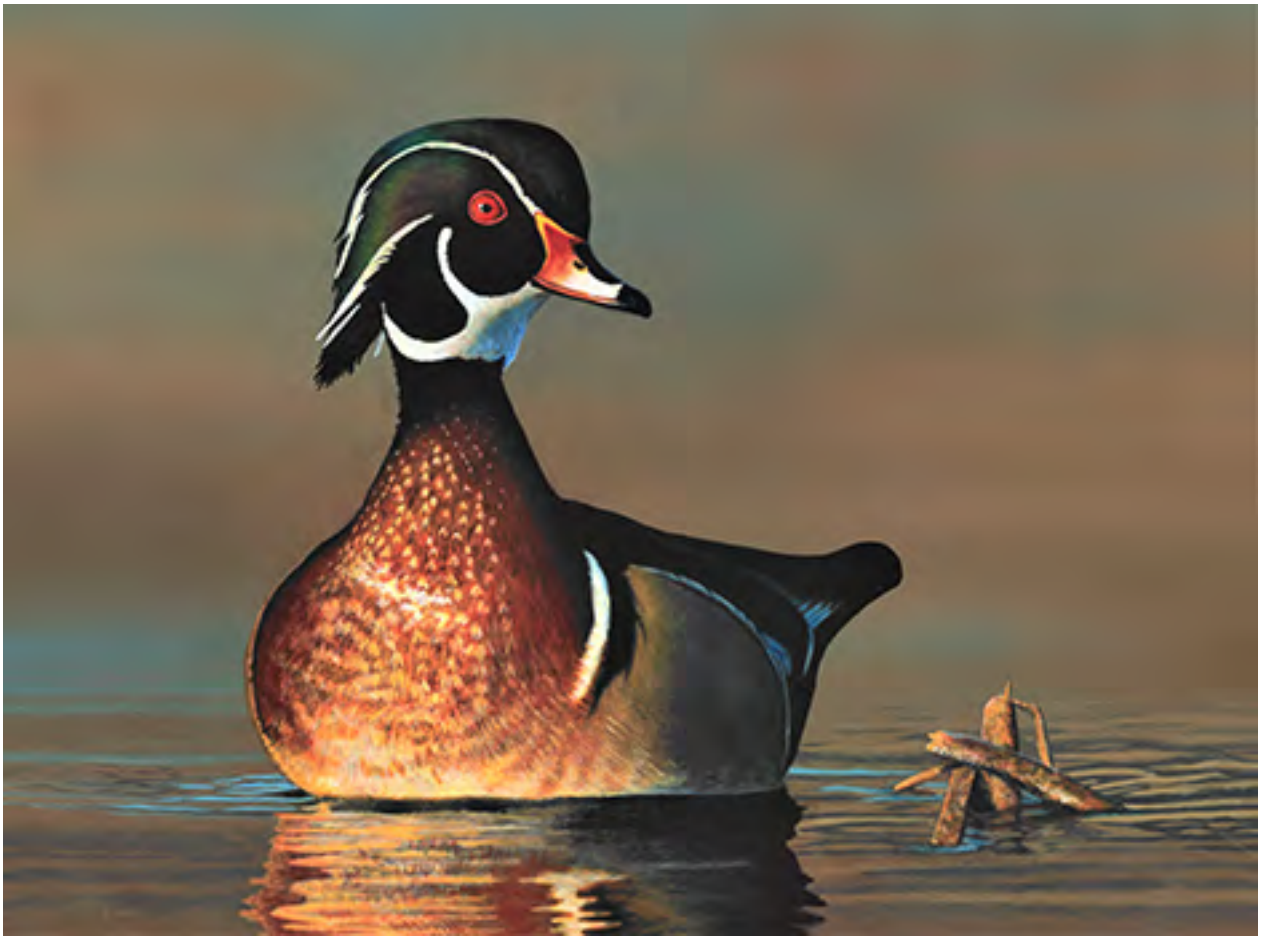
U.S. Fish & Wildlife Service

Waterfowl

Population Status, 2020



Waterfowl Population Status, 2020

August 20, 2020

In the United States the process of establishing hunting regulations for waterfowl is conducted annually. This process involves a number of scheduled meetings in which information regarding the status of waterfowl is presented to individuals within the agencies responsible for setting hunting regulations. In addition, the proposed regulations are published in the Federal Register to allow public comment. This report includes the most current breeding population and production information available for waterfowl in North America and is a result of cooperative efforts by the U.S. Fish and Wildlife Service (USFWS), the Canadian Wildlife Service (CWS), various state and provincial conservation agencies, and private conservation organizations. In addition to providing current information on the status of populations, this report is intended to aid the development of waterfowl harvest regulations in the United States for the 2021–2022 hunting season.

Cover: 2020-2021 Junior Duck Stamp featuring a wood duck by Madison Grimm of South Dakota.

Acknowledgments

Waterfowl Population and Habitat Information: The information contained in this report is the result of the efforts of numerous individuals and organizations. Principal contributors include the Canadian Wildlife Service, U.S. Fish and Wildlife Service, state wildlife conservation agencies, provincial conservation agencies from Canada, and Dirección General de Conservación Ecológica de los Recursos Naturales, Mexico. In addition, several conservation organizations, other state and federal agencies, universities, and private individuals provided information or cooperated in survey activities. Appendix A.2 provides a list of individuals who were primary contacts for information included in the "Status of Geese and Swans" section. We apologize for any omission of individuals from these lists, and thank all participants for their contributions.

This report was compiled by the U.S. Fish and Wildlife Service, Division of Migratory Bird Management, branches of Assessment and Decision Support, Monitoring and Data Management, and Migratory Bird Surveys. The principal authors are Joshua Dooley and Nathan Zimpfer.

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All Division of Migratory Bird Management reports are available from our website (https://www.fws.gov/birds/surveys-and-data/reports-and-publications.php).

Executive Summary

This report summarizes the most recent information about the status of North American waterfowl populations and their habitats to facilitate the development of harvest regulations. The annual status of these populations is monitored and assessed through abundance and harvest surveys. This report details abundance estimates; harvest survey results are discussed in separate reports. The data and analyses were those most currently available when this report was written. Future analyses may yield slightly different results as databases are updated and new analytical procedures become available.

Due to the COVID-19 (SARS-CoV-2) pandemic, most migratory breeding surveys (e.g., the Breeding Waterfowl Population and Habitat Survey, Breeding Bird Survey, and others) conducted by the U.S. Fish and Wildlife Service, Canadian Wildlife Service, US Geological Survey, as well as state and provincial agencies were canceled in spring 2020. We therefore present no status information on any duck species as all the estimates or indices for ducks rely on these surveys. We refer the reader to the 2019 Waterfowl Status report for more detailed historical data. Tables of the historical time series for ducks are presented in Appendix B. Monitoring indices for some goose and swan populations are based on fall and winter surveys or other data. Updated indices for 8 goose populations and 1 swan population are presented. For habitat conditions, we only report conditions in the Arctic and Subarctic using available June 2 snow/ice satellite data, as this was the only habitat data comprehensively collected similarly to previous years.

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List of Tables and Figures

Tables

Figures

Status of Geese and Swans

This section summarizes information on the status of goose and swan populations in North America. Information was compiled from a broad geographic area and is provided to assist managers in regulating harvest. Most populations of geese and swans in North America nest in the Arctic and Subarctic regions of Alaska and northern Canada (Figure 1), but several Canada goose (*Branta canadensis*) populations nest in temperate regions of the United States and southern Canada ("temperate-nesting" populations). Arctic-nesting geese rely predominantly on stored reserves for egg production. Thus, persistent snow cover reduces nest site availability, delays nesting activity, and often results in depressed reproductive effort and productivity. In general, goose productivity will be above average if nesting begins by late May in western and central portions of the Arctic and by early June in the eastern Arctic. Production usually is poor if nest initiation is delayed much beyond 15 June. For temperate-nesting Canada goose populations, productivity is generally less variable among years, but recruitment can be affected by local factors such as drought or weather events.

Methods

We have used common nomenclature for various goose and swan populations, but they may differ from other published information. Species nomenclature follows the List of Migratory Birds in Title 50 of the Code of Federal Regulations, Section 10.13, revised 16 April 2020 (85 FR 21286). Some of the goose populations described herein are composed of more than one subspecies, and some light goose populations contain two species (i.e., snow and Ross's geese). Population estimates for geese (Appendices C.1, C.2, and C.3) are derived from a variety of surveys conducted by biologists from federal, state, and provincial agencies, or from universities (Appendices A.1). Surveys include the Waterfowl Breeding Population and Habitat Survey (WBPHS), the Midwinter Survey (MWS), the Yukon–Kuskokwim Delta (YKD) Coastal Zone Survey, the Arctic Coastal Plain (ACP) Survey, and surveys that are specifically designed for various goose populations. Where survey methodology allowed, 95% confidence intervals are presented in parentheses following population estimates. Trends of population estimates were calculated by regressing the natural logarithms of survey results on year, and slope coefficients were presented and tested for equality to zero (t-statistic). Changes in population indices between the most recent and previous years were calculated and, where possible, assessed with a two-tailed z-test using the sum of sampling variances for the two estimates. All statistical tests and analyses were conducted using an alpha level of 0.05. Primary abundance indices used as management plan population objectives are described, graphed, and included in appendices. Beginning in 2019, we only report the primary abundance indices for goose populations. Other survey information can be found in the Flyway Databooks at: https://www.fws.gov/birds/surveys-and-data/reports-and-publications/flyway-data-books.php. Information was the best available at the time of finalizing this report but can differ from final estimates or observed conditions.

Results and Discussion

Conditions in the Arctic and Subarctic

In 2020, spring phenology was later than average across many areas of the eastern and central Arctic and Subarctic. The snow and ice cover graphics (Figure 2) illustrate that ice or snow cover on 2 June 2020 compared to the same date in 2019 was generally comparable in Alaska

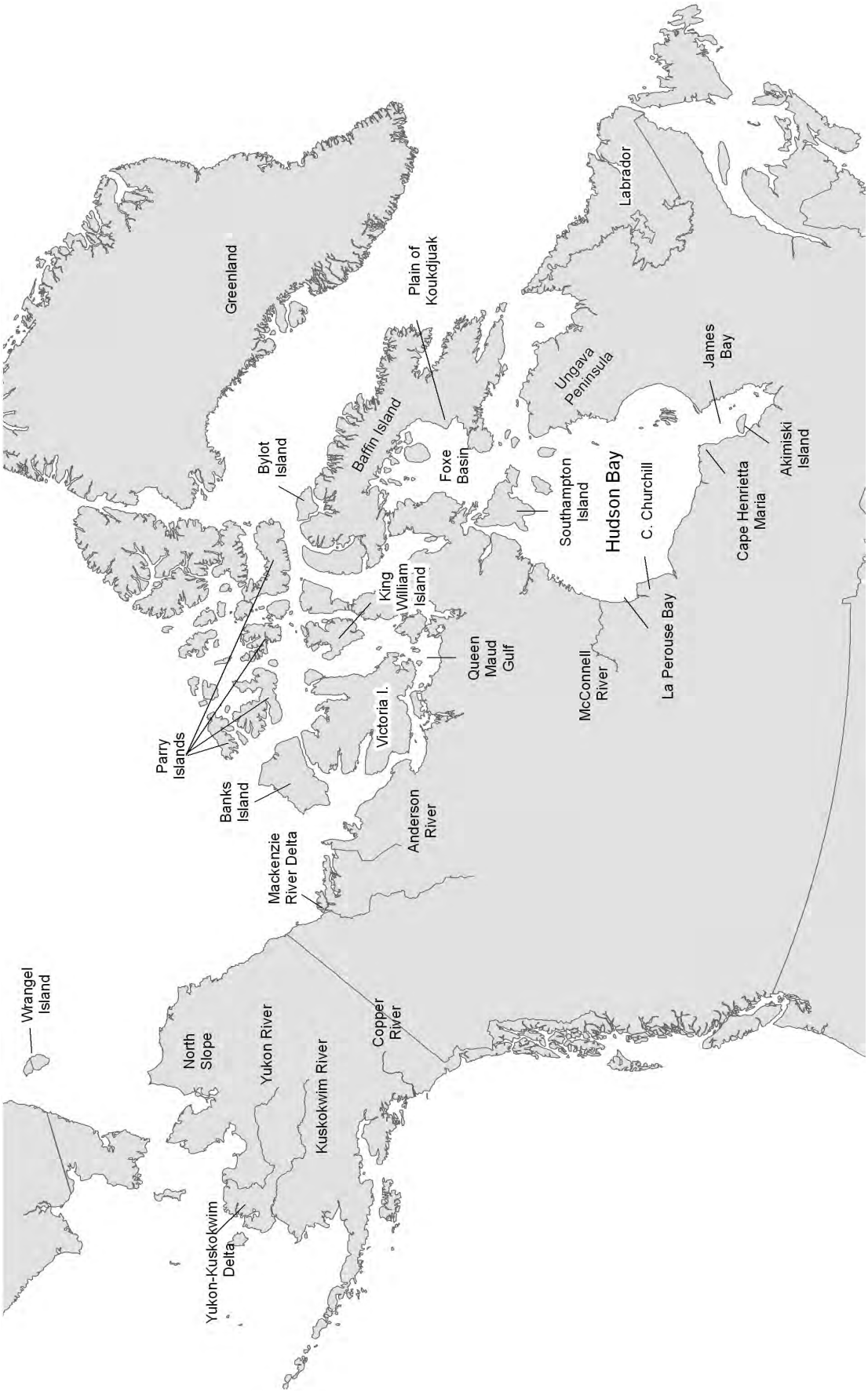

Figure 1. Important goose and swan nesting areas in Arctic and Subarctic North America.

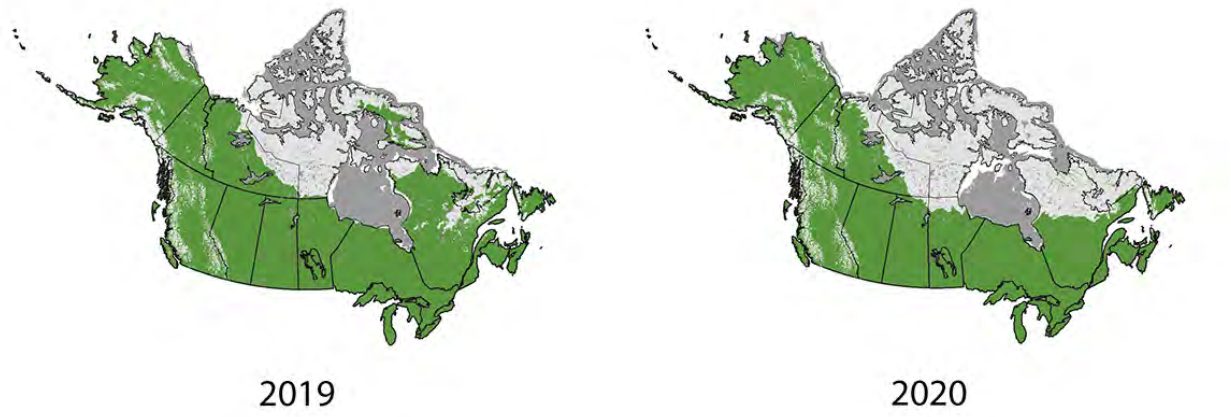

Figure 2. The extent of snow (light gray) and ice (dark gray) cover in North America on 2 June 2019 and 2 June 2020 (National Ice Center 2020).

and the western Arctic but more extensive in the central and eastern Arctic and Subarctic (National Ice Center 2020).

Conditions in Southern Canada and the United States

Biologists were unable to comprehensively survey these areas in 2020 due to the COVID-19 pandemic.

Description of Populations and Primary Monitoring Surveys

Canada and Cackling Geese

See Figure 5, Table 1, and Appendices C.1.

North Atlantic Population (NAP)

NAP Canada geese principally nest in Newfoundland and Labrador. They commingle during winter with other Atlantic Flyway Canada goose populations, although NAP geese have a more coastal distribution than other populations (Figure 3). In 2016, biologists revised the index used to monitor this population to a composite estimate that combines data from both the Canadian Wildlife Service (CWS) helicopter plot survey and the WBPHS (strata 66, 67, and 70). The new composite time series is updated annually due to the estimation procedure. Estimates presented are mean and 2.5% and 97.5% Bayesian credible intervals.

Atlantic Population (AP)

AP Canada geese nest throughout much of Quebec, especially along Ungava Bay, the eastern shore of Hudson Bay, and on the Ungava Peninsula. This population winters from New England to South Carolina, but the largest concentrations occur on the Delmarva Peninsula (Figure 3). This population is monitored by a spring survey of the Ungava Peninsula in northern Quebec (Atlantic Flyway Council 2008).

Atlantic Flyway Resident Population (AFRP)

AFRP Canada geese were introduced and established throughout the Atlantic Flyway during the early 20^{th} century and are composed of various subspecies. This population of large Canada geese inhabits all states of the Atlantic Flyway and southern portions of Quebec and the Maritime provinces (Figure 3). The breeding population is estimated during the spring via the Atlantic Flyway Breeding Waterfowl Plot Survey (Atlantic Flyway Council 1999).

Southern Hudson Bay Population (SHBP)

SHBP Canada geese nest in the Hudson Bay Lowlands, on Akimiski Island, and along

the eastern and southern portions of Hudson and James Bays, and they concentrate during fall and winter throughout Manitoba, Ontario, and the Mississippi Flyway states (Figure 3). SHBP Canada geese are comprised of the former Southern James Bay, Mississippi Valley, and Eastern Prairie Populations of Canada geese. In 2016 a new aerial survey was developed to monitor SHBP Canada geese along the south and west coastal areas of the Hudson and James Bays (Mississippi Flyway Council 2017).

Mississippi Flyway Giant Population (MFGP)

MFGP Canada geese nest in the Mississippi Flyway states and in southern Ontario and southern Manitoba. Giant Canada geese were reestablished or introduced in all Mississippi Flyway states (Figure 3), and they now represent a large proportion of all Canada geese in the Mississippi Flyway. The total population is estimated during spring surveys within the Mississippi Flyway states and provinces (Mississippi Flyway Council 2017).

Western Prairie and Great Plains Populations (WPP/GPP)

WPP Canada geese nest in eastern Saskatchewan and western Manitoba. GPP Canada geese are composed of large Canada geese resulting from restoration efforts in Saskatchewan, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and Texas. These two populations are managed jointly. Geese from these breeding populations commingle during migration and winter with Canada geese from other populations (Figure 3). The WBPHS (strata 21–25, 31, 34–40, 43–49) provides indices of this population within its primary breeding range.

Mid-continent Cackling Geese

Mid-continent cackling geese (*B. hutchinsii*) nest across the Canadian Arctic and winter throughout the Central and Mississippi Flyways (Figure 3). Lincoln estimates of the adult cohort are the primary management indices for this population. Lincoln estimates are derived from annual estimates of total harvest and harvest rate and represent an indirect measure of abundance. Due to the methodology, Lincoln estimates are typically not available from the most recent years. Alternative nomenclature, Central Flyway Arctic Nesting geese (Central and Mississippi Flyway Councils 2013), has also been used for this population.

Hi-line Population (HLP)

HLP Canada geese nest in southeastern Alberta, southwestern Saskatchewan, eastern Montana and Wyoming, and Colorado. This population winters in these states and New Mexico (Figure 3). A breeding index of HLP geese is based on the WBPHS estimates from portions of Alberta (strata 26–29), Saskatchewan (strata 30, 32, 33), and Montana (strata 41–42; (Central Flyway Council 2010).

Rocky Mountain Population (RMP)

RMP Canada geese nest in southern Alberta and western Montana, and the inter-mountain regions of Utah, Idaho, eastern Nevada, Wyoming, and Colorado. This population winters mainly in central and southern California, Arizona, Nevada, Utah, Idaho, and Montana (Figure 3). An index of breeding RMP geese is based on WBPHS estimates from portions of strata 26–29 in Alberta and strata 41–42 in Montana (Pacific Flyway Council 2000*b*).

Pacific Population (PP)

PP Canada geese nest and winter west of the Rocky Mountains from northern Alberta and British Columbia to California (Figure 3). An index of breeding PP geese is based on WBPHS estimates from strata 76–77 in Alberta and the standardized surveys in British Columbia, Washington, Oregon, and California (Pacific Flyway Council 2000*a*).

Dusky Canada Geese

Dusky Canada geese nest on the Copper River Delta of south-central Alaska and winter in the Willamette and Lower Columbia River

Valleys of Oregon and Washington (Figure 3). Dusky Canada geese are surveyed on their breeding grounds on the Copper River Delta and Middleton Island, Alaska (Pacific Flyway Council 2015).

Cackling/minima Cackling Geese

Cackling/minima cackling geese nest on the YKD of western Alaska and primarily winter in the Willamette and Lower Columbia River Valleys of Oregon and Washington (Figure 3). The total fall population is estimated from counts of adults during the YKD Coastal Zone Survey during the spring, expanded by a ratio derived from neck-collared individuals observed in the fall and winter (Pacific Flyway Council 2016*a*).

Lesser Canada Geese

Lesser Canada geese nest throughout interior and south-central Alaska and winter in Washington, Oregon, and California (Figure 3). Population indices are based on WBPHS estimates in stratum 1 (Kenai-Susitna), stratum 2 (Nelchina), stratum 3 (Tanana-Kuskokwim), stratum 4 (Yukon Flats), and stratum 12 (Old Crow Flats).

Taverner's Cackling Geese

Taverner's cackling geese nest throughout tundra areas of the North Slope and western Alaska and winter in Washington, Oregon, and California (Figure 3). Population indices are derived from three breeding survey efforts: the Arctic Coastal Plain Survey, the YKD Coastal Zone Survey, and the WBPHS (stratum 9 [inland portions of the YKD], stratum 10 [Seward Peninsula], and stratum 11 [Kotzebue Sound]).

Aleutian Cackling Geese

Aleutian cackling geese nest primarily on the Aleutian Islands and winter along the Pacific Coast as far south as central California (Figure 3). The total population during the fall and winter is estimated from mark-resight observations of neck-banded geese (Pacific Flyway Council 2006*a*).

Light Geese

See Figure 7, Table 2, and Appendices C.2.

The term light geese collectively refers to Ross's geese (*Anser rossii*) and both the lesser (*A. caerulescens caerulescens*) and greater (*A. c. atlantica*) snow goose subspecies (including all hybrids and both white and blue color phases). There are three populations of lesser snow geese based on their breeding ranges (Wrangel Island, Western Arctic, and Mid-continent). Lesser snow geese and Ross's geese occur in many wintering areas together and are not typically differentiated during the Midwinter Survey, so we report indices of light geese from this survey.

Ross's Geese

Ross's geese nest primarily in the Queen Maud Gulf region, but increasing numbers are nesting in other areas of the central and eastern Arctic and along the western coast of Hudson Bay. Ross's geese primarily winter in California, New Mexico, Texas, and Mexico, with increasing numbers wintering in other portions of the Central and Mississippi Flyways (Figure 4). Ross's geese are annually surveyed at Karrak Lake in the Queen Maud Gulf region. Estimates from Karrak Lake are typically not available until after the publication of this report, so we present the previous year's estimate.

Mid-continent Population (MCP)

MCP lesser snow geese winter in the Central and Mississippi Flyways and nest primarily from Banks Island in the western Arctic to Baffin Island in the eastern Arctic (Figure 4). The management plan for MCP lesser snow geese was updated in 2018 and replaced prior management guidelines for MCP and Western Central Flyway Population (WCFP; wintering population) lesser snow geese (Mississippi Flyway Council 2018, Central Flyway Council 2018). Lincoln estimates of the adult cohort are now the primary management indices.

Western Arctic (WA) and Wrangel Island (WI) Populations

Lesser snow geese in the Pacific Flyway originate from nesting colonies in the western and central Arctic and on Wrangel Island, Russia. WA lesser snow geese nest primarily on Banks Island, with smaller colonies in coastal areas of the Northwest Territories, and along the Alaskan Arctic Coastal Plain. WI lesser snow geese nest on Wrangel Island. WA and WI lesser snow geese mix during winter and also occur with MCP lesser snow geese and Ross's geese. WA lesser snow geese primarily winter in central and southern California, the western Central Flyway, and the northern highlands of Mexico. WI lesser snow geese principally winter in the Skagit-Fraser River Deltas in British Columbia and Washington and in northern and central California (Figure 4). Light geese in the Pacific Flyway (Pacific Flyway Population) are indexed by fall and winter surveys in California, Oregon, Washington and British Columbia. Breeding ground surveys are periodically conducted for WA (Pacific Flyway Council 2013) and WI lesser snow geese (Pacific Flyway Council 2006*b*).

Greater Snow Geese

Greater snow geese nest on Bylot, Axel Heiberg, Ellesmere, and Baffin Islands, and in Greenland, and winter along the Atlantic coast from New Jersey to North Carolina (Figure 4). This population is monitored on spring staging areas near the St. Lawrence Valley in Quebec by an annual aerial photographic survey (Atlantic Flyway Council 2009).

Greater White-fronted Geese

See Figure 8, Table 3, and Appendices C.3.

Pacific Population White-fronted Geese

Pacific Population white-fronted geese (*A. albifrons*) primarily nest on the YKD in Alaska and winter in the Central Valley of California (Figure 4). This population is monitored using a predicted fall population index, which is based on the number of indicated total birds from the YKD Coastal Zone Survey and the WBPHS in the Bristol Bay area (stratum 8) and interior portions of the YKD (stratum 9) and expanded by a factor derived from the correlation of these indices with past fall counts in Oregon and California (Pacific Flyway Council 2003).

Mid-continent Population White-fronted Geese

Mid-continent Population white-fronted geese nest from central and northwestern Alaska to the west coast of Hudson Bay and the Melville Peninsula. This population concentrates in southern Saskatchewan and Alberta during the fall and in southern Central and Mississippi Flyway states and Mexico during the winter (Figure 4). This population is monitored via a fall staging survey in Saskatchewan and Alberta (Central, Mississippi, and Pacific Flyway Councils 2015).

Brant

See Figure 8, Table 3, and Appendices C.3.

Atlantic Brant (ATLB)

Atlantic brant (*B. bernicla bernicla*) primarily nest on islands in the eastern Canadian Arctic and winter along the Atlantic Coast from Massachusetts to North Carolina (Figure 4). The Midwinter Survey provides an index of this population within its winter range in the Atlantic Flyway (Atlantic Flyway Council 2002).

Pacific Brant (PACB)

PACB include black brant (BLBR; *B. b. nigricans*) and western high arctic brant (WHAB; *B. b. bernicla*). BLBR nest across the YKD and North Slope in Alaska, Banks Island, other islands of the western and central Arctic, the Queen Maud Gulf, and Russia. They stage during fall at Izembek Lagoon, Alaska, and winter as far south as Mexico. WHAB nest on the Parry Islands of the Northwest Territories and Nunavut. They stage during fall at Izembek Lagoon, Alaska, and predominantly winter in the Padilla, Samish, and Fidalgo Bays of Washington and near Boundary Bay, British Columbia, although some individuals have been observed as

far south as Mexico (Figure 4). Fall and winter counts in the U.S., Canada, and Mexico are the primary management indices for PACB (Pacific Flyway Council 2018).

Emperor Geese

See Figure 8, Table 3, and Appendices C.3.

Emperor geese (*A. canagica*) breed along coastal areas of the Bering Sea, with the largest concentration on the YKD in Alaska. Emperor geese stage along the Alaska Peninsula during the fall and spring and winter along the Aleutian Islands (Figure 4). This population is monitored during spring by the YKD Coastal Zone Survey (Pacific Flyway Council 2016*b*).

Swans

See Figure 8, Table 3, and Appendices C.3.

Western Population Tundra Swans

Western Population tundra swans (*Cygnus columbianus*) nest along the coastal lowlands of western Alaska, and the YKD is a primary breeding area. Western Population tundra swans primarily winter in California, Utah, and the Pacific Northwest (Figure 4). The management plan for Western Population tundra swans was updated in 2017, and the primary management indices are derived from the YKD Coastal Zone Survey and the WBPHS (stratum 8 [Bristol Bay], stratum 9 [inland portions of the YKD], stratum 10 [Seward Peninsula], and stratum 11 [Kotzebue Sound]; Pacific Flyway Council 2017).

Eastern Population Tundra Swans

Eastern Population tundra swans nest from the Seward Peninsula of Alaska to the northeast shore of Hudson Bay and Baffin Island. The Mackenzie River Delta and adjacent areas in the Northwest Territories are of particular importance. This population predominantly winters in coastal areas from Maryland to North Carolina (Figure 4). The Midwinter Survey provides an index of this population within its winter range of the Atlantic and Mississippi Flyways (Atlantic, Mississippi, Central, and Pacific Flyway Councils 2007).

Trumpeter Swans

Trumpeter swans (*C. buccinator*) nest south of the Brooks Range and east of the YKD in Alaska and within localized areas of Yukon Territory, western Northwest Territories, southern Canadian provinces from British Columbia to Quebec, and some northern U.S. states from Washington to New York. There are three recognized North American populations: the Pacific Coast, Rocky Mountain, and Interior Populations. Trumpeter swan abundance and productivity is comprehensively monitored through the North American Trumpeter Swan Survey. This range-wide survey was first conducted in 1968, repeated in 1975, and continued at 5-year intervals through 2015. The first survey in 1968 recorded 2,600 adult and subadult trumpeter swans. The most recent survey was completed in 2015, and 63,000 adult and subadult trumpeter swans were observed. Information from this, and other, trumpeter swan surveys can be found at: https://www.fws.gov/birds/surveys-and-data/reports-and-publications.php.

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Pacific Flyway Council. 2013. Pacific Flyway Management Plan for the Western Arctic Population of Lesser Snow Geese.

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Pacific Flyway Council. 2018. Management Plan for the Pacific Population of Brant.

Table 1. Canada and cackling goose indices (in thousands) from primary monitoring surveys.

	Estimate/Count		Change from 2019		10-year Trend	
Population	2020	2019	%	*P*	%/yr[a]	*P*
North Atlantic	-	53	-	-	-	-
Atlantic	-	120	-	-	-	-
Atlantic Flyway Resident	-	1,040	-	-	-	-
Southern Hudson Bay	-	75	-	-	-	-
Mississippi Flyway Giant	-	1,501	-	-	-	-
Western Prairie and Great Plains	-	1,443	-	-	-	-
Midcontinent[b]	2,802	2,499	+12	0.675	−6	0.034
Hi-Line	-	375	-	-	-	-
Rocky Mountain	-	176	-	-	-	-
Pacific	-	347	-	-	-	-
Dusky	-	18	-	-	-	-
Cackling/minima	-	205	-	-	-	-
Lesser	-	13	-	-	-	-
Taverner's	-	59	-	-	-	-
Aleutian	118	200	−41	0.008	+2	0.315

[a] Rounded values mask change in estimates.
[b] Years presented refer to year–2.

Table 2. Light goose (Ross's goose and lesser and greater snow goose) indices (in thousands) from primary monitoring surveys.

	Estimate/Count		Change from 2019		10-year Trend	
Population	2020	2019	%	*P*	%/yr	*P*
Ross's geese[a]	233	368	−37	< 0.001	−11	0.002
Mid-continent Population lesser snow geese[b]	9,917	11,483	−14	0.325	−4	0.134
Pacific Flyway Population light geese	-	1,414	-	-	-	-
Wrangel Island Population lesser snow geese	685	442	+55	-	+16	< 0.001
Greater snow geese	-	714	-	-	-	-

[a] Years presented refer to year–1.
[b] Years presented refer to year–2.

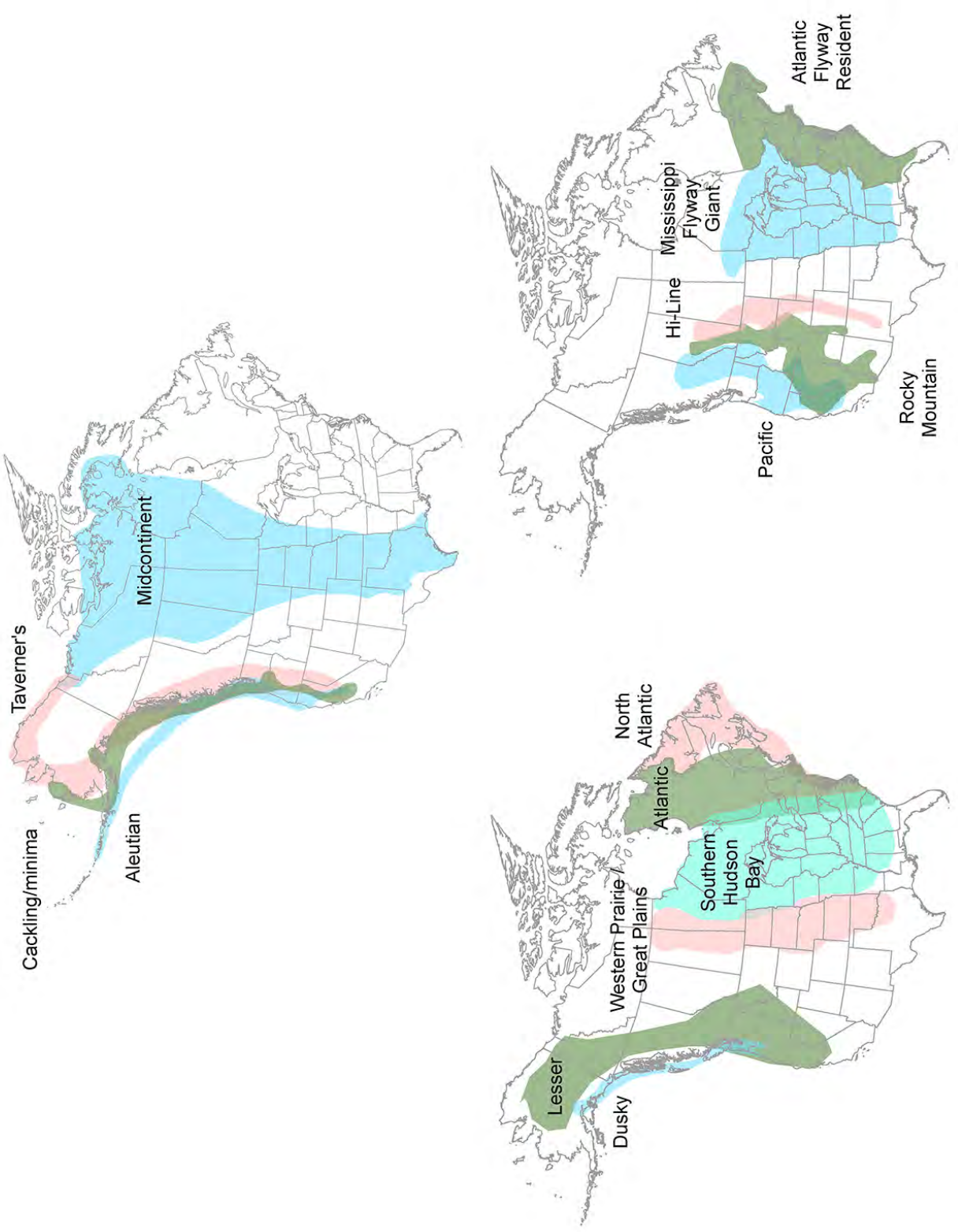

Figure 3. Approximate ranges of Canada and cackling goose populations in North America.

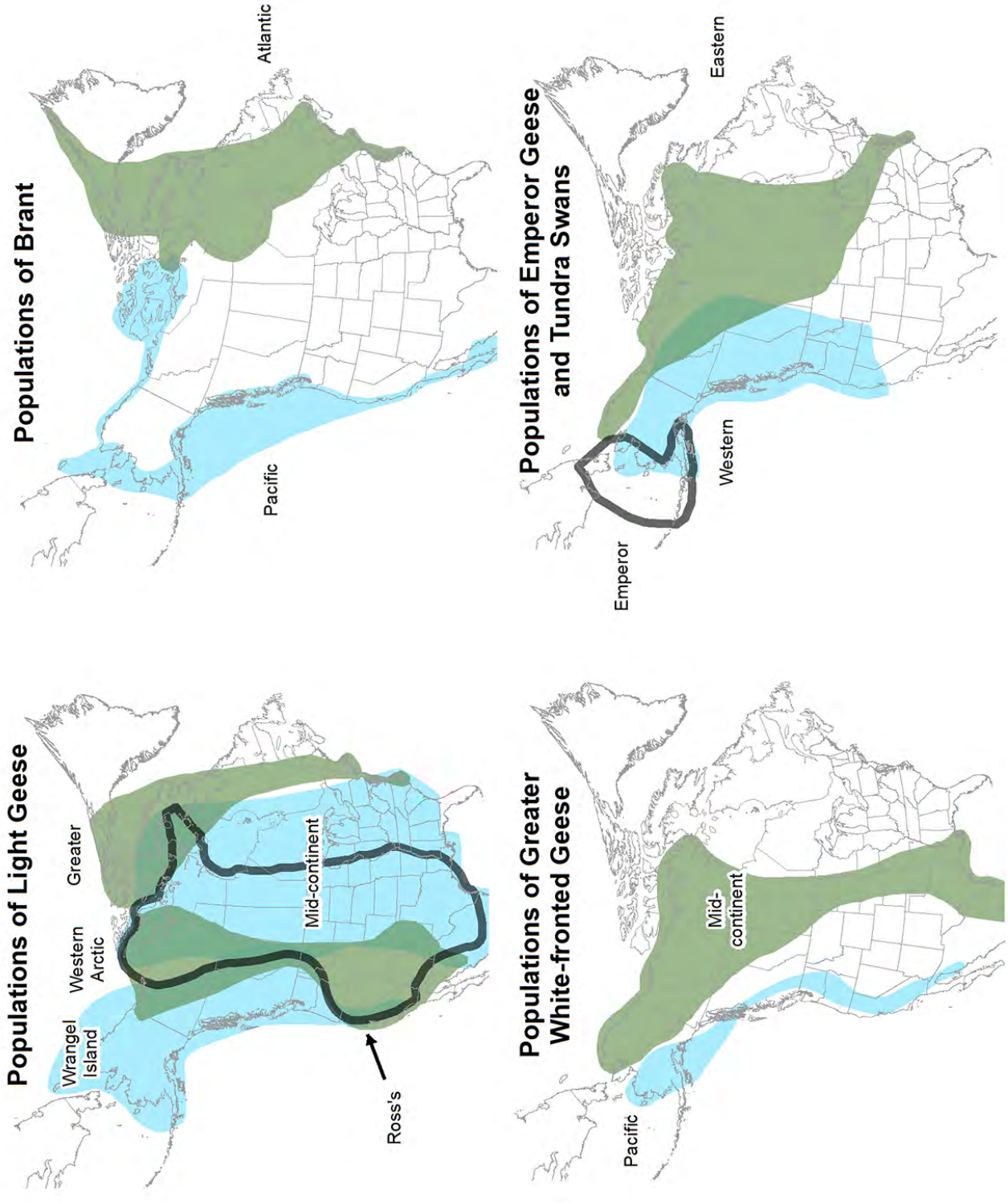

Figure 4. Approximate ranges of tundra swan and Ross's, snow, brant, greater white-fronted, and emperor goose populations in North America.

Table 3. White-fronted goose, emperor goose, brant, and tundra swan indices (in thousands) from primary monitoring surveys.

	Estimate/Count		Change from 2019		10-year Trend	
Population	2020	2019	%	*P*	%/yr	*P*
Pacific Population white-fronted geese	-	479	-	-	-	-
Mid-continent Population white-fronted geese[a]	1,267	774	+64	-	+4	0.074
Atlantic brant	140	120	+16	-	+1	0.753
Pacific brant	143	161	−12	-	−2	0.085
Emperor geese	-	27	-	-	-	-
Western swans	-	101	-	-	-	-
Eastern swans	79	93	−15	-	−2	0.270

[a] Years presented refer to year–1.

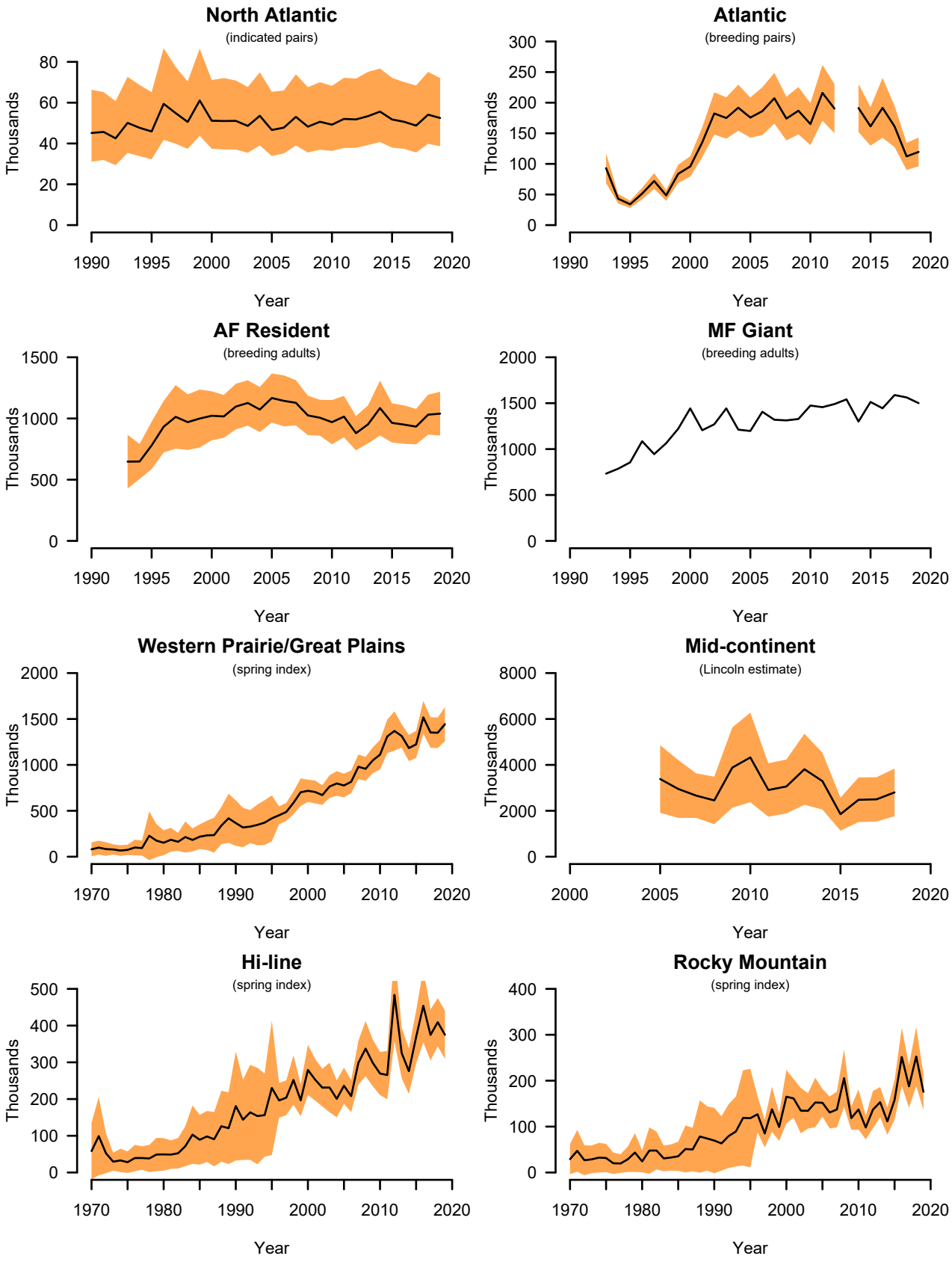

Figure 5. Estimated abundance indices (and 95% confidence intervals, where applicable) for Canada and cackling goose populations based on primary management surveys.

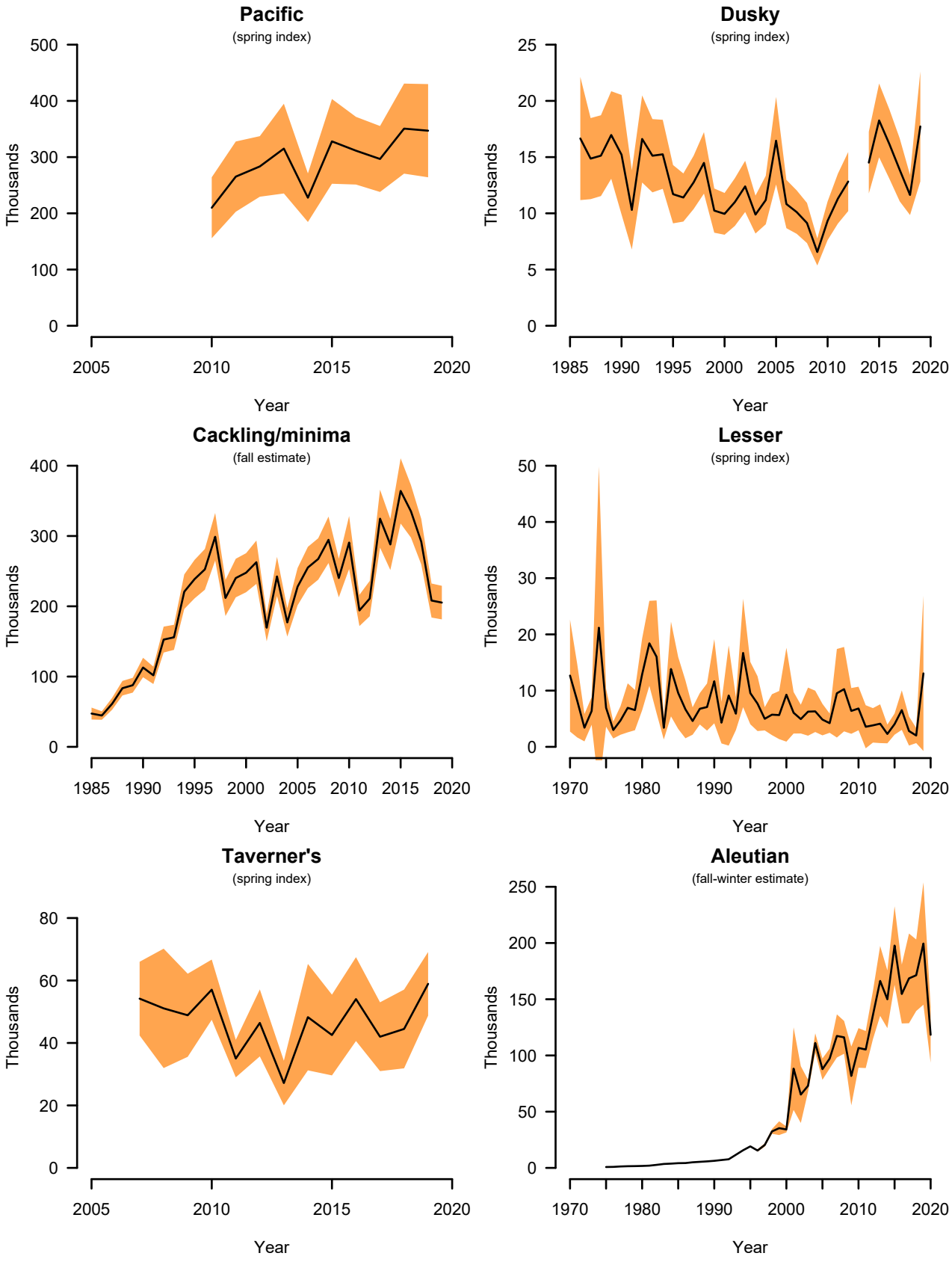

Figure 5. Continued.

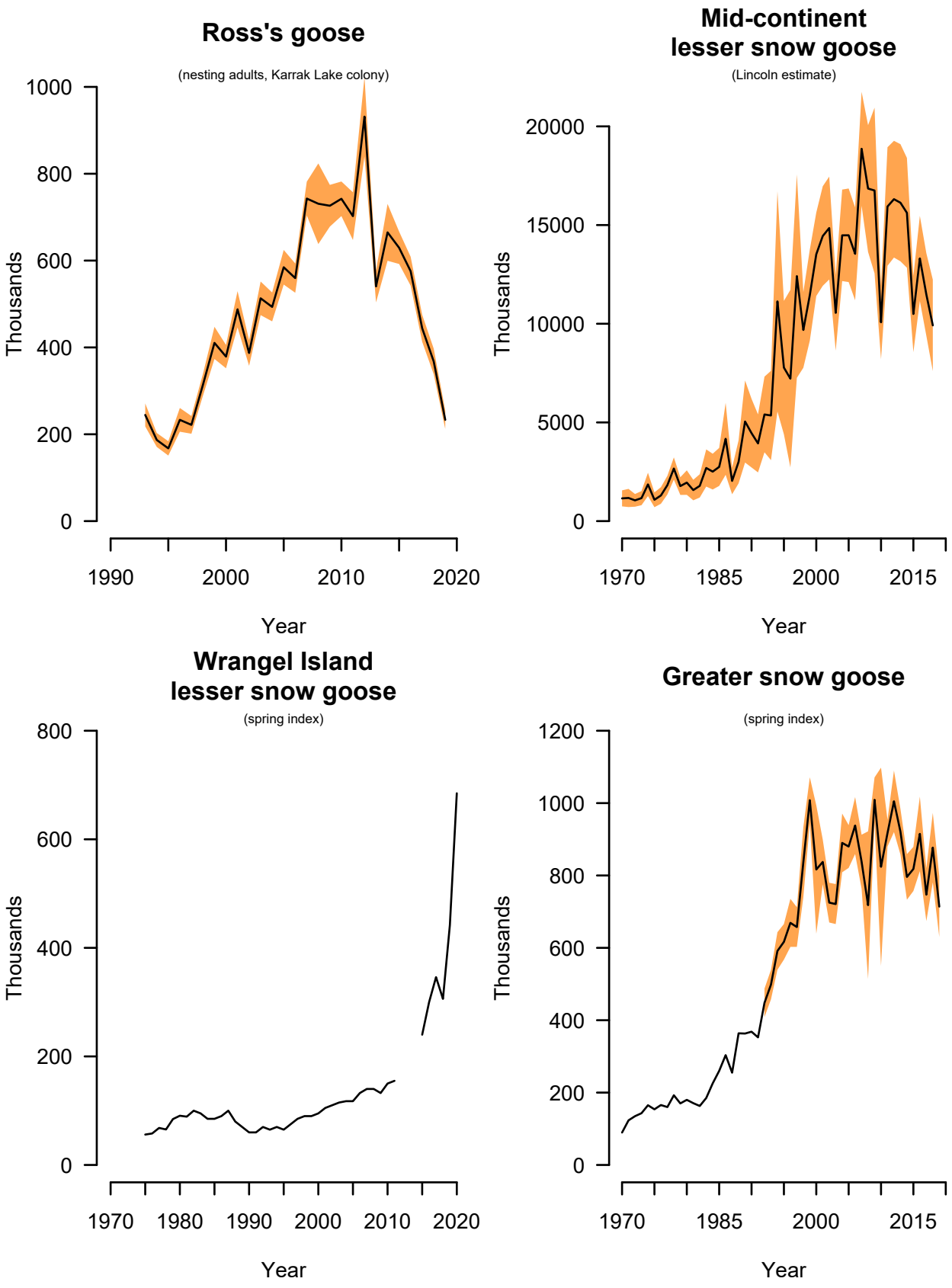

Figure 7. Estimated abundance indices (and 95% confidence intervals, where applicable) for Ross's and snow goose populations based on primary management surveys.

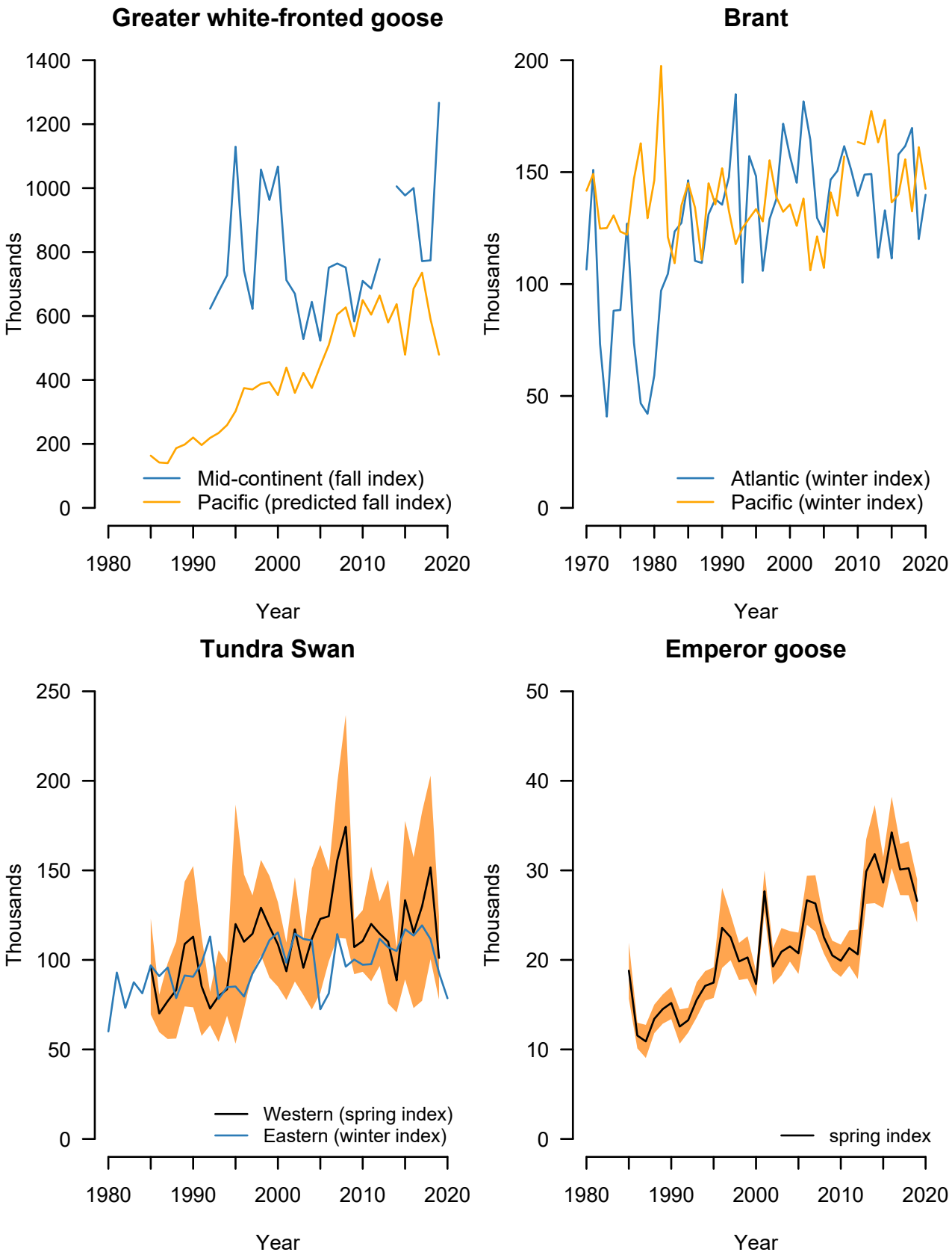

Figure 8. Estimated abundance indices (and 95% confidence intervals, where applicable) for greater white-fronted goose, brant, tundra swan, and emperor goose populations based on primary management surveys.

A. Individuals who supplied information for the generation of this report

A.1: Individuals who supplied information on the status of geese and swans.

Flyway and Regional Survey Reports

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Ross's Geese and Mid-continent Lesser Snow Geese

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Wrangel Island Population Lesser Snow Geese

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Mid-continent Population White-fronted Geese

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B. Historical estimates of May ponds and regional waterfowl populations

Table B.1. Estimated number of May ponds and standard errors (in thousands) in portions of Prairie Canada and the northcentral U.S.

	Prairie Canada		Northcentral U.S.[a]		Total	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
1961	1,977.20	165.40				
1962	2,369.10	184.60				
1963	2,482.00	129.30				
1964	3,370.70	173.00				
1965	4,378.80	212.20				
1966	4,554.50	229.30				
1967	4,691.20	272.10				
1968	1,985.70	120.20				
1969	3,547.60	221.90				
1970	4,875.00	251.20				
1971	4,053.40	200.40				
1972	4,009.20	250.90				
1973	2,949.50	197.60				
1974	6,390.10	308.30	1,840.80	197.20	8,230.90	366.00
1975	5,320.10	271.30	1,910.80	116.10	7,230.90	295.10
1976	4,598.80	197.10	1,391.50	99.20	5,990.30	220.70
1977	2,277.90	120.70	771.10	51.10	3,049.10	131.10
1978	3,622.10	158.00	1,590.40	81.70	5,212.40	177.90
1979	4,858.90	252.00	1,522.20	70.90	6,381.10	261.80
1980	2,140.90	107.70	761.40	35.80	2,902.30	113.50
1981	1,443.00	75.30	682.80	34.00	2,125.80	82.60
1982	3,184.90	178.60	1,458.00	86.40	4,642.80	198.40
1983	3,905.70	208.20	1,259.20	68.70	5,164.90	219.20
1984	2,473.10	196.60	1,766.20	90.80	4,239.30	216.50
1985	4,283.10	244.10	1,326.90	74.00	5,610.00	255.10
1986	4,024.70	174.40	1,734.80	74.40	5,759.50	189.60
1987	2,523.70	131.00	1,347.80	46.80	3,871.50	139.10
1988	2,110.10	132.40	790.70	39.40	2,900.80	138.10
1989	1,692.70	89.10	1,289.90	61.70	2,982.70	108.40
1990	2,817.30	138.30	691.20	45.90	3,508.50	145.70
1991	2,493.90	110.20	706.10	33.60	3,200.00	115.20
1992	2,783.90	141.60	825.00	30.80	3,608.90	144.90
1993	2,261.10	94.00	1,350.60	57.10	3,611.70	110.00
1994	3,769.10	173.90	2,215.60	88.80	5,984.80	195.30
1995	3,892.50	223.80	2,442.90	106.80	6,335.40	248.00
1996	5,002.60	184.90	2,479.70	135.30	7,482.20	229.10

Table B.1. Continued.

	Prairie Canada		Northcentral U.S.[a]		Total	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
1997	5,061.00	180.30	2,397.20	94.40	7,458.20	203.50
1998	2,521.70	133.80	2,065.30	89.20	4,586.90	160.80
1999	3,862.00	157.20	2,842.20	256.80	6,704.30	301.20
2000	2,422.50	96.10	1,524.50	99.90	3,946.90	138.60
2001	2,747.20	115.60	1,893.20	91.50	4,640.40	147.40
2002	1,439.00	105.00	1,281.00	63.40	2,720.00	122.70
2003	3,522.30	151.80	1,667.80	67.40	5,190.10	166.10
2004	2,512.60	131.00	1,407.00	101.70	3,919.60	165.80
2005	3,920.50	196.70	1,460.70	79.70	5,381.20	212.20
2006	4,449.50	221.50	1,644.40	85.40	6,093.90	237.40
2007	5,040.20	261.80	1,962.50	102.50	7,002.70	281.20
2008	3,054.80	147.60	1,376.60	71.90	4,431.40	164.20
2009	3,568.10	148.00	2,866.00	123.10	6,434.00	192.50
2010	3,728.70	203.40	2,936.30	142.30	6,665.00	248.20
2011	4,892.70	197.50	3,239.50	127.40	8,132.20	235.00
2012	3,885.10	146.50	1,658.90	52.70	5,544.00	155.60
2013	4,550.50	185.50	2,341.20	99.00	6,891.70	210.20
2014	4,629.90	168.30	2,551.30	106.50	7,181.20	199.20
2015	4,151.00	146.30	2,156.80	86.00	6,307.70	169.70
2016	3,494.50	147.20	1,518.00	52.70	5,012.50	156.40
2017	4,330.30	157.70	1,765.70	92.20	6,096.00	182.70
2018	3,660.20	147.60	1,567.20	90.20	5,227.40	173.00
2019	2,855.60	103.80	2,134.70	137.30	4,990.30	172.10

[a] No comparable survey data available for the northcentral U.S. during 1961–1973.

Table B.2. Breeding population estimates (in thousands) for total ducks[a] and mallards for states, provinces, or regions that conduct spring surveys.

	British Columbia		California		Michigan		Minnesota	
Year	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards
1955								
1956								
1957								
1958								
1959								
1960								
1961								
1962								
1963								
1964								
1965								
1966								
1967								
1968							321.0	83.7
1969							323.2	88.8
1970							324.2	113.9
1971							277.1	78.5
1972							217.2	62.2
1973							389.5	99.8
1974							281.6	72.8
1975							471.6	175.8
1976							684.1	117.8
1977							501.1	134.2
1978							462.5	146.8
1979							552.4	158.7
1980							690.6	172.0
1981							439.8	154.8
1982							465.2	120.5
1983							367.1	155.8
1984							529.7	188.1
1985							562.9	216.9
1986							520.8	233.6
1987							589.0	192.3
1988							725.2	271.7
1989							813.6	273.0
1990							807.9	232.1
1991					408.4	289.3	753.7	225.0
1992			497.4	375.8	867.5	385.8	973.3	360.9
1993			666.7	359.0	742.8	437.2	837.2	305.8
1994			483.2	311.7	683.1	420.5	1,115.6	426.5
1995			589.7	368.5	791.9	524.1	797.1	319.4
1996			843.7	536.7	680.5	378.2	889.1	314.8
1997			824.3	511.3	784.0	489.3	868.1	407.4
1998			706.8	353.9	1,068.5	523.0	693.1	368.5
1999			851.0	560.1	744.6	466.1	680.5	316.4

Table B.2. Continued.

	British Columbia		California		Michigan		Minnesota	
Year	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards
2000			562.4	347.6	793.9	427.2	747.8	318.1
2001			413.5	302.2	497.8	324.2	716.4	320.6
2002			392.0	265.3	742.5	323.2	1,171.5	366.6
2003			533.7	337.1	535.4	298.9	721.8	280.5
2004			412.8	262.4	624.5	342.0	1,008.3	375.3
2005			615.2	317.9	468.3	258.1	632.0	238.5
2006	364.4	90.4	649.4	399.4	412.2	244.6	521.1	160.7
2007	383.9	98.8	627.6	388.3	641.9	337.7	488.5	242.5
2008	377.1	81.1	554.3	297.1	437.5	200.5	739.6	297.6
2009	349.7	72.5	510.8	302.0	493.6	258.9	541.3	236.4
2010	339.3	81.1	541.3	367.9	595.3	338.3	530.7	241.9
2011	277.8	69.7	558.6	314.7	471.4	258.6	687.5	283.3
2012	313.7	75.6	529.7	387.1	860.1	439.3	468.6	225.0
2013	333.6	82.9	451.3	298.6	678.6	288.4	682.9	293.2
2014	355.8	82.6	448.7	238.7	395.3	230.1	474.4	257.0
2015	365.8	81.4	315.6	173.9	431.1	237.8	524.2	206.2
2016	321.3	74.0	417.8	263.8	502.6	278.1	787.1	250.2
2017	351.3	70.9	393.7	198.4	684.5	298.1	636.0	213.6
2018	346.3	79.3	549.2	272.9	452.4	251.4	692.6	295.4
2019	409.2	74.5	470.8	239.8	333.9	179.1	694.8	286.4

[a] Species composition for the total duck estimate varies by region.

Table B.2. Continued.

	Nevada[b]	Northeast U.S.[c]		Oregon		Washington		Wisconsin	
Year	Mallards	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards
1955									
1956									
1957									
1958									
1959	2.1								
1960	2.1								
1961	2.0								
1962	1.7								
1963	2.2								
1964	3.0								
1965	3.5								
1966	3.4								
1967	1.5								
1968	1.2								
1969	1.4								
1970	1.5								
1971	1.1								
1972	0.9								
1973	0.7							412.7	107.0
1974	0.7							435.2	94.3
1975	0.6							426.9	120.5
1976	0.6							379.5	109.9
1977	1.0							323.3	91.7
1978	0.6							271.3	61.6
1979	0.6					98.6	32.1	265.7	78.6
1980	0.9					113.7	34.1	248.1	116.5
1981	1.6					148.3	41.8	505.0	142.8
1982	1.1					146.4	49.8	218.7	89.5
1983	1.5					149.5	47.6	202.3	119.5
1984	1.4					196.3	59.3	210.0	104.8
1985	1.5					216.2	63.1	192.8	73.9
1986	1.3					203.8	60.8	262.0	110.8
1987	1.5					183.6	58.3	389.8	136.9
1988	1.3					241.8	67.2	287.1	148.9
1989	1.3					162.3	49.8	462.5	180.7
1990	1.3					168.9	56.9	328.6	151.4
1991	1.4					140.8	43.7	435.8	172.4
1992	0.9					116.3	41.0	683.8	249.7
1993	1.2	1,158.1	686.6			149.8	55.0	379.4	174.5
1994	1.4	1,297.3	856.3	323.6	116.4	123.9	52.7	571.2	283.4
1995	1.0	1,408.5	864.1	215.9	77.5	147.3	58.9	592.4	242.2
1996	1.7	1,430.9	848.6	288.4	102.2	163.3	61.6	536.3	314.4

Table B.2. Continued.

	Nevada[b]	Northeast U.S.[c]		Oregon		Washington		Wisconsin	
Year	Mallards	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards	Total ducks	Mallards
1997	2.5	1,423.5	795.2	359.5	121.2	172.8	67.0	409.3	181.0
1998	2.1	1,444.0	775.2	345.1	124.9	185.3	79.0	412.8	186.9
1999	2.3	1,522.7	880.0	320.0	125.6	200.2	86.2	476.6	248.4
2000	2.1	1,933.5	762.6	314.9	110.9	143.6	47.7	744.4	454.0
2001	2.0	1,397.4	809.4			146.4	50.5	440.1	183.5
2002	0.7	1,466.2	833.7	364.6	104.5	133.3	44.7	740.8	378.5
2003	1.7	1,266.2	731.9	246.1	89.0	127.8	39.8	533.5	261.3
2004	1.7	1,416.9	805.9	229.8	82.5	114.9	40.0	651.5	229.2
2005	0.7	1,416.2	753.6	210.4	74.1	111.5	40.8	724.3	317.2
2006	1.8	1,384.2	725.2	251.2	81.1	135.4	45.5	522.6	219.5
2007	2.1	1,500.1	687.6	319.1	92.5	128.3	46.1	470.6	210.0
2008	1.9	1,197.1	619.1	224.3	75.4	120.9	50.6	626.9	188.4
2009	12.7	1,271.1	666.8	186.0	72.6	116.5	47.5	502.4	200.5
2010	8.9	1,302.0	651.7	205.1	66.8	200.9	92.9	386.5	199.1
2011	2.3	1,265.0	586.1	158.4	61.6	157.1	71.4	513.7	187.9
2012	4.1	1,309.9	612.6	263.5	88.8	169.0	89.5	521.1	197.0
2013	8.8	1,281.8	604.2	251.7	84.3	157.2	74.4	527.3	181.2
2014	4.2	1,343.8	634.6	315.2	85.3	177.0	86.3	395.1	158.7
2015	5.5	1,197.2	540.1	279.7	87.4	193.1	86.4	372.8	176.2
2016	14.4	1,240.8	551.3	213.6	87.3	121.5	59.9	390.5	164.1
2017	6.4	1,330.8	448.5	239.9	71.7	242.2	103.4	479.1	180.9
2018	13.9	1,448.1	482.1	293.9	97.1	281.1	124.9	439.4	216.7
2019	10.0	1,307.0	564.6	251.4	83.9	248.3	126.2	413.7	204.3

[b] Survey redesigned in 2009, and not comparable with previous years.

[c] Includes all or portions of Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia.

Table B.3. Breeding population estimates and standard errors (in thousands) for 10 species of ducks from the traditional survey area (strata 1–18, 20–50, 75–77), 1955–2019.

	Mallard		Gadwall		American wigeon		Green-winged teal		Blue-winged teal	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
1955	8,777.3	457.1	651.5	149.5	3,216.8	297.8	1,807.2	291.5	5,305.2	567.6
1956	10,452.7	461.8	772.6	142.4	3,145.0	227.8	1,525.3	236.2	4,997.6	527.6
1957	9,296.9	443.5	666.8	148.2	2,919.8	291.5	1,102.9	161.2	4,299.5	467.3
1958	11,234.2	555.6	502.0	89.6	2,551.7	177.9	1,347.4	212.2	5,456.6	483.7
1959	9,024.3	466.6	590.0	72.7	3,787.7	339.2	2,653.4	459.3	5,099.3	332.7
1960	7,371.7	354.1	784.1	68.4	2,987.6	407.0	1,426.9	311.0	4,293.0	294.3
1961	7,330.0	510.5	654.8	77.5	3,048.3	319.9	1,729.3	251.5	3,655.3	298.7
1962	5,535.9	426.9	905.1	87.0	1,958.7	145.4	722.9	117.6	3,011.1	209.8
1963	6,748.8	326.8	1,055.3	89.5	1,830.8	169.9	1,242.3	226.9	3,723.6	323.0
1964	6,063.9	385.3	873.4	73.7	2,589.6	259.7	1,561.3	244.7	4,020.6	320.4
1965	5,131.7	274.8	1,260.3	114.8	2,301.1	189.4	1,282.0	151.0	3,594.5	270.4
1966	6,731.9	311.4	1,680.4	132.4	2,318.4	139.2	1,617.3	173.6	3,733.2	233.6
1967	7,509.5	338.2	1,384.6	97.8	2,325.5	136.2	1,593.7	165.7	4,491.5	305.7
1968	7,089.2	340.8	1,949.0	213.9	2,298.6	156.1	1,430.9	146.6	3,462.5	389.1
1969	7,531.6	280.2	1,573.4	100.2	2,941.4	168.6	1,491.0	103.5	4,138.6	239.5
1970	9,985.9	617.2	1,608.1	123.5	3,469.9	318.5	2,182.5	137.7	4,861.8	372.3
1971	9,416.4	459.5	1,605.6	123.0	3,272.9	186.2	1,889.3	132.9	4,610.2	322.8
1972	9,265.5	363.9	1,622.9	120.1	3,200.1	194.1	1,948.2	185.8	4,278.5	230.5
1973	8,079.2	377.5	1,245.6	90.3	2,877.9	197.4	1,949.2	131.9	3,332.5	220.3
1974	6,880.2	351.8	1,592.4	128.2	2,672.0	159.3	1,864.5	131.2	4,976.2	394.6
1975	7,726.9	344.1	1,643.9	109.0	2,778.3	192.0	1,664.8	148.1	5,885.4	337.4
1976	7,933.6	337.4	1,244.8	85.7	2,505.2	152.7	1,547.5	134.0	4,744.7	294.5
1977	7,397.1	381.8	1,299.0	126.4	2,575.1	185.9	1,285.8	87.9	4,462.8	328.4
1978	7,425.0	307.0	1,558.0	92.2	3,282.4	208.0	2,174.2	219.1	4,498.6	293.3
1979	7,883.4	327.0	1,757.9	121.0	3,106.5	198.2	2,071.7	198.5	4,875.9	297.6
1980	7,706.5	307.2	1,392.9	98.8	3,595.5	213.2	2,049.9	140.7	4,895.1	295.6
1981	6,409.7	308.4	1,395.4	120.0	2,946.0	173.0	1,910.5	141.7	3,720.6	242.1
1982	6,408.5	302.2	1,633.8	126.2	2,458.7	167.3	1,535.7	140.2	3,657.6	203.7
1983	6,456.0	286.9	1,519.2	144.3	2,636.2	181.4	1,875.0	148.0	3,366.5	197.2
1984	5,415.3	258.4	1,515.0	125.0	3,002.2	174.2	1,408.2	91.5	3,979.3	267.6
1985	4,960.9	234.7	1,303.0	98.2	2,050.7	143.7	1,475.4	100.3	3,502.4	246.3
1986	6,124.2	241.6	1,547.1	107.5	1,736.5	109.9	1,674.9	136.1	4,478.8	237.1
1987	5,789.8	217.9	1,305.6	97.1	2,012.5	134.3	2,006.2	180.4	3,528.7	220.2
1988	6,369.3	310.3	1,349.9	121.1	2,211.1	139.1	2,060.8	188.3	4,011.1	290.4
1989	5,645.4	244.1	1,414.6	106.6	1,972.9	106.0	1,841.7	166.4	3,125.3	229.8
1990	5,452.4	238.6	1,672.1	135.8	1,860.1	108.3	1,789.5	172.7	2,776.4	178.7
1991	5,444.6	205.6	1,583.7	111.8	2,254.0	139.5	1,557.8	111.3	3,763.7	270.8
1992	5,976.1	241.0	2,032.8	143.4	2,208.4	131.9	1,773.1	123.7	4,333.1	263.2
1993	5,708.3	208.9	1,755.2	107.9	2,053.0	109.3	1,694.5	112.7	3,192.9	205.6
1994	6,980.1	282.8	2,318.3	145.2	2,382.2	130.3	2,108.4	152.2	4,616.2	259.2
1995	8,269.4	287.5	2,835.7	187.5	2,614.5	136.3	2,300.6	140.3	5,140.0	253.3
1996	7,941.3	262.9	2,984.0	152.5	2,271.7	125.4	2,499.5	153.4	6,407.4	353.9
1997	9,939.7	308.5	3,897.2	264.9	3,117.6	161.6	2,506.6	142.5	6,124.3	330.7
1998	9,640.4	301.6	3,742.2	205.6	2,857.7	145.3	2,087.3	138.9	6,398.8	332.3
1999	10,805.7	344.5	3,235.5	163.8	2,920.1	185.5	2,631.0	174.6	7,149.5	364.5
2000	9,470.2	290.2	3,158.4	200.7	2,733.1	138.8	3,193.5	200.1	7,431.4	425.0
2001	7,904.0	226.9	2,679.2	136.1	2,493.5	149.6	2,508.7	156.4	5,757.0	288.8
2002	7,503.7	246.5	2,235.4	135.4	2,334.4	137.9	2,333.5	143.8	4,206.5	227.9

Table B.3. Continued.

	Mallard		Gadwall		American wigeon		Green-winged teal		Blue-winged teal	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
2003	7,949.7	267.3	2,549.0	169.9	2,551.4	156.9	2,678.5	199.7	5,518.2	312.7
2004	7,425.3	282.0	2,589.6	165.6	1,981.3	114.9	2,460.8	145.2	4,073.0	238.0
2005	6,755.3	280.8	2,179.1	131.0	2,225.1	139.2	2,156.9	125.8	4,585.5	236.3
2006	7,276.5	223.7	2,824.7	174.2	2,171.2	115.7	2,587.2	155.3	5,859.6	303.5
2007	8,307.3	285.8	3,355.9	206.2	2,806.8	152.0	2,890.3	196.1	6,707.6	362.2
2008	7,723.8	256.8	2,727.7	158.9	2,486.6	151.3	2,979.7	194.4	6,640.1	337.3
2009	8,512.4	248.3	3,053.5	166.3	2,468.6	135.4	3,443.6	219.9	7,383.8	396.8
2010	8,430.1	284.9	2,976.7	161.6	2,424.6	131.5	3,475.9	207.2	6,328.5	382.6
2011	9,182.6	267.8	3,256.9	196.9	2,084.0	110.1	2,900.1	170.7	8,948.5	418.2
2012	10,601.5	324.0	3,585.6	208.7	2,145.0	145.6	3,471.2	207.9	9,242.3	425.1
2013	10,371.9	360.6	3,351.4	204.5	2,644.3	169.2	3,053.4	173.7	7,731.7	363.2
2014	10,899.8	347.6	3,811.0	206.0	3,116.7	190.4	3,439.9	247.4	8,541.5	461.9
2015	11,643.3	361.8	3,834.1	219.4	3,037.0	199.2	4,080.9	269.8	8,547.3	401.1
2016	11,792.5	367.4	3,712.0	197.3	3,411.3	196.4	4,275.4	329.8	6,689.4	340.1
2017	10,488.5	333.9	4,180.0	209.0	2,777.1	156.0	3,605.3	233.3	7,888.9	395.8
2018	9,255.2	298.9	2,885.9	161.7	2,820.4	166.5	3,042.7	213.9	6,450.5	307.7
2019	9,423.4	284.5	3,258.7	173.5	2,832.1	215.8	3,178.2	184.4	5,427.6	318.8

Table B.3. Continued.

	Northern shoveler		Northern pintail		Redhead		Canvasback		Scaup	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
1955	1,642.8	218.7	9,775.1	656.1	539.9	98.9	589.3	87.8	5,620.1	582.1
1956	1,781.4	196.4	10,372.8	694.4	757.3	119.3	698.5	93.3	5,994.1	434.0
1957	1,476.1	181.8	6,606.9	493.4	509.1	95.7	626.1	94.7	5,766.9	411.7
1958	1,383.8	185.1	6,037.9	447.9	457.1	66.2	746.8	96.1	5,350.4	355.1
1959	1,577.6	301.1	5,872.7	371.6	498.8	55.5	488.7	50.6	7,037.6	492.3
1960	1,824.5	130.1	5,722.2	323.2	497.8	67.0	605.7	82.4	4,868.6	362.5
1961	1,383.0	166.5	4,218.2	496.2	323.3	38.8	435.3	65.7	5,380.0	442.2
1962	1,269.0	113.9	3,623.5	243.1	507.5	60.0	360.2	43.8	5,286.1	426.4
1963	1,398.4	143.8	3,846.0	255.6	413.4	61.9	506.2	74.9	5,438.4	357.9
1964	1,718.3	240.3	3,291.2	239.4	528.1	67.3	643.6	126.9	5,131.8	386.1
1965	1,423.7	114.1	3,591.9	221.9	599.3	77.7	522.1	52.8	4,640.0	411.2
1966	2,147.0	163.9	4,811.9	265.6	713.1	77.6	663.1	78.0	4,439.2	356.2
1967	2,314.7	154.6	5,277.7	341.9	735.7	79.0	502.6	45.4	4,927.7	456.1
1968	1,684.5	176.8	3,489.4	244.6	499.4	53.6	563.7	101.3	4,412.7	351.8
1969	2,156.8	117.2	5,903.9	296.2	633.2	53.6	503.5	53.7	5,139.8	378.5
1970	2,230.4	117.4	6,392.0	396.7	622.3	64.3	580.1	90.4	5,662.5	391.4
1971	2,011.4	122.7	5,847.2	368.1	534.4	57.0	450.7	55.2	5,143.3	333.8
1972	2,466.5	182.8	6,979.0	364.5	550.9	49.4	425.9	46.0	7,997.0	718.0
1973	1,619.0	112.2	4,356.2	267.0	500.8	57.7	620.5	89.1	6,257.4	523.1
1974	2,011.3	129.9	6,598.2	345.8	626.3	70.8	512.8	56.8	5,780.5	409.8
1975	1,980.8	106.7	5,900.4	267.3	831.9	93.5	595.1	56.1	6,460.0	486.0
1976	1,748.1	106.9	5,475.6	299.2	665.9	66.3	614.4	70.1	5,818.7	348.7
1977	1,451.8	82.1	3,926.1	246.8	634.0	79.9	664.0	74.9	6,260.2	362.8
1978	1,975.3	115.6	5,108.2	267.8	724.6	62.2	373.2	41.5	5,984.4	403.0
1979	2,406.5	135.6	5,376.1	274.4	697.5	63.8	582.0	59.8	7,657.9	548.6
1980	1,908.2	119.9	4,508.1	228.6	728.4	116.7	734.6	83.8	6,381.7	421.2
1981	2,333.6	177.4	3,479.5	260.5	594.9	62.0	620.8	59.1	5,990.9	414.2
1982	2,147.6	121.7	3,708.8	226.6	616.9	74.2	513.3	50.9	5,532.0	380.9
1983	1,875.7	105.3	3,510.6	178.1	711.9	83.3	526.6	58.9	7,173.8	494.9
1984	1,618.2	91.9	2,964.8	166.8	671.3	72.0	530.1	60.1	7,024.3	484.7
1985	1,702.1	125.7	2,515.5	143.0	578.2	67.1	375.9	42.9	5,098.0	333.1
1986	2,128.2	112.0	2,739.7	152.1	559.6	60.5	438.3	41.5	5,235.3	355.5
1987	1,950.2	118.4	2,628.3	159.4	502.4	54.9	450.1	77.9	4,862.7	303.8
1988	1,680.9	210.4	2,005.5	164.0	441.9	66.2	435.0	40.2	4,671.4	309.5
1989	1,538.3	95.9	2,111.9	181.3	510.7	58.5	477.4	48.4	4,342.1	291.3
1990	1,759.3	118.6	2,256.6	183.3	480.9	48.2	539.3	60.3	4,293.1	264.9
1991	1,716.2	104.6	1,803.4	131.3	445.6	42.1	491.2	66.4	5,254.9	364.9
1992	1,954.4	132.1	2,098.1	161.0	595.6	69.7	481.5	97.3	4,639.2	291.9
1993	2,046.5	114.3	2,053.4	124.2	485.4	53.1	472.1	67.6	4,080.1	249.4
1994	2,912.0	141.4	2,972.3	188.0	653.5	66.7	525.6	71.1	4,529.0	253.6
1995	2,854.9	150.3	2,757.9	177.6	888.5	90.6	770.6	92.2	4,446.4	277.6
1996	3,449.0	165.7	2,735.9	147.5	834.2	83.1	848.5	118.3	4,217.4	234.5
1997	4,120.4	194.0	3,558.0	194.2	918.3	77.2	688.8	57.2	4,112.3	224.2
1998	3,183.2	156.5	2,520.6	136.8	1,005.1	122.9	685.9	63.8	3,471.9	191.2
1999	3,889.5	202.1	3,057.9	230.5	973.4	69.5	716.0	79.1	4,411.7	227.9
2000	3,520.7	197.9	2,907.6	170.5	926.3	78.1	706.8	81.0	4,026.3	205.3
2001	3,313.5	166.8	3,296.0	266.6	712.0	70.2	579.8	52.7	3,694.0	214.9
2002	2,318.2	125.6	1,789.7	125.2	564.8	69.0	486.6	43.8	3,524.1	210.3
2003	3,619.6	221.4	2,558.2	174.8	636.8	56.6	557.6	48.0	3,734.4	225.5

Table B.3. Continued.

	Northern shoveler		Northern pintail		Redhead		Canvasback		Scaup	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
2004	2,810.4	163.9	2,184.6	155.2	605.3	51.5	617.2	64.6	3,807.2	202.3
2005	3,591.5	178.6	2,560.5	146.8	592.3	51.7	520.6	52.9	3,386.9	196.4
2006	3,680.2	236.5	3,386.4	198.7	916.3	86.1	691.0	69.6	3,246.7	166.9
2007	4,552.8	247.5	3,335.3	160.4	1,009.0	84.7	864.9	86.2	3,452.2	195.3
2008	3,507.8	168.4	2,612.8	143.0	1,056.0	120.4	488.7	45.4	3,738.3	220.1
2009	4,376.3	224.1	3,225.0	166.9	1,044.1	106.3	662.1	57.4	4,172.1	232.3
2010	4,057.4	198.4	3,508.6	216.4	1,064.2	99.5	585.2	50.8	4,244.4	247.9
2011	4,641.0	232.8	4,428.6	267.9	1,356.1	128.3	691.6	46.0	4,319.3	261.1
2012	5,017.6	254.2	3,473.1	192.4	1,269.9	99.2	759.9	68.5	5,238.6	296.8
2013	4,751.0	202.3	3,335.0	188.4	1,202.2	90.5	787.0	57.6	4,165.7	250.8
2014	5,278.9	265.3	3,220.3	179.7	1,278.7	102.5	685.3	50.7	4,611.1	253.3
2015	4,391.4	219.0	3,043.0	182.5	1,195.9	92.9	757.3	63.3	4,395.3	252.5
2016	3,966.9	189.0	2,618.5	204.2	1,288.8	115.4	736.5	68.8	4,991.7	297.6
2017	4,353.1	202.3	2,889.2	206.2	1,115.4	91.8	732.5	61.7	4,371.7	228.7
2018	4,207.9	196.5	2,365.3	150.2	999.0	85.3	686.1	59.1	3,989.3	212.5
2019	3,649.2	169.0	2,268.5	123.3	732.2	63.7	651.9	49.1	3,590.8	207.0

Table B.4. Total breeding duck estimates for the traditional survey area, in thousands.

	Traditional Survey Area[a]	
Year	$\widehat{N}$	$\widehat{SE}$
1955	39,603.6	1,264.0
1956	42,035.2	1,177.3
1957	34,197.1	1,016.6
1958	36,528.1	1,013.6
1959	40,089.9	1,103.6
1960	32,080.5	876.8
1961	29,829.0	1,009.0
1962	25,038.9	740.6
1963	27,609.5	736.6
1964	27,768.8	827.5
1965	25,903.1	694.4
1966	30,574.2	689.5
1967	32,688.6	796.1
1968	28,971.2	789.4
1969	33,760.9	674.6
1970	39,676.3	1,008.1
1971	36,905.1	821.8
1972	40,748.0	987.1
1973	32,573.9	805.3
1974	35,422.5	819.5
1975	37,792.8	836.2
1976	34,342.3	707.8
1977	32,049.0	743.8
1978	35,505.6	745.4
1979	38,622.0	843.4
1980	36,224.4	737.9
1981	32,267.3	734.9
1982	30,784.0	678.8
1983	32,635.2	725.8
1984	31,004.9	716.5
1985	25,638.3	574.9
1986	29,092.8	609.3
1987	27,412.1	562.1
1988	27,361.7	660.8
1989	25,112.8	555.4
1990	25,079.2	539.9
1991	26,605.6	588.7
1992	29,417.9	605.6
1993	26,312.4	493.9
1994	32,523.5	598.2
1995	35,869.6	629.4
1996	37,753.0	779.6

Table B.4. Continued.

Year	Traditional Survey Area[a]	
	$\widehat{N}$	$\widehat{SE}$
1997	42,556.3	718.9
1998	39,081.9	652.0
1999	43,435.8	733.9
2000	41,838.3	740.2
2001	36,177.5	633.1
2002	31,181.1	547.8
2003	36,225.1	664.7
2004	32,164.0	579.8
2005	31,734.9	555.2
2006	36,160.3	614.4
2007	41,172.2	724.8
2008	37,276.5	638.3
2009	42,004.8	701.9
2010	40,893.8	718.4
2011	45,554.3	766.5
2012	48,575.3	796.8
2013	45,607.3	749.8
2014	49,152.2	831.1
2015	49,521.7	812.1
2016	48,362.8	827.6
2017	47,265.6	773.6
2018	41,193.2	662.1
2019	38,898.9	658.3

[a] Total ducks in the traditional survey area include species in Appendix B.3 plus American black ducks, ring-necked duck, goldeneyes, bufflehead, and ruddy duck.

Table B.5. Breeding population estimates and 90% credibility intervals (in thousands) for the six most abundant species of ducks in the eastern survey area, 1990–2019[a].

	Mallard		American black duck		Green-winged teal		Ring-necked duck		Goldeneyes[b]		Mergansers[c]	
Year	$\widehat{N}$	90% CI	$\widehat{N}$	90% CI	$\widehat{N}$	90% CI	$\widehat{N}$	90% CI	$\widehat{N}$	90% CI	$\widehat{N}$	90% CI
1998	1,421.8	(1,226.5, 1,623.8)	939.9	(791.4, 1,103.6)	300.3	(212.8, 400.5)	585.8	(429.7, 765.4)	550.5	(379.6, 763.6)	560.3	(456.2, 666.8)
1999	1,415.8	(1,228.2, 1,623.7)	919.6	(791.1, 1,055.5)	388.7	(283.4, 508.0)	694.8	(518.1, 923.0)	659.9	(474.6, 872.0)	588.1	(489.9, 691.6)
2000	1,364.6	(1,178.0, 1,548.3)	806.7	(711.8, 909.0)	356.7	(268.2, 458.6)	921.0	(587.8, 1,434.3)	642.5	(442.0, 896.1)	578.5	(484.8, 677.1)
2001	1,374.1	(1,196.7, 1,577.7)	797.4	(685.7, 909.9)	298.5	(218.4, 387.0)	658.4	(490.3, 849.1)	746.2	(507.6, 1,018.0)	554.1	(462.6, 647.6)
2002	1,357.4	(1,176.9, 1,548.8)	972.7	(834.2, 1,126.5)	405.6	(294.6, 519.9)	669.7	(502.6, 844.8)	852.6	(578.3, 1,191.0)	772.6	(655.0, 904.1)
2003	1,330.7	(1,151.6, 1,529.1)	900.6	(761.4, 1,054.0)	393.0	(285.5, 523.8)	670.1	(530.6, 837.1)	644.8	(435.0, 922.8)	667.5	(563.7, 785.2)
2004	1,328.6	(1,137.2, 1,521.9)	932.4	(775.9, 1,102.9)	463.5	(334.3, 611.0)	737.5	(554.9, 963.0)	592.5	(419.7, 795.9)	681.5	(577.8, 797.1)
2005	1,290.1	(1,109.2, 1,487.8)	813.6	(703.8, 939.5)	340.4	(245.8, 456.4)	622.5	(492.8, 772.0)	517.0	(381.3, 684.1)	652.4	(550.8, 762.5)
2006	1,247.6	(1,072.1, 1,426.8)	873.9	(747.4, 1,014.4)	333.2	(240.8, 441.4)	654.2	(510.3, 824.9)	474.0	(347.8, 624.6)	583.1	(491.0, 680.3)
2007	1,268.9	(1,087.7, 1,480.6)	942.8	(815.8, 1,070.2)	440.6	(299.2, 640.5)	833.0	(652.9, 1,030.1)	661.3	(473.9, 905.0)	666.2	(558.5, 780.9)
2008	1,241.5	(1,066.5, 1,446.5)	846.3	(719.6, 988.0)	406.3	(284.3, 553.7)	671.3	(500.8, 854.8)	626.8	(437.6, 862.0)	601.1	(507.7, 702.7)
2009	1,231.5	(1,046.8, 1,434.1)	872.6	(718.8, 1,048.2)	429.0	(300.9, 588.1)	683.9	(505.5, 889.9)	541.9	(379.7, 732.0)	630.0	(534.4, 743.2)
2010	1,141.9	(979.2 , 1,311.7)	759.8	(639.1, 889.5)	417.1	(293.0, 577.7)	675.9	(509.3, 851.8)	534.8	(369.4, 727.1)	525.3	(442.2, 621.2)
2011	1,183.6	(1,001.6, 1,379.1)	816.9	(667.0, 986.6)	402.3	(275.7, 561.3)	609.3	(470.1, 761.1)	545.9	(393.7, 735.4)	567.8	(477.0, 670.9)
2012	1,158.0	(987.7 , 1,336.0)	879.6	(738.8, 1,035.5)	364.7	(256.8, 495.4)	633.1	(470.4, 806.2)	574.7	(383.0, 819.3)	591.2	(498.0, 693.0)
2013	1,225.0	(1,017.5, 1,462.0)	874.4	(709.5, 1,062.0)	400.1	(277.0, 554.7)	783.2	(558.5, 1,048.3)	620.3	(432.3, 877.4)	633.3	(524.6, 773.3)
2014	1,154.8	(982.3 , 1,353.9)	868.1	(719.9, 1,025.3)	305.8	(214.9, 414.3)	596.8	(456.6, 757.6)	580.0	(368.1, 884.7)	558.3	(471.3, 657.4)
2015	1,109.1	(950.0 , 1,296.9)	861.3	(689.3, 1,067.1)	312.6	(219.0, 427.1)	713.2	(501.2, 992.8)	439.0	(312.8, 592.8)	552.5	(464.8, 649.4)
2016	1,097.5	(932.3 , 1,282.6)	936.0	(752.6, 1,146.9)	319.4	(224.2, 445.2)	732.6	(551.8, 947.1)	503.4	(345.2, 708.2)	599.7	(505.5, 706.1)
2017	1,113.8	(933.1 , 1,299.9)	763.1	(633.9, 898.2)	344.7	(249.3, 454.8)	611.9	(454.2, 810.4)	561.6	(383.5, 797.7)	698.7	(586.3, 814.0)
2018	1,066.5	(901.7 , 1,238.0)	695.2	(595.4, 797.9)	339.5	(241.2, 457.1)	627.5	(470.8, 826.8)	489.1	(337.5, 678.9)	666.9	(565.8, 780.5)
2019	1,049.8	(894.9 , 1,221.5)	729.4	(626.0, 832.7)	302.8	(214.6, 401.8)	693.5	(514.0, 924.7)	515.9	(347.4, 738.0)	643.4	(540.4, 747.8)

[a] Estimates for six most abundant species in the eastern survey area. Estimates for black ducks, green-winged teal, ring-necked ducks, goldeneye, and mergansers are at the eastern survey scale (strata 51–53, 56, 62–72) and mallards at the eastern North America scale (eastern survey area plus Virginia north to New Hampshire)

[b] Common and Barrow's.

[c] Common, red-breasted, and hooded.

C. Historical estimates of goose and swan populations

Table C.1. Abundance indices (in thousands) for North American Canada and cackling goose populations, 1969–2020.

	North Atlantic[a,b]		Atlantic[a,b]		Atlantic Flyway Resident[a]		Southern Hudson Bay[a]		Mississippi Flyway Giant[a]
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$
1969/70									
1970/71									
1971/72									
1972/73									
1973/74									
1974/75									
1975/76									
1976/77									
1977/78									
1978/79									
1979/80									
1980/81									
1981/82									
1982/83									
1983/84									
1984/85									
1985/86									
1986/87									
1987/88									
1988/89									
1989/90	45.1	8.7							
1990/91	45.7	8.6							
1991/92	42.5	8.0							
1992/93	50.1	9.6	93.0	12.5	647.5	111.8			732.7
1993/94	47.7	8.7	43.2	4.0	648.7	73.0			785.7
1994/95	45.9	8.5	34.0	3.0	780.0	98.8			855.2
1995/96	59.4	11.3	51.5	4.8	932.7	107.4			1,085.8
1996/97	54.9	9.6	72.1	6.6	1,013.3	132.5			944.8
1997/98	50.6	8.5	48.6	4.5	970.1	115.7			1,064.4
1998/99	61.1	11.0	83.7	7.6	999.5	120.8			1,221.2
1999/00	51.1	8.6	95.8	8.4	1,022.3	101.9			1,443.1
2000/01	51.0	8.9	135.2	12.5	1,016.6	89.3			1,205.2
2001/02	51.1	8.6	182.4	17.6	1,097.1	95.1			1,269.9
2002/03	48.6	8.3	174.9	17.2	1,126.7	94.5			1,443.2
2003/04	53.6	9.3	191.8	19.2	1,073.1	93.8			1,211.5
2004/05	46.6	8.0	175.7	16.7	1,167.1	102.3			1,197.2
2005/06	47.8	8.1	186.1	20.0	1,144.0	106.2			1,406.4
2006/07	53.0	9.0	207.3	21.1	1,128.0	94.5			1,319.5
2007/08	48.2	8.1	174.0	18.2	1,024.9	82.1			1,312.6

Table C.1. Continued.

Year	North Atlantic[a,b]		Atlantic[a,b]		Atlantic Flyway Resident[a]		Southern Hudson Bay[a]		Mississippi Flyway Giant[a]
	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$
2008/09	50.6	8.5	186.8	19.7	1,006.1	74.8			1,327.7
2009/10	49.2	8.2	165.1	17.5	969.9	92.1			1,474.3
2010/11	52.0	8.8	216.0	23.2	1,015.1	86.5			1,456.4
2011/12	51.8	8.6	190.3	20.4	879.8	71.6			1,490.2
2012/13	53.4	9.2			951.9	79.1			1,541.4
2013/14	55.6	9.2	191.2	20.1	1,084.9	114.4			1,299.7
2014/15	51.8	8.7	161.3	16.0	963.8	81.7			1,513.4
2015/16	50.6	8.4	191.5	24.9	950.0	80.1	69.6	1.3	1,444.3
2016/17	48.8	8.3	161.1	17.2	933.3	74.0	89.7	1.8	1,588.7
2017/18	54.1	8.9	112.2	11.3	1,030.9	83.2	85.7	1.8	1,562.8
2018/19	52.5	8.5	119.5	12.0	1,039.5	91.3	74.5	1.8	1,500.6
2019/20									

[a] Surveys conducted in spring.
[b] Number of breeding pairs.
[c] Lincoln estimates of adults.
[d] Fall-winter indices.

Table C.1. Continued.

Year	W. Prairie & Great Plains[a]		Mid-continent[c]		Hi-line[a]		Rocky Mountain[a]		Pacific[a]	
	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
1969/70	80.4				58.3	39.2	29.1	16.7		
1970/71	98.9				99.0	54.3	47.2	23.3		
1971/72	83.0				52.4	27.8	26.7	16.7		
1972/73	78.8				29.5	12.5	28.6	15.3		
1973/74	66.8				32.9	16.2	32.4	16.5		
1974/75	74.4				28.0	14.9	31.6	15.7		
1975/76	99.9	43.7			39.3	18.3	20.1	11.9		
1976/77	94.0	42.0			39.4	16.3	19.6	10.3		
1977/78	227.9	135.4			38.1	18.8	28.6	14.0		
1978/79	174.7	92.0			48.9	23.2	43.5	21.6		
1979/80	152.1	69.0			49.3	22.5	24.2	12.1		
1980/81	184.9	66.2			48.7	19.8	47.8	25.8		
1981/82	162.1	50.1			52.4	21.3	47.8	21.0		
1982/83	214.2	86.5			71.5	27.7	30.7	14.2		
1983/84	182.4	64.2			103.1	40.5	32.7	14.6		
1984/85	217.7	68.7			89.1	34.6	35.3	16.2		
1985/86	232.1	81.3			98.2	35.4	51.1	26.1		
1986/87	235.0	97.1			90.6	37.8	50.1	24.2		
1987/88	338.9	103.3			126.0	49.3	78.4	40.2		
1988/89	418.3	136.2			120.6	49.7	74.1	35.8		
1989/90	366.3	126.5			180.9	75.6	69.6	36.3		
1990/91	318.2	109.6			143.7	55.9	63.3	30.2		
1991/92	328.1	91.9			163.8	66.0	79.3	35.5		
1992/93	346.5	113.1			153.7	67.0	89.4	38.9		
1993/94	371.0	124.5			156.2	57.8	119.0	53.0		
1994/95	417.7	127.5			230.3	93.1	118.3	54.8		
1995/96	451.4	49.8			196.2	24.1	126.8	20.1		
1996/97	487.3	50.0			203.7	24.1	85.0	15.3		
1997/98	587.1	63.0			252.0	34.3	137.8	25.1		
1998/99	702.1	76.8			196.6	22.3	99.1	15.3		
1999/00	717.7	61.6			279.3	34.9	165.1	29.8		
2000/01	704.5	63.8			252.8	29.0	161.4	21.6		
2001/02	670.9	54.6			231.0	26.1	134.7	25.2		
2002/03	764.1	62.8			231.5	34.4	134.3	19.6		
2003/04	797.7	68.5			200.5	25.6	152.5	27.5		
2004/05	775.6	65.9	3,384.2	751.8	236.2	25.2	151.8	15.4		
2005/06	816.1	62.8	3,952.0	642.8	208.0	22.2	130.7	17.7		
2006/07	979.6	68.3	2,660.6	494.8	298.8	30.5	137.2	19.9		

Table C.1. Continued.

Year	W. Prairie & Great Plains[a]		Mid-continent[c]		Hi-line[a]		Rocky Mountain[a]		Pacific[a]	
	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
2007/08	957.1	66.5	2,452.1	528.6	337.3	38.4	205.6	32.0		
2008/09	1,049.7	71.8	3,880.9	892.5	298.4	32.5	118.4	12.8		
2009/10	1,111.1	82.0	4,324.3	995.3	269.5	29.9	137.3	22.4	209.9	27.7
2010/11	1,309.9	93.4	2,906.0	593.1	265.4	33.6	98.1	13.1	265.3	31.9
2011/12	1,369.6	109.0	3,059.4	600.4	483.6	64.4	137.0	20.7	283.4	27.5
2012/13	1,314.7	65.5	3,809.9	788.7	325.5	35.3	153.2	16.8	315.1	40.7
2013/14	1,183.4	72.8	3,291.9	631.7	275.9	31.5	111.3	14.9	227.8	22.0
2014/15	1,223.1	75.3	1,853.0	367.5	368.5	36.6	158.2	22.0	328.0	38.5
2015/16	1,517.7	91.2	2,479.3	495.6	453.9	50.8	251.6	32.4	311.4	30.7
2016/17	1,352.8	84.8	2,499.1	492.1	374.6	35.4	187.7	23.7	296.7	29.9
2017/18	1,349.7	85.2	2,802.0	529.9	409.2	33.4	252.7	32.7	350.7	40.9
2018/19	1,443.4	94.4			374.9	33.5	175.7	20.0	347.0	42.3
2019/20										

[a] Surveys conducted in spring.
[b] Breeding pairs.
[c] Lincoln estimate.
[d] Fall-winter indices

Table C.1. Continued.

	Dusky[a]		Cackling/minima[d]		Lesser[a]		Taverner's[a]		Aleutian[d]	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
1969/70					12.7	5.1				
1970/71					8.2	3.3				
1971/72					3.4	1.2				
1972/73					6.4	1.3				
1973/74					21.2	14.6				
1974/75					6.9	1.7			0.8	
1975/76					3.0	0.8			0.9	
1976/77					4.7	1.3			1.3	
1977/78					6.9	2.2			1.5	
1978/79					6.5	1.8			1.6	
1979/80					12.9	3.3			1.7	
1980/81					18.4	3.9			2.0	
1981/82					16.0	5.1			2.7	
1982/83					3.4	1.1			3.5	
1983/84					13.8	4.3			3.8	
1984/85			47.3	4.3	9.6	3.3			4.2	
1985/86	16.7	2.8	44.5	3.1	6.7	2.6			4.3	
1986/87	14.9	1.8	61.3	4.3	4.6	1.2			5.0	
1987/88	15.1	1.8	83.4	5.3	6.8	1.4			5.4	
1988/89	17.0	2.0	87.7	5.4	7.1	2.1			5.8	
1989/90	15.2	2.7	112.9	7.1	11.7	3.8			6.3	
1990/91	10.3	1.8	101.8	6.3	4.3	1.9			7.0	
1991/92	16.6	2.0	152.6	9.4	9.1	4.5			7.7	
1992/93	15.1	1.7	155.8	9.1	5.9	1.5			11.7	
1993/94	15.2	1.6	220.7	12.6	16.7	4.9			15.7	
1994/95	11.7	1.3	238.6	14.0	9.6	2.8			19.2	
1995/96	11.4	1.1	252.5	14.8	7.7	2.5			15.5	0.6
1996/97	12.8	1.2	298.9	17.3	5.0	1.1			20.4	0.8
1997/98	14.5	1.4	211.8	13.1	5.7	1.9			32.4	1.1
1998/99	10.2	1.0	240.2	14.0	5.7	2.2			35.3	3.1
1999/00	10.0	0.9	247.8	14.2	9.3	4.3			34.2	1.3
2000/01	11.0	1.1	262.7	15.7	6.1	1.9			88.3	18.7
2001/02	12.4	1.2	169.5	9.9	4.9	1.3			65.2	12.9
2002/03	9.9	0.9	242.5	14.2	6.3	2.2			73.0	2.8
2003/04	11.2	1.1	177.1	10.3	6.3	1.9			111.1	4.4
2004/05	16.5	2.0	227.9	13.5	4.8	1.4			87.8	4.8
2005/06	10.8	1.1	255.2	15.0	4.2	0.9			97.2	4.5
2006/07	10.1	1.0	267.3	15.0	9.5	4.0	54.2	6.0	117.3	9.8
2007/08	9.1	0.9	294.6	16.9	10.3	3.8	51.1	9.8	116.1	7.4

Table C.1. Continued.

	Dusky[a]		Cackling/minima[d]		Lesser[a]		Taverner's[a]		Aleutian[d]	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$
2008/09	6.6	0.6	240.2	14.0	6.4	2.1	48.9	6.8	81.8	13.3
2009/10	9.3	0.9	290.7	19.2	6.8	2.0	57.1	4.9	106.7	9.0
2010/11	11.3	1.1	194.1	11.3	3.6	2.0	35.0	3.1	105.3	8.4
2011/12	12.8	1.3	210.9	12.8	3.8	1.6	46.4	5.5	135.9	10.9
2012/13			324.7	21.0	4.1	1.8	27.2	3.6	166.3	15.9
2013/14	14.5	1.4	288.0	18.6	2.3	0.8	48.3	8.7	150.0	13.1
2014/15	18.3	1.7	364.1	23.7	4.0	1.0	42.5	6.6	197.7	17.8
2015/16	16.2	1.6	335.1	19.1	6.5	1.8	54.0	6.8	154.7	13.4
2016/17	13.9	1.4	292.0	16.5	2.8	1.3	42.0	5.6	168.5	20.3
2017/18	11.6	0.9	208.2	12.4	2.0	0.7	44.5	6.4	171.3	16.2
2018/19	17.7	2.5	205.3	12.2	13.1	7.0	58.9	5.2	199.5	27.8
2019/20									118.4	12.7

[a] Surveys conducted in spring.
[b] Breeding pairs.
[c] Lincoln estimate.
[d] Fall-winter indices

Table C.2. Abundance indices (in thousands) for Ross's and snow goose populations, 1969–2020.

			Snow Geese					
	Ross's geese[a]		Mid-continent[c]		Pacific Flyway[b]	Wrangel Island[a]	Greater [a]	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{SE}$
1969/70			1,152.2	207.2			89.6	
1970/71			1,172.4	235.0			123.3	
1971/72			1,051.4	164.0			134.8	
1972/73			1,164.1	182.8			143.0	
1973/74			1,859.4	301.6			165.0	
1974/75			1,080.7	191.4		56.0	153.8	
1975/76			1,298.6	214.5		58.0	165.6	
1976/77			1,822.6	242.2		68.2	160.0	
1977/78			2,664.5	287.4		65.4	192.6	
1978/79			1,774.6	228.5		84.5	170.1	
1979/80			1,951.5	317.0	528.1	90.7	180.0	
1980/81			1,573.1	265.4	204.2	89.0	170.8	
1981/82			1,785.5	301.5	759.9	100.0	163.0	
1982/83			2,691.5	480.3	354.1	95.0	185.0	
1983/84			2,507.6	462.3	547.6	85.0	225.4	
1984/85			2,745.6	491.5	466.3	85.0	260.0	
1985/86			4,169.5	930.7	549.8	90.0	303.5	
1986/87			2,037.0	344.8	521.7	100.0	255.0	
1987/88			3,005.4	557.7	525.3	80.0	363.8	
1988/89			5,046.5	1,060.9	441.0	70.0	363.2	
1989/90			4,456.1	887.3	463.9	60.0	368.3	
1990/91			3,936.5	749.8	708.5	60.0	352.6	15.7
1991/92			5,403.3	977.6	690.1	70.0	448.1	20.1
1992/93	244.5	13.5	5,351.2	1,154.1	639.3	65.0	498.4	20.8
1993/94	186.9	8.2	11,132.4	2,846.9	569.2	70.0	591.4	26.5
1994/95	167.5	8.4	7,777.5	1,724.5	478.2	65.0	616.6	25.1
1995/96	233.2	13.9	7,218.9	2,295.1	501.4	75.0	669.1	33.9
1996/97	221.7	10.4	12,412.6	2,630.3	366.3	85.0	657.5	28.0
1997/98	313.8	12.8	9,685.0	977.7	416.4	90.0	836.6	49.2
1998/99	410.4	18.9	11,449.9	1,177.2	354.3	90.0	1,008.0	32.3
1999/00	378.9	13.7	13,519.1	1,078.8	579.0	95.0	816.5	90.5
2000/01	487.8	21.3	14,443.1	1,287.1	656.8	105.0	837.4	31.6
2001/02	387.1	15.1	14,848.4	1,329.2	448.2	110.0	725.0	28.0
2002/03	513.1	19.7	10,552.5	978.0	596.8	115.0	721.0	28.2
2003/04	493.3	17.0	14,479.0	1,182.6	587.8	117.5	890.0	41.4
2004/05	584.6	20.3	14,481.7	1,209.4	750.3	117.5	880.0	30.2
2005/06	559.6	17.2	13,541.9	1,200.3	710.7	132.5	938.0	40.2
2006/07	742.8	19.8	18,864.5	1,472.9	799.7	140.0	838.0	38.1
2007/08	730.9	47.3	16,848.8	1,638.8	1,073.5	140.0	718.0	104.1

Table C.2. continued.

			Snow Geese					
	Ross's geese[a]		Mid-continent[c]		Pacific Flyway[b]	Wrangel Island[a]	Greater [a]	
Year	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{SE}$
2008/09	726.3	24.5	16,751.4	2,140.7	957.4	132.5	1,009.0	31.6
2009/10	742.3	20.3	10,073.7	954.9	901.0	150.0	824.0	139.8
2010/11	702.3	28.0	15,938.5	1,532.3	863.8	155.0	917.0	18.9
2011/12	931.6	46.8	16,310.7	1,508.7	1,097.9		1,005.0	43.4
2012/13	540.6	18.8	16,131.3	1,514.1	881.4	160.0	921.0	32.1
2013/14	665.0	33.4	15,618.4	1,419.4	1,351.2		796.0	32.1
2014/15	629.5	19.1	10,494.8	987.0	1,199.6	240.0	818.0	31.1
2015/16	575.5	17.0	13,309.6	1,099.7		300.0	915.0	52.6
2016/17	444.2	15.9	11,483.0	1,066.9	1,906.8	346.0	747.0	37.2
2017/18	367.7	15.0	9,916.7	1,182.2	1,355.2	306.0	877.0	49.0
2018/19	233.3	10.8			1,413.8	442.0	714.0	42.9
2019/20						684.8		

[a] Surveys conducted in spring.
[b] Fall-winter indices.
[c] Lincoln estimates.

Table C.3. Abundance indices (in thousands) of North American white-fronted geese, brant, emperor geese, and tundra swan populations, 1969–2020.

	White-fronted geese		Brant				Tundra swans		
	Pacific[b]	Mid-continent[b]	Atlantic[b]	Pacific[b]	Emperor geese[a]		Western[a]		Eastern[b]
Year	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$
1969/70			106.5	141.7					
1970/71			151.0	149.2					
1971/72			73.3	124.8					
1972/73			40.8	125.0					
1973/74			88.1	130.7					
1974/75			88.4	123.4					
1975/76			127.0	122.0					
1976/77			73.8	147.0					
1977/78			46.7	162.9					
1978/79			42.0	129.4					
1979/80			59.2	146.4					60.1
1980/81			97.0	197.5					93.0
1981/82			104.5	121.0					73.2
1982/83			123.5	109.3					87.5
1983/84			127.3	135.0					81.4
1984/85	163.2		146.3	145.1	18.8	1.6	96.3	13.7	96.9
1985/86	141.9		110.4	134.2	11.6	0.7	70.1	5.3	90.9
1986/87	140.0		109.4	110.9	10.9	0.9	77.0	10.8	95.8
1987/88	186.7		131.2	145.0	13.4	0.8	83.2	13.8	78.7
1988/89	198.1		137.9	135.6	14.5	0.8	108.9	17.8	91.3
1989/90	220.0		135.4	151.7	15.2	0.9	113.0	20.1	90.6
1990/91	196.5		147.7	132.7	12.6	1.0	85.2	14.1	98.2
1991/92	218.8		184.8	117.8	13.3	0.7	72.8	4.7	113.0
1992/93	234.1	622.9	100.6	125.0	15.5	1.0	79.8	13.1	78.2
1993/94	258.9	676.3	157.2	129.3	17.1	0.8	83.6	7.5	84.8
1994/95	302.2	727.3	148.2	133.5	17.5	0.9	120.0	34.1	85.1
1995/96	374.6	1,129.4	105.9	128.0	23.6	2.3	110.2	19.2	79.5
1996/97	370.5	742.5	129.1	155.3	22.5	1.3	114.6	10.9	92.4
1997/98	388.0	622.2	138.0	138.8	19.8	1.1	129.2	13.6	100.6
1998/99	393.4	1,058.3	171.6	132.3	20.3	1.2	118.5	14.5	111.0
1999/00	352.7	963.1	157.2	135.6	17.3	0.7	108.7	12.0	115.3
2000/01	438.9	1,067.6	145.3	126.0	27.7	1.2	93.7	8.2	98.4
2001/02	359.7	712.3	181.6	138.2	19.3	1.0	117.1	14.9	114.7
2002/03	422.0	669.7	164.5	106.1	20.9	1.4	95.6	7.8	111.7
2003/04	374.9	528.2	129.6	121.3	21.5	0.9	111.7	20.1	110.8
2004/05	443.9	644.3	123.2	107.2	20.7	1.2	122.9	21.1	72.5
2005/06	509.3	522.8	146.6	141.0	26.7	1.4	124.4	12.9	81.3
2006/07	604.7	751.3	150.6	130.6	26.3	1.6	155.6	22.1	114.4
2007/08	627.0	764.3	161.6	157.0	22.5	0.9	174.3	31.8	96.2

Table C.3. Continued.

	White-fronted geese		Brant				Tundra swans		
	Pacific[b]	Mid-continent[b]	Atlantic[b]	Pacific[b]	Emperor geese[a]		Western[a]		Eastern[b]
Year	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$	$\widehat{SE}$	$\widehat{N}$
2008/09	536.7	751.7	151.3		20.5	0.8	107.2	7.7	100.2
2009/10	649.8	583.2	139.4	163.5	19.9	0.9	110.6	8.8	97.3
2010/11	604.3	709.8	148.9	162.5	21.3	1.0	120.1	16.3	97.6
2011/12	664.2	685.7	149.2	177.3	20.6	1.4	114.6	9.2	111.7
2012/13	579.9	777.9	111.8	163.3	29.9	1.8	110.2	17.6	107.1
2013/14	637.2		132.9	173.3	31.8	2.8	88.6	9.1	105.0
2014/15	479.1	1,005.6	111.4	136.5	28.6	1.4	133.4	22.6	117.1
2015/16	685.5	977.1	157.9	140.0	34.2	2.0	115.2	21.5	113.6
2016/17	735.6	1,000.1	161.7	155.7	30.1	1.5	129.9	26.9	119.3
2017/18	590.0	771.6	169.7	132.5	30.2	1.5	151.7	26.1	111.6
2018/19	479.3	774.1	120.1	161.2	26.6	1.2	101.1	11.8	92.8
2019/20		1,266.9	139.9	142.6					78.6

[a] Surveys conducted in spring.
[b] Fall-winter indices.

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