Report on monitoring the translocated seals (Action D1)

Action D1: Monitoring of the success of the translocations and veterinary care

Project acronym:	Our Saimaa Seal LIFE
Project full title:	Working together to save the Saimaa Ringed Seal in changing environment
Grant / Contract No.:	LIFE19NAT/FI/000832
Instrument:	Financial Instrument for the Environment and Climate action (LIFE)
Duration:	5 years
Project start date:	01/09/2020
Project expected end date:	31/12/2025
Date of this document:	21/11/2025
Produced by:	Marja Niemi (UEF), Piia Mutka (UEF), Miina Auttila (MH), Riikka Alakoski (MH), Jari Ilmonen (MH), Mervi Kunnasranta (UEF)
Name of the beneficiary:	Metsähallitus Parks &Wildlife Finland
Submitted:	21/11/2025

Summary

To maintain the current remaining genetic diversity and mitigate the potential negative effects of inbreeding pressure of the Saimaa ringed seal, assisted gene flow was conducted within Lake Saimaa. The translocations of four ringed seals were carried out in 2023 and 2024. Two adult females from Pihlajavesi and a male pup that was rehabilitated in Metsähallitus in 2024, were released to Kolovesi basin. One adult male from Pihlajavesi was released to South Saimaa. Post-release monitoring methods such as short-term satellite tracking, long-term photo-identification, and genetic analysis are used to track seals' movements and residency. Satellite tracking in 2023 showed that the seals remained in their new areas during the first summer. At least one of the females has established residency in the target area over multiple years, observed in 2024 and 2025. However, the adult male did not stay in his new habitat, and it was observed two years later in the capture area in Pihlajavesi. No sightings have yet been reported of the female translocated in 2024 or the pup.

Introduction

To maintain the current remaining genetic diversity and mitigate the potential negative effects of inbreeding pressure of the endangered Saimaa ringed seal (*Pusa saimensis*), we conducted assisted gene flow within Lake Saimaa by translocating seal individuals (Niemi et al. 2025). Translocations were carried out from Pihlajavesi basin with the highest population density to areas genetically isolated and/or with a small population but with suitable and safe habitat for the seals (South Saimaa and Kolovesi basins, Fig 1) according to the principles and guidelines for genetic rescue (Biard et al. 2022, Sundell et al. 2023).

Post release monitoring was conducted by satellite telemetry tracking, photo-identification (photo-ID), and genetical tools. Satellite telemetry enables animals to be tracked multiple times per day as long as the tracking device stays on the animal. In addition, devices can collect other behavior data such as dives and resting periods (e.g. Niemi et al. 2012). This monitoring enables short-term, but very exact tracking of the animals and info on their daily movements. Saimaa ringed seal photo-ID is based on identifying permanent pelage patterns, distinguished for each seal, from images (e.g. Koivuniemi et al. 2016). This enables long-term (even life-long) monitoring of the animals, as long as they are captured on camera. This monitoring method gives information on animal movements over the years. Genetical tools in our case are based on comparing the DNA of the translocated animals to the DNA of found seal hair, placenta, or dead pups which enables over generation monitoring of the translocations. This report includes information on post-release monitoring and what we know about the translocated individuals (three adults and one pup) to date.

Satellite monitoring

The translocated adult seals (individual codes: Phs221, Phs499, Phs083) were equipped with GPS/GSM

tag (SMRU, Univ. of St. Andrews, Scotland) that was glued using rapid glue (Loctite 454) to the fur between the scapulae. In addition, a numbered plastic flipper tag was attached to the hind flipper for each seal which enables later identification if animals are found dead, and the pelage patterns are no longer visible. The tracking period of female Phs221 lasted six months and of male Phs499 less than two months. Female's Phs083 tag dropped off during the first day/s due to unfinished molt and no tracking records were received. In 2023, the tracked seals moved some 10 km a day after their release. After that they stayed mainly within the target area (Fig 1). The male made longer trips up to 45 km one way but returned to the release site before the tag dropped off.

Movements and habitat usage of translocated seals were typical for the Saimaa ringed seals. Female's Phs221 total home range (100% adaptive local convex hull, *a*-LoCoh, land areas included in the area) was 39 km^2 and core area (50% minimum convex polygon, MCP50) was 2,6 km^2, as male's Phs499 total home range was 168 km^2 with core area of 9,9 km^2 (Table 1). Both home ranges correspond to earlier studies on Saimaa ringed seals movements where adults' average total home range is 92 km^2 (range 20-172 km^2) and core area 4,6 km^2 (range 0,5-11 km^2; Niemi et al. 2012, Niemi 2013).

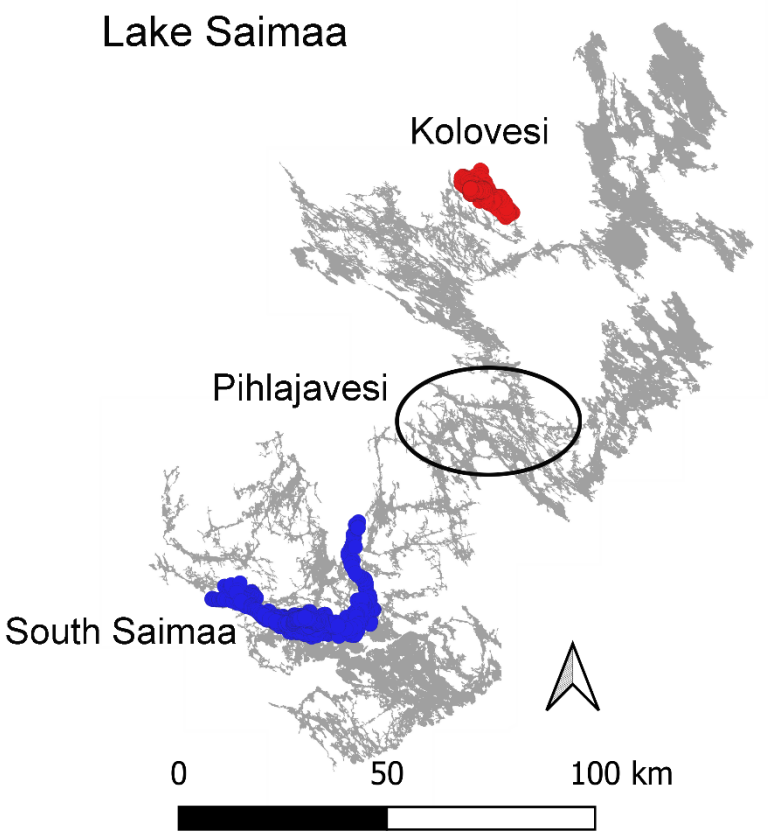

Figure 1. Map of the locations of female Phs221 (red) and male Phs499 (blue) after translocating them from Pihlajavesi. ©Base map / National Land Survey of Finland MML/25.

Table 1. Descriptives of translocated seals and satellite tracking. F = female, M = male, from = water basin where the seal was captured, to = water basin where the seal was translocated, PV= Pihlajavesi, KV=Kolovesi, SS=South Saimaa

Seal ID	Sex	From	To	Release date (GPS tracking start dd/mm/yy)	GPS tracking end (dd/mm/yy)	Number of locations	Home range: total / core km²
Phs221 (AM23)	F	PV	KV	22.5.23	23.11.23	6 897	39 / 2,6
Phs499 (TU23)	M	PV	SS	24.5.23	15.7.23	2 918	168 / 9,9
Phs083 (JE13)	F	PV	KV	22.5.24	NA	NA	NA/NA
Phs527* (AS24)	M	PV	KV	31.8.24	NA	NA	NA/NA

*Rehab pup

Photo identification

Translocated individuals were photographed during the handling procedure (Niemi et al. 2025). Photo-ID, which relies on unique pelage patterns (Koivuniemi et al. 2016), is used for long-term monitoring. Game camera traps were set to the known haulout sites based on the GPS-tracking during 2023. Annual photo-ID effort is made during the seals molt each year in May/early June by photographing the seals from motorboats using digital cameras and by using game camera traps. The image data from 2024 and 2025 are still partly unreviewed.

Currently we know that female Phs221, based on Photo-ID, has stayed in the target area since 2023 (Fig 2). The male Phs499 has been found so far from the year 2025 images from Pihlajavesi, and it has returned into his capture area, travelling some 100 km. Other female Phs083 was photographed one week after the release on the target area ca. 6 km from the release site, and it could be confirmed that the tag had dropped off. After that this female have not yet found from the images. The male pup Phs527 has not yet been found from image data after releasing in 2024. We'll gain more information on the seals, when large image data processing is done.

Figure 2. Game camera trap images of female Phs221, translocated from Pihlajavesi to Kolovesi, during a) autumn 2023 b) spring 2024 and c) spring 2025.

DNA

DNA samples, including saliva and skin, were collected from the seals during handling and analyzed at the University of Helsinki to determine the genetic background of the translocated seals, enabling future comparisons with DNA from pups, placentas, or hair samples to monitor their reproductive success and integration over time.

Acknowledges

We would like to acknowledge all the skillful and dedicated people who have participated in the monitoring of the translocated seals in various ways. The Action is part of the Our Saimaa Seal LIFE (LIFE19NAT/FI/000832) project. The material reflects the views of the authors, and the European Commission or the CINEA is not responsible for any use that may be made of the information it contains.

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