



**TITLE:** Waterfowl Breeding Population Survey:  
Alaska-Yukon (Crew Area 1)

**STRATA COVERED:** 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12

**DATES:** May 14 to June 5, 2007

**DATA SUPPLIED BY:** Ed Mallek<sup>1</sup> and Deborah J. Groves<sup>2</sup>  
U.S. Fish and Wildlife Service,  
Fairbanks<sup>1</sup> and Juneau<sup>2</sup>, Alaska

### **ABSTRACT**

The survey area experienced normal to early spring breakup, except for the northern Seward Peninsula and Old Crow Flats where normal to late phenology occurred. There was no flooding due to low snow fall and early snow melt throughout the survey area. This should generally provide for better than average waterfowl production throughout the survey area.

Total duck numbers were up from the previous 10-year mean by 5%. Dabbler ducks increased from the previous 10-year mean by 1% while divers and miscellaneous species increased by 16% from the previous 10-year mean. Duck production is expected to be better than average.

Goose and swan (trumpeter and tundra) production should be better than average throughout the survey area.

### **INTRODUCTION**

This year the standardized waterfowl breeding pair survey in Alaska was conducted for the 51<sup>st</sup> consecutive year. These data collected from this survey continue to increase in value and are the basis for management decisions at the state, flyway, and continental level.

The survey was flown in the specially modified de Havilland Turbine Beaver (N754). This aircraft has been used on this survey since 1977 and provides extremely high visibility and reliability. Continued use of N754 for this survey (and others) is highly recommended.

### **METHODS**

Survey methods followed “Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America” (USFWS and CWS 1987). Pond data presented in Table 9 are three year averages from past pond counts using standard methods mentioned above.

We used two panel mounted computers (Aero-PC) that ran survey software developed by John I. Hodges, USFWS-Alaska (retired). The software provided a moving map for situational

awareness and recorded observations through a microphone (sound files) that are linked to coordinates from the aircraft GPS (latitude and longitude). We then used a second computer program on the ground to transcribe the linked sound files and produce a text file. The text files contained all relevant data for each observation and were used for analyses and production of stratum summaries and tables. All data and summaries were provided to the Division of Migratory Bird Management (DMBM) in Laurel, MD upon completion of the survey.

The survey design consisted of 12 strata and a total of 232 segments. The Alaska portion of the survey consisted of 214 segments each 16 miles in length and 10 segments each 8 miles in length. The Yukon portion of the survey (Old Crow Flats) consisted of 8 segments each 18 miles in length. All segments were flown in 2007.

We incorporated visibility correction factors (VCFs) in the estimates of ducks. The VCFs were obtained from a six-year (1986-1991) helicopter/fixed-wing comparison study in Alaska. The VCFs were species and habitat specific; boreal forest (strata 1-7), tundra (strata 8-11), and Old Crow Flats in Canada (stratum 12). These VCFs have been used since 1992 and all data previous to 1992 have been corrected as well.

In 2002, the Waterfowl Management Branch in Alaska (following DMBM) decided to double all observations of single geese when calculating indicated total geese. The rationale for this decision was based on the premise that a single goose indicates a pair of geese with the unobserved goose on a nest. All historical data have been updated to reflect this change in analyses. Furthermore, we do not apply a VCF to Canada geese while the DMBM does apply a VCF of 2.89 for Canada geese. Finally, starting in 2002, the DMBM started deleting all flock sightings greater than 45 from the calculations of continental population indices while the results reported here include all flocked observations regardless of size.

## **WEATHER AND HABITAT CONDITIONS**

This year spring breakup occurred early throughout the survey area with exceptions on the Seward Peninsula and Old Crow Flats which were normal to slightly late. Ice melt and vegetation green-up appeared early in all areas with the exceptions of those listed above. The interior of Alaska received little snow fall during the winter and early spring runoff resulted in very low river levels and no flooding.

## **BREEDING POPULATION ESTIMATES**

Caution should be used when interpreting the graphs that include data previous to 1977. The specially modified turbine beaver (N754) has been used on this survey from 1977 to present. This aircraft has increased visibility when compared to aircraft used prior to 1977 on this survey. This suggests that any long term declines may be more significant than depicted on the graphs and any long term increases may be less significant than depicted on the graphs (depending on the span of years in question). Likewise, long-term averages that include pre-1977 data could be somewhat misleading. Historical data from this survey (1957-1994) have been analyzed and are available in a report (Hodges et al 1996).

## **Ducks**

Estimates of ducks are provided in Tables 1, 2 and 10-21 and Figures 1-3.

Dabbler populations increased from last year by 18% but were only 1% above the previous 10-year mean. Northern pintail and American wigeon populations increased by 10 and 11% from their previous 10-year means, respectively. The northern pintail has traditionally been the most numerous dabbler in Alaska and in recent years the Alaska population has accounted for a significant portion of the Pacific Flyway total for that species (Figure 1). Results from this survey (2007, which does not include the Arctic Coastal Plain of Alaska) accounted for approximately 32% of the continental pintail population. The American green-winged teal population was up 4% from the previous 10-year mean. Mallard and northern shoveler populations were down -20 and -12% from their previous 10-year means, respectively.

Scaup, which account for the majority of divers observed on this survey, were up 21% from the previous 10-year mean. The canvasback population was down -19% from the previous 10-year mean. Ring-necked duck and goldeneye populations were down -6 and -52% from their previous 10-year means, respectively. The bufflehead population was up 35% from the previous 10-year mean. The long-tailed duck population was up 49% from the previous 10-year mean. Eider and scoter populations were up 13 and 19%, respectively, from their previous 10-year means. Merganser observations were up 43% from the previous 10-year mean.

## **Geese**

Figure 3 includes the trend of all geese recorded on 5 segments of this survey within the coastal zone of the Yukon-Kuskokwim Delta (actual geese seen on transect only). Data from 1964 was excluded because of extreme weather conditions experienced that year. Two lines were fit to these data (1957-1984 and 1985-2007) due to restricted harvest regulations that were first applied in 1984 and in subsequent years based on the Yukon-Kuskokwim Delta Goose Management Plan. The general upward trend since 1984 probably reflects a response in goose populations (primarily white-fronted geese and cackling Canada geese) to the management plan.

## **Swans**

Estimates of swans are provided in Tables 3, 10-21 and Figure 3.

Trumpeter Swans – Trumpeter swan observations from this survey in boreal forest strata (1-4, 6, and 7) estimate the population at 18,700 adults and sub-adults. Overall, excellent production is expected this year for trumpeter swans in Alaska.

Tundra Swans – The population index from tundra strata (8-11), not including the Arctic Coastal Plain of Alaska, was 178,900, which is 30% above the previous 10-year mean. The breeding index (singles and pairs) was 93,300 which is 22% above the previous 10-year mean. Overall, excellent production is expected this year for tundra swans in western Alaska.

## **Cranes**

Estimates for sandhill cranes are available in Tables 4, 10-21 and Figure 4.

The sandhill crane index for Alaska in 2007 was 44,000, which is equal to the previous 10-year mean.

## **Loons**

Estimates for loons are available in Tables 5-7 and Figure 4.

The 2007 red-throated loon index for this survey was 16,600, up 78% from the previous 10-year mean.

The 2007 pacific loon index for this survey was 66,400, up 36% from the previous 10-year mean.

The 2007 common loon index for this survey was 8,800, down -22% from the previous 10-year mean.

## **CONCLUSION**

The generally normal to early spring breakup (with the exception of the northern Seward Peninsula and Old Crow Flats), low winter snow fall, and lack of flooding should result in excellent waterfowl production within the survey area.

## **TELEMETRY**

A Telonics telemetry receiver-scanner is incorporated in the panel of the survey aircraft. On previous surveys specific frequencies were scanned which were provided by various individuals and agencies. No requests were made this year so we did not monitor any frequencies.

## **ACKNOWLEDGMENTS**

We thank Bruce Conant for passing on some of his knowledge and experience regarding this survey. Bruce had conducted this survey for many years and his expertise and experience will be missed. We wish him well during his retirement, but will continue to call on him for advice.

We thank John Pribbenow, John Alley, and other OAS personnel for providing a fast yet thorough annual inspection to the aircraft prior to the survey. We also thank Doug Alcorn, Russ Oates, and Kevin Fox for their needed support. Special thanks to Mike Spindler, Daryle Lons, Mike Rearden, and Lee Anne Ayres for providing housing, vehicles, or other logistical support.

## **LITERATURE CITED**

Hodges, J.I., J.G. King, B. Conant, and H.A. Hanson. 1996. Aerial Surveys of Waterbirds in Alaska 1957-94: Population Trends and Observer Variability. Information and Technology Report 4. U.S. Dept. of the Interior-National Biological Service. 24pp.

U.S. Fish and Wildlife Service and Canadian Wildlife Service. 1987. Standard operating procedures for aerial breeding ground population and habitat surveys in North America. U.S. Fish and Wildl. Ser. And Can. Wildl. Ser., Laurel, MD 103 pp.

Table 1. Alaska-Yukon. Ten year trend in adjusted waterfowl breeding population estimates by species, 1998 - 2007 (estimates in thousands).

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Ducks:										
Dabblers:										
Mallard	836.1	712.9	770.2	718.3	667.2	843.5	811.1	703.3	515.4	575.6
Black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	0.3	4.9	2.7	6.5	1.0	4.6	1.9	2.7	1.8	3.2
Am. wigeon	1196.9	932.4	1141.3	1106.0	1036.5	1019.5	897.1	873.2	821.4	1102.9
G.W. teal	678.9	679.5	946.4	1029.0	631.1	1035.4	818.6	713.1	779.7	814.6
B.W. teal	0.0	0.0	0.0	0.0	0.0	2.9	2.2	2.8	0.0	9.2
N. shoveler	852.5	658.3	846.5	666.2	580.7	671.0	642.5	666.2	408.4	573.1
Pintail	946.0	1021.9	1452.4	1426.4	942.0	848.3	927.4	905.5	1040.3	1120.2
SUBTOTAL	4510.7	4009.9	5159.5	4952.4	3858.5	4425.2	4100.8	3866.8	3567.0	4198.8
Divers:										
Redhead	0.0	0.0	0.6	0.0	4.6	3.0	2.4	0.2	10.1	1.6
Canvasback	105.4	89.0	186.7	89.0	142.4	88.9	210.6	95.1	73.2	90.8
Scaups	927.9	956.1	1219.1	1148.1	815.4	1027.2	1001.0	960.8	883.0	1178.0
Ringneck	60.5	19.0	65.3	86.4	51.9	96.2	71.5	78.6	83.4	61.0
Goldeneyes	77.2	69.3	55.6	95.7	104.7	75.8	92.5	61.0	88.2	38.0
Bufflehead	46.7	41.1	39.7	54.3	38.3	46.7	43.9	51.7	46.2	60.6
SUBTOTAL	1217.7	1174.5	1567.0	1473.5	1157.3	1337.8	1421.9	1247.4	1184.1	1430.0
Miscellaneous:										
L.T. Duck	90.9	72.1	105.2	99.8	84.1	83.2	83.3	66.3	103.0	127.8
Eiders	13.5	15.7	13.0	6.2	24.1	17.5	17.4	7.9	13.7	16.0
Scoters	348.4	345.9	327.1	242.5	319.7	399.0	367.3	350.2	400.6	396.2
Ruddy duck	0.0	0.0	0.0	1.0	0.0	0.0	0.8	0.0	0.0	0.0
Mergansers	24.6	15.0	32.9	27.2	22.9	20.6	22.0	36.3	27.0	36.3
SUBTOTAL	477.4	448.7	478.2	376.7	450.8	520.3	490.8	460.7	544.3	576.3
TOTAL DUCKS	6205.8	5633.1	7204.7	6802.6	5466.6	6283.3	6013.5	5574.9	5295.4	6205.1

Table 2. Alaska-Yukon. Status of adjusted waterfowl breeding population estimates by species and strata, comparing 2007 with 2006, the 1997-2006 average, and the 1957-2006 average (estimates in thousands).

Species	Strata*			Total 2007	Total 2006	1997 - 2006 Average	% Change from 2006	% Change from Avg. 1997-2006	1957 - 2006 Average	% Change from Avg. 1957-2006
	1-7	8-11	12							
Ducks:										
Dabblers:										
Mallard	284.7	281.6	9.3	575.6	515.4	716.2	+12	-20	368.9	+56
Black duck	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-
Gadwall	2.5	0.7	0.0	3.2	1.8	2.8	+78	+16	2.0	+62
Am. wigeon	648.8	400.4	53.7	1,102.9	821.4	997.8	+34	+11	532.1	+107
G.W. teal	450.5	357.2	6.9	814.6	779.7	782.4	+4	+4	381.0	+114
B.W. teal	2.9	6.3	0.0	9.2	0.0	0.8	-	+1065	1.1	+721
N. shoveler	256.0	311.8	5.3	573.1	408.4	649.0	+40	-12	279.6	+105
Pintail	249.6	847.0	23.6	1,120.2	1,040.3	1,015.8	+8	+10	909.1	+23
SUBTOTAL	1,895.0	2,205.0	98.8	4,198.8	3,567.0	4,164.7	+18	+1	2,473.7	+70
Divers:										
Redhead	0.6	0.0	1.0	1.6	10.1	2.1	-84	-24	1.6	+4
Canvasback	57.6	12.5	20.7	90.8	73.2	112.5	+24	-19	91.1	0
Scaups	450.0	691.0	37.0	1,178.0	883.0	973.9	+33	+21	916.6	+29
Ringneck	59.8	1.2	0.0	61.0	83.4	65.0	-27	-6	39.5	+55
Goldeneyes	37.2	0.8	0.0	38.0	88.2	78.7	-57	-52	71.5	-47
Bufflehead	59.8	0.8	0.0	60.6	46.2	44.9	+31	+35	43.8	+38
SUBTOTAL	665.0	706.3	58.7	1,430.0	1,184.1	1,277.1	+21	+12	1,146.7	+25
Miscellaneous:										
L.T. Duck	2.1	111.3	14.4	127.8	103.0	85.7	+24	+49	137.3	-7
Eiders	0.0	16.0	0.0	16.0	13.7	14.2	+17	+13	27.2	-41
Scoters	75.8	259.4	61.0	396.2	400.6	333.6	-1	+19	375.7	+5
Ruddy duck	0.0	0.0	0.0	0.0	0.0	0.2	-	-100	0.1	-100
Mergansers	9.7	22.7	3.9	36.3	27.0	25.4	+34	+43	12.6	+188
SUBTOTAL	87.6	409.4	79.3	576.3	544.3	459.0	+6	+26	552.9	+4
TOTAL DUCKS	2,647.6	3,320.7	236.8	6,205.1	5,295.4	5,900.8	+17	+5	4,287.1	+45

\* 1-7 Interior Alaska Taiga; 8-11 Coastal Alaska Tundra; 12 Old Crow Flats, Yukon Territory, Canada

Table 3. Alaska. Ten year trend in tundra swan breeding population observations, 1998 - 2007 (estimates in thousands).

Stratum	Status	1998	1999	2000	Y E A R						1997 - 2006 Average	% Change from 2006	% Change from Avg	
					2001	2002	2003	2004	2005	2006				2007
8	Singles & pairs	12.4	10.9	10.9	11.2	12.7	13.7	10.9	8.5	12.4	8.4	11.3	-32	-26
Bristol Bay	Flocks	1.5	3.8	5.4	3.2	5.1	1.2	2.4	15.6	5.4	7.5	4.8	+39	+56
	Total	13.9	14.7	16.3	14.4	17.8	14.9	13.3	24.1	17.8	15.9	16.0	-11	-1
9	Singles & pairs	58.6	62.3	52.6	49.8	50.7	51.6	49.8	53.2	52.9	66.2	54.1	+25	+22
Yukon Delta	Flocks	58.1	35.4	15.1	32.7	26.6	6.8	143.1	52.2	58.2	67.6	49.1	+16	+38
	Total	116.7	97.7	67.7	82.5	77.3	58.4	192.9	105.4	111.1	133.8	103.1	+20	+30
10	Singles & pairs	5.2	8.1	7.3	6.2	8.1	7.4	8.3	5.5	4.1	7.3	6.8	+78	+7
Seward Pen.	Flocks	3.4	0.0	0.0	4.0	0.0	0.8	0.6	0.0	0.0	4.5	0.9	-	+400
	Total	8.6	8.1	7.3	10.2	8.1	8.2	8.9	5.5	4.1	11.8	7.7	+188	+53
11	Singles & pairs	7.0	8.5	8.5	6.8	8.9	7.8	5.6	6.7	7.2	11.4	7.4	+58	+54
Kotzebue So.	Flocks	10.7	0.0	1.7	1.1	3.0	0.8	6.1	0.0	1.4	6.0	3.1	+329	+94
	Total	17.7	8.5	10.2	7.9	11.9	8.6	11.7	6.7	8.6	17.4	10.5	+102	+66
Total	Singles & pairs	83.2	89.8	79.3	74.0	80.4	80.5	74.6	73.9	76.6	93.3	79.5	+22	+17
	Flocks	73.7	39.2	22.2	41.0	34.7	9.6	152.2	67.8	65.0	85.6	57.8	+32	+48
	Total	156.9	129.0	101.5	115.0	115.1	90.1	226.8	141.7	141.6	178.9	137.3	+26	+30

Note: There are additional tundra swans nesting in Alaska outside of these strata.  
Actual swans observed are expanded for area only.

Table 4. Alaska-Yukon. Ten year trend in sandhill crane breeding population observations, 1998 - 2007 (estimates in thousands).

Stratum	1998	1999	2000	2001	2002	Y E A R					1997 - 2006 Average	% Change from 2006	% Change from Avg.
						2003	2004	2005	2006	2007			
1. Kenai-Susitna	0.1	0.0	0.7	0.1	0.3	0.0	0.4	0.2	0.2	0.1	0.2	-50	-50
2. Nelchina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
3. Tanana-Kusko.	0.4	0.2	1.3	1.3	0.7	1.3	1.0	0.6	0.4	0.6	0.8	+50	-25
4. Yukon Flats	3.2	0.4	1.8	0.5	1.4	1.5	1.5	1.1	0.4	0.9	1.4	+125	-36
5. Innoko	1.1	1.5	0.5	0.7	0.4	0.2	0.4	0.5	0.2	0.2	0.6	+0	-67
6. Koyukuk	0.6	0.9	1.4	1.4	0.6	0.8	2.3	0.6	0.8	0.9	1.0	+12	-10
7. Copper Delta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Subtotal - Interior	5.4	3.0	5.7	4.0	3.4	3.8	5.6	3.0	2.0	2.7	4.0	+35	-33
8. Bristol Bay	2.4	2.9	5.1	6.1	5.9	3.8	2.4	2.5	4.5	5.1	4.0	+13	+27
9. Yukon Delta	29.8	22.2	18.2	34.6	19.5	23.2	22.5	22.3	36.3	27.7	26.0	-24	+7
10. Seward Pen.	8.0	4.0	5.2	6.3	7.6	5.1	9.2	2.2	4.7	6.0	5.6	+28	+7
11. Kotzebue So.	3.0	4.8	7.2	5.8	2.3	3.6	2.6	3.1	6.1	2.5	4.3	-59	-42
Subtotal - Tundra	43.2	33.9	35.7	52.8	35.3	35.7	36.7	30.1	51.6	41.3	40.0	-20	+3
TOTAL - ALASKA	48.6	36.9	41.4	56.8	38.7	39.5	42.3	33.1	53.6	44.0	44.0	-18	+0
12. Old Crow Flats Yukon	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.3	0.1	0.1	0.1	+0	+0

Note: There are additional sandhill cranes nesting in Alaska - Yukon outside of these strata.  
Actual sandhill cranes observed are expanded for area only.

Table 5. Alaska-Yukon. Ten year trend in red-throated loon breeding population observations, 1998 - 2007 (estimates in thousands).

Stratum	Y E A R										1997 - 2006 Average	% Change from 2006	% Change from Avg.	
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007				
1. Kenai-Susitna	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-	-
2. Nelchina	0.0	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.1	-	-100
3. Tanana-Kusko.	0.1	0.1	0.1	0.2	0.3	0.1	0.1	0.1	0.2	0.4	0.1	0.1	+100	+300
4. Yukon Flats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-	-100
5. Innoko	0.1	0.5	0.3	0.0	0.3	0.9	1.0	0.5	0.2	0.5	0.4	0.4	+150	+25
6. Koyukuk	0.1	0.2	0.2	0.1	0.2	0.3	0.1	0.2	0.2	0.3	0.2	0.2	+50	+50
7. Copper Delta	0.3	0.1	0.1	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	-	-100
Subtotal - Interior	0.6	1.0	0.8	0.7	1.0	1.4	1.3	1.0	0.6	1.2	1.0	1.0	+100	+20
8. Bristol Bay	1.5	1.1	1.2	0.9	0.6	1.3	1.3	1.2	0.8	2.0	1.0	1.0	+150	+100
9. Yukon Delta	2.7	3.8	2.6	4.9	3.9	3.6	5.4	4.4	5.7	5.9	4.2	4.2	+4	+40
10. Seward Pen.	2.3	2.3	2.6	0.3	1.9	3.4	2.9	3.2	5.2	6.6	2.6	2.6	+27	+154
11. Kotzebue So.	0.8	0.1	0.6	0.3	0.3	0.9	0.3	0.2	1.0	0.9	0.5	0.5	-10	+80
Subtotal - Tundra	7.3	7.3	7.0	6.4	6.7	9.2	9.9	9.0	12.7	15.4	8.4	8.4	+21	+83
TOTAL - ALASKA	7.9	8.3	7.8	7.1	7.7	10.6	11.2	10.0	13.3	16.6	9.3	9.3	+25	+78
12. Old Crow Flats Yukon	0.1	0.1	0.1	0.0	0.1	0.2	0.2	0.4	0.4	0.3	0.2	0.2	-25	+50

Note: There are additional red-throated loons nesting in Alaska - Yukon outside of these strata.  
Actual red-throated loons observed are expanded for area only.

Table 6. Alaska-Yukon. Ten year trend in Pacific loon breeding population observations, 1998 - 2007 (estimates in thousands).

Stratum	Y E A R										1997 - 2006 Average	% Change from 2006	% Change from Avg.
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007			
1. Kenai-Susitna	0.3	0.4	0.4	0.6	0.4	0.3	0.3	0.6	0.2	0.4	0.4	+100	+0
2. Nelchina	0.1	0.1	0.4	0.1	0.7	0.1	0.1	0.0	0.1	0.0	0.2	-100	-100
3. Tanana-Kusko.	1.1	0.7	0.7	1.0	0.6	1.1	0.7	0.6	0.8	0.7	0.8	-13	-13
4. Yukon Flats	0.9	2.8	3.8	2.7	3.5	4.9	4.2	4.0	2.8	4.0	3.3	+43	+21
5. Innoko	0.2	0.5	0.5	0.6	0.2	0.6	0.5	0.3	0.2	0.5	0.4	+150	+25
6. Koyukuk	0.4	0.3	0.3	1.0	1.0	0.8	0.9	0.3	0.1	0.8	0.5	+700	+60
7. Copper Delta	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Subtotal - Interior	3.1	4.8	6.1	6.0	6.4	7.8	6.7	5.8	4.2	6.4	5.6	+52	+14
8. Bristol Bay	5.4	4.1	2.2	1.4	4.2	1.1	2.9	0.3	2.3	0.6	2.5	-74	-76
9. Yukon Delta	38.1	24.8	41.1	33.9	45.1	40.2	39.1	29.7	36.6	52.0	35.1	+42	+48
10. Seward Pen.	3.2	2.5	6.3	2.5	5.2	1.4	2.6	4.3	1.9	2.5	3.2	+32	-22
11. Kotzebue So.	1.9	0.8	4.7	2.2	2.9	3.0	2.0	3.1	2.5	4.9	2.6	+96	+88
Subtotal - Tundra	48.6	32.2	54.3	40.0	57.4	45.7	46.6	37.4	43.3	60.0	43.3	+39	+39
TOTAL - ALASKA	51.7	37.0	60.4	46.0	63.8	53.5	53.3	43.2	47.5	66.4	48.9	+40	+36
12. Old Crow Flats Yukon	1.3	2.6	1.7	3.3	3.9	3.0	3.4	3.6	2.8	2.1	2.7	-25	-22

Note: There are additional Pacific loons nesting in Alaska - Yukon outside of these strata.  
Actual Pacific loons observed are expanded for area only.

Table 7. Alaska-Yukon. Ten year trend in common loon breeding population observations, 1998 - 2007 (estimates in thousands).

Stratum	Y E A R										1997 - 2006 Average	% Change from 2006	% Change from Avg.
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007			
1. Kenai-Susitna	1.6	1.6	2.0	2.6	1.9	1.7	1.6	2.0	1.8	1.3	1.9	-28	-32
2. Nelchina	0.1	0.4	0.1	0.5	0.1	0.3	0.5	0.0	0.5	0.2	0.3	-60	-33
3. Tanana-Kusko.	1.1	2.1	2.5	0.4	2.0	2.4	1.3	1.2	0.9	0.4	1.5	-56	-73
4. Yukon Flats	0.5	1.4	0.9	0.3	1.8	3.1	1.9	1.1	2.3	1.4	1.4	-39	+0
5. Innoko	0.2	0.4	0.2	0.2	0.2	0.5	0.0	0.5	0.2	0.3	0.2	+50	+50
6. Koyukuk	0.4	0.6	0.5	1.2	0.8	0.8	1.3	0.6	0.2	0.3	0.7	+50	-57
7. Copper Delta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Subtotal - Interior	3.9	6.5	6.2	5.2	6.8	8.8	6.6	5.4	5.9	3.9	6.0	-34	-35
8. Bristol Bay	0.9	0.8	0.8	0.1	1.2	1.4	1.5	1.1	1.1	2.6	0.9	+136	+189
9. Yukon Delta	3.2	2.1	2.4	1.6	2.6	2.3	2.9	3.3	4.1	2.3	2.7	-44	-15
10. Seward Pen.	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	-	-
11. Kotzebue So.	0.3	0.4	0.3	0.1	0.1	0.2	0.2	0.6	0.2	0.0	0.2	-100	-100
Subtotal - Tundra	4.4	3.4	3.5	1.8	3.9	3.9	4.7	5.1	5.4	4.9	3.8	-9	+29
TOTAL - ALASKA	8.3	9.9	9.7	7.0	10.7	12.7	11.3	10.5	11.3	8.8	9.8	-22	-10
12. Old Crow Flats Yukon	0.3	0.0	0.1	0.3	0.2	0.5	0.1	0.2	0.3	0.2	0.2	-33	+0

Note: There are additional common loons nesting in Alaska - Yukon outside of these strata.  
Actual common loons observed are expanded for area only.

Table 8. Alaska-Yukon. Stratum data sheet, 2007 , strata 1 through 12.

Survey Design	S t r a t u m												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Square miles in stratum	2200	3900	9300	10800	3400	4100	400	9900	26600	3850	5350	1970	81,770
Square miles in sample	40	52	132	80	44	80	20	92	260	28	48	36	912
Linear miles in sample	160	208	528	320	176	320	80	368	1040	112	192	144	3,648
No. of transects in sample	6	10	18	12	7	10	7	11	8	4	7	3	103
No. of segments in sample	10	13	33	20	11	20	10	23	65	7	12	8	232
Expansion factor	55.000	75.000	70.455	135.000	77.273	51.250	20.000	107.609	102.308	137.500	111.458	54.722	-

Current Year Design	S t r a t u m												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Square miles in sample	40	52	132	80	44	80	20	92	260	28	48	36	912
Linear miles in sample	160	208	528	320	176	320	80	368	1040	112	192	144	3,648
No. of transects in sample	6	10	18	12	7	10	7	11	8	4	7	3	103
No. of segments in sample	10	13	33	20	11	20	10	23	65	7	12	8	232
Expansion factor	55.000	75.000	70.455	135.000	77.273	51.250	20.000	107.609	102.308	137.500	111.458	54.722	-

Note: Stratum 7 has 8 mile segments; stratum 12 has 18 mile segments.

Table 9. Relationship of total ducks to square miles of habitat and number of ponds in 2007 .

	Sq. Miles of Habitat	Number of Ponds (thousands)	Total Ducks (thousands)	Ponds per Sq. Mi.	Ducks per Sq. Mi.	Ducks per Pond
1. Kenai-Susitna	2200	17.5	56.4	8.0	25.6	3.2
2. Nelchina	3900	52.5	100.9	13.5	25.9	1.9
3. Tanana-Kusko.	9300	113.4	558.4	12.2	60.0	4.9
4. Yukon Flats	10800	109.8	1393.8	10.2	129.1	12.7
5. Innoko	3400	57.3	241.6	16.9	71.1	4.2
6. Koyukuk	4100	68.1	244.6	16.6	59.7	3.6
7. Copper Delta	400	19.0	51.9	47.5	129.8	2.7
Subtotal - Interior	34100	437.6	2647.6	12.8	77.6	6.1
8. Bristol Bay	9900	209.3	465.3	21.1	47.0	2.2
9. Yukon Delta	26600	960.1	2174.9	36.1	81.8	2.3
10. Seward Pen.	3850	94.1	236.6	24.4	61.5	2.5
11. Kotzebue So.	5350	87.8	443.9	16.4	83.0	5.1
Subtotal - Tundra	45700	1351.3	3320.7	29.6	72.7	2.5
TOTAL - ALASKA	79800	1788.9	5968.3	22.4	74.8	3.5
12. Old Crow Flats Yukon	1970	27.1	236.8	13.8	120.2	8.7

Note: Number of ponds is averaged from 1982-1984 transect counts  
Totals are for surveyed areas only.

TABLE 10.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 1

KENAI-SUSITNA

DATES: 5 / 16 / 2007 THRU 5 / 16 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	11	4		30	3.57	5891
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	2	5		14	3.65	2811
GREEN-WINGED TEAL	3	7	16	36	8.88	17582
BLUE-WINGED TEAL					10.31	
SHOVELER	1	4		10	3.35	1843
PINTAIL	7	3		20	2.51	2761
REDHEAD a					3.11	
CANVASBACK			24	24	2.43	3208
SCAUP a	5	8	115	136	1.82	13614
RING-NECKED DUCK a	2	5		12	4.02	2653
GOLDENEYE	4	2		12	3.61	2383
BUFFLEHEAD	3	3		12	1.86	1228
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	7	8	6	36	1.08	2138
RUDDY DUCK					5.94	
MERGANSE		2		4	1.27	279
SUB - TOTAL	45	51	161	346		56389
CANADA GOOSE					1.00	
SWAN	1	5		11	1.00	605
CRANE	1			1	1.00	55

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	2200
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	40
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	10
V = VISIBILITY RATIO	EXPANSION FACTOR	55.000
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 11.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 2

NELCHINA

DATES: 6 / 5 / 2007 THRU 6 / 5 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	16	6		44	3.57	11781
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	17	10		54	3.65	14783
GREEN-WINGED TEAL	4	1		10	8.88	6660
BLUE-WINGED TEAL					10.31	
SHOVELER	6	3		18	3.35	4523
PINTAIL	5		27	37	2.51	6965
REDHEAD a	1			1	3.11	233
CANVASBACK					2.43	
SCAUP a	71	75	10	231	1.82	31532
RING-NECKED DUCK a	4	4		12	4.02	3618
GOLDENEYE					3.61	
BUFFLEHEAD	15	8		46	1.86	6417
LONG-TAILED DUCK		1		2	1.99	299
EIDER					3.58	
SCOTER	25	48	16	162	1.08	13122
RUDDY DUCK					5.94	
MERGANSE	4	1		10	1.27	953
SUB - TOTAL	168	157	53	627		100884
CANADA GOOSE			5	5	1.00	375
SWAN	13	17	25	72	1.00	5400
CRANE					1.00	

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	3900
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	52
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	13
V = VISIBILITY RATIO	EXPANSION FACTOR	75.000
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 12.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 3

TANANA-KUSKOKWIM

DATES: 5 / 18 / 2007 THRU 5 / 26 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	73	45	6	242	3.57	60869
BLACK DUCK					1.57	
GADWALL	4			8	3.04	1713
AMERICAN WIGEON	80	121	26	428	3.65	110064
GREEN-WINGED TEAL	36	47	22	188	8.88	117620
BLUE-WINGED TEAL		2		4	10.31	2906
SHOVELER	23	53	69	221	3.35	52161
PINTAIL	54	27	25	187	2.51	33069
REDHEAD a					3.11	
CANVASBACK	4	23	28	82	2.43	14039
SCAUP a	55	203	123	584	1.82	74885
RING-NECKED DUCK a	11	30		71	4.02	20109
GOLDENEYE	11	18		58	3.61	14752
BUFFLEHEAD	55	53		216	1.86	28306
LONG-TAILED DUCK	1	2	7	13	1.99	1823
EIDER					3.58	
SCOTER	24	65	127	305	1.08	23208
RUDDY DUCK					5.94	
MERGANSE	4	6	11	31	1.27	2774
SUB - TOTAL	435	695	444	2638		558296
CANADA GOOSE	1	2	8	14	1.00	986
SWAN	21	32	45	130	1.00	9159
CRANE	6	1		8	1.00	564

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	9300
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	132
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	33
V = VISIBILITY RATIO	EXPANSION FACTOR	70.455
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 13.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 4

YUKON FLATS

DATES: 5 / 22 / 2007 THRU 5 / 22 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	79	59	27	303	3.57	146031 146.0
BLACK DUCK					1.57	
GADWALL		1		2	3.04	821 0.8
AMERICAN WIGEON	90	257	118	812	3.65	400113 400.1
GREEN-WINGED TEAL	27	46	8	154	8.88	184615 184.6
BLUE-WINGED TEAL					10.31	
SHOVELER	34	93	48	302	3.35	136580 136.6
PINTAIL	65	69	102	370	2.51	125375 125.4
REDHEAD a					3.11	
CANVASBACK	11	15	65	117	2.43	38382 38.4
SCAUP a	64	230	564	1088	1.82	267322 267.3
RING-NECKED DUCK a	7	21		49	4.02	26592 26.6
GOLDENEYE	5	9		28	3.61	13646 13.6
BUFFLEHEAD	15	20		70	1.86	17577 17.6
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	11	34	141	231	1.08	33680 33.7
RUDDY DUCK					5.94	
MERGANSE	6	3		18	1.27	3086 3.1
SUB - TOTAL	414	857	1073	3544		1393818 1393.8
CANADA GOOSE	2	3	12	22	1.00	2970 3.0
SWAN	3	4		11	1.00	1485 1.5
CRANE	5	1		7	1.00	945 0.9

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	10800
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	80
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	20
V = VISIBILITY RATIO	EXPANSION FACTOR	135.000
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 14.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 5

INNOKO

DATES: 5 / 26 / 2007 THRU 5 / 26 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	35	8		86	3.57	23724 23.7
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	43	43	10	182	3.65	51332 51.3
GREEN-WINGED TEAL	19	24		86	8.88	59012 59.0
BLUE-WINGED TEAL					10.31	
SHOVELER	39	17	40	152	3.35	39347 39.3
PINTAIL	72	40	9	233	2.51	45191 45.2
REDHEAD a					3.11	
CANVASBACK		2		4	2.43	751 0.8
SCAUP a	16	44		104	1.82	14626 14.6
RING-NECKED DUCK a					4.02	
GOLDENEYE	1	2		6	3.61	1674 1.7
BUFFLEHEAD	4	5		18	1.86	2587 2.6
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	3	9		24	1.08	2003 2.0
RUDDY DUCK					5.94	
MERGANSE	4	3		14	1.27	1374 1.4
SUB - TOTAL	236	197	59	909		241622 241.6
CANADA GOOSE		5		10	1.00	773 0.8
SWAN	10	2		14	1.00	1082 1.1
CRANE	1	1		3	1.00	232 0.2

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	3400
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	44
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	11
V = VISIBILITY RATIO	EXPANSION FACTOR	77.273
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 15.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 6

KOYUKUK

DATES: 5 / 23 / 2007 THRU 5 / 23 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	43	19		124	3.57	22687
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	62	86	37	333	3.65	62292
GREEN-WINGED TEAL	32	15	8	102	8.88	46420
BLUE-WINGED TEAL					10.31	
SHOVELER	22	35		114	3.35	19572
PINTAIL	69	48	23	257	2.51	33060
REDHEAD a		1		2	3.11	319
CANVASBACK	4	1		10	2.43	1245
SCAUP a	49	99	235	482	1.82	44959
RING-NECKED DUCK a	2	9		20	4.02	4121
GOLDENEYE	2	10		24	3.61	4440
BUFFLEHEAD	8	11		38	1.86	3622
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	5	8		26	1.08	1439
RUDDY DUCK					5.94	
MERGANSE		4		8	1.27	521
SUB - TOTAL	298	346	303	1540		244697
CANADA GOOSE	2		26	30	1.00	1538
SWAN	8	10		28	1.00	1435
CRANE	8	5		18	1.00	923

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	4100
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	80
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	20
V = VISIBILITY RATIO	EXPANSION FACTOR	51.250
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 16.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 7

COPPER DELTA

DATES: 5 / 15 / 2007 THRU 5 / 15 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	59	37		192	3.57	13709
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	6	27	35	101	3.65	7373
GREEN-WINGED TEAL	23	18	23	105	8.88	18648
BLUE-WINGED TEAL					10.31	
SHOVELER	6	9		30	3.35	2010
PINTAIL	24	6		60	2.51	3012
REDHEAD a	2			2	3.11	124
CANVASBACK					2.43	
SCAUP a	4	10	61	85	1.82	3094
RING-NECKED DUCK a	12	11		34	4.02	2734
GOLDENEYE	1	1		4	3.61	289
BUFFLEHEAD	1			2	1.86	74
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	4	2		12	1.08	259
RUDDY DUCK					5.94	
MERGANSE	5	7		24	1.27	610
SUB - TOTAL	147	128	119	651		51936
CANADA GOOSE	37	74	24	246	1.00	4920
SWAN	9	12		33	1.00	660
CRANE					1.00	

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	400
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	20
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	10
V = VISIBILITY RATIO	EXPANSION FACTOR	20.000
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 17.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 8

BRISTOL BAY

DATES: 5 / 26 / 2007 THRU 5 / 28 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	37	19	50	162	4.01	69905 69.9
BLACK DUCK					1.56	
GADWALL	1			2	3.04	654 0.7
AMERICAN WIGEON	25	24	6	104	3.84	42975 43.0
GREEN-WINGED TEAL	19	7		52	8.36	46780 46.8
BLUE-WINGED TEAL					10.31	
SHOVELER	29	12		82	3.79	33443 33.4
PINTAIL	86	23	31	249	3.05	81723 81.7
REDHEAD a					3.11	
CANVASBACK					2.43	
SCAUP a	74	172	33	451	1.93	93666 93.7
RING-NECKED DUCK a					4.02	
GOLDENEYE					3.61	
BUFFLEHEAD					1.86	
LONG-TAILED DUCK	3	9		24	1.87	4829 4.8
EIDER		3		6	3.58	2311 2.3
SCOTER	52	190	173	657	1.17	82718 82.7
RUDDY DUCK					5.94	
MERGANSE	8	11	8	46	1.27	6287 6.3
SUB - TOTAL	334	470	301	1835		465290 465.3
CANADA GOOSE	2	1	3	9	1.00	968 1.0
SWAN	36	21	70	148	1.00	15926 15.9
CRANE	22	8	9	47	1.00	5058 5.1

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	9900
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	92
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	23
V = VISIBILITY RATIO	EXPANSION FACTOR	107.609
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 18.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 9

YUKON DELTA

DATES: 5 / 29 / 2007 THRU 6 / 1 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	146	57	11	417	4.01	171076
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	198	139	10	684	3.84	268717
GREEN-WINGED TEAL	109	48	5	319	8.36	272838
BLUE-WINGED TEAL	2	1		6	10.31	6329
SHOVELER	188	92	9	569	3.79	220628
PINTAIL	554	212	28	1560	3.05	486780
REDHEAD a					3.11	
CANVASBACK	8	14		44	2.43	10939
SCAUP a	320	839	436	2434	1.93	480603
RING-NECKED DUCK a		1		2	4.02	823
GOLDENEYE					3.61	
BUFFLEHEAD		2		4	1.86	761
LONG-TAILED DUCK	118	102	25	465	1.87	88962
EIDER	12	4		32	3.58	11720
SCOTER	118	392	160	1180	1.17	141246
RUDDY DUCK					5.94	
MERGANSE	20	13	39	105	1.27	13643
SUB - TOTAL	1793	1916	723	7821		2175064
CANADA GOOSE	124	136	135	655	1.00	67012
SWAN	317	165	661	1308	1.00	133818
CRANE	135	58	20	271	1.00	27725

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	26600
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	260
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	65
V = VISIBILITY RATIO	EXPANSION FACTOR	102.308
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 19.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 10

SEWARD PENINSULA

DATES: 6 / 1 / 2007 THRU 6 / 1 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	5	1		12	4.01	6617 6.6
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	2	5		14	3.84	7392 7.4
GREEN-WINGED TEAL	3	2		10	8.36	11495 11.5
BLUE-WINGED TEAL					10.31	
SHOVELER	6	9		30	3.79	15634 15.6
PINTAIL	102	45	41	335	3.05	140491 140.5
REDHEAD a					3.11	
CANVASBACK					2.43	
SCAUP a	24	40		104	1.93	27599 27.6
RING-NECKED DUCK a					4.02	
GOLDENEYE					3.61	
BUFFLEHEAD					1.86	
LONG-TAILED DUCK	5	16		42	1.87	10799 10.8
EIDER		2		4	3.58	1969 2.0
SCOTER	7	34		82	1.17	13192 13.2
RUDDY DUCK					5.94	
MERGANSE	1	3		8	1.27	1397 1.4
SUB - TOTAL	155	157	41	641		236584 236.6
CANADA GOOSE	9	10		38	1.00	5225 5.2
SWAN	31	11	33	86	1.00	11825 11.8
CRANE	19	8	9	44	1.00	6050 6.1

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	3850
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	28
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	7
V = VISIBILITY RATIO	EXPANSION FACTOR	137.500
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 20.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 11

KOTZEBUE SOUND

DATES: 6 / 2 / 2007 THRU 6 / 2 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	25	13		76	4.01	33968 34.0
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	57	38		190	3.84	81320 81.3
GREEN-WINGED TEAL	10	4		28	8.36	26090 26.1
BLUE-WINGED TEAL					10.31	
SHOVELER	27	19	8	100	3.79	42243 42.2
PINTAIL	112	53	76	406	3.05	138019 138.0
REDHEAD a					3.11	
CANVASBACK	1	2		6	2.43	1625 1.6
SCAUP a	42	117	138	414	1.93	89057 89.1
RING-NECKED DUCK a	1			1	4.02	448 0.4
GOLDENEYE		1		2	3.61	805 0.8
BUFFLEHEAD					1.86	
LONG-TAILED DUCK	5	8	6	32	1.87	6670 6.7
EIDER					3.58	
SCOTER	22	49	29	171	1.17	22299 22.3
RUDDY DUCK					5.94	
MERGANSE	2	3		10	1.27	1416 1.4
SUB - TOTAL	304	307	257	1436		443960 443.9
CANADA GOOSE	16	11	12	66	1.00	7356 7.4
SWAN	34	34	54	156	1.00	17388 17.4
CRANE	12	3	4	22	1.00	2452 2.5

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	5350
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	48
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	12
V = VISIBILITY RATIO	EXPANSION FACTOR	111.458
$P = A * (T/S) * V$		

a Drakes not doubled in arriving at indicated total birds (T).

TABLE 21.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 12

OLD CROW FLATS

DATES: 6 / 3 / 2007 THRU 6 / 3 / 2007

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	15	13	6	62	2.74	9296
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	40	39		158	6.21	53692
GREEN-WINGED TEAL	5	3		16	7.84	6864
BLUE-WINGED TEAL					10.31	
SHOVELER	4	10		28	3.49	5347
PINTAIL	59	22		162	2.66	23581
REDHEAD a		3		6	3.11	1021
CANVASBACK	9	8	112	146	2.59	20693
SCAUP a	44	105	41	295	2.29	36968
RING-NECKED DUCK a					4.02	
GOLDENEYE					3.61	
BUFFLEHEAD					2.21	
LONG-TAILED DUCK	16	29	42	132	1.99	14374
EIDER					3.58	
SCOTER	66	130	387	779	1.43	60959
RUDDY DUCK					5.94	
MERGANSE	6	3	38	56	1.27	3892
SUB - TOTAL	264	365	626	1840		236688
CANADA GOOSE	3	5	79	95	1.00	5199
SWAN	6	4	3	17	1.00	930
CRANE		1		2	1.00	109

COMPUTATION OF THE POPULATION INDEX	NUMBER OF OBSERVED PONDS (x2)	0
P = POPULATION INDEX	POND INDEX	0
A = SQUARE MILES IN THE STRATUM	SQUARE MILES IN THE STRATUM (A)	1970
T = INDICATED TOTAL BIRDS	SQUARE MILES IN THE SAMPLE (S)	36
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	8
V = VISIBILITY RATIO	EXPANSION FACTOR	54.722
P = A * (T/S) * V		

a Drakes not doubled in arriving at indicated total birds (T).

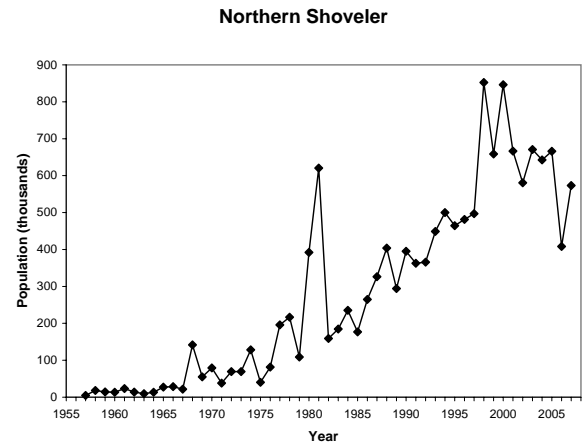
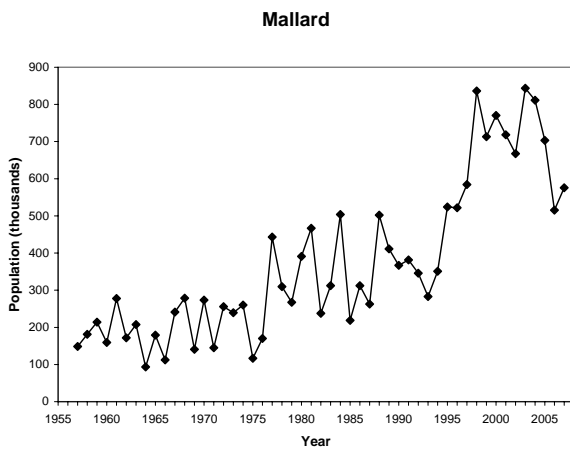
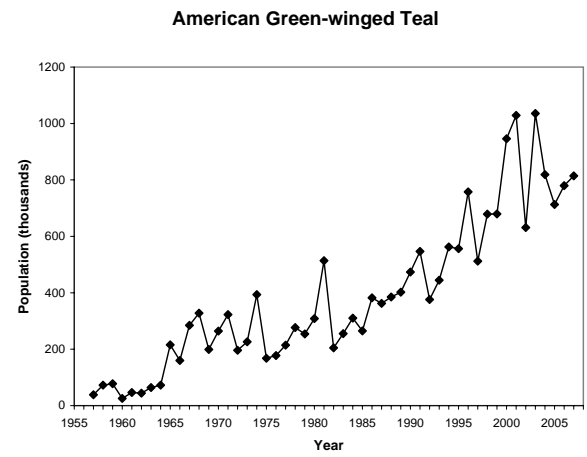
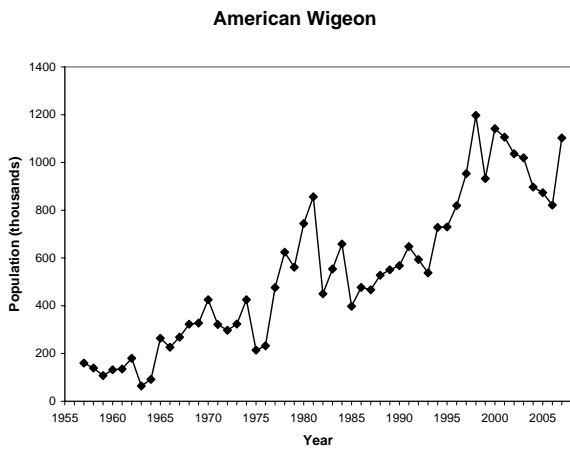
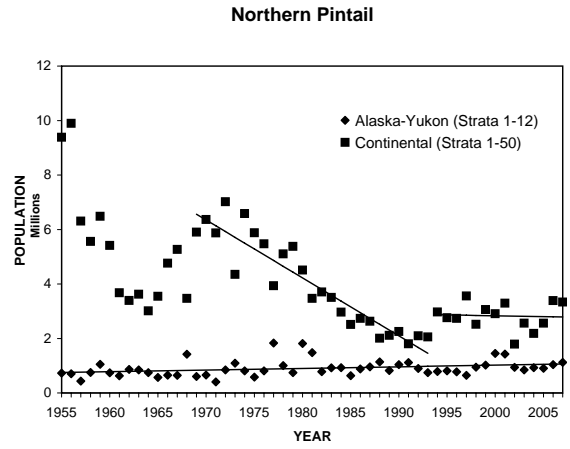
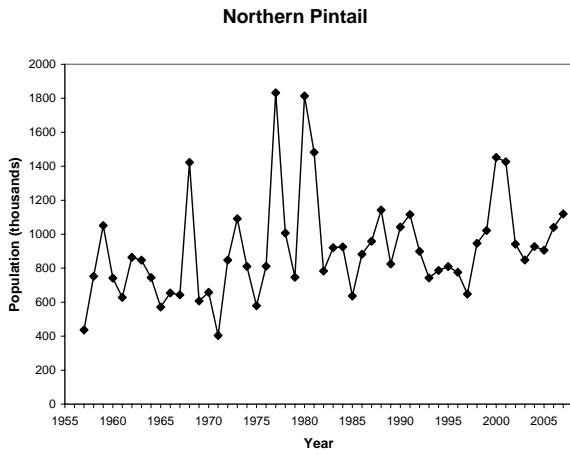
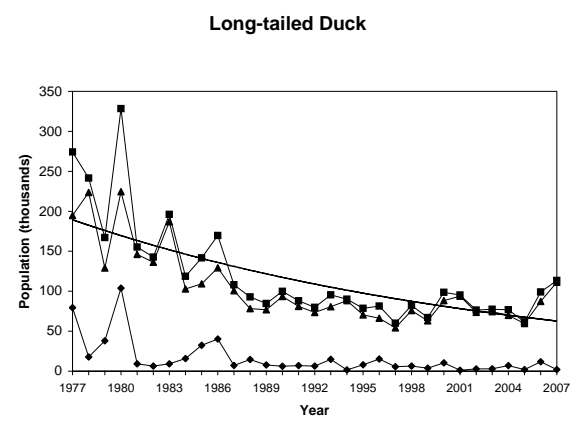
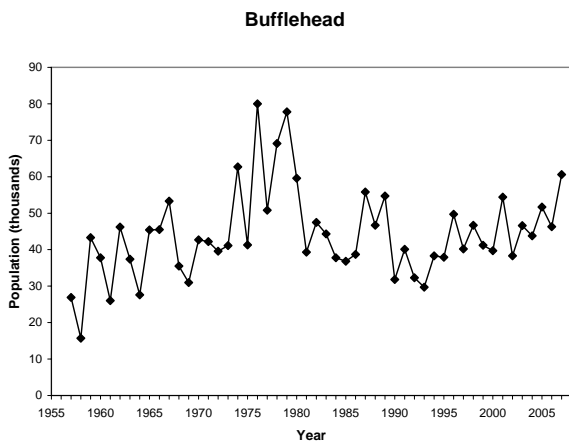
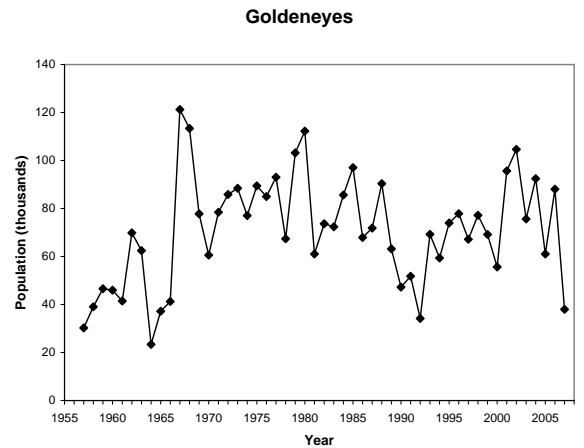
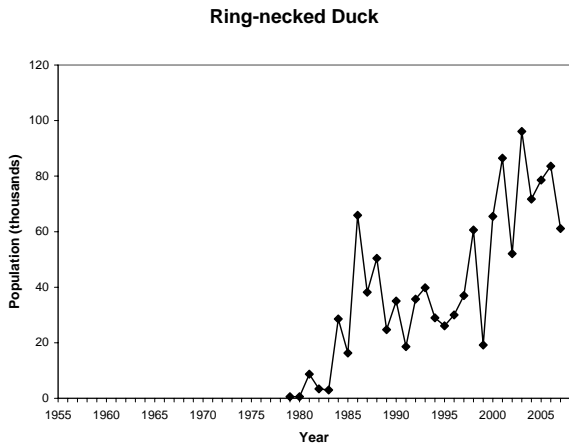
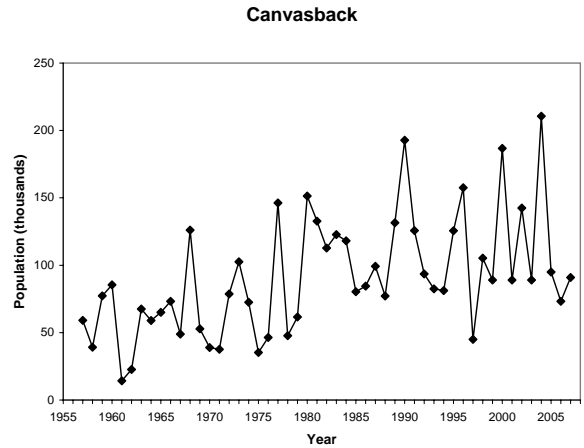
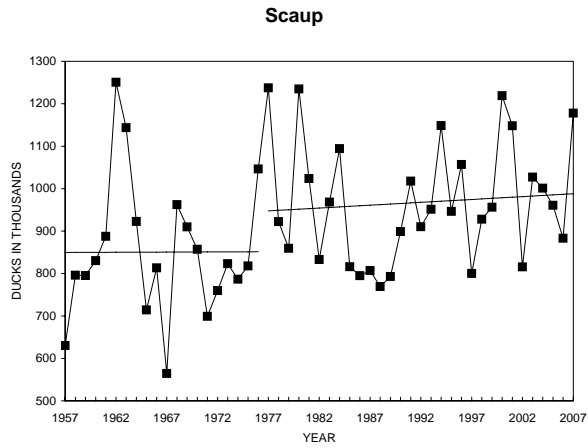


Figure 1. Trends in dabbling ducks from the Alaska-Yukon Waterfowl Breeding Population Survey.



◆ Interior ▲ Tundra ■ All Habitats — Expon. (All Habitats)

Figure 2. Trends in diver ducks from the Alaska-Yukon Waterfowl Breeding Population Survey.

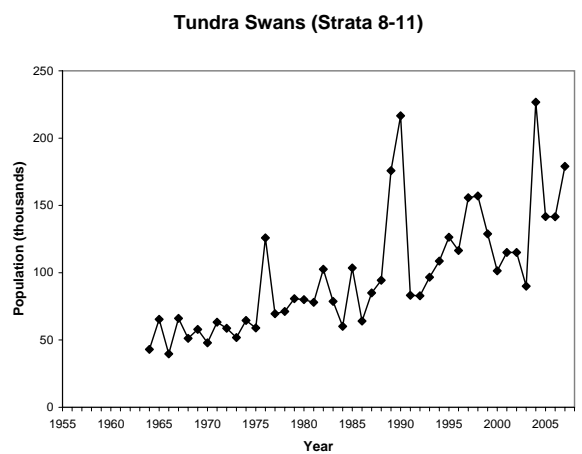
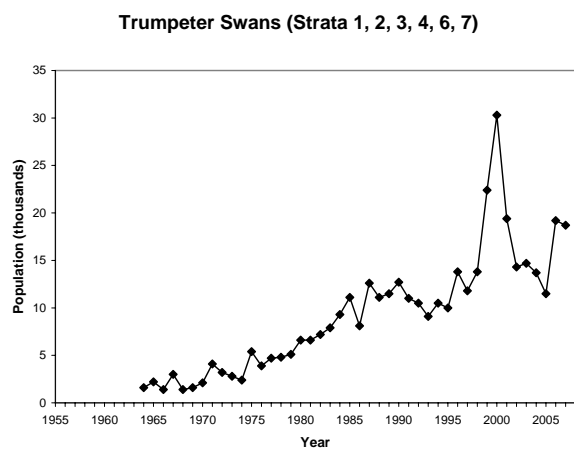
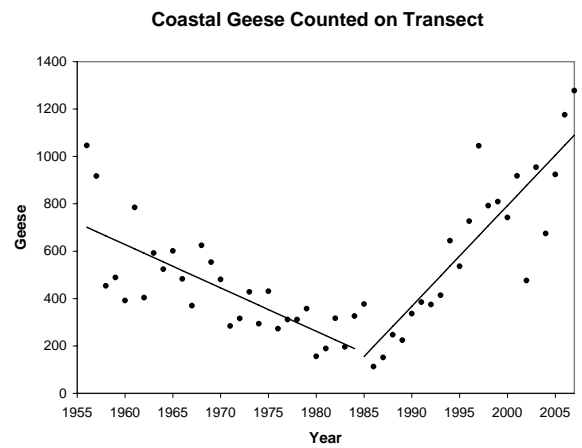
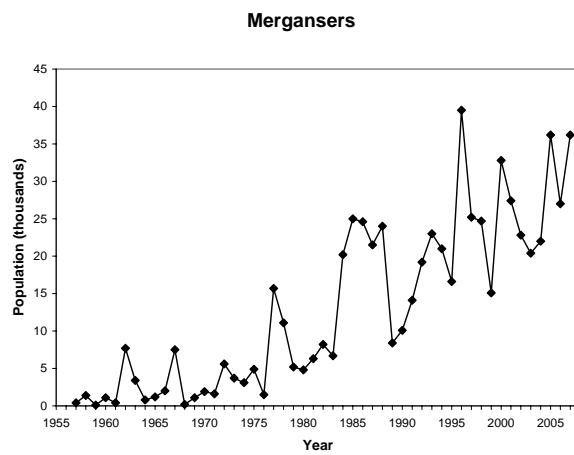
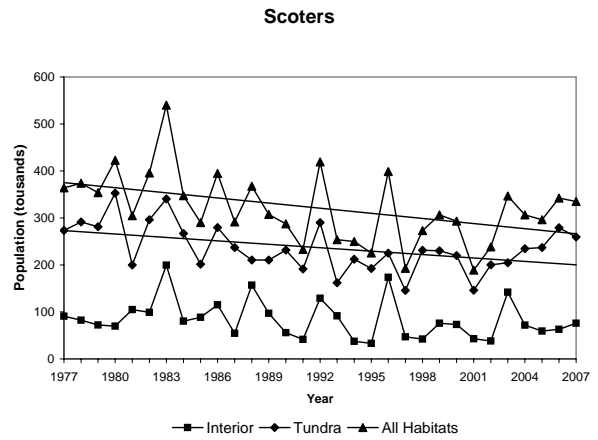
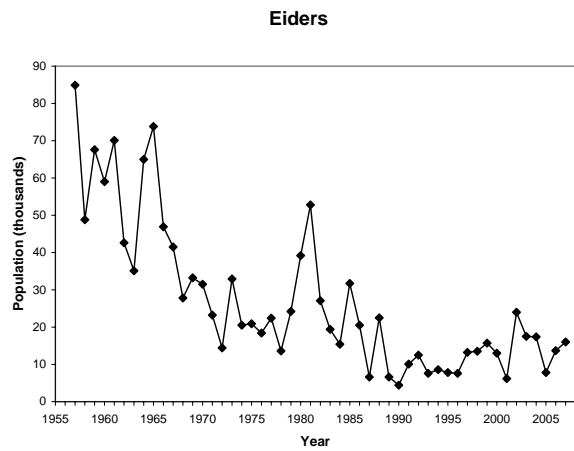


Figure 3. Trends in diver ducks, coastal geese, and swans from the Alaska-Yukon Waterfowl Breeding Population Survey.

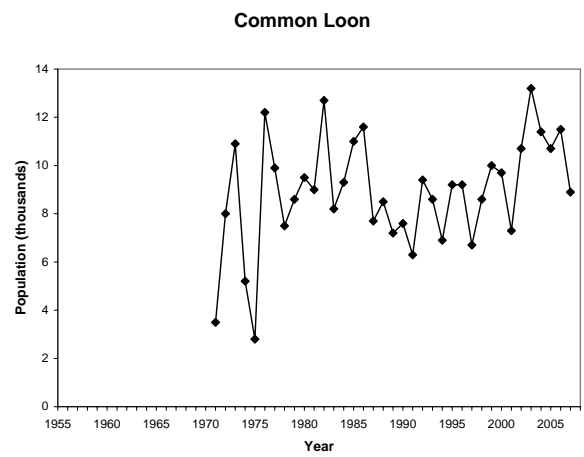
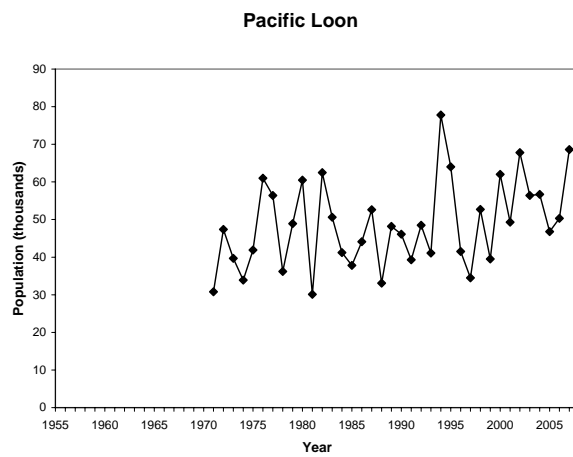
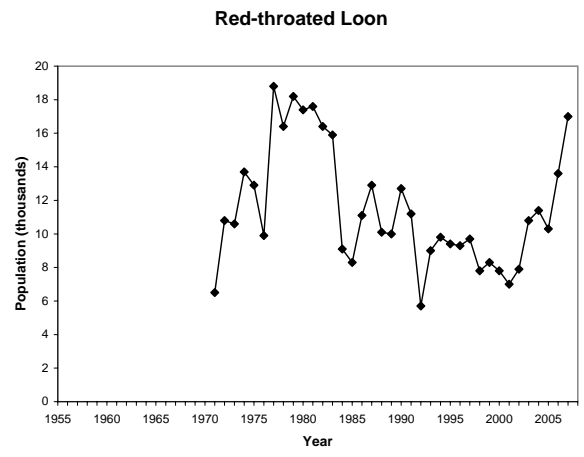
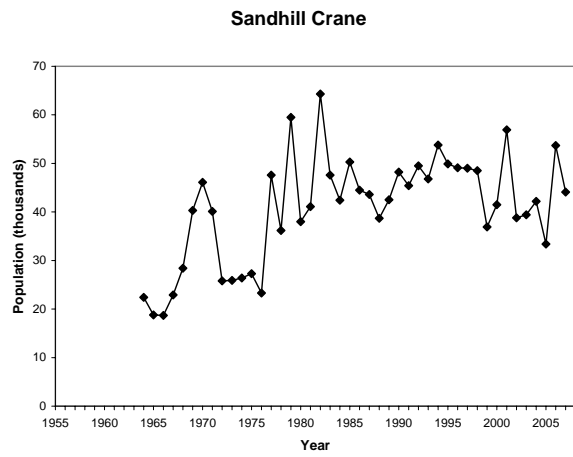


Figure 4. Trends in sanhill cranes and loons from the Alaska-Yukon Waterfowl Breeding Population Survey.