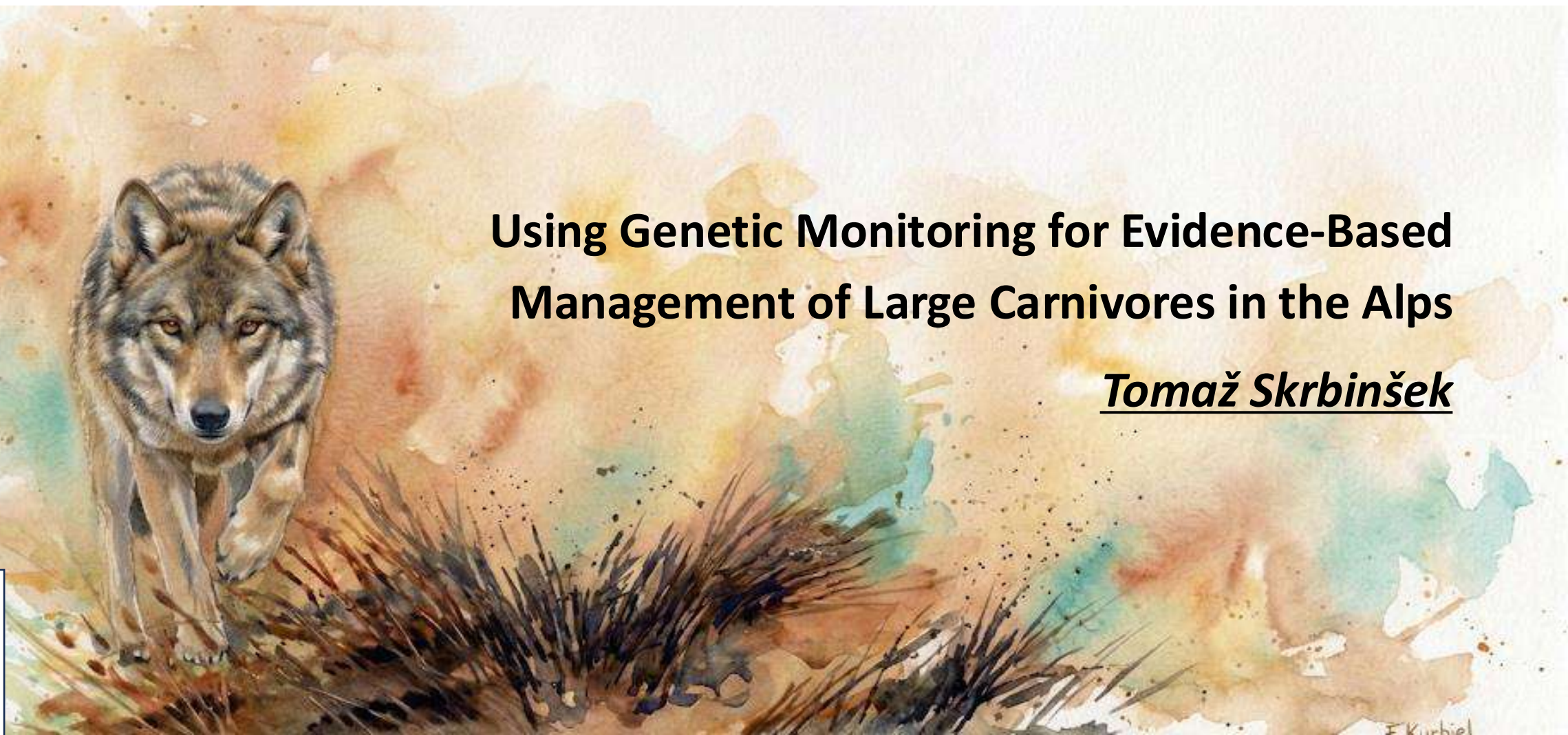


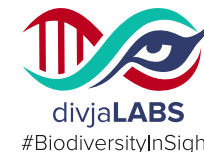
Using Genetic Monitoring for Evidence-Based Management of Large Carnivores in the Alps

Tomaž Skrbinšek



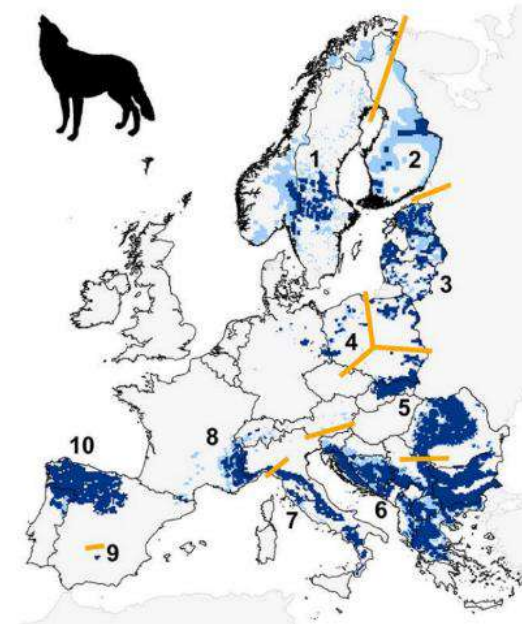
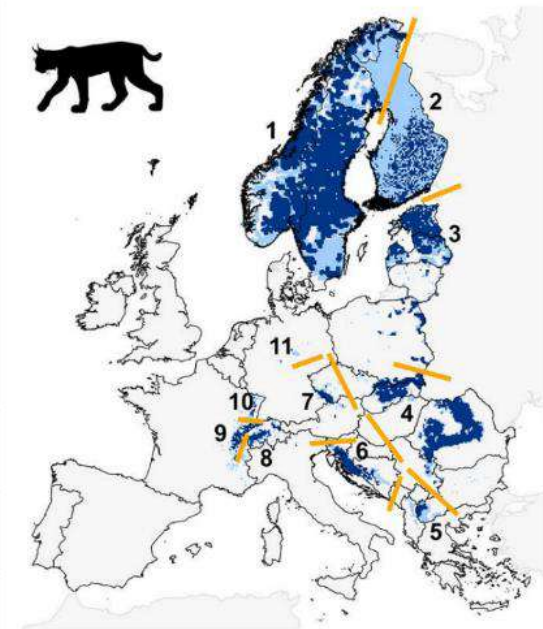
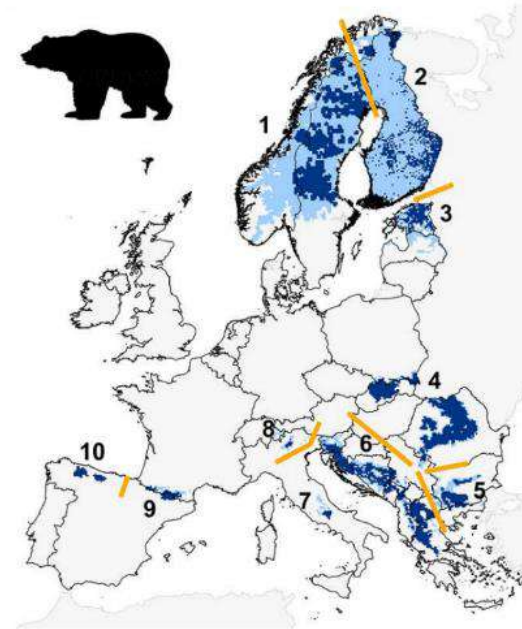
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Biotechnical Faculty





CHAPRON ET AL. (2014) **Recovery of large carnivores in Europe's modern human-dominated landscapes.** *Science* 346, 1517.



Europe at night (NASA/NOAA)



Wildlife preserves



Biology

Coexistence?

- Social sciences
- Solving conflicts

Can wildlife live with us?

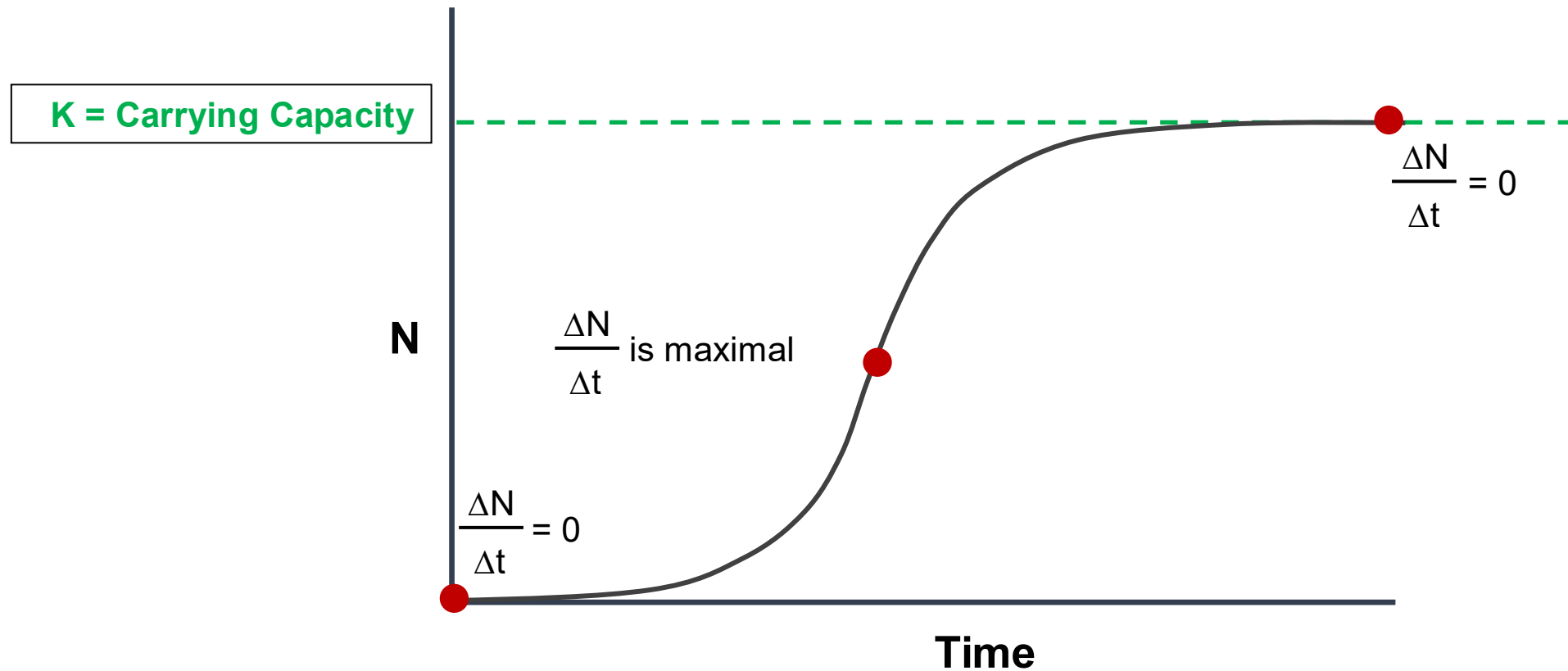


Can we live with wildlife?

Population growth and carrying capacity

Logistic growth

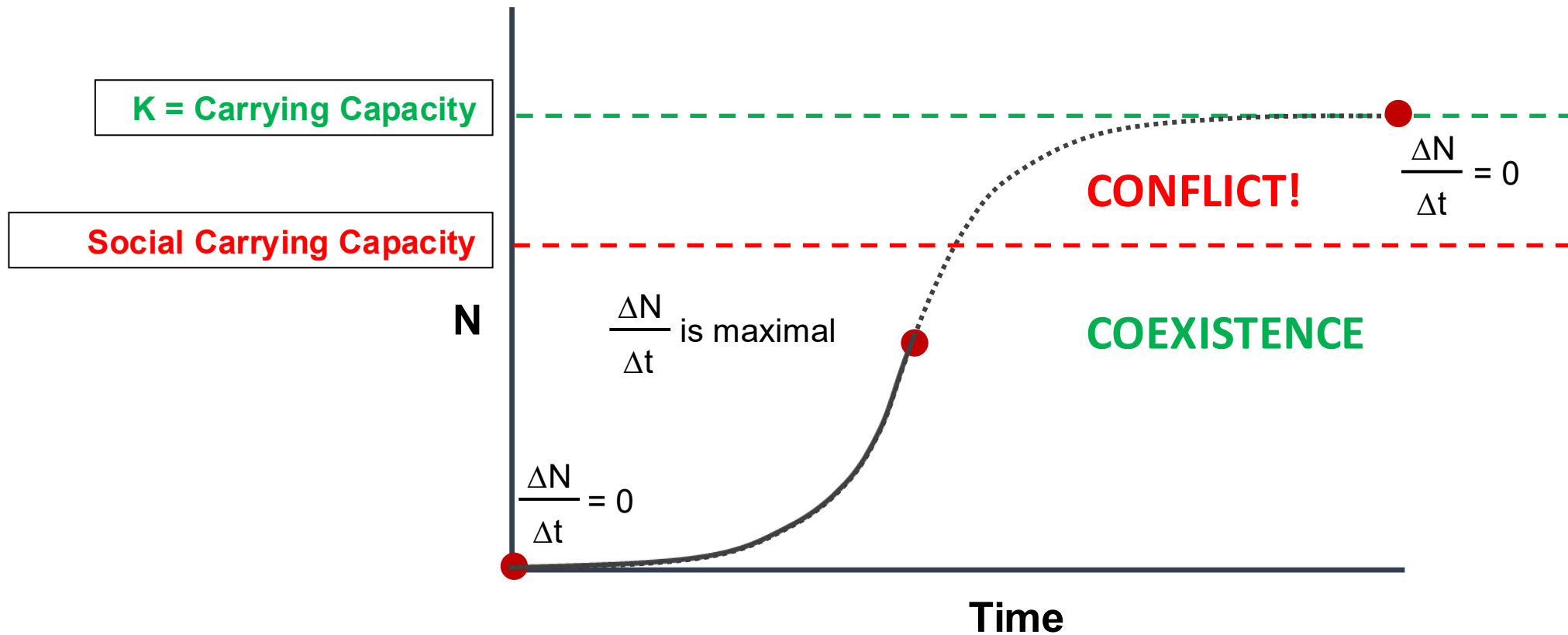
$$\frac{\Delta N}{\Delta t} = r \cdot N \cdot \left(1 - \frac{N}{K}\right)$$



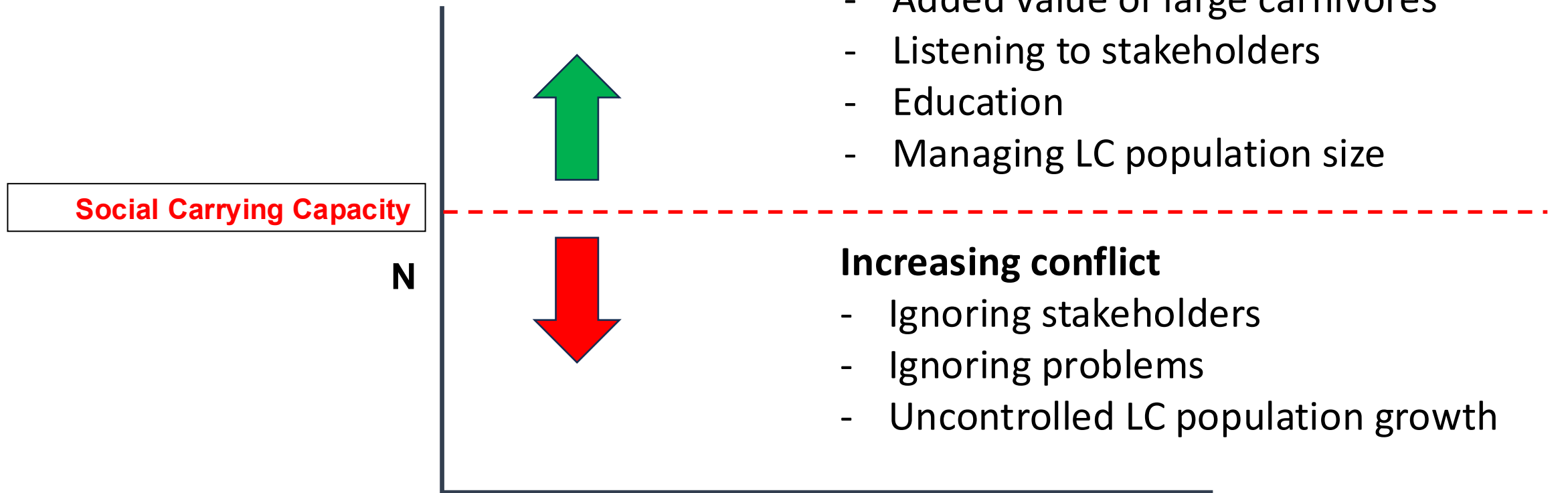
Population growth and carrying capacity

Logistic growth

$$\frac{\Delta N}{\Delta t} = r \cdot N \cdot \left(1 - \frac{N}{K}\right)$$

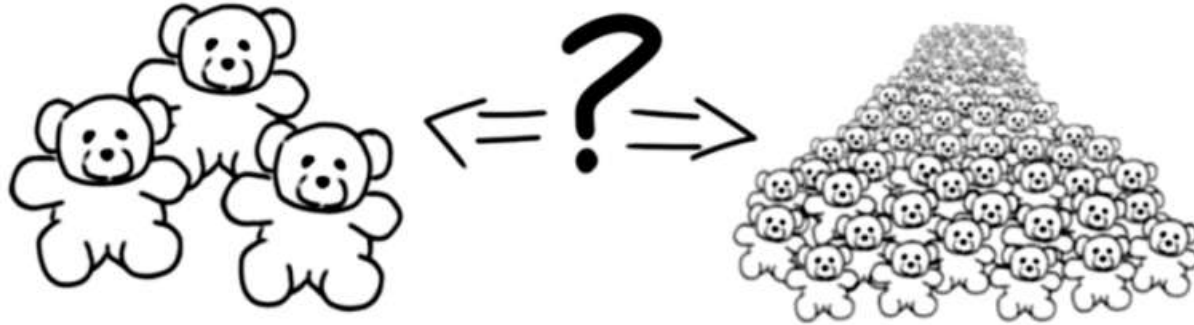


Population growth and carrying capacity



To make decisions...

...we must understand what we have.



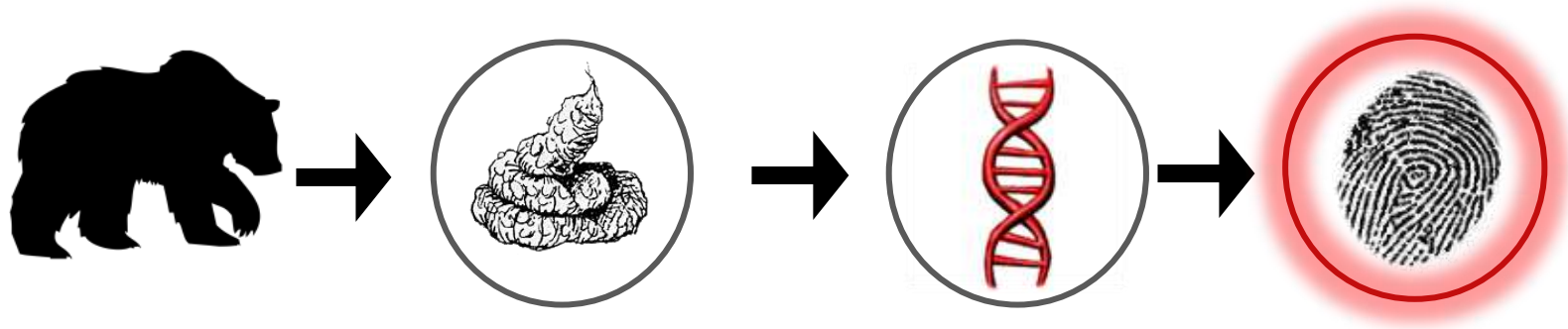
“Counting fish is like counting trees...

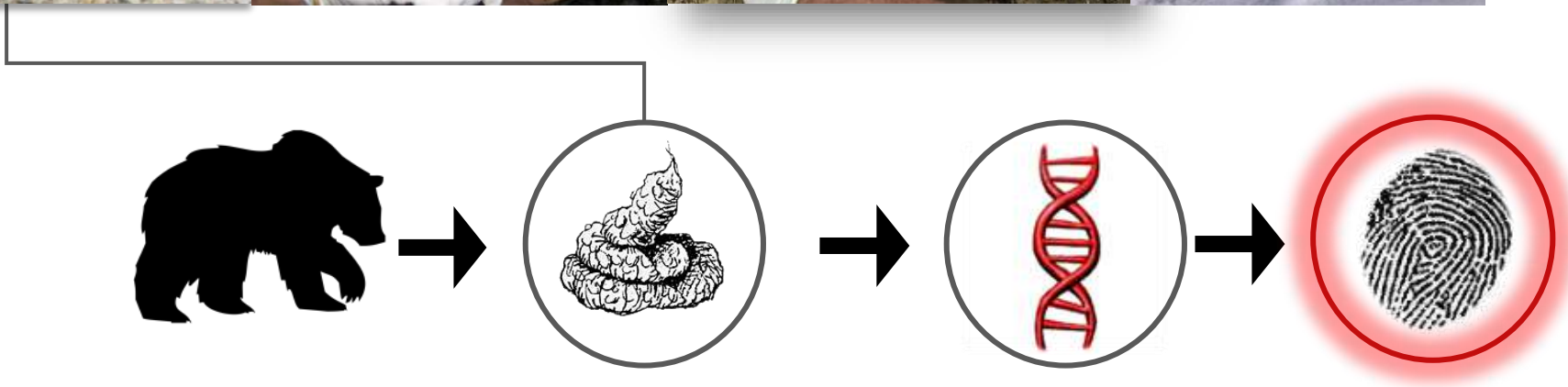
...except they’re invisible and they keep moving.”

John Shepherd



The game changing recipe...

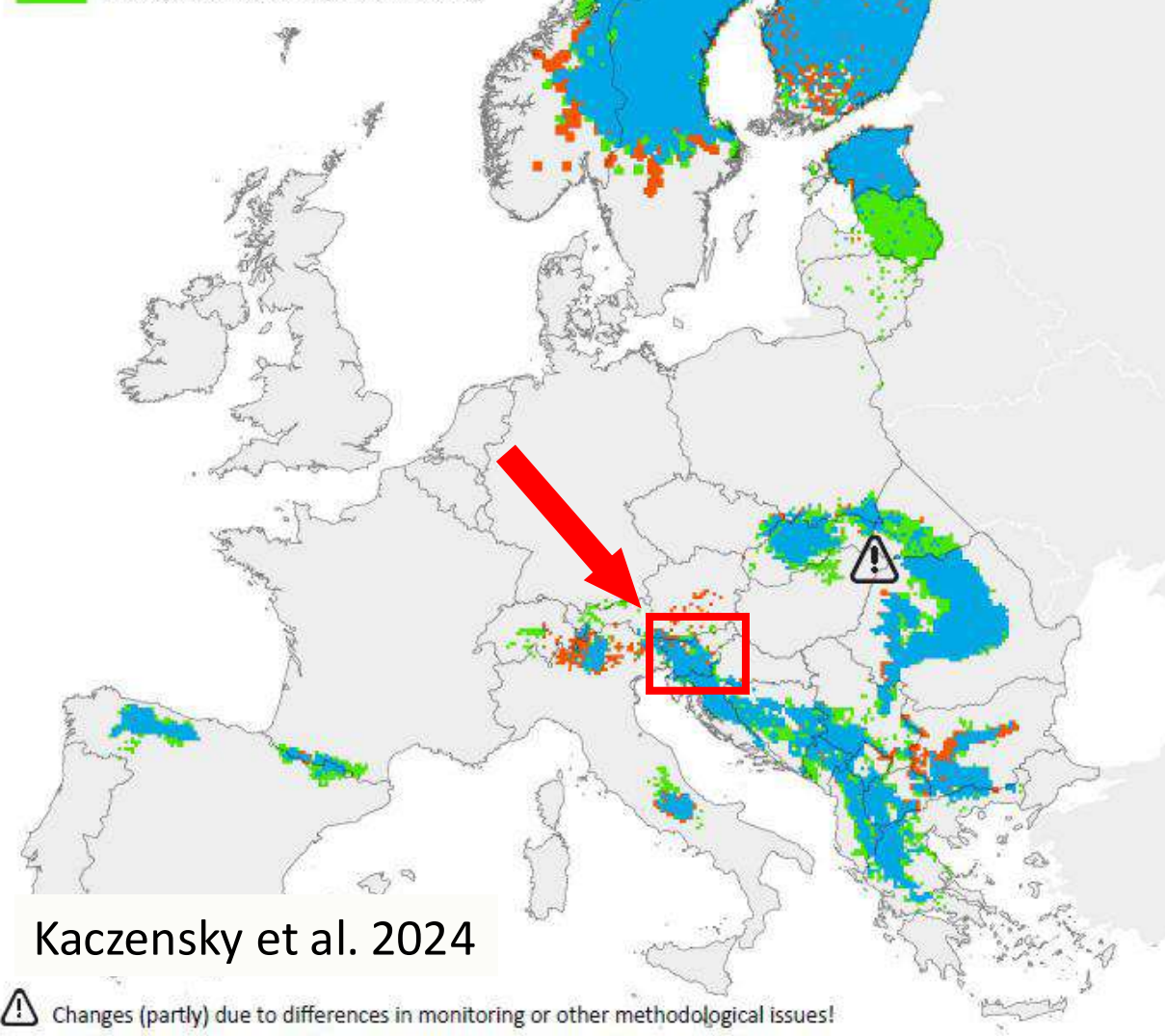




Change in distribution 2012-2016 (1) versus 2017-2022/23 (2)

All presence categories included
(undefined, permanent, sporadic)

- Loss (presence in 1, absence in 2)
- No change (presence in 1 & 2)
- Gain (absence in 1, presence in 2)

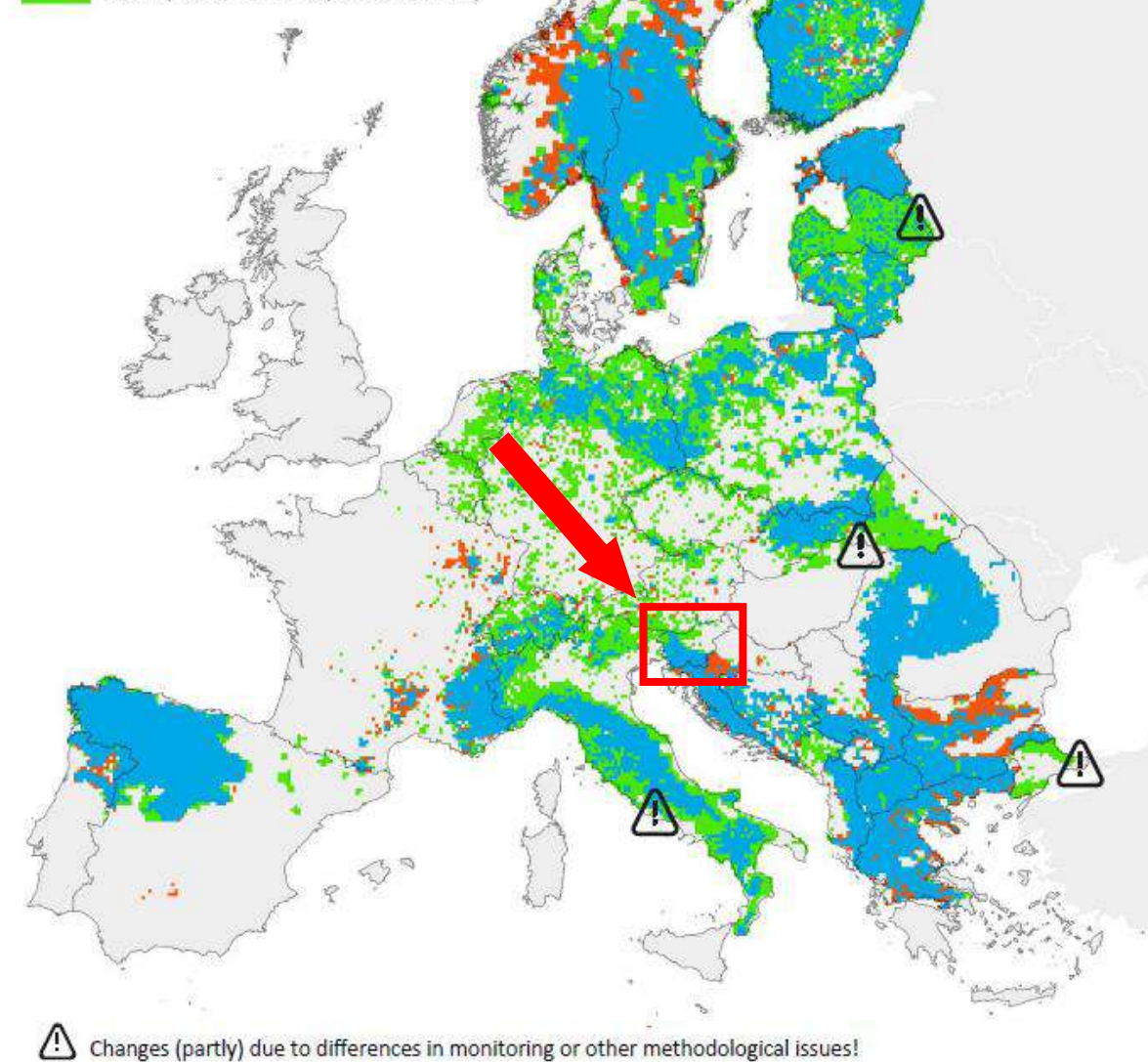


Kaczensky et al. 2024

Change in distribution 2012-2016 (1) versus 2017-2022/23 (2)

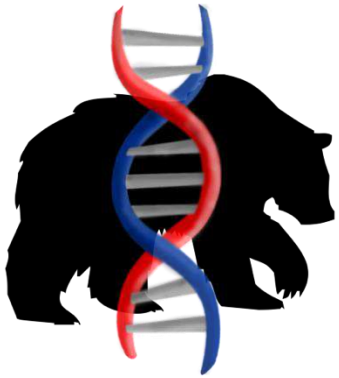
All presence categories included
(undefined, permanent, sporadic)

- Loss (presence in 1, absence in 2)
- No change (presence in 1 & 2)
- Gain (absence in 1, presence in 2)



⚠ Changes (partly) due to differences in monitoring or other methodological issues!

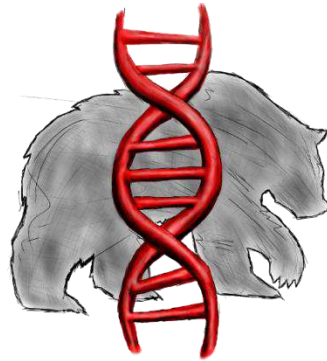
The evolution of bear genetic monitoring in NW Dinaric Mts.



2004 – 2006: Pilot study

Research project

Learning the ropes.



2007: First snapshot

National funding

The first country-wide population size estimate.

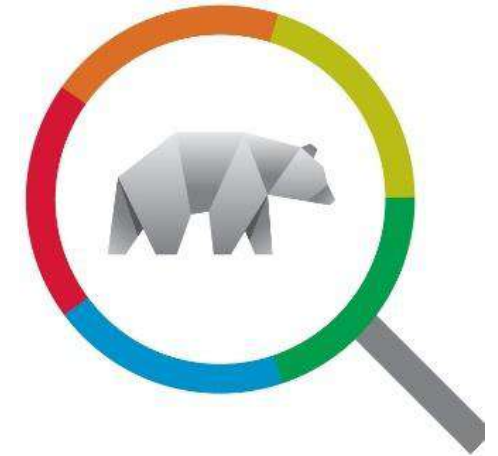


2015: Monitoring

LIFE DinAlp Bear

First monitoring cycle, starting to follow population trends.

Inclusion of Croatia.



2023: Monitoring

National funding

Cyclic monitoring

Routine, essential for management.

Population dynamics (Slovenia)

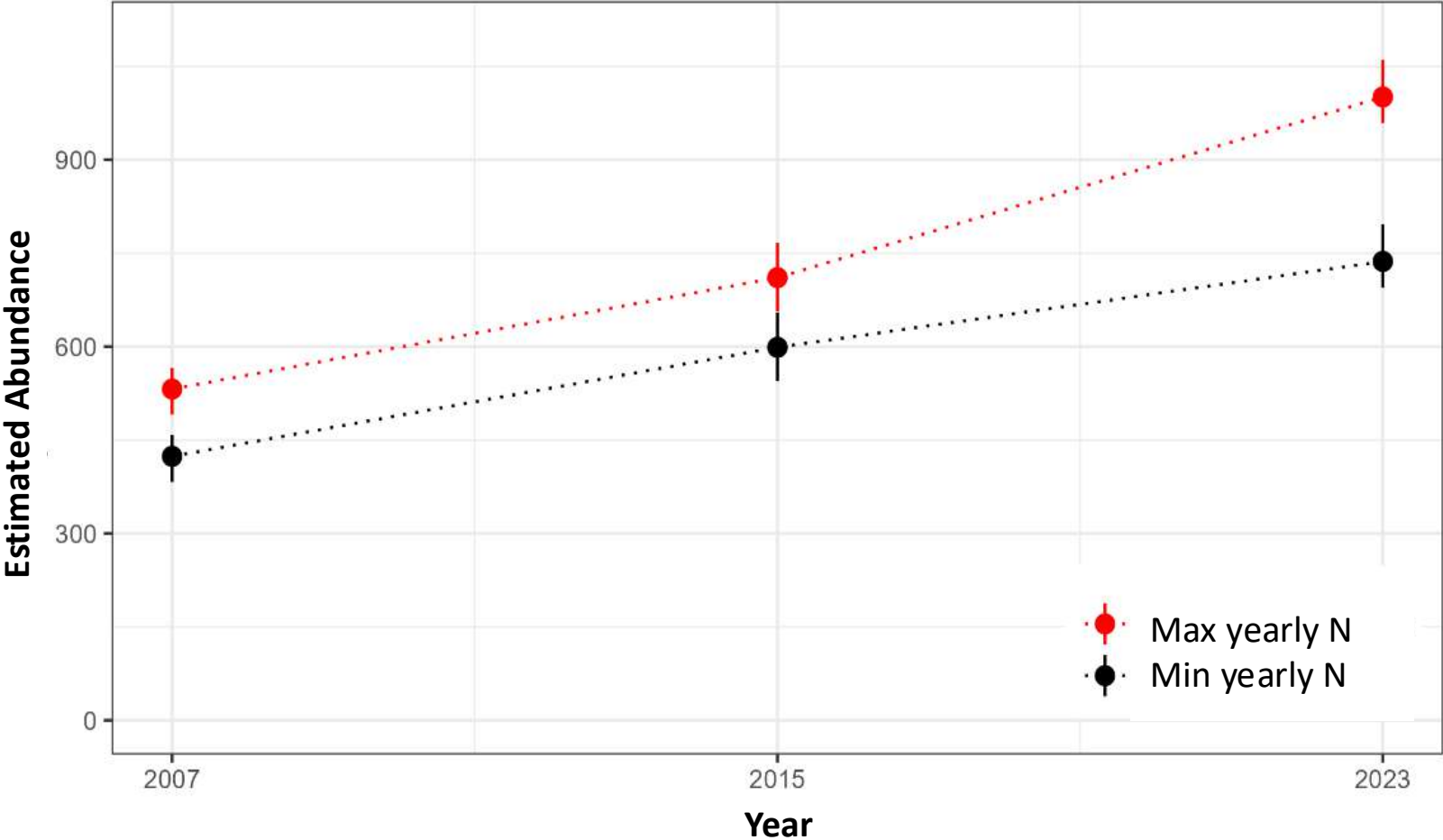
Year	Min Yearly N	Max Yearly N	Sex Structure
2007	424 (383 - 458)	532 (491 - 566)	females 59,5% : 40,5 % males
2015	599 (545 - 655)	711 (657 - 767)	females 59,6% : 40,4 % males
2023	737 (695 - 797)	1001 (959 - 1061)	females 60,2% : 39,8 % males



Zavod za gozdove Slovenije
Slovenia Forest Service



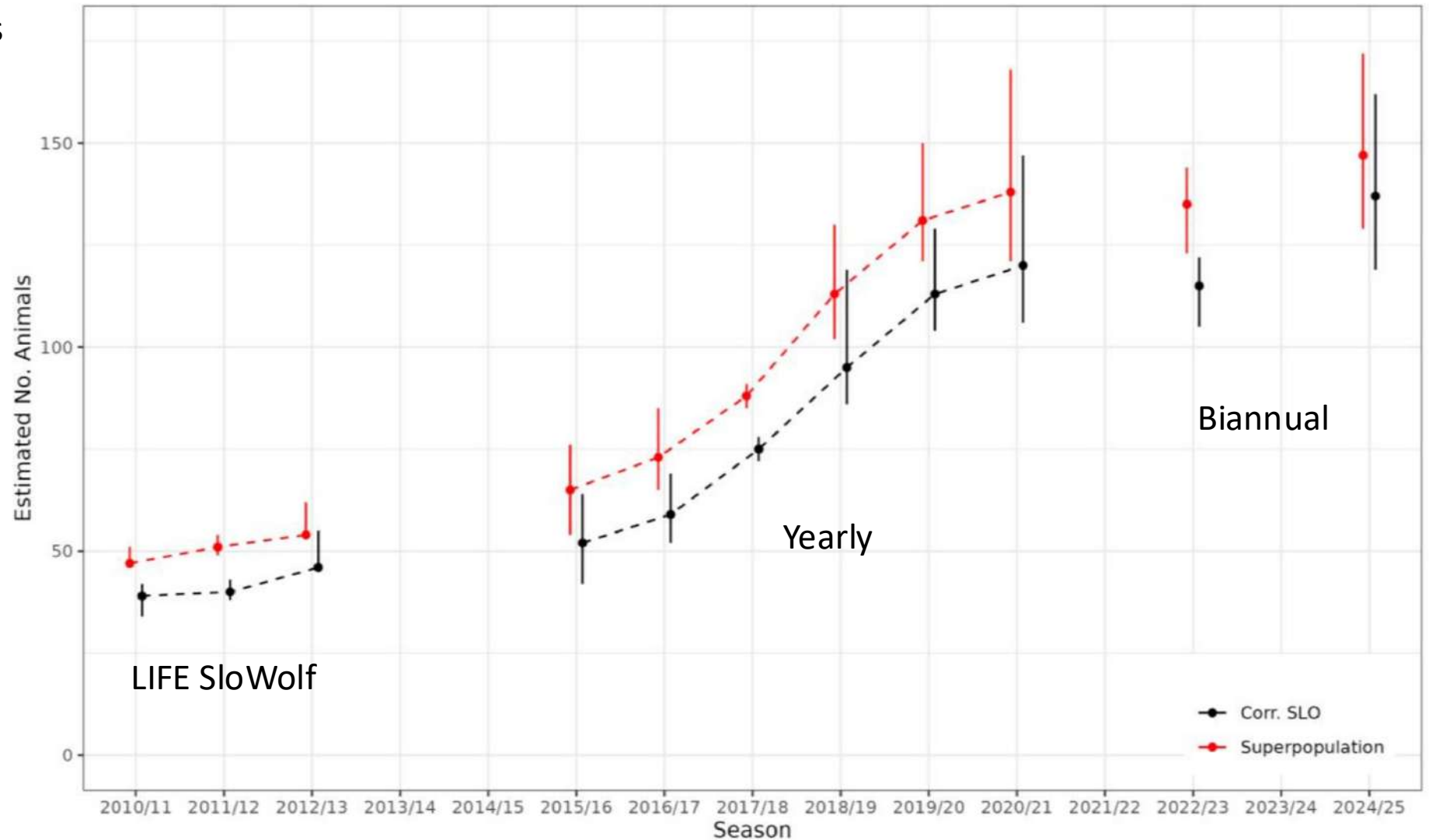
Hunting Association
of Slovenia

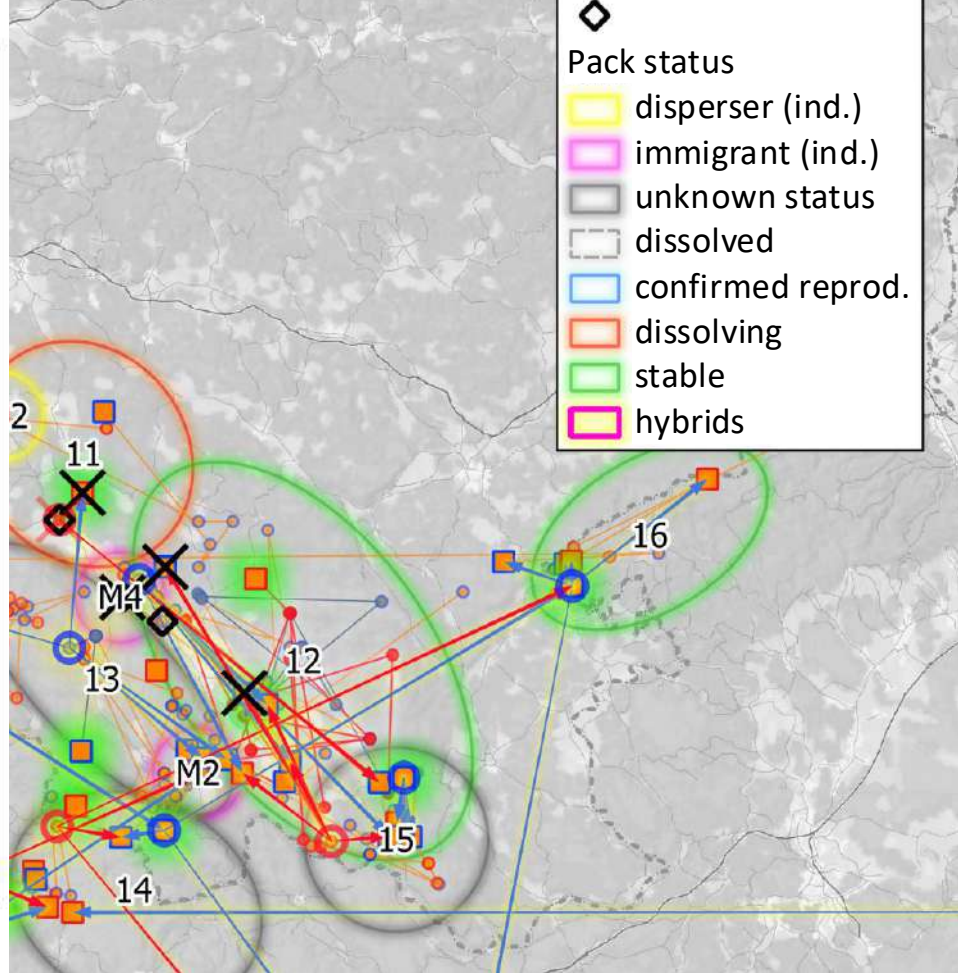
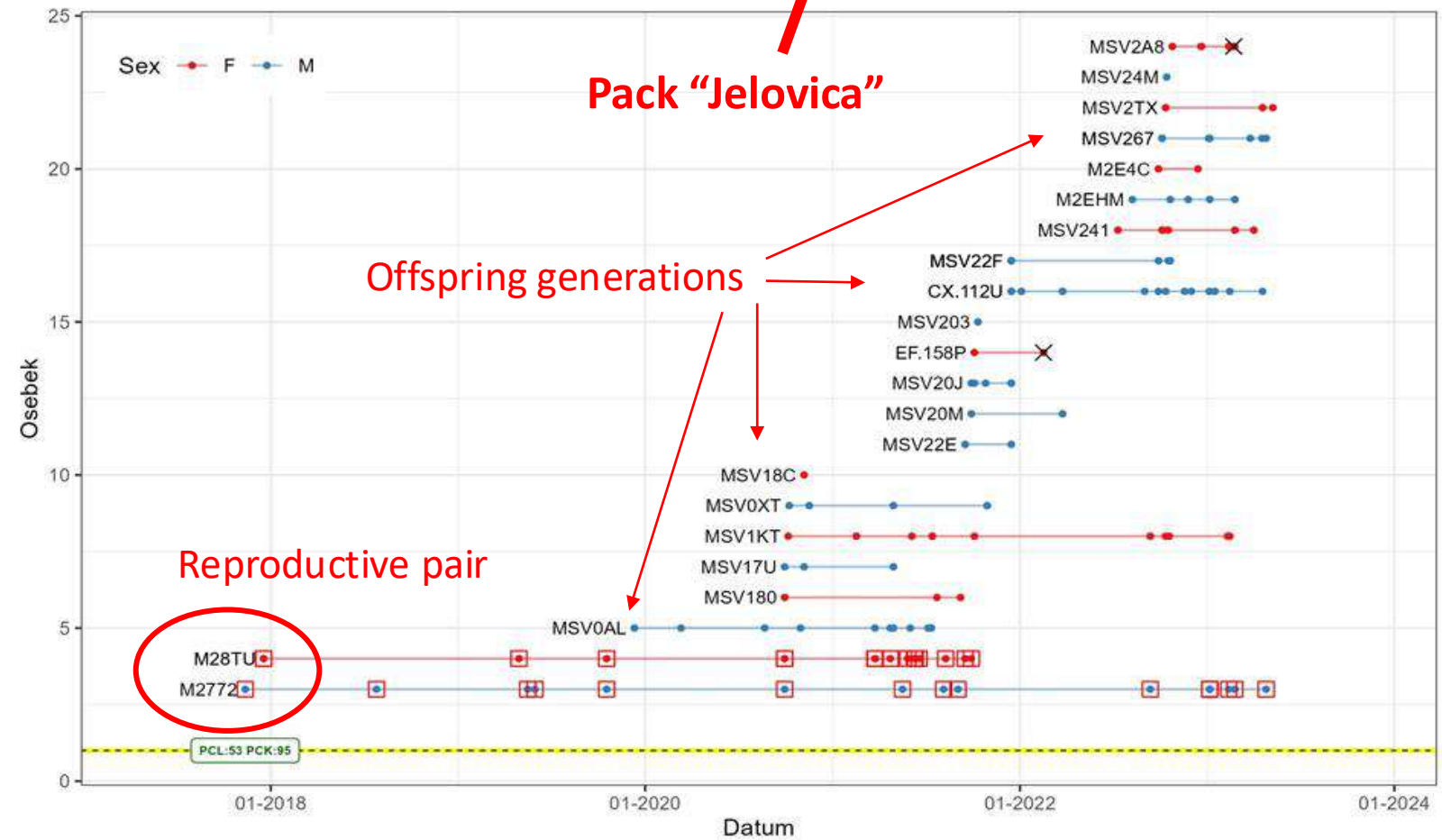
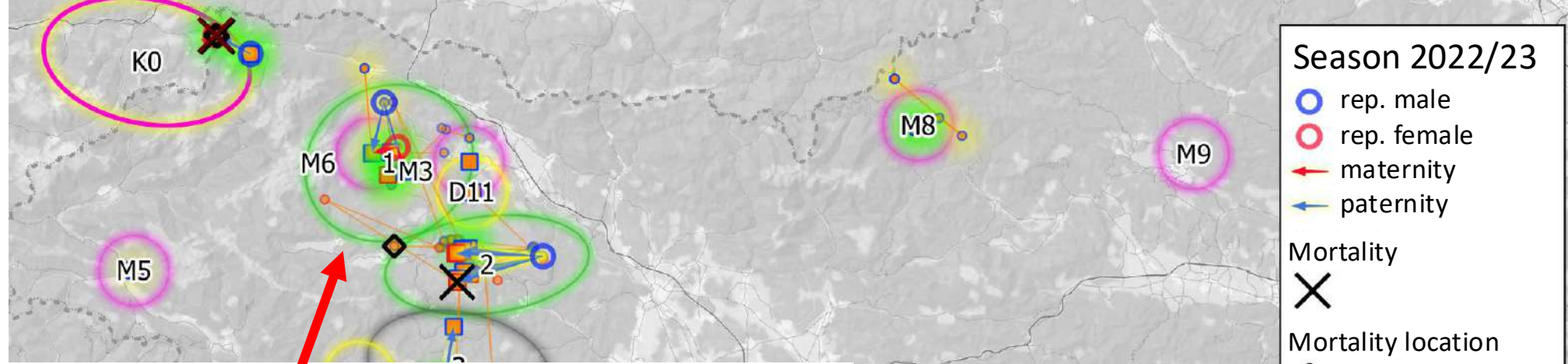


Genetic monitoring of wolves in Slovenia....

...a very detailed insight into our wolf population since 2010

Population dynamics
2010 - 2023

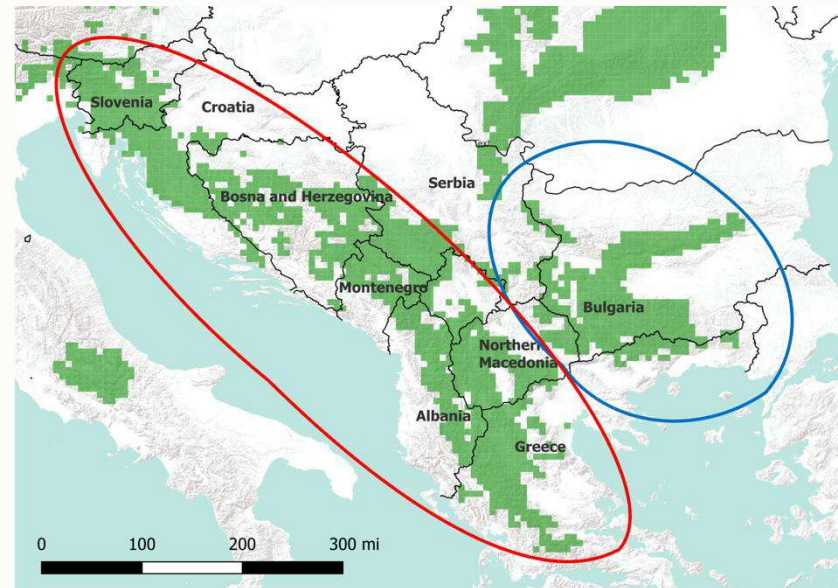




Getting to the population level...



LIFE
**DinPin
Bear**

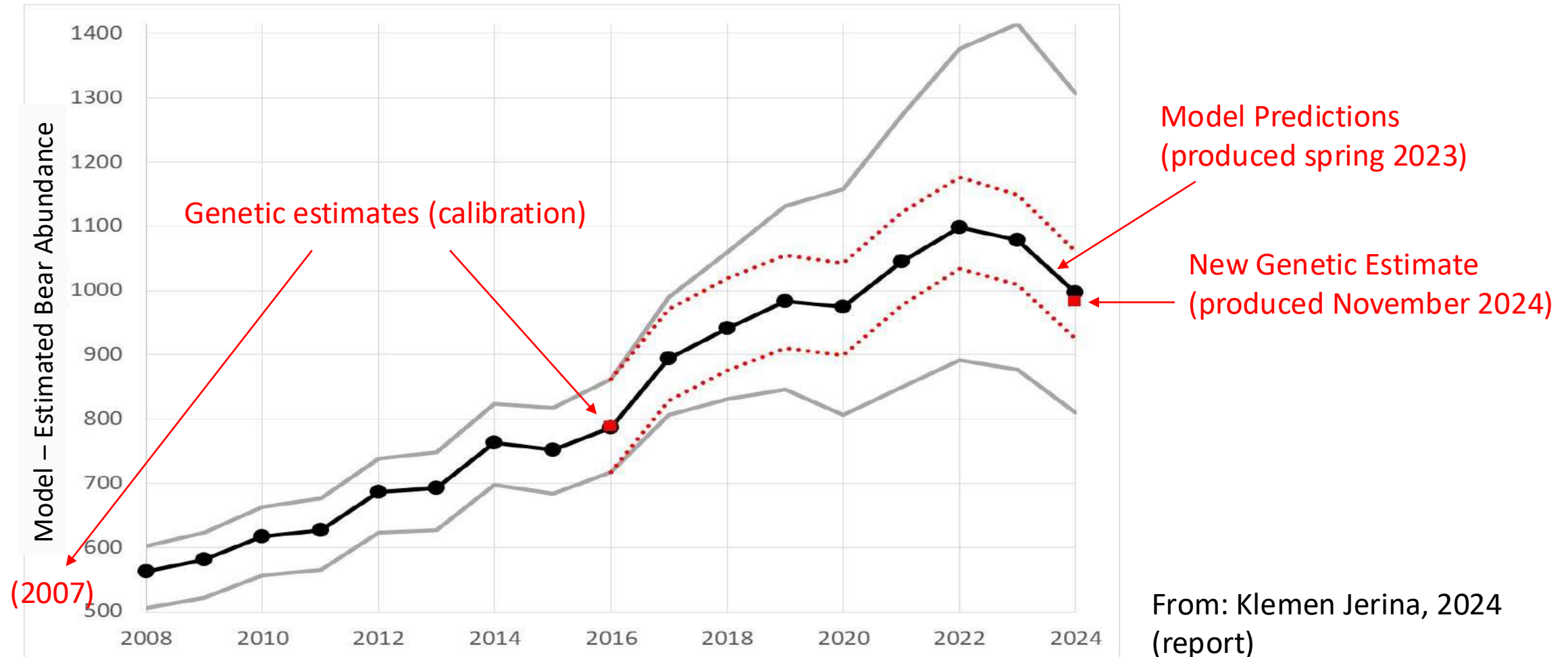


Knowledge → management?

Brown bear genetic estimate: every 8 years.

Year-to-year estimate: population modeling (calibrated with genetics)

Basis for management (culling quotas)



Knowledge → management?



Knowledge → management?

Current management goal: 800 bears. Estimated (assumed?) social carrying capacity.
Not without challenges!

Year	Bears Killed
2022	234
2023	264
2024	199



From: Klemen Jerina, 2024 (report)

Knowledge → management?



but...

- Societal conflicts are based on emotions and values.

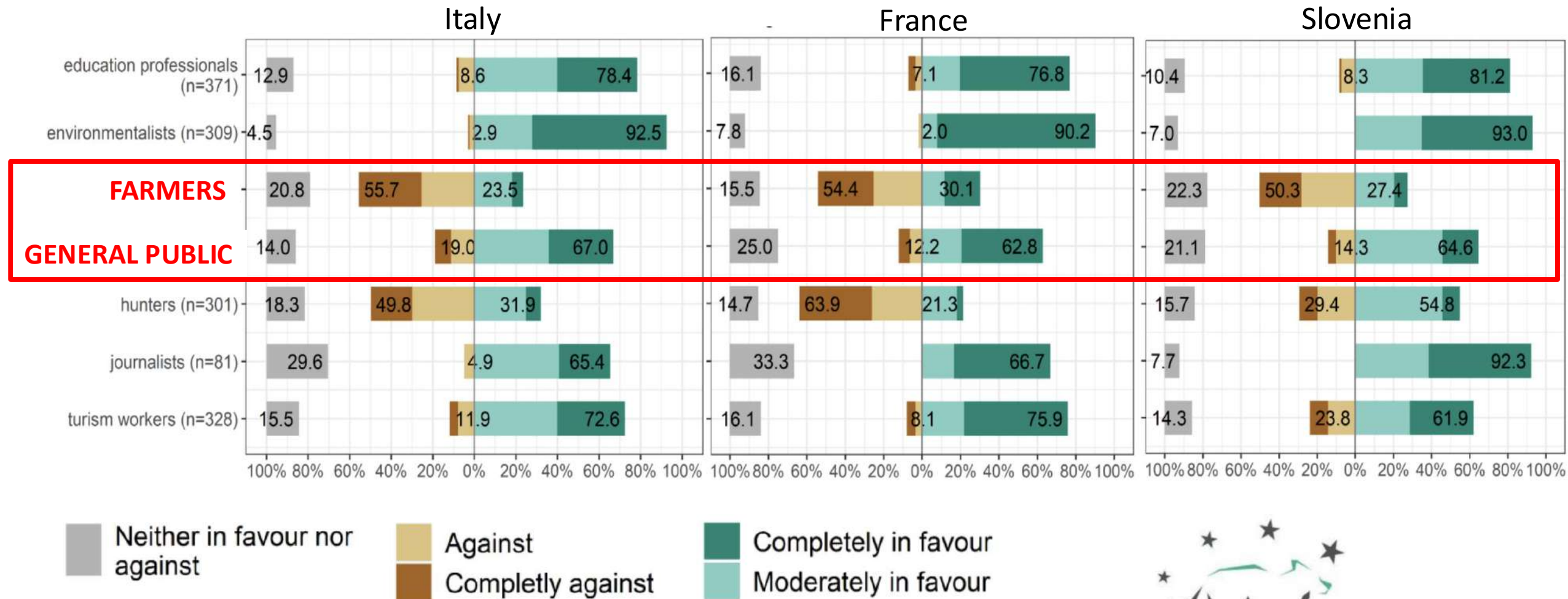
LISTEN-OFF IN
THE DISTANCE...
HOW MAJESTIC!

LISTEN- IT'S
GETTING CLOSER...
HOW THREATENING!

AAR ROO



Which of the following best describes your feelings toward wolves?



Bele, B., Skrbinšek, T., et al., (2022), Public attitudes toward wolves and wolf conservation in Austrian, French, Italian and Slovenian Alps, Technical report, Project LIFE 18 NAT/IT/000972 WOLFALPS EU.





Coexistence?

Ecology

Can wildlife live with us?



Can we live with wildlife?

- Sociology
- Solving conflicts

Can we live with each other?

POLITICS

Conclusions

Whether we like it or not, **large carnivores are here to stay** – and we need to find a way to live with them.

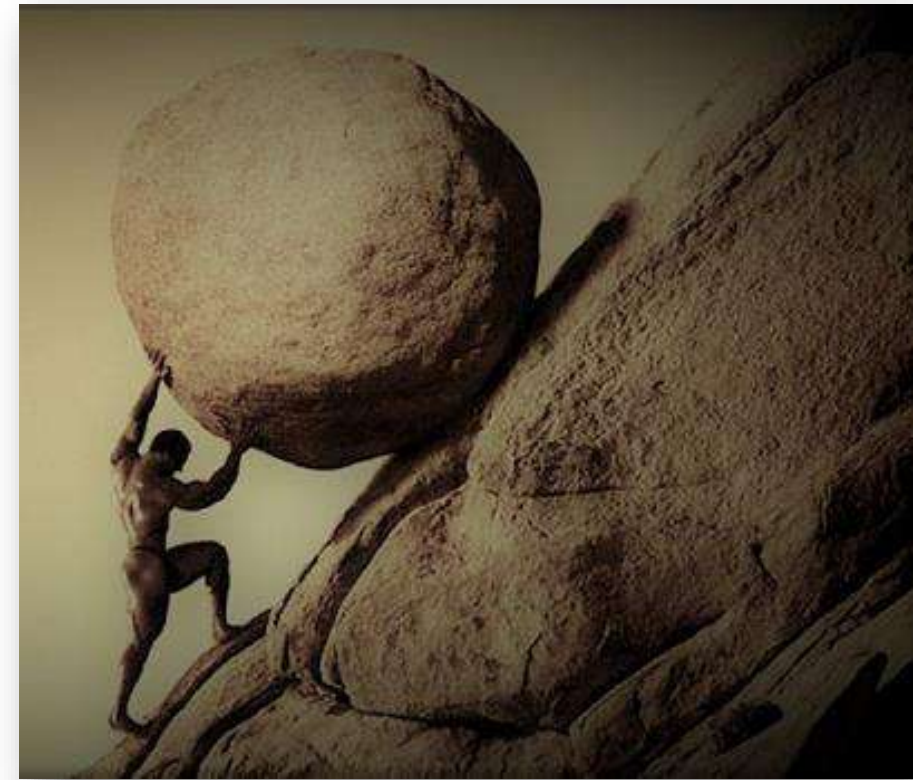
The **ultimate goal** of management and conservation should be **coexistence**, not protection or „saving“ of individual animals.

Coexistence requires compromise – on all sides.

We need to **calm down the public discourse** – only then can we make a step forward.

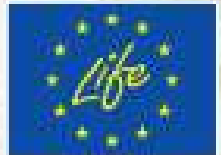
We should work at **increasing social carrying capacity**, but also **control large carnivore populations**.

To make all this work we need **knowledge and evidence**. We need **comprehensive, population level monitoring**.





LIFE
wild wolf



Co-funded by
the European Union



NATURA 2000



Thank you!

tomaz.skrbinsek@bf.uni-lj.si



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divjaLABS
#BiodiversityInSight