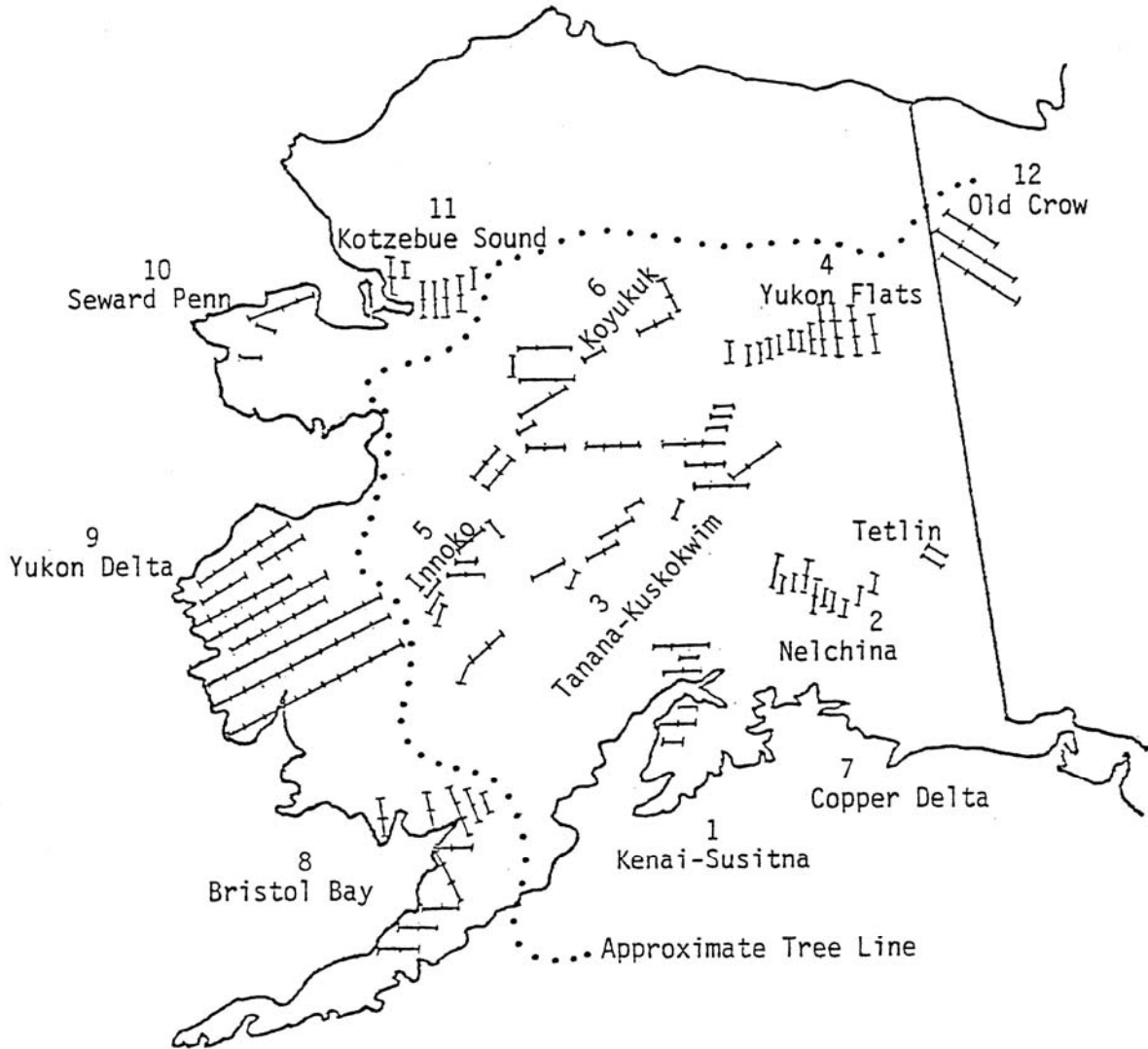


ALASKA - YUKON

WATERFOWL BREEDING POPULATION SURVEY

May 16 to June 8, 2010



By

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**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:** 16 May to 8 June 2010

**DATA SUPPLIED BY:** Ed Mallek<sup>1</sup> and Deborah J. Groves<sup>2</sup>  
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### **ABSTRACT**

Waterfowl breeding conditions within the survey area depend largely on the timing of spring phenology. A very mild spring breakup occurred in Interior Alaska, due to very low winter snow fall resulting in lower than normal water levels across the Interior. Spring breakup, while initially delayed, occurred normally throughout the majority of Coastal Alaska. Overall, waterfowl production is expected to be good across the survey area.

Total duck numbers were equal to the previous 10-year mean, but were up 39% from the long-term mean (1957 – 2009). Dabbler ducks increased from the previous 10-year mean by 6%, and were up 71% from the long-term mean. Divers and “miscellaneous” species differed by -13% and -16% from their previous 10-year means, respectively, and differed from their long-term means by -1% and -26%, respectively. Duck production is expected to be good.

Goose and swan (trumpeter and tundra) production should be good throughout the survey area.

### **INTRODUCTION**

This year the standardized waterfowl breeding pair survey in Alaska was conducted for the 54<sup>th</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). We used two panel-mounted computers (Sony VAIO VGN-UX490N) 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 were 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) 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 2010 with the exception of one segment (between Fairbanks and McGrath) which was skipped due to heavy smoke and a wildfire-related temporary flight restriction occurring around the survey segment.

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 (Conant et al. 1991). 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**

Good conditions were present throughout Alaska in 2010, with an early mild breakup occurring in the interior portion of the state and a slightly late spring arrival in some coastal areas. There was no flooding in the typical interior areas (lower Innoko and Koyukuk River drainages). Bristol Bay (stratum 8), Yukon Delta (stratum 9), Seward Peninsula (stratum 10), and Kotzebue Sound (stratum 11) survey areas seemed to have normal conditions during the survey. The Old Crow Flats (stratum 12) was average and slightly further along in breakup compared to more recent years.

## **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 9-20 and Figures 1-3.

Dabbler populations increased from last year by 31%, were 6% above the previous 10-year mean, and were up 71% from the long-term mean (1957-2009). The northern pintail population was 6% above the previous 10-year mean and 25% above the long-term mean. 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. Results from this survey (2010, which does not include the Arctic Coastal Plain of Alaska) accounted for approximately 33% of the continental pintail population. American wigeon were up 9% from the previous 10-year mean and were up 90% from the long-term mean. The American green-winged teal population was up 17% from the previous 10-year mean, and up 136% from the long-term mean. Mallard and northern shoveler populations were down 10% and up 3% from their previous 10-year means, respectively, and were up 58% and 112% from their long-term means.

Scaup, which account for the vast majority of divers observed on this survey, were down 6% from the previous 10-year mean, and up 3% from the long-term mean. The canvasback population was down 49% and 38% from the previous 10-year mean and long-term mean, respectively. Ring-necked duck and goldeneye populations were down 31% and 42% from their previous 10-year means, and were up 96% and down 42% from their long-term means, respectively. The bufflehead population was up 7% and 19% from the previous 10-year mean and long-term mean, respectively. The long-tailed duck population was down 12% from the previous 10-year mean and was also down 40% from the long-term mean. Eider and scoter populations were down 49% and 18%, respectively, from their previous 10-year means and were down 71% and 23% from their long-term means. Mergansers were up 10% from the previous 10-year mean, and were up 126% from the long-term 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 1985-2010) 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 suggests 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, 9-20 and Figure 3.

Trumpeter Swans – Trumpeter swan observations from this survey in boreal forest strata (1-4, 6, and 7) estimate the population at 15,100 adults and sub-adults, which is 13% below the previous 10-year mean, but is 57% above the long-term mean (1964 – 2009). Overall, good production is expected this year for trumpeter swans in Alaska.

Tundra Swans – The tundra swan population index from tundra strata (8-11), not including the Arctic Coastal Plain of Alaska, was 102,200, which is 27% below the previous 10-year mean, and 2% above the long-term mean. The breeding index (singles and pairs) was 89,900, which is 9% above the previous 10-year mean. Overall, good production is expected this year for tundra swans in western Alaska.

### **Cranes**

Estimates for sandhill cranes are available in Tables 4, 9-20 and Figure 4.

The sandhill crane index for Alaska in 2010 was 55,800, which is 21% above the previous 10-year mean, and 34% above the long-term mean.

### **Loons**

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

The 2010 red-throated loon index for the Alaska portion of this survey (excludes Old Crow Flats) was 13,300, up 16% from the previous 10-year mean.

The 2010 Pacific loon index for Alaska was 46,900, down 14% from the previous 10-year mean.

The 2010 common loon index for Alaska was 9,800, down 1% from the previous 10-year mean.

### **CONCLUSION**

Overall, total duck numbers experienced no change in 2010 when compared to previous ten-year means (dabblers +6%, divers -13%, total 0%). However, total duck numbers were 39% above the long-term mean. Overall waterfowl production within the survey area is expected to be good.

### **TELEMETRY**

A Telonics telemetry receiver-scanner is incorporated in the panel of the survey aircraft. This year we did not receive any requests to scan for frequencies during the survey.

### **ACKNOWLEDGMENTS**

We thank John Pribbenow, Daryl Carson, Wade Smith and other OAS personnel for providing a fast yet thorough annual inspection to the aircraft prior to the survey, and for their help during

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### **LITERATURE CITED**

Conant, B., C.P. Dau, and W.W. Larned. 1991. Yukon Delta Alaska helicopter/ fixed wing comparative waterfowl breeding population survey – progress report III. Unpubl. Rep., U.S. Fish and Wildl. Ser., Juneau, AK 11pp.

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, 2001 - 2010 (estimates in thousands).

Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Ducks:										
Dabblers:										
Mallard	718.3	667.2	843.5	811.1	703.3	515.4	575.6	526.0	496.4	597.8
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gadwall	6.5	1.0	4.6	1.9	2.7	1.8	3.2	3.9	2.0	2.9
Am. wigeon	1106.0	1036.5	1019.5	897.1	873.2	821.4	1102.9	910.2	795.0	1056.7
Am. green-winged teal	1029.0	631.1	1035.4	818.6	713.1	779.7	814.6	646.1	649.6	941.2
Blue-winged teal	0.0	0.0	2.9	2.2	2.8	0.0	9.2	0.0	0.0	3.9
N. shoveler	666.2	580.7	671.0	642.5	666.2	408.4	573.1	459.7	457.0	617.6
N. pintail	1426.4	942.0	848.3	927.4	905.5	1040.3	1120.2	1259.1	932.5	1146.5
SUBTOTAL	4952.4	3858.5	4425.2	4100.8	3866.8	3567.0	4198.8	3805.0	3332.5	4366.6
Divers:										
Redhead	0.0	4.6	3.0	2.4	0.2	10.1	1.6	2.0	0.8	1.3
Canvasback	89.0	142.4	88.9	210.6	95.1	73.2	90.8	85.0	41.0	56.0
Scaups	1148.1	815.4	1027.2	1001.0	960.8	883.0	1178.0	1069.1	822.0	947.8
Ring-necked duck	86.4	51.9	96.2	71.5	78.6	83.4	61.0	40.5	28.7	45.7
Goldeneyes	95.7	104.7	75.8	92.5	61.0	88.2	38.0	52.2	31.9	40.5
Bufflehead	54.3	38.3	46.7	43.9	51.7	46.2	60.6	56.1	58.3	53.0
SUBTOTAL	1473.5	1157.3	1337.8	1421.9	1247.4	1184.1	1430.0	1304.9	982.7	1144.3
Miscellaneous:										
Long-tailed duck	99.8	84.1	83.2	83.3	66.3	103.0	127.8	101.0	65.8	80.9
Eiders	6.2	24.1	17.5	17.4	7.9	13.7	16.0	17.5	14.8	7.6
Scoters	242.5	319.7	399.0	367.3	350.2	400.6	396.2	347.1	366.4	289.3
Ruddy duck	1.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Mergansers	27.2	22.9	20.6	22.0	36.3	27.0	36.3	26.9	24.2	30.5
SUBTOTAL	376.7	450.8	520.3	490.8	460.7	544.3	576.3	492.5	471.2	408.3
TOTAL DUCKS	6802.6	5466.6	6283.3	6013.5	5574.9	5295.4	6205.1	5602.4	4786.4	5919.2

Table 2. Status of Alaska-Yukon waterfowl breeding population estimates (thousands, adjusted for visibility bias) by species and strata in 2010, with comparisons to 2009, the previous 10-year mean, and the long-term mean.

Species	Strata <sup>a</sup>			2010 Total	2009 Total	10-Year Mean <sup>b</sup>	Long-Term Mean <sup>c</sup>	% Change From		
	1-7	8-11	12					2009	10-Year Mean	Long-Term Mean
Ducks:										
Dabblers:										
Mallard	293.9	284.7	19.2	597.8	496.4	662.7	378.2	+20	-10	+58
Am. black duck	0.0	0.0	0.0	0.0	0.0	0.0	0.0	--	--	--
Gadwall	0.9	2.0	0.0	2.9	2.0	3.0	2.0	+45	-4	+45
Am. wigeon	497.8	452.9	106.0	1056.7	795.0	970.3	555.0	+33	+9	+90
Am. green-winged teal	357.4	559.8	24.0	941.2	649.6	806.4	399.4	+45	+17	+136
Blue-winged teal	3.9	0.0	0.0	3.9	0.0	1.7	1.2	--	+128	+225
N. shoveler	226.7	366.5	24.4	617.6	457.0	597.1	291.9	+35	+3	+112
N. pintail	287.2	839.1	20.2	1146.5	932.5	1085.4	920.3	+23	+6	+25
Subtotal	1667.8	2505.0	193.8	4366.6	3332.5	4126.7	2548.0	+31	+6	+71
Divers:										
Redhead	0.0	1.0	0.3	1.3	0.8	2.5	1.6	+63	-49	-19
Canvasback	29.3	14.4	12.3	56.0	41.0	110.3	90.0	+37	-49	-38
Scaups	299.5	565.5	82.8	947.8	822.0	1012.4	923.0	+15	-6	+3
Ring-necked duck	42.7	2.1	0.9	45.7	28.7	66.3	23.3	+59	-31	+96
Goldeneyes	33.6	5.3	1.6	40.5	31.9	69.6	70.0	+27	-42	-42
Bufflehead	50.1	1.2	1.7	53.0	58.3	49.6	44.6	-9	+7	+19
Subtotal	455.2	589.5	99.6	1144.3	982.7	1310.7	1152.5	+16	-13	-1
Miscellaneous:										
Long-tailed duck	2.0	74.1	4.8	80.9	65.8	91.9	135.2	+23	-12	-40
Eiders	0.0	7.6	0.0	7.6	14.8	14.8	26.6	-49	-49	-71
Scoters	35.8	170.2	83.3	289.3	366.4	351.6	376.0	-21	-18	-23
Ruddy duck	0.0	0.0	0.0	0.0	0.0	0.2	0.1	--	-100	-100
Mergansers	14.6	14.2	1.7	30.5	24.2	27.6	13.5	+26	+10	+126
Subtotal	52.4	266.1	89.8	408.3	471.2	486.2	551.4	-13	-16	-26
Total Ducks	2175.4	3360.6	383.2	5919.2	4786.4	5923.5	4251.9	+24	0	+39

<sup>a</sup>1-7 Interior Alaska Taiga; 8-11 Coastal Alaska Tundra; 12 Old Crow Flats, Yukon Territory, Canada

<sup>b</sup>2000-2009

<sup>c</sup>1957-2009



Table 3. Alaska. Ten year trend in tundra swan breeding population observations, 2001 - 2010 (estimates in thousands).

Stratum	Status	2001	2002	2003	2004	Y E A R					2000 - 2009 Average	% Change from 2009	% Change from Avg	
						2005	2006	2007	2008	2009				
8	Singles & pairs	11.2	12.7	13.7	10.9	8.5	12.4	8.4	9.3	9.9	8.3	10.8	-16	-23
Bristol Bay	Flocks	3.2	5.1	1.2	2.4	15.6	5.4	7.5	3.6	3.6	0.0	5.3	-100	-100
	Total	14.4	17.8	14.9	13.3	24.1	17.8	15.9	12.9	13.5	8.3	16.1	-39	-48
9	Singles & pairs	49.8	50.7	51.6	49.8	53.2	52.9	66.2	73.4	60.6	64.4	56.1	+6	+15
Yukon Delta	Flocks	32.7	26.6	6.8	143.1	52.2	58.2	67.6	46.7	17.0	8.9	46.6	-48	-81
	Total	82.5	77.3	58.4	192.9	105.4	111.1	133.8	120.1	77.6	73.3	102.7	-6	-29
10	Singles & pairs	6.2	8.1	7.4	8.3	5.5	4.1	7.3	7.2	7.8	7.3	6.9	-6	+6
Seward Pen.	Flocks	4.0	0.0	0.8	0.6	0.0	0.0	4.5	0.0	0.0	3.4	1.0	-	+240
	Total	10.2	8.1	8.2	8.9	5.5	4.1	11.8	7.2	7.8	10.7	7.9	+37	+35
11	Singles & pairs	6.8	8.9	7.8	5.6	6.7	7.2	11.4	10.9	11.9	9.9	8.6	-17	+15
Kotzebue So.	Flocks	1.1	3.0	0.8	6.1	0.0	1.4	6.0	24.9	0.3	0.0	4.5	-100	-100
	Total	7.9	11.9	8.6	11.7	6.7	8.6	17.4	35.8	12.2	9.9	13.1	-19	-24
Total	Singles & pairs	74.0	80.4	80.5	74.6	73.9	76.6	93.3	100.8	90.2	89.9	82.4	-0	+9
	Flocks	41.0	34.7	9.6	152.2	67.8	65.0	85.6	75.2	20.9	12.3	57.4	-41	-79
	Total	115.0	115.1	90.1	226.8	141.7	141.6	178.9	176.0	111.1	102.2	139.8	-8	-27

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, 2001 - 2010 (estimates in thousands).

Stratum	Y E A R										2000 - 2009 Average	% Change from 2009	% Change from Avg.
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			
1. Kenai-Susitna	0.1	0.3	0.0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.2	+0	-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.	1.3	0.7	1.3	1.0	0.6	0.4	0.6	1.1	0.9	0.7	0.9	-22	-22
4. Yukon Flats	0.5	1.4	1.5	1.5	1.1	0.4	0.9	1.4	1.2	1.1	1.2	-8	-8
5. Innoko	0.7	0.4	0.2	0.4	0.5	0.2	0.2	1.1	0.9	0.2	0.5	-78	-60
6. Koyukuk	1.4	0.6	0.8	2.3	0.6	0.8	0.9	1.2	1.7	1.7	1.2	+0	+42
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	4.0	3.4	3.8	5.6	3.0	2.0	2.7	4.9	4.8	3.8	4.0	-21	-5
8. Bristol Bay	6.1	5.9	3.8	2.4	2.5	4.5	5.1	7.7	5.6	8.5	4.9	+52	+73
9. Yukon Delta	34.6	19.5	23.2	22.5	22.3	36.3	27.7	33.9	38.0	34.3	27.6	-10	+24
10. Seward Pen.	6.3	7.6	5.1	9.2	2.2	4.7	6.0	5.2	4.1	4.3	5.6	+5	-23
11. Kotzebue So.	5.8	2.3	3.6	2.6	3.1	6.1	2.5	4.1	5.1	4.9	4.2	-4	+17
Subtotal - Tundra	52.8	35.3	35.7	36.7	30.1	51.6	41.3	50.9	52.8	52.0	42.3	-2	+23
TOTAL - ALASKA	56.8	38.7	39.5	42.3	33.1	53.6	44.0	55.8	57.6	55.8	46.3	-3	+21
12. Old Crow Flats Yukon	0.0	0.1	0.0	0.0	0.3	0.1	0.1	0.1	0.1	0.0	0.1	-100	-100

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, 2001 - 2010 (estimates in thousands).

Stratum	Y E A R										2000 - 2009 Average	% Change from 2009	% Change from Avg.
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			
1. Kenai-Susitna	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	-	-
2. Nelchina	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.3	0.0	0.3	0.1	-	+200
3. Tanana-Kusko.	0.2	0.3	0.1	0.1	0.1	0.2	0.4	0.5	0.3	0.8	0.2	+167	+300
4. Yukon Flats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.0	-	-
5. Innoko	0.0	0.3	0.9	1.0	0.5	0.2	0.5	0.8	0.3	0.5	0.5	+67	+0
6. Koyukuk	0.1	0.2	0.3	0.1	0.2	0.2	0.3	0.3	0.4	0.3	0.2	-25	+50
7. Copper Delta	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	-	-100
Subtotal - Interior	0.7	1.0	1.4	1.3	1.0	0.6	1.2	2.0	1.0	2.4	1.1	+140	+118
8. Bristol Bay	0.9	0.6	1.3	1.3	1.2	0.8	2.0	0.6	1.4	1.5	1.1	+7	+36
9. Yukon Delta	4.9	3.9	3.6	5.4	4.4	5.7	5.9	7.6	4.8	5.6	4.9	+17	+14
10. Seward Pen.	0.3	1.9	3.4	2.9	3.2	5.2	6.6	4.7	6.9	3.6	3.8	-48	-5
11. Kotzebue So.	0.3	0.3	0.9	0.3	0.2	1.0	0.9	1.3	0.0	0.2	0.6	-	-67
Subtotal - Tundra	6.4	6.7	9.2	9.9	9.0	12.7	15.4	14.2	13.1	10.9	10.4	-17	+5
TOTAL - ALASKA	7.1	7.7	10.6	11.2	10.0	13.3	16.6	16.2	14.1	13.3	11.5	-6	+16
12. Old Crow Flats Yukon	0.0	0.1	0.2	0.2	0.4	0.4	0.3	0.4	0.5	0.2	0.3	-60	-33

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, 2001 - 2010 (estimates in thousands).

Stratum	Y E A R										2000 - 2009 Average	% Change from 2009	% Change from Avg.
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			
1. Kenai-Susitna	0.6	0.4	0.3	0.3	0.6	0.2	0.4	0.3	0.1	0.3	0.4	+200	-25
2. Nelchina	0.1	0.7	0.1	0.1	0.0	0.1	0.0	0.6	0.6	0.4	0.3	-33	+33
3. Tanana-Kusko.	1.0	0.6	1.1	0.7	0.6	0.8	0.7	1.3	1.1	0.4	0.9	-64	-56
4. Yukon Flats	2.7	3.5	4.9	4.2	4.0	2.8	4.0	4.3	4.3	1.2	3.8	-72	-68
5. Innoko	0.6	0.2	0.6	0.5	0.3	0.2	0.5	0.3	0.1	0.4	0.4	+300	+0
6. Koyukuk	1.0	1.0	0.8	0.9	0.3	0.1	0.8	0.5	0.7	0.3	0.6	-57	-50
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	6.0	6.4	7.8	6.7	5.8	4.2	6.4	7.3	6.9	3.0	6.4	-57	-53
8. Bristol Bay	1.4	4.2	1.1	2.9	0.3	2.3	0.6	1.7	1.0	1.5	1.8	+50	-17
9. Yukon Delta	33.9	45.1	40.2	39.1	29.7	36.6	52.0	44.3	34.4	34.7	39.6	+1	-12
10. Seward Pen.	2.5	5.2	1.4	2.6	4.3	1.9	2.5	1.9	4.5	2.9	3.3	-36	-12
11. Kotzebue So.	2.2	2.9	3.0	2.0	3.1	2.5	4.9	5.3	2.5	4.8	3.3	+92	+45
Subtotal - Tundra	40.0	57.4	45.7	46.6	37.4	43.3	60.0	53.2	42.4	43.9	48.0	+4	-9
TOTAL - ALASKA	46.0	63.8	53.5	53.3	43.2	47.5	66.4	60.5	49.3	46.9	54.4	-5	-14
12. Old Crow Flats Yukon	3.3	3.9	3.0	3.4	3.6	2.8	2.1	3.0	2.4	1.4	2.9	-42	-52

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, 2001 - 2010 (estimates in thousands).

Stratum	Y E A R										2000 - 2009 Average	% Change from 2009	% Change from Avg.
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010			
1. Kenai-Susitna	2.6	1.9	1.7	1.6	2.0	1.8	1.3	1.6	0.7	1.6	1.7	+129	-6
2. Nelchina	0.5	0.1	0.3	0.5	0.0	0.5	0.2	0.1	0.2	0.1	0.3	-50	-67
3. Tanana-Kusko.	0.4	2.0	2.4	1.3	1.2	0.9	0.4	1.8	1.6	1.4	1.5	-13	-7
4. Yukon Flats	0.3	1.8	3.1	1.9	1.1	2.3	1.4	1.1	1.1	0.8	1.5	-27	-47
5. Innoko	0.2	0.2	0.5	0.0	0.5	0.2	0.3	0.6	0.2	0.8	0.3	+300	+167
6. Koyukuk	1.2	0.8	0.8	1.3	0.6	0.2	0.3	0.3	1.0	0.9	0.7	-10	+29
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	5.2	6.8	8.8	6.6	5.4	5.9	3.9	5.5	4.8	5.6	5.9	+17	-5
8. Bristol Bay	0.1	1.2	1.4	1.5	1.1	1.1	2.6	1.2	0.8	0.9	1.2	+12	-25
9. Yukon Delta	1.6	2.6	2.3	2.9	3.3	4.1	2.3	2.6	2.4	3.2	2.7	+33	+19
10. Seward Pen.	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	-	-
11. Kotzebue So.	0.1	0.1	0.2	0.2	0.6	0.2	0.0	0.0	0.0	0.1	0.2	-	-50
Subtotal - Tundra	1.8	3.9	3.9	4.7	5.1	5.4	4.9	3.8	3.2	4.2	4.0	+31	+5
TOTAL - ALASKA	7.0	10.7	12.7	11.3	10.5	11.3	8.8	9.3	8.0	9.8	9.9	+23	-1
12. Old Crow Flats Yukon	0.3	0.2	0.5	0.1	0.2	0.3	0.2	0.2	0.2	0.0	0.2	-100	-100

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, 2010 , 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	128	80	44	80	20	92	260	28	48	36	908
Linear miles in sample	160	208	512	320	176	320	80	368	1040	112	192	144	3,632
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	32	20	11	20	10	23	65	7	12	8	231
Expansion factor	55.000	75.000	72.656	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.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 1

KENAI-SUSITNA

DATES: 5 / 17 / 2010 THRU 5 / 17 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	14	12		52	3.57	10210
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	3	8	6	28	3.65	5621
GREEN-WINGED TEAL	12	7		38	8.88	18559
BLUE-WINGED TEAL					10.31	
SHOVELER		3		6	3.35	1106
PINTAIL	7	3		20	2.51	2761
REDHEAD a					3.11	
CANVASBACK	1	1		4	2.43	535
SCAUP a	7	7	30	51	1.82	5105
RING-NECKED DUCK a	2	3		8	4.02	1769
GOLDENEYE	5	6		22	3.61	4368
BUFFLEHEAD		4		8	1.86	818
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	4	9		26	1.08	1544
RUDDY DUCK					5.94	
MERGANSE	4	9		26	1.27	1816
SUB - TOTAL	59	72	36	289		54212
CANADA GOOSE					1.00	
SWAN	4	3		10	1.00	550
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 10.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 2

NELCHINA

DATES: 6 / 8 / 2010 THRU 6 / 8 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	15	2		34	3.57	9104 9.1
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	12	5		34	3.65	9308 9.3
GREEN-WINGED TEAL	18	9		54	8.88	35964 36.0
BLUE-WINGED TEAL			5	5	10.31	3866 3.9
SHOVELER	5			10	3.35	2513 2.5
PINTAIL	3	2		10	2.51	1883 1.9
REDHEAD a					3.11	
CANVASBACK					2.43	
SCAUP a	54	58	20	190	1.82	25935 25.9
RING-NECKED DUCK a	8	2		12	4.02	3618 3.6
GOLDENEYE	3	1		8	3.61	2166 2.2
BUFFLEHEAD	9	7		32	1.86	4464 4.5
LONG-TAILED DUCK		2		4	1.99	597 0.6
EIDER					3.58	
SCOTER	12	20		64	1.08	5184 5.2
RUDDY DUCK					5.94	
MERGANSE	6	1	23	37	1.27	3524 3.5
SUB - TOTAL	145	109	48	494		108125 108.2
CANADA GOOSE	1	2		6	1.00	450 0.4
SWAN	9	14		37	1.00	2775 2.8
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 11.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 3

TANANA-KUSKOKWIM

DATES: 5 / 20 / 2010 THRU 5 / 29 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	91	46	8	282	3.57	73146 73.1
BLACK DUCK					1.57	
GADWALL		2		4	3.04	884 0.9
AMERICAN WIGEON	82	105		374	3.65	99183 99.2
GREEN-WINGED TEAL	28	22		100	8.88	64519 64.5
BLUE-WINGED TEAL					10.31	
SHOVELER	36	41	31	185	3.35	45029 45.0
PINTAIL	56	52	53	269	2.51	49057 49.1
REDHEAD a					3.11	
CANVASBACK	5	12	28	62	2.43	10946 10.9
SCAUP a	85	233	113	664	1.82	87804 87.8
RING-NECKED DUCK a	15	19		53	4.02	15480 15.5
GOLDENEYE	9	12		42	3.61	11016 11.0
BUFFLEHEAD	32	29	9	131	1.86	17703 17.7
LONG-TAILED DUCK	1	3		8	1.99	1157 1.2
EIDER					3.58	
SCOTER	19	38	71	185	1.08	14517 14.5
RUDDY DUCK					5.94	
MERGANSE	8	10		36	1.27	3322 3.3
SUB - TOTAL	467	624	313	2395		493762 493.7
CANADA GOOSE	1	3		8	1.00	581 0.6
SWAN	21	29	37	116	1.00	8428 8.4
CRANE	8	1		10	1.00	727 0.7

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)	128
S = SQUARE MILES IN THE SAMPLE	NUMBER OF SEGMENTS	32
V = VISIBILITY RATIO	EXPANSION FACTOR	72.656
$P = A * (T/S) * V$		

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

TABLE 12.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 4

YUKON FLATS

DATES: 5 / 22 / 2010 THRU 5 / 22 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	78	54	10	274	3.57	132054
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	108	130	43	519	3.65	255737
GREEN-WINGED TEAL	32	25		114	8.88	136663
BLUE-WINGED TEAL					10.31	
SHOVELER	51	68	26	264	3.35	119394
PINTAIL	122	76	83	479	2.51	162309
REDHEAD a					3.11	
CANVASBACK	4	16	8	48	2.43	15746
SCAUP a	96	183	142	604	1.82	148403
RING-NECKED DUCK a	6	9		24	4.02	13025
GOLDENEYE	4	7		22	3.61	10722
BUFFLEHEAD	23	22		90	1.86	22599
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	9	14	11	57	1.08	8311
RUDDY DUCK					5.94	
MERGANSE	3	7		20	1.27	3429
SUB - TOTAL	536	611	323	2515		1028392
CANADA GOOSE	5	4	18	36	1.00	4860
SWAN	1	3		7	1.00	945
CRANE	6	1		8	1.00	1080

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 13.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 5

INNOKO

DATES: 5 / 28 / 2010 THRU 5 / 28 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	33	14		94	3.57	25931   25.9
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	69	44	5	231	3.65	65153   65.2
GREEN-WINGED TEAL	26	14		80	8.88	54895   54.9
BLUE-WINGED TEAL					10.31	
SHOVELER	35	18	9	115	3.35	29769   29.8
PINTAIL	58	30	14	190	2.51	36851   36.9
REDHEAD a					3.11	
CANVASBACK					2.43	
SCAUP a	9	29		67	1.82	9423   9.4
RING-NECKED DUCK a		2		4	4.02	1243   1.2
GOLDENEYE	1			2	3.61	558   0.6
BUFFLEHEAD	1	2		6	1.86	862   0.9
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER	1	4		10	1.08	835   0.8
RUDDY DUCK					5.94	
MERGANSE	5	3		16	1.27	1570   1.6
SUB - TOTAL	238	160	28	815		227089   227.2
CANADA GOOSE	3	3	3	15	1.00	1159   1.2
SWAN	2	3		8	1.00	618   0.6
CRANE	2			2	1.00	155   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 14.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 6

KOYUKUK

DATES: 5 / 25 / 2010 THRU 5 / 25 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	54	27	7	169	3.57	30921   30.9
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	70	67	31	305	3.65	57054   57.1
GREEN-WINGED TEAL	30	15		90	8.88	40959   41.0
BLUE-WINGED TEAL					10.31	
SHOVELER	33	30	7	133	3.35	22834   22.8
PINTAIL	71	46	6	240	2.51	30873   30.9
REDHEAD a					3.11	
CANVASBACK					2.43	
SCAUP a	41	59	35	194	1.82	18095   18.1
RING-NECKED DUCK a	8	7	6	28	4.02	5769   5.8
GOLDENEYE	3	9		24	3.61	4440   4.4
BUFFLEHEAD	11	8		38	1.86	3622   3.6
LONG-TAILED DUCK		1		2	1.99	204   0.2
EIDER					3.58	
SCOTER	17	26	14	100	1.08	5535   5.5
RUDDY DUCK					5.94	
MERGANSE	1	3		8	1.27	521   0.5
SUB - TOTAL	339	298	106	1331		220828   220.8
CANADA GOOSE	5	2	4	18	1.00	923   0.9
SWAN	11	11		33	1.00	1691   1.7
CRANE	18	4	7	33	1.00	1691   1.7

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 15.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 7

COPPER DELTA

DATES: 5 / 16 / 2010 THRU 5 / 16 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	57	31		176	3.57	12566 12.6
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	7	22	20	78	3.65	5694 5.7
GREEN-WINGED TEAL	7	9		32	8.88	5683 5.7
BLUE-WINGED TEAL					10.31	
SHOVELER	11	13	43	91	3.35	6097 6.1
PINTAIL	12	10	21	65	2.51	3263 3.3
REDHEAD a					3.11	
CANVASBACK	1	2	40	46	2.43	2236 2.2
SCAUP a	8	20	84	132	1.82	4805 4.8
RING-NECKED DUCK a	6	8		22	4.02	1769 1.8
GOLDENEYE		2		4	3.61	289 0.3
BUFFLEHEAD					1.86	
LONG-TAILED DUCK					1.99	
EIDER					3.58	
SCOTER		1		2	1.08	43 0.0
RUDDY DUCK					5.94	
MERGANSE	5	5		20	1.27	508 0.5
SUB - TOTAL	114	123	208	668		42953 43.0
CANADA GOOSE	48	42	132	312	1.00	6240 6.2
SWAN	9	12	4	37	1.00	740 0.7
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 16.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 8

BRISTOL BAY

DATES: 5 / 29 / 2010 THRU 5 / 30 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)	
MALLARD	40	18		116	4.01	50055	50.1
BLACK DUCK					1.56		
GADWALL	2	1		6	3.04	1963	2.0
AMERICAN WIGEON	20	27		94	3.84	38842	38.8
GREEN-WINGED TEAL	18	12		60	8.36	53977	54.0
BLUE-WINGED TEAL					10.31		
SHOVELER	19	19	5	81	3.79	33035	33.0
PINTAIL	70	28	15	211	3.05	69252	69.3
REDHEAD a					3.11		
CANVASBACK	1			2	2.43	523	0.5
SCAUP a	65	117	18	317	1.93	65836	65.8
RING-NECKED DUCK a					4.02		
GOLDENEYE	1	2		6	3.61	2331	2.3
BUFFLEHEAD		1		2	1.86	400	0.4
LONG-TAILED DUCK	1	2		6	1.87	1207	1.2
EIDER					3.58		
SCOTER	50	170	35	475	1.17	59804	59.8
RUDDY DUCK					5.94		
MERGANSE	6	5		22	1.27	3007	3.0
SUB - TOTAL	293	402	73	1398		380231	380.2
CANADA GOOSE	7	10	8	42	1.00	4520	4.5
SWAN	33	22		77	1.00	8286	8.3
CRANE	21	11	36	79	1.00	8501	8.5

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)	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 17.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 9

YUKON DELTA

DATES: 5 / 30 / 2010 THRU 6 / 4 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	157	63	10	450	4.01	184614   184.6
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	162	118	20	580	3.84	227860   227.9
GREEN-WINGED TEAL	167	57		448	8.36	383171   383.2
BLUE-WINGED TEAL					10.31	
SHOVELER	140	114	33	541	3.79	209771   209.8
PINTAIL	513	158	73	1415	3.05	441534   441.5
REDHEAD a					3.11	
CANVASBACK	2	2	30	38	2.43	9447   9.4
SCAUP a	155	646	411	1858	1.93	366869   366.9
RING-NECKED DUCK a	1	2		5	4.02	2056   2.1
GOLDENEYE	1	2		6	3.61	2216   2.2
BUFFLEHEAD		2		4	1.86	761   0.8
LONG-TAILED DUCK	51	71		244	1.87	46681   46.7
EIDER	3	2		10	3.58	3663   3.7
SCOTER	60	231	124	706	1.17	84508   84.5
RUDDY DUCK					5.94	
MERGANSE	6	19	22	72	1.27	9355   9.4
SUB - TOTAL	1418	1487	723	6377		1972507   1972.7
CANADA GOOSE	206	187	324	1110	1.00	113562   113.6
SWAN	317	156	87	716	1.00	73252   73.3
CRANE	167	52	64	335	1.00	34273   34.3

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 18.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 10

SEWARD PENINSULA

DATES: 6 / 4 / 2010 THRU 6 / 4 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	13	8		42	4.01	23158 23.2
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	20	25		90	3.84	47520 47.5
GREEN-WINGED TEAL	12	4	5	37	8.36	42532 42.5
BLUE-WINGED TEAL					10.31	
SHOVELER	20	14		68	3.79	35437 35.4
PINTAIL	141	63	109	517	3.05	216817 216.8
REDHEAD a					3.11	
CANVASBACK	1			2	2.43	668 0.7
SCAUP a	12	56	40	164	1.93	43522 43.5
RING-NECKED DUCK a					4.02	
GOLDENEYE					3.61	
BUFFLEHEAD					1.86	
LONG-TAILED DUCK	10	13	30	76	1.87	19542 19.5
EIDER	1	3		8	3.58	3938 3.9
SCOTER	3	20	30	76	1.17	12227 12.2
RUDDY DUCK					5.94	
MERGANSE	2			4	1.27	699 0.7
SUB - TOTAL	235	206	214	1084		446057 445.9
CANADA GOOSE	6	5	18	40	1.00	5500 5.5
SWAN	27	13	25	78	1.00	10725 10.7
CRANE	11	7	6	31	1.00	4263 4.3

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 19.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 11

KOTZEBUE SOUND

DATES: 6 / 5 / 2010 THRU 6 / 5 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	22	8		60	4.01	26817 26.8
BLACK DUCK					1.56	
GADWALL					3.04	
AMERICAN WIGEON	90	62	20	324	3.84	138672 138.7
GREEN-WINGED TEAL	30	13		86	8.36	80134 80.1
BLUE-WINGED TEAL					10.31	
SHOVELER	56	36	25	209	3.79	88287 88.3
PINTAIL	113	35	32	328	3.05	111503 111.5
REDHEAD a	1	1		3	3.11	1040 1.0
CANVASBACK	5	2		14	2.43	3792 3.8
SCAUP a	60	162	31	415	1.93	89273 89.3
RING-NECKED DUCK a					4.02	
GOLDENEYE	1			2	3.61	805 0.8
BUFFLEHEAD					1.86	
LONG-TAILED DUCK	10	6		32	1.87	6670 6.7
EIDER					3.58	
SCOTER	3	42	15	105	1.17	13693 13.7
RUDDY DUCK					5.94	
MERGANSE	1	3		8	1.27	1132 1.1
SUB - TOTAL	392	370	123	1586		561817 561.8
CANADA GOOSE	15	12	16	70	1.00	7802 7.8
SWAN	31	29		89	1.00	9920 9.9
CRANE	26	7	4	44	1.00	4904 4.9

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)	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 20.

WATERFOWL BREEDING POPULATION SURVEY

STRATUM: 12

OLD CROW FLATS

DATES: 6 / 6 / 2010 THRU 6 / 6 / 2010

SPECIES	DRAKES	PAIRS	GROUPED BIRDS	INDICATED TOTAL BIRDS (T)	VISIBILITY RATIO (V)	POPULATION INDEX (P)
MALLARD	45	19		128	2.74	19192 19.2
BLACK DUCK					1.57	
GADWALL					3.04	
AMERICAN WIGEON	82	31	86	312	6.21	106025 106.0
GREEN-WINGED TEAL	14	14		56	7.84	24025 24.0
BLUE-WINGED TEAL					10.31	
SHOVELER	33	21	20	128	3.49	24446 24.4
PINTAIL	46	21	5	139	2.66	20233 20.2
REDHEAD a		1		2	3.11	340 0.3
CANVASBACK	8	2	67	87	2.59	12331 12.3
SCAUP a	121	231	78	661	2.29	82832 82.8
RING-NECKED DUCK a	4			4	4.02	880 0.9
GOLDENEYE	4			8	3.61	1580 1.6
BUFFLEHEAD	6	1		14	2.21	1693 1.7
LONG-TAILED DUCK	9	13		44	1.99	4791 4.8
EIDER					3.58	
SCOTER	169	331	65	1065	1.43	83339 83.3
RUDDY DUCK					5.94	
MERGANSE	6	6		24	1.27	1668 1.7
SUB - TOTAL	547	691	321	2672		383377 383.2
CANADA GOOSE	1	3	9	17	1.00	930 0.9
SWAN	9	2		13	1.00	711 0.7
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)	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).

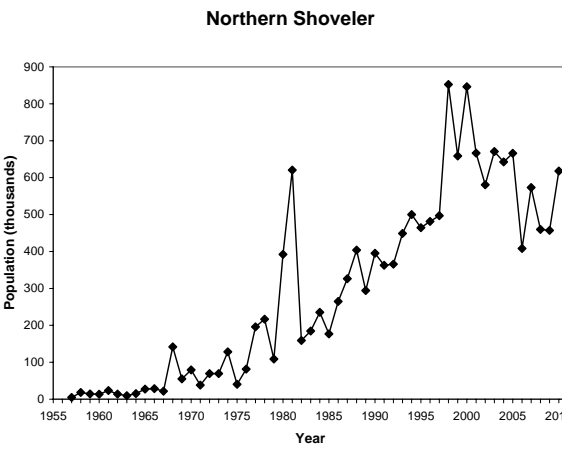
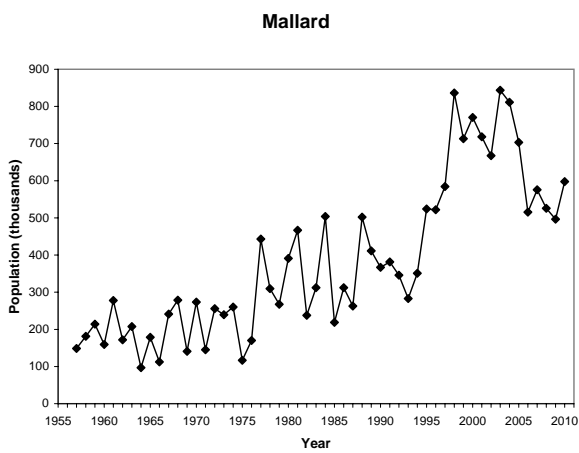
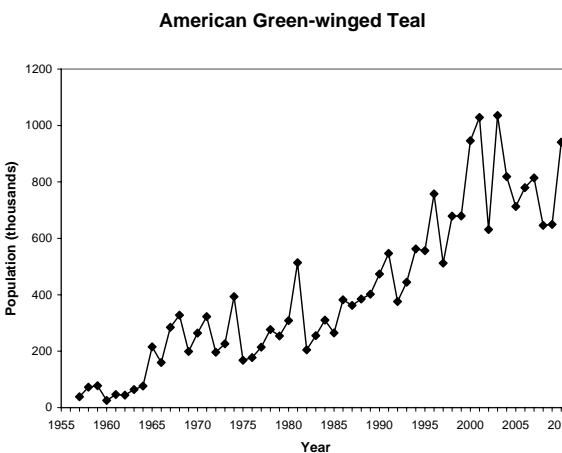
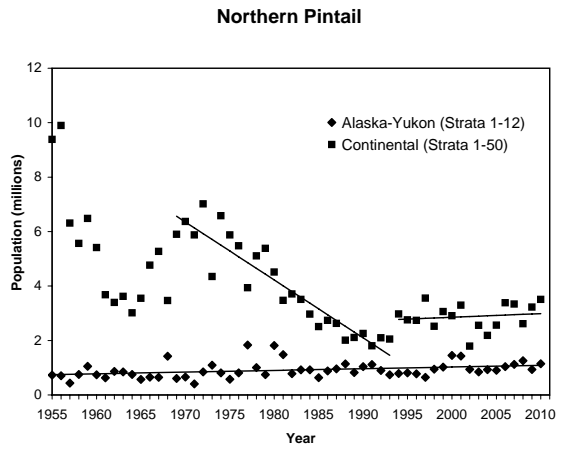
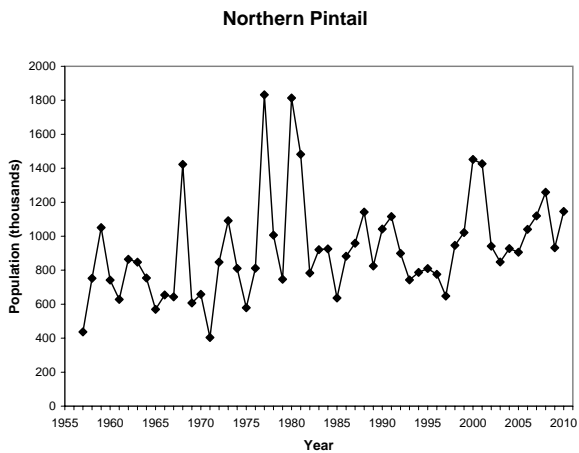


Figure 1. Trends in dabbling ducks from the Alaska-Yukon Waterfowl Breeding Population Survey.

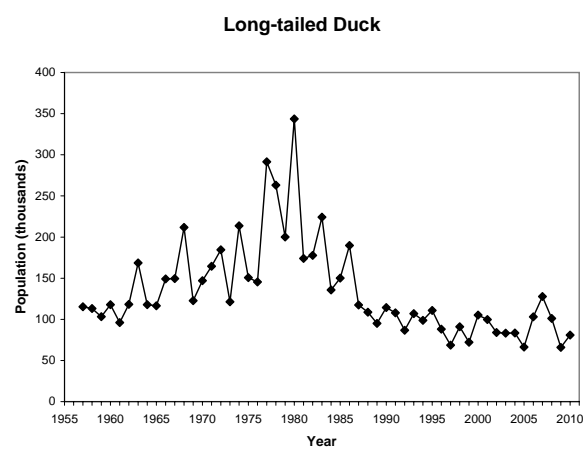
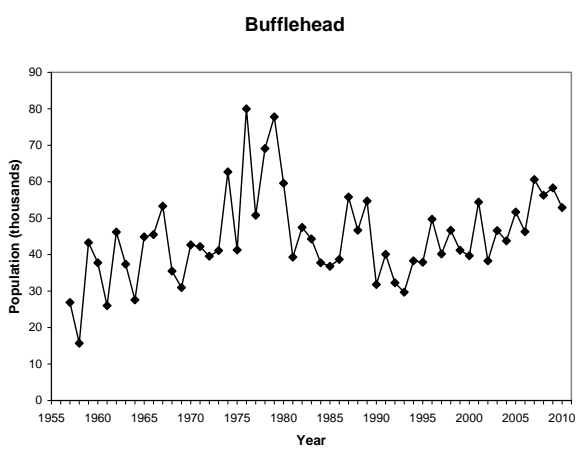
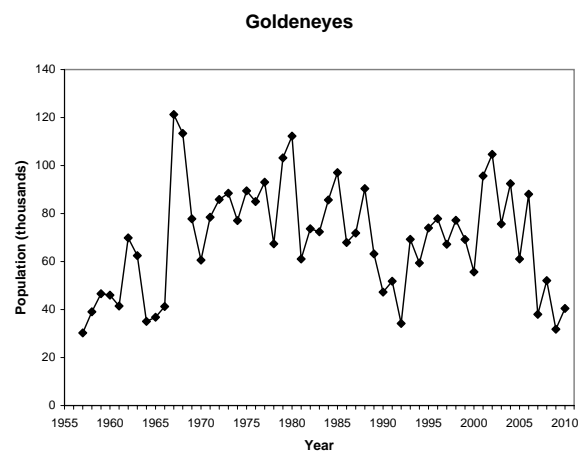
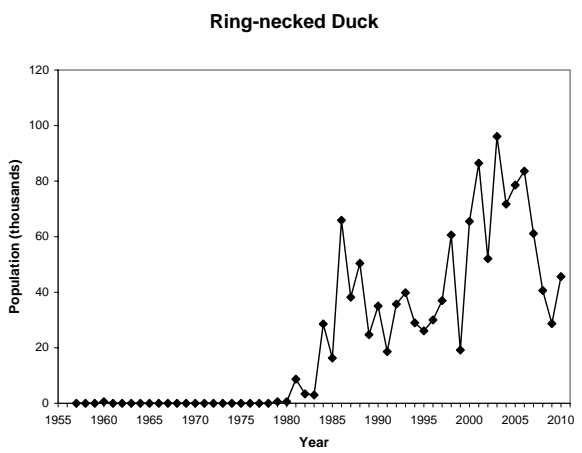
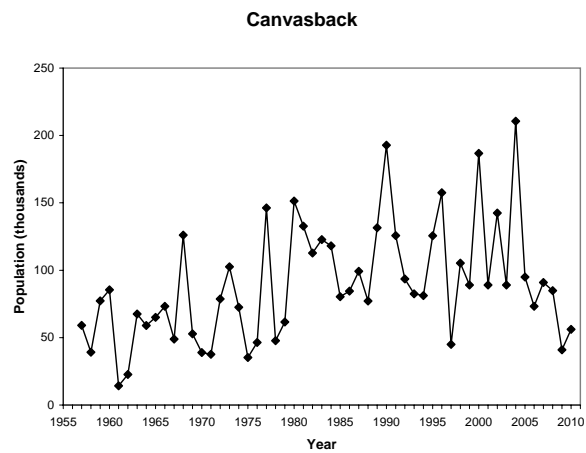
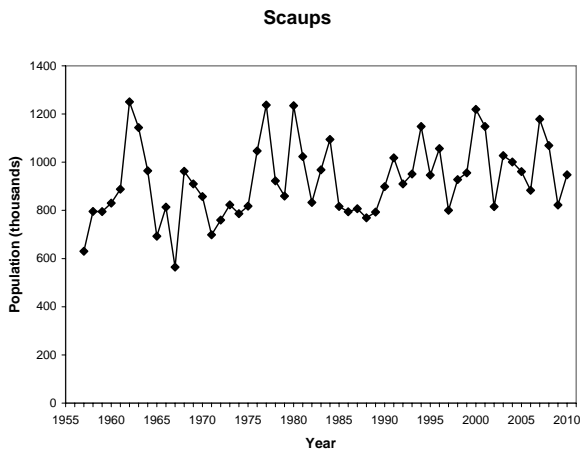


Figure 2. Trends in diver ducks from the Alaska-Yukon Waterfowl Breeding Population Survey.

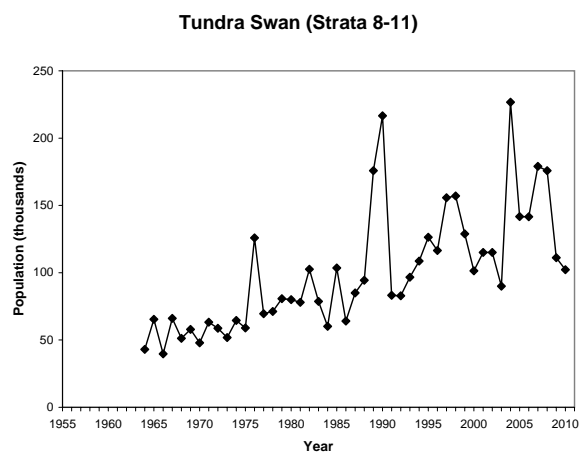
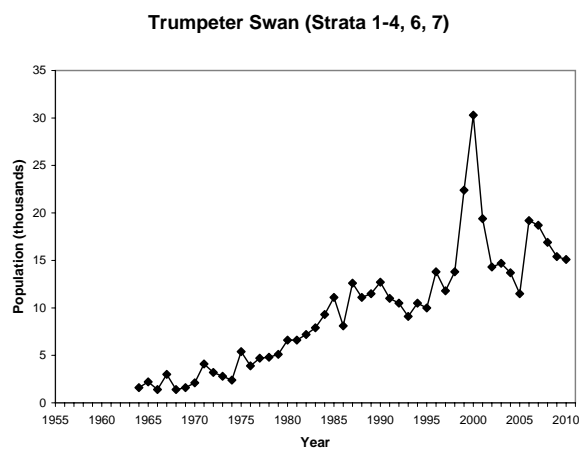
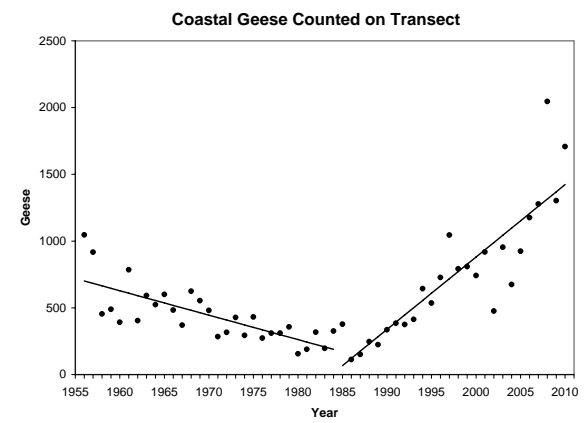
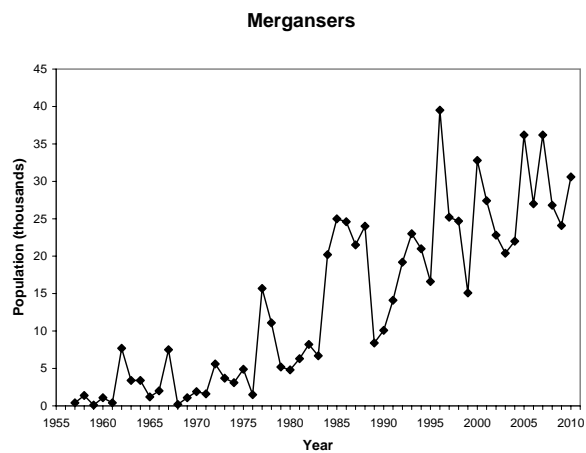
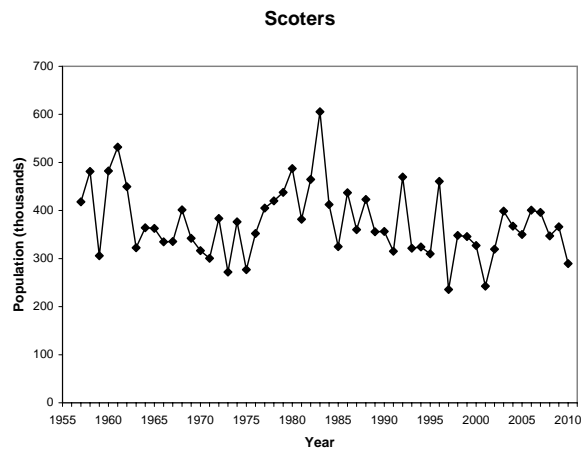
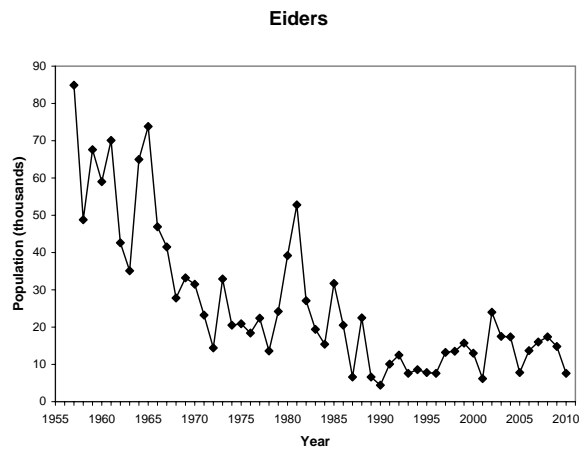


Figure 3. Trends in diver ducks, coastal geese, and swans from the Alaska-Yukon Waterfowl Breeding Population Survey.

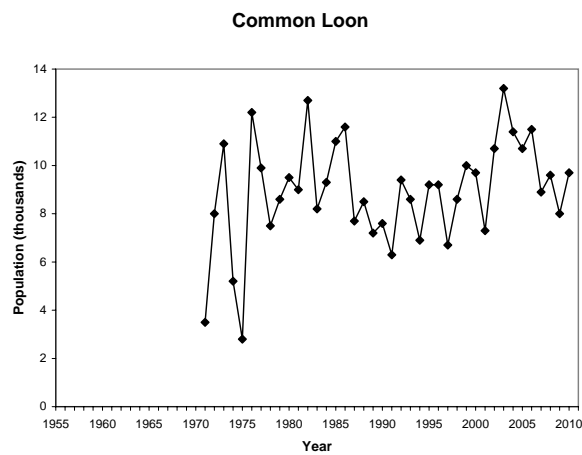
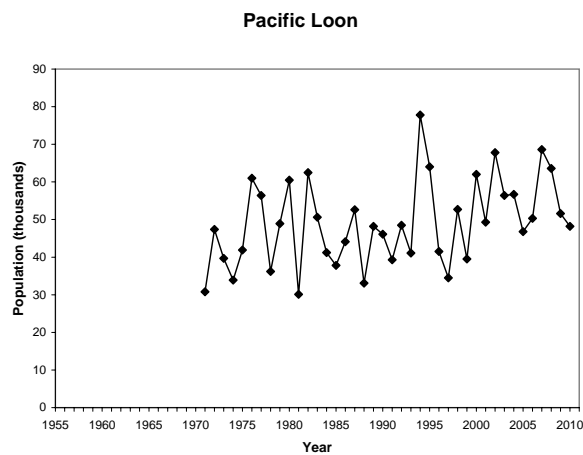
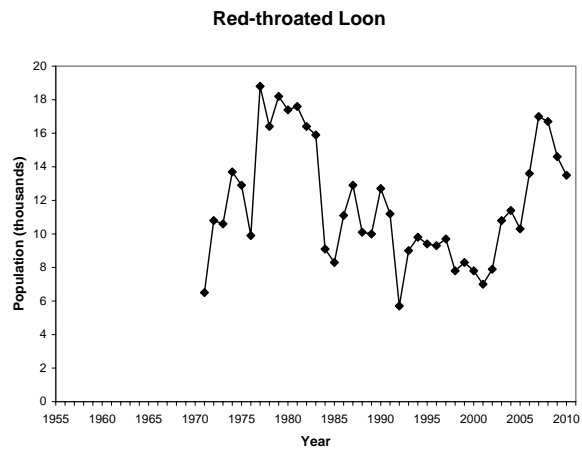
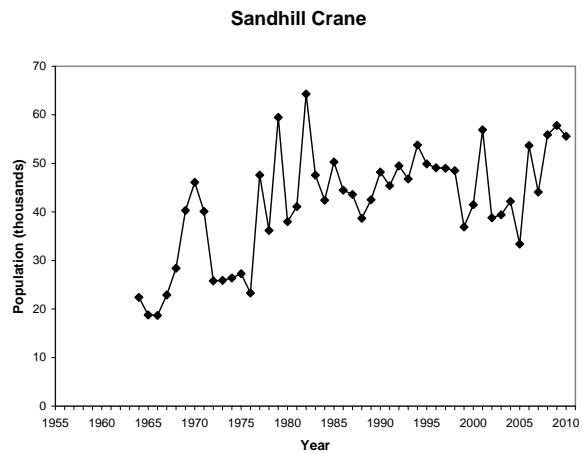


Figure 4. Trends in sandhill cranes and loons from the Alaska-Yukon Waterfowl Breeding Population Survey.