

AERIAL SCOTER AND SCAUP MONITORING SURVEY
OF THE YUKON FLATS,
ALASKA – 2005

U.S. Fish and Wildlife Service
Waterfowl Management
1412 Airport Way, Fairbanks, AK 99701

AERIAL SCOTER AND SCAUP MONITORING SURVEY OF THE YUKON FLATS, ALASKA – 2005

Edward J. Mallek, U.S. Fish and Wildlife Service, Waterfowl Management, 1412 Airport Way, Fairbanks, AK 99701

Abstract: The fifth annual aerial survey to monitor scoter populations on the Yukon Flats, Alaska was conducted 6-8 June 2005. The survey area consisted of four strata with a total of 58 transects. White-winged scoters and surf scoters accounted for 97% and 3% of the indicated-total scoters observed during survey, respectively. No black scoters were observed on the survey. The monitoring indices for white-winged scoters, surf scoters, and black scoters were 19,048, 552, and 0, respectively. The index for white-winged scoters was 16% more than the previous four-year mean (2001-2004, 16,430). The index for lesser scaup was 36,665 and was 45% more than the previous three-year mean (2002-2004, 25,215).

Key Words: aerial survey, Yukon Flats, white-winged scoter, surf scoter, lesser scaup, monitoring **March 2006**

INTRODUCTION

Scoters are among the least studied of North American waterfowl and little is known of their life history, ecology, and distribution (USFWS 1999). Furthermore, existing monitoring surveys such as the Alaska-Yukon Waterfowl Breeding Population Survey (AYWBPS, Conant and Groves 2005) are not temporally designed to monitor scoters, which are among the latest migrants to arrive on their breeding grounds (Lensink 1965). Although the AYWBPS was not designed to monitor scoters, data from that survey indicate a substantial population decline across Alaska with a gradual decline occurring in interior Alaska (Conant and Groves 2004).

The Yukon Flats supports the highest densities of scoters and lesser scaup (*Aythya affinis*) in interior Alaska (Lensink 1965, King and Lensink 1971, Bellrose 1980). Furthermore, scoters and scaup are among the latest waterfowl to commence nesting on the Yukon Flats (Lensink 1965). Due to the late arrival of scoters and late nesting by scoters and scaup, traditional monitoring efforts for these divers are not optimally timed.

This survey was initiated in 2001 (Mallek 2002^a) to provide monitoring data primarily for white-winged scoters (*Melanitta fusca*) that breed on the Yukon Flats. Due to the late nesting efforts by scoters, as well as scaup, scaup were added to this monitoring survey in 2002. This report summarizes the results of the 2005 scoter and scaup monitoring survey of the Yukon Flats, Alaska.

STUDY AREA AND METHODS

Study Area and Survey Design

The survey area (9,728.3 km²) included 58 transects systematically located in four strata within the Yukon Flats where previous surveys (Platte and Butler 1992) indicated relatively high scoter

densities (Figure 1). Transects were 400 meters wide resulting in 678.4 km² of sample area. The survey was flown at 100-150 feet above ground level and at 90-105 mph. Aircraft navigation and altitude were maintained with a Global Positioning System (GPS) and radar altimeter, respectively. Scoters and scaup were the only waterfowl recorded during the survey, and a circling maneuver was used to positively identify scoters to species when necessary.

The survey was temporally designed to occur when the highest number of indicated-breeding white-winged scoters was present in the survey area. Previous replicate scoter surveys of the Yukon Flats (Mallek 2001, 2002^b, 2003^a) indicated that the end of the first week through the second week of June was the most appropriate time to monitor white-winged scoters.

Survey Procedures

Observations were recorded directly into laptop computers as sound files using a computer program developed by John Hodges (USFWS, Region 7, Waterfowl Management-Juneau). Each laptop computer (one for each observer) was linked to the aircraft GPS unit. The computer program simultaneously recorded observations and their geographic coordinates into linked sound and ASCII files, respectively. A second computer program, also developed by John Hodges, was used on the ground to replay the linked sound files and produce transcribed ASCII files. The transcribed ASCII files were then used for data analyses.

Observations of scoters and scaup were recorded according to breeding pair survey protocol (U.S. Fish and Wildlife Service and Canadian Wildlife Service 1987). All observations of lone male scoters and scaup (drakes) were recorded as singles. Drakes in flocks were recorded as flocked drakes. A male scoter or scaup in close association with a female of the same species was recorded as a pair. Scoters and scaup in mixed-sex groupings of three or more of the same species which could not be separated into singles and pairs were recorded as groups (a hen and two drakes were recorded as a pair and a single). Females not accompanied by drakes were not counted.

Statistical Methods

Following standard waterfowl breeding population survey data protocol (U.S. Fish and Wildlife Service and Canadian Wildlife Service 1987, Smith 1985), all observations of lone scoter drakes, flocked scoter drakes (<5), and scoter and scaup pairs were doubled for analyses. Observations of lone scaup drakes, and flocked scaup drakes were not doubled for analyses. Groups of scoters and scaup were not doubled for analyses.

Population indices and variance estimates were calculated using standard statistical procedures for stratified analyses as described by Smith (1995). Visibility correction factors were not incorporated in the population indices.

RESULTS

The fifth annual scoter monitoring survey (fourth annual survey that included scaup) was conducted over a three day period from 6-8 June 2005. A Cessna 206 amphibious equipped

aircraft was used to conduct the survey (N234JB). Species composition, group classification, stratum information, and index values are presented in Table 1. Figure 2 depicts the five year trend for white-winged scoters. Appendices 1-4 provide information from previous monitoring surveys (Mallek 2002^a, 2003^b, 2005, Mallek and Lysne 2004).

Scoters

White-winged scoters accounted for 97% of the observed scoters on the survey, while surf scoters (*Melanitta perspicillata*) accounted for 3%. The white-winged scoter index for 2005 was 19,048. This index value was greater than previous 2001-2004 index values (range 15,709-16,951). The primary reason for the greater index value in 2005 was a significant increase in white-winged scoters observed in the east strata. The surf scoter index for 2005 was 552. Few surf scoters were observed on these surveys therefore between-year variation was higher than for white-winged scoters. The 2001-2005 range for surf scoters was 165-1,036. No black scoters (*Melanitta nigra*) were observed on the 2005 survey. Previous surveys indicated that very few black scoters use this area and it is doubtful if any breed on the Yukon Flats.

Scaup

The scaup index for 2005 was 36,665. This species appears to have more annual variation than white-winged scoters. Scaup have been counted on this survey since 2002 and the range of index values from 2002 through 2004 was 22,921-28,978.

ACKNOWLEDGEMENTS

I thank Mark Bertram (USFWS, Region 7, Yukon Flats NWR) for his help in funding and participating as an observer during the 2005 survey. I also thank Bob Platte (USFWS, Region 7, Waterfowl Management–Anchorage) for his help with survey design and map production. Thanks are extended to Arctic NWR for use of their aircraft fueling facility at Fort Yukon.

Data and conclusions presented in this report are preliminary and are not for publication or citation in published manuscripts without permission from the author.

REFERENCES CITED

- Bellrose, F. C. 1980. Ducks, geese, and swans of North America. Stackpole Books, Harrison PA
- Conant, B., and D. J. Groves 2005. Alaska-Yukon waterfowl breeding population survey: May 15 to June 7, 2005. Unpubl. Rept., U. S. Fish and Wildl. Serv., Juneau, AK
- King, J. G. and C. J. Lensink. 1971. An evaluation of Alaska habitat for migratory birds. Unpubl. Rept., U. S. Fish and Wildl. Serv., Washington DC
- Lensink, C. J. 1965. Waterfowl of the Yukon Flats, Alaska. Unpubl. Rept., U. S. Fish and Wildl. Serv.
- Mallek, E. J. 2001. Replicate aerial scoter surveys of the Yukon Flats, Alaska, 2000. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Mallek, E. J. 2002^a. Aerial scoter monitoring survey of the Yukon Flats of Alaska – 2001. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Mallek, E. J. 2002^b. Replicate aerial scoter surveys of the Yukon Flats, Alaska – 2001. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Mallek, E. J. 2003^a. Replicate aerial scoter surveys of the Yukon Flats, Alaska - 2002 Final Report. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Mallek, E. J. 2003^b. Aerial scoter and scaup monitoring survey of the Yukon Flats, Alaska – 2002. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Mallek, E. J. 2005. Aerial scoter and scaup monitoring survey of the Yukon Flats, Alaska-2004. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Mallek, E. J. and L. A. Lysne. 2004. Aerial scoter and scaup monitoring survey of the Yukon Flats, Alaska – 2003. Unpubl. Rept., U. S. Fish and Wildl. Serv., Fairbanks, AK
- Platte, R. M. and W. I. Butler Jr. 1992. Aerial surveys and mapping of waterbird distribution and abundance for impact assessment of potential oil development on the Yukon Flats National Wildlife Refuge, Alaska. Unpubl. Rept., U. S. Fish and Wildl. Serv., Anchorage, AK
- Smith, G. W. 1995. A critical review of the aerial and ground surveys of breeding waterfowl in North America. Biological Science Report 5, National Biological Serv., Washington DC
- U. S. Fish and Wildl. Serv. – Canadian Wildl. Serv. 1987. Standard operating procedures for aerial waterfowl breeding ground population and habitat surveys in North America. Unpubl. Manual
- U. S. Fish and Wildl. Serv. 1999. Population status and trends of sea ducks in Alaska. Unpubl. Rept., Anchorage, AK

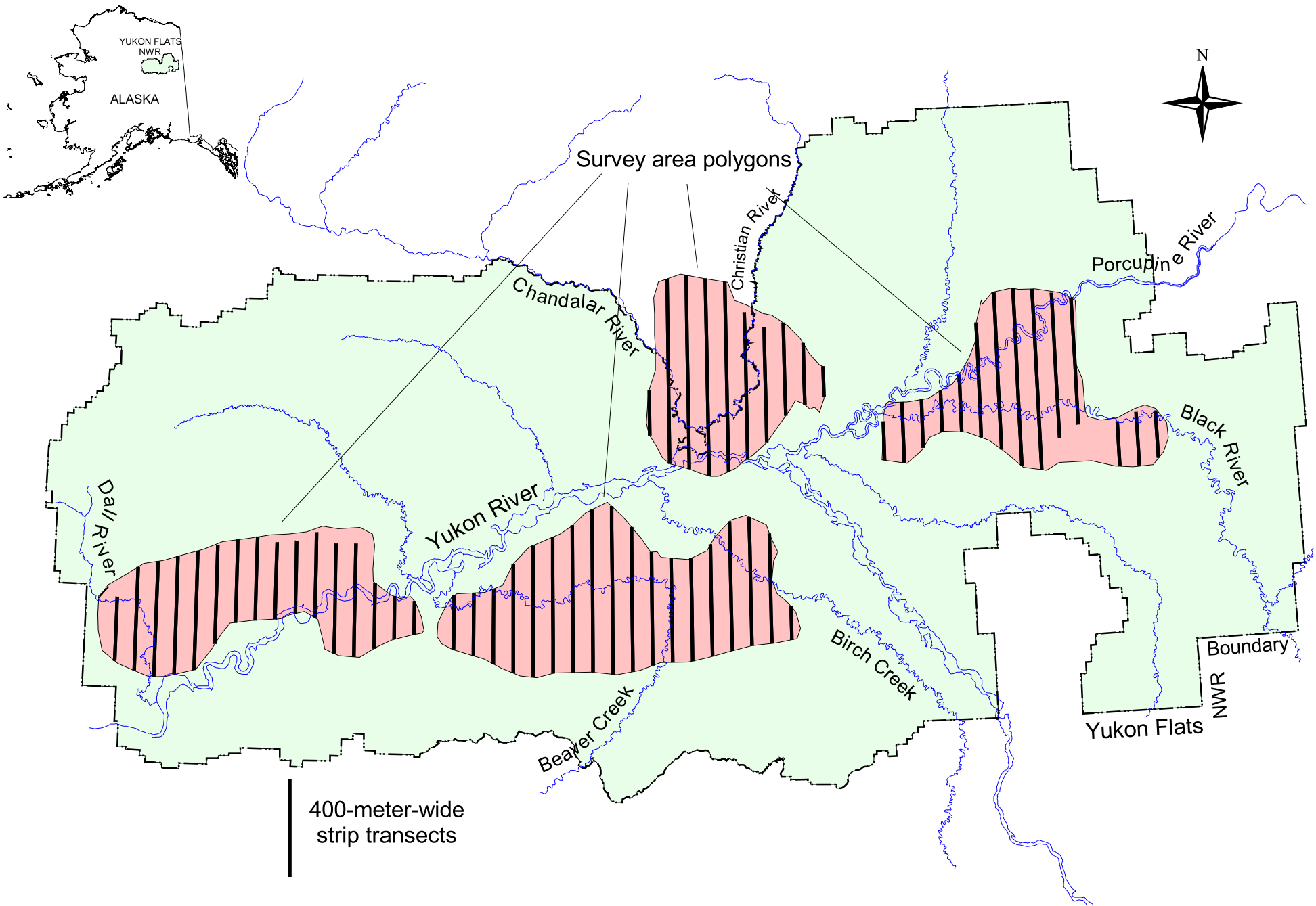


Figure1. Map features of the Yukon Flats, Alaska in relation to the transect locations, 2001 - 2005.

Table 1. Species composition, group classification, and index values for scoters and scaup from an aerial monitoring survey conducted on the Yukon Flats, Alaska 6-8 June 2005.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated breeding	Indicated total	Sample Area km ² (n)
WWSC	west	22	15	97	7	268	275	157.8 (16)
	south central	25	19	166	0	420	420	268.1 (18)
	north central	10	7	81	0	196	196	105.3 (10)
	east	25	21	149	34	390	424	147.3 (14)
	WWSC Total	82	62	493	41	1,274	1,315	678.5 (58)
WWSC	Index =	19,048	SE =	2,472				
SUSC	west	2	0	8	0	20	20	157.8 (16)
	south central	1	0	3	0	8	8	268.1 (18)
	north central	0	0	1	0	2	2	105.3 (10)
	east	1	0	3	0	8	8	147.3 (14)
	SUSC Total	4	0	15	0	38	38	678.5 (58)
SUSC	Index =	552	SE =	103				
SCAU	west	51	48	240	121	579	700	157.8 (16)
	south central	36	53	218	125	525	650	268.1 (18)
	north central	40	47	181	80	449	529	105.3 (10)
	east	33	37	217	67	504	571	147.3 (14)
	SCAU Total	160	185	856	393	2,057	2,450	678.5 (58)
SCAU	Index =	36,665	SE =	3,377				

WWSC = white-winged scoter, SUSC = surf scoter, SCAU = scaup, no black scoters were observed during this survey.
 Stratum Area (km²): west = 2,388.7, south central = 3,217.3, north central = 1,989.8, east = 2,132.4.

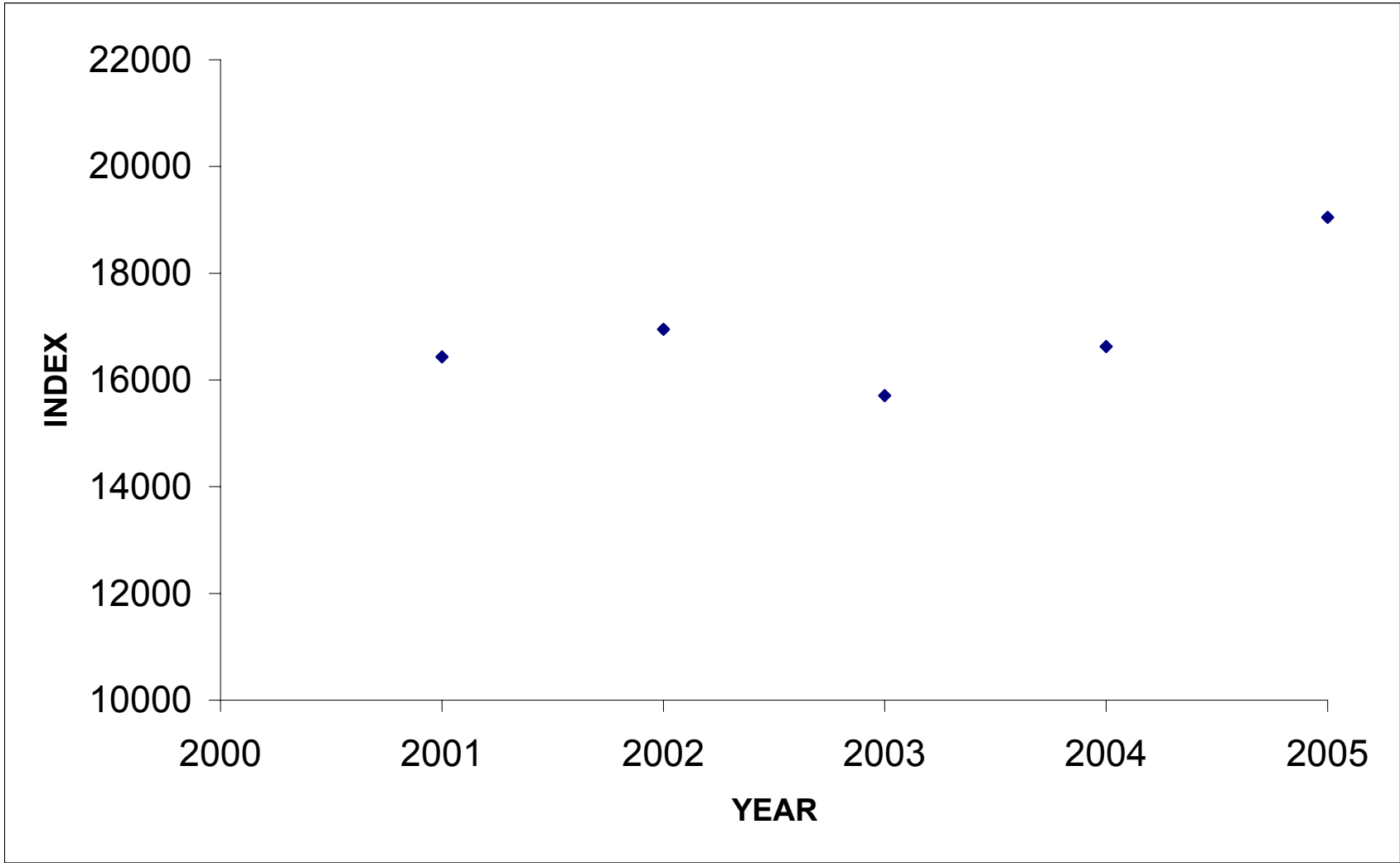


Figure 2. Index values for white-winged scoters from aerial monitoring surveys conducted on the Yukon Flats, Alaska 2001 - 2005.

Appendix 1. Species composition, group classification, and index values for scoters and scaup from an aerial monitoring survey conducted on the Yukon Flats, Alaska 8-10 June 2004.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated breeding	Indicated total	Sample Area km ² (n)
WWSC	west	25	26	137	0	376	376	157.8 (16)
	south central	35	25	229	10	578	588	268.1 (18)
	north central	7	0	68	0	150	150	105.3 (10)
	east	4	4	28	0	72	72	147.3 (14)
	WWSC Total	71	55	462	10	1,176	1,186	678.5 (58)
WWSC	Index =	16,628	SE =	2,086				
SUSC	west	1	2	0	0	6	6	157.8 (16)
	south central	0	0	0	0	0	0	268.1 (18)
	north central	1	0	1	0	4	4	105.3 (10)
	east	0	0	0	0	0	0	147.3 (14)
	SUSC Total	2	2	1	0	10	10	678.5 (58)
SUSC	Index =	166	SE =	74				
SCAU	west	41	55	236	34	568	602	157.8 (16)
	south central	32	31	173	123	409	532	268.1 (18)
	north central	18	21	106	17	251	268	105.3 (10)
	east	36	56	181	127	454	581	147.3 (14)
	SCAU Total	127	163	696	301	1,682	1,983	678.5 (58)
SCAU	Index =	28,978	SE =	2,103				

WWSC = white-winged scoter, SUSC = surf scoter, SCAU = scaup, no black scoters were observed during this survey.
 Stratum Area (km²): west = 2,388.7, south central = 3,217.3, north central = 1,989.8, east = 2,132.4.

Appendix 2. Species composition, group classification, and index values for scoters and scaup from an aerial monitoring survey conducted on the Yukon Flats, Alaska 8-11 June 2003.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated breeding	Indicated total	Sample Area km ² (n)
WWSC	west	51	15	102	20	336	356	157.8 (16)
	south central	66	17	111	47	388	435	268.1 (18)
	north central	20	11	36	10	134	144	105.3 (10)
	east	18	0	51	26	138	164	147.3 (14)
	WWSC Total		155	43	300	103	996	1,099
WWSC	Index =	15,709	SE =	1,779				
SUSC	west	3	0	0	0	6	6	157.8 (16)
	south central	0	0	0	0	0	0	268.1 (18)
	north central	0	0	0	0	0	0	105.3 (10)
	east	0	0	4	15	8	23	147.3 (14)
	SUSC Total		3	0	4	15	14	29
SUSC	Index =	424	SE =	288				
SCAU	west	58	55	193	84	499	583	157.8 (16)
	south central	41	38	111	77	301	378	268.1 (18)
	north central	26	21	54	41	155	196	105.3 (10)
	east	41	42	122	77	327	404	147.3 (14)
	SCAU Total		166	156	480	279	1,282	1,561
SCAU	Index =	22,921	SE =	1,967				

WWSC = white-winged scoter, SUSC = surf scoter, SCAU = scaup, no black scoters were observed during this survey.

Stratum Area (km²): west = 2,388.7, south central = 3,217.3, north central = 1,989.8, east = 2,132.4.

Data in this table were corrected on 24 March 2005.

Appendix 3. Species composition, group classification, and index values for scoters and scaup from an aerial monitoring survey conducted on the Yukon Flats, Alaska 9-12 June 2002.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated breeding	Indicated total	Sample Area km ² (n)
WWSC	west	24	18	73	5	230	235	157.8 (16)
	south central	63	45	135	5	486	491	268.1 (18)
	north central	19	16	55	36	180	216	105.3 (10)
	east	21	22	75	0	236	236	147.3 (14)
	WWSC Total	127	101	338	46	1,132	1,178	678.5 (58)
WWSC	Index =	16,951	SE =	2,106				
SUSC	west	0	0	1	0	2	2	157.8 (16)
	south central	2	0	2	0	8	8	268.1 (18)
	north central	0	0	1	0	2	2	105.3 (10)
	east	0	0	0	0	0	0	147.3 (14)
	SUSC Total	2	0	4	0	12	12	678.5 (58)
SUSC	Index =	165	SE =	89				
SCAU	west	52	47	171	70	441	511	157.8 (16)
	south central	54	66	145	112	410	522	268.1 (18)
	north central	35	45	67	5	214	219	105.3 (10)
	east	42	74	102	67	320	387	147.3 (14)
	SCAU Total	183	232	485	254	1,385	1,639	678.5 (58)
SCAU	Index =	23,745	SE =	2,348				

WWSC = white-winged scoter, SUSC = surf scoter, SCAU = scaup, no black scoters were observed during this survey.
 Stratum Area (km²): west = 2,388.7, south central = 3,217.3, north central = 1,989.8, east = 2,132.4.

Appendix 4. Species composition, group classification, and index values for scoters from an aerial monitoring survey conducted on the Yukon Flats, Alaska 11-14 June 2001.

Species	Stratum	Singles	Flocked drakes	Pairs	Groups	Indicated breeding	Indicated total	Sample Area km ² (n)
WWSC	west	22	3	87	77	224	301	157.8 (16)
	south central	32	26	132	55	380	435	268.1 (18)
	north central	11	16	53	8	160	168	105.3 (10)
	east	15	10	78	33	206	239	147.3 (14)
	WWSC Total		80	55	350	173	970	1,143
WWSC	Index =	16,432	SE =	1,978				
SUSC	west	1	0	2	0	6	6	157.8 (16)
	south central	4	3	7	5	28	33	268.1 (18)
	north central	3	2	2	0	14	14	105.3 (10)
	east	2	0	8	0	20	20	147.3 (14)
	SUSC Total		10	5	19	5	68	73
SUSC	Index =	1,036	SE =	297				
BLSC	west	0	0	0	0	0	0	157.8 (16)
	south central	0	0	0	0	0	0	268.1 (18)
	north central	0	0	0	0	0	0	105.3 (10)
	east	0	4	1	0	10	10	147.3 (14)
	BLSC Total		0	4	1	0	10	10
BLSC	Index =	145	SE =	193				

WWSC = white-winged scoter, SUSC = surf scoter, BLSC = black scoter, scaup were not recorded on this survey.

Stratum Area (km²): west = 2,388.7, south central = 3,217.3, north central = 1,989.8, east = 2,132.4.

Data in this table were corrected on 10 April 2003.