

# The growth of the Saimaa ringed seal population is unstable

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The critically endangered Saimaa ringed seal (*Pusa hispida saimensis*) population only lives in landlocked Lake Saimaa. Lake Saimaa 4 380 km<sup>2</sup> is actually a highly fragmented lake complex totalling some 13 710 islands and islets. Mainland morphology split Lake Saimaa into smaller lakes, which are connected to each other by narrow straits.

The main threats to the population are; by catch in fishing gear, climate change related loss of snow and ice and highly fragmented population structure (e.g. Sipilä 2013, Kovacs et al. 2012). In the 21st century the Saimaa ringed seal population size has increased slowly from approximately 240 to 310 seals (Fig 1). Annual pup production has varied between 44 and 66 pups and estimated annual mortality between approximately 30 and 60 seals. This leads to an annual variation in population growth from approximately +20 to -20 seals per year.

Survival rate were estimated from observations of 190 known-aged carcasses during 21th century (Fig. 2). According to the mortality data, approximately around 80% of annual pup births have been

Fig. 1. Saimaa seal population size estimates 2000–2013

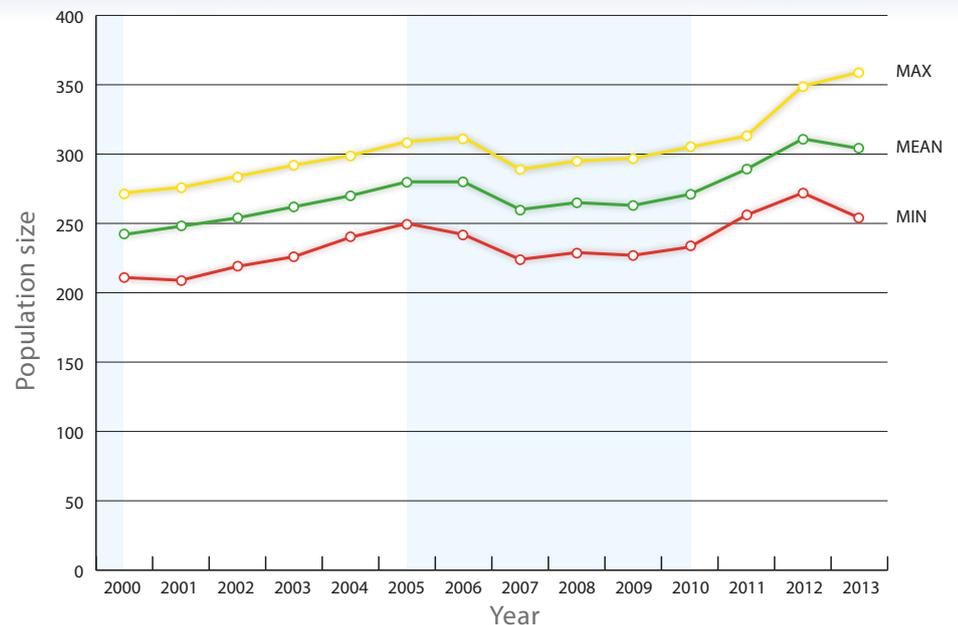


Fig. 2. Saimaa seal survival rate

Data: 190 carcasses, years 2000–2009, age determined from canine tooth.

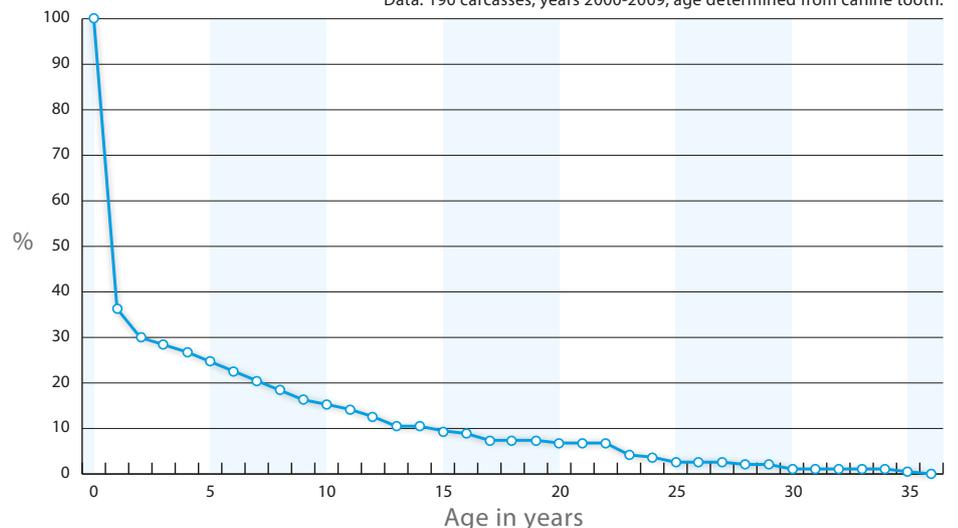
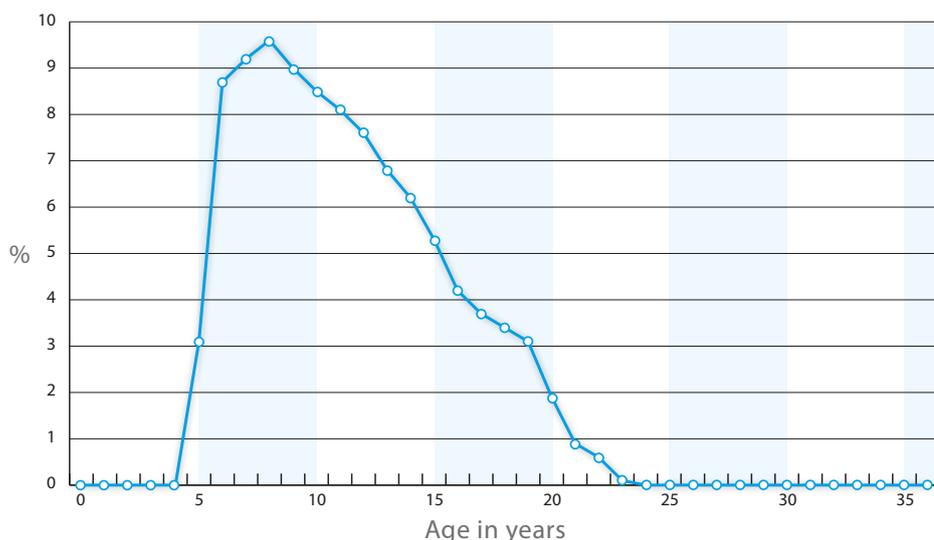


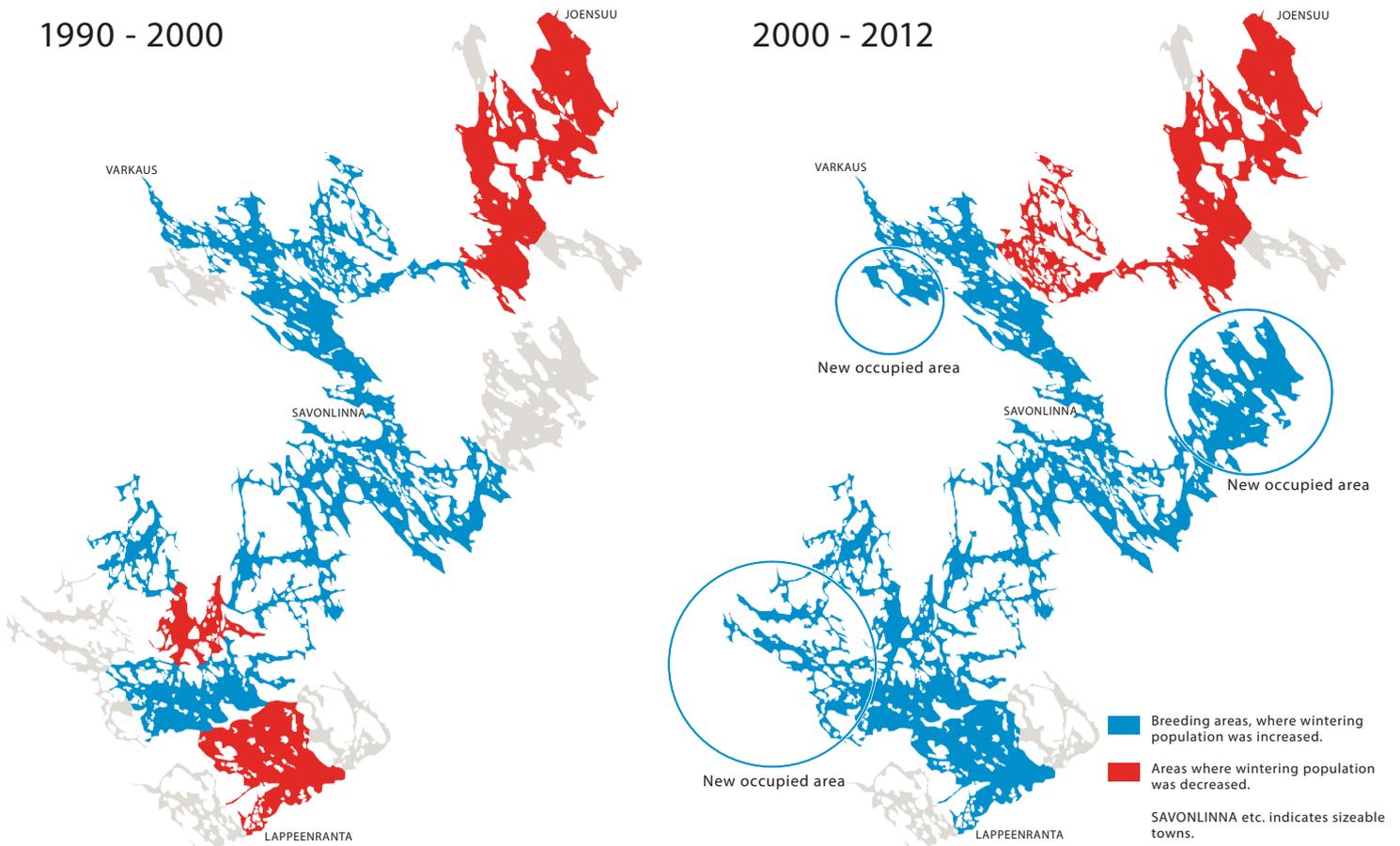
Fig. 3. Estimated proportion of pup production in different age classes



produced by seals aged from 6 to 16 years (See; Baker et al. 2011) (Fig. 3).

Saimaa seals have high site fidelity mainly owing to the unique breeding habitat of snow piles on the shoreline (e.g. Sipilä 2003, Niemi et al. 2013). According to data from the past 30 years of monitoring, earlier on, in the 20th century, 13 settled breeding areas were detected in the Saimaa Lake complex. In the 21st century, the number of seals in one breeding area collapsed, in four areas the numbers of seals slowly decreased and in 8 areas numbers slowly increased (Fig. 4).

**Fig. 4. Breeding areas**



The population density in the settled breeding areas is relatively low at a maximum of approximately 0.1–0.2 seal per ice km<sup>2</sup>. Unexpectedly, during the last 5 years, the Saimaa seal population has reoccupied 3 new areas, from which the populations vanished over fifty years ago. In two of these new areas, one pup has already been born annually (Fig. 4).

Although the total number of Saimaa ringed seals is slowly increasing in the lake area, increasing disunity will probably influence further fluctuation of its growth rate. The scattered spatial structure of the Lake Saimaa ringed seal population poses a threat to the long-term persistence of the critical endangered population. It should be noted that the present small recovery in numbers does not automatically forecast a safe future for the Saimaa ringed seal population (e.g. Ranta et al. 1996, Sipilä 2003).

### Acknowledgments

We thank the Finnish Ministry of the Environment, Safeguarding the Saimaa Ringed Seal LIFE project, the Raija and Ossi Tuuliainen Foundation and WWF Finland. We appreciate the help from over 140 field work volunteers.

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