Usage of GIS in bird conservation in the Ukrainian forest zone

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Territory. Location.
Forest coverage and loss.
(data from www.globalforestwatch.org)

Ukraine

TREES COVER (2000)

810,000 KHa

PERCENT TREE COVER (2000)

40%

TREES COVER LOSS (2001 - 2014)

5,760 Ha

TREES COVER GAIN (2001 - 2012)

34,121 Ha

NOTE: tree cover loss and gain statistics cannot be compared against each other. Learn more
Main target species. Black Stork *Ciconia nigra*.

Status in the IUCN Red List – Least concern;
Global population trend - Unknown;

Ukrainian Red List – Vulnerable;
National trend – Decreasing;

Some facts:
Reproduction age – >3-5 years;
Number of eggs – 3-5;
Monogamous;

Avg. life span in wild nature ~ 18 years (in captivity ~31 year)
Example of intensive forest logging

**red** - new cuts

**blue** - old cuts with young pine forest

Old oaks:
most important for Black Storks and most expensive when sold as timber
Some other threats to rare birds in the region

- Poaching
- Illegal mining of amber and subsequent habitat damage
- High disturbance during breeding season
Ornithological part (since 2006):
- to study distribution and population numbers of Black Stork;
- to study it’s habitat preferences;
- to study migration routes of Black Stork;

GIS part (now):
- to find patterns in species distribution in relation to characteristics of the environment (in progress);
- to create maps which will represent our results and should facilitate conservation of target species;

Educational part (2009-2016):
- to publish and distribute educational materials relevant to conservation of target species (brochures, posters, stickers e.g.).
- to organize workshops for forestry workers.
Data types and sources

- SRTM elevation grid
- Paper maps of forest types (from separate forestry agencies)
- Forestry grids (from forestry agency)
- Forest growing conditions (soil-moisture types by Pogrebniak, from forestry agency)
- Forest loss layer (globalforestwatch.org)
- Nests and their buffers
Black Stork distribution in the region

~150 nests found during 2006-2015
Highest density is associated with the lowest humid places.
Distribution of Black Stork nests in relation to old forest plots
(vectorized plots of old forest from forestry paper map)
Distribution of Black Stork nests in relation to soil and humidity types (analysis based on the data provided by the forestry agency)

Legend:
- Black Stork nests
- Forestry boundary

Forest types:
- CODE
  - A1
  - A2
  - A3
  - A4
  - A5
  - B1
  - B2
  - B3
  - B4
  - B5
  - C2
  - C3
  - C4
  - C5

% nests vs random points:
- A1
- A2
- A3
- A4
- A5
- B1
- B2
- B3
- B4
- B5
- C2
- C3
- C4
- C5
Forest loss since 2000 and distribution of Black Stork

% of forest loss

- 0% - 5%
- 6% - 10%
- 11% - 15%
- 16% - 20%
- 21% - 25%
- 26% - 30%
- 31% - 35%
- Protected areas
- GFL data

Black Stork nests

0 10 20 40 Km
Logging on breeding sites (within radius 100, 250, 500m around nests)
% of breeding territories where logging has taken place since 2000 versus percentage of forest loss in buffers 100, 250, 500m

- 0-10%: 79
- 10-20%: 66
- 20-30%: 65
- 30-40%: 22
- 40-50%: 23
- 50-60%: 13
- 60-70%: 7
- 70-80%: 8
- 80-90%: 4
- 90-100%: 1

n = 145
FSC conservation plots proposed by forestries

- nests;

- conservation zones proposed by forestry companies.
Recommended buffer zones (500m) around Black Stork nests
Forestries that agreed to shift conservation zones

- >1200 sq. km
- 60 - 120 sq. km for conservation

Legend:
- Black Stork nests
- Vysockyi Forestry
- Dubrovuckyi Forestry
- Zarichnenske Forestry
- Rivne Nature Reserve
Thank you for attention!

Acknowledgements to: