Spatial Analysis of Rare Species Distribution in Lipetsk Region of Russia for Optimization of the Protected Area Network

Dmitrii Sarychev
sarychev.geo@gmail.com
Crane Working Group of Eurasia
Crane Working Group of Eurasia (CWGE): Members

More than 230 members from 9 countries
CWGE: GIS-related projects…

Updating maps for IUCN Crane Conservation Plan
CWGE: GIS-related projects…
Crane Census Maps in Russia
Key Area is Lipetsk Region of Russia
Objectives

a. Identification and analysis of spatial distribution of rare species and their habitats;

b. Application of the corresponding results for optimization of the protected area network.
Distribution of nesting sites of 60 rare species (1163 points)
Ranking of the rarity of the nesting sites according to the categories of the regional Red List
Density of the rare species nesting sites (izolines) and protected area network (green polygons)
Rare bird species richness (pie charts) and abundance of nesting sites (color density) per cell 10 x 10 km
Spearman Rank Order Correlation of species richness and some environmental variables

$p < 0.05$
Identification of valuable habitats by umbrella species niche modelling

Area of valuable habitats

- 55% not protected
- 40% half protected
- 5% protected
Interactive maps for conservation in Lipetsk Region
Nest
Nesting Site
Zonal Statistics + Proximity Analysis
Variables
Potential Site
Valuable Habitats ...
Nestling Site
Potential Site

\[
\text{X}_1 \quad \text{X}_2 \quad \text{X}_3 \quad \ldots
\]
Distribution modelling/
Niche modelling/ Habitat
suitability modelling/ ...

BD Nesting Sites of Red List Birds
Predictor Layers

Model Builder
Open Modeller

MaxEnt

GARP

?
IDENTIFICATION OF RARE SPECIES SITES AND THEIR HABITATS

EXPLORATION OF SPATIAL PATTERNS & RELATIONSHIPS OF SPECIES

IDENTIFICATION OF THE MOST VALUABLE HABITATS FOR CONSERVATION

SPATIAL OPTIMISATION OF THE PROTECTED AREA NETWORK
Thank you for your attention!

Dmitrii Sarychev
sarychev.geo@gmail.com