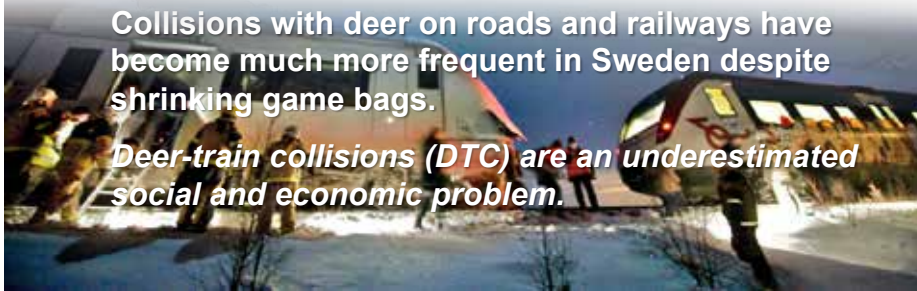


Costs and effects of deer-train collisions

in Sweden

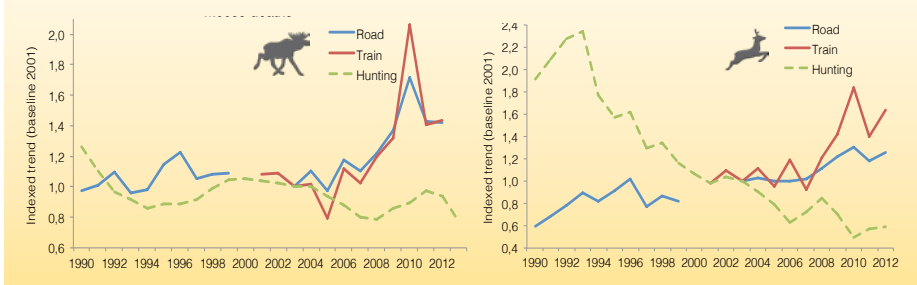


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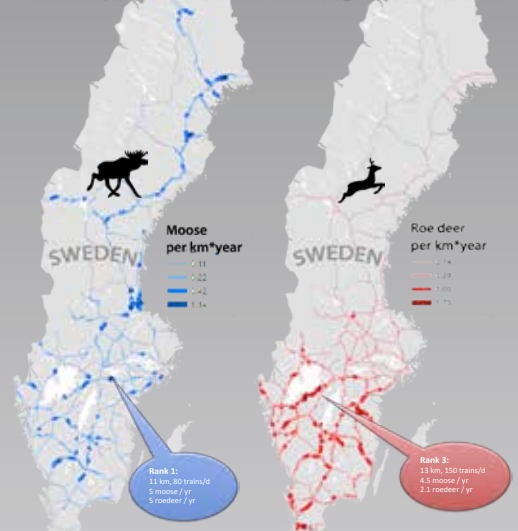


Collisions with deer on roads and railways have become much more frequent in Sweden despite shrinking game bags.

Deer-train collisions (DTC) are an underestimated social and economic problem.



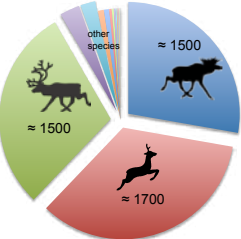
Hotspots in DTC during 2001-2011



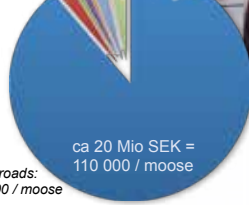
Collisions on rail ≈ collisions on road

Type	Species	Deer / year 2002-2009	Length (km)	Collisions / 100 km
Roads	Moose	4 713	98 467	4,79
	Roe deer	28 929	98 467	29,38
Railways	Moose	905	11 456	7,90
	Roe deer	1 255	11 456	10,96

DTC per year



Repair costs for SJ per year



Costs on roads: ca. 170 000 / moose



Examples of consequences to 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 = 1,59 Mio. SEK
- 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 = 1,3 Mio. SEK



Effects and costs to society:

- Ethical: Animal suffering
- Social: Working environment of drivers
- Economic: Train damages and repairs
- Economic: Compensation and managment.
- Traffic: Train delays and traffic disruptions
- Ecological: Mortality ?

What needs to be done:

- Improve empirical data on DTC (reporting, registration, GIS location)
- Built fences and safe passages
- Develop warning systems for deer along tracks & on trains
- Study animal behavior and reaction
- Collaborate internationally

Outlook:

- We expect further increase in DTC with the upgrade and extension of railways and increased train speeds
- We use IENE to establish the question globally and with rail operators
- We develop mitigation strategies and innovative technical solutions

