

Ecography

ECOG-03093

Turkia, T., Selonen, V., Danilov, P., Kurhinen, J.,
Ovaskainen, O., Rintala, J. and Brommer, J. E. 2017.
Red squirrels decline in abundance in the boreal forests
of Finland and NW Russia. – Ecography doi: 10.1111/
ecog.03093

Supplementary material

Appendix 1

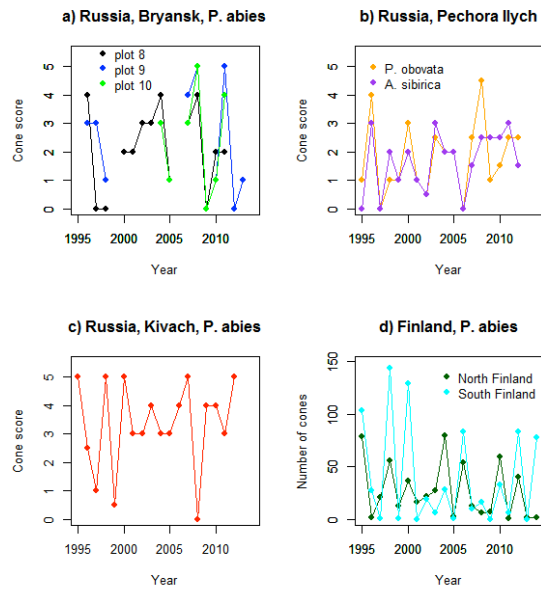


Figure A1. Conifer cone crop data for Finland and Russia based on counts in research forests. a-c: cone crop on scale of 0–5, d: number of cones per tree. Plots 8–10 in a refer to different forest patches. In b the species are *Picea obovata* and *Abies sibirica*. In d North Finland refers to 64.35 degrees in latitude or greater.

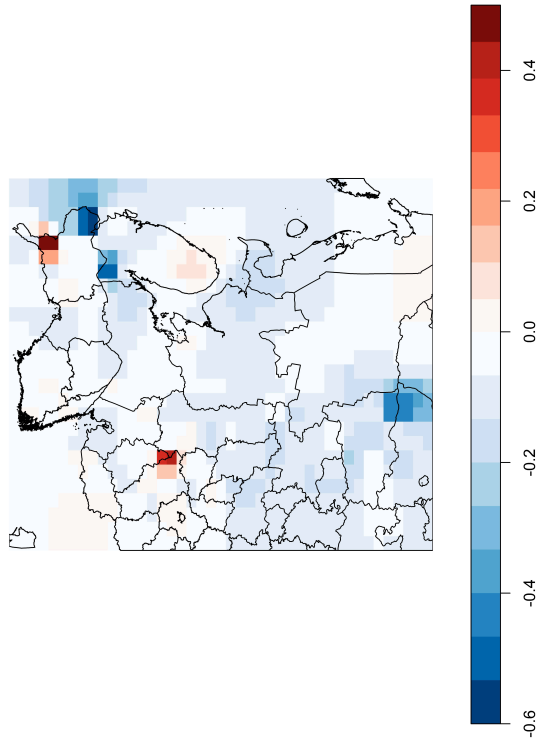


Figure A2. Smoothed red squirrel population growth rates over the study period 1996–2012 in Finland and Russia.

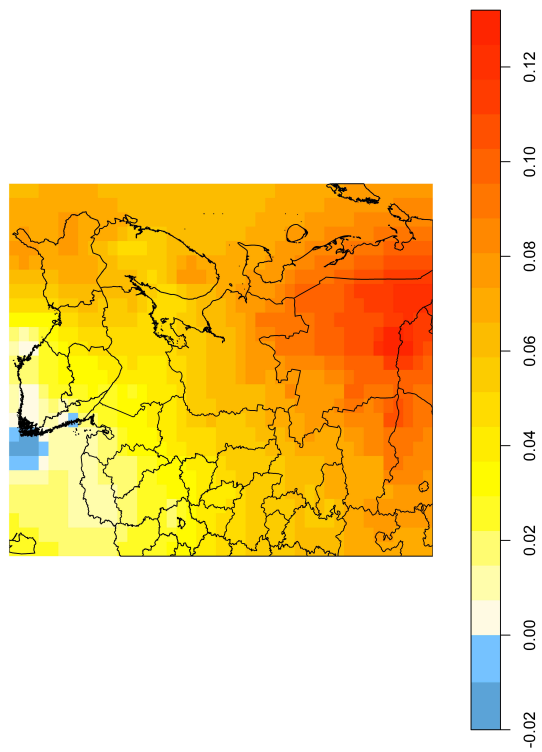


Figure A3. Smoothed warming of winter ($\text{year}_{t-1}\text{December} - \text{year}_t\text{February}$), $^{\circ}\text{C}/\text{year}$, during the study period, 1996–2012, in Finland and Russia, based on data from 100 weather stations.

Table A1. Linear model of the change in red squirrel abundance index during 17 years (1996 – 2012) in a region as a function of several variables relating to a higher trophic level (population growth rate (pgr) of pine martens), as well as landscape (proportional forest loss) and climate (mean summer and mean winter temperature and mean winter precipitation). The significant variable is indicated in bold.

Variable	Effect	s.e.	F _{1,143}	P
Intercept	–0.029	0.10		
pgr pine marten	–0.14	0.092	2.2	0.14
prop. loss forest	–0.0013	0.0038	1.1	0.29
mean summer temperature	–0.004	0.006	0.6	0.42
mean winter temperature	0.007	0.003	7.4	0.007
mean winter rain	0.0008	0.0005	2.6	0.11

Table A2. Pearson's correlations between year and cone score (for Russia) or number of cones per tree (for Finland) ,the associated *P*-values and N of years with data for different locations and conifer species.

Country	Location	Species	N	Pearson's <i>r</i>	<i>P</i>
Russia	Bryansk	<i>Picea abies</i>	16	-0.15	0.58
	Pechora Ilych	<i>Picea obovata</i>	18	0.22	0.39
	Pechora Ilych	<i>Abies sibirica</i>	18	0.38	0.12
	Kivach	<i>Picea abies</i>	18	0.12	0.63
Finland	North Finland	<i>Picea abies</i>	20	-0.29	0.21
	South Finland	<i>Picea abies</i>	20	-0.19	0.41