

Mammalian Biology

Supplementary Material no. 1

Extreme moulting site fidelity of the Saimaa ringed seal

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Table S1. Number of surveying days and total number of boats patrolling each water basin of Lake Saimaa for each survey season. Note that each boat did not necessarily participate in each day of survey. Abbreviation of the water basins: PS = Pohjois-Saimaa, PEV = Pyyvesi-Enonvesi, KV = Kolovesi, JV = Joutenvesi, HV = Haukivesi, PV = Pihlajavesi, KS = Katoselkä-Lepistöselkä-Haapaselkä, LL = Lietvesi-Luonteri, PUV = Puruvesi, ES = Etelä-Saimaa.

Table S2. Descriptive statistics of Photo-ID data collection from Lake Saimaa 2016-2019 for individuals observed at least two seasons. The total number of seals differ when considering the different water basins because 11 individuals were observed in two different ones during the study period, which also explained the minimum number of seasons observed to be equal to one for some water basins. Abbreviation of the water basins: PS = Pohjois-Saimaa, PEV = Pyyvesi-Enonvesi, KV = Kolovesi, JV = Joutenvesi, HV = Haukivesi, PV = Pihlajavesi, KS = Katoselkä-Lepistöselkä-Haapaselkä, LL = Lietvesi-Luonteri, PUV = Puruvesi, ES = Etelä-Saimaa.

Table S3. Descriptive statistics of moulting site usage by Saimaa ringed seal for the period 2016-2019. Abbreviation of the water basins: PS = Pohjois-Saimaa, PEV = Pyyvesi-Enonvesi, KV = Kolovesi, JV = Joutenvesi, HV = Haukivesi, PV = Pihlajavesi, KS = Katoselkä-Lepistöselkä-Haapaselkä, LL = Lietvesi-Luonteri, PUV = Puruvesi, ES = Etelä-Saimaa.

Table S4. Descriptive statistics of distances between successive moulting sites used by Saimaa ringed seal for the period 2016-2019. Abbreviation of the water basins: PS = Pohjois-Saimaa, PEV = Pyyvesi-Enonvesi, KV = Kolovesi, JV = Joutenvesi, HV = Haukivesi, PV = Pihlajavesi, KS = Katoselkä-Lepistöselkä-Haapaselkä, LL = Lietvesi-Luonteri, PUV = Puruvesi, ES = Etelä-Saimaa. Abbreviations separated by a dash correspond to movements between the two water basins.

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	2016		2017		2018		2019	
	Days	Boats	Days	Boats	Days	Boats	Days	Boats
PS	10	1	11	1	11	1	6	2
PEV	1	1	2	1	2	2	4	2
KV	5	1	1	1	4	3	3	1
JV	5	2	9	1	13	2	7	1
HV	16	3	28	5	27	7	25	5
PV	35	7	27	4	32	4	40	4
KS	10	2	6	3	6	3	12	3
LL	10	4	13	5	13	2	9	2
PUV	11	2	13	2	14	2	11	2
ES	11	4	21	3	16	3	8	4

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Sex	Number of seals (N)	Number of seals per year (median (IQR) [min-max])	Number of years observed (median (IQR) [min-max])	Number of observations per individual (median (IQR) [min-max])	Number of observations per individual per year (median (IQR) [min-max])
Females	76	57.5 (55.5-59.5) [54-61]	3 (2-4) [2-4]	8 (5-14.25) [2-49]	3 (1-5) [1-23]
Males	55	42.5 (40.5-44.75) [39-47]	3 (2.5-4) [2-4]	10 (7-15.5) [2-40]	3 (2-5) [1-20]
Unknown	61	39.5 (38.25-40.25) [36-41]	2 (2-3) [2-4]	5 (3-7) [2-18]	2 (1-3) [1-15]
Total	192	42.5 (39.75-54.5) [36-61]	3 (2-4) [2-4]	7 (4-12) [2-49]	2 (1-4) [1-23]
Water Basin					
PS	10	7.5 (7-8) [7-8]	3 (2.25-3.75) [2-4]	8 (6.25-10.75) [3-21]	2.5 (1.25-3.75) [1-8]
PEV	2	1 (1-1.25) [1-2]	2.5 (2.25-2.75) [2-3]	2.50 (2.25-2.75) [2-3]	1(1-1) [1-1]
HV	46	34 (33-35) [30-38]	3 (2-4) [2-4]	7.5 (5-11) [2-29]	2 (1-4) [1-11]
JV	7	4.5 (3.5-5.25) [2-6]	3 (2-3) [1-3]	4 (3.5-5) [1-8]	2 (1, 2) [1-3]
KV	5	3 (2-4.25) [2-5]	2 (2-3) [2-4]	5 (4-10) [4-17]	3 (2-4) [1-7]
PV	85	61 (59.25-62.5) [57-64]	3 (2-4) [1-4]	10 (6-17) [1-49]	3 (2-6) [1-23]

KS	15	8.5 (7.75-9) [7-9]	2 (1-3) [1-4]	3 (2-6.5) [1-7]	1 (1-2) [1-7]
LL	11	6.5 (6-7.25) [6-8]	2 (2-3) [1-4]	4 (2.5-5.5) [1-8]	1 (1-2) [1-5]
PUV	6	4 (2.75-5) [2-5]	2.50 (2-3) [1-4]	6.5 (3-7.75) [1-9]	2 (1-3) [1-6]
ES	16	9 (8-10.75) [8-13]	2 (2-3) [2-3]	3 (2.75-5) [2-7]	1 (1-2) [1-4]

Table S3. Descriptive statistics of moulting site usage by Saimaa ringed seal for the period 2016-2019. Abbreviation of the water basins: PS = Pohjois-Saimaa, PEV = Pyyvesi-Enonvesi, KV = Kolovesi, JV = Joutenvesi, HV = Haukivesi, PV = Pihlajavesi, KS = Katosselkä-Lepistönselkä-Haapaselkä, LL = Lietvesi-Luonteri, PUV = Puruvesi, ES = Etelä-Saimaa.

Sex	Total number of moulting site	Number of moulting sites per individual (median (IQR) [min-max])	Number of moulting sites per individual per year (median (IQR) [min-max])	Number of seals reusing same moulting sites	Number of moulting sites reused per individual (median (IQR) [min-max])	Number of years a moulting site is reused (median (IQR) [min-max])
Females	340	4 (3-6) [1-13]	2 (1-2) [1-7]	37	1 (1-1) [1-3]	2 (2-2) [2-4]
Males	266	5 (3-7) [1-10]	2 (1-3) [1-6]	29	1 (1-2) [1-3]	2 (2-3) [2-4]
Unknown	182	3 (2-4) [1-12]	1 (1-2) [1-5]	29	1 (1-1) [1-2]	2 (2-2) [2-3]
Total	788	4 (3-6) [1-13]	1 (1-2) [1-7]	95	1 (1-1) [1-3]	2 (2-2) [2-3]
Water Basin						
PS	43	4.5 (3-6.75) [1-7]	2 (1-2.75) [1-5]	7	1 (1-1.5) [1-3]	2 (2-2) [2-2]
PEV	3	1.5 (1.25-1.75) [1-2]	1 (1-1) [1-1]	2	1 (1-1) [1-1]	2 (2-2) [2-2]
HV	228	5 (3-6) [1-13]	2 (1-3) [1-7]	19	1 (1-1) [1-3]	2 (2-3) [2-4]
JV	21	3 (2.5-3.5) [1-5]	1 (1-2) [1-2]	2	1 (1-1) [1-1]	2 (2-2) [2-2]

KV	12	2 (2-3) [2-3]	1 (1-1) [1-2]	2	1.5 (1.25-1.75) [1-2]	2 (2-2.5) [2-3]
PV	350	4 (3-6) [1-13]	2 (1-2) [1-7]	46	1 (1-1) [1-3]	2 (2-3) [2-4]
KS	38	2 (1.5-3) [1-6]	1 (1-1) [1-3]	4	1 (1-1) [1-1]	2 (2-2.25) [2-3]
LL	32	3 (2-4) [1-5]	1 (1-2) [1-4]	6	1 (1-1) [1-1]	2 (2-2) [2-3]
PUV	23	4.5 (2.25-6) [1-7]	2 (1-2) [1-3]	-	-	-
ES	38	2 (2-3) [1-4]	1 (1-1) [1-3]	7	1 (1-1) [1-2]	2 (2-2) [2-2]

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Sex	Number of seals (N)	Distance between successive moulting sites (m) (median (IQR) [min-max])	Distances between successive moulting sites used between years (m) (median (IQR) [min-max])	Distances between successive moulting sites used within year (m) (median (IQR) [min-max])
Females	76	643 (163-2,077) [0-30,279]	1,126 (247-3,704) [0-30,279]	445 (145-1,313) [30-23,628]
Males	55	622 (196-1,561) [0-44,664]	842 (153-1,979) [0-44,664]	594 (223-1,326) [19-22,269]
Unknown	61	718 (180-2,916) [0-47,550]	1,041 (179-4,229) [0-47,550]	421 (183-1,480) [44-28,824]
Total	192	643 (170-1,982) [0-47,550]	982 (177-2,980) [0-47,550]	494 (170-1,324) [19-28,824]
Water Basin				
PS	10	718 (250-1,298) [0-2,608]	718 (470-1,144) [0-2,608]	502 (206-1,345) [93-2,379]
PEV	2	4,229 (2,114-4,229) [0-4,229]	4,229 (2,114-4,229) [0-4,229]	-
HV	44	905 (258-2,170) [0-28,488]	1,212 (376-2,892) [0-28,488]	784 (207-1,798) [51-18,266]

JV	6	2,008 (506-2,368) [306-7,162]	2,045 (879-2,745) [306-7,162]	939 (556-1,831) [306-2,586]
KV	5	109 (105-140) [75-1,678]	109 (105-350) [105-1,678]	105 (105-140) [75-1,318]
PV	76	473 (125-1,443) [0-25,224]	756 (111-2,436) [0-25,224]	421 (127-1,054) [19-23,628]
KS	9	318 (58-1,907) [0-15,991]	1,064 (41-2,129) [0-15,991]	142 (87-308) [35-1,533]
LL	10	637 (170-1,198) [0-9,332]	644 (149-1,064) [0-9,177]	556 (219-1,271) [62-9,332]
PUV	4	2,850 (817-5,230) [125-9,474]	3,384 (2,305-5,700) [1,217-9,474]	1,716 (336-4,574) [125-6,178]
ES	15	558 (68-2,144) [0-25,836]	558 (68-1,952) [0-25,836]	1,403 (197-2,882) [47-3,368]
PV/HV	1	23,103 (1,293-44,619) [364-44,664]	44,634 (44,619-44,649) [44,604-44,664]	983 (674-1,293) [364-1,603]
PV/KS	6	2,142 (198-15,542) [0-30,279]	13,362 (7,280-24,298) [0-30,279]	753 (135-3,132) [71-28,824]
PV/PUV	2	26,921 (14,676-37,235) [2,431-47,550]	26,921 (14,676-37,235) [2,431-47,550]	-
LL/ES	1	1,118 (959-5,956) [801-10,793]	5,797 (3,299-8,295) [801-10,793]	1,118 (1,118-1,118) [1,118-1,118]

HV/JV	1	1,119 (682-1,745) [62-8,866]	4,167 (3,617-6,517) [3,066-8,866]	937 (561-1,404) [62-1,745]
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