

13th UIC conference
Workshop: Sustainable Landuse



Wildlife and Railways

*Andreas Seiler (SLU) &
Mattias Olsson (Enviroplanning AB)*



Wildlife and Railways



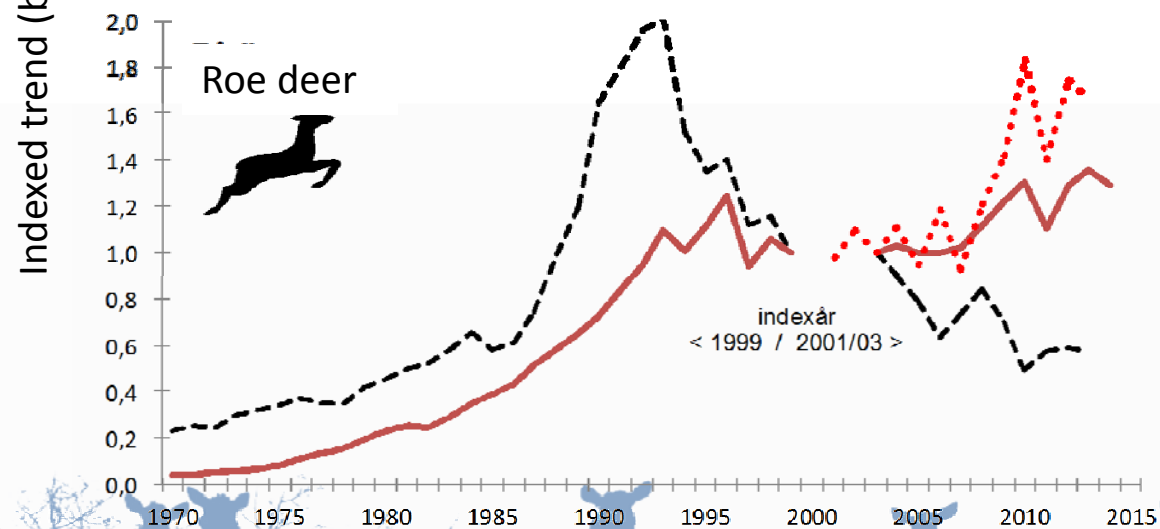
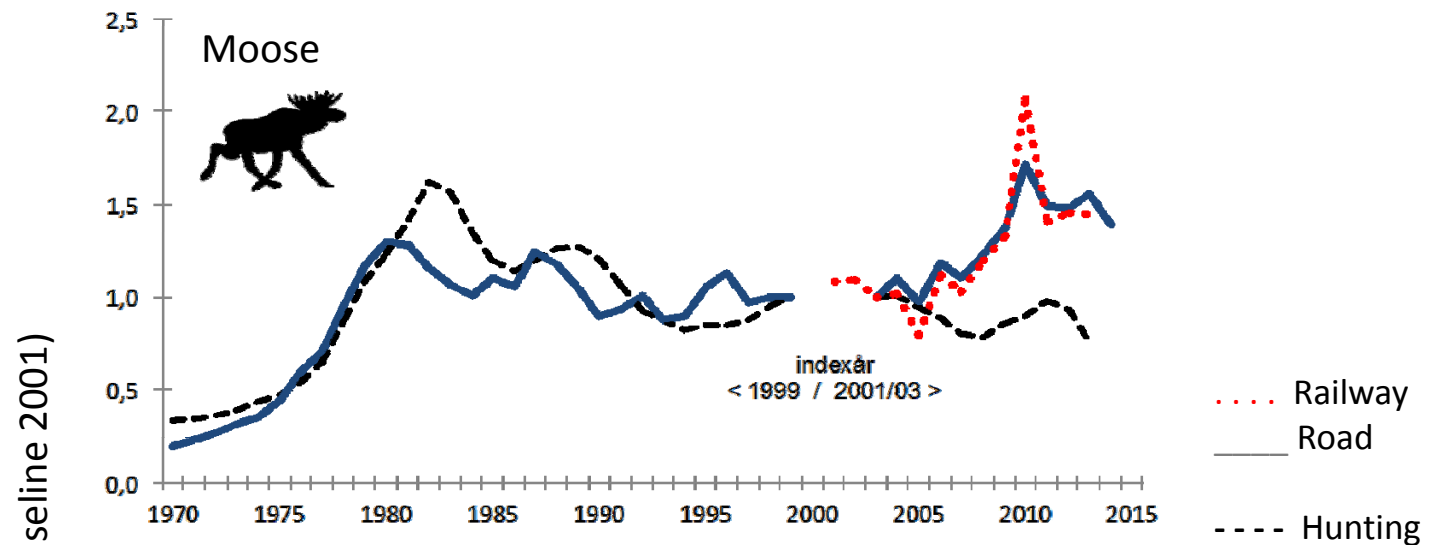
Wildlife and Railways



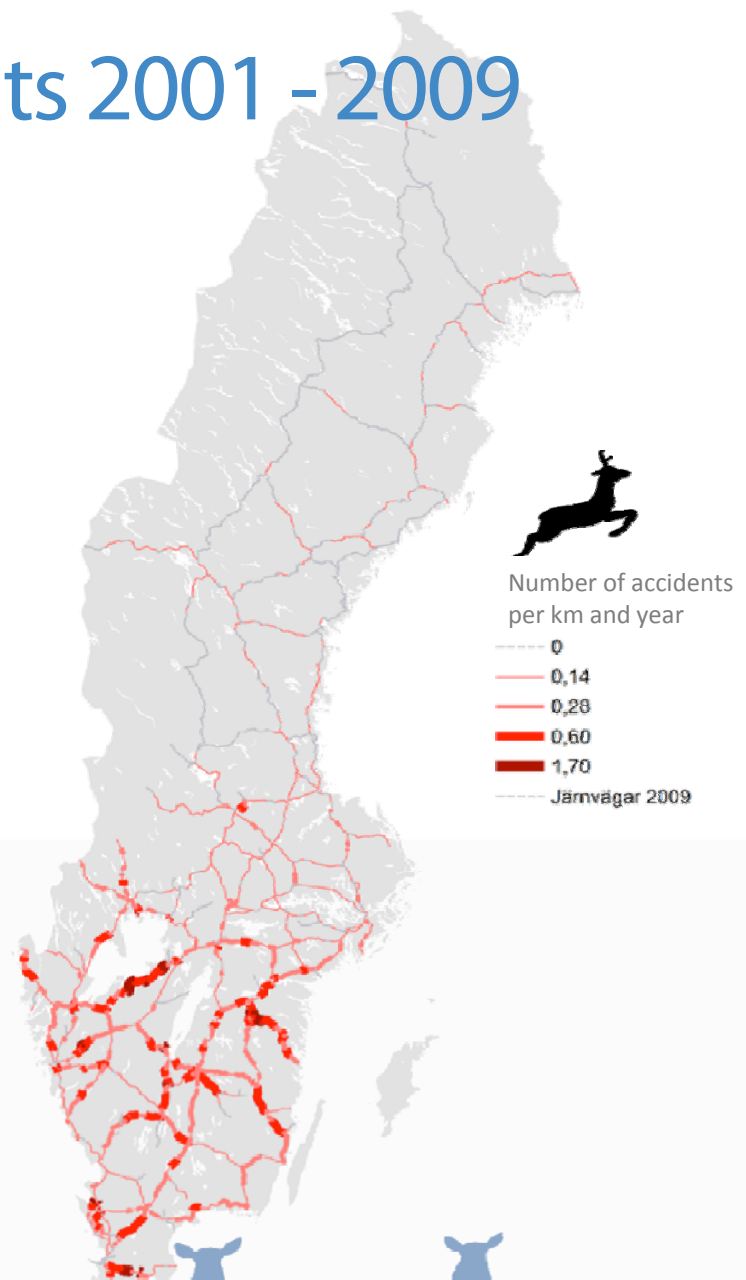
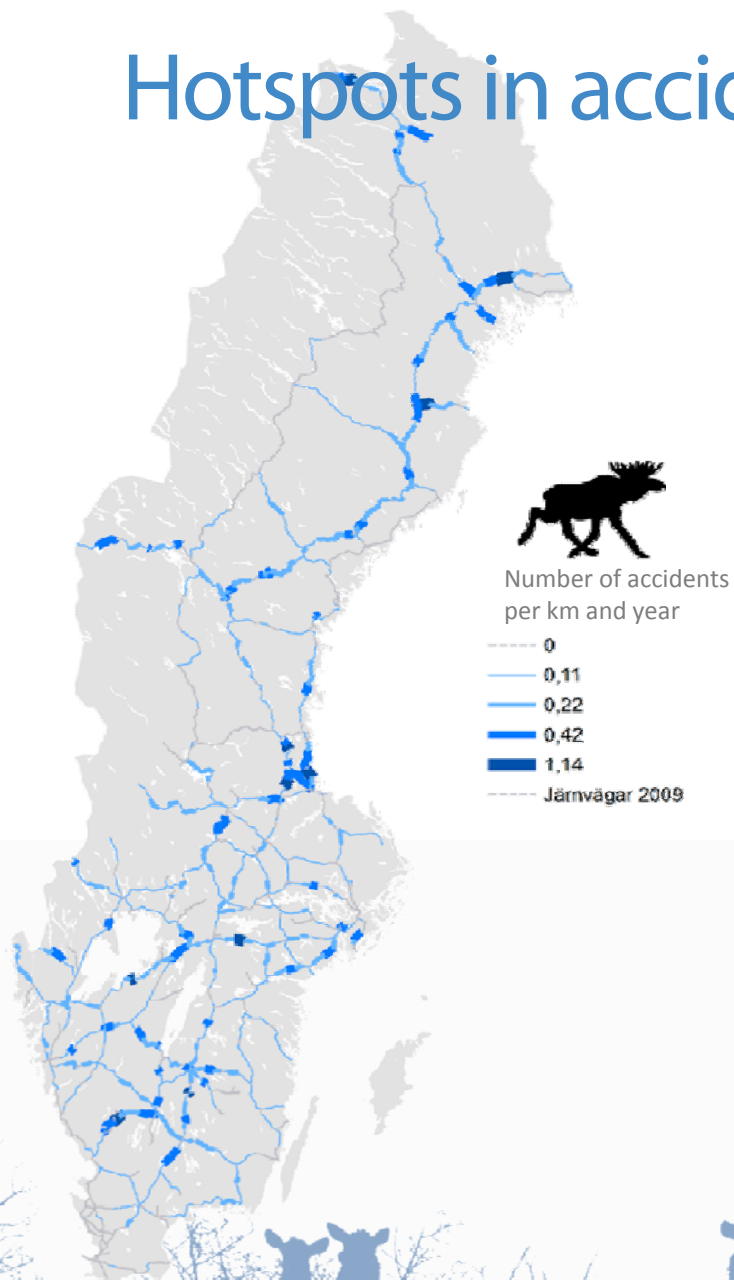
Wildlife and Railways ?



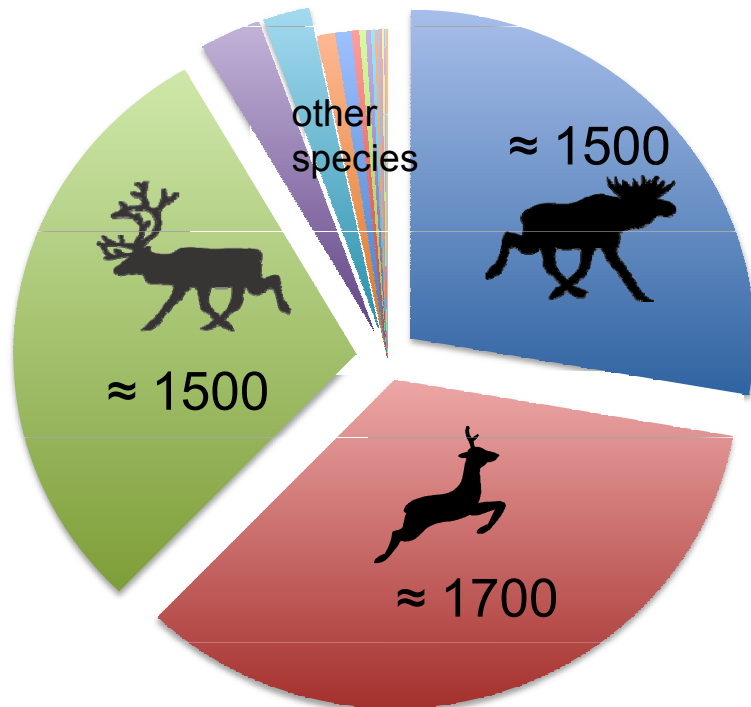
Accident statistics from Sweden



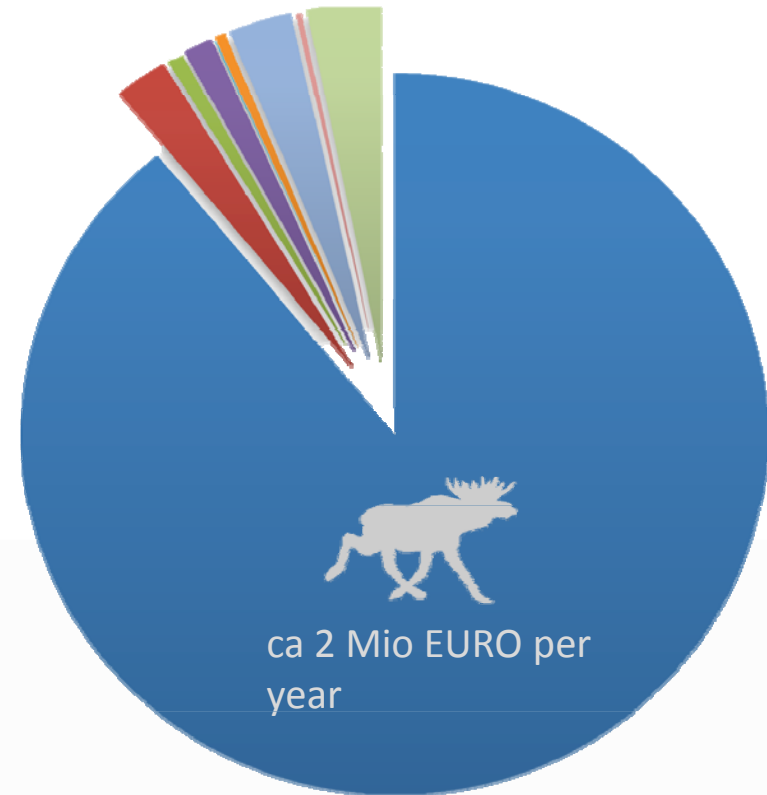
Hotspots in accidents 2001 - 2009



Reported collisions with trains per year



Repair costs for SJ per year



Costs of delays in train traffic



Costs of delays in train traffic

• Train 579 collides with moose and must be replaced

• Damages to front and connection = 630 000 SEK

• Train out of duty for 2 days

• Train is delayed by 164 min.

• 6 other passenger trains are delayed with 37-164 min.

• 1120 passengers are delayed with a total of 103260 min.

• Cost of delays = 960 000 SEK

• Total cost of incident =

ca. 200 000 €

• Train 984 collides with moose and must be replaced

• Damages to front and connection = 720 000 SEK

• Train out of duty for 3 days

• 290 passengers evacuate to train 910 after 85 min. delay

• 4 other passenger trains are delayed with 30-90 min.

• 1290 passengers are delayed with more than 64500 min.

• Cost of delays = 600 000 SEK

• Total cost of incident =

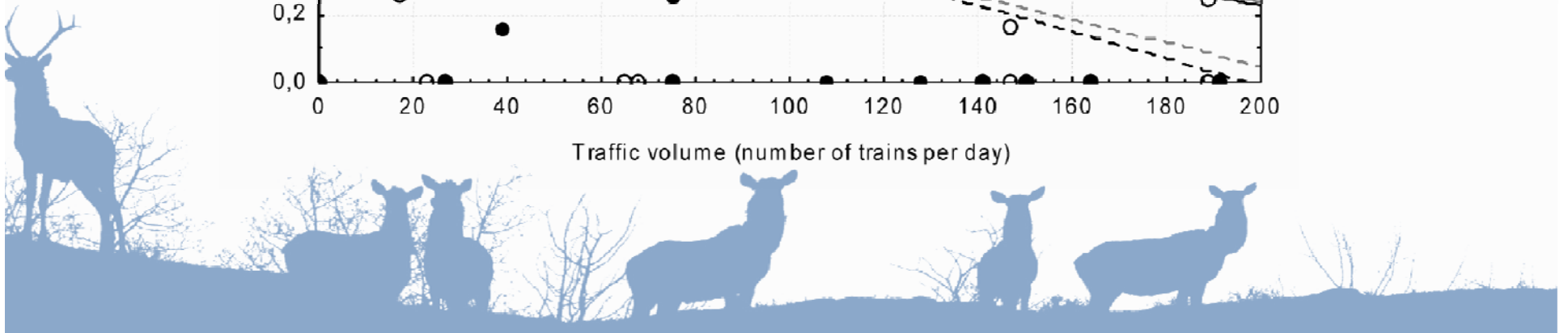
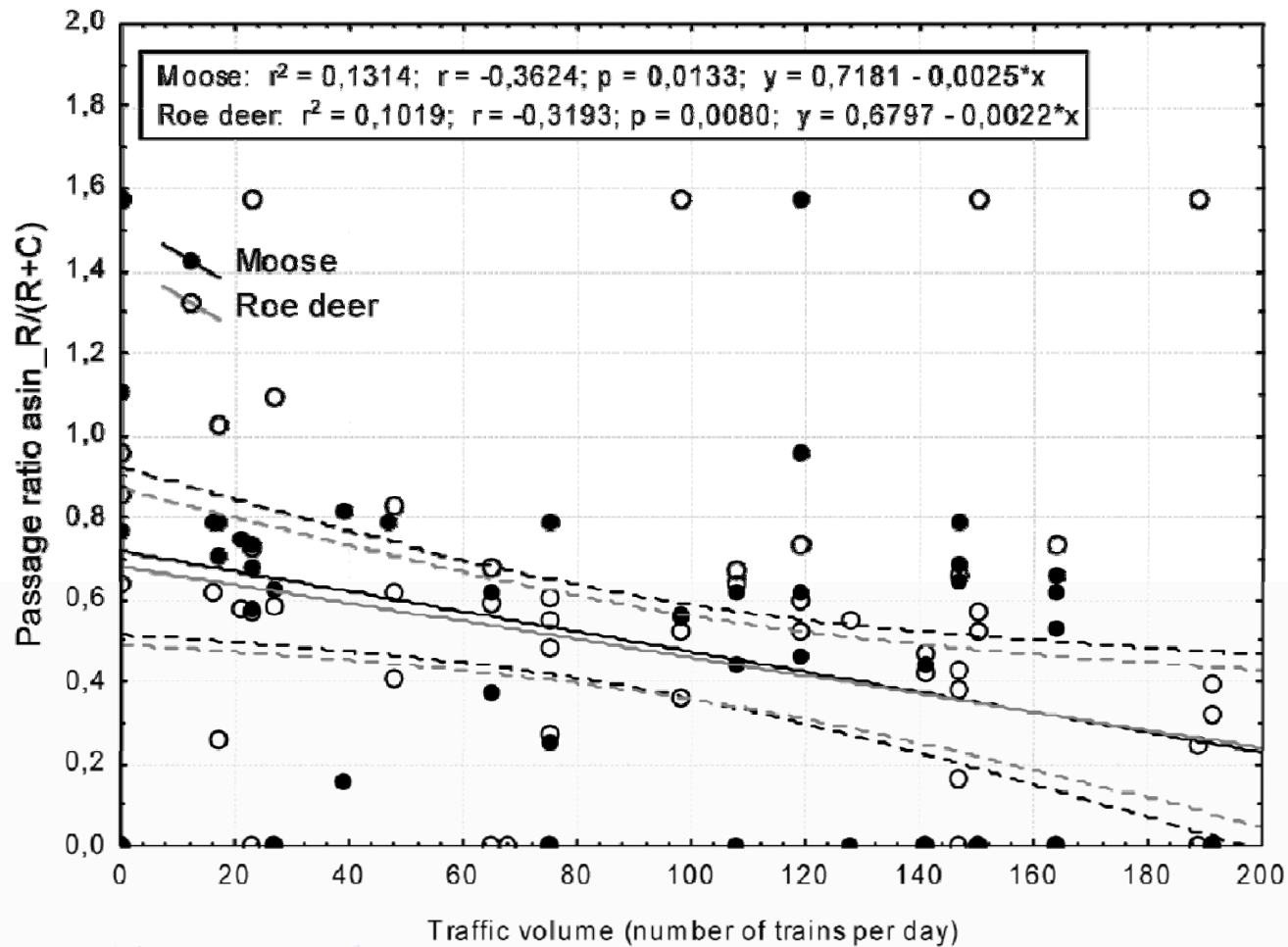
ca. 150 000 €



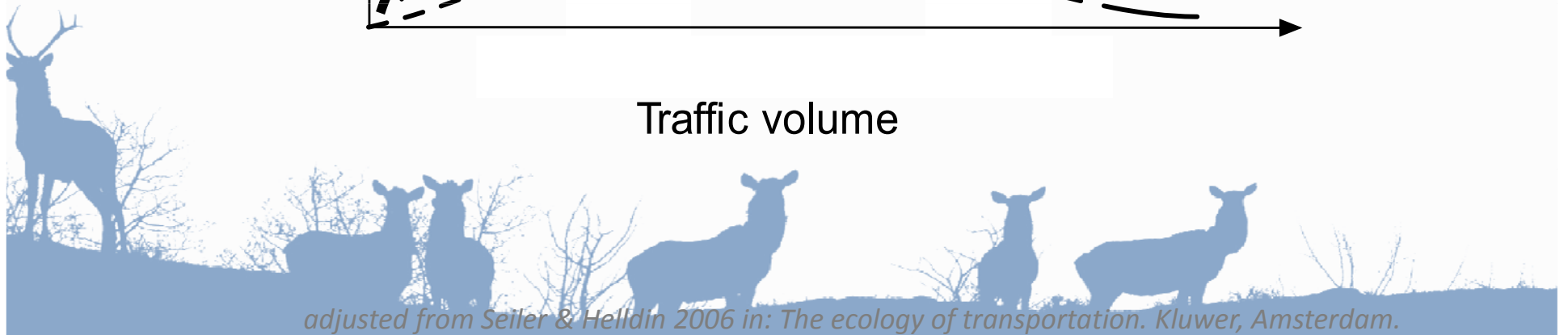
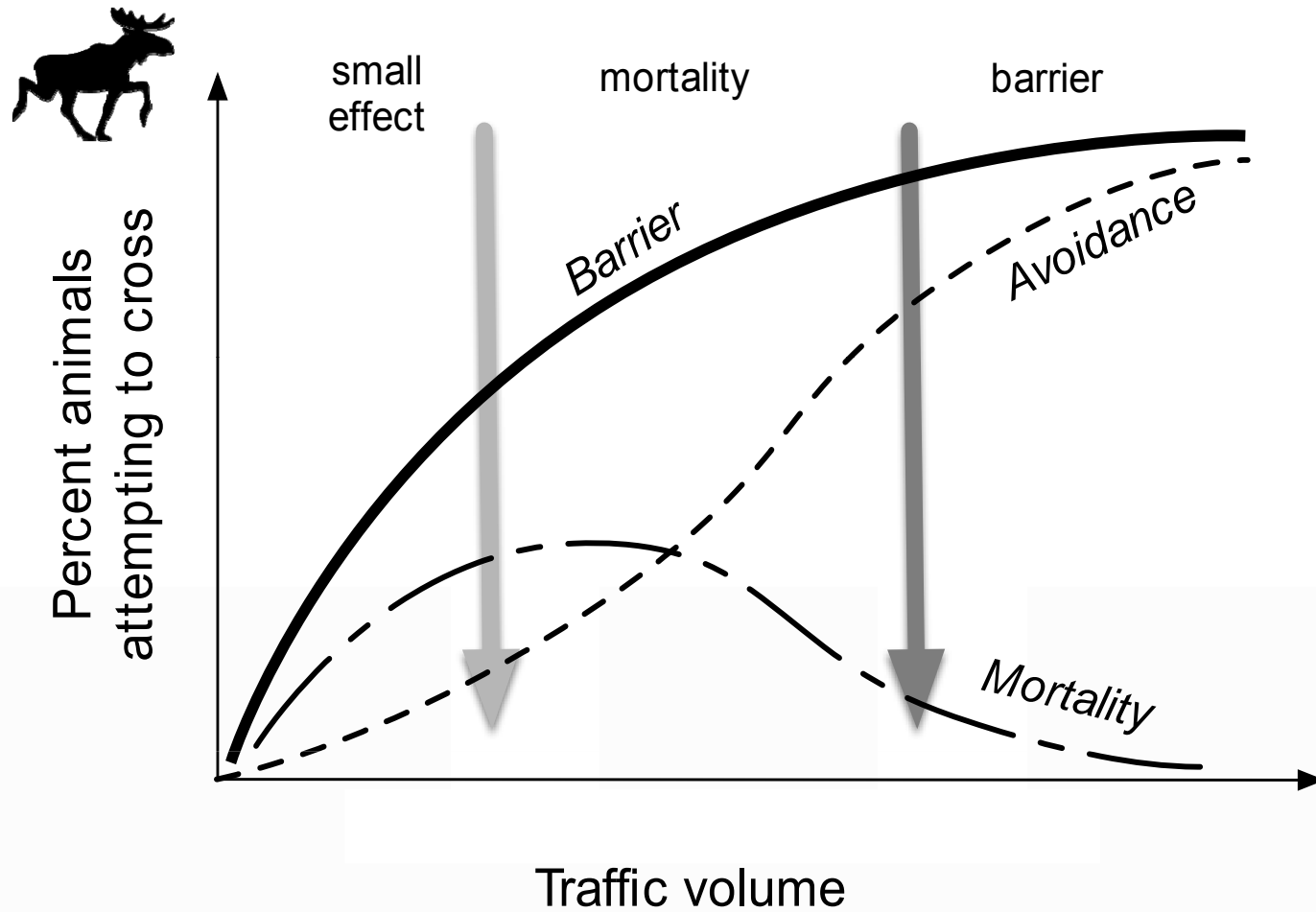
Railways as barriers



Railways as barriers



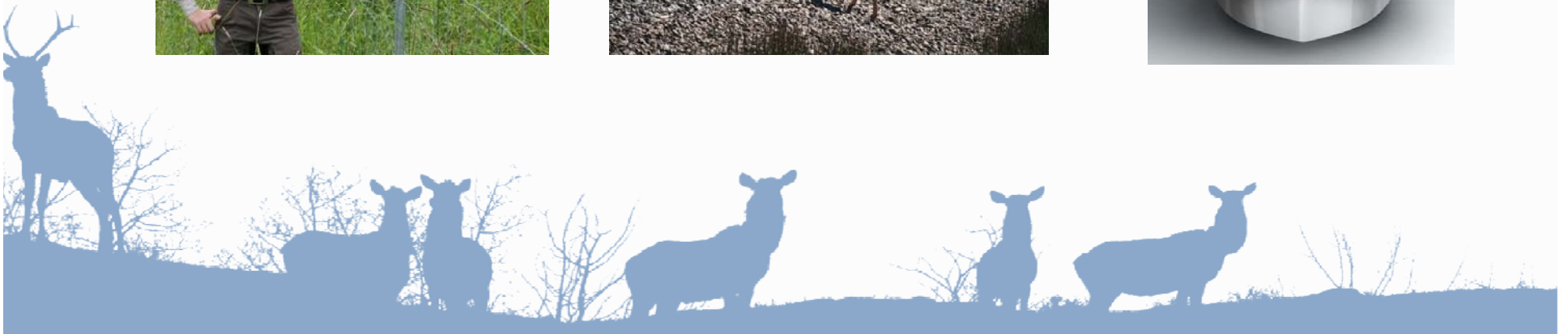
Barrier and Mortality



adjusted from Seiler & Helldin 2006 in: The ecology of transportation. Kluwer, Amsterdam.

Mitigation options ...

- Inclusive fencing system: fences + safe passages
- Open, unattractive rail corridors ?
- Warning devices on train engines ?



Mitigation requisites ...

- Mitigation objectives ?
- Target species ?
- Immediate causes ?
- Cost-effective measures ?
- Cost-benefit analyses ?



Immediate causes for collisions

- Animals utilize rail corridors
- Trains come rarely – long intervals
- Low detectability of approaching trains
- Flight responses are misadapted



Photo: Jimmy Nilsson, SJ



Animal warning devices

- Acoustic & optic warning signals active just before the train arrives but only when animals are present

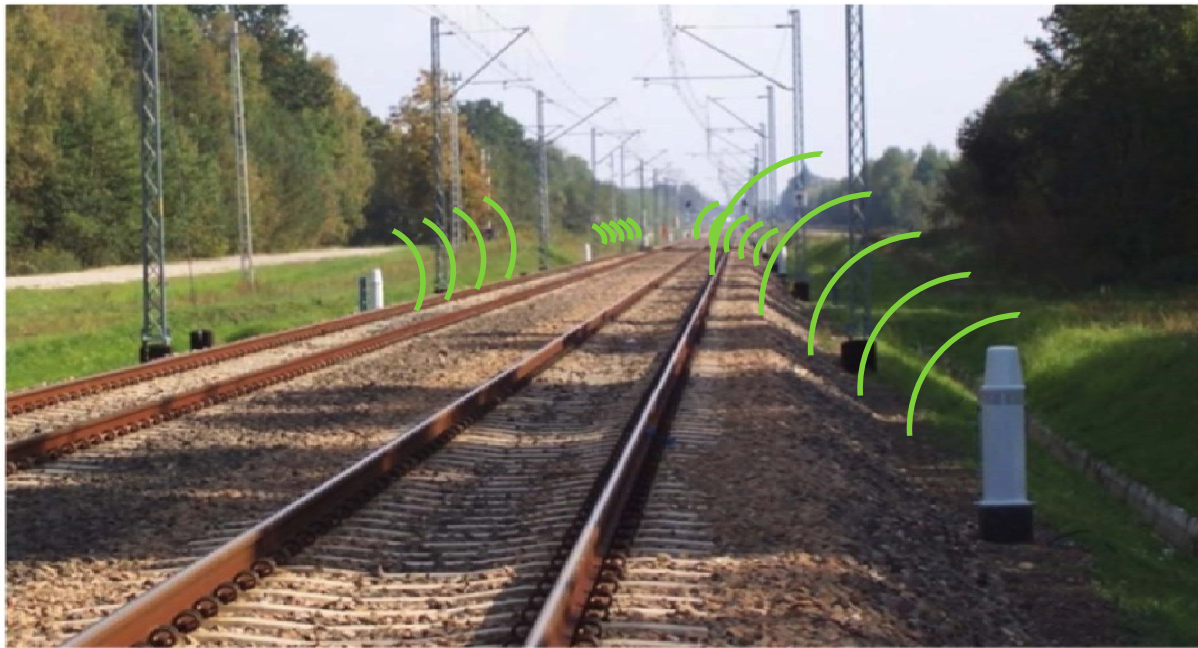
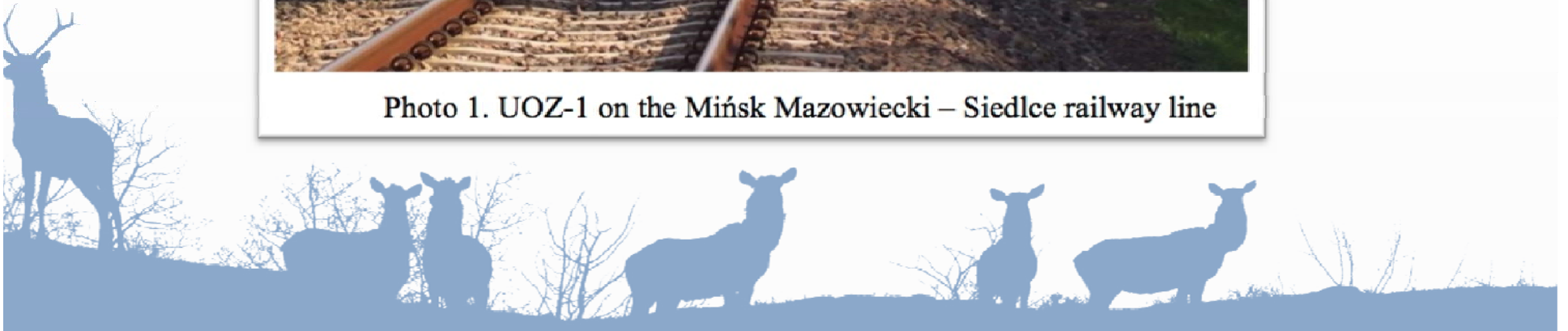
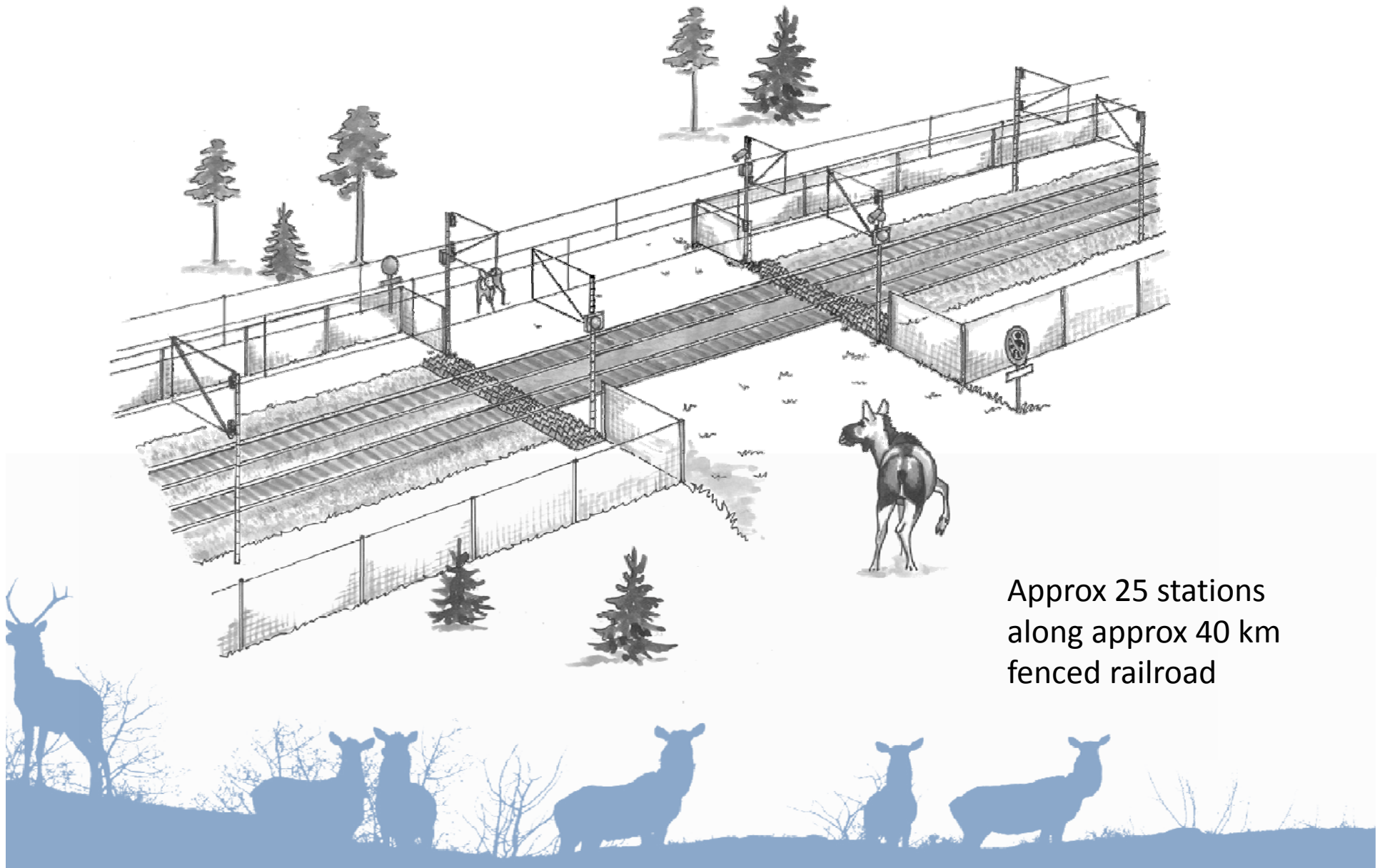


Photo 1. UOZ-1 on the Mińsk Mazowiecki – Siedlce railway line



Experimental studies on crosswalks



Approx 25 stations
along approx 40 km
fenced railroad

Other activities



- Video documentation of animal-train encounters
- Improved statistics (reporting, aerial inventories)
- Economic dimensions
- Influence of vegetation



International cooperation

- IENE working group on Wildlife and Railways 1+2

- www.IENE.info



- UIC working group?
- Coordinated research and mitigation projects ?

- “Railroad Ecology”

- = new book in preparation

contact: Luis Borda de Agua: lbagua@gmail.com





Thank you !

Andreas Seiler & Mattias Olsson

