

Technical proposals to reduce the brown bear depredation on livestock in the Eastern Alps and to promote the establishment of bear Alpine-Dinaric-Pindos metapopulation

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Introduction:

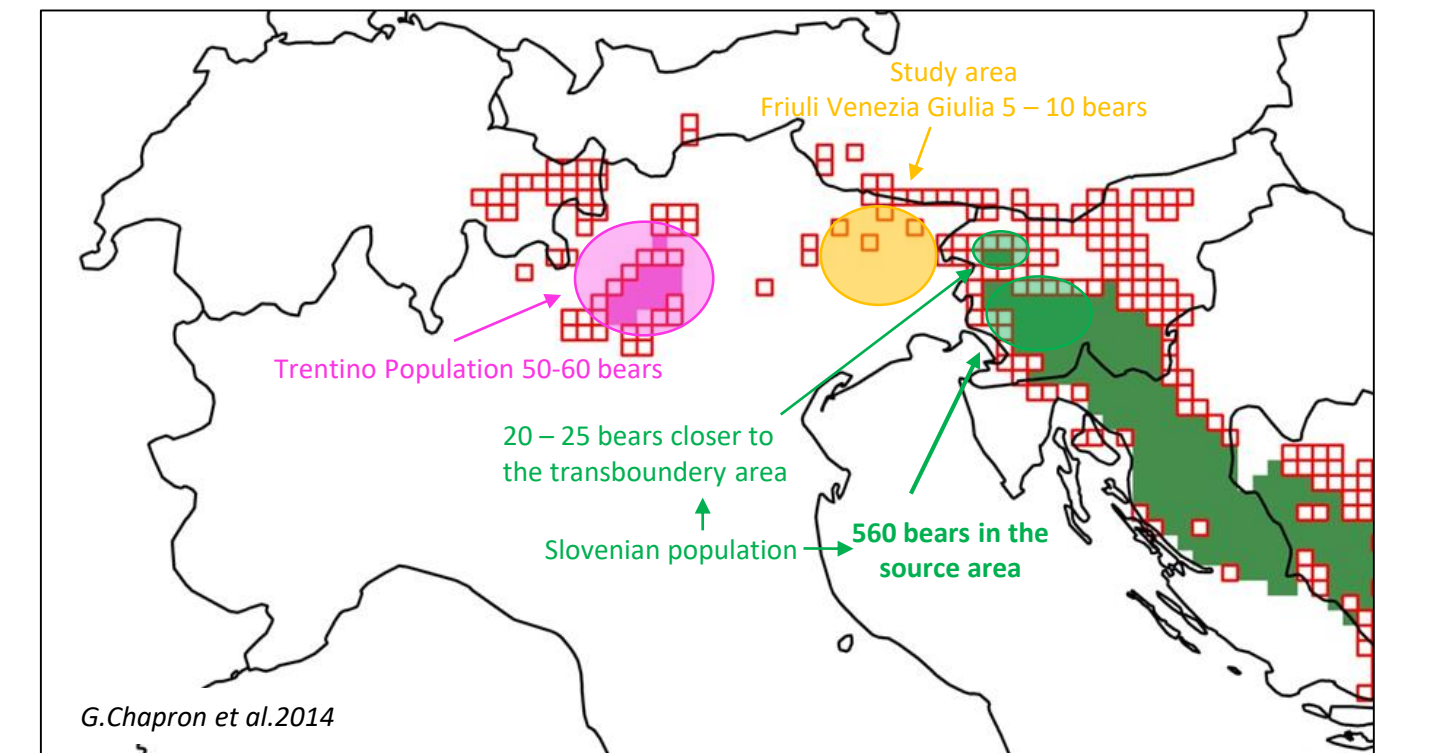
The present status of the brown bear in the Alpine arc is different from country to country. Slovenia faces considerable bear abundance and standard management includes population control through culling. Italy hosts a small but very important source population located in Trentino, instead Friuli Venezia Giulia represents a sink area where few animals (all males) arrive from Slovenia and Trentino with a very few cases of stable permanence. Austria is challenged by the conservation of small and still vulnerable group of animals. In Germany, France and Switzerland any bear showing up is a unique and exciting event causing huge public interest. The common focus of the Alpine countries is clearly on the conservation of the entire population, not on the individual. Definitely the creation of the Alpine Pindos-Dinaric brown bear meta-population is a part of this ambitious goal.

There can be no doubt that the maintenance of a brown bear population in a high human-dominated landscape like the Alps, implies active technical management measures and includes their socially acceptance.

This study is focused on the promotion of the coexistence between large carnivores and local people, throughout the analysis of environmental and social key elements, to understand the local dynamics. We must also consider that to reduce the risk of depredation, the solutions should be technically efficient, but at the same time, economically sustainable. We need also, concrete and easy tools, to better predict the most vulnerable areas.

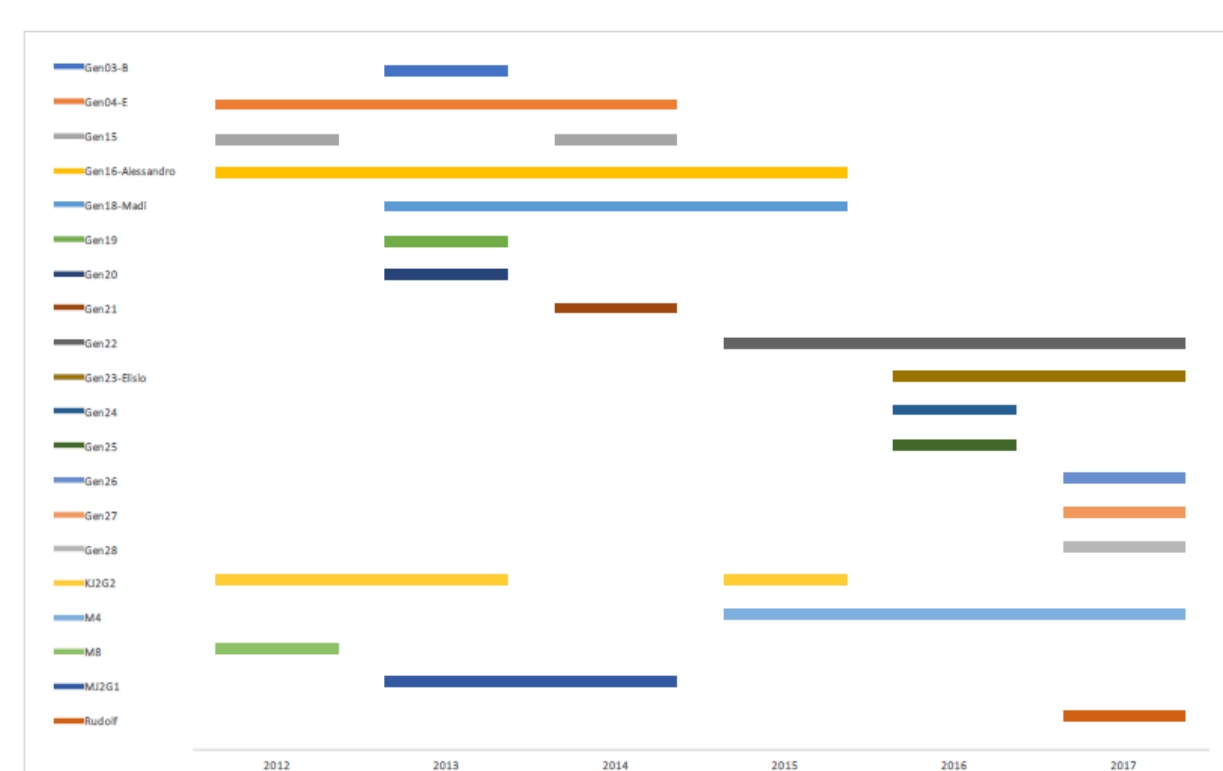
We've investigated the topic trying to find answers to these questions:

- All the bears have a negative behaviour or it is different from individual to individual? And at different ages?
- The negative behavior can be transferred from female to its offspring?
- Which livestock systems are more vulnerable ?
- Can ecological factors (e.g. localization of fencing and beehives, distance from the forest, natural food availability, availability of anthropogenic food) influence the impact of the bears on the livestock?
- Can farmers change their attitude in relation to the knowledge, the history of presence of bear, the behaviour of specific bear, and the compensation measures?



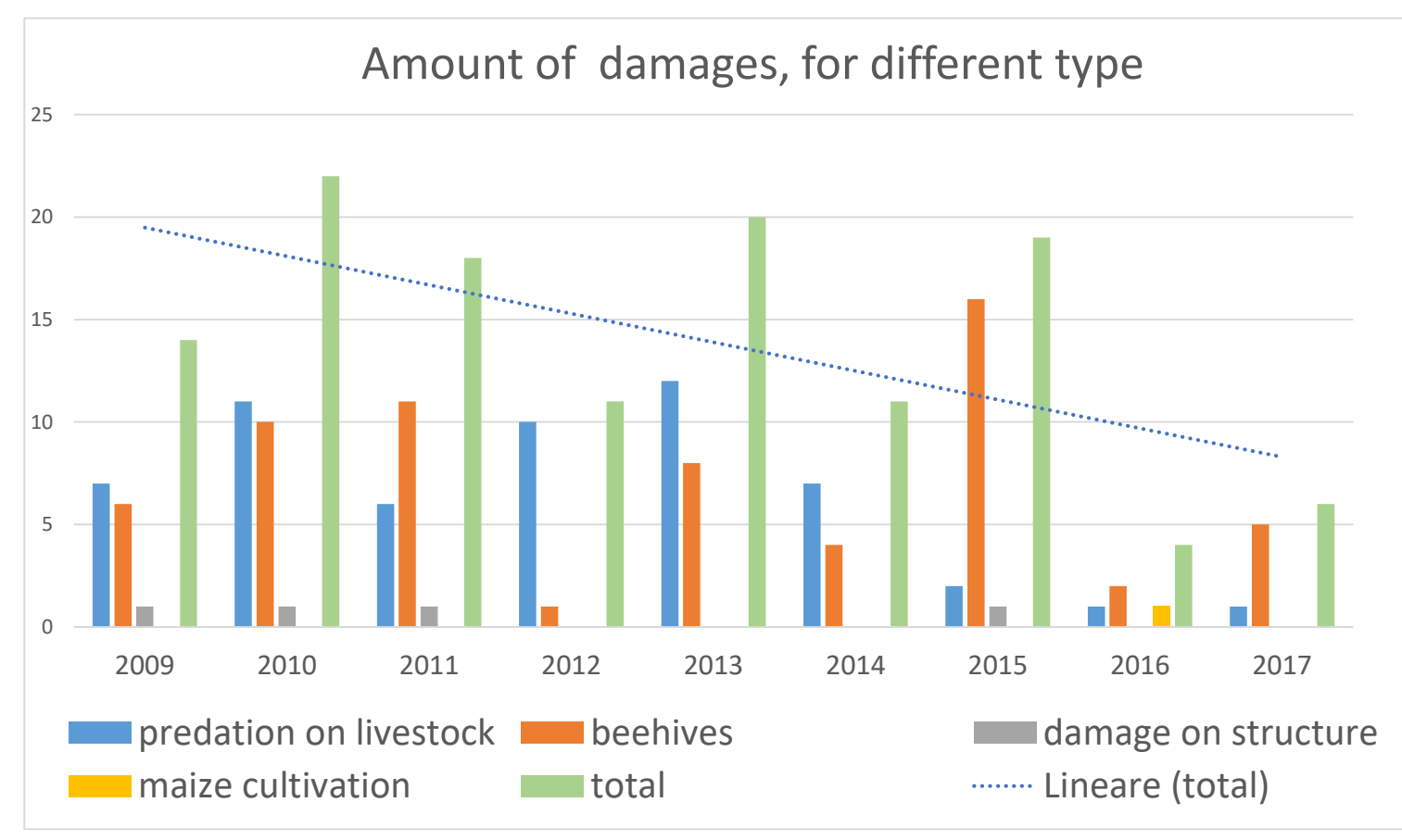
Materials and methods:

✓ 23 different brown bear genotypes from 2004 to 2017, with hair trapping and opportunistic sampling, to estimate the number and predation behavior.



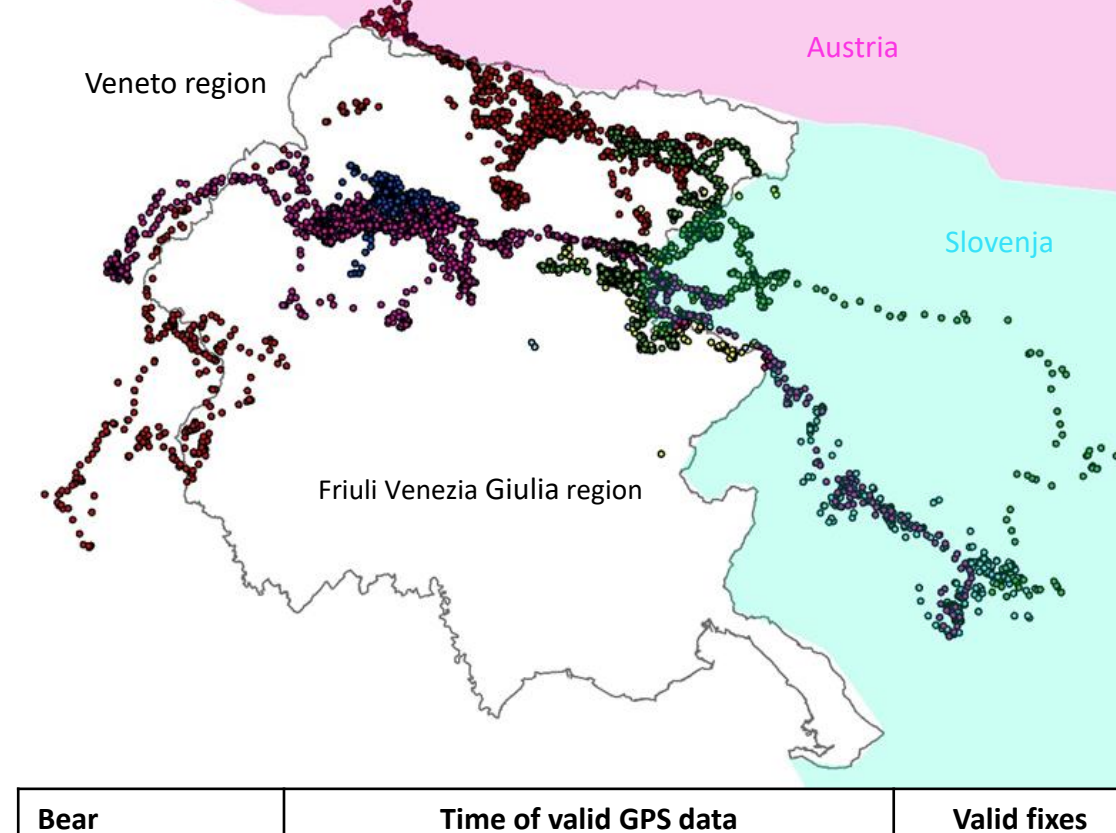
Every year in Friuli region 5-6 male bears are sampled, with a high turnover: some of them remain for 3-4 years, other only for some months.

✓ Analysis of damages and payments data base, in relation to the types of damages and characteristics of farming.



From 2009 to 2017 159 claims were compensated 56.800 euro refunded. In the last years damages are going to decrease, in particular on livestock.

✓ Analysis of the habitat use and behavior through GPS localizations and activity rhythms of 6 radio-collared bears (12.369 valid fixes).



Bear	Time of valid GPS data	Valid fixes
• Stefi	05.03.2007 - 02.10.2007	335
• Andrey	03.04.2007 - 06.08.2007	456
• Alessandro	12.06.2014 - 31.05.2015	2021
• Madi	21.05.2013 - 05.06.2014	2131
• Francesco	28.05.2016 - 06.10.2017	4068
• Elisio	23.06.2017 - 13.09.2018	3353

✓ Questionnaires to the farmers (n=31) to know their attitude.

Results: what we definitely understand:

➤ Not all the bears have the same (negative) behaviour, and the bear can change its behavior during its life



"Alessandro" Gen16, 10 years old, from Slovenia, showed high predation on domestic and wild animals (red deer), no beehives.



"Francesco" M4, 10 years old, from Trento (son of KJ2, a female shot in 2017 as a problem bear): until 6-7 years showed very high predation activity on livestock. After this age during the last 3 years, he showed low predation on livestock and beehives.



"Elisio" Gen23, 4-5 years from Slovenia: few damages to beehives and to maize dispensers.

➤ Among ecological factors, the hunters feeding points can play a crucial role on the modification of bear behaviour (e.g. bear "Francesco" showed a real dependence).

➤ The Farmers present a positive attitude in respect to the bear but it is important the timeliness – rapidity of the payment and technical support to keep it.

➤ The farming system and livestock husbandry practices are crucial for the vulnerability of animals

Small flocks of sheep (4-20 sheep), confined in small fenced areas of 1-2 ha, without dogs.

Small common flocks of sheep (from different farms), free grazing in alpine pastures (with periodic control, every 1-2 weeks).

Transhumant flocks (more than 200 sheep, in general more than 700) with dogs and shepherds.

Alpine farming system with different species, cows included, with dogs and shepherd.

vulnerability



What we are working on:

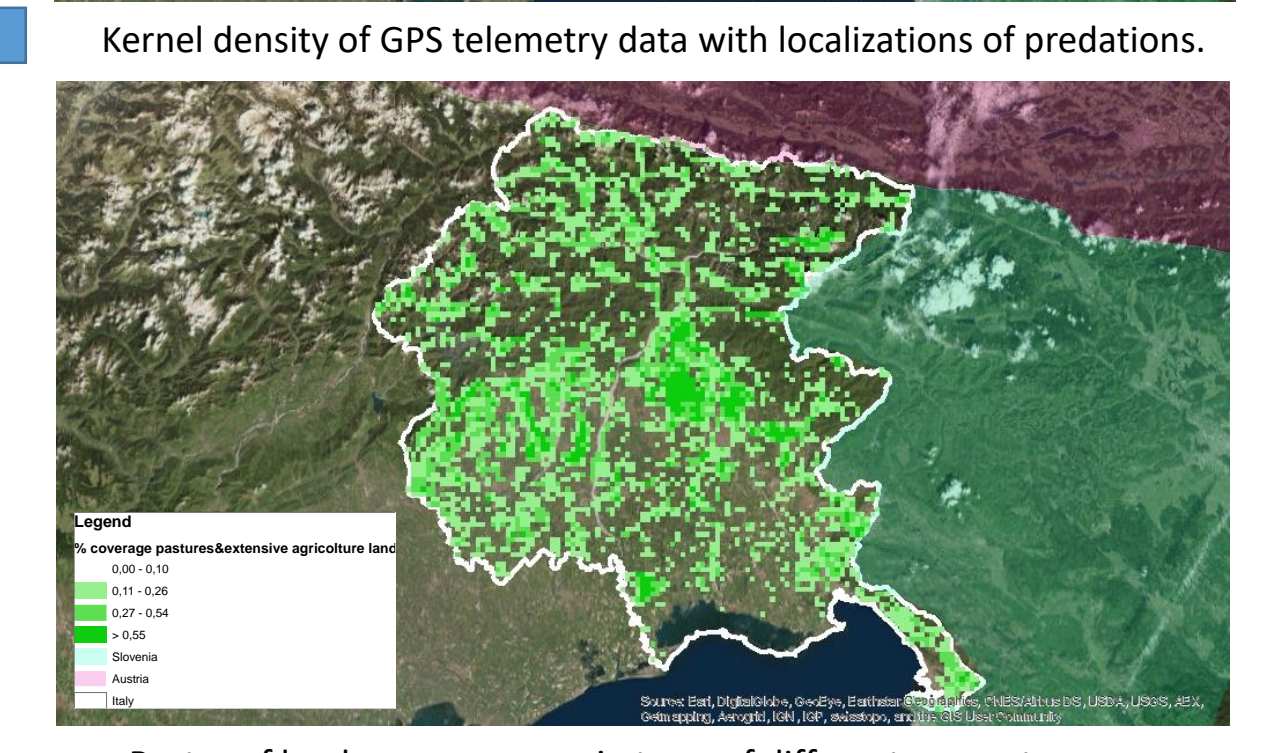
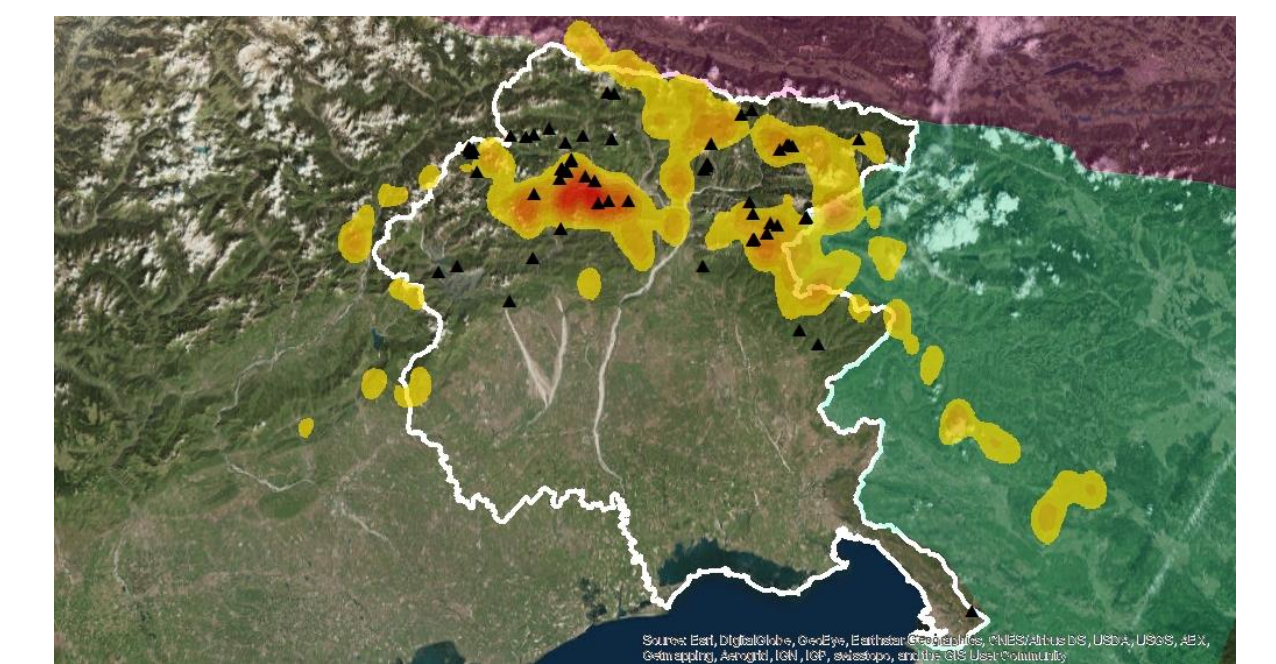
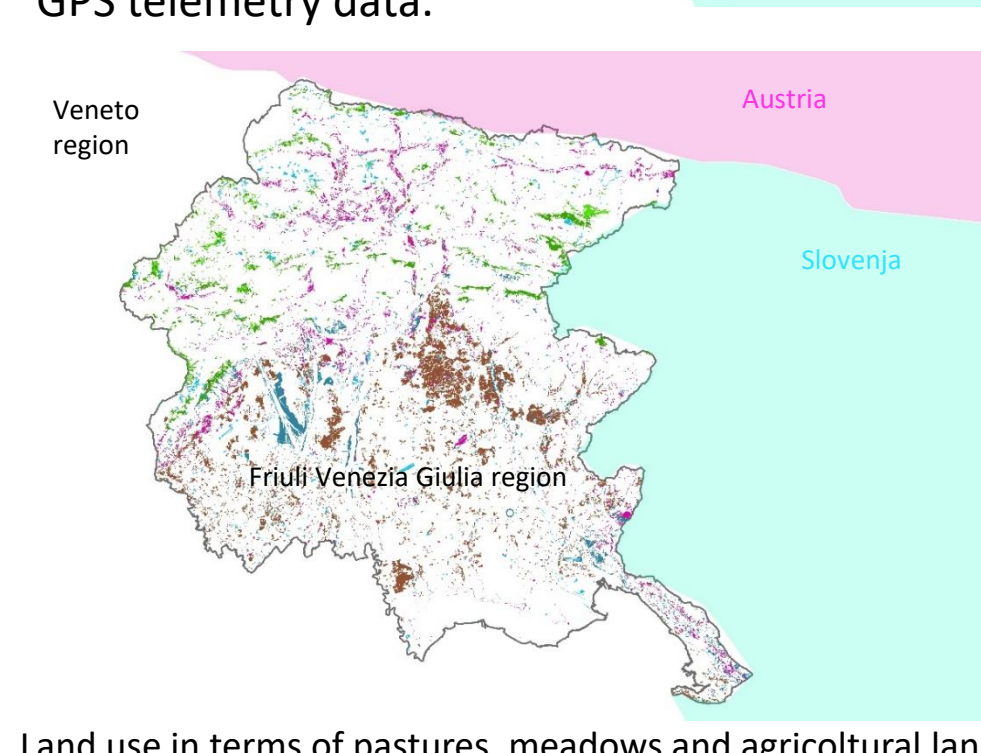
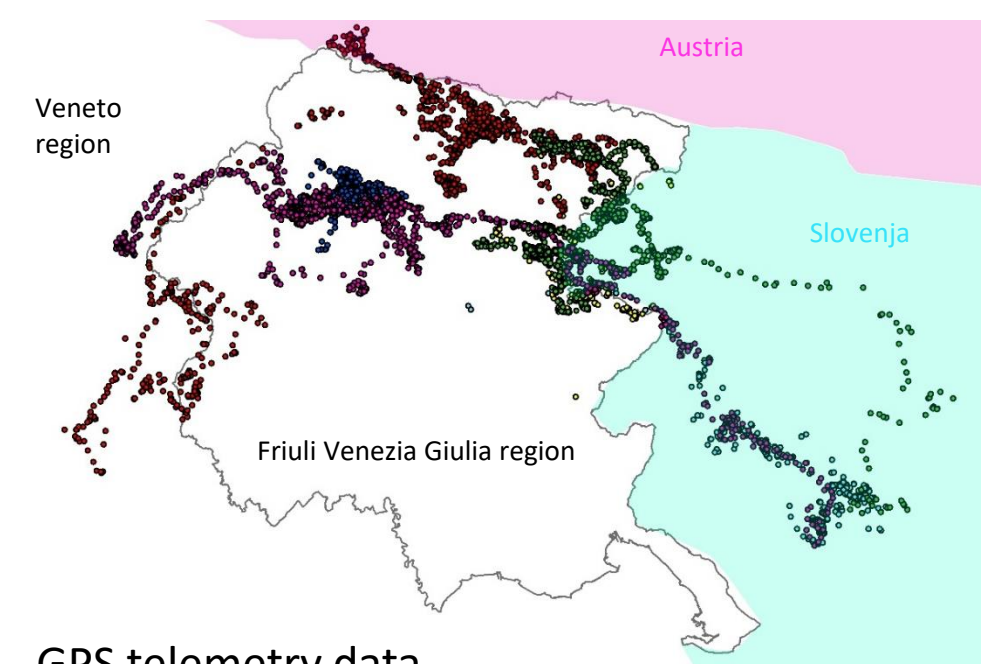
➤ Innovative technical solutions to reduce the risk of predation

- ❖ Electric fencing for the small confined flocks in bottom of the valley.
- ❖ Night fencing with automatic systems for the free ranging flocks on the alpine pastures.
- ❖ GPS systems on sheep (some individuals in free ranging flocks) to monitor their movements, the behavior and relation with predator (proximity sensor).
- ❖ Geofencing for predator (module in the collar), to inform the farmers about the presence of predator in specific risk areas.
- ❖ Use of guardian dogs, where is possible.

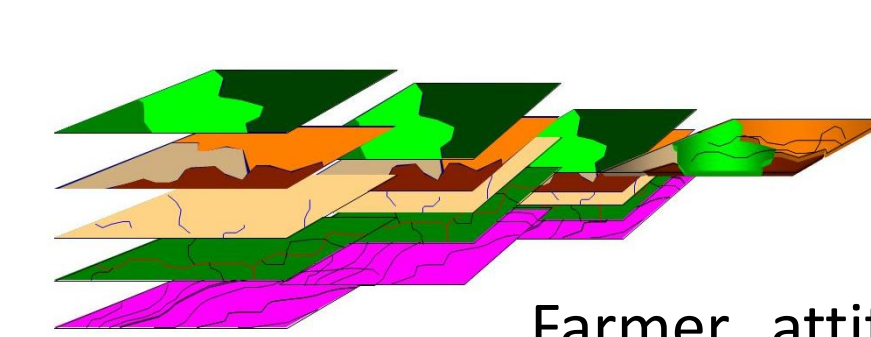
Conclusion:

According to other researchers, bears with a negative behavior represent only a small part of bear population in this sink area too. Close monitoring is very important to better understand the evolution of the behaviour that could be reversed through a "natural" process (and not only through a learning process such as aversive conditioning); protection of livestock herds is very important to deter predators in given situation, but is necessary to study a suitable system to specific reality; definitely constant and concrete support to stakeholders helps to maintain their positive attitude, but there is the need to share strategies in the planning of livestock management.

➤ Data collected are useful to think about a model of a "risk" map



Data collected may be represented as specific layers and with the overlay functions, it will be possible to create new layer to identify the most vulnerable areas.



Farmer attitude + localizations of all mountain farms with type of management + transhumance map +...

References:

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