

## SUPPLEMENTARY

### S1

**Table S1.** *Marked individuals, social status, and sex. Extracted from the monitoring program: Age, pack size, litter size in brackets. PH and DI – philopatric or dispersing offspring. Percentage of marked individuals on minimum total pack size, enlisted on territory year individual ID. FRI is an abbreviation for Finnish/Russian immigrant.*

Territory - Year	Wolf ID	Status	Age	PD	Pack size	% Collared
Graafjell - 2002/2003	M0109	Adult breeder ♂	N/A	N/A		
Graafjell - 2002/2003	M0110	Adult breeder ♀	N/A	N/A		
Graafjell - 2002/2003	M0301	Offspring ♀	0	DI		
Graafjell - 2002/2003	M0302	Offspring ♀	0	DI	6(4)	66
Graafjell - 2003/2004	M0109	Adult breeder ♂	N/A	N/A		
Graafjell - 2003/2004	M0110	Adult breeder ♀	N/A	N/A		
Graafjell - 2003/2004	M0406	Offspring ♂	0	DI	7(5)	42
Gressmark - 2005/2006	M0611	Adult breeder ♂	N/A	N/A		
Gressmark - 2005/2006	M0610	Adult breeder ♀	N/A	N/A		
Gressmark - 2005/2006	M0609	Offspring ♀	0	DI	5(3)	60
Kynna - 2006/2007	M0704	Adult breeder ♀	3/4	N/A		
Kynna - 2006/2007	M0703	Offspring ♂	0	DI		
Kynna - 2006/2007	M0705	Offspring ♀	0	PH	6/7(4/5)	42
Ulriksberg - 2007/2008	M0602	Adult breeder ♀	3	N/A		
Ulriksberg - 2007/2008	M0801	Offspring ♀	0	N/A*	5/6(4/5)	33
Fulufjellet - 2008/2009	M0904	Adult breeder ♂	4	N/A		
Fulufjellet - 2008/2009	M0906	Adult breeder ♀	3/4	N/A		
Fulufjellet - 2008/2009	M0907	Offspring ♀	0	DI		
Fulufjellet - 2008/2009	M0908	Offspring ♀	0	DI		
Fulufjellet - 2008/2009	M0909	Offspring ♀	0	DI	6(4)	83
Fulufjellet - 2009/2010	M0904	Adult breeder ♂	5	N/A		
Fulufjellet - 2009/2010	M0906	Adult breeder ♀	3/4	N/A		
Fulufjellet - 2009/2010	M1011	Offspring ♂	0	DI	9/10(7/8)	30
Galven - 2008/2009	M0903	Adult breeder ♂	FRI	N/A		
Galven - 2008/2009	M0914	Adult breeder ♀	2/3	N/A		
Galven - 2008/2009	M0901	Offspring ♂	0	DI		
Galven - 2008/2009	M0902	Offspring ♀	0	DI	7/8(5/6)	50
Tandsjo - 2013/2014	M1103	Adult breeder ♂	4/5	N/A		
Tandsjo - 2013/2014	M0909	Adult breeder ♀	4	N/A		
Tandsjo - 2013/2014	M1402	Offspring ♀	0	DI		
Tandsjo - 2013/2014	M1403	Offspring ♂	0	DI	8(6)	50
Rotna - 2010/2011	M1109	Adult breeder ♂	3/4	N/A		
Rotna - 2010/2011	M1110	Adult breeder ♀	N/A	N/A		
Rotna - 2010/2011	M1108	Offspring ♂	0	PH		

Rotna - 2010/2011	M1111	Offspring ♀	0	PH	5(3)	80
Rotna - 2011/2012	M1110	Adult breeder ♂	N/A	N/A		
Rotna - 2011/2012	M1206	Offspring ♂	0	DI	7(5)	28
Julussa - 2013/2014	M1410	Adult breeder ♂	3	N/A		
Julussa - 2013/2014	M1409	Adult breeder ♀	4/5	N/A		
Julussa - 2013/2014	M1408	Offspring ♂	0	DI		
Julussa - 2013/2014	M1407	Offspring ♀	0	PH		
Julussa - 2013/2014	M1406	Offspring ♂	0	DI	10(8)	50
Osdalen - 2016/2017	M1710	Adult breeder ♂	4/5	N/A		
Osdalen - 2016/2017	M1705	Adult breeder ♀	5	N/A		
Osdalen - 2016/2017	M1706	Offspring ♀	0	PH	***	
Osdalen - 2016/2017	M1707	Offspring ♂	0	PH		
Osdalen - 2016/2017	M1708	Offspring ♂	1	DI	*	
Osdalen - 2016/2017	M1709	Offspring ♀	0	PH		
Osdalen - 2016/2017	M1711	Offspring ♂	0	DI		
Osdalen - 2016/2017	M1712	Offspring ♀	1	PH	*	
Osdalen - 2016/2017	M1713	Offspring ♀	0	DI	10(6)	90
Slettaas - 2016/2017	M1503	Adult breeder ♂	3/4	N/A		
Slettaas - 2016/2017	M1714	Adult breeder ♀	8	N/A		
Slettaas - 2016/2017	M1701	Offspring ♂	0	DI		
Slettaas - 2016/2017	M1702	Offspring ♀	0	DI		
Slettaas - 2016/2017	M1703	Offspring ♀	0	DI		
Slettaas - 2016/2017	M1704	Offspring ♀	0	DI	9/10(7/8)	60
N = 14 territory years	51 unique individuals			22DI 7PH		

\* Yearlings M1708 and M1712 kept for capture effect matrices, removed from subsequent analysis (GAMM).

\*\* Collar malfunction (M0801), unknown fate.

\*\*\* Collar malfunction (M1706), confirmed philopatric (PH) by DNA.

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### S2

**Table S2.** Territory – year overview on territory size (MCP) and acquired number of positions from adult breeders used to construct yearly MCP territories, the obtained 75 inter-quantile distances from all 4-hourly position intervals from the adult breeder movement in a given territory, and the divided 75% distance used as an additional buffer around MCP territories.

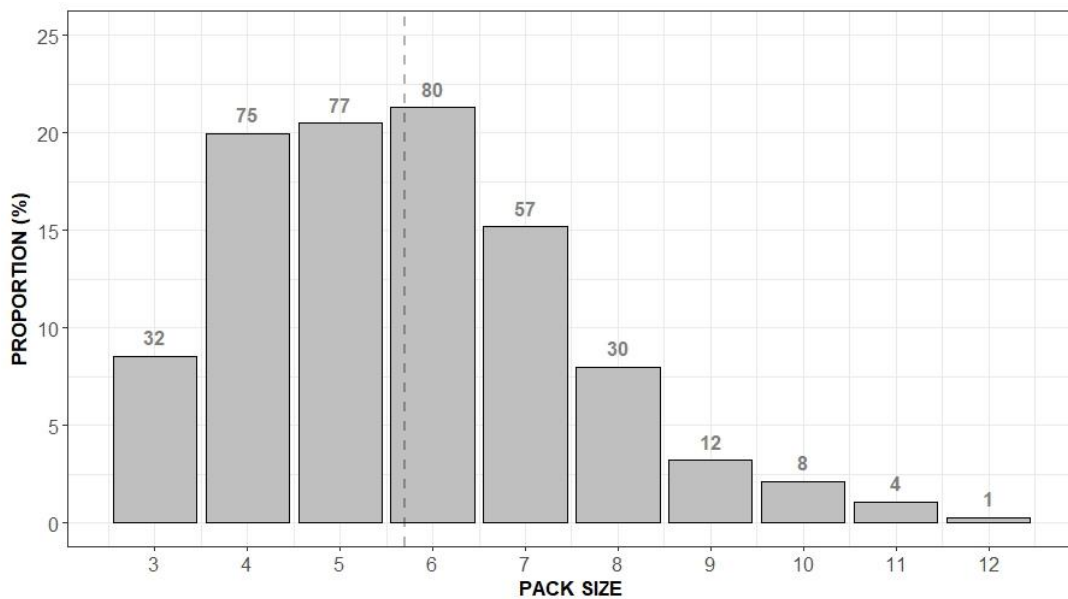
<b>Territory - year</b>	<b>MCP (Km<sup>2</sup>)</b>	<b>#positions</b>	<b>75% quantile distances (m)</b>	<b>Divided 75% quantile (m)</b>
Graafjell - 2002/2003	1123.94	5579	4583.75	2291.87
Graafjell - 2003/2004	1129.92	1631	4254.25	2127.12
Gressmark - 2005/2006	1221.89	3144	3480.24	1740.12
Kynna - 2006/2007	414.79	216	3988.19	1994.10
Ulriksberg - 2007/2008	875.22	869	3342.53	1671.27
Fulufjellet - 2008/2009	763.65	3178	2132.31	1066.15
Galven - 2008/2009	983.73	2144	4254.64	2127.32
Fulufjellet - 2009/2010	999.91	8033	2546.57	1273.29
Rotna - 2010/2011	719.03	2848	3500.03	1750.01
Rotna - 2011/2012	722.51	1434	3284.39	1642.19
Tandsjo - 2013/2014	1132.87	3088	5516.13	2758.07
Julussa - 2013/2014	767.71	1599	4150.18	2075.09
Osdalen - 2016/2017	1162.97	2494	2465.51	1232.76
Slettaas - 2016/2017	845.11	4493	2202.51	1101.25
Mean =	848.70 (SD 296.3)	2352.43 (SD 2073.3)	3396.63 (SD 1165.72)	1698.31 (SD 582.86)

\* Adult male M0910 confirmed deceased 07/03/2009 by age-related mortality cause

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### S3

**Figure S3.** Wolf pack size distribution (%) of  $n = 376$  pack years, including confirmed reproductions within the pack, during the years in Scandinavia 1998-2012, and Norway 2013-2017 from the transborder Scandinavian wolf monitoring program during winter. Sample sizes are indicated above each bar, grey dashed vertical line indicates the mean pack size of 5.7 individuals.

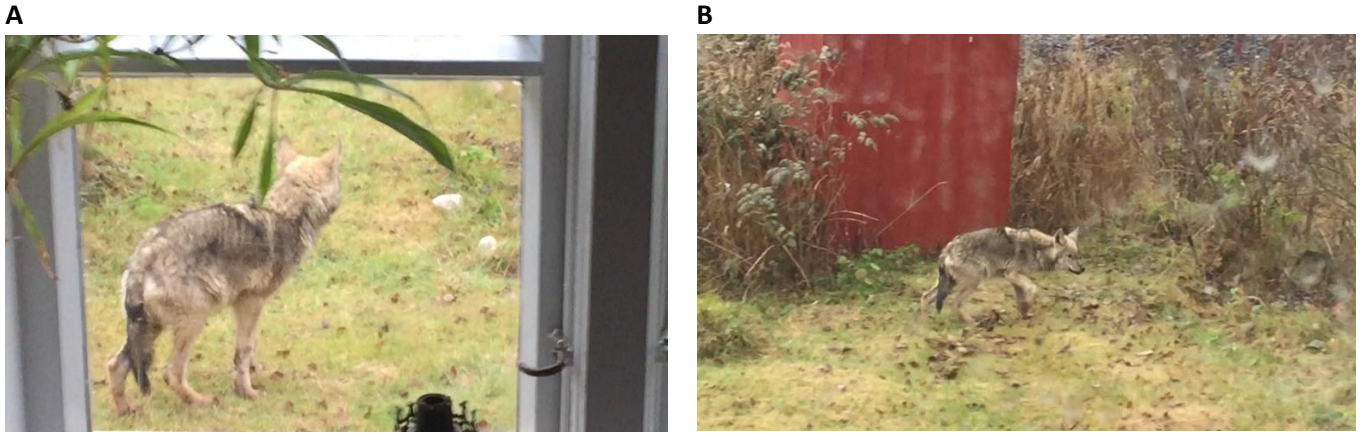


Source: (Wabakken *et al.* 1999; Aronson *et al.* 2000; Aronson *et al.* 2001; Wabakken *et al.* 2002; Wabakken *et al.* 2004a; Wabakken *et al.* 2004b; Wabakken *et al.* 2005; Wabakken *et al.* 2006; Wabakken *et al.* 2007; Wabakken *et al.* 2008; Wabakken *et al.* 2009; Wabakken *et al.* 2010; Wabakken *et al.* 2011; Wabakken *et al.* 2012; Wabakken *et al.* 2013; Wabakken *et al.* 2014; Wabakken *et al.* 2015; Wabakken *et al.* 2016; Svensson *et al.* 2017)



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S5



**Figure S5 A-B)** *One of several visits by one out of two wolf pups, confirmed by DNA (V646), from the Julussa territory in the fall 2016 and early winter of 2017. The pups recurrently visited the compost heap and bird feeding station. Pictures are taken with Iphone 6, by the author.*

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