

**The 2000 Harvest of Migratory Birds in Ten  
Upper Yukon River Communities, Alaska**

by

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## ABSTRACT

This report summarizes the harvest and use of migratory birds and eggs by residents of the Yukon Flats during the spring, summer, and fall of 2000. The research was funded by the U.S. Fish and Wildlife Service, Migratory Bird Management, and carried out by the Alaska Department of Fish and Game, Division of Subsistence in cooperation with the Council of Athabascan Tribal Governments (CATG). Data were collected through household surveys administered by locally hired research assistants in each community.

Surveys were completed with 333 of 472 households in the 10 survey communities, for an overall contact rate of 71%. Hunters in these communities harvested an estimated 9,404 migratory birds, including 6,381 ducks, 2,958 geese, 64 sandhill cranes, and one tundra swan. The number of birds harvested per household in Yukon Flats communities ranged from 2.7 birds per household in Rampart to 83.9 birds per household in Birch Creek. The percentage of households harvesting birds ranged from 25.6% in Venetie to 100% in Canyon Village and the percentage of households using migratory birds ranged from 33.3% in Venetie to 100% in Canyon Village and Chalkyitsik. In general, about one-third to one-half of the households in most communities were involved in the hunting and harvesting of birds with the proceeds of these hunts distributed to all or most households in the community through sharing networks.

Few households in the Yukon Flats reported harvesting or using migratory bird eggs during the study period. The total estimated harvest was 25 eggs, including five mallard eggs gathered by residents of Birch Creek and 20 white-fronted goose eggs gathered by several households in Fort Yukon.

Eleven species of ducks were identified as being harvested by Yukon Flats hunters; the top five species taken included scoters, mallards, northern pintails, American wigeon, and long-tailed ducks. Scoters, known locally as "black ducks," constituted 51% of the overall duck harvest in the region. Three species of geese were harvested on the Yukon Flats including Canada geese, white-fronted geese, and snow geese. The harvest of migratory birds on the Yukon Flats is primarily a spring activity with 83% percent of all ducks and 93% of all geese taken during the

period April through June. Two-thirds of the birds harvested by Yukon Flats hunters were taken in the month of May.

Harvest levels of migratory birds by Yukon Flats communities documented by the 2000 survey are significantly lower than annual harvest levels reported in the 1980s. While it is difficult to generalize using a single year of harvest data, it appears that fewer households participating in waterfowl hunting, combined with weather and habitat changes that have resulted in a loss of area wetlands, may have contributed to these reduced harvests. Despite lower levels of harvest, migratory birds remain an important local resource used by a majority of Yukon Flats households at certain times of the year.

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## INTRODUCTION

In October 1997, the United States Senate ratified amendments to migratory bird treaties with Canada and Mexico. The amendments acknowledge the common practice of spring waterfowl hunting and egg gathering for subsistence purposes in Alaska, and thus provide a framework for a legal and regulated spring harvest of migratory birds.

Information concerning contemporary harvest levels and traditional uses of waterfowl and their eggs is being compiled and used to develop subsistence hunting regulations, the intent of which is to accommodate the needs and practices of subsistence users. In May 1999, the Yukon Flats was identified by management agencies as an area of Alaska where information on contemporary waterfowl harvests was lacking. Previous subsistence studies in the region by Caulfield 1983, Sumida 1988 and 1989, and Sumida and Andersen 1990, did not include all Yukon Flats communities and did not offer sufficient detail on the number, species, or timing of bird and egg harvests. The intent of this project was to address these data gaps by using a common methodology in all Yukon Flats communities for a single harvest year.

The area commonly referred to as the Yukon Flats is a broad wooded lowland intersected by the Yukon River in eastern central Alaska. It is bordered by the White Mountains to the south, the Brooks Range to the north, the U.S./Canada border to the east and Yukon River canyon or “ramparts” area in the west. The Arctic Circle traces an east-west line through the center of the Yukon Flats.

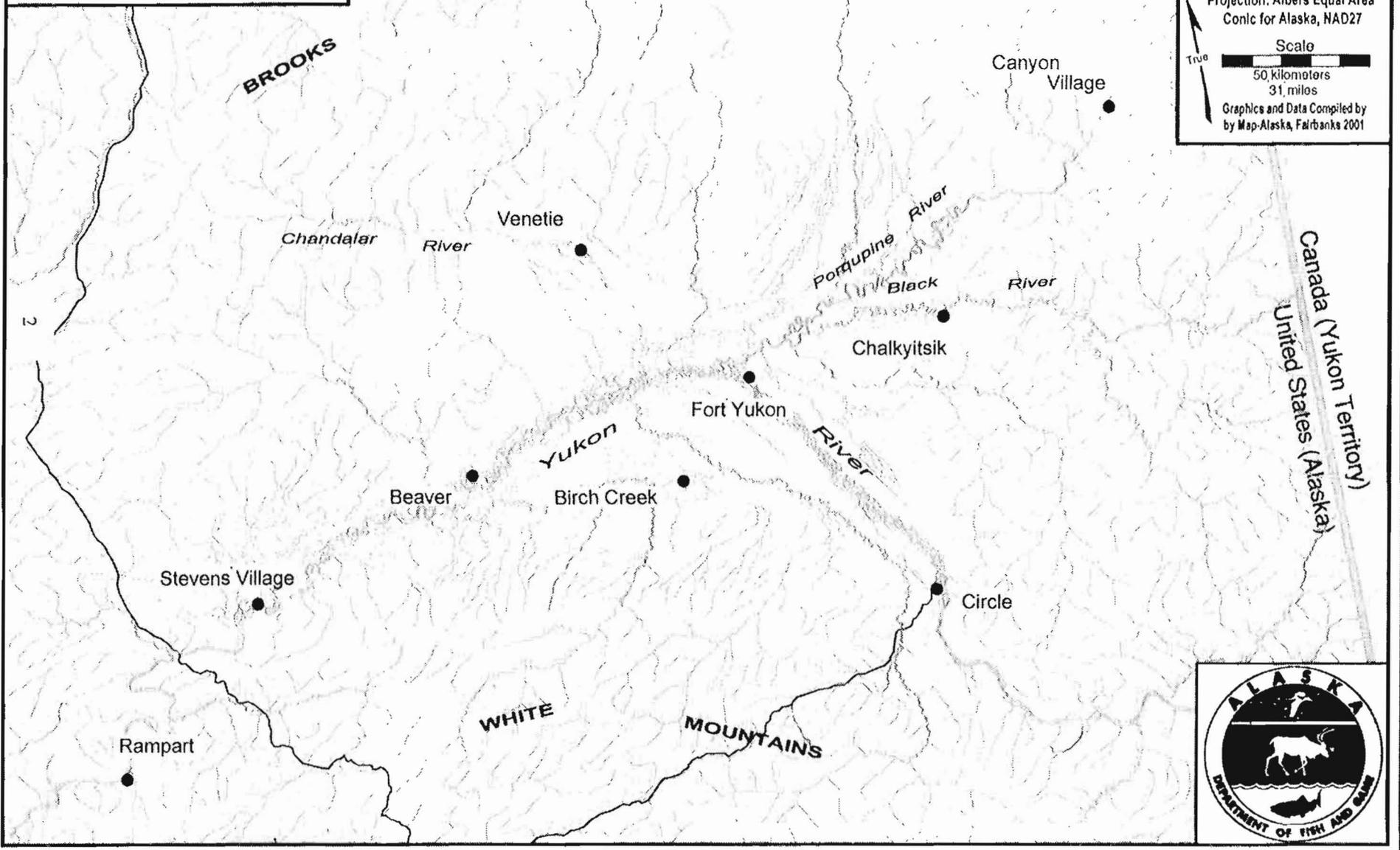
The ten Yukon Flats communities surveyed as part of this study included Arctic Village, Beaver, Birch Creek, Canyon Village, Chalkyitsik, Circle, Fort Yukon, Rampart, Stevens Village, and Venetie. Locations of communities and major geographic features of the Yukon Flats are shown in Figure 1. The area population is predominantly Gwich'in and Koyukon Athabascan and was estimated at 1,268 individuals at the time surveys were conducted. Fort Yukon, with an estimated population of 539, is located at the confluence of the Yukon and Porcupine rivers and serves as a regional center to the smaller outlying

# Figure 1: Yukon Flats Region

Alaska Department of Fish and Game  
Subsistence Division  
Interior and Arctic Regions  
Fairbanks, Alaska



Projection: Albers Equal Area  
Conic for Alaska, NAD27  
Scale  
50 kilometers  
31 miles  
Graphics and Data Compiled by  
by Map-Alaska, Fairbanks 2001



communities. Subsistence hunting, fishing, and trapping are integral parts of the economy and way of life on the Yukon Flats. Major wild food resources on the Yukon Flats include salmon (*Oncorhynchus sp.*), moose (*Alces alces*), caribou (*Rangifer tarandus*), a wide variety of waterfowl, and non-salmon fish species such as whitefish (*Coregonus sp.*) and northern pike (*Esox lucius*) (Caulfield 1983; Sumida and Andersen 1990).

## METHODOLOGY

This project was a cooperative endeavor between the Alaska Department of Fish and Game (ADF&G), Division of Subsistence, and the Council of Athabascan Tribal Governments, (CATG). The project was funded by the U.S. Fish and Wildlife Service, Office of Migratory Bird Management.

Data were collected through face-to-face interviews, primarily with household heads, in each survey community. Surveys were administered in each community by locally-hired CATG Resource Specialists. ADF&G Division of Subsistence staff conducted a training session in Fort Yukon to familiarize participating CATG Resource Specialists with sampling and survey procedures. Resource Specialists are identified in the Acknowledgements section of this report.

Migratory birds are generally present on the Yukon Flats during the open-water period of April through September. To enumerate the 2000 harvest, survey data were collected in two stages: a spring survey, which collected information on the household harvest and use of birds during the three month period April through June, and a fall survey, which collected information for the 3-month period July through September. Surveys covering the spring harvest period took place from mid-July through mid-August. While most migratory birds have left the Yukon Flats by September, bird harvest activities on the Flats have been known to persist into early October in some years. To ensure that all of the fall harvest was accounted for, fall surveys were not initiated until November. Yukon Flats hunters reported no harvest of migratory birds after the month of September during fall 2000 survey period.

The spring and fall survey forms differed slightly in that questions regarding the harvest and use of eggs were only asked in the spring, and questions regarding the (annual) household harvest and use of grouse and ptarmigan were added to the fall survey form. Copies of each survey instrument are contained in Appendix A. To assist hunters in identifying birds, surveyors carried a laminated bird chart assembled from published field guides showing color pictures of 18 migratory bird species common to the area.

Prior to conducting the first round of surveys, current household lists were compiled for each community using information provided by CATG and tribal councils. Accurate household lists were essential in order to assess the workload and direct the survey effort. Two sampling strategies were used. In the relatively large regional center of Fort Yukon a 50 percent random sample (100 households) was selected as the survey population. In the remaining communities a census approach was utilized, with surveyors attempting to contact all households. Table 1 presents information on the survey design, total number of households, number of households surveyed, and estimated population in each Yukon Flats community. Contact rates in communities where a census was attempted ranged from 73% in Stevens Village to 100% percent in Birch Creek and Chalkyitsik. Overall, 333 of 472 Yukon Flats households were surveyed, resulting in an overall contact rate of 71%. Results from surveyed households were extrapolated to unsurveyed households to derive overall harvest estimates for each community.

Table 1. Survey Design, Sample Sizes, and Population Estimates for Surveyed Communities.

<b>Community</b>	<b>Type of Design</b>	<b>Total Number of Households</b>	<b>Number of Surveyed Households</b>	<b>Percent of Households Sampled</b>	<b>Estimated Community Population</b>
Arctic Village	Census	53	52	98%	142
Beaver	Census	37	28	76%	88
Birch Creek	Census	13	13	100%	33
Canyon Village	Census	4	3	75%	16
Chalkyitsik	Census	34	34	100%	84
Circle	Census	31	26	84%	95
Fort Yukon	Random	201	100	50%	539
Rampart	Census	21	19	90%	53
Stevens Village	Census	33	24	73%	84
Venetie	Census	45	34	76%	134
All Communities		472	333	71%	1268

The two-phase survey effort presented some challenges with respect to analysis and extrapolation of the data. While surveyors attempted to contact the same list of households during each survey period, some households surveyed in the spring were unavailable for surveying during the fall survey period, or visa-versa. As a result, slightly different rates of contact were sometimes achieved during the two survey periods and the list of surveyed households in a given community differed slightly between the spring and fall survey periods. In addition, due to turn-over in locally hired assistants, survey data for the fall period were incomplete or not collected at all in three of the ten survey communities (Chalkyitsik, Rampart, and Stevens Village). Because rates of contact were generally highest for the spring survey period, sampling fractions for the spring survey period (shown in Table 1.) were used to calculate community population estimates and to estimate the percentage of households participating in the hunting, harvest, use, and sharing of migratory birds.

The lack of fall survey data for Chalkyitsik, Rampart, and Stevens Village is unfortunate. However, the harvest of migratory birds unaccounted for as a result of these missing data is projected to be relatively small. Among the Yukon Flats communities for which spring and fall surveys were completed, the spring harvest period produced the vast majority of ducks (78%) and geese (93%). Applying these percentages to the documented harvests for Chalkyitsik, Rampart, and Stevens Village, the combined fall harvest of migratory birds by hunters in those communities is estimated at approximately 200 ducks and nine geese. This represents just 2% of the overall harvest of migratory birds documented for the remainder of the Yukon Flats. Missing harvest data for the three communities are referenced with footnotes in the accompanying report tables and community and regional harvest estimates can be regarded as relatively complete. Community harvests of grouse and ptarmigan have not been included in the accompanying report tables in order to focus on the central issue of migratory bird harvests. Consequently, use of the term “birds” or “bird harvest” in this report refers specifically to migratory birds, i.e. ducks, geese, swans, and cranes.

## FINDINGS

### Harvest Numbers

Harvest estimates are summarized in Table 2 by community, season of harvest, and species. An estimated 9,404 migratory birds were taken by residents of the ten Yukon Flats communities during the period April through September 2000. About two thirds (68%) of this total number consisted of ducks (6,381) and about one third (31%) was geese (2,958). The remaining 1% of the migratory bird harvest consisted of 64 sandhill cranes (*Grus canadensis*), and one tundra swan (*Cygnus columbianus*).

In terms of numbers of birds, Fort Yukon and Venetie were the largest harvesters, taking an estimated 3,616 and 2,077 migratory birds respectively. Together, these two communities accounted for 61% of the migratory birds harvested on the Yukon Flats. They are also two of the larger communities on the Yukon Flats (Table 1) accounting for 53% of the area population.

Because surveyed communities are of different sizes, the estimated number of birds harvested may not be the best indicator of a community's participation in migratory bird hunting. The estimated number of birds harvested per household and per person are more useful indices for comparing harvest numbers across communities. Likewise, estimates of the percentage of households in each community involved in hunting, harvesting, using, and sharing birds, provides a means for comparing community participation in migratory bird harvest activities. These data are presented in Table 3.

As shown in Table 3, the number of birds harvested per household ranged from 2.7 birds in Rampart to 83.9 birds in Birch Creek. The harvest of nearly 84 birds per household in Birch Creek was almost double the next highest harvest rate of 46.2 birds per household in Venetie. Beaver, with a harvest rate of 22.7 birds per household, was the only other Yukon Flats community to achieve a harvest rate of more than 20 birds per household. Per capita harvest rates ranged from a low of 1.1 birds per person in Rampart to 33.0 birds per person in Birch Creek (Table 3).

Table 2. Migratory Bird Harvest Estimates by Species and Season for Ten Yukon Flats Communities, 2000.

	Arctic Village			Beaver			Birch Creek			Canyon V.			Chalkyitsik	Circle			Fort Yukon			Rampart	Stevens V.	Venetie			Total Harvest**		
	Total	Spr.	Fall	Total	Spr.	Fall	Total	Spr.	Fall	Total	Spr.	Fall	Spr.*	Total	Spr.	Fall	Total	Spr.	Fall	Spr.*	Spr.*	Total	Spr.	Fall	Total	Spr.	Fall
All Migratory Birds	437	354	83	841	661	180	1091	701	390	64	64	0	568	443	353	90	3616	3266	349	57	210	2077	1839	238	<b>9404</b>	8073	1330
All Ducks	421	338	83	252	133	119	869	578	291	36	36	0	503	230	192	38	2105	1783	322	52	155	1758	1535	223	<b>6381</b>	5305	1076
Canvasback	7	5	2	5	5	0	17	17	0	0			0	0		48	28	20	0	7	0				84	62	22
Goldeneye (sp.)	6	3	3	4	4	0	5	5	0	0			0	0		6	6	0	0	7	0				28	25	3
Mallard	49	42	7	51	10	41	228	121	107	25	25	0	62	107	107	0	930	772	158	28	54	65	8	57	1599	1229	370
Long-Tailed Duck	67	51	16	0			0			0			0	0		0			0	0	217	217	0	284	268	16	
Northern Pintail	12	12	0	10	8	1	88	88	0	3	3	0	110	0		313	292	21	2	26	8	5	2	572	546	24	
Ring-Necked Duck	10	0	10	0			0			0			0	0		41	12	29	0	0	0				51	12	39
Scaup (sp.)	71	32	39	0			0			0			0	0		6	6	0	0	3	17	0	17	97	41	56	
Scoter (sp.)	187	183	4	142	97	45	506	322	184	5	5	0	278	123	85	38	599	531	68	13	29	1354	1305	49	3236	2848	388
Northern Shoveler	0			0			5	5	0	0			0	0		4	4	0	3	10	0				22	22	0
Green-Winged Teal	0			0			0			0			0	0		12	12	0	4	0	0				16	16	0
American Wigeon	10	10	0	39	7	32	20	20	0	3	3	0	53	0		144	121	23	0	12	25	0	25	306	226	80	
Unidentified Duck	2	0	2	1	1	0	0			0			0	0		2	0	2	1	8	73	0	73	87	10	77	
All Geese	16	16	0	589	528	61	221	122	99	28	28	0	65	159	159	0	1509	1481	27	4	48	319	304	15	<b>2958</b>	2755	202
Canada Geese	6	6	0	126	118	8	173	77	96	23	23	0	30	159	159	0	540	519	22	4	39	153	147	6	1253	1122	132
Snow Geese	0			108	108	0	0			0			0	0		149	149	0	0	0	17	17	0	274	274	0	
White-Fronted	10	10	0	355	302	53	45	45	0	5	5	0	35	0		810	810	0	0	10	150	140	9	1420	1357	62	
Unidentified Geese	0			0			3	0	3	0			0	0		10	4	6	0	0	0				13	4	9
Waterfowl Eggs	0			0			5			0			0	0		20			0	0	0				<b>25</b>		
Tundra Swan	0			0			0			0			0	0		0			1	0	0				1	1	0
Sandhill Crane	0			0			1	1	0	0			0	54	2	52	2	2	0	0	7	0			<b>64</b>	12	52

\*Only spring harvest data were collected in Chalkyitsik, Rampart, and Stevens Village--some additional fall harvest likely occurred.

\*\*Due to rounding error, harvest totals may differ slightly from sum of spring and harvest numbers.

Participation data in Table 3 show that in most Yukon Flats communities a high percentage of households used waterfowl as a source of food. The percentage of households using migratory birds ranged from 100% in Canyon Village and Chalkyitsik,

Table 3. Levels of Participation in the Use and Harvest of Migratory Birds, 2000.

Community	Participation of Households					Estimated Harvest Levels		
	Use (%)	Hunt (%)	Harvest (%)	Receive (%)	Give (%)	Total Number of Birds	Number of Birds Per	
							Household	Person
Arctic Village	86.5	51.9	51.9	38.5	36.5	437.7	8.3	3.1
Beaver	89.3	46.3	42.9	50.0	25.0	840.6	22.7	9.5
Birch Creek	83.3	83.3	83.3	41.7	50.0	1090.3	83.9	33.0
Canyon Village	100.0	100.0	100.0	66.7	33.3	64.0	16.0	4.0
Chalkyitsik	100.0	41.2	41.2	70.6	17.7	568.0	16.7	6.8
Circle	75.0	34.4	34.4	59.4	18.8	442.9	14.3	4.6
Fort Yukon	77.0	54.0	51.0	45.0	24.0	3615.2	18.0	6.7
Rampart	52.6	42.1	42.1	21.1	10.5	57.5	2.7	1.1
Stevens Village	91.7	54.2	54.2	83.3	29.2	210.4	6.4	2.5
Venetie	33.3	25.6	25.6	12.8	10.3	2077.4	46.2	15.5

to 33.3% in Venetie. In all but two communities (Rampart and Venetie) birds were used by at least three-quarters of the households. The percentage of households involved in the actual hunting and harvesting of migratory birds ranged from 100% in Canyon Village to 25.6 % in Venetie. The percentage of households hunting birds was similar or identical to the percentage of households harvesting birds in all communities. This indicates that nearly all households attempting to harvest birds were successful.

In most communities, significantly more households reported using birds than actually harvesting birds. This indicates that harvested birds were shared between households; a pattern of use that is common in rural Alaska and consistent with subsistence practices documented elsewhere. In Chalkyitsik, for example, only 41.2% of households hunted and harvested birds, but all Chalkyitsik households (100%) reported using birds, and 70.6% of the households reported receiving birds from other households. The percentage of households receiving birds ranged from a high of 83.3% in Stevens Village to 12.8% in Venetie. The percentage of households giving birds to other households ranged from 50% in Birch Creek to 10.3 % in Venetie.

These data indicate that about one-third to one-half of the households in most Yukon Flats communities participate in the hunting and harvesting of migratory birds while the proceeds from these hunts are broadly distributed to all or most households in the community through sharing. A notable exception to this pattern occurred in Venetie where the harvest and use of birds in 2000 was concentrated within a relatively small segment (25.6%) of community households. Despite having the second largest per capita harvest of birds overall, Venetie had the lowest percentage of households using, hunting, harvesting, receiving, and giving birds. The survey data indicate that fully two-thirds of Venetie households made no use of migratory birds in 2000. This means that the estimated 2,077 birds harvested by Venetie hunters were utilized by only about 15 households. Survey information with regard to the sharing of birds between households did not record the number of birds given or received. Thus, while there is no way to know exactly how these birds were distributed numerically, if they were distributed equally among household that reported using migratory birds it would equate to about 138 birds per household.

The number of ducks harvested exceeded the number of geese harvested in all Yukon Flats communities except Beaver (Table 2). Beaver, Birch Creek, and Fort Yukon emerge as the major harvesters of geese using various indices. As might be expected, Fort Yukon hunters harvested the largest number of geese (1,509), accounting for 51% of all the geese harvested on the Flats. Geese made up the highest percentage of the community harvest in Beaver, where 70% of the birds harvested were geese. Birch Creek had the highest harvest of geese on a per household basis at 17 geese per household. By comparison, per household harvests of geese in the other nine communities ranged from 0.19 geese per household in Rampart to 15.9 geese per household in Beaver.

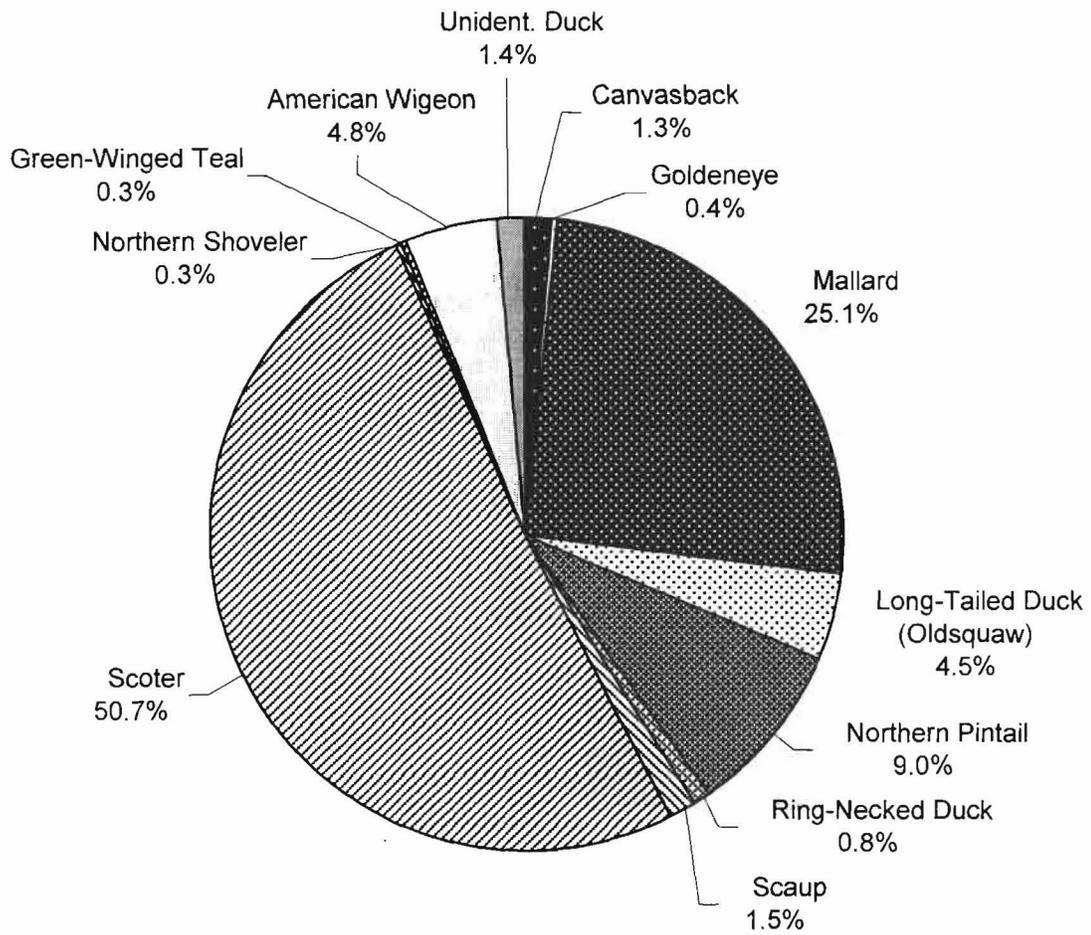
## Species Utilized

### Ducks

Eleven identified species of ducks were harvested by hunters in Yukon Flats communities during both survey periods (Fig. 2). Additional species were included on the survey form (see Appendix) and asked about during the surveys. Space was also provided for hunters to list any other birds that were not specifically asked about on the survey. Report tables and figures include only those species for which harvests were recorded. Scoters (*Melanitta sp.*) made up one-half (51%) of the ducks harvested by area hunters, followed by mallards (*Anas platyrhynchos*) (25%), northern pintails (*Anas Acuta*) (9%), American wigeon (*Anas americana*) (5%), and long-tailed ducks or oldsquaws (*Clangula hyemalis*) (4%). These were the top five species harvested by Yukon Flats hunters, comprising 94% of the duck harvest. The remainder of the harvest consisted of relatively small numbers of scaup (*Aythya sp.*), canvasback (*Aythya valisineria*), ring-necked duck (*Aythya collaris*), goldeneye (*Bucephala sp.*), green-winged teal (*Anas crecca*), northern shoveler (*Anas clypeata*), and the catch-all category “unidentified duck.”

Multiple species of scoter, scaup, and goldeneye are known to occur on the Yukon Flats. For presentation purposes in accompanying harvest tables and figures the species have been combined into a single taxonomic grouping, but most hunters were able to detail their harvest of these birds by species. Of the 3,236 scoters harvested by Yukon Flats hunters, 3,009 (93%) were identified as white-winged scoters (*Melanitta fusca*) known locally as “black ducks.” The remainder of the scoter harvest consisted of 214 surf scoters (*Melanitta perspicillata*) and 13 birds listed as “unknown scoter.” Of the 97 scaups harvested, the majority (77%) were identified as greater scaup (*Aythya marila*). Lesser scaup (*Aythya affinis*) made up the remainder of the scaup harvest and were only reported by hunters in one community (Arctic Village). Among the 28 goldeneyes harvested, 25 (89%) were reported as common goldeneye (*Bucephala clangula*) and the remainder listed as “unknown goldeneye”. Although they are known to occur on the Flats, No Barrow’s goldeneye (*Bucephala islandica*) were positively identified by hunters on the Yukon Flats.

**Figure 2. Duck Species Harvested by Hunters in all Yukon Flats Communities, 2000.**



Among the 10 Yukon Flats communities surveyed there were differences in the species of ducks harvested. Scoters and mallards were the only ducks harvested by hunters in all 10 communities. The community of Circle had the least diverse duck harvest, taking only those two species. Hunters in all other communities also reported taking northern pintails and American wigeons. Duck hunters in Arctic Village and Fort Yukon had the most diverse harvests, reporting 9 and 10 species of ducks, respectively. In seven communities, a single species dominated by contributing more than one-half of the ducks harvested. In Canyon Village and Rampart mallards were the dominant species harvested, while scoters (mostly white-winged scoters) comprised the majority of the ducks harvested in Beaver, Birch Creek, Chalkyitsik, Circle, and Venetie.

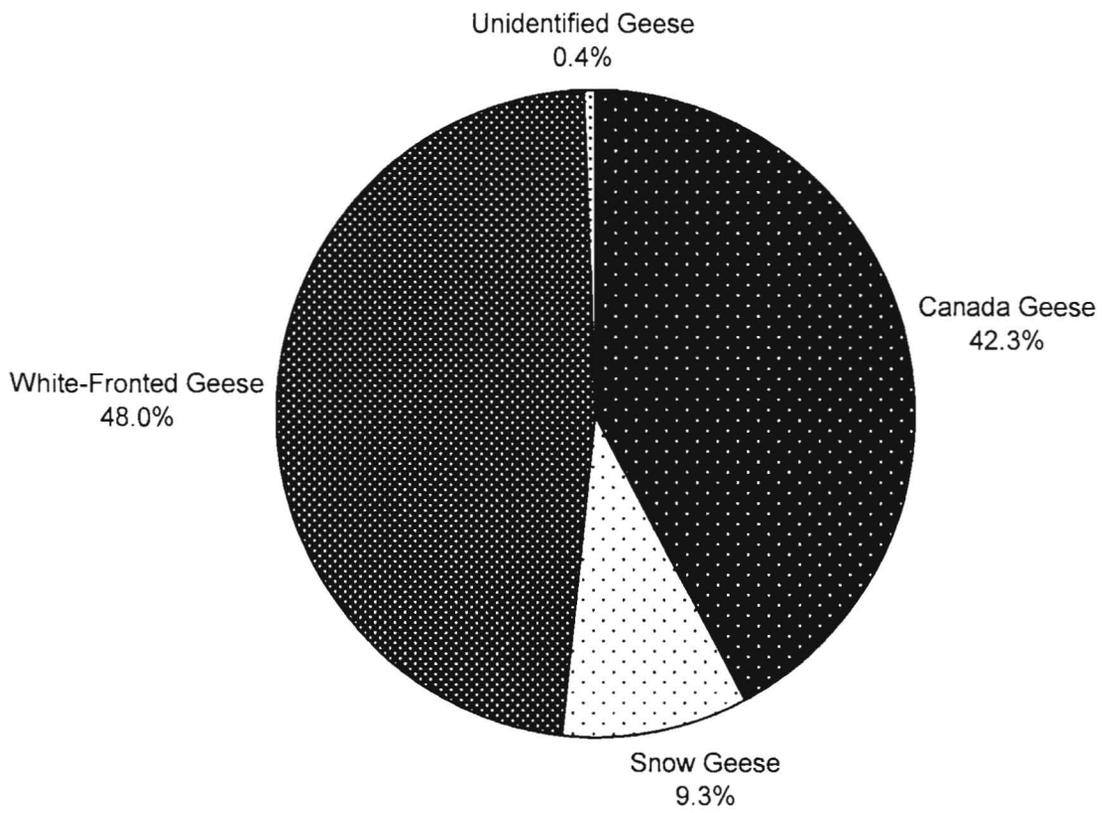
#### Geese

Three species of geese were taken by hunters on the Yukon Flats during the 2000 survey year. Figure 3 illustrates that of the estimated 2,598 geese harvested, 48.0% were white-fronted geese (*Anser albifrons*) known locally as “laughing goose” or “speckle-bellies,” 42.3% were Canada geese (*Branta canadensis*), and 9.3 % were snow geese (*Chen caerulescens*). An additional 13 geese (0.4%) were unidentified by the hunters. While the taxonomy of Canada geese is complex and information on subspecies was not collected on the survey, it is thought that lesser Canada geese (*Branta canadensis parvipes*) are the most common Canada goose on the Yukon Flats (T. Heuer, USFWS pers. comm.). Harvests of Canada geese were reported in all Yukon Flats communities, while harvests of white-fronted geese were reported in eight of the ten communities and snow geese were only reported by hunters in the central Yukon Flats communities of Beaver, Fort Yukon, and Venetie.

#### Other Migratory Birds

Aside from the 14 species of ducks and geese harvested, sandhill cranes and tundra swans were the only other migratory birds taken by Yukon Flats hunters (Table 2). Sandhill cranes were harvested by hunters in the four communities of Birch Creek, Circle, Fort Yukon, and Stevens Village. Of the 64 sandhill cranes taken by hunters, 54 (84%) were

**Figure 3. Species of Geese Harvested by Hunters in All Yukon Flats Communities, 2000.**



harvested by hunters in the community of Circle. The one swan harvested was reported in the community of Rampart.

### Timing of Harvests

According to survey data, the harvest of migratory birds by Yukon Flats hunters occurs primarily in the spring. Eighty six percent of the 9,404 birds harvested by Yukon Flats hunters were taken during the spring harvest period of April through June (Table 4). All ten survey communities reported harvesting the largest number of migratory birds during May, with that single month accounting for nearly two-thirds (65.7%) of the overall harvest. By comparison, no other single month accounted for more than 8.5% of the bird harvest. Eighty three percent of all ducks and 93% of all geese were harvested during spring (Table 2). Harvests of snow geese, northern shoveler, green-winged teal, and swan were only reported during the spring harvest period. Scaup, ring-necked ducks, and sandhill crane were the only species that were harvested in greater numbers during the fall harvest period. Higher numbers of unidentified ducks and geese were also reported during the fall harvest period. For the fall period in general, Table 4 shows a slowly

Table 4. Migratory Bird Harvest by Month and Season in Yukon Flats Communities, 2000.

Community	Spring Harvest				Fall Harvest				Total Birds
	April	May	June	Unk. Spr.	July	Aug.	Sept.	Unk. Fall	
Arctic Village	0	332	22	0	80	1	2	0	437
Beaver	0	609	51	0	0	41	139	0	840
Birch Creek	362	143	196	0	56	99	235	0	1,091
Canyon Village	0	64	0	0	0	0	0	0	64
Chalkyitsik	0	200	0	368	n/a	n/a	n/a	n/a	568
Circle	109	179	66	0	0	4	86	0	444
Fort Yukon	219	3,019	28	0	195	90	64	0	3,615
Rampart	17	36	4	0	n/a	n/a	n/a	n/a	57
Stevens Village	19	191	0	0	n/a	n/a	n/a	n/a	210
Venetie	0	1,410	430	0	0	224	14	0	2,078
Total Birds	726	6,183	797	368	331	459	540	0	9,404
% of Harvest	7.7%	65.7%	8.5%	3.9%	3.5%	4.9%	5.7%	0.0%	100.0%
Spring Harvest = 8,704 (85.9%)					Fall Harvest = 1,330 (14.1%)				

Due to rounding error, harvest totals may differ slightly from those presented in Table 2.

building level of harvest through the fall harvest period from July through September, with the month of September producing the largest number of fall birds by a small margin.

The data presented in Table 2 allow the season of harvest to be compared between communities. All seven communities for which spring and fall surveys were completed took the majority of their bird harvests during the spring (Table 2). In almost all cases, the spring harvest of each bird species in each community exceeded the number taken during the fall. There are some exceptions however, where the fall harvest period appears to have made important contributions to the community take of birds. For example, nearly one-half (47%) of the ducks harvested by hunters in Beaver occurred during the fall, including a majority of the mallards and American wigeons taken. Venetie also reported a majority of their mallard harvest and 100% of their American wigeon harvest during the fall. All of the ring-necked ducks taken by hunters in Arctic Village were reported during the fall. A majority of the ring-necked ducks taken by Fort Yukon hunters also occurred during the fall. In Birch Creek, Canada geese made up the bulk of the geese harvested and 55% of those were taken during the fall. Of the 54 sandhill cranes taken by hunters in Circle, 52 (96%) were harvested during the fall.

#### Harvest and Use of Waterfowl Eggs

According to the survey, only about one percent of Yukon Flats households were involved in the harvest and use of migratory bird eggs in 2000. The total estimated harvest was 25 eggs, including five mallard eggs taken by two gatherers in a single Birch Creek household, and 20 white-fronted goose eggs taken by four gatherers in four separate households in Fort Yukon. Comments received from some survey respondents indicated that egg gathering was a more common activity on the Yukon Flats years ago but has declined in recent decades with the more reliable availability of store-bought foods.

## Comparison with Previously Collected Harvest Information

A number of Division of Subsistence studies conducted during the 1980s provide some basis for comparing past and present harvests of migratory birds on the Yukon Flats (Caulfield 1983, Sumida 1988, Sumida 1989, and Sumida and Andersen 1990.) While comparing these data points can provide some interesting discussion, it is important to note that data for a single year may not be representative or typical.

While Caulfield (1983) provided no estimates of the number of birds harvested by the five Yukon Flats communities examined, (Arctic Village, Birch Creek, Chalkyitsik, Fort Yukon, and Venetie) seasonal round charts from that study confirm that migratory birds are primarily taken by Yukon Flats hunters during May and September. Caulfield also lists 12 species of ducks and geese commonly taken by hunters including Canada goose, northern pintail, American wigeon, green-winged teal, scaup, common goldeneye, white-winged scoter, white-fronted goose, oldsquaw (long-tailed duck), mallard, bufflehead, and snow goose. This list is nearly identical to the list of ducks and geese reported during the 2000 survey. The inclusion of bufflehead (*Bucephala albeola*) and the exclusion of the ring-necked duck are the only differences in the species lists compiled 20 years apart.

Caulfield's focus on qualitative rather than quantitative data provides insights into the importance of waterfowl hunting that may not be apparent from simple harvest numbers.

The following description of bird hunting activities is undoubtedly still relevant today:

“Spring waterfowl hunting is often an activity undertaken by small groups of young men in the community. During spring of 1981 the lives of young men in Venetie seemed to be dominated by a pattern of hunting through the dusky twilight of “night” and sleeping by day. Freshly-killed ducks were brought home and cleaned in the early morning, and all over the village bubbling pots of duck soup were being consumed. Ducks are frozen or dried to keep them for later use. In the past, duck eggs were collected for food, but this practice is reported to be rarely done today. A Fort Yukon resident reported that the last time he harvested duck eggs was in the mid-1950s.....While the actual volume of meat provided today by wildfowl may not be great, its role in providing fresh meat during lean periods and providing diversity in the diet should not be overlooked.” (Caulfield 1983: 70-71).

In a subsistence baseline study of Beaver in 1984-85, Sumida (1989) documented a harvest of 669 ducks, 484 geese, and 7 cranes by hunters in that community. Data on species were not provided, but timing information indicated that 73% of the migratory bird harvest took place during the spring. The 1984-85 harvest total of 1,160 migratory birds was equivalent to approximately 37 birds per household. This is significantly higher than the 841 migratory birds (22.7 birds per household) recorded for Beaver during the 2000 survey. The timing of the harvest was similar, however, with 78.5% of the 2000 migratory bird harvest occurring during spring.

A 1986-87 study of Fort Yukon subsistence uses (Sumida and Andersen 1990) provides another data point for comparison with the 2000 data. An estimated 10,095 migratory birds were taken by Fort Yukon hunters during spring and fall 1987. These are listed by species and category in Table 5. This is more birds than were taken by all Yukon Flats communities in 2000. Although the estimated population of Fort Yukon in 2000 represents a decline of 14% from the estimated population in 1987, this alone does not account for the difference in harvest numbers between the two studies. The estimated harvest of 3,616 birds by Fort Yukon hunters in 2000 represents a decline in harvest of 64% over the levels documented in 1987.

While the species-mix represented in the harvest has remained similar, the side-by-side comparison of harvest data (Table 5) shows declines in the harvest of every species and each category of bird in 2000, with the declines in the harvest of scoters and snow geese standing out as being particularly significant. Data on participation in hunting also reveal declines in number of households using and harvesting migratory birds in 2000 compared with 1987. In 1987, 86.4% of Fort Yukon households, (about 183 households) reported using migratory birds compared with 77% (about 155 households) in 2000. In 1987, 66.6% of Fort Yukon households (about 141 households) hunted migratory birds compared with 51% (about 103 households) in 2000. Thus, the decline in migratory bird harvests relative to 1987 appears to be the result of smaller numbers of Fort Yukon hunters taking significantly fewer birds of all species in 2000.

Table 5. A Comparison of Fort Yukon Bird Harvests, 1987 and 2000.

	<b>Fort Yukon 1987*</b>	<b>Fort Yukon 2000**</b>	<b>% Change</b>
Number of People	626	539	-14%
Number of Households	212	201	-5%
<b>Species</b>	<b>Est. Harvest</b>	<b>Est. Harvest</b>	
<b>Ducks</b>	<b>7,112</b>	<b>2,105</b>	<b>-70%</b>
mallard	1,646	930	-43%
pintail	1,059	313	-70%
canvasback	211	48	-77%
wigeon	404	144	-64%
green-winged teal	48	12	-75%
goldeneye	9	6	-33%
scoter	2,207	599	-73%
other ducks	0	47	n/a
unknown ducks	1,528	2	n/a
<b>Geese</b>	<b>2,945</b>	<b>1,509</b>	<b>-49%</b>
Canada geese	1,071	540	-50%
white-fronted geese	1,058	810	-23%
snow geese	653	149	-77%
unknown geese	163	10	n/a
<b>Swans</b>	<b>10</b>	<b>0</b>	<b>n/a</b>
<b>Cranes</b>	<b>28</b>	<b>2</b>	<b>-93%</b>
<b>Total Migratory Birds</b>	<b>10,095</b>	<b>3,616</b>	<b>-64%</b>
Birds per Person	16.1	6.7	-58%
Birds per Household	47.6	18.0	-62%

\* Sumida and Andersen 1990

\*\*This study

A similar decline in bird harvesting also appears to have taken place in Stevens Village. Sumida (1988) compiled subsistence harvest data for that community during calendar year 1984 and documented an annual harvest of 442 ducks, 158 geese and 9 cranes, for a total of 609 migratory birds. This compares with a total of 210 birds (155 ducks, 48 geese, and 7 cranes) estimated for 2000. The estimated population and number of households for Stevens Village in 1984 (90 people in 30 households) was similar to 2000 (84 people in 33 households). The number of birds harvested per household in 1984 was 20.3 compared with 6.4 birds per household in 2000.

Stevens Village was one of three communities for which fall harvest data were not collected in 2000. However, it is unlikely that inclusion of fall harvest numbers would make up for the difference in harvest levels between 1984 and 2000. Among the Yukon Flats communities for which spring and fall surveys were conducted, only about 22% of the ducks and 7% of the geese were taken during the fall. Applying these percentages to the spring data collected for Stevens Village, the missing fall harvest can be estimated at approximately 45 ducks and 4 geese. This would bring the total number of migratory birds taken by Stevens Village in 2000 to 259 or 7.8 birds per household— far below the 20.3 birds per household recorded in 1984.

Sumida (1988) provided a description of how migratory birds move through the Stevens Village vicinity, the importance placed on spring hunting, and changes in habitat on the Yukon Flats that may be adversely affecting local waterfowl populations. These passages are worth repeating here as they probably still serve to portray local hunting patterns for migratory birds and provide some insight into the possible cause of harvest declines apparent in the 2000 survey.

“Waterfowl begin to arrive in the flats in April and early May when longer days and warmer temperatures cause snowmelt and thawing, resulting in meadows cleared of snow and shallow ice-free lakes. Ducks and geese make their appearance when supplies of previously harvested fish and wildlife have often been depleted and they are usually the first fresh meat available in abundance after the long winter, arriving well in advance of the coming salmon run. The timing of different species varies and certain species like the white-fronted goose appear early in the spring while scoters arrive in June. Ducks and geese that nest in the

flats are available throughout the summer while other species are only present for a short period of time before they continue their journeys to distant nesting sites.

Residents of the flats greet the arrival of waterfowl in the spring as enthusiastically today as they did in the past. Lakes, pond, and sloughs throughout the flats are usually ice-free before break-up of the Yukon River and the open water in these areas attracts the migrating birds. During early spring hunting was pursued in these areas. Hunters took advantage of the colder temperatures of night to travel overland on snowmachines to lakes and meadows known to be good waterfowl habitat and the birds were often harvested during the twilight of the early dawn. As the season progressed and snow melted, hunting focused more along river corridors. Most hunting took place during April and May while the birds were still in good condition prior to nesting. This activity was frequently conducted by young adult men, individually or in groups. Scoters, known locally as "black ducks," were the last migrants to arrive and were eagerly sought because of their fatness. Some older residents lamented the scarcity of this favored bird during the past few years. Waterfowl were seldom taken during summer months when nesting took place. At this time other subsistence activities took precedence.

As fall approached, both adult and young birds began to appear in large numbers. Waterfowl harvest resumed again in August while hunters were traveling along the river or during the pursuit of other fish or wildlife. Ducks and geese were not as actively pursued as in the spring as fewer species were available, the birds were not in as good a condition, and other activities predominated.

Local residents indicated that overall, waterfowl populations appeared to be declining in the area. Environmental changes were often cited as the reason for the decline. Spring floods, which occurred more frequently in the past, used to replenish water in marshes, sloughs, and lakes. Flooding has not taken place for a number of years and this factor, combined with the low precipitation rates and the underlying permafrost in the area has created a drier, less favorable habitat for waterfowl, muskrat, and other wildlife. Areas that were once lakes, have developed into marsh, then meadow, then brushy stands of willow. Sandbars in the river eventually become islands of deciduous trees. Locals frequently commented on these changes and described productive "black duck" lakes or "ratting" areas that have been covered with willows. Similarly, sandbars where geese used to land have become covered with brush and were no longer used by the birds." (Sumida 1988: 146-150).

The environmental changes mentioned by Stevens Village residents in 1984 and described by Sumida above have continued into the present day. Recent information compiled from interviews with elders in Beaver and Fort Yukon regarding the impact of high beaver populations on whitefish movements (Andersen and Fleener 2001) include frequent references to habitat changes on the Yukon Flats. In general, these changes are

described as a “drying up” of the Yukon Flats including a loss of wetland areas reportedly caused by changes in weather patterns, a lack of spring floods, and associated vegetation changes over a period of about 60 years. If the loss of wetlands has indeed resulted in reduced availability of waterfowl in traditional hunting areas surrounding Yukon Flats communities, this could help explain the decline in waterfowl harvesting that appears to have occurred over the last several decades.

## DISCUSSION

While bird harvests appear to have declined from levels documented in the 1980s, migratory birds are still actively pursued by hunters in all ten Yukon Flats communities. The 2000 harvest of more than 9,400 birds by Yukon Flats residents included 13 species of ducks, 3 species of geese, tundra swan, and sandhill cranes. Bird hunting is primarily a spring activity with two-thirds of the overall harvest occurring during the month of May. White-winged scoters, mallards, northern pintail, American wigeon, and long-tailed ducks were the top five species of ducks harvested. White-fronted geese and Canada geese were the most common geese species taken.

Previous subsistence studies have shown that migratory birds constitute a relatively small portion of the wild food harvested (by weight) in Yukon Flats communities. Sumida and Andersen (1990) found that the harvest of more than 10,000 migratory birds by Fort Yukon hunters in 1987 represented just 3% of the total pounds of wild resources harvested that year. That said, the importance of the migratory bird harvest, specifically the spring harvest of birds, should not be underestimated. Ducks and geese arrive and migrate through the Flats at a time when few other subsistence resources are available—prior to the arrival of summer salmon and after winter supplies of moose, caribou, and other major stores of meat have been depleted. The land and rivers are in a seasonal transition from snow and ice cover to open water and bare ground, making travel in pursuit of other subsistence resources difficult and the attention of hunters turns to migratory birds, which can be successfully hunted in areas relatively close to

communities. Bird harvests at this time of year are important in that they provide variety in the local diet and are a preferred and traditional source of fresh meat. The harvest, sharing, and use of this resource signals the beginning of a new annual cycle of subsistence activities and re-enforces important connections the land.

In using these data to help craft regulatory season and bag limits, the limitations of a single year of harvest data should be recognized. Just as the availability of birds varies from year to year due to weather events and small shifts in migration patterns, participation in hunting likely varies as well. In small communities, the number of birds taken in a given year can be significantly affected by changes in the availability or activity of one or two key hunters. The 2000 survey data can thus probably best be used to highlight major trends in harvest timing and the bird species used by Yukon Flats hunters. Additional years of data would be helpful in defining and confirming a pattern of resource use.

The 2000 survey data describe a pattern of hunting on the Yukon Flats that involves a relatively small number of hunting households providing harvested birds to the larger community through sharing networks. In general, about 30 to 50 percent of the households in Yukon Flats communities were involved in the hunting and harvest of migratory birds while 75 to 100 percent of households in most communities reported using birds. In attempting to set reasonable bag limits for spring waterfowl hunting it will be imperative for regulators and managers to recognize and attempt to accommodate this pattern of a small group of hunters sharing proceeds of the hunt with multiple households.

## LITERATURE CITED

Andersen, D.B. and C.L. Fleener

2001 Whitefish and Beaver Ecology of the Yukon Flats, Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 265.

Caulfield, R.A.

1983 Subsistence Land Use in Upper Yukon-Porcupine Communities, Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 16.

Sumida V.A.

1988 Land and Resource Use Patterns in Stevens Village, Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 129.

Sumida V.A.

1989 Patterns of Fish and Wildlife Harvest and Use in Beaver, Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 140.

Sumida V.A. and D.B. Andersen

1990 Patterns of Fish and Wildlife Use for Subsistence in Fort Yukon, Alaska. Division of Subsistence, Alaska Department of Fish and Game, Technical Paper No. 179.



APPENDIX: Survey Instruments

**SPRING 2000 WATERFOWL HARVEST SURVEY, INTERIOR ALASKA**

How many people are in your household? \_\_\_\_\_ SURVEYOR: \_\_\_\_\_  
 Are any household members Alaska Natives? YES: \_\_\_\_\_ NO: \_\_\_\_\_  
 How many household members hunted waterfowl this spring (April-June)? \_\_\_\_\_ DATE: \_\_\_\_\_  
 How many household members gathered eggs this spring (April-June)? \_\_\_\_\_

During April, May, or June 2000, did your household:

	Yes	No
1. Use waterfowl?		
2. Receive waterfowl from other households?		
3. Give away waterfowl to other households?		

During April, May, or June 2000, did your household:

	Yes	No
1. Use eggs?		
2. Receive eggs from other households?		
3. Give away eggs to other households?		

(Please fill in this table.)

	TOTAL SPRING WATERFOWL HARVESTED	How many each month?				TOTAL EGGS TAKEN	RESCODE
		APRIL	MAY	JUNE	Month Unknown		
Canada Geese (Lesser)							410404080
White-fronted Geese							410410000
Snow Geese							410408000
Unknown Geese							410499000
Tundra Swan							410604000
Trumpeter Swan							410602000
Unknown Swan							410699000
Sandhill Crane							410802000
Northern Pintail							410220000
American Wigeon							410236020
Mallard							410214000
Northern Shoveler							410230000
Green-winged Teal							410232060
Canvasback							410204000
Common Goldeneye							410210040
Barrow's Goldeneye							410210020
Unknown Goldeneye							410210990
Bufflehead							410202000
Oldsquaw							410218000
Ring-Necked Duck							410224000
White-winged Scoter							410228060
Surf Scoter							410228040
Unknown Scoter							410228990
Greater Scaup							410226020
Lesser Scaup							410226040
Unknown Scaup							410226990
Unknown Duck							410299000
Other Ducks/Geese/Gulls:							417700000

Do you have any comments about waterfowl in your area? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## FALL 2000 BIRD HARVEST SURVEY, INTERIOR ALASKA

How many people are in your household? \_\_\_\_\_ SURVEYOR: \_\_\_\_\_ DATE: \_\_\_\_\_

Are any household members Alaska Natives? YES: \_\_\_\_\_ NO: \_\_\_\_\_

How many  
HH members  
HARVESTED?      Did household  
USE?      Did household  
RECEIVE?      Did household  
GIVE AWAY?

WATERFOWL (last 3 months)

GROUSE and PTARMIGAN (last 12 months)

	Y / N	Y / N	Y / N
	Y / N	Y / N	Y / N

*If household members harvested birds, please record harvest below.*

<i>For the last 3 months</i>	TOTAL NUMBER HARVESTED	How many each month?			RESCODE
		JULY	AUGUST	SEPTEMBER	
Canada Geese (Lesser)					410404080
White-fronted Geese					410410000
Snow Geese					410408000
Unknown Geese					410499000
Tundra Swan					410604000
Trumpeter Swan					410602000
Unknown Swan					410699000
Sandhill Crane					410802000
Northern Pintail					410220000
American Wigeon					410236020
Mallard					410214000
Northern Shoveler					410230000
Green-winged Teal					410232060
Canvasback					410204000
Common Goldeneye					410210040
Barrow's Goldeneye					410210020
Unknown Goldeneye					410210990
Bufflehead					410202000
Oldsquaw					410218000
Ring-Necked Duck					410224000
White-winged Scoter					410228060
Surf Scoter					410228040
Unknown Scoter					410228990
Greater Scaup					410226020
Lesser Scaup					410226040
Unknown Scaup					410226990
Unknown Duck					410299000
Other:					

<i>For the last 12 months</i>	NUMBER HARVESTED		NUMBER HARVESTED	
Ruffed Grouse		421802060	Willow Ptarmigan	421804040
Sharp-tailed Grouse		421802040	Rock Ptarmigan	421804020
Spruce Grouse		421802020	Unknown Ptarmigan	421804990
Unknown Grouse		421802990	Other:	

Do you have any comments about waterfowl or other birds in your area? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_