

The Golden Eagle *Aquila chrysaetos* in Alto Adige. Knowledge status and activities undertaken

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The current knowledge on the Golden Eagle *Aquila chrysaetos* in Alto Adige is the result of several data collection work that took place in the last 30 years. However, a complete knowledge of this species is not yet available. The large spread and distribution of this species on the territory, the difficulties in carrying out observations due to the topography and the lack of a general plan of continuous monitoring, all make it difficult to unequivocally assess a general trend for this species in the Alto Adige territory. To overcome these difficulties, a database composed of previous knowledge deriving from observations by gamekeepers, from targeted field monitoring during triennial projects, and from systematic observations by amateur enthusiasts has been used.

We put together data collected during a three-year monitoring project about birds of prey in the Fanes-Senes-Braies and Puez-Odle natural parks (Borgo 2001), data from the Italia-Austria 2003-2005 Aquilalp Interreg project regarding the Fanes-Senes-Braies Natural Parks, Vedrette di Ries-Aurina and Stelvio NP (Bliem *et al.* 2005), data collected in 2011-2014 on behalf of Markus Kantioler (Ufficio Parchi Naturali) about Alta Val Pusteria, and by Klaus Bliem (Stazione forestale Silandro) for the Stelvio NP (2002-2016) and the entire Val Venosta (2006-2016).

In order to define the current situation of the Golden Eagle, a preliminary investigation was carried out at the headquarters of the Associazione Cacciatori Alto Adige, where the annual reports by the gamekeepers are stored for each reserve (in Alto Adige there are 148 municipal or fractional hunting reserves), considering the number of pairs present in each reserve, the number of known nests, the rate of reproductive success, the number of young observed. These data were integrated with observations con-

ducted in the 2002-2016 period. In particular, for the Val Venosta the monitoring of the last 15 years involved gamekeepers, forestry staff and retired staff of the Stelvio NP.

The restitution of data collected from the gamekeepers' annual reports in 148 reserves exceeded 80%, but the reliability does not always guarantee certainty of results, thus data had to be carefully weighted. The values presented in Tab. 1 are the result of the integration and comparison of different sources, compared with the results of individual researches carried out in recent years.

An incomplete picture of the available knowledge emerges, mainly with regards to the reproductive trends in the recent years, which knowledge varies considerably from area to area. The emerging picture confirms the presence in Alto Adige of at least 65-67 Golden Eagle's pairs (based on information collected by gamekeepers) with over 250 currently-known nests.

During more accurate surveys carried out between 2005 and 2013, the home ranges of at least 40 territorial pairs out of these 65-67 pairs have been identified. Among these, 18 home ranges interest the Val Venosta, or the western sector of the province of Bolzano.

Young fledged per year range from a minimum of 11 (out of 30 checked pairs in 2013) to 38 (out of 28 controlled pairs in 2008), with productivity trends shown in the Fig. 1. The overall data (originating from a systematic monitoring for the 2004-2014 period) about Alto Adige and those for the Val Venosta are compared (Fig. 1).

The productivity in the Val Venosta resulted lower, due to an overestimation of the Alto Adige data (reproduction is sometimes estimated by gamekeepers only in the take-off phase of the young and, if this does not happen, the pair is often considered unchecked). However, it

Table 1. Preliminary summary of Golden Eagle’s pairs whose presence has been ascertained in Alto Adige in individual reserves. It shows: available nests, trends (where available) of the 2002-2014 reproductive period with correspondent per-year productivity, i.e. number of fledged young compared to the number of checked pairs.

Pair	Nests	N. pair	Youngs that took off													
			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1	2	1	?	?	?	?	1	0	1	2	0	0	2		?	North-East
2	3	1	0	0	0	0	?	?	?	0	?	0	?	0	1	
3	7	1	0	0	0	0	?	?	?	?	?	?	?	?	?	
4	2	1	?	1	0	1	?	1	2	0	?	1	?	?	?	
5	4	1	1	0	0	0	?	?	?	0	?	?	1	?	?	
6	5	1	1	1	1	2	0	1	?	0	1	?	1	?	1	
7	4	1	1	1	0	1	?	?	?	?	?	?	?	?	?	
8	2	1	?	?	?	?	?	1	?	?	?	?	1	?	1	
9	4	1	1	?	?	1	?	1	1	2	?	?	?	0	1	
10	5	1	1	0	1	0	1	0	0	0	0	1	0	0	?	
11	7	1	?	?	1	?	?	1	?	0	2	2	?	?	?	
12	1	1	1	?	?	?	?	?	?	?	?	?	?	?	?	
13	4-6	1	?	?	1	?	1	?	1	1	0	1	1	?	0	
14	2	1	?	1	1	1	1	1	1	1	?	1	1	?	?	
15	2	1	?	?	1	1	?	0	?	?	0	1	?	?	?	
16	9	1	?	?	1	?	1	2	?	1	1	?	2	?	?	
17	1	1	?	1	1	1	1	1	?	?	?	?	?	?	2	Sarentine
18	1	1	?	1	1	1	?	?	?	?	?	?	?	?	2	
19	1	1	1	?	?	?	?	?	?	?	?	?	?	?	?	
20	2-3	1	?	?	?	?	?	1	?	0	1	?	?	1	?	
21	1	1	1	2	1	?	?	?	?	0	?	?	?	?	?	
22	2	1 (2 in 2007)	?	?	1	?	?	3	?	0	0	?	?	?	?	
23	2	1	?	1	1	1	1	1	1	?	?	?	?	?	?	
24	1	1	?	?	?	?	?	1	1	2	2	2	2	?	1	
25	7	1	?	?	1	?	1	?	?	?	?	1	?	?	?	Dolomiti
26	10	1	1	?	?	?	?	?	?	0	1	0	?	0	1	
27	9	1	?	?	?	?	?	?	?	?	?	?	?	?	?	
28	12	1	?	0	1	0	?	?	?	?	?	1	?	?	?	
29	7	1	?	0	1	0	?	?	1	?	?	0	?	0	?	
30	3	1	?	1	1	0	1	?	?	1	0	?	?	?	?	
31	7	1	?	0	1	0	?	1	1	1	1	1	1	?	1	
32	7	1	?	2	0	0	?	1	?	?	?	1	1	?	1	
33	5	1	?	0	0	1	?	?	1	?	?	?	?	?	?	
34	3	1	1	1	0	0	1	?	0	?	?	?	?	?	?	
35	2-4	1 (2 in 2005)	?	0	0	3	1	2	1	1	1	1	1	1	0	
36	2	1	1	1	0	1	?	1	?	?	?	?	0	0	?	
37	1	1	0	1	?	?	?	?	?	1	?	?	?	?	?	
38	5	1	0		2	2	1	2	1	1	1	2	0	1	0	
39	14	1	1	2	0	1	0	0	1	1	0	1	0	1	0	
40	1	1	1	0	?	?	?	?	?	?	?	1	1	?	?	Sud
41	1	1	?	?	?	?	?	?	?	?	1	1	1	?	?	
42	4	1	?	?	?	?	?	?	?	?	?	1	?	?	?	
43	2	1	?	?	?	?	?	?	?	?	?	2	?	?	?	
44	5	1	?	1	?	?	?	2	?	1	1	?	?	1	2	
45	2	1	?	?	?	?	1	?	1	?	2	?	0	2	?	

continued

Pair	Nests	N. pair	Youngs that took off														
			2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
46	2	1	1	1	0	1	2	1	1	2	1	2	1	?	1	Venosta-Meranese	
47	4	1	0	-	2	0	1	1	2	1	2	1	0	1	?		
48	2	1	0	?	?	?	?	?	?	?	?	?	?	?	?		
49	5	1	1	1	2	0	1	1	1	0	1	1	-	-	0		
50	5	1	1	1	1	1	1	0	0	0	1	1	1	0	1		
51	3	1	?	?	?	?	0	0	0	0	1	2	0	0	1		
52	5	1	?	?	?	?	0	0	0	0	1	-	-	0	1		
53	1	1													1		
54	2	1	?	?	?	?	0	0	1	0	1	-	0	0	0		
55	5	1	?	1	?	?	1	0	0	-	0	2	1	0	0		
56	6	1	?	1	2	2	1	0	-	-	-	1	2	1	1		
57	2	1	?	?	1	-	0	0	1	1	0	0	0	0	0		
58	4	1	?	?	?	1	2	0	0	0	1	2	0	0	1		
59	5	1	?	?	1	-	1	1	1	0	1	2	0	0	0		
60	2	1	?	?	-	-	0	0	0	0	2	0	0	0	0		
61	2	1	1	0	1	1	?	?	?	?	1	1	0	1	1		
62	4	1	?	-	?	-	?	?	?	?	?	?	0	0	1		
63	4	1	0	0	1	?	1	?	?	1	?	?	2	1	2		
64	4	1	1	1	0	0	?	?	?	?	?	?	0	0	-		
65	5	1	0	2	0	0	?	?	?	1	0	1	0	0	1		
66	1	1															
			251-256	65-67	18	26	30	24	24	28	22	22	28	38	23	11	26
			Checked pairs		27	36	41	37	29	37	29	38	32	37	36	29	33
			Productivity Alto Adige		0.67	0.72	0.73	0.65	0.83	0.76	0.76	0.58	0.88	1.03	0.64	0.38	0.79

is interesting to note a clear trend, with years of a decline in productivity (2005, 2007, 2009 and 2013). The reproductive year 2011 is particularly relevant; indeed 29 pairs had young fledged, 9 (31%) had two young in Alto Adige, while 4 pairs out of 9 (44%) had two young in the Val Venosta.

For the 203 nests distributed in the Western and central and Eastern districts, whose cartographic location is to

be considered sufficiently precise, an analysis with respect to elevation a.s.l. and slope exposure was carried out. The number of nests, expressed as percentage, was compared with the percentage availability of suitable rock cliffs ($n = 4525$) at different elevations (Fig. 2) and exposures (Fig. 3).

It emerges, as shown in Fig. 2, a more elevated selection of elevations between 1600 and 2200 m a.s.l., as well as southern and eastern exposures.

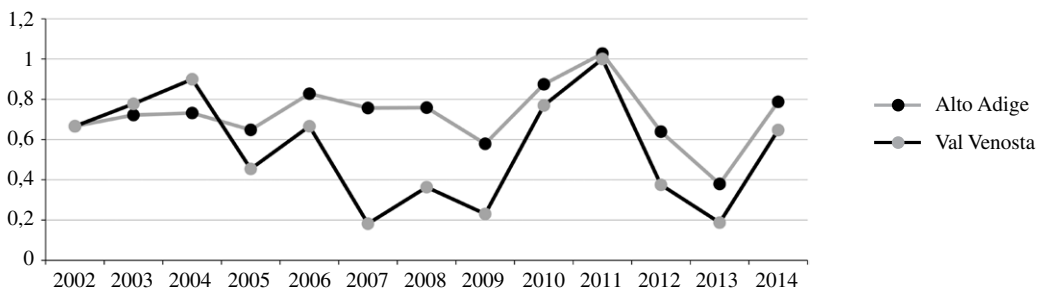


Figure 1. Comparison of Golden Eagle's productivity detected in Alto Adige (2002-2014; light grey) and Val Venosta (2004-2014; dark grey).

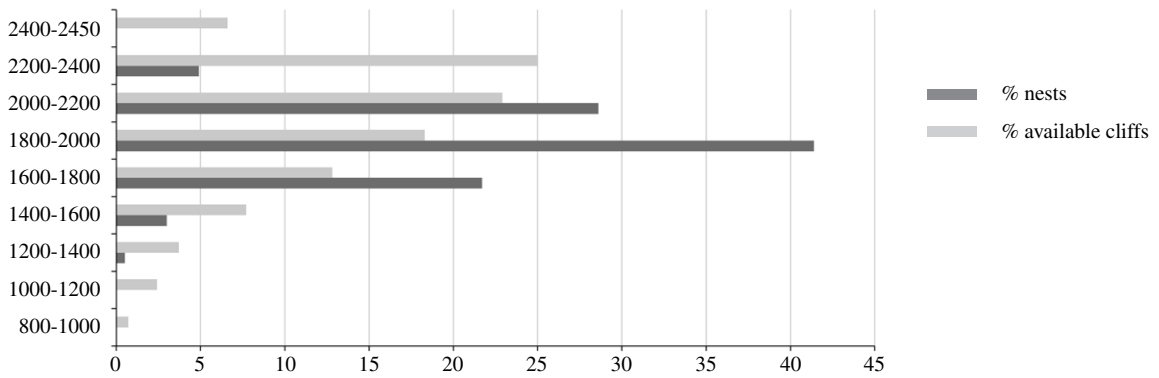


Figure 2. Distribution (%) of nests (n = 203) according to the elevation a.s.l. in relation to the availability of rocky cliffs (n = 4524).

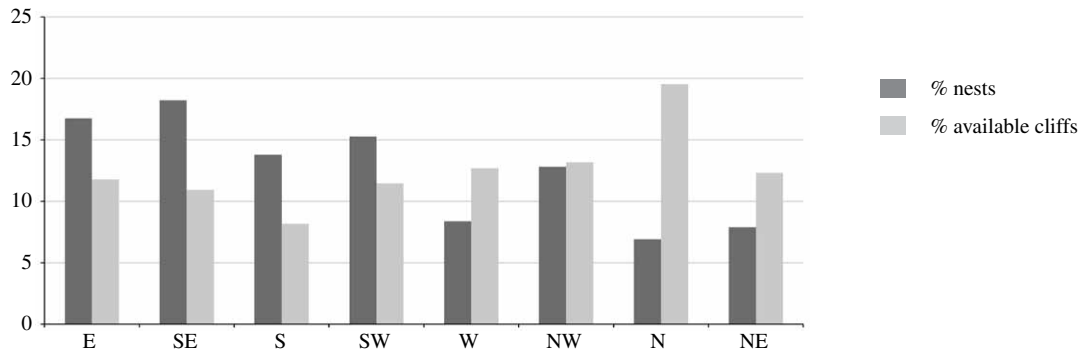


Figure 3. Distribution (%) of nests (n = 203) according to slope exposure in relation to the availability of rocky cliffs (n = 4524).

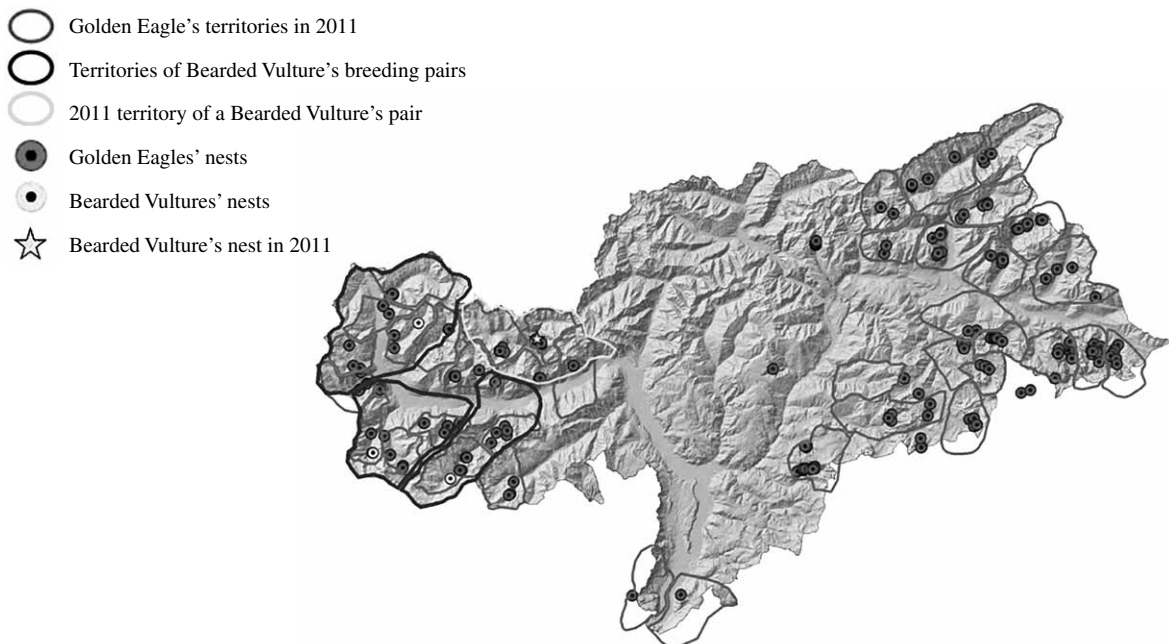


Figure 4. Knowledge status updated to 2015 about the Golden Eagle and the Bearded Vulture in Alto Adige.

For some nests in the Val Venosta, surveys were carried out following the take-off of young through the recovery of the prey remains that were still recognizable. The analyses of the remains allowed the following reconstruction of the trophic spectrum in terms of percentage biomass:

- pair number 64 in an area with plenty of marmots: 59.8% marmot *Marmota marmota*, 33.5% other mammals (wild + domestic), 6.7% poultry species (Tetraonidae, Corvidae);
- pair n. 65 in an area with limited availability of marmots: 26.1% marmot *Marmota marmota*, 67.2% other mammals (wild + domestic), 6.7% poultry species (Tetraonidae, Corvidae).

An analysis of the trophic spectrum performed by placing a phototrap at an active nest of the pair number 58 confirmed the results obtained for the pair No. 64.

In general, it was confirmed that there are “clean” pairs that had not left remains of prey in their nest, while others rear offspring in landfills.

In the Val Venosta area, 3-4 Bearded Vulture *Gypaetus barbatus* pairs are known: since 2011 in Senales (no further breeding pairs since 2014), since 2012 at Planeil, since 2014 at Martello, since 2015 at Ortles. The pairs at

Senales (2013 - attempt to breed) and Martello (2014 - successful nesting) built their nests in the immediate vicinity of Eagles’ nests (about 150 m from the nearest nest).

The Ortles pair in 2016 brought its young into the heart of the territory of the Eagle pair at Trafoi. After the initial difficult interactions, today the two species share peacefully the same territories. It should be checked in the near future if, in the areas of Bearded Vulture’s occurrence, the Eagle can limit itself to use only the smaller nesting cliffs, as it seems to occur in these first cases of extreme proximity (> 50 m), where the Bearded Vulture has always used the largest cliffs (Fig. 4).

REFERENCES

- Borgo A., 2001. I rapaci nei Parchi Naturali di Fanes Sennes Braies e Puez Odle. Ripartizione natura e paesaggio, Ufficio parchi naturali, Provincia Autonoma di Bolzano.
- Borgo A., 2005. L’Aquila reale nel Parco Naturale Fanes Sennes Braies. Ufficio Parchi Naturali, Ripartizione Natura e Paesaggio, Provincia Autonoma di Bolzano.
- Clementi T., 2005. L’Aquila reale nel Parco Naturale Vedrette di Ries/Aurina. Ufficio Parchi Naturali, Ripartizione Natura e Paesaggio, Provincia Autonoma di Bolzano.
- Winding N. & Lindner R., 2005. L’Aquila nelle Alpi Orientali. Interreg III Italia-Austria.