Updated information on distribution and abundance of Baltic ringed seal in the Åland archipelago

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Action: A6 Identifying suitable areas for new Natura 2000 sites for ringed seal conservation in Åland Archipelago
Deliverable: Report on updated information on distribution and abundance, including areas suitable for ringed seal conservation in Åland area

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1. Background

The Government of Åland is the competent authority for the management and protection of the seal populations in the Province of Åland area, including the full processes of establishing and managing Natura 2000 and other protected areas. The Baltic ringed seal (*Pusa hispida botnica*) is a protected species under the section 15 of the Act of Åland on Wildlife Management (1998:82). The number of the seals in the Archipelago Sea subpopulation is low and the species, as also stressed by the European Commission (EC) as well as HELCOM, needs urgent protection. Currently, the ringed seal is not listed as a target species in any of the existing protected areas in Åland province. However, the existing information on the distribution, abundance and important habitats of the species has been deficient for any concrete conservation actions and suitable protected areas cannot be identified. To implement the management actions necessary to reach the favourable conservation status of the species in the area concerned, it was acknowledged that new inventories and monitoring were needed.

The inventories carried out in the action A6, provide essential information on the distribution and abundance of ringed seals in the Åland archipelago by producing up to date information for effective conservation measures for ringed seal in the area administered by the Government of Åland. Results of action A6 can be accompanied with the results of project actions A3, C2 and D2. In later stage, the existing Natura 2000 sites and other protected areas will be re-evaluated based on the project results and the possible importance for ringed seal conservation will be updated to the management plans of these areas (action B1). Moreover, the identified key areas of ringed seals, suitable for Natura 2000 sites, will be officially proposed as special areas of conservation (SAC) during the project by the Government of Åland (action B1). Furthermore, the results of the surveys will be used to produce the first conservation plan of the species for the Åland area (action A6). Knowledge produced in the action A6 will significantly improve the conservation status of the ringed seal in the Åland area.

Inventories for identifying important areas for the Baltic ringed seal in the Province of Åland were conducted during 2021-2023, coordinated by Turku University of Applied Sciences. The inventories have based on previous data on the species from the area, and field surveys of targeted areas. The focus of the field surveys has been in the northeast and southeastern archipelagos which has been identified important for the species in previous studies (e.g., Miettinen et al. 2005; Nordström et al. 2011; Halkka & Tolvanen 2017). The field surveys have been carried out mainly as boat-based surveys, but also aerial surveys (2022 and 2023) and camera trapping has been utilised. Survey methods are described in more detail in project deliverable A3.2.

1.1 Existing knowledge on distribution and abundance of Baltic ringed seal in the Åland islands

Based on the historical catch statistics, especially the eastern parts of the Åland archipelago have been one of the strongholds of ringed seals in the Archipelago Sea. Between 1924 and 1937 reportedly over 7000 ringed seals were hunted in the Archipelago Sea from which major proportion were caught in the Åland islands (Nordström et al. 2011). In the winter 1930 alone, approximately 1400 ringed seals were caught (Bergman 1956) and based on Stenman et al. (2008) between 1925 and 1945 rewards were paid for over 8000 ringed seals. In the late 1930s' the hunting decreased, most likely due to the collapse of seal population resulting from overhunting and poor ice conditions in consecutive winters (Ahlbäck 1955; Bergman 1956). Yet again, between 1967 and 1975, over 700 ringed seals were caught in the Åland islands which was a major part of the reported catch in the Archipelago Sea in that period of time (Nordström et al. 2011). Furthermore, as late as in 1975, 24 ringed seals were reportedly caught in Åland (Åländsk utredningsserie 1990). Besides hunting records, there is information of 14 ringed seals to be killed by fishing tackle in the 1980s' (Helle & Stenman 1990).

In the early 2000s the need for up-to-date information of the state of the Archipelago Sea ringed seal population was acknowledged. Between 2002 and 2011, WWF Finland conducted surveys in the Archipelago Sea also covering the eastern parts of the Åland islands (Miettinen et al. 2005; Nordström et al. 2011; Halkka & Tolvanen 2017). Surveys consisted of aerial transect line surveys when sea ice occurred and piloting of boat-based surveys during the haul-out season of ringed seals in April-May. More information of these past surveys can be found form the project deliverable report A3.2. Prior to field surveys, complementary information was collected by interviewing of people who had spent time in the archipelago observing nature (Nordström et al. 2011). In Åland, a targeted questionnaire survey was carried out by Stenman et al. (2008) together with the Government of Åland.

Aerial transect line censuses were carried out in 2005, 2010 and 2011 (Nordström et al. 2011). The censuses covered the parts of the Åland archipelago that had ice-cover at the time. In 2005, the two flights covered total of 411 survey kilometres on the province of Åland area, and 14 ringed seals were observed, situating in Kökar (9 individuals), Kumlinge (4, including 1 pup) and Sottunga (1) (Nordström et al. 2011). In 2010 and 2011, the large parts of the Archipelago Sea were ice-covered which enabled aerial transect line census of extensive area. On these flights, most of the ringed seal observations in the Åland area were made in the Kökar archipelago, but a few seals were also seen in the northern parts of Kumlinge, Brändö and Saltvik (Table 1). Based on the

surveys conducted in the early 2000s', the ringed seal population in the Åland was estimated to be approximately 35-45 individuals (Table 1; Miettinen et al. 2005; Nordström et al. 2011).

Table 1. *Estimated number of ringed seals in different parts of the Åland islands based on the observations made in 2002-2005 (Miettinen et al. 2005; Nordström et al. 2011).*

Area	Individuals
Kökar	30–40
Kumlinge	4–5
Other parts of the Åland	population is small / status unknown

Furthermore, Nordström et al. (2011) concluded that the core distribution area continues uniform from the Archipelago National Park joint cooperation area to the Kökar archipelago. Based on the observations, the population size of ringed seals in other parts of the Åland islands is small, and is concentrated to the northern parts of Kumlinge, Brändö and Saltvik municipalities, and seems to be isolated from the other areas. Seal pup observations made in several years indicated that the ringed seals breed in the Åland islands (Nordström et al. 2011). In addition to aerial surveys, one day boat-based survey was conducted in the Kökar archipelago in the May 2003. Boat survey covered approximately area of 125 km^2 of the eastern and northeastern parts of the archipelago. Two ringed seals were sighted during that survey. (Nordström et al. 2011)

2. Updated information on distribution and abundance of the Baltic ringed seal in the Åland islands

2.1 Surveys carried out in 2021-2023

Only scattered knowledge on ringed seal distribution was available and the current status was largely unknown. In the years 2021-2023, extensive boat-based surveys were conducted in the Åland archipelago. The boat surveys were supported with aerial counts done with a helicopter in 2022 and 2023 by the Nature Resources Institute of Finland (LUKE). For more detailed information of surveys methods see project deliverable A3.2. Surveys covered most of the potentially suitable areas for the ringed seals in the Åland archipelago (Fig. 1), with the focus on the areas with previous ringed seal sightings (Nordström et al. 2011; Halkka pers. comm.). Many of these areas are remote and unsheltered, and hence the boat surveys are prone to the impacts of weather conditions.

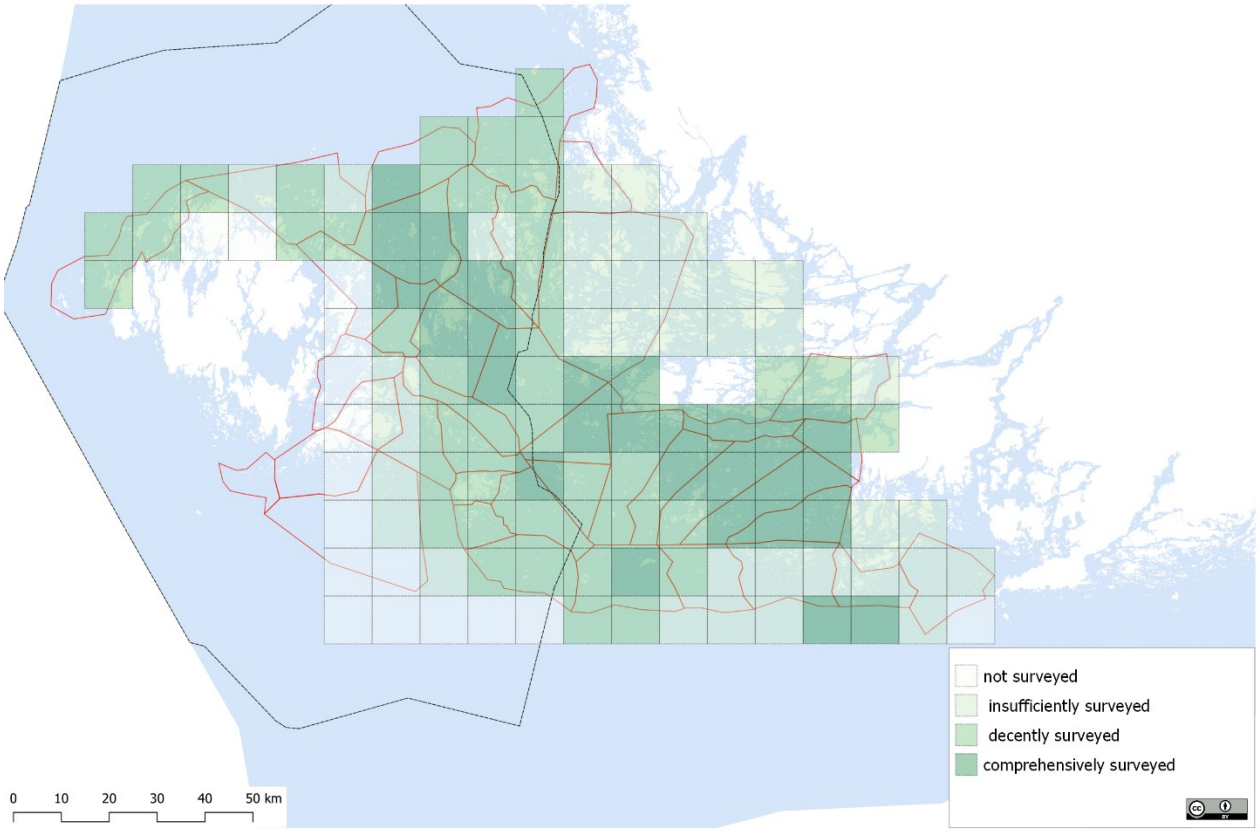

Figure 1. *Survey effort of the boat-based surveys in the Archipelago Sea. Surveys were conducted in the years 2021-2023. Grey line shows the borderline of the Åland (west) and the region of Southwest Finland (east). The map shows survey effort (grid 10 × 10km) and the red segments illustrate the areal division used in the surveys in 2022.*

Boat based surveys were conducted during the moulting season in April-May. Surveyed areas were covered systematically and in coordinated way using 1-3 boats and 2-4 observers per boat. Animals and potential haul-out sites were searched using binoculars (Table 2). Additionally, some selected islands were landed, and the surrounding area was observed with binoculars and fieldscopes from the highest point of an island (Fig. 2). With this method it is possible to observe and identify ringed seals roughly up to distance of 5 kilometres. Observing from a fixed point is functional method to cover large areas in non-invasive way, especially in the ragged and rocky parts of archipelago. In fragmented areas it is possible to scare the hauling seals to water before seeing them, when approaching the sites with a boat.

Figure 2. *Observing with fieldscope from the highest point of selected islands is a practical method to find and census hauling ringed seals and cover large areas in the ragged parts of archipelago.*

In total, 88 ringed seal observations were made on 20 survey days during the haul-out seasons 2021-2023 (Table 2). In addition, some areas of the Åland archipelago were visited during other fieldworks and attention were also given to observing the animals.

Table 2. *Surveys were carried out on total of 20 days during the haul-out seasons 2021-2023. During the surveys, 88 ringed seal observations were made. Note that most of the observations were made in the same area or even at same sites, and same individuals may have been observed multiple times on different visits or years.*

Date	Boats	Seals observed
21.4.2021	1	3
29.4.2021	1	1
1.5.2021	1	1
3.5.2021	1	0
4.5.2021	1	2
9.5.2021	1	14
15.4.2022	1	2
21.4.2022	3	0
22.4.2022	3	11
23.4.2022	3	0
25.4.2022	1	7
27.4.2022	1	5
13.5.2022	1	18
7.5.2023	2	10
12.5.2023	1	0
13.5.2023	1	0
14.5.2023	1	14
15.5.2023	1	0
16.5.2023	1	0

In the spring 2022, seven camera traps were deployed to three potential islands in the northeastern Åland to investigate if seals use the sites for hauling out. The cameras were targeted to photograph a stretch of shore or a larger group of rocks, instead of specific rocks or shoals as when collecting photo-ID material (see deliverable A3.2).

In mid-May 2022 and 2023, aerial surveys were done very first time using a helicopter (Robinson R44). During the both springs, surveys covered almost the whole Archipelago Sea and Åland islands and focused on haul-out sites previously known or which were identified during the boat surveys. Ringed seals hauling out on rocks were counted and if possible, photographed.

2.2 Updated information on distribution and abundance

The surveys have improved the knowledge on the occurrence of seals and revealed new important areas for the species within the Åland province. Based on the surveys, the distribution of ringed seals during the moulting season is centred to two specific areas in the eastern and northeastern Åland (Fig. 4). These areas are remote with very low anthropogenic activity especially in the springtime. In previous studies, the identified core areas in the northeastern Åland were acknowledged but assessed to be isolated from the uniform distribution area situated mostly within

the joint co-operation area of the Archipelago National Park (Nordström et al. 2011; Halkka & Tolvanen 2017).

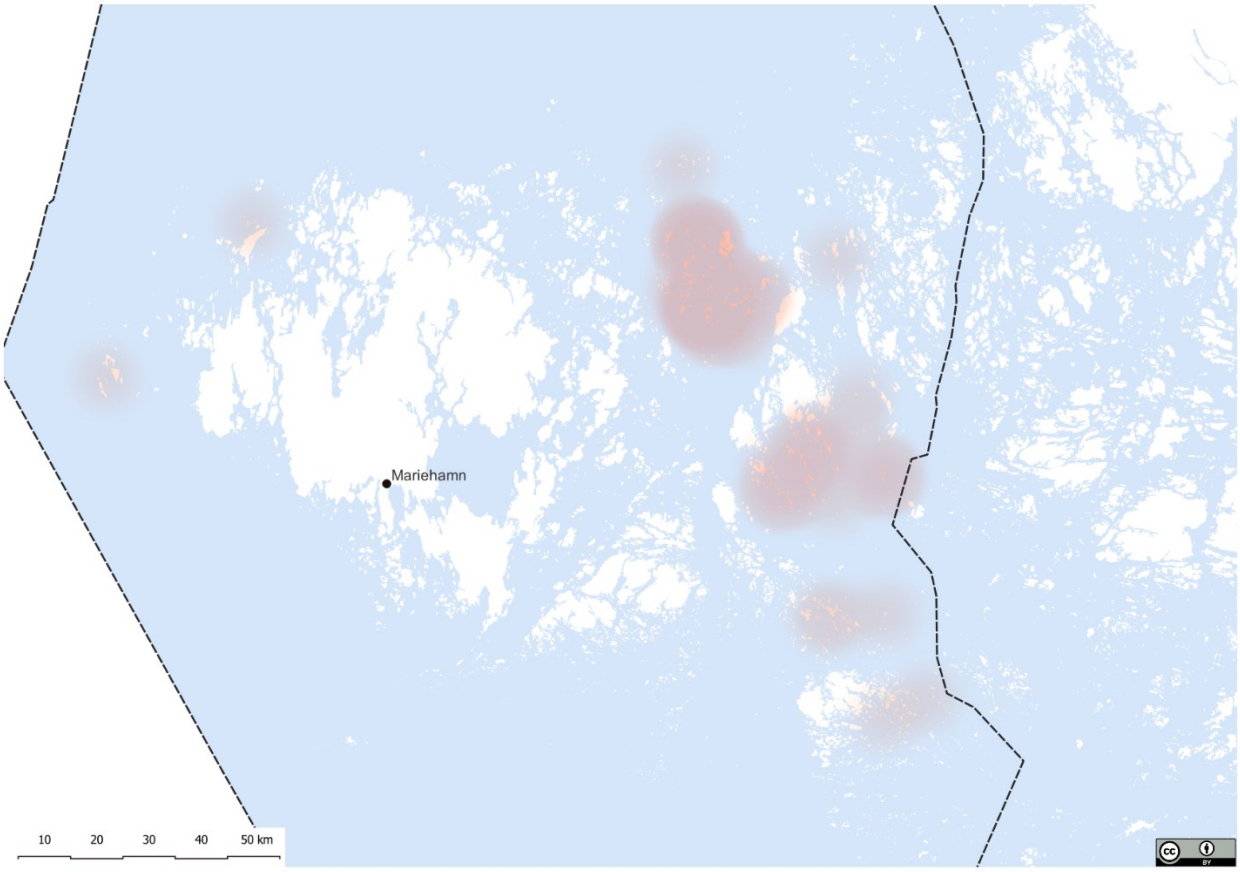

Figure 3. *Distribution of the Baltic ringed seals in the Åland islands based on the surveys conducted in springs 2021-2023. Heat map is based on observations from both boat and aerial surveys. Black dashed line shows the border of the Province of Åland (west). Colour intensity of the heat map depends on the number of encountered seals.*

Apart from these identified core areas, also the other sightings were concentrated on areas where the anthropogenic disturbance is low. In other words, the seals seem to prefer peaceful areas with less marine traffic and inhabitation such as houses and summer cottages. Similar pattern can be seen in the eastern Archipelago Sea core areas. Moreover, the occurrence and abundance of grey seals (*Halichoerus grypus*) may have an effect to the occurrence and distribution of ringed seals, e.g., in parts of the Kökar archipelago, where large numbers of grey seals were seen during the surveys. Based on the observations, the number of ringed seals in the Kökar archipelago has decreased compared to past studies (Nordström et al. 2011). Now the northeastern Åland seems to be more important to ringed seals compared to the conclusions of the surveys made in early 2000s' (Miettinen et al. 2005; Nordström et al. 2011)

In 2021, a total of 21 ringed seals were sighted on five different days between April 21st and May 9th (Fig. 4, Table 2). Based on the timing and distances of the sightings, the encountered seals

were different individuals. The largest group was 13 individuals. On the other sighting occasions, the seals were seen singly and once in a group of two seals. Most of the sightings were made in the northeastern Åland (17 seals) and the rest (4) in the eastern and southeastern parts of the province.

During boat-based surveys in 2022, 43 seal observations were made between April 22nd and May 13th (Fig. 4, Table 2). In addition, six ringed seals were seen in aerial census on May 22nd. Two ringed seals were observed with camera traps deployed in the northeastern archipelago. Based on the observations of boat and aerial surveys, the estimated number of individual ringed seals sighted in the Åland archipelago is roughly 20-25 individuals. In 2022, the largest group was six seals, and it was seen on the same island than the highest count in 2021. On May 13th, 18 individual seals were sighted, which is probably the highest daily count recorded in the Åland archipelago in the 21st century. These seals were seen within a relatively small area (approx. 25 km^2) in the northeastern archipelago.

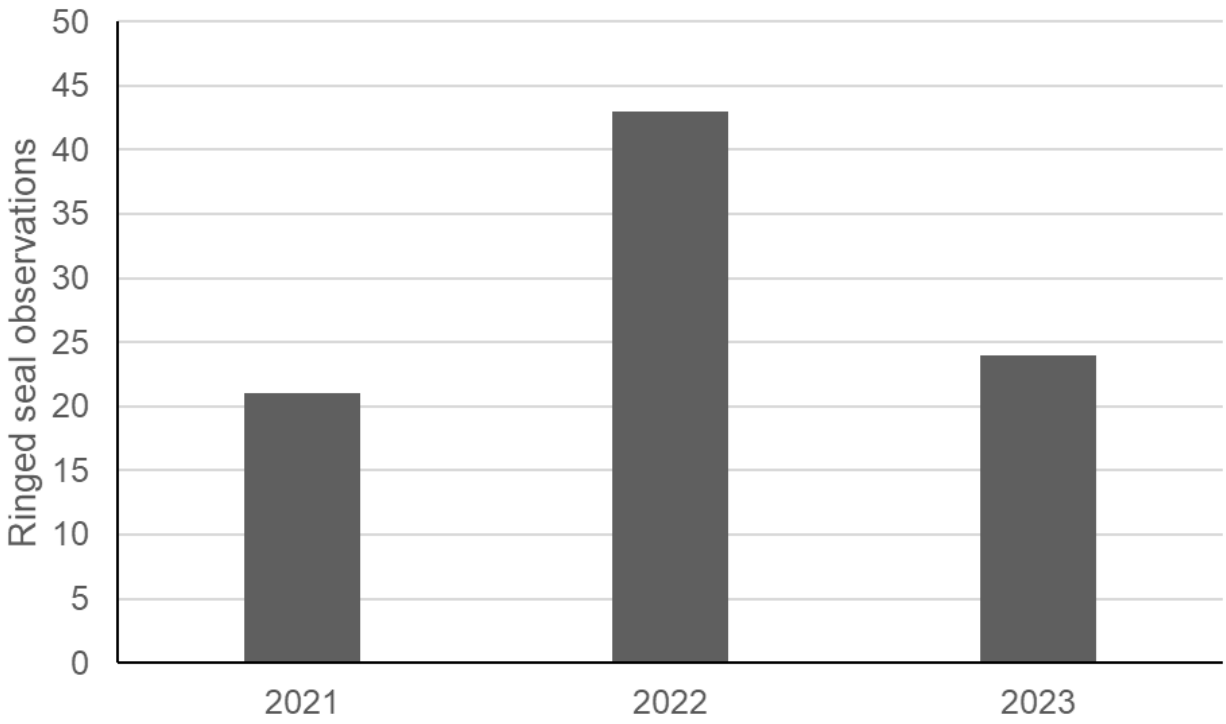

Figure 4. *Annual numbers of ringed seal observations made in the Ålands islands during the boat-based surveys in springs 2021-2023. Most observations are concentrated to the same area in the northeastern archipelago and thus same individuals may have been observed multiple times.*

In 2023, more survey effort was given to the parts of the Åland archipelago that were only superficially surveyed or not visited at all in previous years. On May 6th and 7th, large areas of southeast Åland, covering most parts of the municipalities of Kökar and Sottunga and parts of Föglö and Kumlinge were surveyed in good conditions with two boats. During the survey, 10 ringed

seals were seen. Eight of the animals were sighted in a small area (approx. 12 km^2) situating in municipality of Kumlinge. Two of the encounters included a female with a pup. On May 14th, 14 ringed seals were seen in the northeast Åland. Haul-out sites in this area have remained the same between the survey years. The largest group was four individuals. As in 2022, the aerial census was carried out in mid-May (May 15th). Similar to previous year, seven ringed seals were seen in the Åland area. A conservative estimate of the total number of seals in Åland archipelago was approximately 25 individuals.

Due to the sensitivity of the haul-out sites, the detailed data and maps of observations are removed from this public version of the report but have been provided to the authorities responsible for the protection of the species.

3. Summary

During 2021-2023, extensive boat-based and aerial surveys were conducted in the archipelago areas of Åland islands. The results of the surveys significantly improved the knowledge on the distribution and abundance of ringed seals in the Åland province. Based on the surveys, the most important areas for ringed seals are located in the northeastern and eastern Åland.

Two core areas of higher importance were identified. These areas hold multiple islands and islets that ringed seals use regularly for haul-out. Both areas are relatively remote, and the level of anthropogenic disturbance, originating e.g. from summer cottages, recreational and commercial fisheries and marine traffic is low. Surveys conducted in the whole project area (including Finnish Archipelago Sea) during the last three years clearly indicate that the species prefer the most undisturbed parts of the archipelago.

The results have now provided the needed knowledge for implementation of conservation measures, including both establishment of new protected areas and management of the existing protected areas, where seals were also encountered. The identified two core areas should be considered as new protected areas for the Baltic ringed seal. The collected information will be also used as the basis for the first conservation plan for the Baltic ringed seal in Åland islands, to be produced in the later stage of the action A6.

Due to the sensitivity of the sites, the more detailed maps or data on observations (Appendix 1 & 2) are not public. All the collected data have been transferred to Government of Åland for conservation and management measures.

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