SEAPOP Short Report 1-2025

Key-site monitoring in Norway 2024, including Svalbard and Jan Mayen

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Breeding success

In 2024, breeding success varied widely between species and colonies. Overall, surface-feeding seabirds had lower breeding success than diving species. Among the pelagic surface-feeders, black-legged kittiwakes and northern fulmars had moderate or poor breeding success in most of the monitored colonies, while gannets did well in all monitored colonies.

Among coastal surface-feeding seabirds, large gulls breeding in mainland Norway (great black-backed gulls, herring gulls and lesser black-backed gulls) had moderate to poor breeding success, with the exception of great black-backed gulls on Røst, lesser black-backed gulls in Vestland, and herring gulls on Røst and in Agder, which all had good breeding success. The breeding season was slightly more successful for great skuas and glaucous gulls. Great skuas, one of the species strongly affected by highly pathogenic avian influenza in 2022, had good breeding success in all monitored colonies, except Hjelmsøya (moderate) and Røst (poor). Glaucous gulls had good breeding success on Spitsbergen and Jan Mayen, and moderate on Bjørnøya.

The pelagic diving species generally had a better breeding season than the other species groups (Table 2). Four of six monitored Atlantic puffin colonies had good breeding success, while the other two (on Hornøya and Anda) did moderately well. Exceptions to good breeding success in this group include Brünnich's guillemots Spitsbergen (moderate) and Bjørnøya (poor), as well as razorbills and common guillemots on Hornøya, which both did poorly.

A northern fulmar breeding on Jan Mayen. Fulmars had moderate to low breeding success at all monitored colonies in 2024. Photo: © Erlend Lorentzen

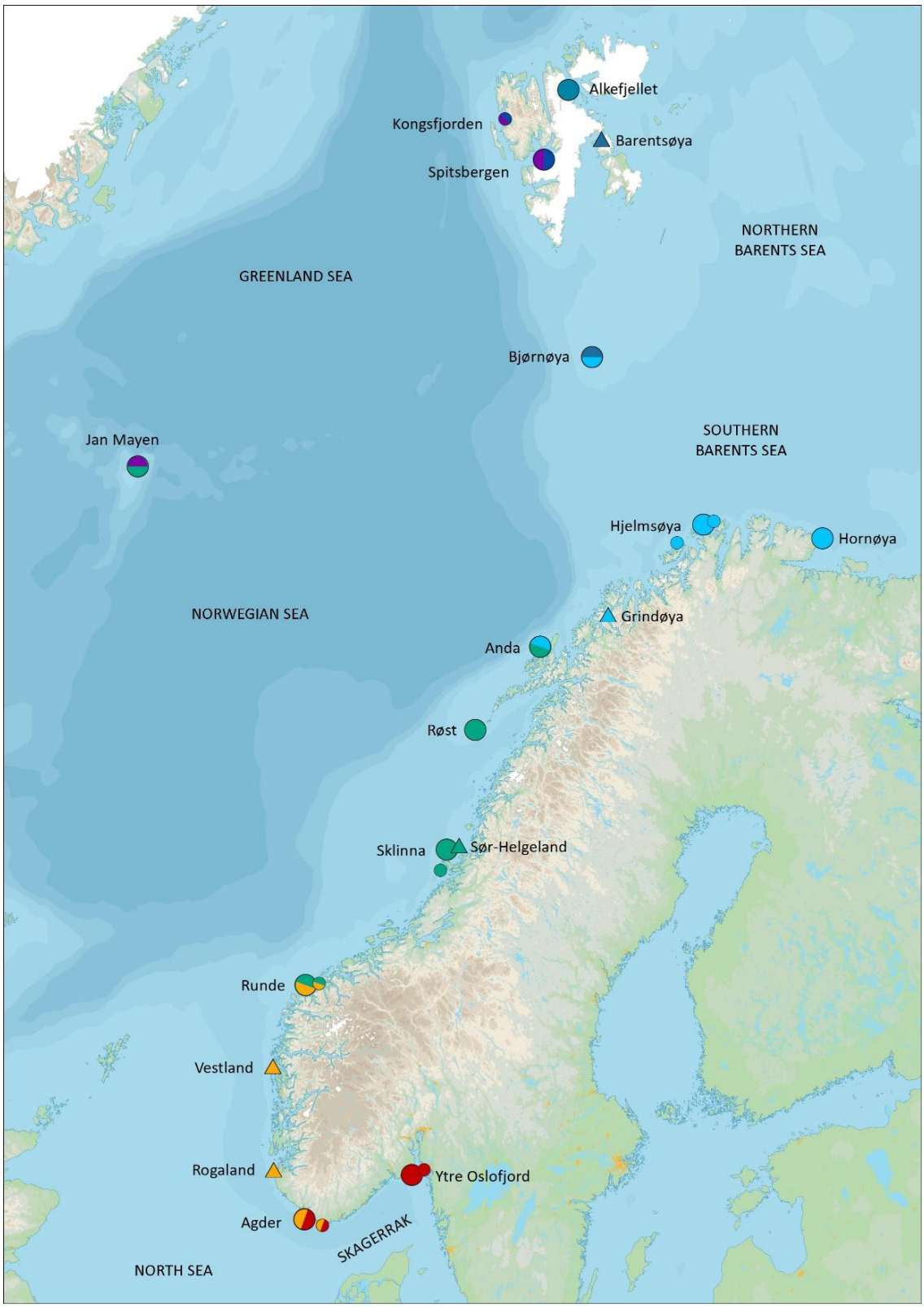
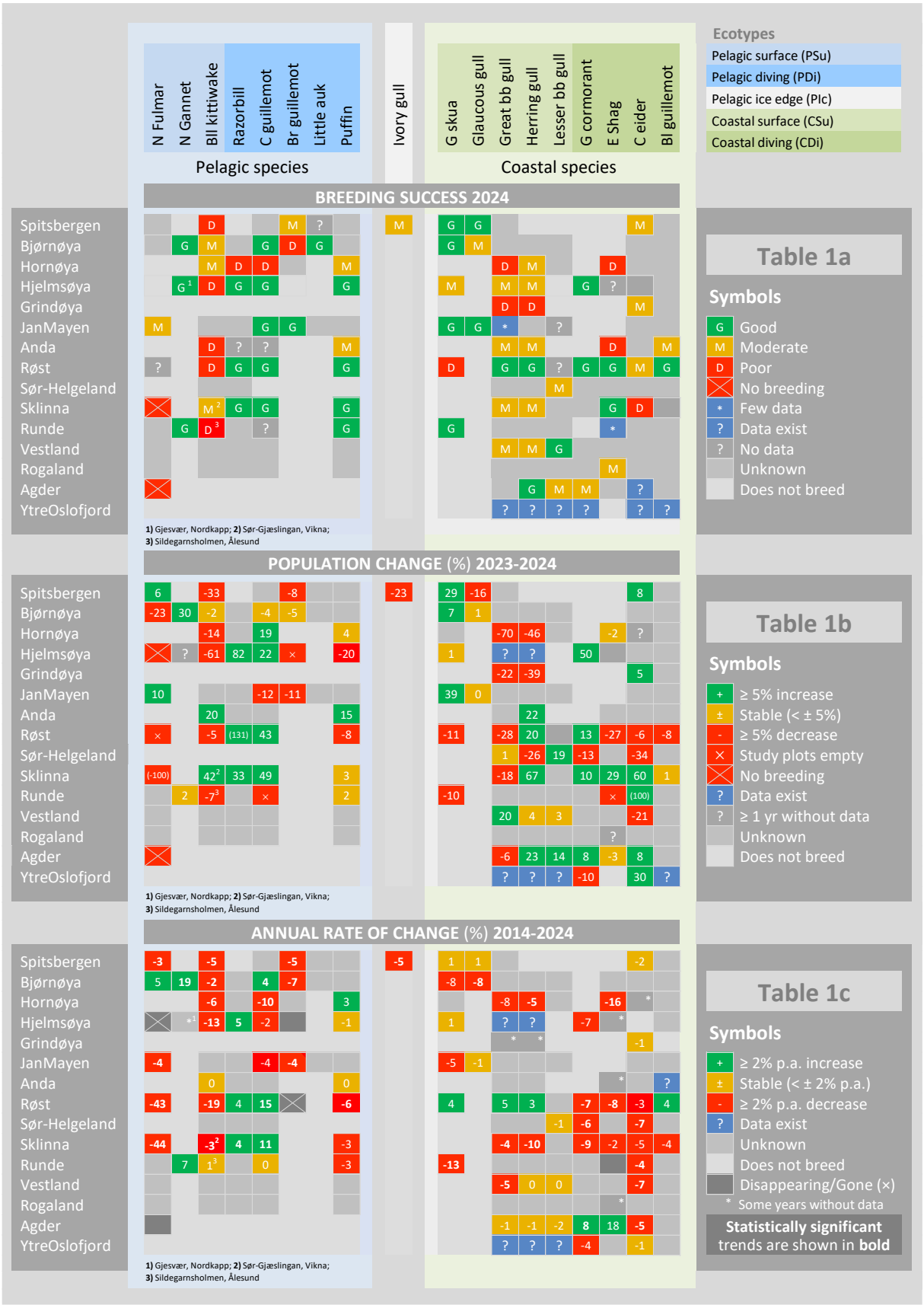


Figure 1

SEAPOP key-sites, as of 2024. Symbol colours indicate which seas they represent: the northern (dark blue) and southern (pale blue) Barents Sea, the Greenland Sea (violet), the Norwegian Sea (green), the North Sea (orange) and the Skagerrak (red). Split colours indicate sites associated with two seas. Large circles indicate the main localities, with some work carried out on nearby sub-localities (small circles). Triangles indicate single-species key-sites for ivory gull (Barentsøya), common eider (Grindøya), lesser black-backed gull (Sør-Helgeland) and shag (Rogaland).

Table 1

Schematic summary of breeding success (1a) and change in breeding numbers (1b) for focal seabird species at the regular SEAPOP key-sites in 2024, and mean population trend over the last ten years (1c).



2024	PSu	PDi	CSu	CDi	All
Barents Sea	M	M	M	M	M
Norwegian Sea	M	G	M	M	M
North Sea			M	M	M
All	M	G	M	M	M

Table 2

Average breeding success in 2024 for different ecotypes of seabirds at the key-sites in the three main sea areas covered by SEAPOP. The codes indicate whether the birds mainly forage in pelagic (P) or coastal (C) areas or seek food at the surface (Su) or by diving (Di).

The picture was mixed for coastal diving species. Great cormorant did well on Hjelmsøya and moderately in Agder. European shags did poorly in the northernmost colonies of Hornøya and Anda, but well further south on Røst and Sklinna. Common eiders had moderate to poor breeding success, while black guillemots had moderate and good breeding success on Anda and Røst respectively.

Population changes

In contrast to 2023, where over 50% of monitored populations[1] had declined since the previous year, 40% of monitored populations increased, 42% declined, and 19% remained stable between 2023 and 2024. Coastal species had a larger proportion of growing populations (43%) than pelagic species (35%), while the proportion of declining populations was highest in pelagic surface-feeding species (59%), and pelagic diving species had the most stable populations (25%).

Although the average population change from 2023 was positive (2.9%; Table 3), there was great variation across species groups and areas. Overall, pelagic diving species had the largest increase (12%), with notable increases in razorbills on Hjelmsøya (82%) and in common guillemots on Sklinna and Røst (43% and 49% respectively). Populations of coastal diving species also grew (4.9%), especially in the Barents Sea. In this group, there were large increases in common eiders on Sklinna (60%) and in European shags on Hjelmsøya (50%). However, some populations of diving species also declined substantially, like common eiders on Sør-Helgeland (-34%), European shags on Røst (-27%) and puffins on Hjelmsøya (-20%). In contrast, both pelagic and coastal surface-feeding species showed little overall change between 2023 and 2024 (-2.7% and -0.8%, respectively), although there was considerable variation at the population level, and mainly declines in the northernmost colonies. For instance, both greater black-backed gulls and herring gulls showed drastic declines on Hornøya (-70% and -46%), while kittiwakes declined on Hjelmsøya (-61%) and Spitsbergen (-33%).

Table 3

Average rates of population change (%) in the last year (left) and annually over the last decade (right) for different ecotypes of seabirds at key-sites in the main sea areas covered by SEAPOP. The codes indicate whether the birds forage mainly in pelagic (P) or coastal (C) areas or seek food at the surface (Su) or by diving (Di).

2023-2024	PSu	PDi	CSu	CDi	All
Barents Sea	-14	11	-17	15	-4.3
Norwegian Sea	10	13	6	3	7.5
North Sea			10	2	5.8
All	-2.7	12.0	-0.8	4.9	**2.9**

2014-2024	PSu	PDi	CSu	CDi	All
Barents Sea	-1	-2	-4	-7	-2.8
Norwegian Sea	-13	1	-2	-5	-4.2
North Sea			-2	2	0.0
All	-7.3	0.1	-2.6	-3.2	**-3.1**

[1] The numbers in this section refer to the number of active breeders within a population.

Over the past decade (2014-2024), seabird populations have shown downward trends (-7.3 to -2.6% p.a.), except for pelagic diving species, which have been stable on average (0.1% p.a.). This decline was particularly strong for pelagic surface-feeding species in the Norwegian Sea (-13% p.a.; Table 3). Overall, there has been a decline in populations of coastal diving species (-3.2% p.a.), except in the North Sea (2% p.a.). During this period, there was also considerable variation both within and between species. For example, northern fulmars increased on Bjørnøya (5% p.a.) but declined drastically on Sklinna (-44% p.a.) and Røst (-43% p.a.), where they have not bred in the monitoring plots in the last five years. Razorbill populations increased in all areas, while many populations of common eiders, lesser black-backed gulls and black-legged kittiwakes declined.

The drastic declines observed in many populations last year (2022-2023) were partly caused by a widespread outbreak of highly pathogenic avian influenza. While fortunately no similar problems were detected in 2024, the decline that has been documented in seabirds both in Norway and globally for many decades continued. Despite a slight improvement for some species in the past year, there is still great cause for concern. Seabirds are exposed to a wide range of threats and changes that negatively affect populations (e.g. climate change, decline in food availability and increased nest predation), and a persistent negative trend means that many seabird populations have reached historically low population sizes. This makes them more vulnerable than before, and an increasing number of seabird species have been red-listed. A stable average trend for 2023-24 therefore does not mitigate the drastic changes that SEAPOP and other European seabird monitoring programmes have long documented – especially since several species and populations are still experiencing strong declines.

Razorbill on Sklinna. In contrast to many other seabird species monitored by SEAPOP, razorbill populations have increased in almost all monitored areas over the last decade. Photo: © Nina Dehnhard

Adult survival

The calculation of seabird adult survival is based on how many marked individuals are observed the following years. Most adult seabirds have a high survival rate and a long lifespan. If the annual adult survival rate of a seabird population decreases or deviates from normal values for the species, it indicates that the population has experienced particularly poor environmental conditions or critical events during the past year, such as mass mortality due to food shortages or disease (e.g. highly pathogenic avian influenza). The adult survival rate of breeding seabirds is therefore a central parameter monitored in SEAPOP that provides important information about the state of the various species and populations monitored. Annual adult survival is measured for 18 different species in 48 different breeding populations from Agder in the south of Norway to Spitsbergen in the north. For analytical reasons, the survival from 2023 to 2024 cannot be calculated until after the breeding season in 2025, so the values of adult survival reported here are from 2022 to 2023, or for a longer time-period when survival was constant through time.

Among the surface-feeding species, the black-legged kittiwake in particular showed a worrying decline in adult survival. It was far lower than normal, either as a result of a sharp decline or a continuation of a low trend from the previous year, both for kittiwakes from Røst (70%), Anda (76%) and Hornøya (66%). Kittiwake populations in Ålesund (82%), Sør-Gjæslingan (80%) and on Bjørnøya (88%), however, showed survival rates within what is considered normal for the species. The large gull species along the mainland coast, the great black-backed, lesser black-backed, and herring gulls, had normal adult survival, which followed the long-term trend. In Kongsfjorden on Spitsbergen, the glaucous gulls experienced a sharp decline in adult survival (from 94% the previous year to 77%). The great skuas on Bjørnøya and Kongsfjorden, on the other hand, had higher adult survival compared to the previous year (from 34% to 63% and 54% to 91%, respectively), although the rate on Bjørnøya is still low for this species (63%). Northern fulmars on Jan Mayen (93%) and ivory gulls (83%), which are only monitored on Barentsøya, showed normal adult survival.

An adult kittiwake with a young at Sør-Gjæslingan. The species had low adult survival rates at several, but not all, key-sites. Photo: © Nina Dehnhard

Among the diving pelagic species there were both negative and positive trends, and some species had severe declines in adult survival. This was the case for the Atlantic puffin, with most populations showing lower adult survival than normal. In fact, only the population on Gåsøyane on Spitsbergen showed normal survival (84%) for this species, whereas puffins on Hornøya (77%), Hjelmsøya (73%) and Anda (77%) had low survival. There was also a decline in puffin adult survival on both Runde and Røst (from 88% to 85%, and 86% to 83% respectively); these values reflect an adult mortality well above normal levels for the species. The latest estimate for Røst was also the lowest measured there in 15 years. In common guillemots, adult survival declined sharply on Jan Mayen from 90% to 82%, while it remained consistently high on Hornøya (98%) and Sklinna (93%). In Brünnich's guillemots, adult survival declined steeply on Bjørnøya (from 96% to 77%) but increased on Jan Mayen (from 75% to 94%). There was also an increase in the adult survival of little auks on Bjørnøya (from 85% to 98%). Razorbills, which are monitored at Sklinna and Hornøya, had adult survival values within the normal range for the species (90% and 94%, respectively).

Finally, among diving coastal species, the most worrying signals were found in European shags from Sklinna and Røst, both of which had very low adult survival (63% and 66% respectively), well below the normal range for the species. Common eiders on Grindøya also had low adult survival (47%), although it was an improvement from the previous year (27%). In contrast, black guillemots, monitored at Sklinna and Røst, had normal adult survival rates for the species (85% at both colonies).

Atlantic puffins on Hornøya. In 2022-2023, puffins had lower than normal adult survival rates at most of the monitored colonies. Photo: © Tone K. Reiertsen

APPENDIX – Key parameters from all key-sites in 2024

Key to Tables A1-A13

Key population parameters (SE, n) of seabirds breeding on the key-sites indicated above each table, from North to South. The start year of most data series are listed on the SEAPOP web (https://seapop.no/en/distribution-status/time-series-data/). Population change (expressed as percentage) is the numeric change in size of the breeding population registered between 2023 and 2024 based on plot counts (p) or total censuses (t). For survival, in all cases the listed estimate is derived from the basic CJS model(s) that fits the dataset best (i.e., the one with the lowest AICc or QAICc value). When the model retained is one with constant survival and recapture rate, the survival can be estimated over the whole monitoring period (up until 2024, yrs >1 in the tables below). If the model retained is one with constant recapture rate but varying survival, it is possible to produce a valid estimate for the last time step (2023-2024). However, when the model retained is one with varying survival and recapture rates, it is not possible to distinguish the two variables in the last time step (2023-2024), so the survival is only reported for the previous time step (2022-2023, yrs = 1 in the tables below). In the tables, parameters that have not yet been calculated are marked as such, while blank cells or "no data" indicate a parameter is not monitored at this particular key-site.

Table A1. *Key population parameters (SE, n) of seabirds on* ***Svalbard*** *in 2024 (excl. Bjørnøya, cf. Table A2).*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Fulmar	*Nøisdalen*	0[p]						
Common eider	*Kongsfjorden*	8[t]	2007-2024 (18)	0.81	(0.010, 453)	Hatching success[1]	0.45	(0.08, 38)
Great skua	*Kongsfjorden*	28.6[t]	2007-2024 (16)	0.91[2]	(0.030, 45)	Hatching success[1]	0.75	(0.15, 9)
	Kongsfjorden					Clutch size[3]	1.89	(0.11, 9)
	Hermansenøy	-1.6[t]				Clutch size[3]	1.89	(0.044, 53)
Ivory gull	*32 colonies*	-23[p]	2011-2024	0.83	(0.020, 307)			
	Barentsøya					Large chicks/nest		
Glaucous gull	*Kongsfjorden*	-16[p]	2022-2023 (1)	0.77	(0.064, 148)	Hatching success	0.81	(0.06, 43)
Kittiwake	*Ossian Sars*	-9[p]	2018-2023 (5)	0.98	(0.186, 80)	Chicks >15d/nest[4]	0	(-, 21)
	Grumantbyer	*No data*		*No data*			*No data*	
	Fuglehuken	-38[p]		*No data*			*No data*	
Brünnich's guillemot	*Ossian Sars*	-31[p]	2022-2023 (1)	0.92	(0.040, 226)	Chicks >15d/nest	0.71	(0.07, 41)
	Diabasodden	-5[t]		*No data*			*No data*	
	Fuglehuken	-6[p]		*No data*			*No data*	
Little auk	*Bjørndalen*	*No data*		*No data*			*No data*	
	Feiringfjellet	*No data*	2022-2023 (1)	0.76	(0.131, 821)		*No data*	
Atlantic puffin	*Gåsøyane*	*No data*	2018-2024 (6)	0.84	(0.022, 169)		*No data*	

[p] plot count [t] total census [1] Minimum proportion of nests with at least one chick hatching, based on nests with known fate. [2] No data in 2022, estimate calculated over 2007-2021, 2023-2024. [3] Number of eggs per active nest. [4] % of nests with at least 1 chick surviving up to 15 days.

Table A2. *Key population parameters (SE, n) of seabirds on* ***Bjørnøya*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Fulmar	-23[P]						
Gannet	30[t]				Large chicks/nets	0.63	(0.09, 32)
Great skua	7[P]	2022-2023 (1)	63.2	(6.6, 298)	Large chicks/nest	0.81	(0.05, 59)
Glaucous gull	1[P]	2009-2024 (15)	80.2	(1.5, 192)	Large chicks/nest	1.38	(0.13, 14)
Kittiwake	-2[P]	2004-2024 (20)	87.7	(0.7, 426)	Large chicks/nest	0.69	(0.07, 49)
Common guillemot	-4[P]		[1]		Fledging success[2]	0.62	(0.04, 133)
Brünnich's guillemot	-5[P]	2022-2023 (1)	76.5	(8.6, 356)	Fledging success[2]	0.35	(0.10, 23)
Little auk	*No data*[3]	2022-2023 (1)	97.8	(4.8, 1135)	Fledging success	0.88	(0.05, 50)

[P] plot count [t] Total count [1] Results not yet available. [2] Measured at the age of 20 days. [3] Pilot project data under analysis.

Table A3. *Key population parameters (SE, n) of seabirds on* ***Hornøya*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Shag	-3[P,1]	2004-2024 (20)	85.1	(1.1, 416)	Clutch size	*No data 2024*	
					Breeding success	*No data 2024*	
Herring gull	-46[P]	2007-2024 (17)	85.9	(1.6, 163)	Clutch size	2.1	(0.18, 31)
					Breeding success[2]	0.23[3]	(0.09, 22)
Great black-backed gull	-80[P]	2001-2024 (23)	83.1	(1.2, 243)	Clutch size	2.25	(0.25, 12)
					Breeding success[2]	1.42[3]	(0.36, 12)
Kittiwake	-7[P]	2022-2023 (1)	66.3	(1.6, 1699)	Clutch size	*No data 2024*[4]	
					Large chicks/nest[2]	0.42	(0.05, 215)
Common guillemot	3	1988-2024 (36)	97.6	(0.3, 313)	Breeding success[2]	0	(0.00, 30)
Razorbill	*No data*	1995-2024 (28)	94.2	(0.6, 428)	Breeding success[2]	0.3	(0.09, 30)
Atlantic puffin	4[P]	2022-2023 (1)	76.6	(4.9, 1035)	Breeding success[2]	0.23	(0.14, 31)

[P] plot count [1] Most shag plots were empty, and breeding birds have moved to more sheltered areas in the cliff. [2] Medium-sized chicks/egg laid. [3] Chicks that survived until day 20/nest. [4] Not possible to monitor due to accessibility of birds/visibility of nest content since population had declined and study plots where this is possible are now no longer available.

Table A4. *Key population parameters (SE, n) of seabirds on* ***Hjelmsøya*** *in 2024. For some species, values are currently unavailable and will be updated at a later date.*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Kittiwake		p,1	2022-2023 (1)	15.4	(5.8, 470)	Clutch size[2,1]		
						Clutch size[3,1]		
						Breeding success[1]		
Common guillemot	*Crevices (total)*	p,1	2007-2024 (18)	90.5	(1.2, 259)			
Brünnich's guillemot		*Extinct*[4]						
Atlantic puffin	*Hjelmsøya*	p,1,5	2022-2023 (1)	73.3	(30.8, 694)	Hatching success[1]		
						Breeding success[1,6]		

[p] plot count [1] Results not yet available. [2] Including empty nests. [3] Excluding empty nests. [4] Very few birds still attended the colony irregularly. [5] 25 plots [6] Large chicks/egg laid.

Table A5. *Key population parameters (SE, n) of seabirds on* ***Jan Mayen*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Fulmar	10[p]	2014-2024 (10)	92.7	(2.6, 93)	Chicks/nest[1,2]	0.47	(0.05, 85)
Common guillemot	-12[p]	2020-2024 (4)	82.2	(3.2, 125)	Breeding success[3,2]	0.63	(0.10, 24)
Brünnich's guillemot	-11[p]	2021-2024 (3)	94.4	(4.8, 165)	Breeding success[3,2]	0.63	(0.07, 46)
Great skua	38[p]				Large chicks/nest[4]	1.15	(0.12, 20)
Glaucous gull	1[p]				Large chicks/nest[4]	1.04	(0.18, 25)
Great black-backed gull	*No data*				Large chicks/nest[4]	*No data 2024*	
Lesser black-backed gull	*No data*				Large chicks/nest[4]	*No data 2024*	

[p] plot count [1] Recorded early in the chick-rearing period when most chicks were still small or medium sized. [2] Due to late start of fieldwork, the number of initially active nests is probably underestimated, hence reproductive performance is probably overestimated. [3] Number of chicks ≥15 days of age divided by number of breeding pairs (n). [4] Number of chicks large enough for ringing divided by number of active nests (n).

Table A6. *Key population parameters (SE, n) of common eider on* ***Grindøya*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Common eider	0.94[t]	2022-2023 (1)	47.3	(45.7, 1546)	Clutch size	4	(0.27, 11)

[t] total census

Table A7. *Key population parameters (SE, n) of seabirds on* ***Anda*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Shag	[1]				Clutch size[2]		
Herring gull	22[t]				Clutch size[2]		
Kittiwake	20[p]	2022-23 (1)	76.3	(4.4, 601)	Large chicks/nest	0.02	(0.006, 926)
Puffin	15[p]	2022-23 (1)	77.3	(5.5, 595)	Hatching success	0.80	(0.058, 49)
					Chicks ≥ 20d/ nest	0.76	(0.062, 49)
Black guillemot	[1]				Large chicks/nest[2]		

[1] Not counted in 2024. [2] Not estimated in 2024. [t] total census [p] plot count

Table A8. *Key population parameters (SE, n) of seabirds on* ***Røst*** *in 2024.*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Fulmar	*Hernyken*	*Extinct in plots*[p]						
Great cormorant		13[t]				Clutch size[1]	*No data 2024*	
						Large chicks/nest	1.96	(0.26, 25)
Shag	*Ellefsnyken*	-27[p]	2022-2023 (1)	66.0	(9.7, 594)	Clutch size	2.43	(0.07, 97)
						Clutch size	2.37	(0.07, 99)
						Large chicks/nest[3]	2.09	(0.17, 22)
Common eider		-6[p]				Clutch size	4.35	(0.14, 55)
Great skua		-11[t,5]				Clutch size[3]	*No data 2024*	
						Breeding success	0.14	(0.13, 7)
Common gull		-7[p]				Clutch size[3]	*No data 2024*	
						Large chicks/nest[3]	0.46	(-, 56)
Lesser black-backed gull		*No data 2024*[p,6]					*No data 2024*	
Herring gull		25[p]				Clutch size[3]	2.7	(0.07, 47)
						Large chicks/nest[3]	1.47	(-, 15)
Great black-backed gull		-26[p]				Clutch size[3]	2.7	(0.09, 47)
						Large chicks/nest[3]	1.55	(-, 33)
Kittiwake	*Vedøy*	*Extinct*[p,7]					*No breeding in 2024*	
	Gjelfruvær	-37[t,8]				Large chicks/nest	0	(0, 135)
	Kårøy area	11[t,9]	2022-2023 (1)	69.6	(4.8, 557)	Clutch size/pair[10]	0.11	(0.03, 126)
						Clutch size/pair[11]	0.95	(0.11, 75)
						Large chicks/pair[10]	0	(0, 126)
						Large chicks/pair[11]	0.11	(0.03, 158)
						Large chicks/pair[12]	0.32	(0.03, 549)
Common tern						Clutch size[3]	*No data 2024*	
Common guillemot		[43][p,13]				Breeding success	0.62	(0.06, 82)
Razorbill		[131][p,13]						
Atlantic puffin		-8[p]	2022-2023 (1)	83.3	(4.3, 577)	Hatching success	0.77	(0.05, 61)
						Breeding success	0.57	(0.06, 60)
Black guillemot		-8[p,14]	1997-2024 (27)	85.3	(1.2, 159)	Clutch size	1.82	(0.34, 28)
						Large chicks/nest	1.24	(0.25, 25)

[p] plot count [t] total census [1] Including empty nests. [3] Excluding nests not known to have contained eggs/chicks. [5] A total of 8 pairs bred in Røst in 2024. [6] Most breed in one colony, which was not counted in 2022-2024. [7] Last breeding in 2019. No kittiwakes seen on the island in 2020-2024. [8] Small cliff-breeding colony 9 km SW of Vedøy with 135 pairs in 2024. [9] Population of 549 pairs in 2024 breeding on/near buildings in Røst harbour. [10] On the new kittiwake hotel in plot VIII (erected winter 2023/24) [11] On remaining nests on other buildings in plot VIII (Kårøy rorbucamping) [12] Total count of entire colony on/near buildings in Røst harbour. [13] Quasi-extinct colony on open ledges on Vedøy with very few birds left, especially razorbills. Birds breeding in shelter on other islands in Røst were seemingly doing OK, but their numbers are monitored less accurately. [14] Based on counts of adult birds in the colony area in early May (before egg laying).

Table A9. *Key population parameters (SE, n) of lesser black-backed gull on* ***Horsvær*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Lesser black-backed gull	19	2005-2024 (19)	88.3	(0.9, 190)	Clutch size	2.91	(0.03, 156)
					Large chicks/pair	0.49	(-, 188)

Table A10. *Key population parameters (SE, n) of seabirds on* ***Sklinna*** *in 2024.*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Fulmar		0[t]					*No breeding 2024*	
Great cormorant		10[t]						
Shag		29[t]	2022-23 (1)	63.3	(4.3, 752)	Clutch size[1]	2.11	(0.05, 485)
						Hatching success/nest	0.62	(-, 31)
						Clutch size at hatching	1.66	(0.15, 50)
						Chicks/nest 10d later	1.28	(0.16, 50)
						Chicks/nest 20d later	1.67	(0.11, 50)
Common eider		60[t]				Clutch size	4.17	(0.37, 6)
Herring gull		67[p]				Clutch size[2]	1.87	(0.22, 23)
						Clutch size[3]	2.26	(0.16, 19)
Great black-backed gull		-18[p]				Clutch size[2]	2.25	(0.26, 16)
						Clutch size[3]	2.57	(0.17, 14)
Kittiwake	*Sklinna*	0[t,4]					*No breeding 2024*	
	Sør-Gjæslingan	42[t,5]	2011-24 (13)	80.1	(1.4, 334)	Large chicks/nest[5]	0.85	(-, 406)
	Rørvik	19[t,6]				Large chicks/nest[6]	1.11	(-, 716)
Common guillemot		49[t]	2008-24 (16)	92.6	(0.6, 396)	Large chicks/nest[7]	0.59	(-, 81)
Razorbill		33[t]	2020-24 (4)	89.7[8]	(3.7, 30)			
Atlantic puffin		3[p]				Hatching success/nest	0.8	(0.09, 20)
						Chicks ≥ 10d/hatched	0.75	(0.1, 20)
						Chicks ≥ 20d/hatched	0.74	(0.1, 20)
Black guillemot		1[p]	2008-24 (16)	84.7	(1.8, 87)			

[t] total census [1] Counted on 5-10 June, including empty nests. [p] plot count [2] Counted on 3 June, including empty nests. [3] Counted on 3 June excluding empty nests. [4] No breeding 2019-2024. [5] Based on nest counts on 7 June and chick count on 01 July. [6] Based on nest counts on 30 May and chick count on 01 July. [7] Based on egg counts on 6 June and chick counts on 13 July in a confined part of the colony. [8] Based on time-dependent survival model, with constant resighting rate - estimate for 2023 can be given

Table A11. *Key population parameters (SE, n) of seabirds on* ***Runde*** *in 2024.*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Gannet						Large chick/nest	0.75	(0.01, 2919)
Shag		[p,1]					*No breeding 2024*	
Great skua		-10[t]				Large chick/nest	1.26	(0.17, 19)
Kittiwake	*Runde*	[p,2]				[3]	*No breeding 2024*	
	Sildegarnsholmen	-7[t]	2011-24 (14)	82.0	(1.0, 374)	Large chicks/nest	0.07	(0.01, 653)
Common guillemot		[p,3]				[3]	*No breeding 2024*	
Atlantic puffin		2[p]	2022-23 (1)	85.4	(3.7, 535)	Hatching success/nest	0.78	(0.06, 42)
						Chicks ≥ 20d/nest	0.71	(0.07, 42)
						Chicks ≥ 30d/hatched	0.67	(0.07, 42)
						Fledged chicks/nest	0.67	(0.07, 42)

[p] plot count [1] No breeding was recorded in the study plots in 2024. [t] total census [2] Breeding success is monitored in study plots at Lisjestakken and Huldene. [3] As in the preceding year, no breeding was recorded in the study plots in 2024.

Table A12. *Key population parameters (SE, n) of shag in* ***Vestland*** *in 2024.*

	Population change	Annual adult survival			Reproductive performance		
Species	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Common eider							
Lesser black-backed gull	3[t,d]	2009-2024 (14)	84.8	(2.39, 108)	Clutch size[1]		
					Breeding success[2]	1.26	
Herring gull	4[t,d]	2009-2024 (14)	81.5	(1.94, 270)	Clutch size[1]		
					Breeding success[2]	0.65	
Great black-backed gull	17[t,d]				Clutch size[1]		
					Breeding success[2]		

[t] total census [d] drone count [1] Including empty nests. [2] Large chicks/fledglings per nest.

Table A13. *Key population parameters (SE, n) of shag in* ***Rogaland*** *in 2024.*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Shag	*Kjør*					Clutch size[1]	2.51	(0.10, 47)
						Breeding success[2]	0.96	(0.14, 45)
	Jarstein		2022-2023 (1)	80.61	(6.11, 287)			

[1] Maximum nest content on 3 visits between 16 May and 28 June, omitting nests not known to have contained eggs/chicks [2] Chicks/nest on 28 June, when some chicks were still small but only one nest contained eggs.

Table A14. *Key population parameters (SE, n) of seabirds on the different sites in* ***Agder*** *in 2024. Slettingene, Storøy and Klovholmene are located in Mandal, Lindesnes municipality. Rauna is in Farsund municipality.*

		Population change	Annual adult survival			Reproductive performance		
Species	**Locality**	**Estimate %**	**Period (yrs)**	**Estimate %**	**(SE, n)**	**Sampling unit**	**Estimate**	**(SE, n)**
Great cormorant	*Rauna*	3.0[t]		*Results not yet available*[1]		Clutch size[2]	3.44	(0.08, 343)
						Large chicks/nest	1.56	(-, 343)
Common eider	*Rauna*	7.5[3]				Clutch size	3.72	(0.3, 25)
						Chicks on sea[4]	*No data 2024*	
Lesser black-backed gull			2007-2024 (19)	77[5]	(5.5, 811)			
	Slettingene	127.0[t]				Clutch size[2]	2.19	(0.08, 234)
						Fledged juv./pair	0.64	(-, 234)
	Storøy	[6]				Clutch size[2]	*No breeding 2024*	
						Fledged juv./pair	*No breeding 2024*	
	Klovholmene	300.0[t]				Clutch size[2]	1.25	(0.48, 4)
						Fledged juv./pair	0	(-, 4)
	Rauna	5.0[t]	2007-2024 (19)	83.2	(0.5, 1447)	Clutch size[2]	*No data 2024*	
						Fledged juv./pair	0.55	(-, 1680)
Herring gull			2007-2024 (19)	80.5[5]	(0.1, 717)			
	Slettingene					Clutch size[2]	2.30	(-, 87)
						Fledged juv./pair	0.45	(-, 111)
	Storøy					Clutch size[2]	2.35	(0.26, 17)
						Fledged juv./pair	0.38	(-, 26)
	Klovholmene					Clutch size[2]	2.79	(0.11, 14)
						Fledged juv./pair	0.37	(-, 19)
	Rauna	40.0[t]	2007-2024 (19)	82.6	(1.4, 272)	Clutch size[2]	*No data 2024*	
						Fledged juv./pair	0.95	(-, 420)

[t] total census [1] Colour-ringing of chicks initiated in 2008. [2] Including empty nests. [3] Based on counts of adult males in Farsund municipality. [4] No estimates of production in 2024 per nest unit. Chicks are still counted at sea (long timeseries of count along Listastrendene), but there is no complete count of nests at Rauna to provide production per nest . [5] General estimate for birds from Slettingene, Storøy and Klovholmene. [6] No breeding in 2020, 2021, 2022, 2023 and 2024.

Cover photo: *Common eiders in Kongsfjorden. Photo: © Sébastien Descamps*

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