

Appendix A. Summary of information on relative abundance and trends for North American sea ducks. Many of these surveys are of small geographic scale, relatively short time series, or periodic counts or surveys. Abundance indices are not estimates of true population size and should be used with caution. Life stage abbreviations: B = breeding (summer), M = molting, FM = fall migrating, SM = spring migrating, N = non-breeding (summer), W = wintering. Survey platform abbreviations: B = boat, F = fixed-wing aircraft, H = helicopter, G = ground. Species Abbreviations: COEI: common eider (*Somateria mollissima*); KIEI (*Somateria spectabilis*); STEI (*Polysticta stelleri*); SPEI (*Somateria fischeri*); SUSC (*Melanitta perspicillata*); WWSC (*Melanitta fusca*); BLSC (*Melanitta americana*); LTDU (*Clangula hyemalis*); HARD (*Histrionicus histrionicus*); COGO (*Bucephala clangula*); BAGO (*Bucephala islandica*); BUFF (*Bucephala albeola*); COME (*Mergus merganser*); RBME (*Mergus serrator*); HOME (*Lophodytes cucullatus*).

Species (subspecies)	Geographic region	Life stage (survey platform)	Years Surveyed	Population Trajectory	Recent Abundance Index and unit of measure (year(s))	Source
COEI (<i>v-nigra</i>)	Northern Alaska and western Canada (Pt. Barrow, Alaska migration counts)	SM (G)	1976, 1987, 1994, 1996, 2003	decreasing (1976-1994); increasing (1996-2003)	119,809 individuals (2003) ⁵	Suydam et al. 2004
	Nearshore waters off Alaska arctic coastal plain	B (F)	1999-2009	stable	1931 total indicated birds (2009) ¹	C. P. Dau and K. S. Bollinger, U.S. Fish and Wildlife Service, unpublished report
	Nearshore waters in northwest Alaska	B (F)	2008-2009	na	4326 total indicated birds (2008-2009) ¹	K. S. Bollinger and R. M. Platte, U.S. Fish and Wildlife Service, unpublished report
	Yukon-Kuskokwim Delta, Alaska	B (G)	1985-2012	increasing	3500 nests (2008-2012) ⁴	J. B. Fischer and R. A. Stehn, U.S. Fish and Wildlife Service, unpublished report
	Yukon-Kuskokwim Delta, Alaska	B (F)	1988-2012	increasing	1500 total indicated birds (2008-2012) ¹	R. M. Platte and R. A. Stehn, U.S. Fish and Wildlife Service, unpublished report
	Nunavak Island, Alaska	B (G)	2009	na	300 nests (2009) ⁶	T. D. Bowman and C. Norment, U. S. Fish and Wildlife Service, unpublished report
	Alutian Islands, Alaska	B (B,G)	1976-2005, piecemeal and interm	unknown	27,000 individuals (1976-2005) ¹	U.S. Fish and Wildlife Service, unpublished report
	Bathurst Inlet, Nunavut	B (H)	1995, 2007, 2008	decreasing	8888 breeding birds (2007-2008) ¹	Raven and Dickson 2009
	Mingan Archipelago National Park Preserve	B (G)	1988, 1998	increasing	5300 pairs (1998) ²	Roberge 2002
	Atlantic Coast	W (F)	2008-2011	na	251,400 individuals (2008-2011) ¹	E. D. Silverman et al., U.S. Fish and Wildlife Service, unpublished report
COEI (<i>dresseri</i>)	North shore, Gulf of St. Lawrence, Quebec	B (G)	1925-2005	increasing	25,570 individuals (2005) ¹	Rail and Cotter 2007
	St. Lawrence River Estuary	B (G)	1965-2013	decreasing (2001-2006); stable (2006-2013)	17,700 nests (2013) ²	Banque informatisée des oiseaux marins du Québec, Canadian Wildlife Service, Quebec Region
	Northern Newfoundland	B (G)	1990-2001	increasing	3,500 nests (1990,1991,1993,1996,2000,2001) ²	S. G. Gilliland, Canadian Wildlife Service, unpublished data
	Northern Newfoundland	B (F)	2006	na	6300 males (2006) ¹	S. G. Gilliland, Canadian Wildlife Service, unpublished data
	Labrador coast, Canada	B (F)	1980, 1994	increasing	18,000 males (1994) ¹	Lock 1986, S. G. Gilliland, Canadian Wildlife Service, unpublished data
	Bay of Fundy, New Brunswick,	B (F)	1991-2011	decreasing	6000 males (2006-2011) ¹	K. Conner, New Brunswick Department of Natural Resources, unpublished data
	Pt. Lepreau, New Brunswick	FM (G)	2000-2012	decreasing	50,000 individuals (2000-2012) ⁵	I. Cameron and J. Wilson Point Lepreau Bird Observatory, personal communication
	Coastal Maine	B (G)	2000, 2012	decreasing	22,740 pairs (2012) ³	R. B. Allen, Maine Department of Inland Fisheries and Wildlife, unpublished data
	Hudson Bay, Canada	B (F)	1980s, 2006		255,000 individuals (2006) ¹	Gilliland et al. 2008a
	Belcher Islands, Hudson Bay	B (G)	1980s, 1997	decreasing	na	Robertson and Gilchrist 1998
COEI (<i>borealis</i>)	Labrador coast	B (G)	1998-2003	increasing	na	Chaulk et al. 2005
	Labrador coast	B (F)	1980, 1994, 2006	increasing	17,400 males (2006) ¹	Chaulk 2009
	Ungava Bay, Nunavut	B (FG)	1980-2000	stable	10,500 nests (2000) ¹	Chapdelaine et al 1986, Falardeau et al 2003
	South Coast of Baffin	B (F)	1998	na	20,750 pairs (1998) ¹	S. G. Gilliland and H. G. Gilchrist, Canadian Wildlife Service, unpublished data
	East Bay, Southampton Island, Nunavut	B (G)	1996-2012	1996-2013	2300 nests (2013) ²	Gilliland et al. 2008b, Merkel et al. 2008, H. G. Gilchrist, Canadian Wildlife Service, unpublished data
	Gulf St. Lawrence, Newfoundland, St. Pierre and Miquelon Islands	B (F)	2003, 2006, 2009	stable	205,000 individuals (2009) ^{1,6}	Bordage et al. 1998; S. G. Gilliland and C. Lepage, Canadian Wildlife Service, unpublished data
	Northern Alaska and western Canada (Pt. Barrow, Alaska migration counts)	SM (G)	1976, 1987, 1994, 1996, 2003	decreasing 1976-1996); stable (1996-2004)	362,000 individuals (2003) ⁵	Suydam et al. 2004
	Victoria Island, Northwest Territories	B (F)	1992-1994; 2004-2005	decreasing (1992-1994 to 2004-2005)	33,199 birds (2004-2005) ²	Raven and Dickson 2006
	Rasmussen Lowlands, Nunavut	B (G)	1975-1976, 1994-1995	decreasing (1975-1976 to 1994-1995)	2500 individuals (1994-1995) ¹	Gratto-Trevor et al. 1998
	Arctic Coastal Plain, Alaska	B (F)	1986-2012	increasing	20,910 total indicated birds (2008-2012) ¹	R. A. Stehn, W. W. Larned, and R. M. Platte, U.S. Fish and Wildlife Service, unpublished report
STEI	Arctic Coastal Plain, Alaska	B (F)	1989-2012	stable	204 total indicated birds (1989-2012) ¹	R. A. Stehn, W. W. Larned, and R. M. Platte, unpublished report
	Barrow area, Alaska	B (F)	1999-2010	na	range 0-224 total indicated birds (1999-2010) ¹	Obritschkewitsch and Ritchie 2011
	Southwest Alaska	SM (G)	1992-2011	decreasing (1992-2011); stable (2003-2011)	81,925 individuals (1992-2010) ¹	W. W. Larned, U. S. Fish and Wildlife Service, unpublished report
	Alaska Peninsula, Alaska	M (F)	2012	na	50,400 molting birds; primarily males (2012) ¹	H. M. Wilson et al., U.S. Fish and Wildlife Service, unpublished report
SPEI	Yukon-Kuskokwim Delta, Alaska	B (G)	1985-2012	stable (1985-2012); increasing (2003-2012)	6210 nests (2008-2012) ⁴	J. B. Fischer and R. A. Stehn, unpublished report
	Arctic Coastal Plain, Alaska	B (F)	1992-2012	stable	6386 total indicated birds (2008-2012) ¹	R. A. Stehn, W. W. Larned, and R. M. Platte, unpublished report
	Bering Sea	W (F)	1997, 1998, 2009, 2010	stable	375,000 individuals (2010) ¹	W. W. Larned, K. Bollinger, and R. Stehn, unpublished report
	Coastal southeast Alaska	N (B,F)	1997-1999, 2001-2002	na	164,264 individuals (1997-2002) ²	Hodges et al. 2008
SUSC	Coastal southeast Alaska	W (B,F)	1997, 2000-2002	na	42,770 individuals (1997-2002) ²	Hodges et al. 2008
	Kodiak Island, Alaska	W (B)	1991-2005	stable	na	D. Zwiefelhofer and J. Reynolds, U.S. Fish and Wildlife Service, unpublished data
	Alaska (WPBHS data)	B (F)	1993-2012	decreasing	na	J. B. Leirness, unpublished data from WPBHS(spell out)
	Coastal British Columbia	W (G)	1999-2011	stable	na	Crewe et al. 2012
	Puget Sound, Washington	W (F)	1999-2013	declining	40,000 individuals (2010-2013) ¹	J. R. Evenson, Washington Department of Wildlife, personal communication
	Atlantic Coast	W (F)	2008-2011	na	149,200 individuals (2008-2011) ¹	E. D. Silverman et al., unpublished report
	Pt. Lepreau, New Brunswick	FM (G)	2000-2012	decreasing	67,000 individuals (2000-2012) ^{3,7}	I. Cameron and J. Wilson Point Lepreau Bird Observatory, personal communication
	Atlantic Coast (Pt. Avalon, New Jersey)	FM (G)	1995-2007	stable	190,000 individuals (2002-2011) ³	David Mizrahi, New Jersey Audubon, personal communication
	Eastern Canada	B (H)	1990-2012	stable	na	Environment Canada 2013
	Coastal southeast Alaska	N (B,F)	1997-1999, 2001-2002	na	21,426 individuals (1997-2002) ⁴	Hodges et al. 2008
WWSC	Coastal southeast Alaska	W (B,F)	1997, 2000-2002	na	33,374 individuals (1997-2002) ⁴	Hodges et al. 2008
	Kodiak Island, Alaska	W (B)	1991-2005	stable	na	D. Zwiefelhofer and J. Reynolds, unpublished data
	Yukon Flats, Alaska	B (F)	2001-2012	stable	16,188 total indicated birds (2001-2012) ¹	N. Guldager, M. Bertram, and B. Lake, U.S. Fish and Wildlife Service, unpublished report
	Alaska (WPBHS data)	B (F)	1993-2012	increasing	na	J. B. Leirness, USFWS, unpublished data from Waterfowl Breeding Population and Habitat Survey
	Puget Sound, Washington	W (F)	1999-2013	declining	12,000 individuals (2010-2013) ¹	J. R. Evenson, Washington Department of Wildlife, personal communication

BISC	Atlantic Coast	W (F)	2008-2011	na	58,600 individuals (2008-2011) ¹	E. D. Silverman et al., unpublihsed report
	Coastal southeast Alaska	W (B,F)	1996-1997, 2000-2002	na	1156 individuals (1997-2002) ²	Hodges et al. 2008
	Kodiak Island, Alaska	W (B)	1991-2005	decreasing (1991-2005)	na	D. Zwiefelhofer and J. Reynolds, unpublished data
	Western Alaska	B (F)	2004-2012	increasing	140,000 total indicated birds (2004-2012) ²	Stehn, R. A., and R. M. Platte, U.S. Fish and Wildlife Service, unpublished report
	Alaska (WPBHS data)	B (F)	1993-2012	stable	na	J. B. Leirness, unpublished data from Waterfowl Breeding Population and Habitat Survey
LTDU	James Bay	M (F)	1983, 1991, 2006, 2009, 2012	unknown	127,000 individuals (2009,2012) ¹	S. Badzinski et al., Canadian Wildlife Service, unpublished report
	Atlantic Coast	W (F)	2008-2011	na	211,300 individuals (2008-2011) ¹	E. D. Silverman et al., unpublished report
	Pt. Lepreau, New Brunswick	FM (G)	2000-2012	decreasing	152,000 individuals (2000-2012) ^{3,7}	I. Cameron and J. Wilson Point Lepreau Bird Observatory, personal communication
	Atlantic Coast (Pt. Avalon, New Jersey)	FM (G)	1995-2007	stable	187,000 individuals (avg 2002-2011) ⁵	D. Mizrahi, New Jersey Audubon, personal communication
	Arctic Coastal Plain, Alaska	B (F)	1986-2012	stable (1986-2012); increasing (2003-2012)	47,000 total indicated birds (2008-2012) ¹	R. A. Stehn, W. W. Larned, and R. M. Platte, unpublished report
	Yukon-Kuskokwim Delta, Alaska	B (F)	1988-2012	stable (1988-2012); decreasing (2003-2012)	4223 total indicated birds (2008-2012) ¹	R. M. Platte and R. A. Stehn, unpublished report
	Kodiak Island, Alaska	W (B)	1991-2005	stable	na	D. Zwiefelhofer and J. Reynolds, unpublished data
	Coastal southeast Alaska	W (B,F)	1997, 2000-2002	na	16,330 individuals (1997-2002) ²	Hodges et al. 2008
	Victoria Island, Northwest Territories	B (F)	1992-1994; 2004-2005	decreasing (1992-1994 to 2004-2005)	14,900 birds (2004-2005) ²	Raven and Dickson 2006
	Lake Ontario, Canada side	W (F)	2007-2008	unknown	90,500 individuals (2007-2008) ¹	Badzinski and Petrie 2008
HARD	Atlantic Coast	W (F)	2008-2011	na	236,600 individuals (2008-2011) ¹	E. D. Silverman et al., unpublished report
	Coastal southeast Alaska	W (B,F)	1996-1997, 2000-2002	na	54,540 individuals (1997-2002) ²	Hodges et al. 2008
	Coastal southeast Alaska	N (B,F)	1994, 1997-1999, 2001-2002	na	34,640 individuals (1994-2002) ²	Hodges et al. 2008, B. A. Agler et al., U.S. Fish and Wildlife Service, unpublished report
	Kodiak Island, Alaska	W (B)	1991-2005	stable	na	D. Zwiefelhofer and J. Reynolds, unpublished data
	Prince William Sound, Alaska	W (B)	1997-2009 (periodic)	increasing (1997-2009)	12,500 individuals (2009) ¹	Rosenberg et al. 2013
	Coastal British Columbia	W (G)	1999-2011	declining	na	Crewe et al. 2012
	Eastern North America	W (G,B,H)	2001-2013	increasing	3,000-3,500 individuals (2008-2013) ¹	Boyne 2008, Mittelhauser 2008, and Canadian Wildlife Service, unpublished data
	Atlantic Canada	W (G,H)	2001-2013	increasing	1600 individuals (2001-2013) ¹	Canadian Wildlife Service, unpublished data
	Greenland	M (F)	1999	na	5,000-10,000 males (1999) ¹	Boertmann and Mosbech 2002
	North America (U.S. and Canada)	W (G)	1974-2012	increasing	na	National Audubon Society 2011, Niven et al. 2004
COGO	Coastal British Columbia	W (G)	1999-2011	stable	na	Crewe et al. 2012
	Kodiak Island, Alaska	W (B)	1991-2005	increasing	na	D. Zwiefelhofer and J. Reynolds, unpublished data
BAGO	Prince William Sound, Alaska	W (B)	1997-2009 (periodic)	stable (1997-2009)	na	Rosenberg et al. 2013
	Coastal southeast Alaska	W (B,F)	1996-1997, 2000-2002	na	119,000 individuals (1996-2002) ²	Hodges et al. 2008
	Interior British Columbia	B (H)	2006-2012	na	24,000 total indicated birds (2006-2012) ¹	A. Breault, Canadian Wildlife Service, unpublished data
	Coastal British Columbia	W (G)	1999-2011	declining	na	Crewe et al. 2012
	St. Lawrence River Estuary	W (G,H)	1999, 2002, 2005	na	5700 individuals (2005) ¹	Robert and Savard 2006
BUFF	North America (U.S. and Canada)	W (G)	1974-2012	increasing	na	National Audubon Society 2011, Niven et al. 2004
	Coastal southeast Alaska	W (B,F)	1996-1997, 2000-2002	na	48,388 individuals (1996-2002) ²	Hodges et al. 2008
	Interior British Columbia	B (H)	2006-2012	na	40,000 total indicated birds (2006-2012) ¹	A. Breault, unpublished data
	Puget Sound, Washington	W (F)	1996-2013	stable	50,000 individuals (2006-2013) ¹	J. R. Evenson, Washington Department of Wildlife, personal communication
	Coastal British Columbia	W (G)	1999-2011	stable	na	Crewe et al. 2012
COME	North America (U.S. and Canada)	W (G)	1974-2012	increasing	na	National Audubon Society 2011, Niven et al. 2004
	Kodiak Island, Alaska	W (B)	1991-2005	increasing	na	D. Zwiefelhofer and J. Reynolds, unpublished data
RBME	North America (U.S. and Canada)	W (G)	1974-2012	stable	na	National Audubon Society 2011, Niven et al. 2004
	Kodiak Island, Alaska	W (B)	1991-2005	stable	na	D. Zwiefelhofer and J. Reynolds, unpublished data
HOME	Coastal British Columbia	W (G)	1999-2011	stable	na	Crewe et al. 2012
	Esatern North America (U.S. and Canada)	W (G)	1974-2012	increasing	na	National Audubon Society 2011
	Western North America (U.S. and Canada)	W (G)	1974-2012	increasing	na	National Audubon Society 2011
	Interior British Columbia	B (H)	2006-2012	na	10,500 total indicated birds (2006-2012) ¹	A. Breault, unpublished data

¹ population index; not adjusted for incomplete detection; breeding estimates typically do not count non-breeders and immatures

² number of nests observed adjusted for incomplete detection

³ index to number of birds migrating past an observation site

⁴ index was adjusted for incomplete detection

⁵ not a complete survey of this area

⁶ number of birds adjusted for observer error in flock size estimation

⁷ does not include unidentified "dark-winged" scoters