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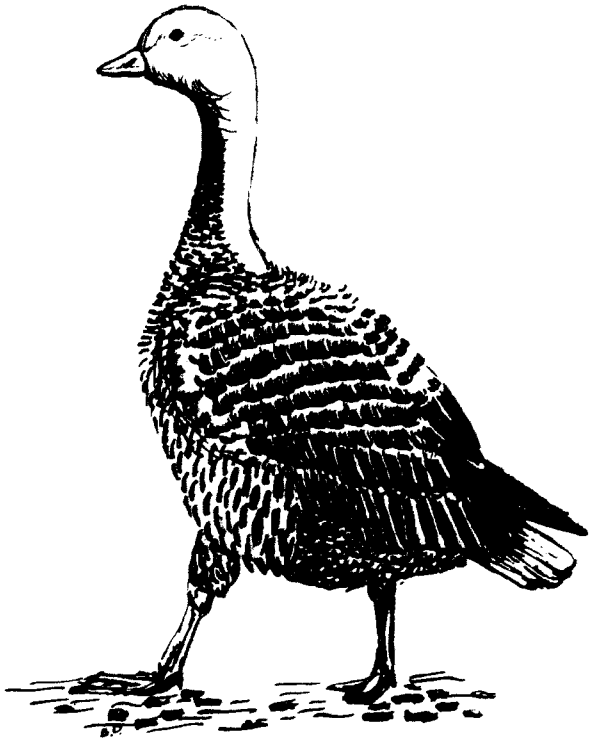
ALASKA DEPARTMENT OF FISH AND GAME

JUNEAU, ALASKA

STATE OF ALASKA
William A. Egan, Governor

DEPARTMENT OF FISH AND GAME
James W. Brooks, Commissioner

DIVISION OF GAME
Frank Jones, Director



REPORT OF SURVEY AND INVENTORY ACTIVITIES

WATERFOWL HUNTER MAIL QUESTIONNAIRE SURVEY - 1971-72

Prepared and Submitted by Dan Timm, Waterfowl Biologist
Edited by Don McKnight, Research Chief

Amendment to Volume III
Annual Project Segment Report
Federal Aid in Wildlife Restoration
Project W-17-4, Job No. 10

(Printed November, 1972)

MEMORANDUM OF TRANSMITTAL

To: James W. Brooks, Commissioner
Alaska Department of Fish and Game

From: Frank Jones, Director
Division of Game

Subject: 1971-72 Waterfowl Hunter Mail Questionnaire Survey - Survey and Inventory Activity

Surveys and inventories include all routine data collections directed toward assessment of the status of game populations and/or determination of annual game harvests. These reports include study results and conclusions and, where applicable, recommend hunting regulation changes.

This mail questionnaire survey represents the first one of its kind in Alaska. The federal government annually measures waterfowl harvest and hunter activity on a statewide basis. Their survey does not break down harvest by area, provide insight into characteristics of Alaska waterfowl hunters, nor does it enable projections of crane and snipe harvests to be made.

We believe the 1971-72 state survey to be the most accurate assessment of waterfowl harvests and hunting activity in Alaska ever made. Similar annual surveys of resident hunters are planned for the future, using a reduced sample size. Nonresident surveys may be conducted every three to five years.

A copy of the 1971-72 seasons and bag limits is included. Also, a sample first mailing resident survey form and second mailing nonresident survey form is included. A table of contents is contained in the report to facilitate access to specific information.

1972 - 1973 WATERFOWL SEASON REGULATIONS

Open Seasons	Species	LIMITS Daily Bag	LIMITS Possession	Exceptions or Explanations
GAME DUCKS, OLD SQUAW, HARLEQUIN, SCOTERS, EIDERS, MERGANSERS, GEESE AND BRANT:				
(a) Pribilof and Aleutian Islands (except Unimak Island). **Oct. 14 — Jan. 26**	Game Ducks	6	18	
	Old Squaw, Harlequin, Scoters, Eiders, and Mergansers	15	30	Singly or in aggregate of all kinds.
(b) Kodiak Island (State Game Management Unit 8). **Sept. 9 — Oct. 1 and Nov. 1 — Jan. 21**	Geese (except Emperor)	6	12	No more than 4 daily or 8 in possession may be Canada geese or sub-species of Canada geese or white-fronted geese.
(c) Remainder of Alaska and Unimak Island **Sept. 1 — Dec. 14**	Emperor Geese	6	12	
	Brant	4	8	
JACKSNIPE:				
All of Alaska **Sept. 1 — Nov. 4**	Jacksnipe	8	16	
CRANES				
All of Alaska **Sept. 1 — Oct. 15**	Cranes	2	4	

STATE OF ALASKA

WILLIAM A. EGAN, GOVERNOR

DEPARTMENT OF FISH AND GAME

SUBPORT BUILDING
JUNEAU 99801

Hunter's Name
Hunter's Address

License Number

DEAR HUNTER:

Your cooperation is needed to better manage Alaska's waterfowl--now and in the future. By accurately answering the questions below concerning your hunting activities in 1971, you can help insure continued liberal bag limits and good hunting for the future.

Thank you for your cooperation.

WATERFOWL HUNTER SURVEY - 1971-72.

Instructions:

All hunters complete Part I. Only those who hunted waterfowl or bought a duck stamp in 1971 complete Part II. If you can't remember exact numbers, give your best estimates. Mail promptly - no stamp is necessary.

PART I

Did you hunt for waterfowl (ducks, geese, cranes, snipe) in Alaska during the 1971-72 season? Yes_____ No_____

Did you buy a duck stamp in Alaska in 1971? Yes_____ No_____

PART II (Complete only if you hunted waterfowl in Alaska this season or bought a duck stamp in 1971.)

How many different days did you hunt waterfowl in Alaska? _____

How many of the following birds did you shoot and retreive?

Game ducks (mallard, teal, pintail, bluebill, etc.) _____

Non-game ducks (merganser, scoter, eider, oldsquaw, etc.) _____

Geese _____ Cranes _____ Snipe _____

In which game management unit did you shoot most of your ducks? _____

geese? _____ cranes? _____ snipe? _____

At what place did you shoot most of your ducks? _____ geese? _____

(i.e., Pilot Point, Minto Flats, 6 miles S.W. Sitka, Chickaloon Flats, etc.)

How do you hunt waterfowl? Jump shoot _____ Pass shoot _____ Decoys _____

Some people hunt waterfowl only incidental to other hunting trips. On how many one day did you go hunting in Alaska only for waterfowl in 1971? Yes_____ No_____

How many days? _____

Approximate date of freeze-up in your area? _____

Comments: _____

UPON COMPLETION, FOLD THIS LETTER ON THE LINES INDICATED, STAPLE SHUT AND DROP IT IN THE MAIL. NO STAMP IS NECESSARY.

Sincerely,

Ralph H. Noorenberg

Commissioner
Department of Fish and Game

Nonresident Questionnaire - Second Mailing

STATE OF ALASKA

WILLIAM A. EGAN, GOVERNOR

DEPARTMENT OF FISH AND GAME

SUBPORT BUILDING
JUNEAU 99801

Hunter's Name
Hunter's Address

REMINDER

License Number

DEAR HUNTER:

Several weeks ago you were requested to fill out a hunter survey form. Perhaps you misplaced it or just neglected to complete this form. Would you at this time please complete the form below and mail it at your earliest convenience? No stamp is necessary. Thank you for your cooperation.

If you have completed and mailed the first questionnaire, please disregard this letter.

NONRESIDENT WATERFOWL HUNTER SURVEY - 1971-72.

Instructions:

All hunters complete Part I. Only those who hunted waterfowl or bought a duck stamp in 1971 complete Part II. If you can't remember exact numbers, give your best estimates. Mail promptly - no stamp is necessary.

PART I

Did you hunt for waterfowl (ducks, geese, cranes, snipe) in Alaska during the 1971-72 season? Yes_____ No_____

Did you buy a duck stamp in Alaska in 1971? Yes_____ No_____

PART II (Complete only if you hunted waterfowl in Alaska this season or bought a duck stamp in 1971.)

How many different days did you hunt waterfowl in Alaska? _____

How many of the following birds did you shoot and retreive?

Game ducks (mallard, teal, pintail, bluebill, etc.) _____

Non-game ducks (merganser, scoter, eider, old squaw, etc.) _____

Geese _____ Cranes _____ Snipe _____

In which game management unit did you shoot most of your ducks? _____

geese? _____ cranes? _____ snipe? _____

At what place did you shoot most of your ducks? _____ geese? _____

(i.e., Pilot Point, Minto Flats, 6 miles S.W. Sitka, Chickaloon Flats, etc.)

How do you hunt waterfowl? Jump shoot _____ Pass shoot _____ Decoys _____

Some people hunt waterfowl only incidental to other hunting trips. On any one day did you go hunting in Alaska only for waterfowl in 1971? Yes_____ No_____

How many days? _____

Approximate date of freeze-up in your area? _____

Comments: _____

UPON COMPLETION, FOLD THIS LETTER ON THE LINES INDICATED, STAPLE SHUT AND DROP IT IN THE MAIL. NO STAMP IS NECESSARY.

Sincerely,

Walter H. Noerenberg

Commissioner
Department of Fish and Game

TABLE OF CONTENTS

	Page No.
INTRODUCTION	1
PROCEDURES	1
Mechanics of the Survey and Hunter Reports	1
Analysis of Survey Results	2
RESULTS	2
Number of Hunters	2
Hunting Activity	4
Duck Harvest	11
Goose Harvest	14
Crane Harvest	21
Snipe Harvest	21
Hunter Characteristics	21
DISCUSSION	24
SUMMARY	26
REFERENCES	27

INTRODUCTION

Although Shepherd (1964) conducted a mail survey of waterfowl hunters in 1964, the Alaska Department of Fish and Game had never accurately determined Alaska's statewide waterfowl harvest until the 1971-72 hunting season. Data derived from a limited number of hunter bag checks and information gathered by the Bureau of Sport Fisheries and Wildlife provided the sole measures of Alaska's annual duck and goose harvests.

Hunter bag checks, conducted annually by state biologists and law enforcement officers as well as personnel of the Bureau of Sport Fisheries and Wildlife, gave some insight into the species composition of the harvest and indicated relative hunter success in localized areas. However, accuracy of species composition projections based on bag checks varied by year, species and harvest area.

Mail questionnaire and parts collections surveys, conducted annually by the Bureau of Sport Fisheries and Wildlife, are designed to assess total harvest and species composition of the nationwide waterfowl harvest. Projections derived from these surveys for Alaska are admittedly questionable, especially for lightly harvested species (Carney, pers. comm., 1970). In addition, the Bureau surveys make no attempt to break down harvests by area or to assess harvests by nonresident hunters. During the 1972-73 waterfowl season the Bureau increased its sample of hunters cooperating in the parts collection survey. This expanded sample base should eventually result in more accurate estimates of the species composition of harvested waterfowl.

The 1971-72 Alaska Department of Fish and Game mail survey is considered to be the most accurate waterfowl harvest estimate ever made in Alaska. This survey provided valuable information on nonresident harvest, derivation of harvest by area and specific location, hunter attitudes and general characteristics of Alaska waterfowl hunting that were unknown until this survey was conducted. The 1970-71 waterfowl season in Alaska was considered by most biologists to be "an average year" in regard to hunter success.

PROCEDURES

Mechanics of the Survey and Hunter Reports

A computerized list of all people purchasing a 1972 resident or nonresident hunting license was used for a sampling base. Approximately every fourth resident and every third nonresident was sent a survey form (24.5% and 34.4% samples, respectively) during early February. Each form was self-contained with a postage-paid return address printed on its reverse side. Three weeks were allowed for return and those persons not replying were then sent a reminder form. Forms received three weeks after the second mailing were not considered in the analysis.

Each hunter's name and address was printed on individual IBM cards. Upon return of a completed survey form, the corresponding IBM card was located and destroyed. Those IBM cards remaining after three weeks were processed for a second mailing. Both the IBM cards and corresponding survey forms were numbered.

The survey sampled 14,150 resident and 3,960 nonresident license buyers. Of these totals, 73.3 percent and 81.2 percent of the residents and nonresidents, respectively, returned the questionnaires. Responses usable for analysis (people who purchased a duck stamp and hunted waterfowl or bought a stamp but didn't hunt) were received from 2,082 residents and 594 nonresidents.

Analysis of Survey Results

The state was divided into 11 harvest areas to facilitate analysis of survey data (Fig. 1). These areas roughly correspond to areas the Bureau has selected for harvest data analysis (Carney, pers. comm., 1971). Because the area of residence for each hunter was known, an accurate estimate of days hunted, birds bagged, etc., could be made in each harvest area. Some idea of hunter movements out of their area of residence could also be obtained by knowing their residence and where they shot most of their ducks.

Bias factors influencing reported days hunted and ducks bagged were considered to be: 1) a superstition bias resulting from a tendency not to report the number 13; 2) a memory bias from the tendency to report numbers ending in zero and five and multiples of the daily bag; and 3) a memory bias from the unreliability of those reporting large numbers. Bias corrections for mean season resident hunter duck bag and hunter days were made (Williams, 1953).

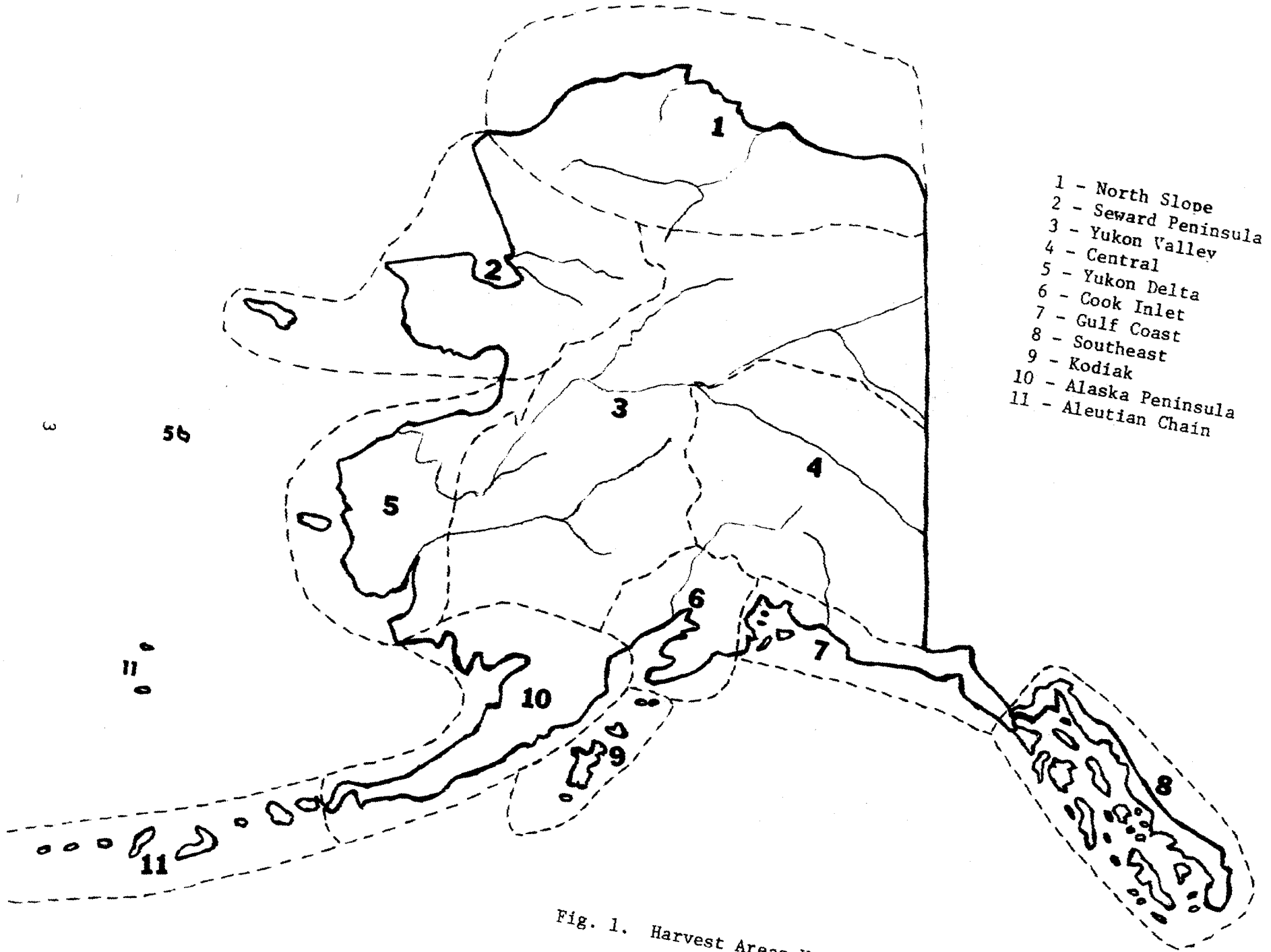
No bias corrections for goose harvest were made. It is believed that most hunters know exactly how many geese they take each year. Reporting rates for geese may be greater than for ducks because geese are generally considered more of a trophy. Corrections for such a bias are unknown.

Data received from the 2,082 residents and 594 nonresidents were expanded for total waterfowl hunters on a proportion basis.

RESULTS

Number of Hunters

The assessment of waterfowl harvests and hunter activity in Alaska is complicated by several unique problems. No other state experiences the magnitude of hunting outside the legal season limits (subsistence hunting) as does Alaska. Comments on survey forms such as, "Got six swans with a fense (sic.) and stick" were not uncommon. Other people, who apparently hunted during the legal season, commented that there were no duck stamps available where they lived.



1 - North Slope
2 - Seward Peninsula
3 - Yukon Valley
4 - Central
5 - Yukon Delta
6 - Cook Inlet
7 - Gulf Coast
8 - Southeast
9 - Kodiak
10 - Alaska Peninsula
11 - Aleutian Chain

Fig. 1. Harvest Areas Used for Data Analysis.

A projected 4,498 people holding a $.25 subsistence license hunted without a stamp. Out of 1,400 forms sent to holders of these licenses, only 51 were returned. Forty-one (80.4 percent) had not purchased a stamp. The comment on one form, "I tear my name off because I afraid you send me to jail," possibly typifies the reason why the subsistence license response rate was very low. It appears that the total number of people taking waterfowl during the legal seasons without a stamp could well be over 5,000. Perhaps twice that many take waterfowl outside the legal season. Data on number of hunters, harvest, etc., in this report are based solely on duck stamp sales and therefore should be considered to be the sport hunting harvest.

One problem associated with determining the number of waterfowl hunters in Alaska is the rate of ingress into the state. A hunter must reside in Alaska one year before becoming eligible for a resident license. Thus, persons intending residency and living in the state must buy a nonresident license. A projected total of 1,726 such nonresidents purchased a duck stamp.

Total duck stamp sales in Alaska were 14,360 according to Bureau of Sport Fisheries and Wildlife figures (Carney, 1972). There were 14,160 potential duck hunters (excluding stamp sales to collectors) according to the Bureau's figures. Residency categories of 1971-72 projected stamp buyers and active hunters in Alaska were: resident - 11,860 and 8,386 (70.71% active); nonresident with Alaska address - 1,726 and 1,457 (84.43% active); nonresidents - 574 and 391 (68.09% active). A projected 118 nonresidents hunted waterfowl in Alaska but purchased a stamp outside the state. All calculations of resident harvest, hunter activity, etc., are based on 9,843 resident active hunters (residents plus nonresidents with an Alaska address). There was an estimated total of 10,352 active waterfowl hunters in the state. Table 1 summarizes these data, Table 2 presents duck stamp sale data by harvest area from 1968 to 1971 and Table 3 provides a 38-year history of stamp sales in Alaska.

Hunting Activity

Residents and nonresidents reported hunting an average of 6.0 and 3.8 days, respectively, during the 1971-72 season. After bias corrections, resident hunters were calculated to have hunted 4.3 days per active hunter. The average of 3.8 days of waterfowl hunting per active nonresident hunter was assumed to be an accurate figure because there were few indications of reporting bias.

Total man-days of waterfowl hunting for residents was calculated to be 42,719. Nonresidents were calculated to have hunted a total of 1,934 man-days.

Table 4 presents a summary of resident hunter activity and success as reported by harvest area. In Table 5 statewide hunter activity and success is broken down into calculated days hunted, birds bagged, etc., by harvest area. Table 6 presents similar information for nonresident hunters. Table 7 provides projected hunter days and duck and goose

Table 1. Summary of Alaska Waterfowl Hunter Mail Questionnaire Survey, 1971-72.

Number of licensed hunters: resident 57,755 (5,595 subsistence), nonresident 11,525

Number of license buyers sampled: resident 14,150 (24.5%), nonresident 3,960 (34.4%)

Number of respondents from resident survey: 1st mailing 8,005, 2nd mailing 1,698

Number of respondents from nonresident survey: 1st mailing 2,329, 2nd mailing 640

Number of returns usable for waterfowl calculations: resident 2,082 nonresident 594

Response rate*: 1st mailing - resident 59.6%, nonresident 61.9%
2nd mailing - resident 32.4%, nonresident 40.1%
Total - resident 73.3%, nonresident 81.2%

Number of hunters:

Duck stamps sold in Alaska: 14,320 (14,160 potential hunters)
Percent active hunters: resident 70.7%, nonresident (Alaska address) 84.4%, nonresident 68.1%
Total active residents**: 72.44%
Calculated number of active hunters: resident 9,843**, nonresident 509***

Calculated Statewide Harvest:

Ducks: resident 80,417, nonresident 3,206
Geese: resident 10,630, nonresident 713
Cranes: resident 492, nonresident 10
Snipe: resident 3,051, nonresident 36

Hunter days: resident 42,719, nonresident 1,934

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* Rate of deliverable questionnaires only.
** Includes nonresidents with an Alaska address.
***Includes 118 hunters who purchased a duck stamp outside Alaska.

Table 2. Number of Duck Stamps Sold in Alaska by Harvest Area, 1968-71.

Area	Year			
	1968	1969	1970	1971
North Slope	17	18	1	2
Seward Peninsula	159	113	155	171
Yukon Valley	109	90	80	72
Central	2,789	1,698	2,979	3,753
Yukon Delta	101	125	170	174
Cook Inlet	5,094	5,441	5,612	5,672
Gulf Coast	583	611	622	595
Southeast	2,576	2,644	2,600	2,737
Kodiak	466	558	446	530
Alaska Peninsula	523	557	837	543
Aleutian Chain	39	112	66	71
Total	12,456	11,967	13,568	14,320

Table 3. A 38-year History of Duck Stamp Sales* in Alaska.

Year	No. Sold	Year	No. Sold	Year	No. Sold	Year	No. Sold
1934	2,000	1944	4,430	1954	10,766	1964	8,826
1935	2,380	1945	4,186	1955	9,797	1965	9,406
1936	1,708	1946	3,758	1956	9,428	1966	10,640
1937	2,094	1947	4,113	1957	9,796	1967	10,358
1938	2,227	1948	4,881	1958	9,112	1968	12,456
1939	2,761	1949	3,349	1959	9,223	1969	11,967
1940	2,520	1950	5,703	1960	11,315	1970	13,568
1941	3,911	1951	7,909	1961	10,557	1971	14,320
1942	3,308	1952	8,302	1962	10,371		
1943	4,143	1953	10,009	1963	10,874		

*Fiscal year sales, 1934 - 7/1/34 through 6/30/35, etc.

Table 4. Resident Hunter Success and Activity as Reported by Area, 1971-72.

Area	Percent Active Hunters	No. Ducks Shot Per Season	No. Days Hunted Per Season	No. Ducks Shot Per Day	No. Geese Shot Per Season*	No. Cranes Shot Per Season*	No. Snipe Shot Per Season*
North Slope	100.0	14.4	8.4	1.7	7.0	0.0	0.0
Seward Peninsula	81.0	14.3	8.0	1.8	8.3	3.3	3.3
Yukon Valley	80.7	10.2	3.3	3.1	9.4	2.3	0.0
Central	70.8	10.1	5.9	1.7	2.5	1.4	2.6
Yukon Delta	86.7	14.1	8.3	1.7	12.9	6.0	3.0
Cook Inlet	74.7	10.3	5.3	1.9	3.6	1.3	7.3
Gulf Coast	65.3	10.5	8.1	1.3	4.3	1.5	18.6
Southeast	71.8	11.4	7.8	1.5	3.2	1.5	6.3
Kodiak	77.1	13.3	8.5	1.6	1.8	0.0	11.8
Alaska Peninsula	75.4	8.3	6.1	1.4	7.9	2.0	6.0
Aleutian Chain	92.3	5.8	8.2	0.7	7.3	0.0	0.0
Unknown	-	0.5	2.9	0.2	5.0	1.0	11.0
Statewide	72.44	9.59 **8.17 per active hunter	5.99 **4.34	1.6 **1.88	4.9 1.08 per active hunter	2.2 .05 per active hunter	8.3 .31 per active hunter

* Bag per hunter taking geese.
**After corrections for bias.

Table 5. Calculated Harvest and Activity by Resident Hunters by Area*, 1971-72.

Area	Hunter Days		Birds Harvested									
			Game Ducks		Nongame Ducks		Geese		Crane		Snipe	
	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total	No.	% of total
North Slope	171	0.4	-	0.0	326	5.3	32	0.3	-	0.0	-	0.0
Seward Peninsula	1,581	3.7	2,599	3.5	597	9.7	1,063	10.0	196	39.8	76	2.5
Yukon Valley	427	1.0	1,411	1.9	62	1.0	225	2.4	45	9.2	-	0.0
Central	9,911	23.2	18,121	24.4	849	13.8	978	9.2	105	21.4	76	2.5
Yukon Delta	769	1.8	1,485	2.0	25	0.4	1,031	9.7	61	12.2	15	0.5
Cook Inlet	13,688	29.7	26,290	35.4	1,205	19.6	1,722	16.2	45	9.2	962	31.5
Gulf Coast	2,264	5.3	3,193	4.3	80	1.3	840	7.9	15	3.1	540	17.7
Southeast	9,398	22.0	14,185	19.1	1,206	19.6	1,254	11.8	15	3.1	430	14.1
Kodiak	2,606	6.1	3,342	4.5	1,335	21.7	64	0.6	-	0.0	882	28.9
Alaska Peninsula	2,093	4.9	3,045	4.1	129	2.1	2,796	26.3	10	2.0	70	2.3
Aleutian Chain	811	1.9	594	0.8	338	5.5	595	5.6	-	0.0	-	0.0
Statewide	42,719	100.0	74,265	100.0	6,152	100.0	10,630	100.0	492	100.0	3,051	100.0

*Unknown area of harvest and activity proportionally included in known areas.

Table 6. Nonresident Hunter Success and Activity as Reported by Area Hunted*, 1971-72.

Area	Hunters		Hunter Days		Duck Harvest		Goose Harvest	
	No.	% of total	No.	% of total	No.	% of total	No.	% of total
North Slope	5	0.9	14	0.7	26	0.8	-	0.0
Seward Peninsula	5	0.9	19	1.0	22	0.7	4	0.6
Yukon Valley	24	4.7	141	7.3	131	4.1	4	0.6
Central	110	21.7	502	25.9	1,164	36.3	32	4.5
Yukon Delta	5	0.9	19	1.0	-	0.0	42	5.8
Cook Inlet	125	24.5	369	19.1	628	19.6	58	8.2
Gulf Coast	72	14.2	277	14.3	423	13.2	99	13.9
Southeast	53	10.4	253	13.1	430	13.4	18	2.5
Kodiak	10	1.9	75	3.9	199	6.2	-	0.0
Alaska Peninsula	97	19.0	219	11.3	183	5.7	456	63.9
Aleutian Chain	5	0.9	46	2.4	-	0.0	-	0.0
Statewide Average	509	100.0	1,934	100.0 3.8 days/ hunter	3,206	100.0 6.3 ducks/ hunter	713	100.0 1.4 geese/ active hunter

*Unknown area of harvest and activity proportionately included in known areas.

Table 7. Areas of Most Resident and Nonresident Hunter Activity, Duck and Goose Harvest, 1971-72.

Calculated duck harvest and hunter days					Calculated goose harvest		
	Hunter Days		Ducks				
Area	No.	% of state total	No.	% of state total	Area	No. geese	% of state total
Susitna Flats	3,885	8.7	7,442	8.9	Cold Bay	1,611	14.2
Palmer-Hay Flats	3,081	6.9	5,854	7.0	Chickaloon Flats	794	7.0
Mendenhall Wetlands	2,813	6.3	3,010	3.6	Susitna Flats	669	5.9
Copper River Delta	1,608	3.6	2,509	3.0	Pilot Point	635	5.6
Minto Flats	1,518	3.4	5,352	6.4	Copper River Delta	590	5.2
Stikine River Delta	1,295	2.9	3,178	3.8	Minto Flats	431	3.8
Eagle River Flats	1,161	2.6	1,254	1.5	Blind Slough	250	2.2
Salchaket Slough	714	1.6	1,003	1.2	Stikine River Delta	227	2.0
Chickaloon Flats	670	1.5	1,840	2.2	Yakutat Area	204	1.8
Cold Bay	625	1.4	669	0.8	Mendenhall Wetlands	113	1.0
Blind Slough	580	1.3	1,422	1.7	Duncan Canal	91	0.8
Yakutat Area	536	1.2	502	0.6	Rocky Pass	79	0.7
Potter Marsh	536	1.2	502	0.6	Palmer-Hay Flats	45	0.4
Rocky Pass	446	1.0	920	1.1			
Subtotal	19,468	43.6	35,457	42.4		5,739	50.6
State Totals	44,653	100.0	83,623	100.0		11,343	100.0

harvests for specific hunting areas in the state on which the most activity and harvest occurred.

Duck Harvest

Magnitude of Harvest

Resident hunters (including nonresidents with an Alaska address) reported taking an average of 9.6 ducks each during the 1970-71 hunting season. Corrections for bias provide a mean calculated kill of 8.17 ducks per active hunter. The projected statewide duck harvest by resident hunters was 80,417. Game ducks represented 92.35 percent (74,265) and nongame ducks 7.65 percent (6,152) of the rresident harvest. Average daily success was calculated to be 1.88 ducks per day per hunter.

Nonresident hunters took an average of 6.3 ducks per hunter. As there was not an abnormal number of season bag sizes of 5, 10, 15, etc., reported bias corrections were not made. The projected statewide duck harvest by nonresidents was 3,206 birds. Ninety-three percent of this harvest was comprised of game ducks and nongame ducks made up 7.0 percent. Daily success was 1.7 birds per day, comparable to calculated resident daily success.

The total Alaska duck harvest by residents and nonresidents during the 1971-72 season was calculated to be 83,623 birds. Tables 4, 5 and 6 present a summary of harvest and hunter success by harvest area. Table 7 gives projected duck and goose harvests for specific, high harvest locations in the state.

Species Composition of Harvest

Since 1960, field bag checks have been intermittently conducted in the following Alaska harvest units: Southeast, Gulf Coast, Cook Inlet, Central and the Alaska Peninsula. It is felt that data from Cook Inlet provide a reliable estimate of area-wide duck species composition in the harvest. Sample size appears adequate, and bag checks have been conducted at representative locations. Southeast data should also provide a reasonable estimate of species composition for that area. Although most information was collected at the two major harvest locations (Mendenhall wetlands and Stikine Flats), the harvest appears to be fairly homogeneous throughout the Southeast. Bag check data from other harvest areas can only be viewed as estimates for species composition from specific locations, and not the harvest area as a whole. No bag checks that have been conducted adequately sample nongame duck harvest. Therefore, Tables 8 and 9 present percent species composition of these birds as reported in the Bureau of Sport Fisheries and Wildlife mail survey.

Although this mail survey samples hunters throughout the state, its sample size is admittedly inadequate. A comparison between Bureau 1970 and 1971 data and a combination of Alaska Department of Fish and Game bag check information for the same period is presented in Table 8.

Table 8. A Comparison of Statewide Species Composition in the Harvest, Alaska Department of Fish and Game Field Bag Checks and Bureau of Sport Fisheries and Wildlife Mail Survey, 1970 and 1971 (Sorensen and Carney, 1971).

	PERCENT OF TOTAL BAG			
	1970		1971	
Species	ADFG*	BSFW	ADFG*	BSFW
Pintail	29.6	21.9	19.6	24.3
Mallard	24.6	31.8	24.4	30.1
American Widgeon	19.8	14.2	20.7	18.9
Green-winged Teal	13.4	13.0	16.3	11.6
Shoveler	5.5	3.8	4.0	4.0
Scaup	3.5	3.7	1.3	2.7
Goldeneye	-	2.6	0.6	1.9
Bufflehead	0.1	1.5	2.5	1.1
Gadwall	2.4	0.8	2.1	0.8
Canvasback	0.8	0.9	0.1	0.1
Blue-winged Teal	-	0.5	0.6	-
Ruddy Duck	-	-	0.1	-
Redhead	-	0.1	-	-
Ring-neck Duck	-	0.2	-	0.1
Nongame Ducks	0.3	5.0	7.7**	4.3
	100.0	100.0	100.0	99.9
Sample Size	1,302	1,116	1,472	882

* 1970-field checks from Cook Inlet, Alaska Peninsula and Gulf Coast; 1971-from these areas plus Central and Southeast.

**Taken from 1971 Alaska Department of Fish and Game mail survey.

Table 9. Calculated Resident and Nonresident Harvest by Species - Cook Inlet, Southeast and Statewide, 1971-72.

Species	Cook Inlet* No.	Cook Inlet* % of total	Southeast* No.	Southeast* % of total	Statewide* No.	Statewide* % of total
Game Ducks						
Pintail	8,241	29.3	1,740	11.0	16,372	19.6
Mallard	6,047	21.5	5,980	37.8	20,388	24.4
Am. Widgeon	6,271	22.3	2,167	13.7	17,299	20.7
G-W Teal	4,585	16.3	3,813	24.1	13,669	16.3
Shoveler	1,098	3.9	490	3.1	3,321	4.0
Scaup	169	0.6	111	0.7	1,081	1.3
Goldeneye	-	-	47	0.3	463	0.6
Bufflehead	28	0.1	111	0.7	2,085	2.5
Gadwall	395	1.4	158	1.0	1,699	2.1
Canvasback	84	0.3	-	-	695	0.1
B-W Teal	-	-	-	-	77	0.6
Ruddy Duck	-	-	-	-	77	0.1
Total Game Ducks	26,918	95.7	14,615	92.4	77,226	92.3
Nongame Ducks	1,205	4.3	1,206	7.6	6,397	7.7
Total Ducks	28,123	100.0	15,821	100.0	83,623	100.0
Geese						
Canada					8,008	70.6
White-fronted					828	7.3
Snow					578	5.1
Black brant					1,214	10.7
Emperor					715	6.3
Total Geese					11,343	100.0

*Cook Inlet, Southeast and statewide ducks - projected from 1971 field bag checks; statewide goose bag composition from an average of 1969 and 1970 Fish and Wildlife Service harvest estimates; nongame duck percent composition from 1971 Alaska Department of Fish and Game mail survey.

Table 9 presents information on the calculated harvest by species for Cook Inlet, the Southeast and statewide. Alaska Department of Fish and Game field bag checks are thought to provide the best estimate of game duck harvest by species available, for the 1971-72 season. Mallards, American widgeons, pintails, green-winged teal and shovelers constituted over 80 percent of the total duck harvest.

All past bag check data for Cook Inlet, Southeast, Gulf Coast, Central and the Alaska Peninsula are summarized in Tables 10, 11, 12, 13 and 14. Average species composition for each area for all years is also presented.

Goose Harvest

Resident hunters (including nonresidents with an Alaska address) reported an average of 4.9 geese per hunter taking geese and 1.08 birds per active hunter. Twenty-two percent of all active hunters reported taking one or more geese. The 1971-72 statewide resident hunter goose harvest was calculated to be 10,630 birds. Bias corrections were not made on reported goose bag information. Most hunters apparently know exactly how many birds they shot during the season.

Table 15 presents data on the frequency of reported season goose bag sizes by resident hunters and what percent of the total harvest each bag size represented. It was assumed that hunters who took five or fewer geese per season took them incidental to duck hunting. These hunters represented about two-thirds of all hunters taking geese, but accounted for only about one-third of the harvest. Conversely, those hunters who apparently actively hunted specifically for geese (killed six or more per season) represented one-third of the hunters taking, but took two-thirds of the harvest.

Nonresident hunters reported an average of 4.1 geese per hunter taking geese and 1.4 geese per active hunter. Thirty-four percent of all active nonresidents reported taking one or more geese. The statewide nonresident goose harvest was calculated to be 713 birds and the total resident and nonresident goose harvest was projected to be 11,343 birds.

Field bag checks are felt to be inadequate for determining statewide or even areawide species composition of the goose kill. Numbers of geese checked are relatively few, and number of bag check locations are not adequate to sample harvest of all species. For example, most of the brant, cackling Canada goose, emperor goose, snow goose and white-fronted goose harvest is not monitored by field checks. Consequently, the Bureau of Sport Fisheries and Wildlife mail survey probably provides the best measure of statewide species composition in the goose harvest. The Bureau does not analyze harvests by harvest area. Table 9 projects statewide harvest by species. Total kill was derived by the Alaska Department of Fish and Game mail survey, and percent composition in the kill was taken from Bureau of Sport Fisheries and Wildlife reports (Carney, et al, 1971). Canada geese comprised over 70 percent of the kill, followed by black brant, whitefronts, emperors and snow geese. The Bureau made no attempt to isolate cackling goose harvest from total Canada goose harvest.

Table 10. Summary of Cook Inlet Duck Species Composition in the Harvest, Field Bag Checks, 1961-1971.

	PERCENT OF TOTAL BAG									
Species	1961	1962	1964	1965	1967	1968	1969	1970	1971	9-year Ave.
Pintail	36.4	39.6	39.4	38.6	34.1	35.5	25.7	35.6	30.3	35.0
Mallard	29.1	28.2	24.1	19.8	18.8	16.2	22.0	24.1	22.3	22.7
Am. Widgeon	14.1	6.0	10.5	15.7	23.3	22.3	23.8	17.8	23.1	17.4
G-W Teal	7.4	10.7	9.0	9.1	10.9	10.1	16.1	12.6	17.1	11.4
Shoveler	6.0	12.8	15.8	5.1	6.2	10.2	8.4	7.1	4.2	8.4
Scaup	1.9	2.0	0.4	7.8	3.6	0.2	1.9	1.4	0.8	2.2
Goldeneye	2.0	-	0.4	2.0	1.8	3.0	-	-	-	1.0
Gadwall	1.4	-	0.4	0.5	0.1	1.4	0.3	1.0	1.6	0.7
Bufflehead	0.6	-	-	-	0.5	0.4	0.9	0.1	0.2	0.3
B-W Teal	0.1	-	-	-	0.1	0.5	0.6	0.1	-	0.1
Scoter	0.6	-	-	-	-	-	-	-	-	0.1
Merganser	0.4	-	-	-	0.2	-	-	-	-	0.1
Canvasback	-	0.7	-	1.2*	0.2	0.7	-	-	0.4	0.3
Old Squaw	-	-	-	0.2	0.1	0.1	-	0.2	-	0.1
Ringneck	-	-	-	-	0.1	-	-	-	-	0.1
Redhead	-	-	-	-	-	-	0.3	-	-	0.1
Sample Size	898	149	266	746	1,423	984	323	1,083	765	100.0%

*Closed season.

Table 11. Summary of Southeast Duck Species Composition in the Harvest, Field Bag Check, 1964-1971.

Species	PERCENT OF TOTAL BAG 1964	1965	1971	3-year Ave.
Pintail	13.7	11.3	11.9	12.3
Mallard	65.0	44.2	40.9	50.1
Am. Widgeon	11.5	14.1	14.9	13.5
G-W Teal	6.6	23.5	26.0	18.8
Shoveler	1.1	1.2	3.4	1.9
Scaup	2.2	2.6	0.7	1.9
Goldeneye	-	-	0.4	0.1
Gadwall	-	1.2	1.1	0.8
Bufflehead	-	-	0.7	0.2
Canvasback	-	1.2*	-	0.4
Sample Size	183	256	269	

*Closed season.

Note: The bulk of data was derived from the Juneau area and Stikine River Delta.

Table 12. Summary of Gulf Coast Duck Species Composition in the Harvest, Field Bag Checks, 1961-1971.

Species	PERCENT OF TOTAL BAG					
	1961	1967	1968	1970	1971	5-year Ave.
Pintail	32.3	25.9	21.5	23.4	18.0	24.2
Mallard	21.2	25.9	39.1	29.9	25.5	28.3
Am. Widgeon	21.2	9.8	14.6	23.4	20.5	17.9
G-W Teal	5.8	20.5	10.9	12.9	21.0	14.2
Shoveler	4.6	7.1	8.4	5.2	8.5	6.8
Scaup	5.8	2.8	2.6	2.6	0.5	2.9
Goldeneye	1.4	0.9	0.4	-	2.0	0.9
Gadwall	7.7	7.1	1.5	-	1.5	3.6
Canvasback	-	-	-	2.6	2.0	0.9
B-W Teal	-	-	1.0	-	0.5	0.3
Sample Size	260	112	274	77	200	

Note: All years Cordova data only, except 1971 - Cordova and Yakutat area.

Table 13. Summary of Central Duck Species Composition in the Harvest, Field Bag Checks, 1960-1971.

Species	PERCENT OF TOTAL BAG						
	1960	1961	1962	1964	1965	1971	6-year Ave.
Pintail	18.0	26.9	21.0	33.7	28.8	16.5	24.2
Mallard	15.4	20.0	15.0	11.6	23.8	13.9	16.6
Am. Widgeon	36.0	23.9	19.5	5.0	11.4	20.9	19.5
G-W Teal	7.4	8.2	4.8	13.3	10.0	12.2	9.3
Shoveler	14.3	10.1	36.3	21.0	6.5	6.1	15.7
Scaup	3.3	4.9	1.9	7.2	6.5	4.4	4.7
Goldeneye	0.6	0.4	0.5	4.4	3.4	2.6	2.0
Bufflehead	3.3	5.2	0.5	3.3	8.8	16.5	6.2
Canvasback	1.5	0.4	0.5	0.5	0.8*	5.2	1.5
Ruddy Duck	-	-	-	-	-	1.7	0.3
B-W Teal	0.2	-	-	-	-	-	Tr.
Sample Size	272	635	421	181	261	115	

*Closed season.

Note: Bulk of data was derived from Minto Flats, except 1971 - Tok area.

Table 14. Summary of Alaska Peninsula Duck Species Composition in the Harvest, Field Bag Checks, 1969-71.

Species	PERCENT OF TOTAL BAG 1969	1970	1971	3-year Ave.
Pintail	51.0	29.6	26.2	35.6
Mallard	2.0	19.7	25.0	15.6
Am. Widgeon	8.2	18.3	1.2	9.2
G-W Teal	18.4	14.8	27.4	20.2
Shoveler	2.0	4.2	-	2.1
Scaup	-	6.3	8.3	4.9
Gadwall	16.3	6.3	8.3	10.3
C. Eider	-	0.7	-	0.2
E. Widgeon	2.0	-	-	0.7
St. Eider	-	-	3.6	1.2
Sample Size	49	142	84	

Note: Bulk of data derived from Pilot Point and Cold Bay areas.

Table 15. Reported Frequency of Season Goose Bags and Percent of Harvest, Resident Hunters, 1971-72.

No. of Geese Harvested During Season	Percent of All Hunters Taking Geese	Percent of Harvest
1	23.8	4.8
2	23.0	9.4
3	13.2	8.1
4	8.6	7.0
5	3.4	3.5
6-10	17.4	27.7
11-15	5.4	14.8
16-20	2.5	9.3
21-40	2.7	15.4
	100.0	100.0

Note: Hunters who reported taking one goose during the season represented 23.8 percent of all hunters taking geese; 4.8 percent of the total goose harvest consisted of season bags of one goose.

Tables 4, 5 and 6 describe hunter success and harvest for each harvest area for resident and nonresident hunters. Table 7 presents projected kill for the major hunting areas in Alaska.

Crane Harvest

Resident hunters (including nonresidents with an Alaska address) reported an average of 2.2 sandhill cranes per hunter taking and 0.05 cranes per season per active waterfowl hunter. Statewide crane harvest by residents was calculated to be 492. Nonresidents took only a calculated 10 cranes. Tables 4 and 5 present data on hunter success and crane harvest by harvest area.

Snipe Harvest

Resident hunters (including nonresidents with an Alaska address) reported an average of 8.3 common (Wilson's) snipe per hunter taking and 0.31 birds per active hunter. Snipe harvest by residents was calculated to be 3,051. Nonresidents took only a projected 36 birds. Tables 4 and 5 present data on hunter success and snipe kill by harvest area.

Hunter Characteristics

Hunters were asked on the survey form to record the type of hunting method - jump shooting, pass shooting or decoy hunting - they employed. Statewide, pass shooting and jump shooting (40 and 39 percent of total) were the most common methods, followed by decoy hunting (21 percent of total). Table 16 presents data on hunting methods as reported by harvest area of residence.

Hunters were also asked whether they went hunting for waterfowl only, or whether they hunted birds only incidental to other hunts. Statewide, 88 percent of those residents hunting waterfowl made trips exclusively for waterfowl. Twelve percent reported they hunted waterfowl only incidental to other species. Table 16 presents these data by harvest area of residence. Seventy-seven percent of reporting nonresidents hunted exclusively for waterfowl at least once. It was impossible to determine how many of these hunters came to Alaska to hunt mainly for waterfowl.

Because both area of residence (hunter's address on license) and area of greatest duck harvest were provided on the survey forms, an estimate of travel involved to go duck hunting could be made. Of all hunters shooting most of their ducks out of their area of residence, one-third went to the Central area, about one-third went to the Alaska Peninsula and about one-fourth went to the Gulf Coast area. Slightly more than 7 percent of all resident hunters reported taking most of their birds outside of their area of residence. Table 17 compares area of residence to the harvest area where hunters reported taking most of their birds.

Table 16. Duck Hunting Methods and Affinity for Waterfowl Hunting as Reported by Area of Residence, 1971-72.

Area of Residence	PERCENT OF TOTAL				
	Hunting Method			Waterfowl Hunt Only	
	Jump	Pass	Decoy	Yes*	No*
North Slope	0	100	0	75	25
Seward Peninsula	23	63	14	79	21
Yukon Valley	47	47	6	50	50
Central	46	40	14	83	17
Yukon Delta	30	48	12	74	26
Cook Inlet	37	39	24	92	8
Gulf Coast	45	32	23	98	2
Southeast	40	40	20	86	14
Kodiak	42	38	20	92	8
Alaska Peninsula	37	53	10	89	11
Aleutian Chain	32	45	23	68	32
Statewide	39	40	21	88	12
Nonresident				77	23

*Yes = percent of total hunters who reported going hunting for waterfowl at least once during the season.
No = percent of total hunters who reported they hunted waterfowl only incidental to other game.

Table 17. Incidence of waterfowl hunting in areas other than that in which the hunter lives.*

Area of Residence	PERCENT OF HUNTERS WHO HUNTED IN: North Slope	Seward Pen.	Yukon Valley	Central	Yukon Delta	Cook Inlet	Gulf Coast	S.E.	Kodiak	Alaska Pen.	Aleut. Chain	Total out of Res. Hunt
North Slope	100.0	-	-	-	-	-	-	-	-	-	-	0.0
Seward Peninsula	-	100.0	-	-	-	-	-	-	-	-	-	0.0
Yukon Valley	-	-	100.0	-	-	-	-	-	-	-	-	0.0
Central	-	0.5	0.8	97.4	-	0.3	1.0	-	-	-	-	2.6
Yukon Delta	-	-	4.3	-	95.7	-	-	-	-	-	-	4.3
Cook Inlet	-	-	0.1	5.5	0.1	86.4	1.9	0.4	0.3	5.3	-	13.6
Gulf Coast	-	-	-	4.5	-	-	95.5	-	-	-	-	4.5
Southeast	-	-	0.3	0.3	-	-	3.0	96.4	-	-	-	3.6
Kodiak	-	-	-	-	-	1.3	-	-	96.1	2.6	-	3.9
Alaska Peninsula	-	-	-	-	-	-	-	-	-	100.0	-	0.0
Aleutian Chain	-	-	-	-	-	-	-	-	-	-	100.0	0.0
Percent of Total Going To:	0.0	1.7	5.0	33.3	0.8	1.7	21.7	2.5	1.7	31.7	0.0	7.3

*Of the waterfowl hunters living in Southeast, 0.3 percent reported shooting most of their ducks in the Yukon Valley and Central areas, 3.0 percent in the Gulf Coast area and 96.4 percent in the Southeast; a total of 3.6 percent traveled out of the Southeast. Of all waterfowl hunters in the state who hunted out of their area of residence, 2.5 percent came to the Southeast. A total of 7.3 percent of all waterfowl hunters shot most of their ducks in a different area than the one in which they live.

DISCUSSION

A comparison of the results of our 1971 mail survey and the 1971 estimates of waterfowl harvest made by the Bureau of Sport Fisheries and Wildlife (Carney, et al, 1972) points out several major differences (Table 18). The ADF&G estimate for hunter days was 46 percent below Bureau figures. Our total duck harvest figure was 16 percent above their estimate while our projected goose kill was 62 percent below their estimated harvest.

The accuracy of independent projections of duck stamp sales derived from the ADF&G mail survey provides good evidence that this survey provided the most reliable harvest information. These data indicate projected stamp sales of 14,493 compared to actual sales of 14,320 (1 percent error). This close correlation strongly suggests that our survey provided an excellent estimate of the 1970-71 waterfowl harvest. As stated previously, the Bureau admittedly takes a very small sample of hunters. Apparently, inadequate sampling (small sample size and possibly nonrandomized sample) in the Bureau survey explains much of this difference.

In addition the state survey included nonresident hunters while the Bureau survey did not. Although numbers of active nonresidents (509) and their resulting bird harvests are not large enough to greatly influence statewide harvest projections, the difference probably explains, at least partially, the greater statewide duck harvest indicated by the ADF&G survey.

As expected, most duck harvest occurred in the areas possessing the highest human populations. The Cook Inlet, Central and Southeast areas accounted for over 75 percent of the state's harvest. Daily and seasonal reported duck hunter success was similar in all areas except for the Alaska Peninsula, Aleutian Chain and unknown harvest areas, where hunters had lower seasonal success. Apparently many hunters concentrated primarily on geese on the Alaska Peninsula and took ducks incidental to goose hunting. Most of the hunters who did not report where they took most of their ducks (unknown harvest area) generally hunted only one or two days and usually shot no birds.

The goose harvest on the Alaska Peninsula was the largest of any harvest area. Goose hunting is excellent there; perhaps some of the best in North America. Nearly two-thirds of the goose harvest by nonresidents occurred on the Peninsula.

Although there are a number of areas which received high hunter use and sustained large harvests, apparently the bulk of Alaska's duck harvest occurs on areas receiving little use by hunters. As seen on Table 7, about 44 percent of the total hunter days and duck harvest occurred on 14 major areas. About 50 percent of the goose harvest occurred on 13 such areas.

The two most popular types of duck hunting in Alaska appear to be pass and jump shooting. Decoy hunting was reported to be only about

Table 18. A Comparison Between 1971 ADF&G and BSF&W Waterfowl Hunter Success Surveys.

	BSF&W	*ADF&G
Percent active hunters	70.0	72.4**
Number active hunters	9,912	10,352
Percent hunters who were successful	55.0	77.5
Days per active hunter	6.6	4.3
Total hunter days	65,136	44,653
Duck bag per active hunter	7.3	8.2
Total duck bag	71,900	83,623
Goose bag per active hunter	1.9	1.1
Total goose bag	18,600	11,343

* Combination of resident and nonresident hunters.
**Resident only.

half as popular as either of the two other methods. Many of the coastal hunting areas are not conducive to decoy hunting because of problems with tidal movements. In Interior areas, where decoy hunting would be more practical, freeze-up apparently arrives too early for most hunters to invest a great deal of money in a spread of decoys.

This survey did not sample hunters under 16 who did not purchase a duck stamp. The BSF&W estimates that about an additional 8 percent total hunter days and 5 percent total duck harvest can be attributed to juveniles. Future analysis of field bag checks may give some insight to the validity of these estimates.

SUMMARY

1. The total calculated duck, goose, crane and snipe harvests in Alaska during the 1971-72 season were as follows: 83,623; 11,343; 502; and 3,087 birds, respectively.

2. Hunters spent a calculated total of 44,653 days hunting waterfowl in Alaska during the 1971-72 season.

3. Out-of-state hunters comprised only 5 percent of the total Alaska waterfowl hunting public.

4. Resident waterfowl hunters harvested an average of 8.2 ducks each and out-of-state hunters averaged a bag of 6.3 ducks each during the 1970-71 Alaska waterfowl season.

5. Resident hunters spent an average of 4.3 days waterfowl hunting and out-of-state hunters spent an average of 3.8 days waterfowl hunting during the 1970-71 season in Alaska.

6. Mallards, widgeon, pintail and green-winged teal constituted over 80 percent of the state's duck harvest during the 1970-71 season.

7. Canada geese constituted over 70 percent of the state's goose harvest during the 1970-71 season.

8. Pass and jump shooting are the two favored methods of duck hunting in Alaska.

9. Eighty-eight percent of all residents taking waterfowl reported they made hunting trips exclusively for waterfowl.

10. This survey indicated that 7.3 percent of reporting resident hunters took the majority of their ducks in a different area than that in which they resided.

11. It is not possible, using this mail survey, to accurately assess the waterfowl harvest by people who do not purchase a duck stamp.

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