

# Distribution of wolf and golden jackal in the north east of Italy and their interactions

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## Introduction

Human activities are one of the main causes which may lead to species extinction worldwide (Woodroffe, 2000). Factors such as human persecution, deforestation and decrease of natural preys, caused the decline in wolf (*Canis lupus*) population, once widespread throughout the Alps (Zimen and Boitani, 1975; Lucchini et al., 2004). In Friuli Venezia Giulia it became extinct in 1869, when the last individual has been killed near Budoia in the Province of Pordenone. The golden jackal (*Canis aureus*), following the European expansion process, arrived in Friuli from Balkans for the first time, probably, in 1984. (Lapini, 2009). Subsequently the species has spread in all the regional province.

In 2010 a lone wolf individual was detected with camera trap in the karst area of Basovizza near the slovenian boundary. In the Slovenia Territory there are some stable wolf packs (Chapron et al 2014). In 2013 the first evidence of the wolf return was recorded in the Carnic Pre-Alps (Pordenone), and thanks to Life WolfAlps monitoring, it was possible to confirm its presence in Val Tramontina (Pordenone) and Carnic pre-alps (Udine) until winter 2014-2015. After one year of absence (no signs of presence were collected), in 2016 wolf appeared again in the Region, but in the area of Magredi (Pordenone), where golden jackal was present in the same year.

At the beginning of this year, a single wolf individual was detected in the Cansiglio area. The Cansiglio forest is a ZSC, located between Veneto and Friuli Venezia Giulia.

The aim of this study is, then, to assess the distribution and interaction among these two sympatric carnivores in Friuli Venezia Giulia.

## Study area and methods

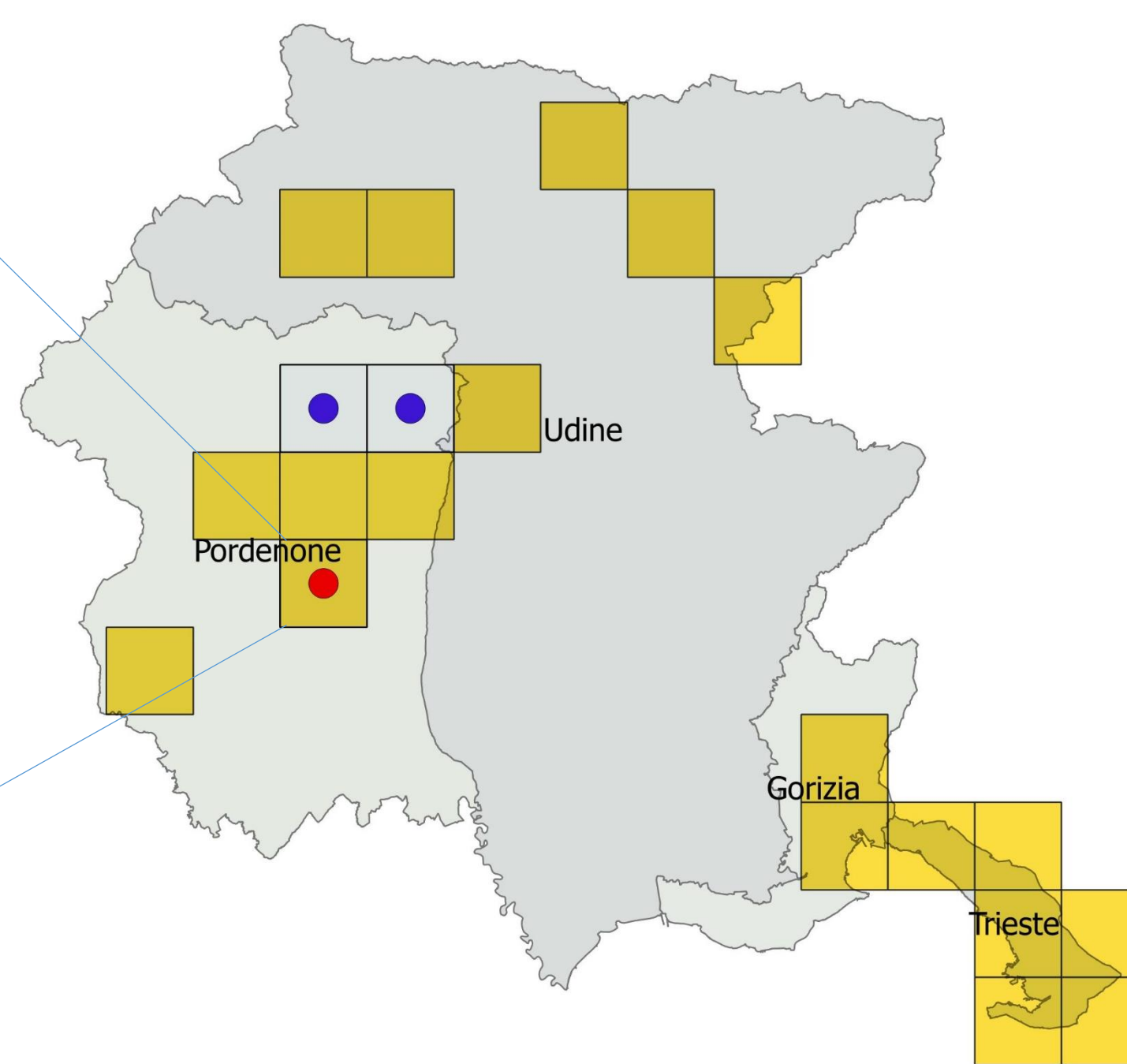
For data collection, different methods were implemented: linear and close path transects were mainly used to assess the wolf presence, acoustic survey for golden jackal and camera trapping for both species. Concerning wolf, between December 2017 and March 2018, four transects were planned in the province of Pordenone (Magredi area) and it was adopted the WolfAlps protocol to collect samples. To assess the presence of golden jackal, two sessions of jackal howling per year were realized (from 2010 and 2018). Camera was active only in the area of Magredi during spring/summer 2016.

## Results



Map A: Wolf transects in Magredi.

The "Magredi" is a land area in contact with foothills of Pordenone Alps. The south is extended almost to the line of resurgences that separate notoriously the high from the low plain of Friuli. The characteristics of the Magredi, a term which means "skinny" meadow, are linked to the scarce availability of water, soil extremely permeable and a lack of nutrients for vegetation. The area coincide with the "Magredi del Cellina" ZSC (IT3310009). The surrounding area is characterized by intensive agriculture with cereal crops, and several settlements.



Map B: Distribution of golden jackal and wolf in Friuli Venezia Giulia.



Picture A: Wolf (picture taken in south Sequals PN, Italy 19/06/2016).

Picture B: Golden jackal (picture taken in Cossana, Maniago PN, Italy 25/07/2016).

Province	Transect	Number	Length (km)	Total fecal samples	Possible wolf fecal samples	Hair samples
Pordenone	Ponte Giulio	3	8.26	2	-	-
	San Leonardo	4	8.25	2	-	-
	Tesis	4	9.18	2	-	-
	Casarotto	4	8.66	7	4	1
Total	-	15	129.14	13	4	1

Table A: Sample collected during wolf transects from 2017 to 2018 in the Province of Pordenone.

Province	Number of jackal couple	
	Min.	Max.
Gorizia	5	7
Trieste	4	7
Udine	1	2
Pordenone	0	0

Table B: Estimation of jackal couple recorded from 2016 to 2018 in the different Provinces.

During transect a total distance of 129.14 km has been covered, and a lot and different samples were collected and identified: tracks, fecal and hair, but also a direct sighting of two wolf individuals was documented. In total 42 samples were collected and considered as "*Canis Genus*", but only few of them probably belonging to grey wolf.

Regarding the presence of the golden jackal: the Karst area belonging to Gorizia and Trieste, have the most abundant and stable presence. In the mountain area of the province of Udine, the presence are more fragmented. After the recent return of the grey wolf in the area of Magredi the presence of golden jackal has not been documented as in the past. With camera trapping method we detected the presence of both species in the same area. The most important thing was a picture of a single golden jackal recorded 36 days after the detection of a wolf individual.

## Discussions and Conclusions

Assessing the real distribution and the nature of interactions among these species, is quite hard, due the dynamic of expansion of both species. However we can assume that the presence of the wolf is still rare in the region while the golden jackal is more consolidated. We can assume that between wolf and golden jackal exist an interaction. Despite from other studies (e.g. Mohammadi et al., 2017) the existence of a negative interaction among the two species has been identified, we can't determine the type of interaction due to lack of data.

Further and detailed studies in terms of monitoring methods, are strongly suggested in order to obtain more detailed information concerning the presence and interaction among these two sympatric carnivores in the Region.

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