INTERSPECIFIC INTERACTIONS AMONG LARGE CARNIVORES IN SLOVENIA

Miha Krofel, Miha Adamič, Claudio Groff, Djuro Huber, Klemen Jerina, Petra Kaczensky, Irena Kavčič, Franc Kljun, Ivan Kos, Hubert Potočnik, Marko Rajković, Nina Ražen

INTERSPECIFIC INTERACTIONS

- interspecific interactions are key factor affecting structure of animal communities

INTERSPECIFIC INTERACTIONS AMONG LARGE CARNIVORES

- several authors stressed importance of interspecific interactions in carnivore communities… (e.g. Linnell & Strand, 2000)
- … but few studies among European large carnivores (e.g. Schmidt et al., 2009, Mattisson et al. 2011)

ORIGINAL ARTICLE

Spatial interactions betwe
in Bialowieza Primeval For

Temporal and spatial interactions between an obligate predator, the Eurasian lynx (*Lynx lynx*), and a facultative scavenger, the wolverine (*Gulo gulo*)

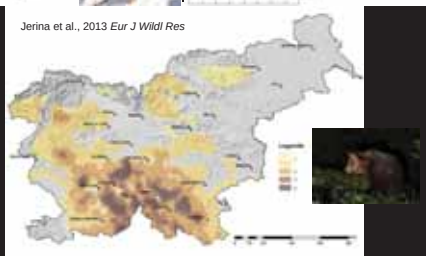
Jenny Mattisson, Jens Persson, Henrik Andrén, and Peter Segerström

LC DISTRIBUTION IN SLOVENIA

Adamič et al., 2004 *unpubl. report*

Kos et al., 2012 *Acta Biol Slov*

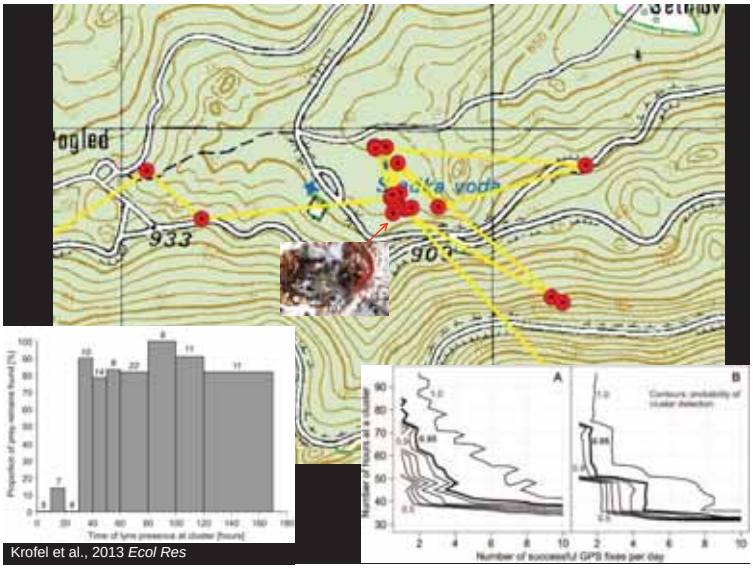
Jerina et al., 2013 *Eur J Wildl Res*



OBJECTIVES

- Exploitative competition (feeding niche overlap)
- Interference competition (intra-guild predation)
- Temporal avoidance
- Spatial avoidence
- Frequency and effects of kleptoparasitism
- Potential anthropogenic influence on LC interactions

METHODS



Krofel et al., 2013 *Ecol Res*

METHODS

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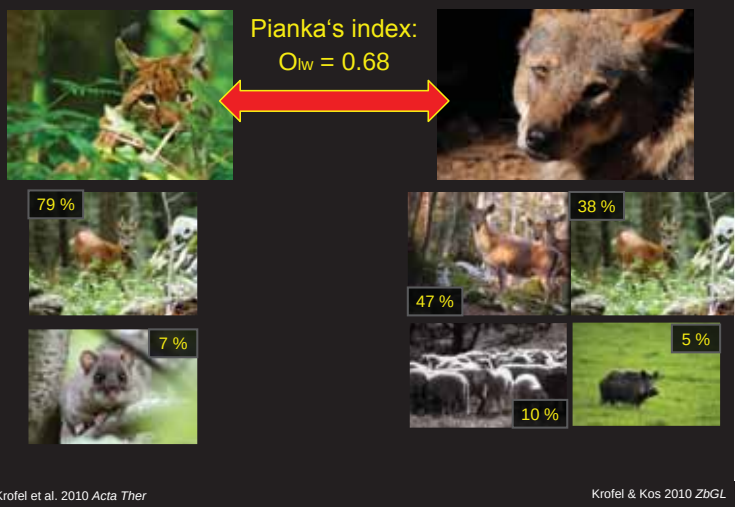
RESULTS

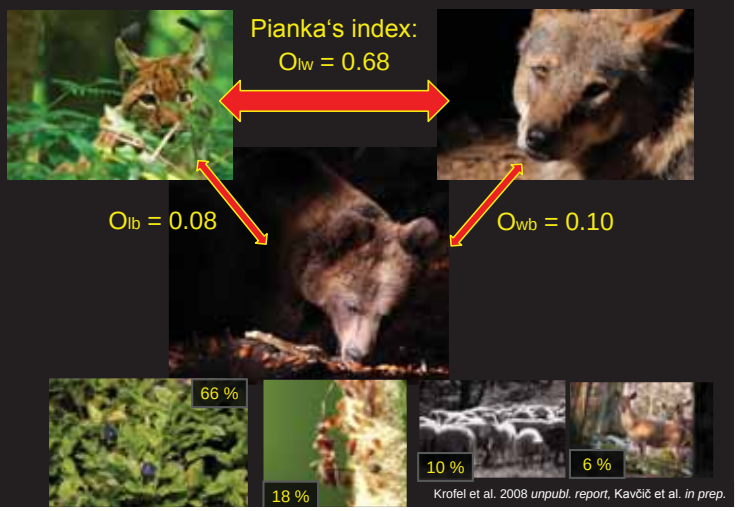
FOOD NICHE OVERLAP



Krofel et al. 2010 *Acta Ther*

Krofel & Kos 2010 *ZbGL*

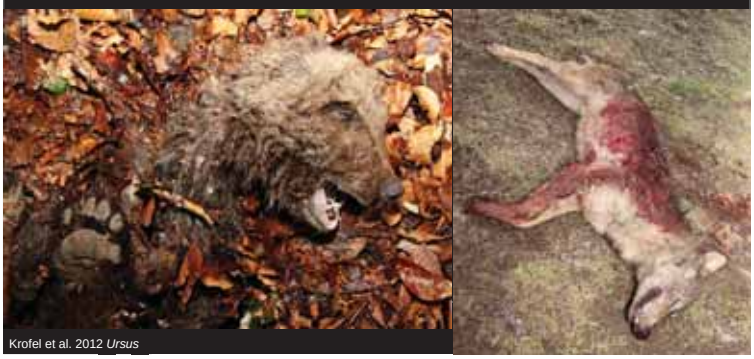
FOOD NICHE OVERLAP



Krofel et al. 2008 *unpubl. report*, Kavčič et al. *in prep.*

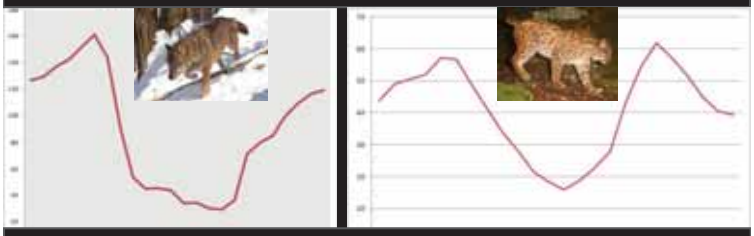
INTERFERENCE INTERACTIONS ?

- no known cases of intra-guild predation among LC in SLO
- interspecific < intraspecific interference interactions

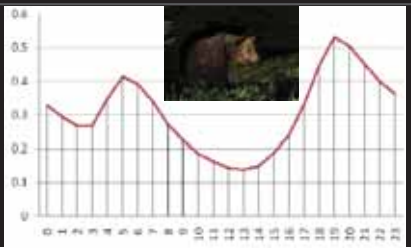


Krofel et al. 2012 *Ursus*

CIRCADIAN ACTIVITY



no temporal avoidence



SPATIAL AVOIDANCE

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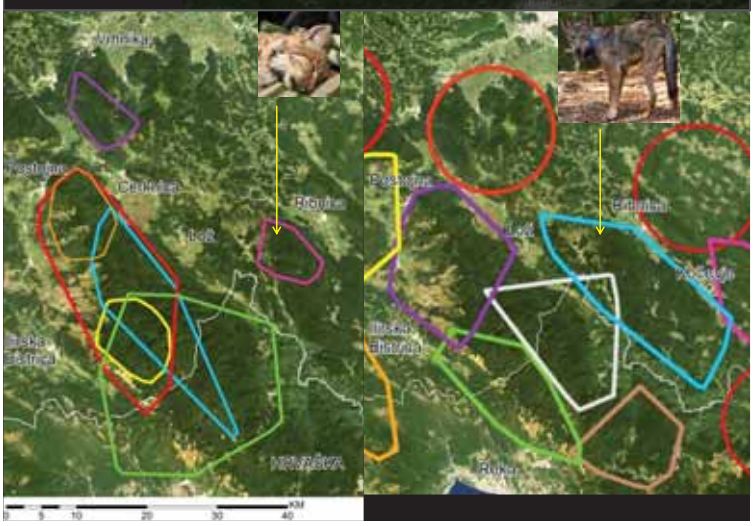


SPATIAL AVOIDANCE
dynamic interactions

no spatial avoidence

Jacobs index (-1 < *D* < 1):
D = -0,03

Krofel 2012 *unpubl. PhD thesis*

KLEPTOPARASITISM

- "when one individual steals food from another individual, which already located and caught the food" (Hopkins & Wiley, 1972)
- can effect predators' social system (Cooper 1991, Vucetich et al., 2004), evolution (Krofel et al. 2013), prey selection (Jędrzejewski et al., 1993; Hayward et al., 2006) and in combination with human influence -> potential threat (e.g. Carbone et al., 1997)

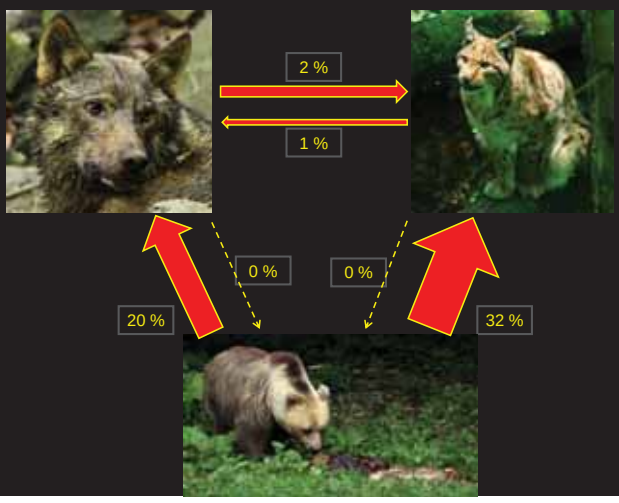
EFFECTS OF KLEPTOPARASITISM BY BEARS ON GREY WOLF


EFFECTS OF KLEPTOPARASITISM BY BEARS ON GREY WOLF

- bears present at 20 % of wolf kills (n=41)
- January-March: 20 % (n=24)
- April-August: 29 % (n=5)
- September-December: 0 % (n=4)


EFFECTS OF KLEPTOPARASITISM BY BEARS ON EURASIAN LYNX

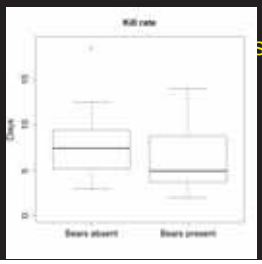
KLEPTOPARASISITM IN LC COMMUNITY



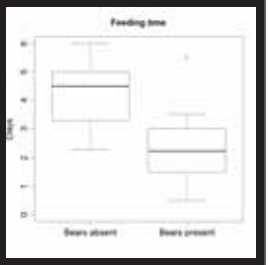
EFFECTS OF KLEPTOPARASITISM BY BEARS ON EURASIAN LYNX

EFFECTS OF KLEPTOPARASITISM BY BEARS ON EURASIAN LYNX

- bears usurped 32 % of lynx kills (n=83)
- 15 % losses of all prey biomass killed by lynx
- lynx increased their kill rate by 23 %,

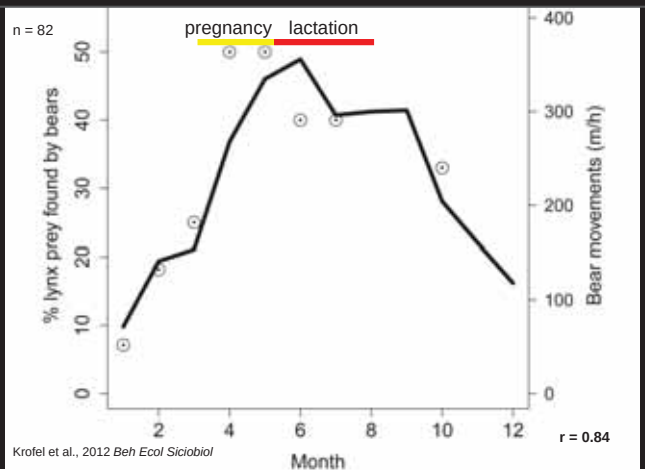


s compensated



Krofel et al. 2012 *Beh Ecol Sociobiol*

EFFECTS OF KLEPTOPARASITISM BY BEARS ON EURASIAN LYNX



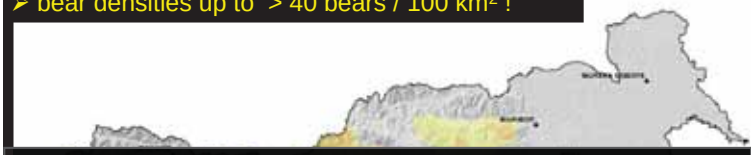
Krofel et al., 2012 *Beh Ecol Siciobiol*

EFFECTS OF KLEPTOPARASITISM BY BEARS ON EURASIAN LYNX

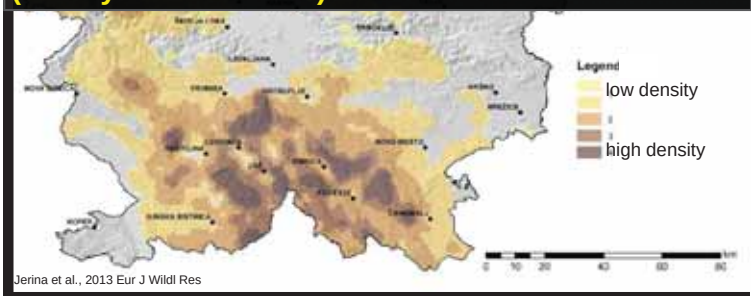
POTENTIAL ANTHROPOGENIC INFLUENCE ON LC INTERACTIONS

Supplemental feeding bears

- total population estimate for Slovenia: 430 bears
- bear densities up to > 40 bears / 100 km² !



potential for ↑ kleptoparasitic interactions (bear-lynx & bear-wolf)



Jerina et al., 2013 Eur J Wildl Res

EFFECTS OF SUPPLEMENAL FEEDING ON BEAR DENNING BEHAVIOUR

	ITALY no feeding	SLOVENIA suppl. feeding	Δ	P
Total days denning	94 days	75 days	20 %	0.06

potential for ↑ kleptoparasitic interactions (bear-lynx & bear-wolf)

POTENTIAL ANTHROPOGENIC INFLUENCE ON LC INTERACTIONS

potential for ↓ explotative competition

POTENTIAL ANTHROPOGENIC INFLUENCE ON LC INTERACTIONS

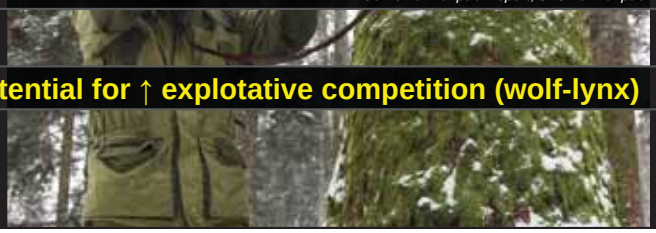
- **human harvest: 1.04 roe deer / km²**
- **max. lynx predation: 0.33-0.38 roe deer / km²**

Krofel et al., 2013 *Ecol Res,* Krofel et al. 2013 *Eur J Wildl Res*

- **human harvest: 1-01-2.29 red deer / km²**
- **wolf predation: 0.41 red deer / km²**

Černe 2011 *unpubl. report*, SFS 2011 *unpubl. report*

potential for ↑ explotative competition (wolf-lynx)



CONCLUSIONS

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- moderate wolf-lynx food niche overlap, low with bears
- no evidence of spatial or temporal wolf-lynx avoidance
- no evidence of interspecific interference interactions
- high kleptoparasitism rate (especially bear-lynx)
- potentially important influence of human activities (intensifying or mitigating effects)

All photos by: M. Krofel

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Thank you for your attention!