must remain attached to all migratory game birds being transported or shipped between a port of entry and one's home or to a migratory bird preservation facility. No person may import migratory birds belonging to another person.

Possession. Federal Regulations require migratory birds to be tagged before being left at any place other than the hunter's residence or placed in the custody of another person for any purpose. Tags must state the number and kind of birds, dated killed and address and signature of hunter.

Shipment. No person shall ship migratory game birds unless the package is marked on the outside with: (1) the name and address of the person sending the birds, (2) the name and address of the person to whom the birds are being sent, and (3) the number birds, by species, contained in the package.

CAUTION: More restrictive regulations may apply to National Wildlife Refuges open to hunting. For additional information on Federal regulations, contact Special Agent-in-Charge, U. S. Fish and Wildlife Service, 1011 E. Tudor Road, Anchorage, AK 99503. Telephone (907) 276-3800.



WATERFOWL HARVEST AND HUNTER ACTIVITY

Introduction

A state waterfowl hunter survey was conducted in 1983 by ADF&G. This was the 2nd year of the state survey program, which was reinstituted in 1982. The state survey, used in conjunction with the data from U. S. Fish and Wildlife Service (FWS) surveys, provides a more accurate estimate of hunter activity and harvest in Alaska.

Survey Procedures

A computerized list of all residents legally licensed to hunt in 1983 was used as a sampling base. Eight thousand and sixty-one individuals (10.0% sample) were randomly selected by computer and mailed a survey form (Fig. 1). A total of 3,999 reminder notices (Fig. 1) was sent to nonrespondents approximately 2 months after the initial survey mailing. Forms were self-contained inside a snap-open envelope, and a postage-paid return address was printed on the form's reverse side.

To standardize results, survey data were categorized according to location codes used in the FWS parts collection survey (Table 1). Data were coded to specific locations within 11 harvest areas (Fig. 2) or, if birds were not taken at the specific locations listed in Table 1, then the general harvest area code was assigned. For example, a duck shot in the Kasilof Flats would be coded to general harvest area 06 (Cook Inlet). Timm (1978) provided a more detailed description of the coding system. Reporting bias was corrected during data analysis as described by Timm (1977).

Results

Number of Hunters:

Because of the number of people in Alaska hunting without duck stamps and the incidence of hunting outside legal season limits, the assessment of waterfowl hunter activity and waterfowl harvest is complicated (Timm 1972). While 76 people reported hunting waterfowl in the spring or without purchasing a duck stamp, these data were not included in the analyses. Data on number of hunters, harvest, etc., in this report are based solely on duck stamp sales and, therefore, reflect only the fall sport hunting harvest.

A total of 4,661 people returned the questionnaire for a response rate of 58.8%. Of the 1,145 individuals indicating

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

WATERFOWL HUNTER SURVEY
1983 - 1984

DEAR HUNTER:

Your cooperation is needed to better manage Alaska's waterfowl. By accurately answering the questions below concerning your hunting activities in 1983, you can help insure continued liberal bag limits and good hunting for the future. If you can't remember exact numbers, give your best estimate. Complete the form printed below and drop this card in the mail. No stamp is necessary. Thank you for your cooperation.

1.

PART I (ALL HUNTERS COMPLETE)

2. DID YOU BUY A DUCK STAMP IN 1983? _____ YES ☐ NO ☐
3. DID YOU HUNT FOR WATERFOWL DURING THE 1983-84 SEASON? YES ☐ NO ☐

PART II (COMPLETE ONLY IF YOU BOUGHT A STAMP OR HUNTED)

4. HOW MANY DAYS DID YOU HUNT WATERFOWL? ☐

AT WHAT PLACE DID YOU HUNT FOR MOST OF YOUR DUCKS?

5. _____
(E.G. PILOT POINT, MINTO FLATS, PYBUS BAY, ETC.)

AT WHAT PLACE DID YOU HUNT FOR MOST OF YOUR GEESE?

6. _____

COMMENTS _____

PART II (CONT.) HOW MANY OF THE FOLLOWING BIRDS DID YOU SHOOT AND RETRIEVE?

DUCKS	☐	7.
SEA DUCKS AND MERGANSER	☐	8.
CANADA GEESE	☐	9.
SNOW GEESE	☐	10.
WHITE-FRONTED (SPECKS) GEESE	☐	11.
BRANT	☐	12.
EMPEROR GEESE	☐	13.
UNKNOWN KIND OF GEESE	☐	14.
CRANE	☐	15.
SNIPE	☐	16.
* HOW MANY DUCKS DID YOU SHOOT IN APRIL, MAY AND JUNE?	☐	17.
* HOW MANY GEESE DID YOU SHOOT IN APRIL, MAY AND JUNE?	☐	18.

* YOU WILL NOT BE PROSECUTED FOR ANSWERING

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

WATERFOWL HUNTER SURVEY
1983 - 1984

REMINDER

DEAR HUNTER:

Your cooperation is needed to better manage Alaska's waterfowl. By accurately answering the questions below concerning your hunting activities in 1983, you can help insure continued liberal bag limits and good hunting for the future. If you can't remember exact numbers, give your best estimate. Complete the form printed below and drop this card in the mail. No stamp is necessary. Thank you for your cooperation.

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(E.G. PILOT POINT, MINTO FLATS, PYBUS BAY, ETC.)

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* YOU WILL NOT BE PROSECUTED FOR ANSWERING

Figure 1. Alaska State waterfowl hunter survey and reminder forms, 1983-84.

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

FWS code	ADF&G code	ADFG region (R) and area names	Original FWS "County" name	Harvest zone
0000	00	Unknown	Unknown	Unknown
0101	01	North Slope (R)	Arctic Slope	NW
0301	02	Seward Peninsula (R)	Seward Peninsula	
0502	03	Yukon Valley (R)	Upper Yukon-Kuskokwim	Central
0512	12	Yukon Flats	"	
0702	04	Central (R)	Fairbanks-Minto	"
0712	13	Minto Flats	"	"
0722	14	Eielson AFB	"	"
0732	15	Salchaket Slough	"	"
0742	16	Healy Lake	"	"
0752	17	Delta Area	"	"
0762	18	Tok-Northway		
0901	05	Yukon Delta (R)	Yukon-Kuskokwim Delta	NW
1103	06	Cook Inlet (R)	Anchorage-Kenai	SC
1113	19	Susitna Flats	"	"
1123	20	Palmer-Hay Flats	"	"
1133	21	Goose Bay	"	"
--	22	Eagle River	"	"
1143	23	Potter Marsh	"	"
1153	24	Chickaloon Flats	"	"
1163	25	Portage	"	"
1173	26	Trading Bay	"	"
1183	27	Redoubt Bay	"	"
1193	28	Kachemak Bay	"	"
--	46	Jim-Swan area	"	"
1303	07	Gulf Coast (R)	Cordova-Copper River	"
1313	29	Copper River Delta	"	"
1323	30	Yakutat Area	"	"
1333	31	Prince William Sound	"	"
1503	08	Southeast Coast (R)	Juneau-Sitka	SE
1513	32	Chilkat River	"	"
1523	33	Blind Slough	"	"
1533	34	Rocky Pass	"	"
1543	35	Duncan Canal	"	"
1553	36	St. James Bay	"	"
1563	37	Mendenhall Wetlands	"	"
1573	38	Farragut Bay	"	"
1583	39	Stikine River Delta	"	"
1704	09	Kodiak (R)	Kodiak Island	SW
1714	40	Kalsin Bay	"	"
1904	10	AK Peninsula (R)	Cold Bay-AK Peninsula	"
1914	41	Cold Bay	"	"
1924	42	Pilot Point	"	"
1934	43	Port Moller	"	"
1944	44	Port Heiden	"	"
--	45	Cinder River	"	"
2104	11	Aleutian Chain (R)	Aleutians-Pribilofs	"

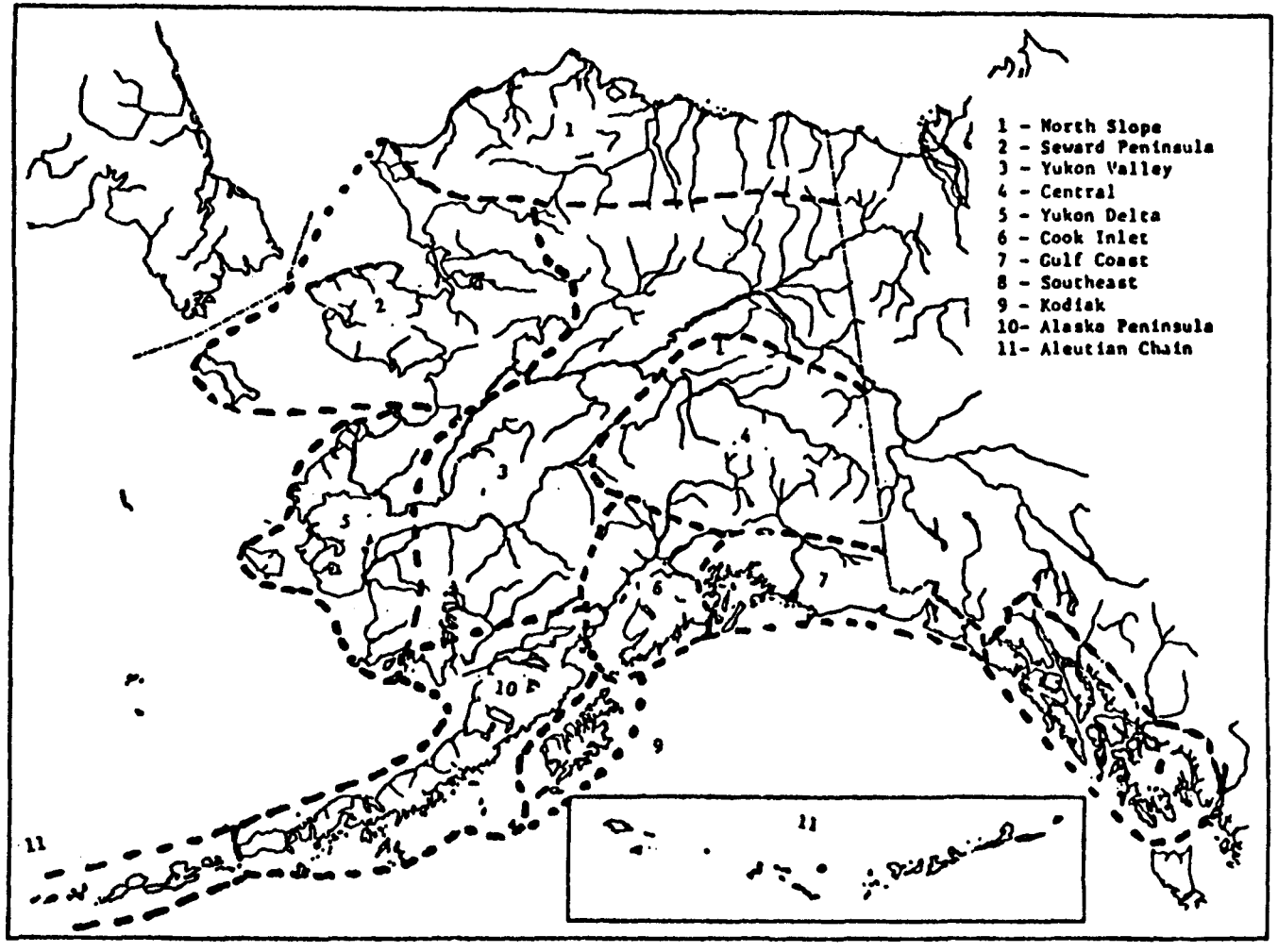

Fig. 2. Harvest areas used in data analyses.

that they had purchased a duck stamp, 781 reported hunting 1 or more days

(68.2% active hunters). Based on the total duck stamp sales in Alaska of 18,879 reported by Carney et al. (1984), a calculated 12,875 people hunted waterfowl during the 1983-84 season (Table 2).

Hunting Activity:

Hunters reported hunting an average of 5.9 days during the 1983-84 season. This projects to a total of 75,963 waterfowl hunter-days (Table 2), compared to 61,425 hunter days in 1982. The distribution of hunter-days and resulting harvest are summarized by region in Table 3 and by specific hunting area in Table 4.

Duck Harvest:

A calculated average of 9.6 ducks/active hunter was taken in 1983. This compares to 10.1 ducks/active hunter in 1982, and a 1973-82 average of 8.7 ducks/active hunter. Calculated average daily hunting success was 1.6 ducks/hunter in 1983, as compared to 1.8 in 1982.

The projected statewide duck harvest was 123,600, of which 114,588 (92.7%) were dabblers and divers and 9,012 (7.3%) were sea ducks (Table 2). This estimate is comparable to a Fish and Wildlife Service estimated harvest of 103,681, of which 85,728 (82.7%) were dabblers, 15,936 (15.4%) were divers and 2,017 (1.9%) were sea ducks and mergansers (Carney et al. 1984). The 1983 state survey estimated harvest was 2.3% greater than 1982 and 40.6% above the 1973-82 average harvest of 87,924 ducks.

Based on the FWS parts collection survey, which is believed to provide the best estimate available for species composition projections, the mallard was the most important game duck in 1983, comprising about 30% of the harvest, followed by American wigeon (18%), pintail (15%) and green-wing teal (14%) (Table 5). Species composition of the statewide duck harvest has remained relatively constant during the past 10 years (1974-83) with 85% (±2.9) of the harvest composed of dabbling ducks, 10.8% (±2.8) diving ducks and 4.3% (±2.2) sea ducks and mergansers (Table 6). As calculated from the State waterfowl hunter survey, over 37% of the duck harvest occurred in Cook Inlet with the Central Region contributing an additional 25.6% (Table 7). The distribution of harvest in 1983 shifted significantly ($\chi^2 = 5.85$, df = 11, $P \leq 0.05$) from the 1972-76 and 1982 ADF&G survey average. This shift was primarily the result of increasing harvest in the Central, Yukon Delta, Kodiak

Table 2. Summary of Alaska waterfowl hunter activity and harvest from the ADF&G state mail questionnaire survey, 1983-84.

No. of licensed resident hunters (all classes): 80,610

No. of license buyers sampled: 8,061 (10%)

No. and proportion of respondents from survey[a]: 4,661 (58.8%)

No. of returns usable for data analysis: 781 (16.8%)

Projected No. of fall sport hunters:

Duck stamps sold in Alaska[b]: 18,879

No. of active hunters: 12,875 (68.2%)

Calculated statewide fall sport harvests:

Ducks: Dabblers/divers: 114,588; sea ducks: 9,012; Total 123,600

Geese: Canada: 9,013; emperor: 1,674; brant: 1,931; white-fronted: 1,159

snow: 515; unknown species: 386; Total: 14,678

Cranes: 1,803

Snipe: 3,476

Calculated Hunter-days: 75,963

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[a] Estimated rate of deliverable questionnaires only; excludes change of address, insufficient address, deceased hunter, etc.

[b] Carney et al. 1984.

Table 3. Calculated duck, crane and snipe fall sport harvests and sport hunter activity by harvest area, 1983-84.

Harvest Area	Hunter-days		Dabblers/Divers		Sea Ducks		Crane		Snipe	
	N	%	N	%	N	%	N	%	N	%
North Slope	531	0.7	115	0.1	0	0.0	0	0.0	0	0.0
Seward Pen.	1,899	2.5	2406	2.1	0	0.0	56	3.1	0	0.0
Yukon Valley	1,671	2.2	2865	2.5	63	0.7	97	5.4	0	0.0
Central	16,408	21.6	30,710	26.8	964	10.7	1,221	67.7	483	13.9
Yukon Delta	2,279	3.0	2,635	2.3	802	8.9	166	9.2	0	0.0
Cook Inlet	30,081	39.6	43,658	38.1	2,541	28.2	195	10.8	1,787	51.4
Gulf Coast	3,874	5.1	8,021	7.0	18	0.2	56	3.1	222	6.4
Southeast	14,433	19.0	15,928	13.9	3,217	35.7	14	0.8	831	23.9
Kodiak	3,040	4.0	3,781	3.3	713	7.9	0	0.0	83	2.4
Alaska Pen.	1,671	2.2	4,469	3.9	694	7.7	0	0.0	70	2.0
Aleutian Chain	76	0.1	0	0.0	0	0.0	0	0.0	0	0.0
Statewide	75,963	100.0	114,588	100.0	9,012	100.0	1,805	100.1	3,476	100.0

Table 4. Calculated hunting activity and harvest for specific locations in Alaska, 1983-84.

Location	Calculated duck harvest and hunter-days: Ducks N	Ducks % of state total	Hunter-days N	Hunter-days % of state total	Location	Calculated goose harvest N	Goose % of state total
Susitna Flats	14,584	11.8	6,913	9.1	Cold Bay	1321	9.0
Palmer Hay Flats	12,978	10.5	6,913	9.1	Delta Area	1042	7.1
Minto Flats	9,542	7.2	2,887	7.2	Minto Flats	705	4.8
Copper River Delta	4,450	3.6	2,127	2.8	Pilot Point	631	4.3
Mendenhall	3,832	3.1	2,127	2.8	Susitna Flats	602	4.1
Kachemak Bay	3,337	2.7	1,595	2.1	Copper River Delta	500	3.4
Stikine River Delta	3,090	2.5	1,978	1.6	Prince William Sound	440	3.0
Tok-Northway	3,090	2.5	1,978	1.6	Palmer Hay Flats	410	2.8
Prince William Sound	2,719	2.2	684	0.9	Mendenhall	367	2.5
Trading Bay	2,101	1.7	608	0.8	Stikine River Delta	191	1.3
Healy Lake	1,730	1.4	608	0.8	Trading Bay	147	1.0
Portage	1,607	1.3	2,887	3.8	Chickaloon	103	0.7
Delta Area	1,483	1.2	1,823	2.4	Portage	103	0.7
Chilkat River	1,236	1.0	304	0.4	Goose Bay	88	0.6
Duncan Canal	1,236	1.0	380	0.5	Duncan Canal	88	0.6
Cold Bay	1,112	0.9	1,215	1.6	Blind Slough	59	0.4
Pilot Point	1,112	0.9	685	0.9	Rocky Pass	59	0.4
Rocky Pass	989	0.8	228	0.3	Kachemak Bay	44	0.3
Goose Bay	865	0.7	1,063	1.4	Tok-Northway	30	0.2
Chickaloon	865	0.7	760	1.0	Eagle River Flats	30	0.2
Eielson AFB	742	0.6	1,291	1.7	Redoubt Bay	30	0.2
Jim-Swan Lake	742	0.6	380	0.5	Yakutat	30	0.2
Blind Slough	618	0.5	532	0.7	Chilkat River	30	0.2
Salchaket Slough	494	0.4	228	0.3			
Redoubt Bay	370	0.3	608	0.8			
Potters Marsh	247	0.2	684	0.9			
Yakutat area	247	0.2	228	0.3			
Eagle River Flats	124	0.1	304	0.4			
Subtotals	75,542	60.6	42,017	56.7		7,050	48.0
Statewide totals	123,600	100.0	75,963	100.0		14,678	100.0

Table 5. Species (%) composition of the 1983–84 duck harvest by region based on the Fish and Wildlife Service parts collection survey (N = 1,830 wings).

Species	North Slope[a]	Seward Pen.	Yukon Valley	Central	Yukon Delta	Cook Inlet	Gulf Coast	Southeast	Kodiak[a]	Alaska Pen.	Aleutian Chain	% total statewide
Mallard	–	0	28.4	24.9	0	27.4	54.9	38.3	–	32.2	0	29.8
Am. Wigeon	–	4.6	46.2	20.6	0	17.8	14.2	11.6	–	3.7	0	17.5
Pintail	–	15.3	0	10.2	0	20.2	9.4	7.3	–	20.8	0	14.7
G-W Teal	–	36.3	17.4	7.8	52.2	11.0	7.2	21.7	–	17.4	100.0	13.7
Shoveler	–	0	0	4.8	0	6.7	7.1	3.6	–	1.2	0	5.1
Gadwall	–	0	0	0	0	1.0	0	0.7	–	24.7	0	1.6
B-W Teal	–	0	0	0	0	0.2	–	0.6	–	0	0	0.2
Unknown	–	0	0	0.3	0	0	0	0	–	0	0	0.1
Total Dabblers		56.2	92.0	68.6	52.2	84.3	92.8	83.8	–	100.0	100.0	82.7
Lesser Scaup	–	9.1	4.0	15.6	0	1.8	2.4	1.2	–	0	0	3.8
Barrow's Goldeneye	–	4.7	0	1.4	0	3.4	2.4	3.9	–	0	0	2.9
Greater Scaup	–	1.4	1.0	3.1	0	3.2	0	0.6	–	0	0	2.3
Bufflehead	–	23.2	0	4.7	0	0.7	0	6.2	–	0	0	2.6
Common Goldeneye	–	0	2.0	2.1	0	2.6	0	1.2	–	0	0	2.0
Canvasback	–	0	0	1.4	0	1.5	0	0	–	0	0	1.0
Redhead	–	0	0	0	0	0.7	0	0	–	0	0	0.4
Ringneck	–	0	1.0	1.4	47.8	0	0	0	–	0	0	0.3
Total Divers		38.4	8.0	29.7	47.8	13.9	4.8	13.1		0	0	15.3
W-W Scoter	–	0	0	1.0	0	0.7	0	0.6	–	0	0	0.7
Common Merganser	–	0	0	0	0	0.6	0	0.6	–	0	0	0.5
Harlequin	–	5.5	0	0.3	0	0.1	0	0.6	–	0	0	0.3
Hooded Merganser	–	0	0	0	0	0	0	1.2	–	0	0	0.3
Oldsquaw	–	0	0	0	0	0.2	0	0	–	0	0	0.1
R-B Merganser	–	0	0	0	0	0.2	0	0	–	0	0	0.1
Black Scoter	–	0	0	0.3	0	0	0	0	–	0	0	0.1
Surf Scoter	–	0	0	0	0	0	2.4	0	–	0	0	0.005
Total seaducks/ mergansers	–	5.5	0	1.6	0	1.8	2.4	3.0	–	0	0	2.2

[a] No duck harvest reported by FWS parts collection survey.

Table 6. Species composition of the statewide duck harvest in Alaska, 1974-83 based on FWS parts collection surveys.

Category	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	$\bar{x}$	±SD
Dabbling Ducks %	79.9	88.0	82.6	88.2	82.5	87.5	85.0	87.7	85.4	82.7	85.0	2.98
Diving Ducks %	14.3	5.8	9.5	10.3	11.1	8.2	12.5	9.9	11.0	15.3	10.8	2.8
Sea Duck/ Mergansers, %	5.8	6.2	7.9	1.5	6.5	4.2	2.5	2.3	3.6	2.2	4.3	2.2

Table 7. Projected distribution of 1983 duck harvest by harvest area compared to the ADF&G mail survey 1972-76 and 1982 average.

Harvest area	1983 (%)	1972-76 and 1982 avg. (%)
North Slope	0.1	0.2
Seward Peninsula	2.1	2.0
Yukon Valley	2.4	2.3
Central	25.6	17.6
Y-K Delta	2.8	1.8
Cook Inlet	37.4	42.6
Gulf Coast	6.5	7.3
Southeast	15.5	19.1
Kodiak	3.6	2.9
Alaska Peninsula	4.2	3.9
Aleutian Chain	0.0	4.7

and Alaska Peninsula regions and a decrease in harvest in the Cook Inlet region.

Goose Harvest:

Hunters reported taking an average of 1.1 geese/active waterfowl hunter in 1983. This was slightly lower than the 1.2 geese/ hunter reported in 1982 but virtually identical to the 10-year average of 1.1 geese/hunter. The calculated 1983 statewide goose harvest was 14,678, an increase from 13,125 in 1982 and very similar to the 10-year average of 14,762. The state harvest estimate was 28% greater than the Fish and Wildlife Service estimate of 11,447 (Carney et al. 1984).

As in previous years, the Canada goose was the most common bird harvested by sport hunters in 1983 (Table 2). This species made up 61.4% of the harvest, followed by brant (13.2%), emperor (11.4%), white-fronts (7.9%), snow (3.5%), and unknown species (2.6%). This compares to a 1982 harvest of 58% Canadas, 13.5% emperors, 13.5% brant, 8.3% white-fronts, and 5% snow geese.

Goose harvest distribution in 1983 was more evenly distributed than in 1982 when Cook Inlet and Yukon Delta accounted for 54.6% of the harvest. These 2 regions accounted for smaller proportions of the statewide harvest than in 1982, while the Alaska Peninsula, Central and Seward Peninsula areas took larger percentages (Table 8).

Crane Harvest:

Hunters reported taking an average of 0.14 sandhill cranes/-active hunter in 1983. This compares to an average of 0.16 in 1982. The calculated statewide crane harvest was 1,803 (Table 2), compared to 1,746 in 1982, and a 10-year average of 920 birds/year. Over 67% of the 1983 crane harvest occurred in the central region of the state (Table 3).

Snipe Harvest:

An average of 0.27 snipe was harvested/active hunter in 1983 for a calculated statewide harvest of 3,476 birds (Table 2). This compares to 0.44 birds/hunter and a calculated harvest of 4,833 snipe in 1982. Over half (51.4%) of the 1983 harvest occurred in Cook Inlet, with Southeastern Alaska contributing an additional 23.9% (Table 3).

Discussion

The combination of state and federal harvest survey data has produced reasonable estimates of harvest and hunter activity

Table 8. Magnitude and distribution of the fall goose sport harvest by species and harvest area, 1983-84.

Region	Canada		Emperor		Brant		Snow		Whitefront		Unknown		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
North Slope	0	0.0	0	0.0	27	1.4	0	0.0	81	7.0	0	0.0	108	0.7
Seward Pen.	721	8.0	43	2.6	828	42.9	290	56.4	54	4.7	0	0.0	1936	13.2
Yukon Valley	613	6.8	217	13.0[a]	0	0.0	0	0.0	81	7.0	31	8.0	942	6.4
Central	1703	18.9	43	2.6[a]	97	5.0[a]	79	15.4	566	48.8	15	4.0	2503	17.2
Yukon Delta	865	9.6	393	23.5	303	15.7	26	5.1	81	7.0	232	60.0	1900	12.7
Cook Inlet	1217	13.5	15	0.9	97	5.0	40	7.7	148	12.8	93	24.0	1610	11.0
Gulf Coast	829	9.2	59	3.5	83	4.3	0	0.0	27	2.3	15	4.0	1013	6.9
Southeast	1587	17.6	0	0.0	0	0.0	53	10.3	0	0.0	0	0.0	1640	11.4
Kodiak	81	0.9	0	0.0	0	0.0	0	0.0	14	1.2	0	0.0	95	0.6
Alaska Pen.	1388	15.4	787	47.0	496	25.7	26	5.1	108	9.3	0	0.0	2805	18.9
Aleutian Chain	9	0.1	117	7.0	0	0.0	0	0.0	0	0.0	0	0.0	126	0.8
Statewide totals	9013	100.0	1674	100.1	1931	100.0	515	100.0	1159	100.1	386	100.0	14,678	99.8

[a] Probable reporting error, species rare in these regions.

for the past 2 years. Although both surveys have different sampling problems and are largely duplicative, the state survey provides more accurate information by specific localities within the state. For consistency over a 3-year period, both surveys will be used again in the 1984-85 season.

In the 1985-86 season, Alaska will initiate a state duck stamp program which will produce substantial revenue dedicated to waterfowl work and provide direct access to the state's waterfowl hunters. In the past, the waterfowl harvest survey sample has been drawn from all licensed hunters, resulting in a small proportion of usable harvest reports. Survey cards distributed with sales of state duck stamps should provide a larger sample and the best available harvest data.

The number of waterfowl hunters and hunting effort in Alaska, as measured by duck stamp sales and hunter-days, continues to reflect the rapid growth rate and redistribution of the human population of the state. Over the past 10 years, duck stamp sales have been declining in the Pacific Flyway, but in Alaska, the trend has been one of steady increase except for a sharp drop in 1981. While stamp sales have risen approximately 17% and active hunters have increased by only 8.3%, hunter-days have increased by 41.6%.

Much of the increase in hunter effort can be attributed to population growth and more hunting activity in Cook Inlet. Since 1970, the population of the Anchorage Borough has increased by over 93%; on adjacent waterfowling areas, hunter-days have risen by 43.8% on Susitna Flats, 76% at Trading Bay and 83.9% on Palmer Hay Flats. Upper Cook Inlet now accounts for 28.6% of total hunter-days and 27.9% of the state duck harvest. At popular hunting areas in other parts of the state, hunter effort has increased by nearly 27% at Minto near Fairbanks, but decreased by 19.7% on Copper River Delta and 36.8% on Mendenhall Flats near Juneau.

During the 1983-84 season, bag limit changes were instituted on geese. The daily limits were raised from 1 to 2 for white-fronts (Pacific), because previous restrictions did not influence the harvest. Survey data indicate that, despite the increased limits, Pacific white-front harvest was reduced 41% from the 1982-83 estimate of 621. An increase noted for the Alaska Peninsula was offset by decreases on the Y-K Delta and Cook Inlet. Concurrently, an increase in Canada goose bag limits from 1 to 2 in Subunit 9E, intended to redistribute the harvest, resulted in an increase in harvest from 210 to 631 geese at Pilot Point and Cinder River; however, this harvest was well below those prior to 1982. Clearly, the bag limit change was the main cause of a tripling of the number of hunter-days and the goose harvest in these areas.

DUSKY CANADA GOOSE STUDIES

Production

Conditions on the Copper River Delta were favorable for nesting in 1984. Spring weather was mild and the Delta was free of snow and ice by early April. Development of foliage was somewhat retarded by cool nighttime temperatures, but "green-up" still occurred 10 days to 2 weeks earlier than normal. Weather during nesting was much drier and warmer than most years.

The 1st duskys arrived on the nesting grounds between 15-20 March (G. Covel, USFS, pers. commun.) with a major build-up reported around 9 April (J. Reynolds, pers. commun.). Nest initiation was early, as determined by back dating age of eggs from 123 nests using techniques suggested by Bromley (pers. commun.). Frequency distribution of estimated nest initiation dates indicated a minor peak in nest initiation between 21-25 April with primary nest initiation occurring between 3-8 May.

While 1984 nest densities on the west Delta study plots were similar to 1983 and well below the 9-year-average, average clutch size and nesting success indicated a highly productive effort by the breeding population (Table 9). Average clutch size was 5.6 eggs, the 2nd largest recorded since 1959 and considerably above the 16-year-mean of 5.2 eggs. Nesting success was 76%, the highest recorded since 1977. This compares to about 52% in 1983, and a 16-year average of 56%.

Contrary to data from 1982 and 1983, nest predation, estimated from nesting study plots, was not a major factor in 1984. Only 15% of the nests on the study plots were destroyed by predators; 62.4% of the nest destruction was attributed to mammals and 37.6% to avian predators (Table 10). This compares to 64.8% nest destruction by mammals and 5.6% avian in 1983, and 45% mammals and 33.8% avian in 1982. Further refinement of predatory agent identification techniques allowed relatively accurate delineation between canid and bear destruction in 1984. Brown bears were responsible for about 34% of the nest losses and canids about 25%.

A production survey during July 1984 indicated that only about 18-20% of the population was composed of young birds. This low production estimate, in contrast to high nesting success, indicates either an underestimate of young due to poor survey conditions, poor brood survival, or both. Low numbers of young seen during an additional survey and banding suggest that brood survival was poor. Breeding population survey techniques were tested during May 1984 by the U. S. Fish and Wildlife Service in cooperation with ADF&G. Survey data have

Table 9. Dusky Canada goose nest densities, hatching success, and average clutch size on the West Copper River Delta study area, 1959-84.

Year	$\bar{x}$ nest density/mi^2	Nest success		Clutch size	
		N	%	N	$\bar{x}$
1959-74	ND[a]	ND	82.9	ND	5.0
1975	179	215	31.6	215	4.8
1976	156	ND	ND	168	4.8
1977	175	229	79.0	181	5.4
1978	183	390	56.2	ND	ND
1979	133	409	18.8	338	5.7
1980	108	ND	ND	152	5.4
1981	ND	ND	ND	28	4.9
1982	102	151	49.8	135	4.8
1983	91	162	51.9	87	5.5
1984	95	161	75.8	123	5.6
Means	136		56.3		5.2

[a] Data not recorded.

Table 10. Fate of dusky Canada goose nests on the west Copper River Delta study area, 1982-84.

Year	No. nests	Succ. %	Aban. %	Unknown %	Destr. %	Type destruction (%)			
						Mammal	Avian	Flooding	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[a]	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

[a] Trainer 1959.
[b] Eggs rather than nests.
[c] Bromley 1976.
[d] Not reported.
[e] Percentage not given, but major losses attributed to avian predators.

not been thoroughly analyzed, but aerial survey techniques appear promising, and the difficulty in obtaining adequate ground comparison counts from a large, inaccessible area makes the feasibility of a breeding grounds survey questionable.

Population estimates were calculated from counts on the wintering grounds for the 7th year. Bob Jarvis of Oregon State University and John Cornely from the Willamette Valley Refuge Complex, USFWS, estimated a 1984 post-season population of 10,000 duskys in western Oregon and southwestern Washington (unpubl. rep. to Pacific Flyway Waterfowl Study Committee). That estimate, compared with a 1983 fall flight estimate of 19,300, indicated the loss of 9,300 geese during the winter and early spring of 1983-84 (Table 11). An estimated 9,750 breeding grounds population in 1984 plus 18-20% young, resulted in a calculated fall 1984 flight of about 12,000 birds (Table 11).

Banding

The revised flyway management plan recommends banding every 3rd year to monitor distribution and timing of harvest. However, due to the population decline, the Dusky Subcommittee of the Pacific Flyway Technical Committee has recommended annual banding. In response to this recommendation, a total of 1,038 geese were captured during molt in July 1984. Of these, 108 were recaptures, 12 were goslings too small to band, 6 were released due to injuries, 1 was a trapping mortality and 911 were banded. Age and sex composition of banded birds was 328 female after hatching year birds (AHY), 374 AHY males, 110 young or local (L) females, 95 L males, and 4 unknown age and sex birds. Red neck collars were fitted to 496 geese to support wintering and breeding grounds studies. Sex and age composition of collared birds was 165 AHY females, 193 AHY males, 36 L females, 44 L males, 8 unknown; 47 birds were banded prior to 1984.

Band return data since banding was initiated in 1951 is currently being updated and reanalyzed. A preliminary distribution of band returns is presented in Table 12.

BROWN BEAR ACTIVITY AND IMPACTS ON NESTING GEESE ON THE WEST COPPER RIVER DELTA

Introduction

A 3-year investigation of the activity of brown bears and their impact on nesting dusky Canada geese was initiated on the Copper River Delta by ADF&G in May 1984. This investigation is jointly funded by the Oregon Department of Fish and

Table 11. Summary of population data for dusky Canada geese, 1971-84.

Year	Mid-winter pop.	Spring populations [a]	Percent young	Non-prod. [b]	No. Young produced	Fall flight	Fall-spring mortality [c]
1971	19,800	19,060	16.2	79.7	3,690	22,750	4,850
1972	17,900	17,230	10.6	71.7	2,045	19,275	3,475
1973	15,800	15,210	36.0	64.6	8,560	23,770	5,170
1974	18,600	17,900	51.4	35.7	18,935	36,835	10,335
1975	26,500	25,510	17.9	84.5	5,565	31,075	8,075
1976	23,000	22,140	24.2	54.2	6,975	29,115	5,015
1977	24,100	23,200	44.3	56.9	18,460	41,660	17,660
1978	24,000	23,100	24.8	71.8	7,635	30,735	5,235
1979	25,500	24,545	16.0	87.0	4,680	29,225	7,225
1980	22,000	21,175	23.7	67.4	6,575	27,750	4,750
1981	23,000	22,140	17.9	92.0	4,830	26,970	9,230
1982	17,740	17,075	23.7	79.1	5,310	22,385	5,385
1983	17,000	16,360	15.0	87.7	2,890	19,250	9,150
1984	10,100	9,720	18.3	83.0	2,180	11,900	

[a] Mid-winter less 0.0375 mortality (Chapman et al. 1969).

[b] Percent of total adults seen in flocks with no young.

[c] Fall flight less mid-winter inventory.

Table 12. Percentage distribution of band recoveries from sport harvested dusky Canada geese since 1951; data analysis as of 3 August 1984.

Hunting Season	No. recoveries	Alaska	British Columbia	Washington	Oregon	Other
1951	3	0	0	0	100	0
1952	35	17.1	2.9	5.7	74.3	0
1953	105	8.6	24.8	8.6	58.1	0
1954	201	10.0	7.0	18.4	64.2	0.5[a]
1955	92	5.4	4.3	9.8	80.4	0
1956	86	4.7	26.7	9.3	59.3	0
1957	172	4.1	22.1	8.1	64.5	1.2[a]
1958	135	4.4	14.1	11.1	70.4	0
1959	140	7.1	22.1	4.3	66.4	0
1960	156	5.1	19.9	17.3	57.7	0
1961	48	12.5	18.8	12.5	56.3	0
1962	105	13.3	11.4	11.4	63.8	0
1963	123	5.7	15.4	6.5	69.9	2.4[a]
1964	64	4.7	7.8	18.8	68.8	0
1965	112	7.1	14.3	14.3	63.4	0.9
1966	95	9.5	7.4	3.2	80.0	0
1967	73	8.2	6.8	16.4	68.5	0
1968	96	9.4	17.7	10.4	62.5	0
1969	97	10.3	10.3	11.3	68.0	0
1970	159	10.7	8.2	8.8	72.3	0
1971	67	11.9	6.0	9.0	73.1	0
1972	103	9.7	0	8.7	80.6	1.0[a]
1973	66	18.2	4.5	10.6	66.7	0
1974	191	13.6	5.2	13.6	67.5	0
1975	194	13.9	5.2	13.9	67.0	0
1976	235	10.2	10.6	14.0	64.7	0.4[b]
1977	243	16.5	4.9	9.1	69.1	0.4[a]
1978	236	24.2	2.1	13.6	57.6	2.5[a]
1979	98	16.3	2.0	12.2	69.4	0
1980	104	2.9	2.9	8.7	84.6	1.0[a]
1981	69	4.3	0	10.1	85.5	0
1982	33	24.2	0	9.1	63.6	3.0[d]
1983	76	6.6	0	5.3	88.2	0
$\bar{x}$ ± SD		10.3±5.5	9.5±17.8	10.8±3.9	69.0±8.4[e]	

[a] California.
[b] Minnesota.
[c] Utah.
[d] Idaho.
[e] Excluding 1951.

Wildlife, U.S. Forest Service, and Alaska Department of Fish and Game, and is endorsed by the Dusky/Taverner Canada goose subcommittee of the Pacific Waterfowl Flyway Technical Committee. It has 2 primary objectives: (1) to ascertain the activity of brown bears on the nesting grounds and their impact on nesting geese; and (2) to collect information to evaluate brown bear management options.

A comprehensive report for the 1st year of this investigation will be presented to the U.S. Forest Service as a contract completion report (Contract 53-0109-3-00156) in February 1985. The following report briefly summarizes 1st year results.

Objectives

The following are objectives of the investigation:

1. Determine seasonal home range of brown bears on the Delta during goose nesting.

2. Define bear habitat selectivity during the period of goose nesting.

3. Estimate number of bears using the Delta during goose nesting.

4. In conjunction with nesting studies, quantify the extent of nest predation by brown bears.

5. Determine when bears become active in the spring and when they move onto the Delta.

6. Determine the fidelity of bears to the Delta in the spring.

7. Determine bear seasonal home ranges on the Delta during the remainder of their annual activity cycle.

8. In conjunction with nesting studies, further develop and refine criteria for determining predatory agents at nest sites.

Since several objectives will not be addressed until spring 1985 or data was still being collected at the end of the 1984 survey and inventory reporting period (31 August 1984), only objectives 1-4 are addressed in this report.

Study Area

The study area is defined by bear movements. However, the area of interest lies between the Heney Range, Copper River, Gulf of Alaska and Chugach Mountains (Fig. 3). The area of

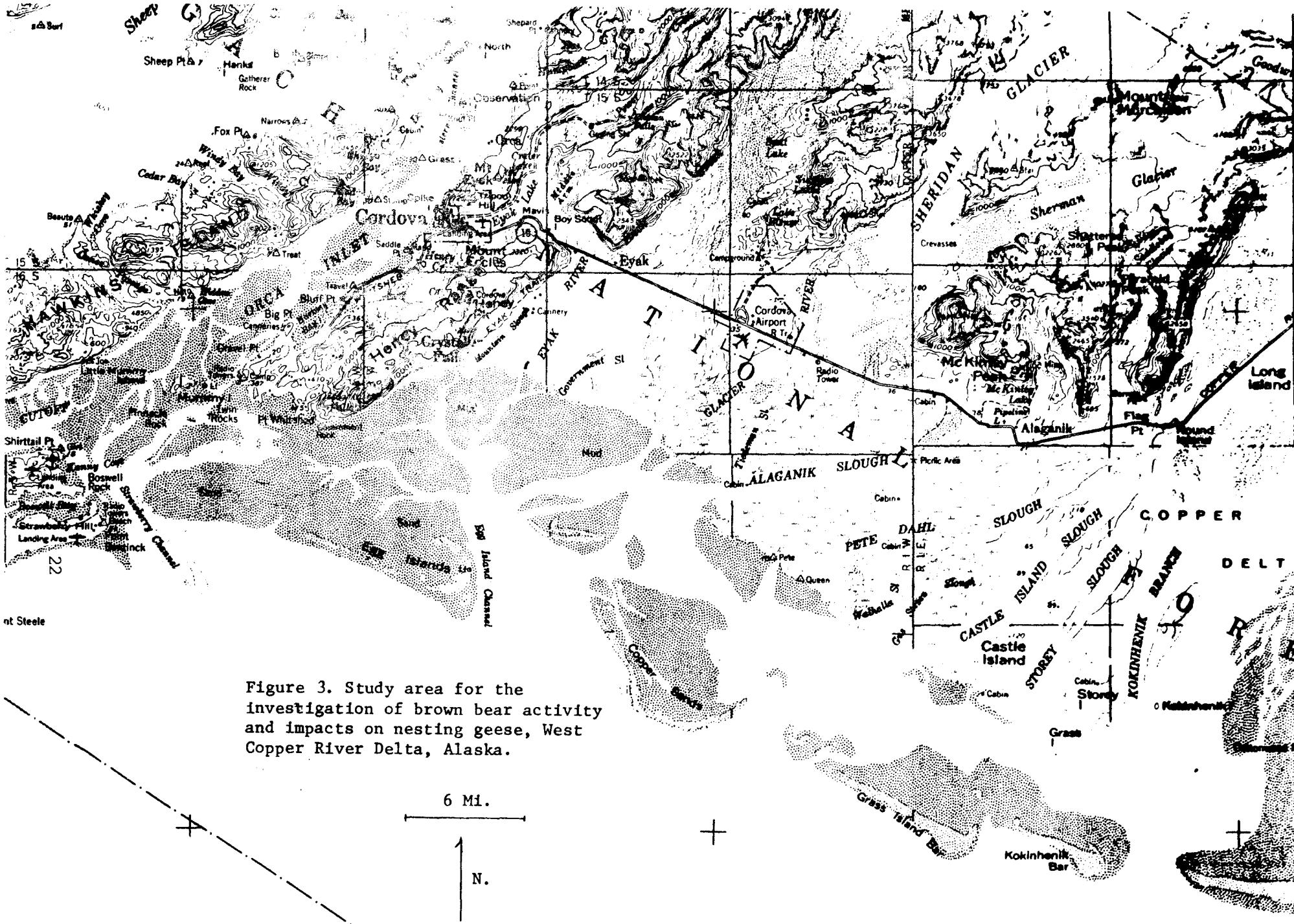

Figure 3. Study area for the investigation of brown bear activity and impacts on nesting geese, West Copper River Delta, Alaska.

primary concern is the coastal portion of the Delta south of the Copper River Highway where the density of nesting geese is highest.

Results

Twelve bears were captured in 1984 (Table 13); 9 of these were tagged and released. Two 2.5-year-old cubs were lost to hyperthermia, and 1 large male was captured, but not tagged, because of size and the probability that a collar would be slipped, or, if attached tightly, might harm the animal.

Study animals were relocated 298 times between 14 May-18 June when geese were nesting. Each bear was relocated an average of 33 times (range 28-36). Home ranges averaged 59 mi^2 (±28.5), but varied considerably from 23 mi^2-110.2 mi^2 (Table 14).

An additional 34 relocations were made between 18 June and 31 August 1984. Each animal was relocated an average of 3.8 times during the period. Home ranges were not computed for the period after 18 June because bears were still active at the end of the reporting period.

Bear activity, habitat selectivity, and nest destruction on the Delta were apparently related to age and breeding condition of the bears. Three of the 4 adult females had lost or were separated from their offspring by 1 June and spent a minimum of 9+ days out of the 36-day intensive study period paired with the opposite sex (Table 15). Breeding adults were more frequently relocated inland from the coast in tall shrub and lowland forest than immature bears which were more frequently relocated in open coastal habitat types (Figure 4).

Eighty-five, (29%) of the 298 relocations occurred in or immediately adjacent to high nest density areas, and 60 relocations (71%) were of immature bears. Nine of the remaining 25 relocations were from a sow and cub who spent the entire summer on an island in the mouth of the Copper River. Adult males and single females were relocated only 16 times in areas considered to be good goose nesting habitat and 8 of those relocations were in immediately adjacent, dense shrub vegetation.

Low nest predation by brown bears was associated with the observed differences in activity and habitat selectivity. Nesting success of near 80% occurred on approximately 1.7 mi^2 of the outer delta considered to be good nesting habitat and where tagged bears were known to be active. Nest destruction by bears was only about 5%.

Table 13. Captured brown bears, their associations and status on the West Copper River Delta in 1984.

Date	Bear No.	Sex	Age	Association at capture	Status
12 May	13	F	10.5	cub, unknown age	tagged
	40	F	15±[a]	2 2.5-yr. cubs	tagged
	--	F	2.5	040, 2.5-yr. M cub	mortality
	--	M	2.5	040, 2.5-yr. F cub	mortality
	102	F	12.5	yrlg. cub	tagged
	024	M	6.5	none	tagged
	105	F	5.5	cub, unknown age	tagged
	106	M	2.5	none	tagged
13 May	108	F	3.5	none	tagged
	609	M	13.5	none	released
17 May	17	M	12.5	none	tagged
	91	F	2.5	none	tagged

[a] No tooth extracted for aging. Animal revived immediately after tagging due to signs of severe hyperthermia.

Table 14. Home range of radio-tagged brown bears on the West Copper River Delta, 14 May-18 June 1984.

Bear	Sex	Age	Reproductive condition	No. relocations	Area (mi^2)
13	F	10.5	lost yrlg. cub 5/12[b] -breeding	34	81.6[a]
17	M	12.5	breeding	28	110.2
40	F	15 ±	lost 2-2.5 yr. cubs[c] -breeding	35	37.3
91	F	2.5	--	29	48.7[a]
102	F	12.5	w/yrlg. cub	34	23.3
104	M	6.5	breeding	32	51.6
105	F	5.5	lost yearling cub 6/1[b] -breeding	34	35.9
106	M	2.5	--	35	89.1
108	F	3.5	--	35	55.7
$\bar{x}$					59.3 ±28.5

[a] Includes a long distance move out of and back into the study area in a 24-hr period.

[b] Disappeared, fate unknown.

[c] Capture mortality.

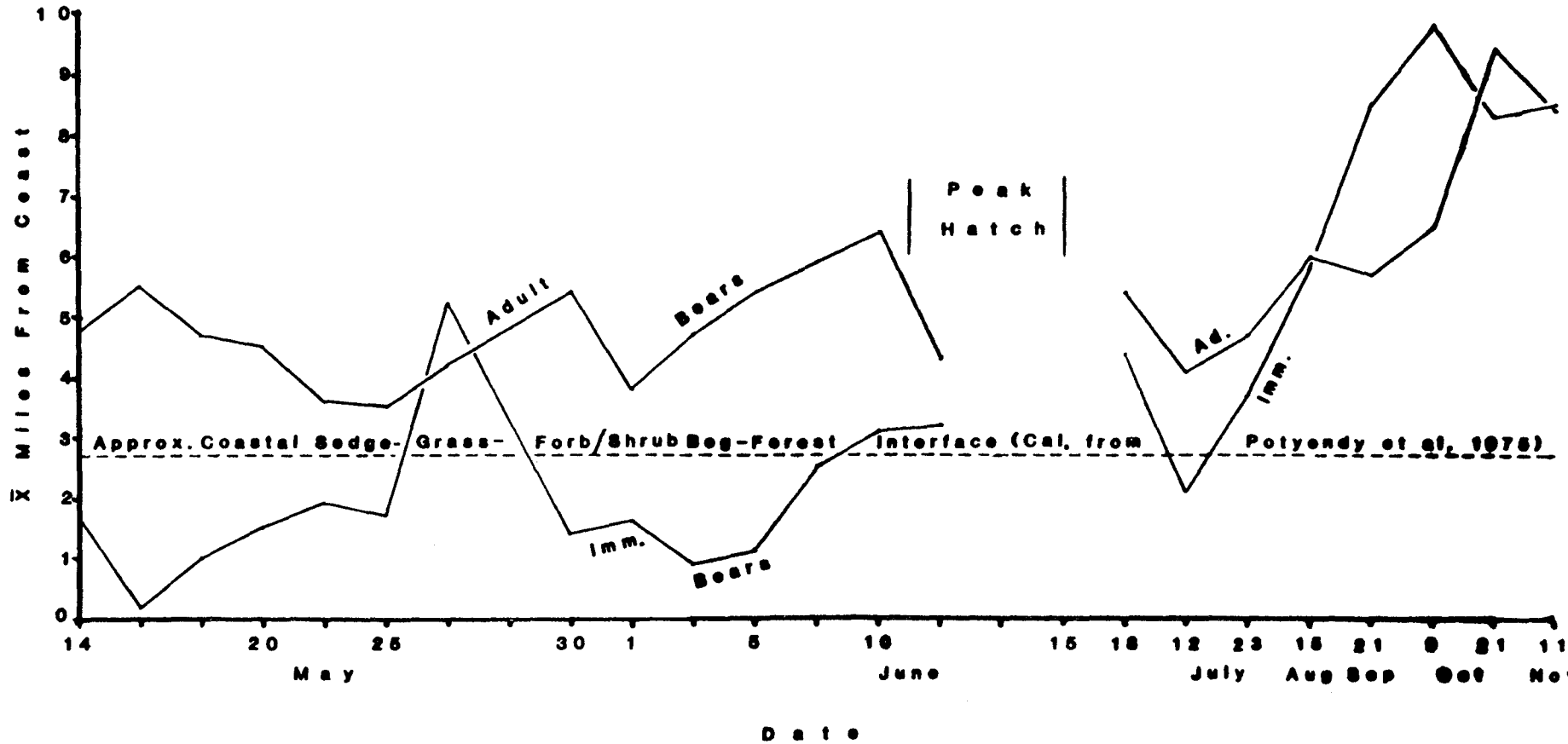

Figure 4. Distribution of tagged and recognizable untagged bears in relation to the coast and general habitat types on the west Copper River Delta, May 14-Nov. 11, 1984. May-June distribution based on average of locations over 48-hour periods. July 12-Nov. 9 distributions based on average of locations for each radio-tracking flight. June 11-16 data gap due to extensive nesting plot investigations and administrative duties.

Table 15. Observed pairings of tagged adult bears on the West Copper River Delta, 14 May-18 June 1984.

Bear	Sex	Age	Associations				Minimum No. days paired with opposite sex
			Male	No. Observations	Female	No. Observations	
13	F	10.5	Unmarked[a]	7	105	3	8
			17	2	--	--	2
17	M	12.5	--	--	40	2	2+
			--	--	105	8	6
			--	--	13	3	2
40	F	15±	Unmarked[b]	6	--	--	8
			17	2	--	--	2+
105	F	5.5	Unmarked[a]	1	13	3	1
			17	8	--	--	6
120	M	6.5	--	--	unmarked	2	8

[a]Large, dark unmarked male(s).

[b]Medium sized dark male with lighter hair down middle of back.

Conclusions

While 1 year's data is insufficient to define bear activities and impacts on nesting geese on the west Copper River, it appears that there may be a relationship between the age and breeding condition of bears on the Delta and nest predation. Apparently, most of the bears active in major nesting areas in 1984 were immature. High nesting success on areas known to have been used extensively by these animals suggests that they were either incapable of finding goose nests or not interested in them. At any rate, nest destruction by bears apparently did not have a significant impact on goose nesting success in 1984.

1985 Work Plan

To determine when bears become active in the spring and move onto the Delta (Objective 5) and the fidelity of study animals to the Delta in the spring (Objective 6), weekly radio-tracking will start around 1 March 1985. If untagged bears are present, and/or 1984 tagged bears do not return to the Delta, an additional 10 bears will be tagged. Radio-tracking will be intensified when geese begin to nest and data pertinent to bear seasonal home range (Objective 1), habitat selectivity (Objective 2), population size (Objective 3), and nest predation (Objective 4) will be collected. After the peak of goose nesting, radio-tracking will occur twice monthly to determine bear activities on the Delta during the remainder of their annual activity cycle (Objective 7). Criteria for classifying predatory agents at nest sites will also be further refined (Objective 8).

SPRING GOOSE MIGRATION IN COOK INLET

Since 1981, there has been concerted effort to document the magnitude and timing of goose migrations through the Cook Inlet area. The coastal marshes and flats attract cackling Canada, Pacific white-fronted, and snow geese headed for western Alaska and beyond, as well as resident lesser Canadas and Tule white-fronts. Observations in 1984 were made by ADF&G and USFWS ground crews at Redoubt Bay, Trading Bay and Susitna Flats; no coordinated aerial surveys were flown.

Over 4 years of spring surveys, phenology of snow melt and availability of open water has varied as much as 2 weeks early and 2 weeks late around an assumed average date. However, the arrival and peak occurrence of geese has been relatively consistent among years. In 1984, snow melt was 2 weeks earlier than usual and most water areas were ice-free by 18 April. Arriving birds were 1st recorded on Kenai River Flats, on the

east side of Cook Inlet, where there were 100-200 Canadas 10-15 April, and over 1,000 snow geese by 14-21 April, with a peak of 5,250 on 17 April.

An opportunistic aerial survey by ADF&G on 18 April turned up fewer than 3,000 Canada geese and 1,500 snows on west Cook Inlet areas; but a survey by USFWS (Rod King, pers. commun.) indicated a major influx by 20 April, tallying 17,700 Canadas and 5,800 snows. Although no estimates of peak numbers of geese were made in 1984, Timm (1982) suggested that as many as 25,000 cackling Canadas and 40-50,000 snow geese move through Cook Inlet.

Observations by ground crews indicate that cackling Canada geese arrived in a somewhat bimodal fashion in 1984, with early birds departing westward in front of a weather system 2-3 May and the remainder accumulating gradually and leaving after 7 May. No dramatic peak was observed as in 1983. Several thousand cacklers were present on 10 May when all crews left the field. During the 1981-83 seasons, cacklers peaked more dramatically in the period 2-7 May. In 1984, cacklers arrived on the Yukon-Kuskokwim Delta as early as 25 April and peaked 11-14 May (Garrett and Wege 1984), compared to peak arrival of 7-12 May in 1982 and 1983.

A maximum of 16 yellow-collared cacklers were seen among over 9,700 observations at the 3 Cook Inlet sites.

Snow geese and white-fronted geese pass through Cook Inlet with similar timing to cackling Canadas. In 1984, snow geese peaked 1-4 May, and most had departed by 6 May. Observations of Pacific white-fronts were not sufficient to detect arrival, peak or departure dates.

ALEUTIAN CANADA GOOSE RECOVERY TEAM

One Aleutian Canada goose (Branta canadensis leucapareia) Recovery Team meeting was attended in 1983. The population continues to increase: 3,800-4,000 birds were observed during fall 1983 migration. Evidence of nesting on Agattu Island by transplanted birds was found during the spring of 1983, but nesting was not confirmed. An additional 110 geese were transplanted from Buldir Island to Agattu to augment the Agattu population. Fox removal continues on Amukta Island with 49 animals removed by traps, M-44 and shooting in 1983. The effectiveness of disphacinore as a fox control agent was questioned, since controlled tests using arctic and red foxes have not been successful. Possible revision of the Recovery Plan was discussed, but the team felt that none of the needed revisions were important enough to warrant immediate action.

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