Eurasian lynx biology, main threats and conservation measures in Poland

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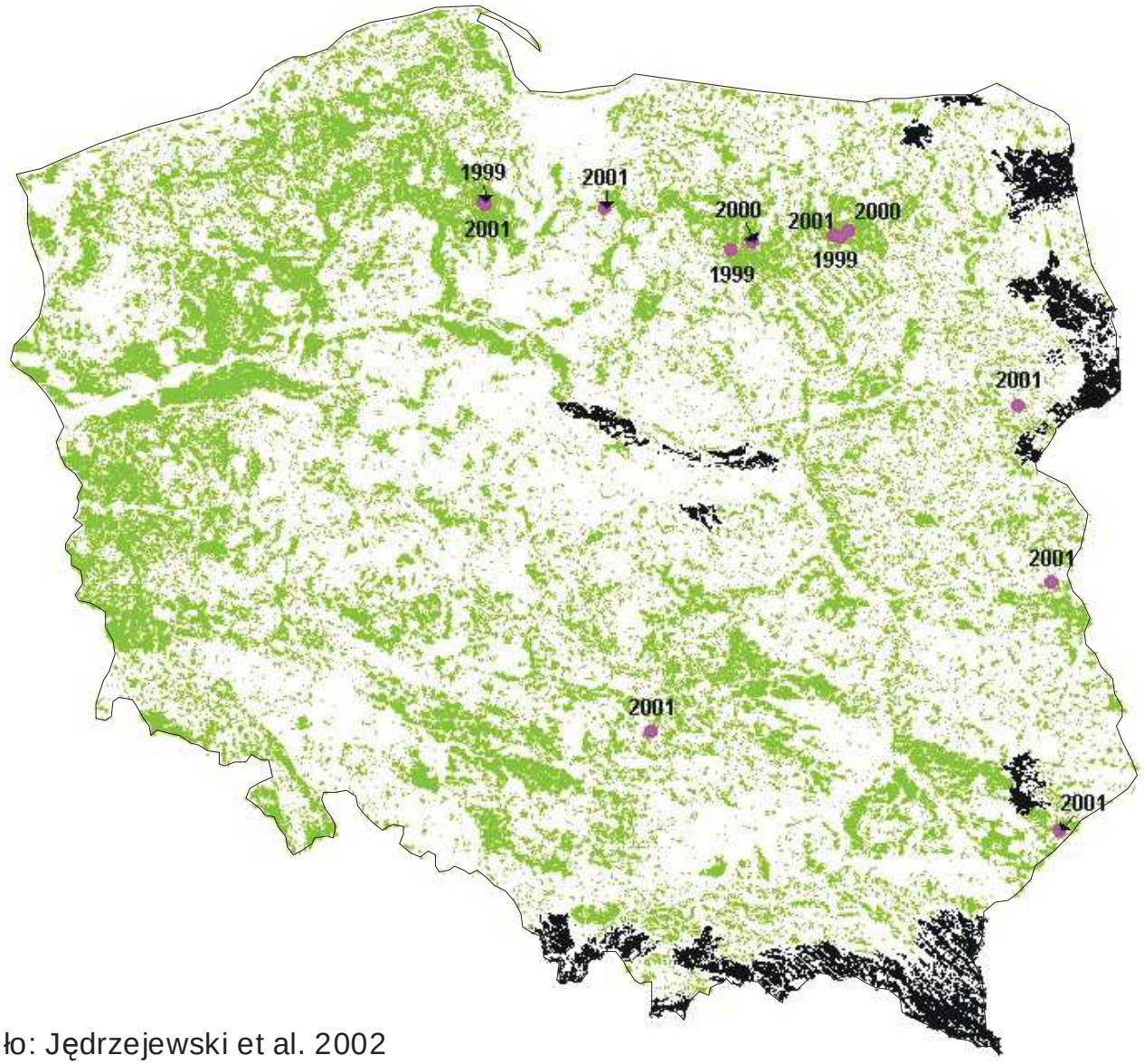
Fot. J.Walencik

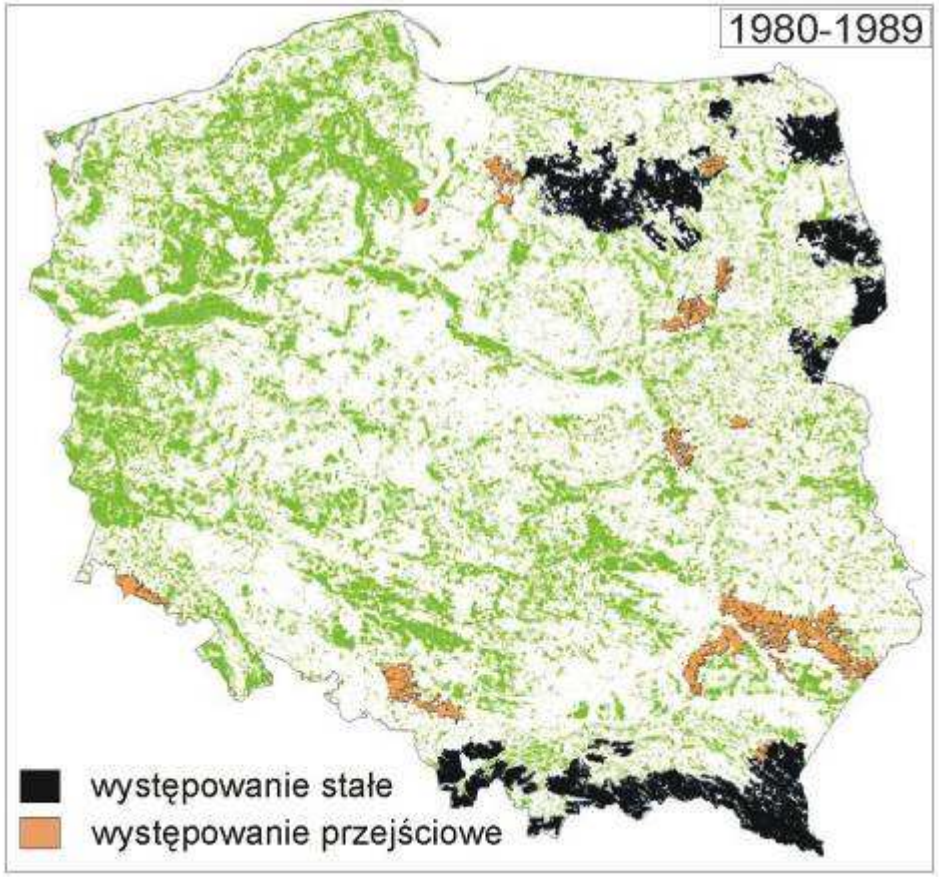
Lynx distribution in Poland

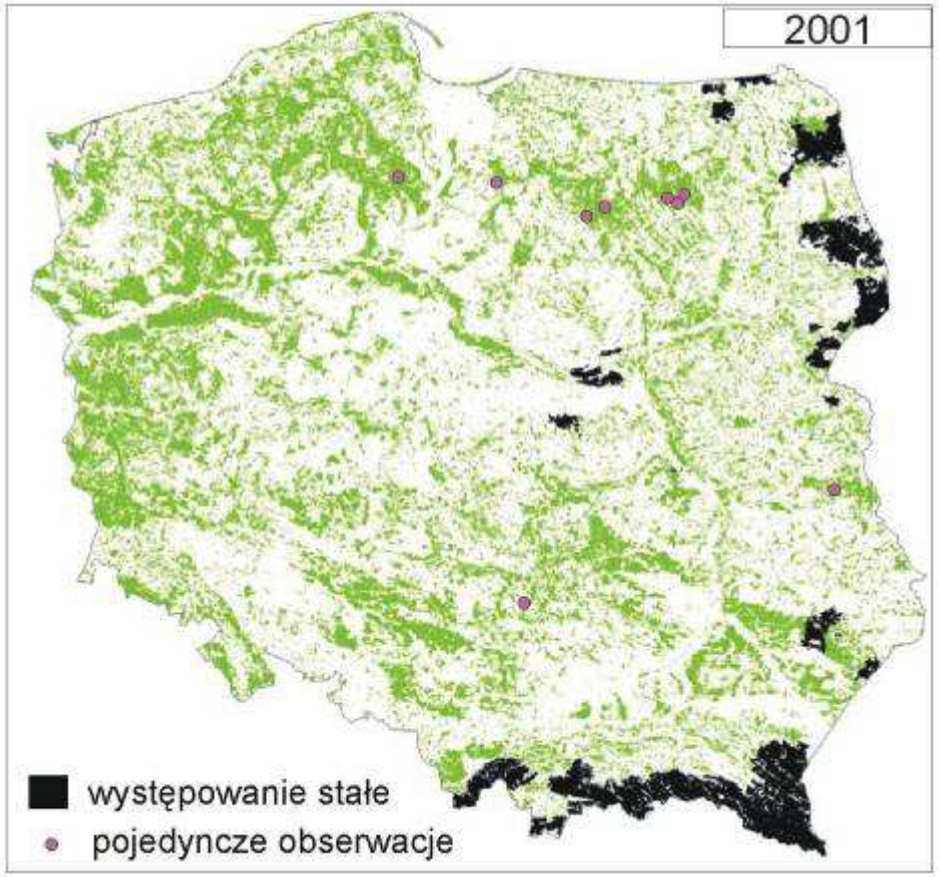


Źródło: Jędrzejewski et al. 2002

Lynx range
in middle Europe

Recent decrease in lynx range in Poland





Źródło: Bieniek i in. 1998,
Jędrzejewski i in. 2002

Size of lynx population in Poland

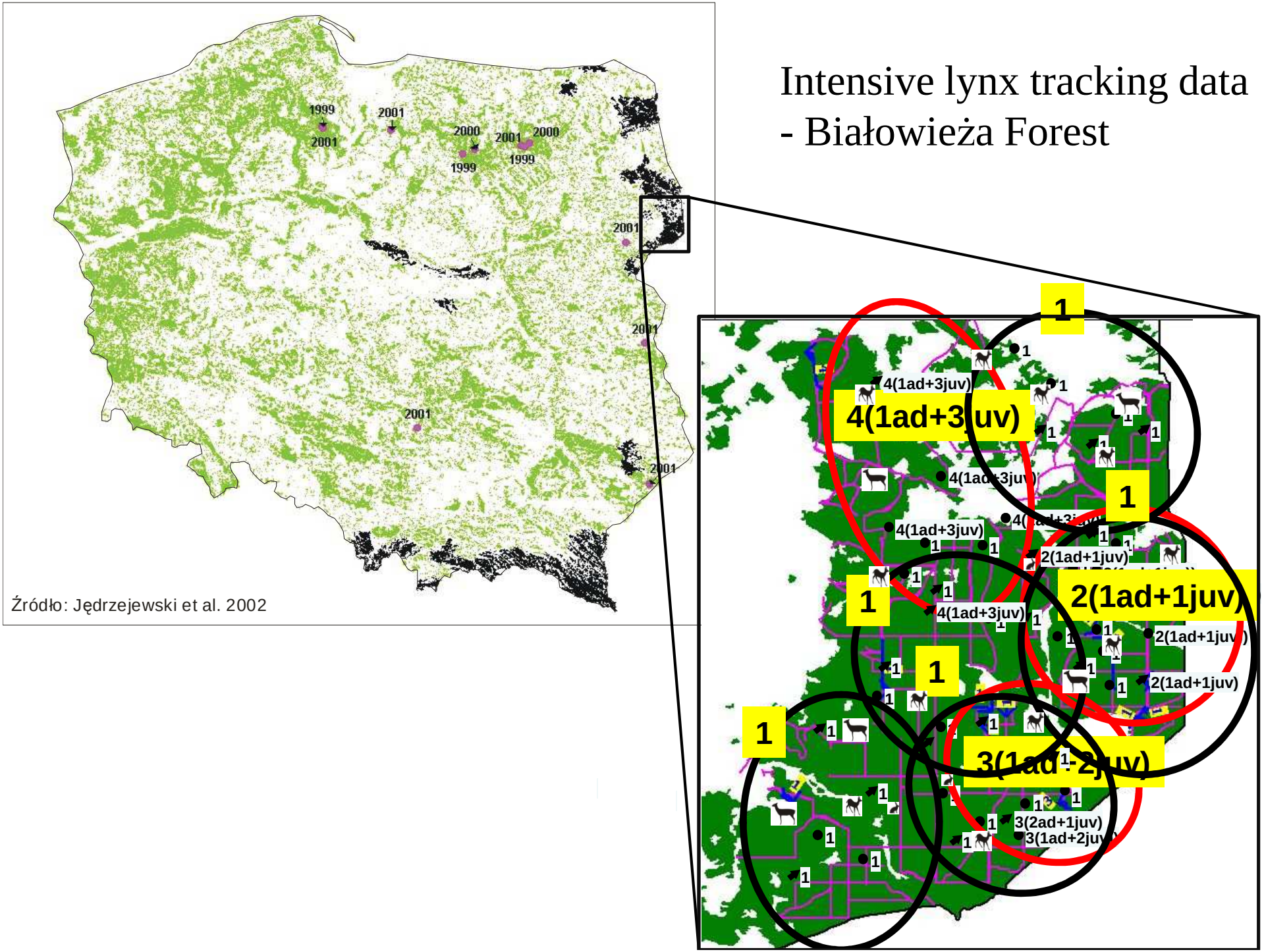
Year	Minimum	Maximum
2000/2001	196	207
2001/2002	136	157
2002/2003	140	209
2003/2004	178	217
2004/2005	120	?
2005/2006	128	?
2006/2007	128	?
2007/2008	121	?
2008/2009	115	?

Dane: ZBS PAN; Inwentaryzacja wilków i rysi w nadleśnictwach i Parkach Narodowych Polski

Distribution of lynx population in Poland in 2000/2001

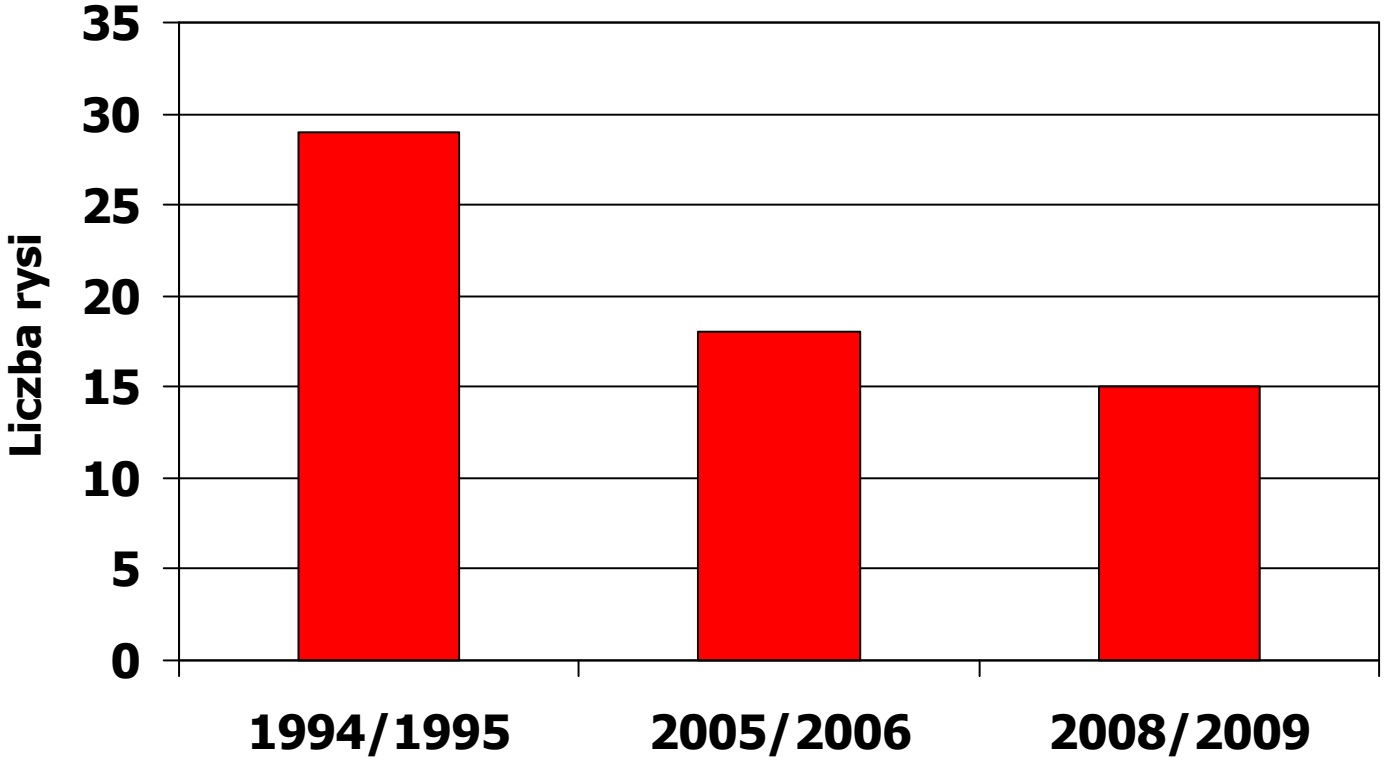
Distribution of lynx population in Poland in 2008/2009

Intensive lynx tracking data - Białowieża Forest



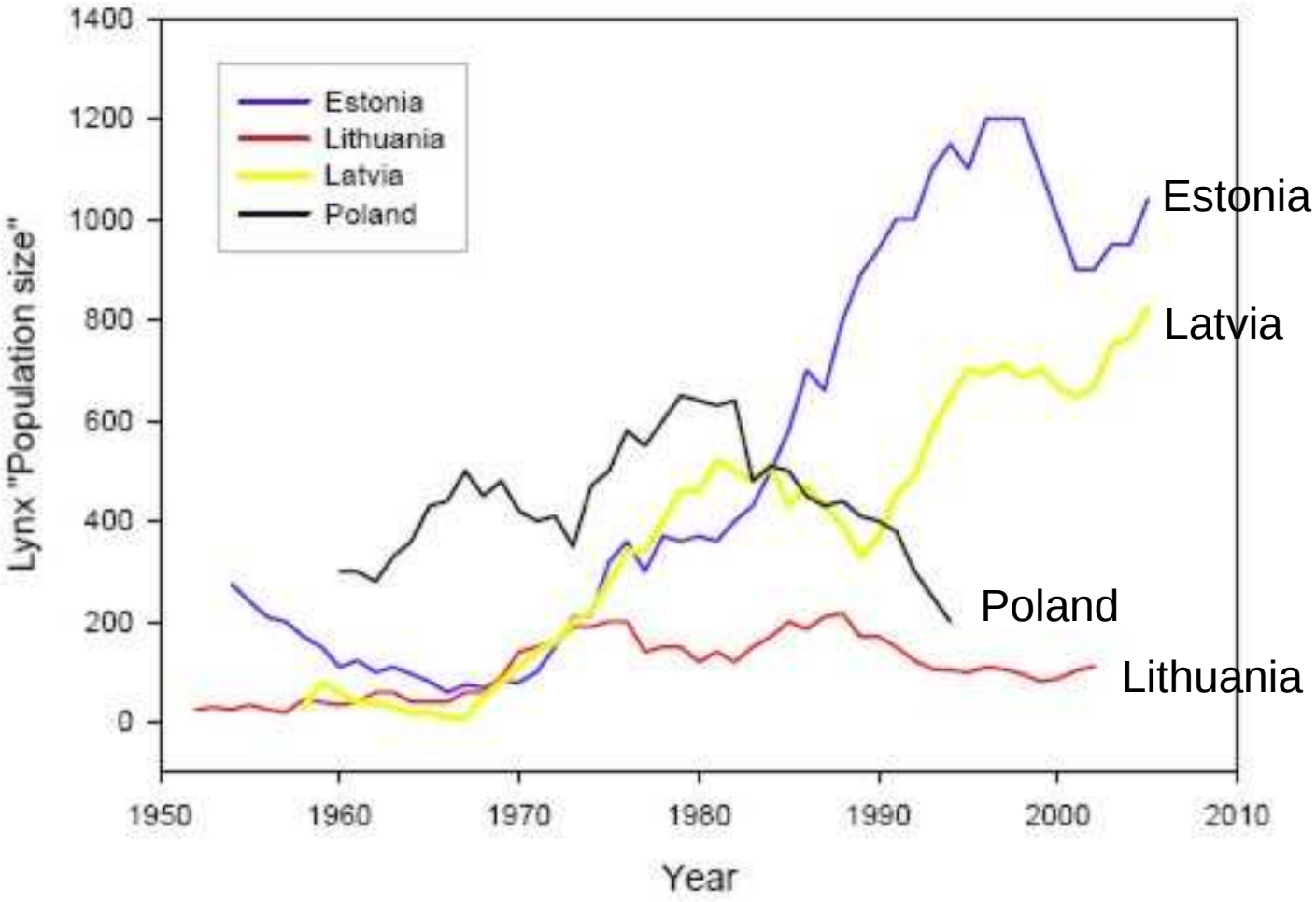
Źródło: Jędrzejewski et al. 2002

Changes of lynx numbers in the Białowieża Forest



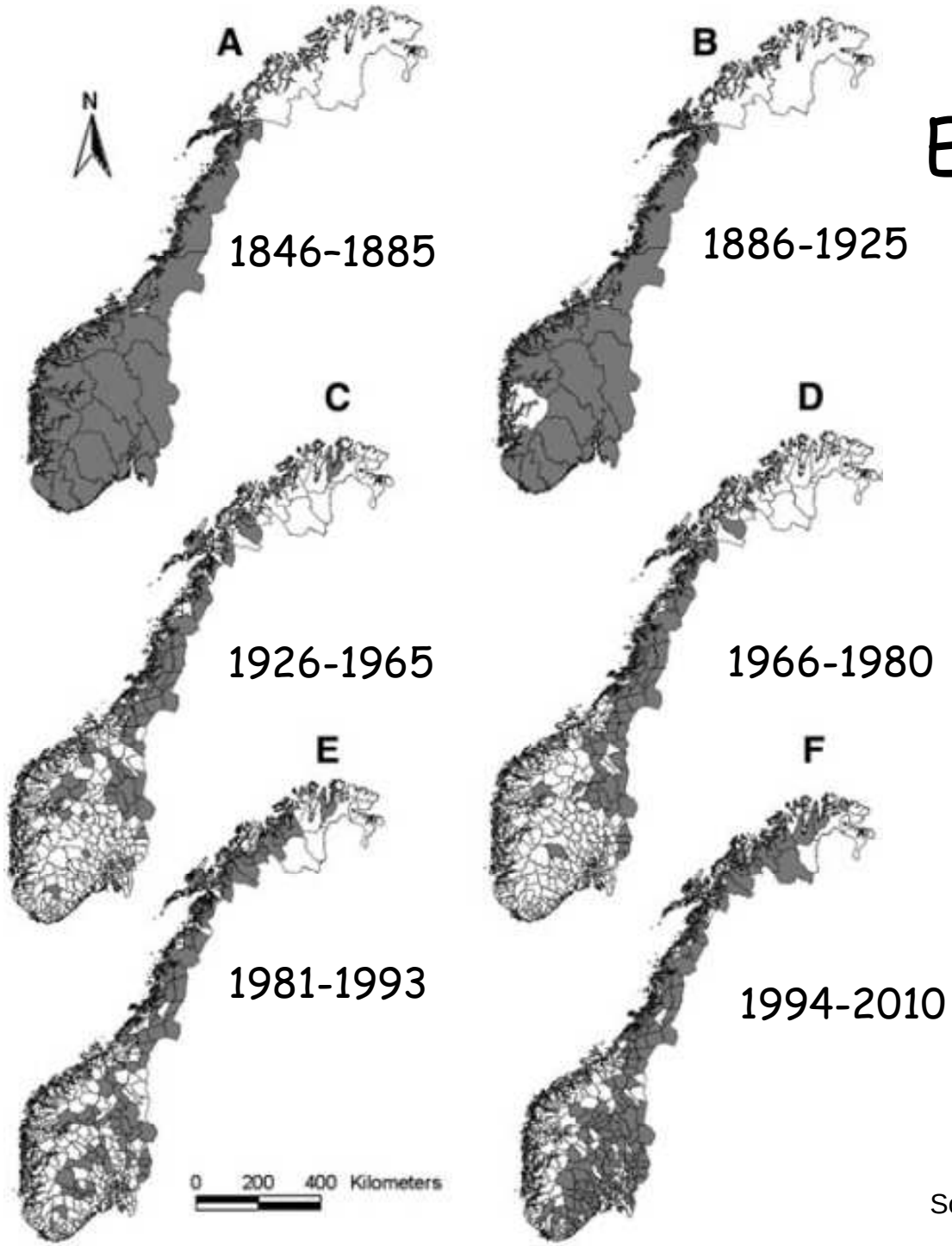
Źródło: Schmidt i Kowalczyk, niepubl.

Dynamics of lynx population in Poland and Baltic countries in 1950-2005



Source: Linnell et al. 2005

Expansion of lynx in Norway

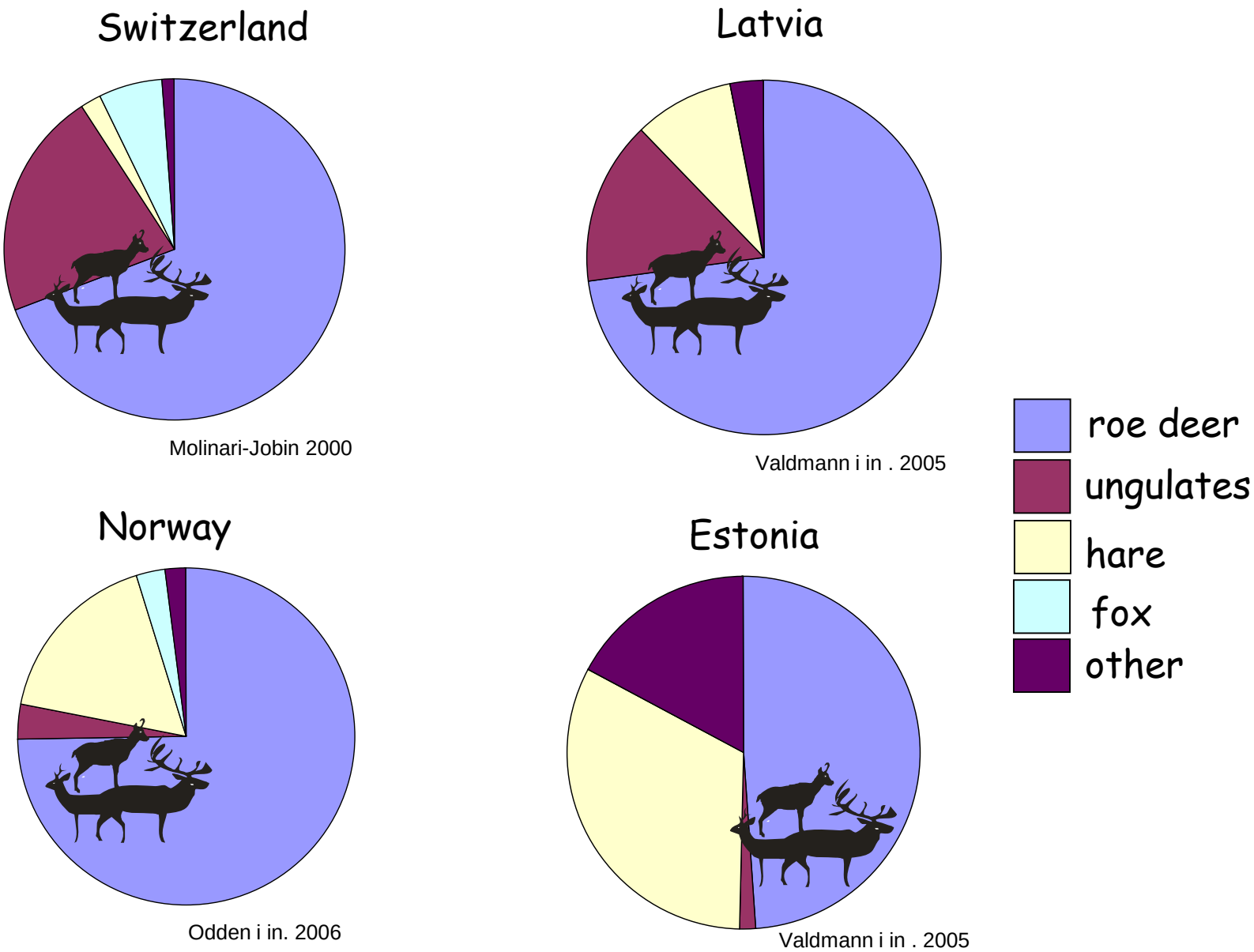


Source: J. Linnell et al. 2010

Possible factors

- **Low accessibility of prey**
- **Lack of habitat connectivity**
- **Low habitat quality**

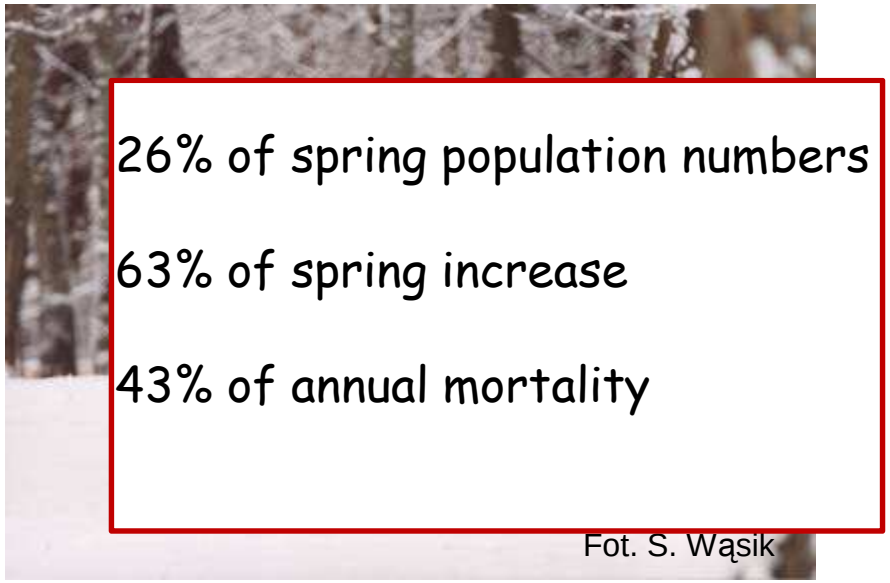
Diet of lynx in middle and northern Europe



Lynx predation effect on prey populations

	Predation rate N days/ 1 deer/lynx	n deer /year/lynx	% population/ Year	Source
Switzerland (roe deer, chamoix)	**6.6**	**60**	**3-9**	Breitenmoser & Haller 1987
Poland (roe deer, red deer)	**5.4**	**66**	**21-36**	Okarma et al. 1997
Norway (roe deer)	**9.2**	**40**	**33**	Karlsen 1997
Norway (reindeer)	**5.0**	**30/winter**	**?**	Pedersen et al. 1999

Lynx predation in Białowieża Forest



26% of spring population numbers

63% of spring increase

43% of annual mortality

4 roe deer/lynx/month (48/year)

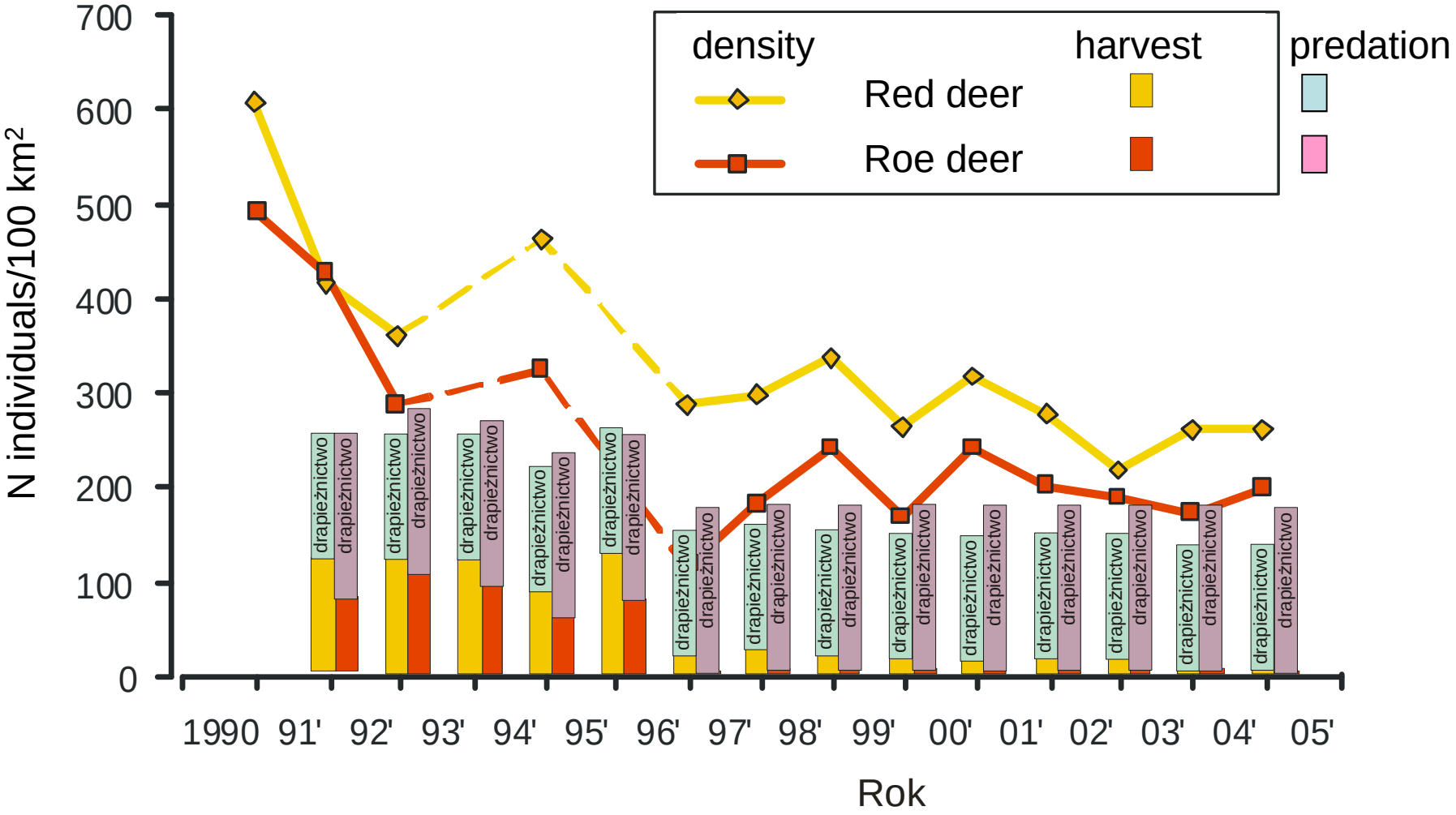
1.5 red deer/lynx/month (18/year)

640-980 roe deer killed by all lynx in Białowieża Forest

240-400 red deer killed by all lynx in Białowieża Forest

Source: Okarma et al. 1997

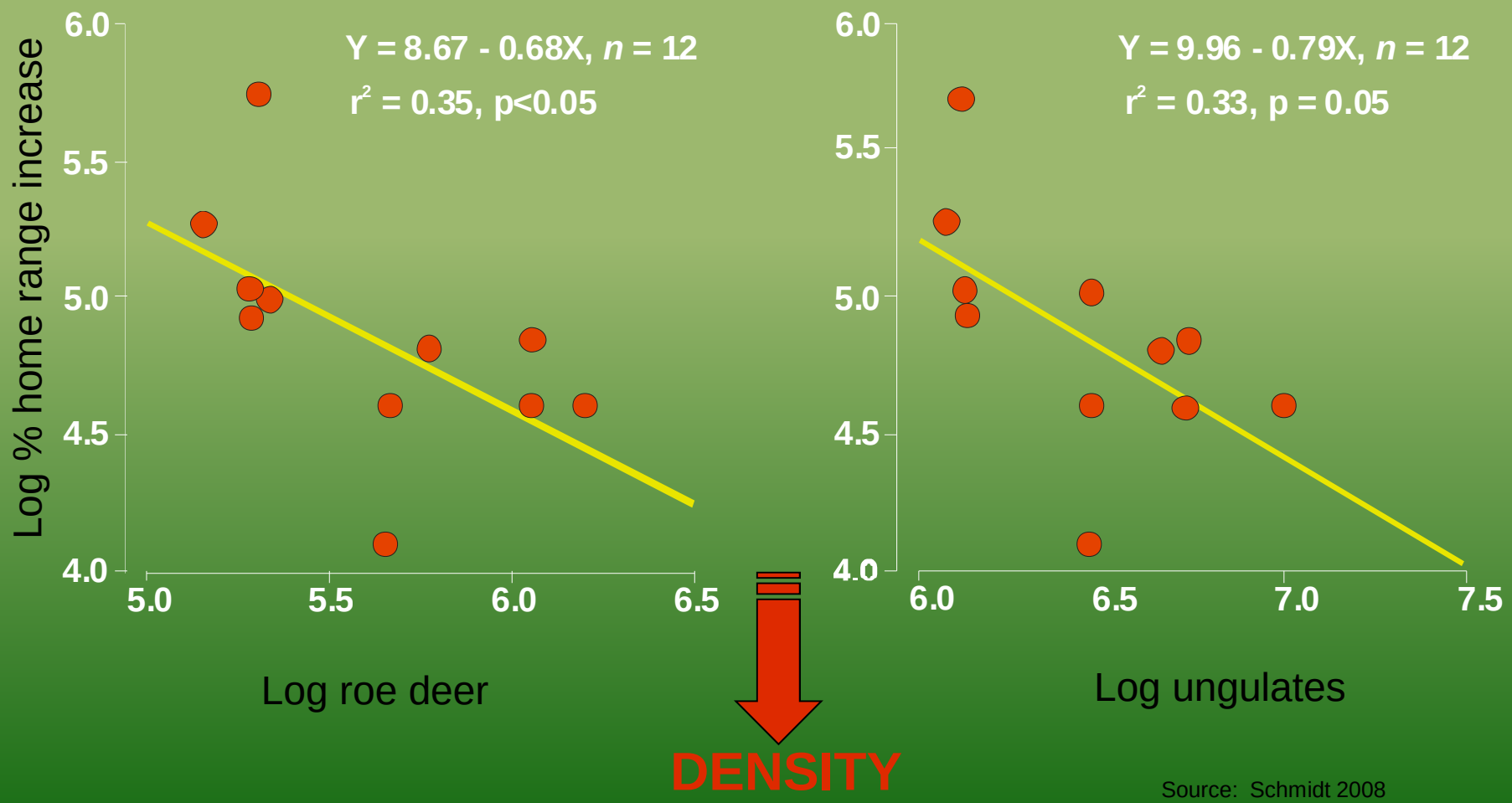
Changes in ungulate densities in Białowieża Forest (1990 – 2005)



Źródło: RDLP Białystok

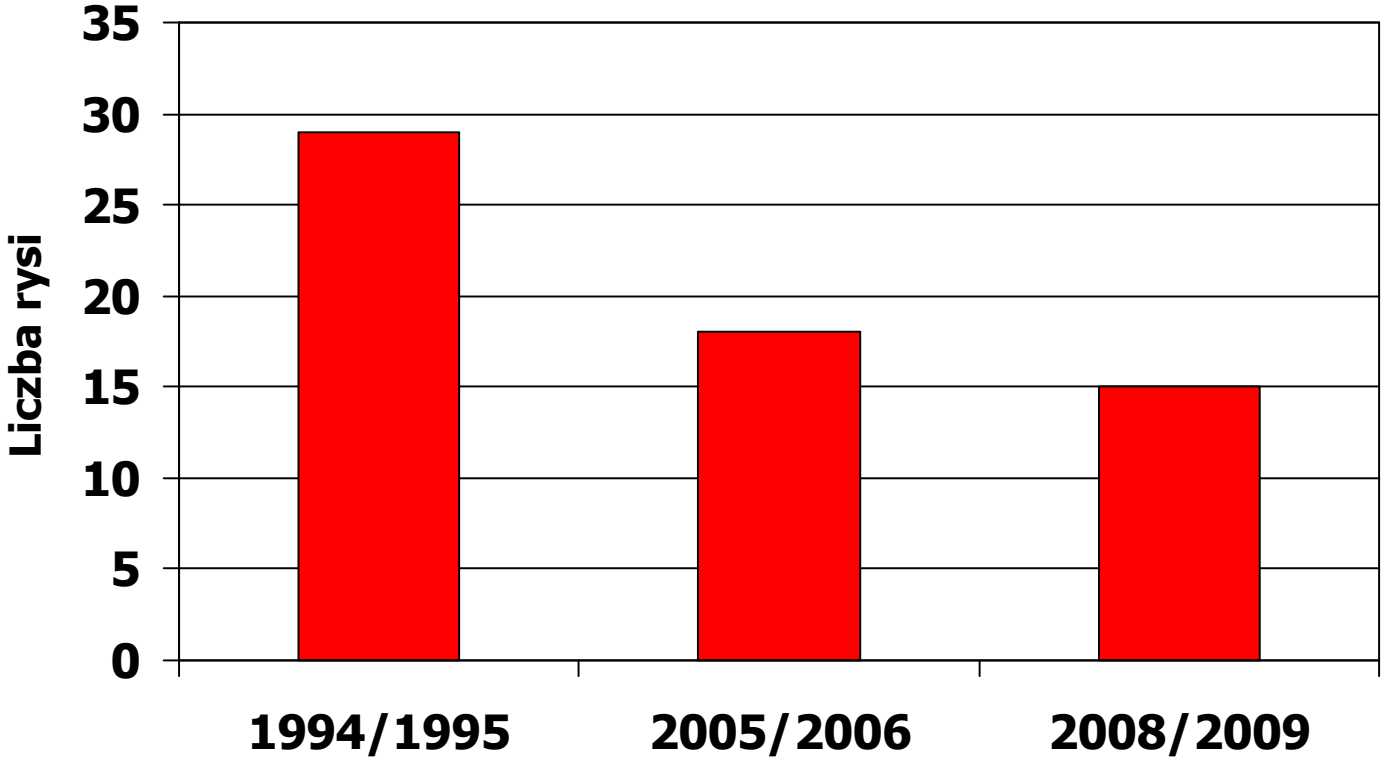
Prey availability

Lynx home range size and ungulate density



Source: Schmidt 2008

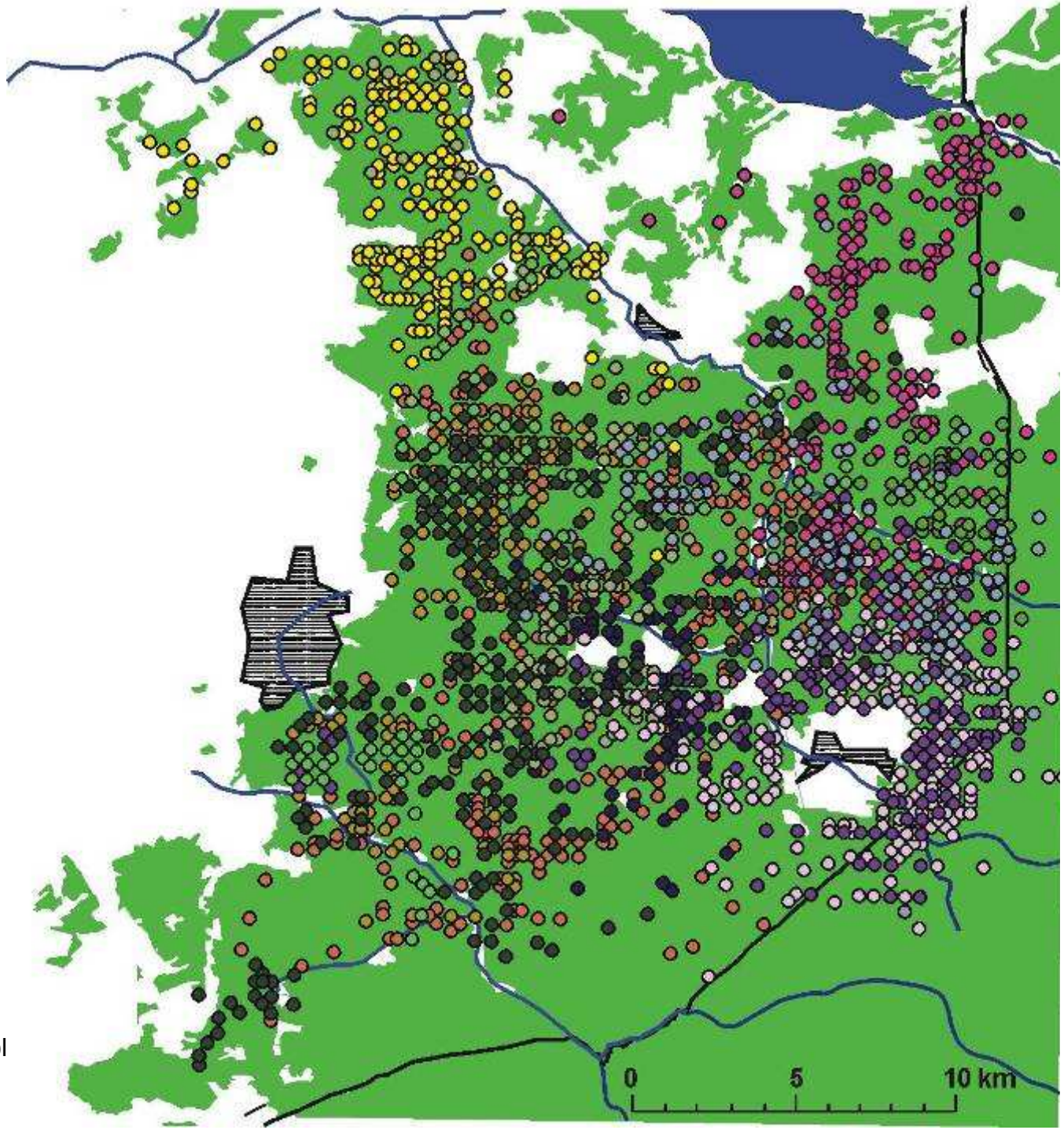
Changes of lynx numbers in the Białowieża Forest



Źródło: Schmidt i Kowalczyk, niepubl.

Habitat

Lynx radiolocations
in Białowieża Forest



Schmidt, Jędrzejewski, Okarma, unpubl

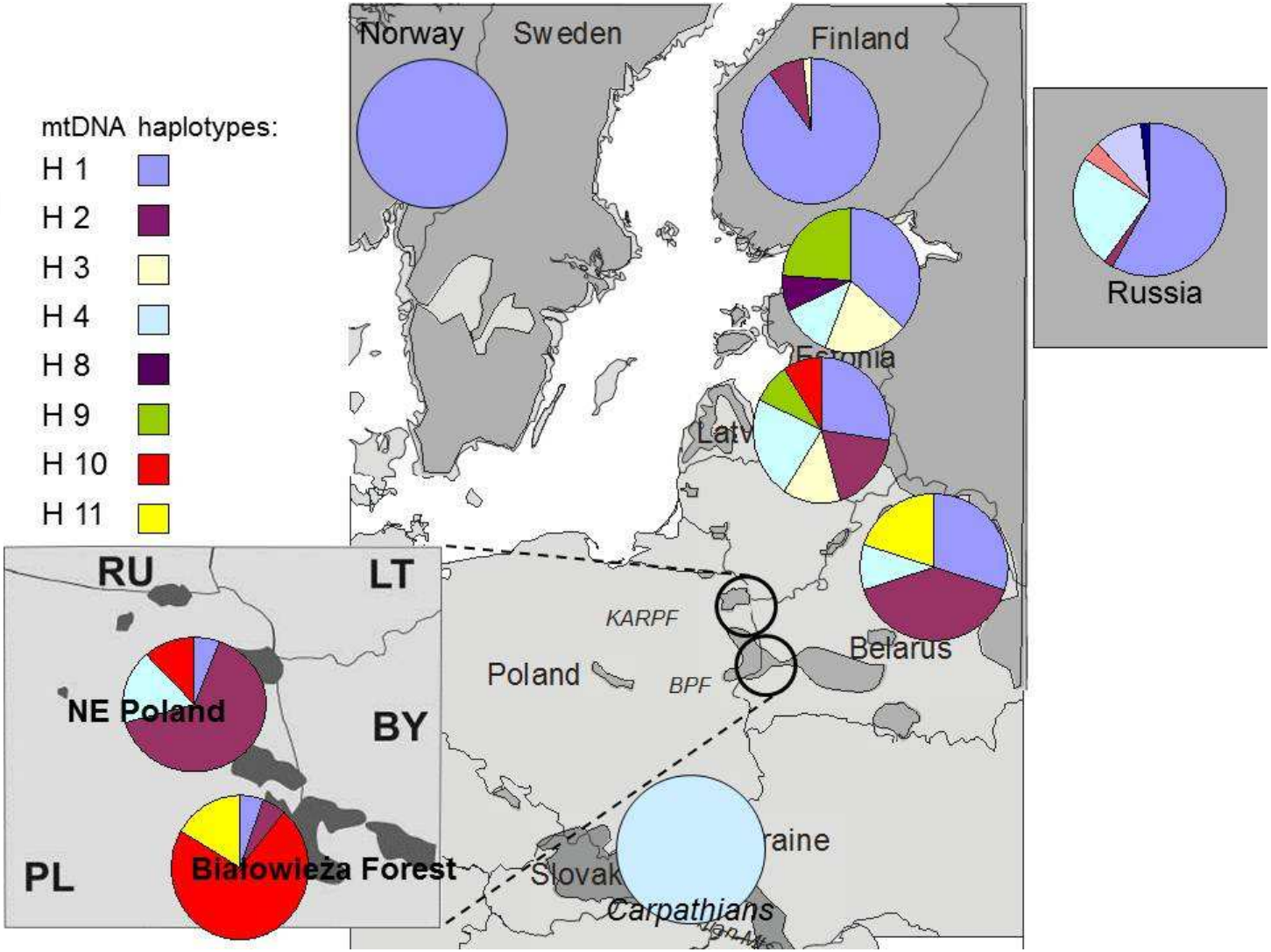
Habitat connectivity

Distribution of forests and lynx in eastern Europe

Eurasian lynx genetic variability

Mitochondrial DNA

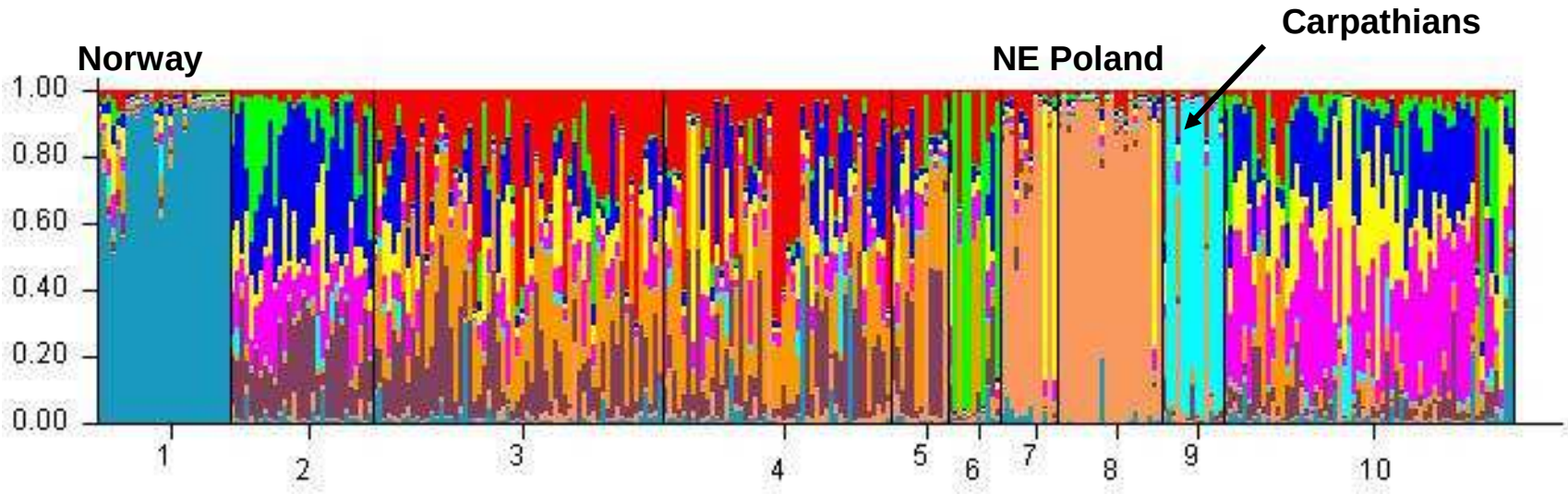
High genetic differentiation among Eurasian lynx populations in Eastern Europe



Source: Ratkiewicz et al. 2012

Eurasian lynx genetic variability

microsatellites

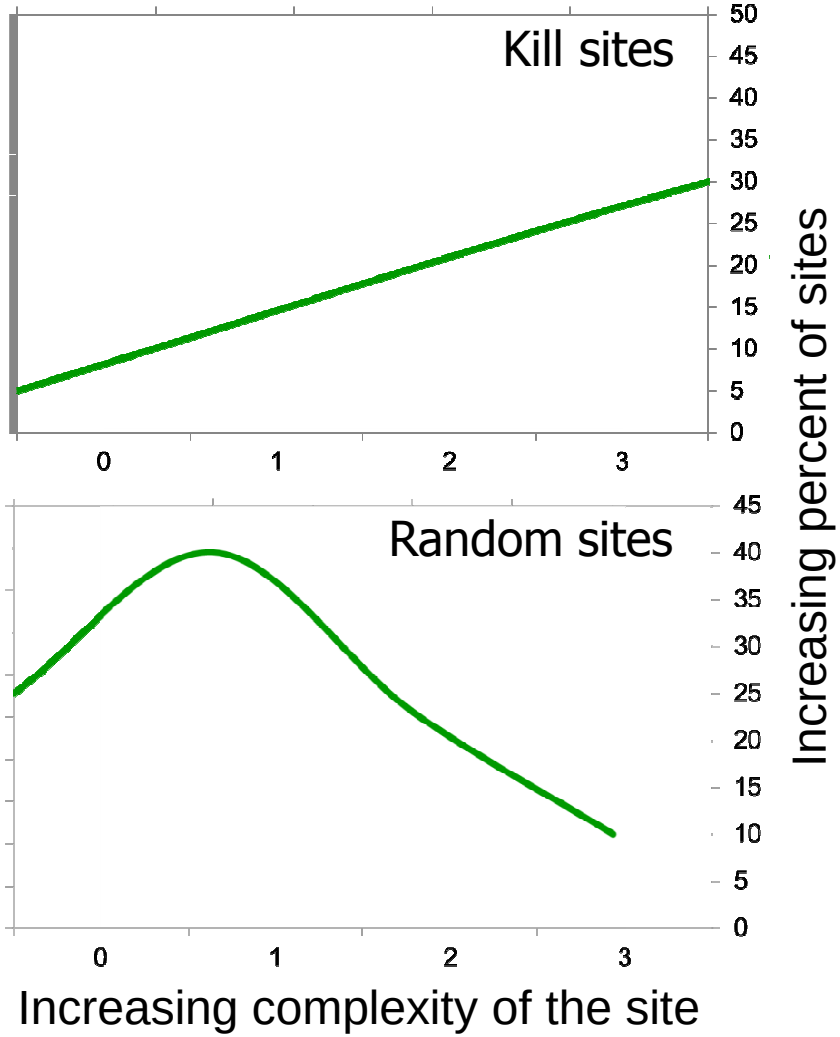


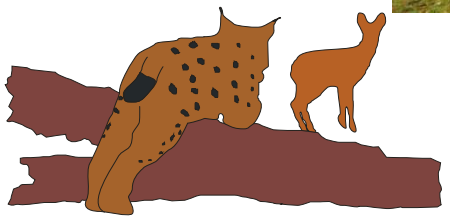
- Low variability in Norway, Carpathian mountains and NE Poland
- habitat fragmentation
- population bottlenecks
- climate

Source: Schmidt et al. unpubl

Habitat quality

Selection of hunting sites

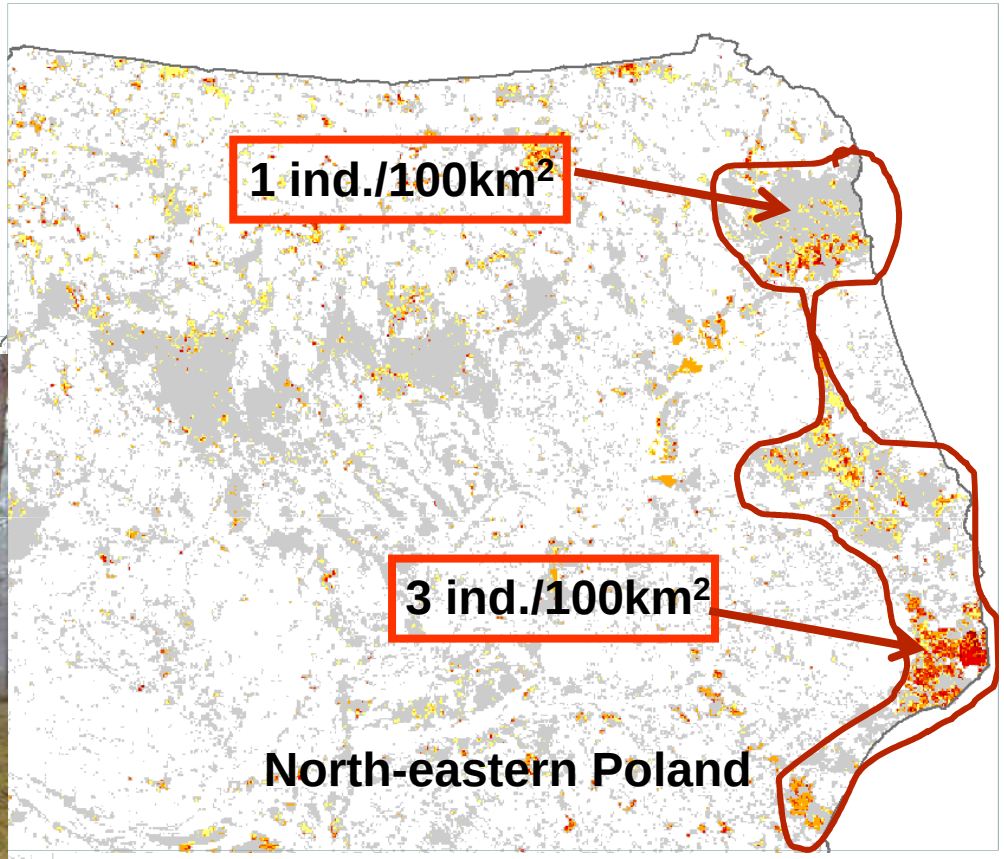




Podgórski et al. 2008

Distribution of biologically valuable forests in Poland

Species, age and vertical structure, protected areas, old stands

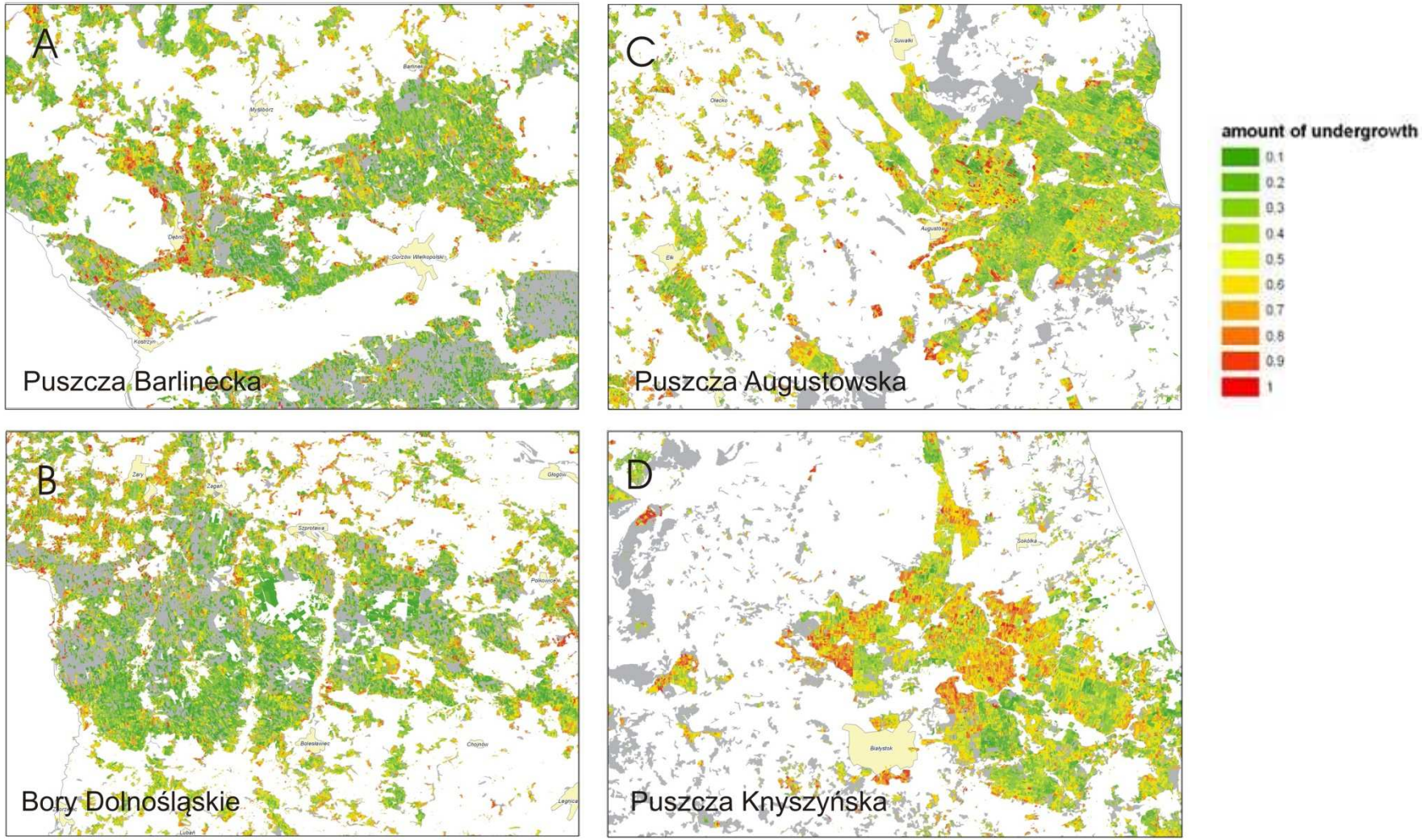


Stachura-Skierczyńska (2009)

Undergrowth cover in selected forests in Poland (according to forestry digital database)

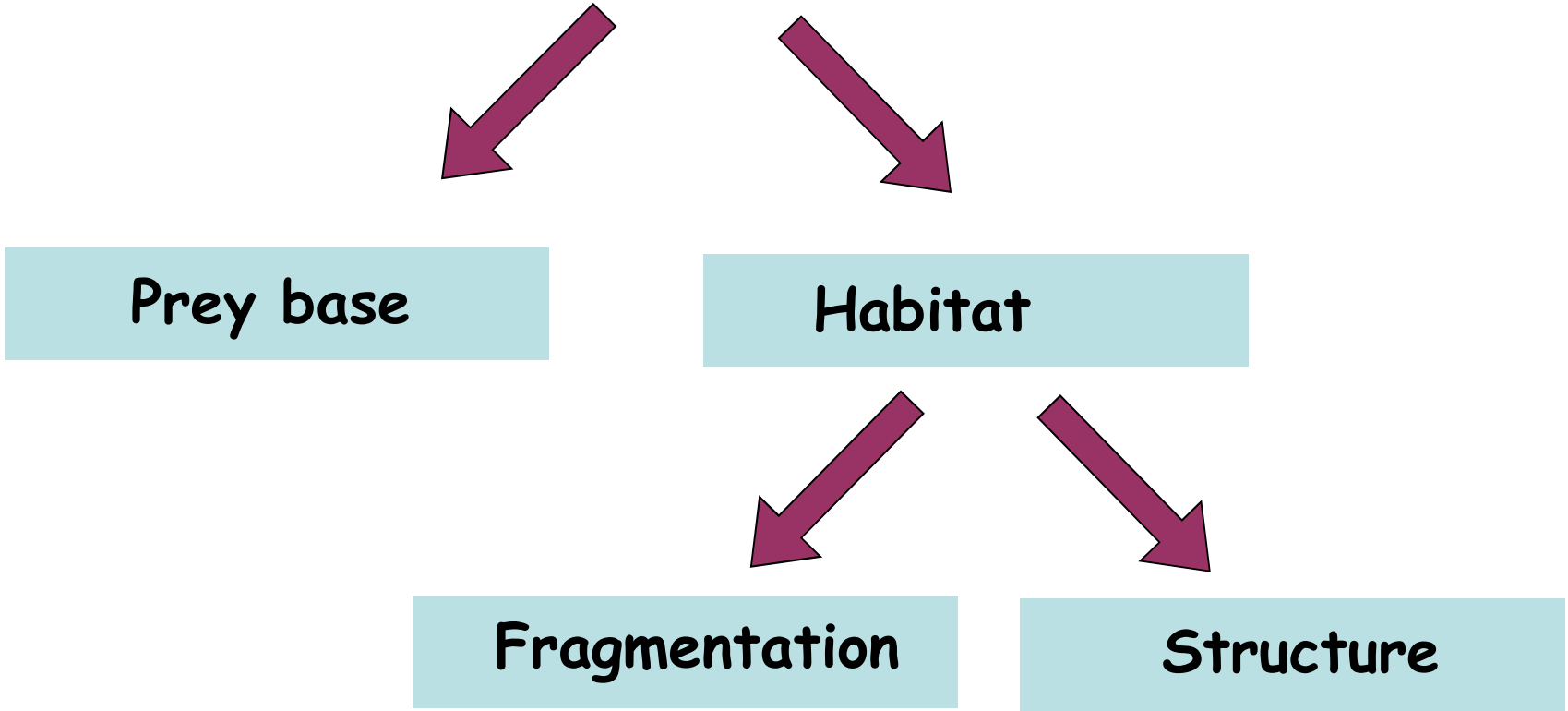
Western Poland

Eastern Poland



Opr. M. Górny, IBS PAN

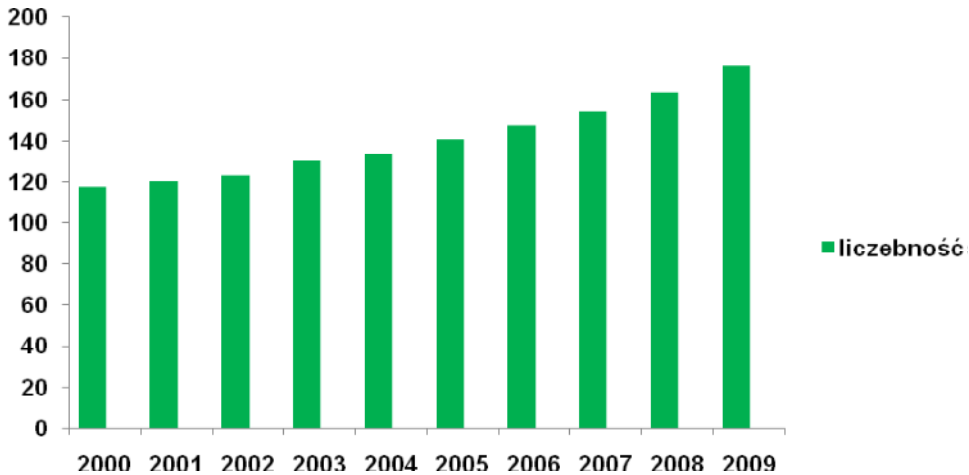
Strategy for lynx conservation in Poland



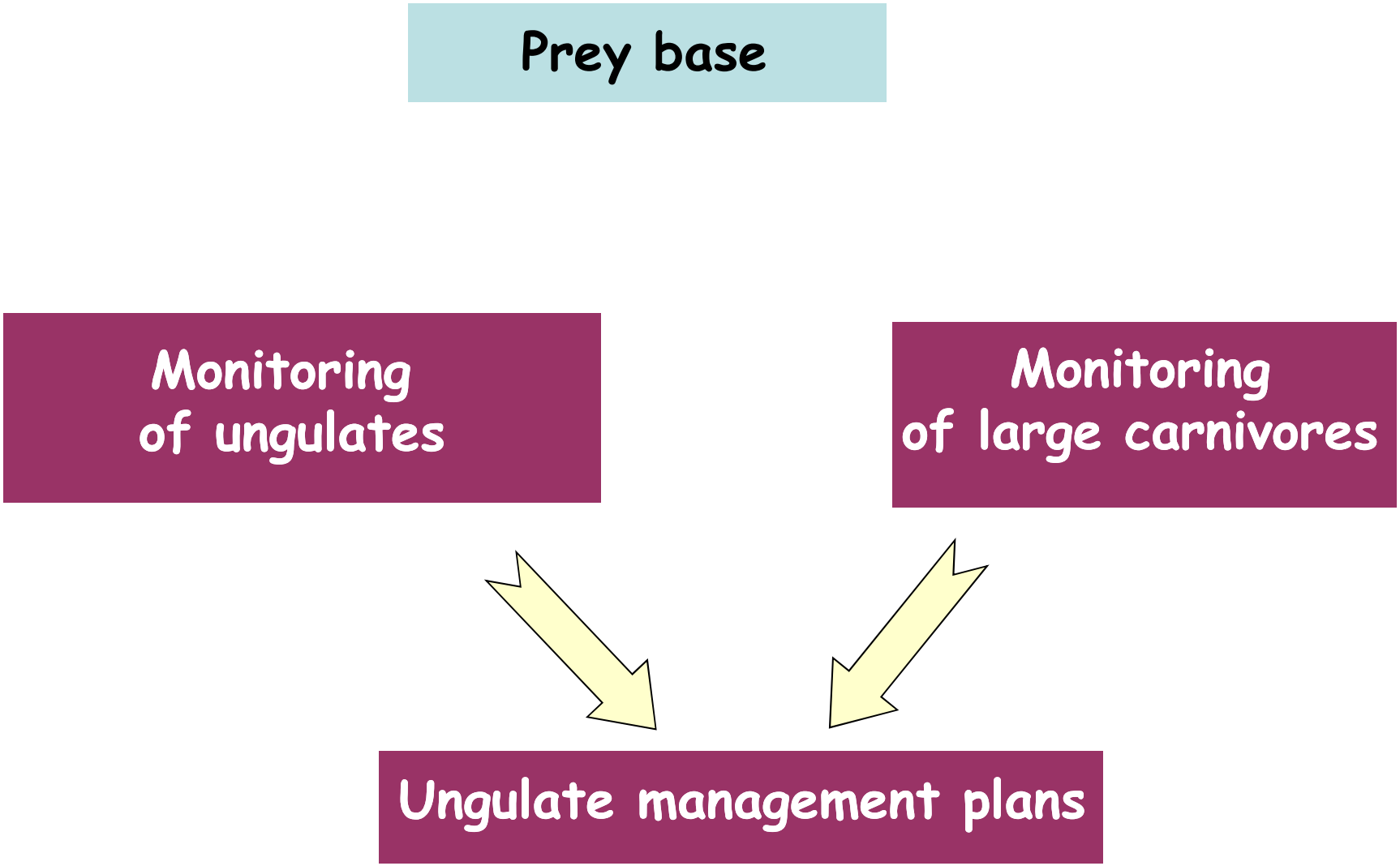
Prey base

Tendencies in ungulate numbers in Poland – data: J. Gryz, Institute of Forestry Research

Red deer



Roe deer



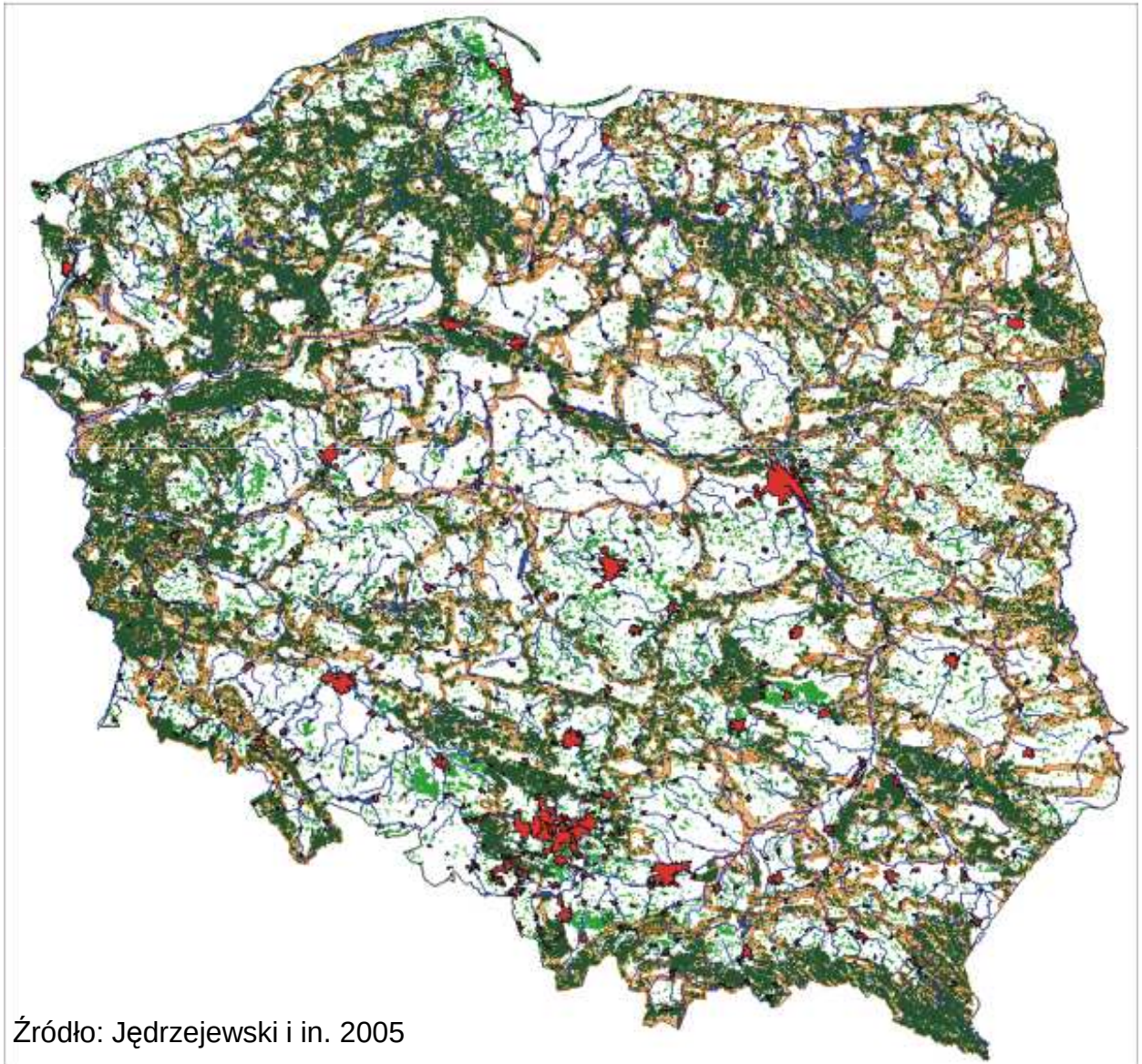
Goal: preventing „overhunting" prey populations

Prey base

- Plans for ungulate harvest should include:

- **Considering high predation rate (up to 30% of population) based on:**
  - **Numbers of ungulates,**
  - **Numbers of large carnivores,**
  - **Average food requirements of carnivores.**
- Temporary exclusion of roe deer (including males) from hunting harvest on forest areas inhabited by large carnivores.

Habitat fragmentation



Źródło: Jędrzejewski i in. 2005

Habitat fragmentation

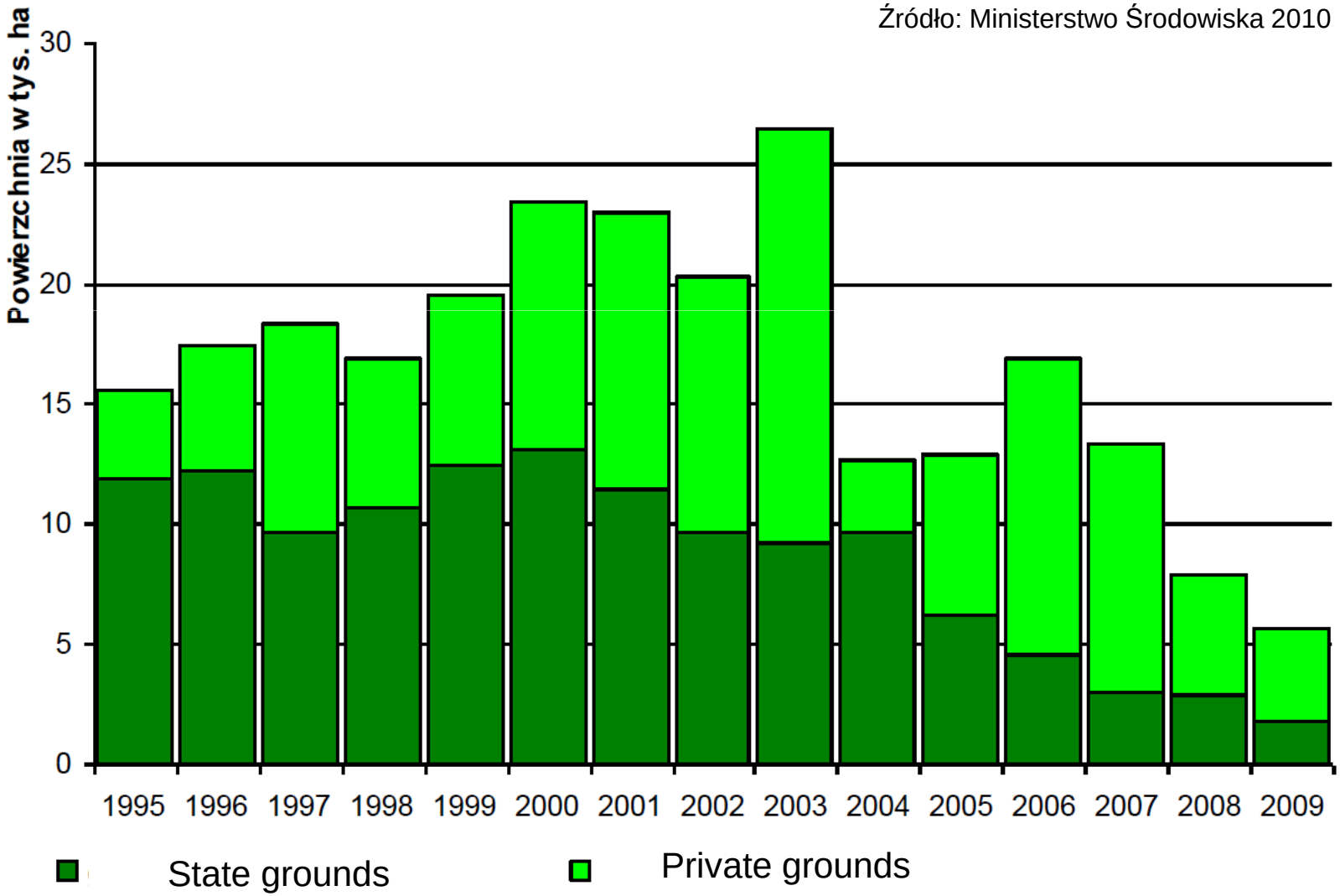
GOAL: reconstruction of large metapopulation interconnected by a network of corridors enabling effective gene exchange

- Improving connectivity between large forest complexes currently occupied and suitable for recolonization by lynx

- basis: „Project of ecological corridors ...” (Jędrzejewski et al. 2005)

Habitat fragmentation

State program for increasing forest cover



Habitat fragmentation

Mechanisms

- Incorporating ecological corridors into local space management plans
- Increasing the share of state forests in the Program for Increasing the State Forest Cover
- Support for afforestation of private agriculture lands (to avoid fragmentation)

Habitat fragmentation

- Counteracting to secondary fragmentation of habitats by roads infrastucture – <u>passes for animals</u>
- Number of passes
- Localization and parameters of passes

Jędrzejewski i in. 2006. Zwierzęta a drogi. Metody ograniczania negatywnego wpływu dróg na populacje dzikich zwierząt

Kurek 2010. Poradnik projektowania przejść dla zwierząt i działań ograniczających śmiertelność fauny przy drogach.

Habitat fragmentation

Reintroductions

- Continuation and monitoring the effects of reintroductions conducted in NE Poland

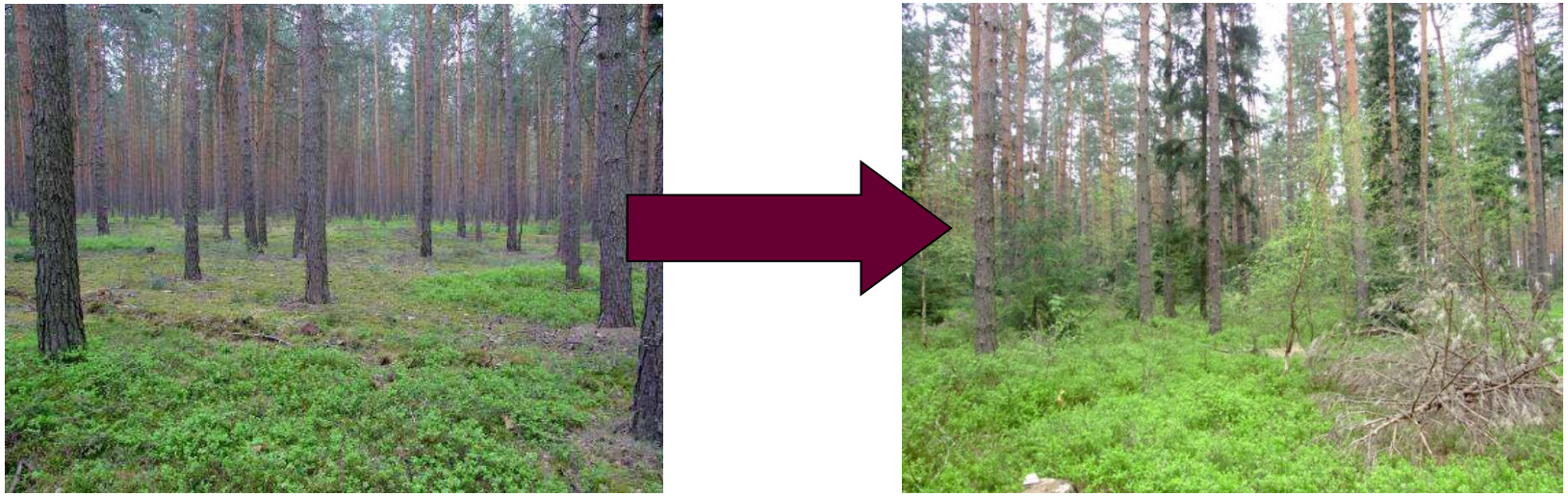
- Background plans – dispersing the range of lynx into western Poland

- Habitat analyses,
- Prey availability,
- Habitat connectivity and quality,
- Analysis of habitat capacity,
- Determining reintroduction sites,
- Number and origin of animals.

Habitat structure

- Increasing the diversity of forests (particularly in western Poland):

- enrichment of undergrowth
- increasing the amount of dead wood
- diversification of vertical and horizontal structure of the forests



Legislative changes

The law for nature conservation

- Paragraph 111 should contain following:

„The Minister of environment will determine the list of ecological corridors with recommendations for its protection".

Legislative changes

The Directive of Minister of Transport

of 30 May 2000 concerning the technical conditions of road objects

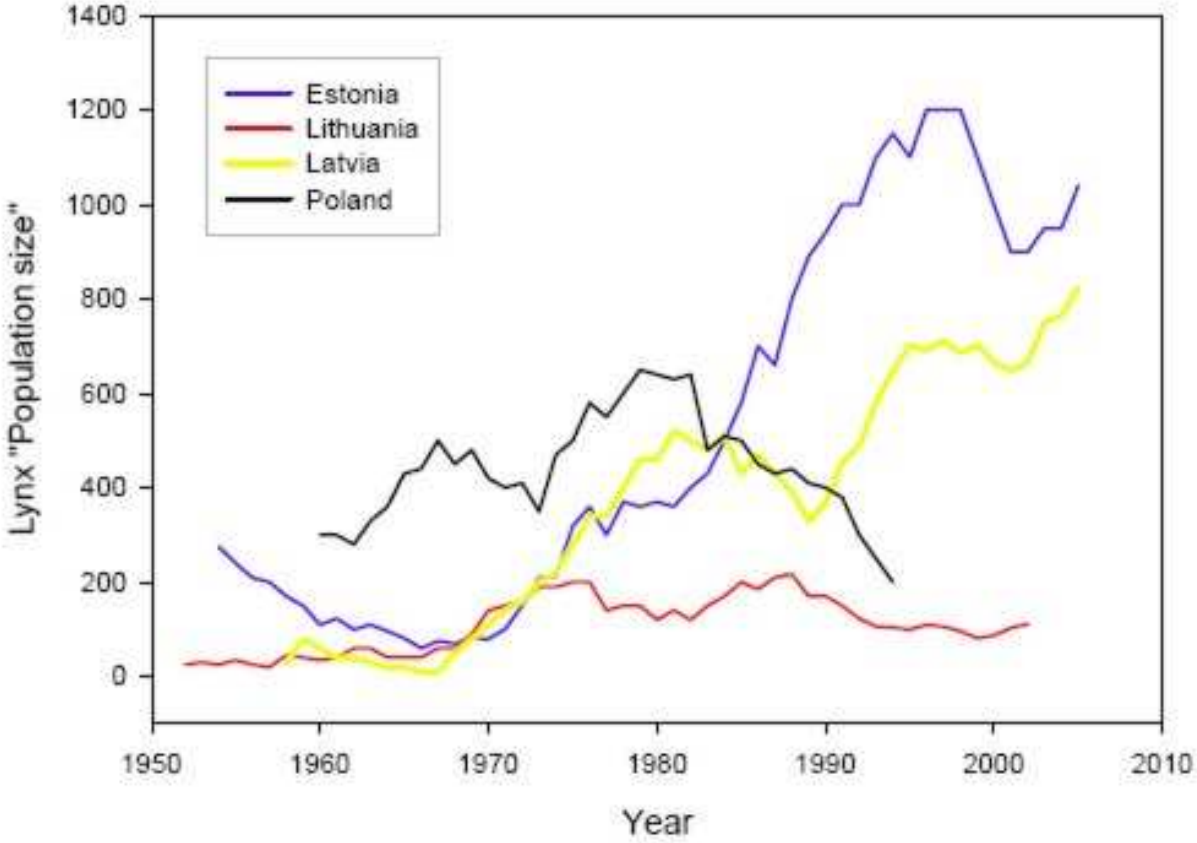
- Delete Paragraph 10.1, (releasing the investors from constructing the road passes for animals on reconstructed roads)

Najważniejsze zmiany legislacyjne

The Directive of the Minister of Enviroment for yearly plans of hunting harvest

- Consider the numbers of ungulates killed by large predators in the estimation of general losses in the wildlife.

What common, trans-boundary management /conservation measures can we undertake while dealing with sub-populations of totally different status?



Source: Linnell et al. 2005

Why is it important to coordinate management/conservation of lynx populations across countries?

- Goal – to allow strengthening the western lynx populations and increase a chance for expansion of the population westwards

Measures to undertake
- monitoring

- **Goal** - updating and disseminating the status and distribution of lynx across the lynx range shared by all countries
- Monitoring the population numbers and distribution – standardizing methods and synchronizing census intervals
- Creating a common database with lynx occurrences and population trends
- Monitoring prey (ungulates) populations

Measures to undertake
- management

- Considering the status of lynx populations in neighbouring countries while planning the management/exploitation of the lynx populations
- **Goal:**

- „saving” the borderland parts of populations
- increasing dispersal rate into the „sink” countries
- replacing a part of hunting quota with translocations to „sink” countries

Measures to undertake
- conservation

- Establishment of international expert group (under Baltic Large Carnivore Initiative?)
- Particular focus on a balance between ungulates' hunting quota, local lynx numbers and their food requirements
- Strengthening and coordination of efforts related to wildlife corridors
- Coordination of lynx reintroductions and respecting origin of individuals

Thank you for your attention