4 Conclusion

The results from this year's survey, as in previous years (2022–2024), show an uneven distribution of nests across the islands. Most nesting activity was recorded on the outer islands of the archipelago, while the islands closest to the current airport and construction area had fewer nests. Interestingly, there was no clear correlation between locations with significant declines in nesting and their distance from the construction work.

Due to increased disturbance, noise, and major environmental changes associated with the establishment of the sea embankment for the new runway, a decline was expected on Ravholmene, Lyngholman, Hesterøya, and Kvannøya—areas directly affected by the development. A decline in the number of nests was recorded on all of these islands except Lyngholman, but the percentage decrease was similar to that observed on the other islands. On Lyngholman, the number of nests remained the same between years. When combining the number of nests and pairs, the decline was less pronounced, and on some islands—interestingly including Lyngholman—there was even an increase. It is unclear whether the observed pairs had nests, were failed breeders, or had not attempted to breed this year.

Based on the fieldwork conducted, it is not possible to determine where pairs that previously nested at a given location may have relocated. Monitoring such movements would require different methods, such as bird ringing, which allows for individual identification. This type of fieldwork is very time-consuming and has not been encouraged. It is possible that pairs displaced from areas like Ravholmene have established themselves on nearby islands, but this cannot be confirmed.

Coastal birds, especially colonial nesters like gulls and terns, are particularly vulnerable to disturbance and human presence during the breeding season (Follestad, 2012). The most notable change observed between survey years is the decline in breeding lesser black-backed gulls (VU) and common gulls (VU), as well as the absence of any signs of breeding terns. Over the four survey years, the number of lesser black-backed gull nests has dropped from 58 in 2022 to 13 in 2025. For common gulls, the highest number of nests was recorded in 2023 (50), but only 22 were recorded this year. Lesser black-backed gulls lay eggs from late April to mid-May, and common gulls during May (Lorentsen, 1994 a & b). The survey was conducted at the same time as in 2024, and one week earlier than in the first two years, but the timing is unlikely to be the cause of the decline. Breeding populations of both gull species are declining in Norway and elsewhere in Europe (Stokke, 2021 a & b). The great black-backed gull (A) has also declined compared to 2023 and 2024, but the number of nests is the same as in 2022 (16). Norwegian breeding populations of great black-backed gulls are also in decline, with the most noticeable decreases in the northern parts of the country (Grønningsæter, 2024).

This year was the first since the survey began in 2022 with no confirmed tern breeding. Ten terns were observed flying overhead, but their behavior did not indicate nesting in the area. In both 2022 and 2024, tern colonies (Arctic tern (EN) and common tern) of over 100 individuals were observed—on Slåttøya in 2022 and on Ravholmene and Skagskjæran in 2024 (Norconsult Report DB01 & DNV Note 2024:10). Terns are highly sensitive in their breeding areas and may abandon colonies due to disturbance from human activity or predation (Spikkeland, 1994 a, b). Given the significant changes associated with the construction of the sea embankment for the new runway, it is not surprising that terns did not breed in the area this year. At the same time, terns often change breeding sites between years and are known to abandon breeding if food resources are insufficient in a given year (Spikkeland, 1994 a, b). Therefore, multiple factors may explain the absence of tern breeding in the archipelago this year.

Due to the construction work on the sea embankment, no breeding was expected on Ravholmene or the embankment itself. However, a pair of Eurasian oystercatchers (NT) had established a nest on the southern side of the embankment, and a pair of great black-backed gulls had a nest on one of the islets nearby. Four additional oystercatcher pairs were observed along the embankment. It was interesting to observe breeding so close to the construction site despite the disturbances. This should be monitored with regard to bird strike risk once the airport is completed and operational.

Other observations relevant to future aviation safety include the flight behavior of ducks. During field inspections, special attention was paid to whether ducks flew low around land or chose to fly over land (the islands), to assess how they might behave around the new runway. The archipelago is an attractive area for foraging and resting ducks, and throughout the survey period (2023–2025), several flocks of various duck species were observed. Common eiders (VU) were seen flying low over the water and around land masses, while red-breasted mergansers, mallards, and greylag geese flew over the islands at varying altitudes (between 5–20 meters above land) when startled. Based on these observations, it appears likely that some duck species will fly over the new runway rather than around it. Continued field monitoring is necessary to better understand the behavior of these species in the archipelago and to predict future bird strike risks at the new airport.

Previous reports have recommended trapping and monitoring of mink on the islands and raised concerns that the sea embankment could facilitate the spread of this invasive species (Austad, 2023 a; 2024 a; Norconsult 2022). Mink are active predators and nest raiders, with a significant negative impact on ground-nesting seabirds (Norwegian Directorate for Nature Management, 2011). The Norwegian Nature Inspectorate participated in a site inspection around the embankment in May and concluded that the embankment is not suitable mink habitat. The embankment and the smooth coastal rocks south of the project area are not suitable for mink, although the species may

occasionally occur in the surrounding area. The inspected area is also not suitable for mink trapping (Heggmo, G., Norwegian Nature Inspectorate, 2025).

Red-listed species with breeding declines following the start of construction:

- **Lesser black-backed gull (VU):** Decline in number of nests and pairs from 2022–2024
- **Common gull (VU):** Decline in number of nests from 2022–2024
- **Eurasian oystercatcher (NT):** Decline in number of nests since 2022, but similar to 2024

There are likely multiple reasons for the decline in breeding among these species. Construction-related disturbance and habitat changes have probably had an impact. However, the extent of this impact cannot be determined at this stage of the survey process, nor can future developments be predicted. It will be interesting to see whether the trends observed so far continue and how breeding populations and behavior evolve with continued monitoring in the coming years.