Post-socialist land use change in Eastern Europe
Challenge or opportunity for nature conservation?

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The collapse of socialism

- Rapid and drastic changes in Eastern Europe’s institutional, societal, and economic conditions after 1989
- Outmigration from rural areas
- Restructuring of agricultural sectors
  - Disappearance of former markets
  - Price liberalization (of inputs and outputs)
Change in Nighttime Lights
1992 to 2000

www.ngdc.noaa.gov/dmsp/
Privatization & individualization of land use
Overarching research questions

- What are the rates and patterns of post-socialist land use change?
- What are the impacts of these changes on ecosystem services and biodiversity?
Focus today: farmland abandonment

Photo: T. Kuemmerle

Western Ukraine
Map land use change based on Landsat images
32% abandonment rate
Annual logging rates $\sim 5,000$–12,000 ha

Kuemmerle et al. 2011, *Global Change Biology*
Baumann et al. 2010, *Land Use Policy*
Differences in abandonment rates across Central and Eastern Europe

- Baumann et al. 2011
- Griffiths et al. 2012
- Hostert et al. 2011
- Kuemmerle et al. 2008
- Kuemmerle et al. 2009
- Müller & Munroe 2008
- Nikodemus 2005
- Peterson & Aunap 1998
- Prishchepov et al, 2012
- Sieber et al., 2013
- Vaclavik & Rogan 2009

= 50% abandonment
Abandonment mapping based on MODIS

Alcantara et al., in prep. & Estel et al. in prep.
European Russia

- Substantial amounts of carbon sequestered
- 'Rewilding' in some parts of Eastern Europe

Photo: A. Prishchepov
Land change and wildlife populations

- Abandonment and less human pressure \(\rightarrow\) increased habitat availability for some species

European bison

Kuemmerle et al. 2010, Biological Conservation
Land change and wildlife populations (2)

- Initial populations declines for many species, but subsequent recovery above 1991 levels

Bragina et al., *in prep.*
More recently: large-scale recultivation (here: Western Ukraine)
Polarization of land use (abandonment and intensification) threatens traditional landscapes

Photo: T. Kuemmerle
Transformation of socio-ecological systems inevitable and needed

Fischer et al. 2012, Conservation Letters
Abandonment also means displacement of land use abroad

Location of cropland linked to EU consumption

Kastner et al., in preparation
Summary

- Large spatial heterogeneity in land change
- Rewilding and relaxing human pressure provide conservation opportunities in some areas
- But: transition phase also characterized by big conservation challenges
  - Poaching and illegal resource use
  - Displacement of land use
  - Polarization of land use threatens traditional, multifunctional landscapes and their biodiversity
- Forward-looking conservation planning which links across scales and political borders is needed
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Thank you for listening!

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