

## A PRELIMINARY OVERVIEW OF RAPTOR MONITORING IN AUSTRIA

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### Predhodni pregled monitoringa ptic roparic v Avstriji

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Austria has a rich raptor fauna with 34 documented species, 18–20 of them belonging to the breeding avifauna. The main players in monitoring activities are NGOs, Environmental Agencies and private initiatives. Monitoring areas are patchily distributed all over the country, but concentrated in the eastern part of the country. Main purposes for raptor monitoring are conservation issues like Red Lists, faunistic and atlas projects as well as scientific projects connected with universities and museums. Although no national network for monitoring raptors exists, data exchange operates well. Monitoring efficiency varies among the raptor species dependent on their size, rarity and habitat preferences. The best and detailed population estimates are available of medium-sized to large raptor key species living in open habitats. Knowledge about small species and forest living taxa is more limited. The key issues addressed by these monitoring programmes are to census the populations in order to identify population development and potential threats of population decline. Gaps exist of common and widespread taxa, relationships between breeding and wintering populations, information on non-breeders and, in general, long-term studies to recognize population dynamics. Such gaps on the regional level are found mainly in the Alpine region, which is difficult to explore due to topographic reasons and the low numbers of active ornithologists. Highly desirable is a national conservation law, as governments of the nine separate Austrian states are currently responsible for such topics, which makes conservation and science work considerably complex.

**Key words:** raptor monitoring, diurnal raptors, owls, Austria

**Ključne besede:** monitoring ptic roparic, ujede, sove, Avstrija

### 1. Introduction

Birds of prey monitoring under different aspects is one of the fundamental concerns in raptor conservation, given that threats concerning either birds or their habitats can be identified only with long-term population monitoring (WITMER 2005, ANDERSEN 2007). In this way, adequate measures can be taken, which is one of the main reasons to embark on this kind of investigations.

Although Austria is a small country covering only 83,855 km<sup>2</sup>, raptor monitoring is a more difficult task than expected. Specifically, as the country is largely mountainous (62%) due to its location in the Alps, some major gaps still exist. Only 32% of the country is situated below 500 m a.s.l. (STATISTIK AUSTRIA

2011). Therefore, harsh climatic conditions with long and high snow cover in large parts of the country make fieldwork often difficult.

Due to its geographic position in Central Europe and the polymorphic landscape (44% forest), Austria harbours a rich raptor fauna with 34 recorded species, 18–20 species among them as breeding species (DVORAK *et al.* 1993) (Table 1). As a result of short or long-term monitoring of several raptor species, more or less exact population numbers and development can be estimated. These figures are updated from time to time (GAMAUF 1991, MEBS & SCHMIDT 2006).

The most common and widespread species are the Buzzard *Buteo buteo*, Sparrowhawk *Accipiter nisus* and Kestrel *Falco tinnunculus* (GAMAUF 1991), while seven species are usually represented by less than

**Table 1:** Breeding raptor species and estimated populations in Austria. Species involved in monitoring activities over the last years are indicated.**Tabela 1:** Gnezdeče vrste ptic roparic in ocenjene velikosti populacij v Avstriji. Vrste, v zadnjih nekaj letih vključene v monitoring, so označene s kljukico.

Species / Vrsta	No. of pairs / Št. parov	Monitoring activities/ Vključene v monitoring	Source / Vir
Honey Buzzard <i>Pernis apivorus</i>	1,500		1
Black Kite <i>Milvus migrans</i>	60–75	✓	1
Red Kite <i>Milvus milvus</i>	20	✓	1
White-tailed Eagle <i>Haliaeetus albicilla</i>	14–17	✓	2
Lammergeier <i>Gypaetus barbatus</i>	3–4	✓	3
Griffon Vulture <i>Gyps fulvus</i>	1		1
Marsh Harrier <i>Circus aeruginosus</i>	400		1
Hen Harrier <i>Circus cyaneus</i>	1–5	✓	5
Montagu's Harrier <i>Circus pygargus</i>	20–30	✓	4, 5
Goshawk <i>Accipiter gentilis</i>	2,300	✓	1
Sparrowhawk <i>Accipiter nisus</i>	8,000	✓	1
Buzzard <i>Buteo buteo</i>	12,000	✓	1
Imperial Eagle <i>Aquila heliaca</i>	11	✓	4
Golden Eagle <i>Aquila chrysaetos</i>	350	✓	1
Booted Eagle <i>Aquila pennata</i>	0–2		1
Kestrel <i>Falco tinnunculus</i>	7,000	✓	1
Red-footed Falcon <i>Falco vespertinus</i>	5–15	✓	6
Hobby <i>Falco subbuteo</i>	600–800		1
Saker Falcon <i>Falco cherrug</i>	25–30	✓	1, 4
Peregrine Falcon <i>Falco peregrinus</i>	220–325	✓	1

(1) A. GAMAUF in MEBS & SCHMIDT (2006), (2) PROBST (2012) / WWF Austria, (3) H. FREY & A. SCHWARZENBERGER (*pers. comm.*), Bearded Vulture Introduction Project, (4) BIRDLIFE AUSTRIA (*unpubl.*), (5) SACHSLEHNER (2012 & *pers. comm.*), (6) H.-M. BERG (*pers. comm.*), NHM Vienna

20 pairs each: the Lammergeier *Gypaetus barbatus*, Griffon Vulture *Gyps fulvus*, Imperial Eagle *Aquila heliaca*, Montagu's Harrier *Circus pygargus*, Red Kite *Milvus milvus*, White-tailed Eagle *Haliaeetus albicilla* and the Red-footed Falcon *F. vespertinus*. Three species (Imperial Eagle, Saker Falcon *F. cherrug* and Red-footed Falcon) reach in eastern Austria their westernmost breeding limit. With a few exceptions, population development is positive or at least stable in most of the species.

## 2. Main players in monitoring for raptors

At the national level, the main players are NGOs (BirdLife Austria, WWF) and Environmental Agencies, which are often commissioned by the federal government and separate state governments. Private initiatives, however, are also accountable for short- or even long-term monitoring activities. In contrast, universities and museums are responsible for more complex and scientific issues, but raptor monitoring can always be included in such topics. Monitoring

areas are patchily distributed all over the country, although concentrated mainly in its eastern half. Usually, these areas are regionally restricted by habitat or political borders (ZUNA-KRATKY & KÜRTHY 1999, SUMASGUTNER & THOBY 2011). For investigating sparsely populated large species (Lammergeier, Golden Eagle) in vast areas, however, collaborations within Alpine regions (FREY 1992, WINDING & LINDNER 2005) or between provinces are requisite.

Occasionally, collaboration within Austria among state governments, NGOs or individual researchers also takes place. Along the national border, especially with Slovakia (CORO-SKAT for Imperial and White-tailed Eagles and Saker Falcon; BIRDLIFE ÖSTERREICH 2013), collaboration at the international level is fulfilled. The aim of the project is to develop concepts which can be used for conservation measures in Natura 2000 areas and in the course of rural development. Monitoring of breeding populations of diurnal raptors, owls and storks form the base in both countries. The results will be integrated with data on habitat resources and habitat utilisation to

achieve concrete data on habitat needs of the species in question. In 2003–2005, in the course of the Interreg IIIA Project, the Golden Eagle population was recorded and monitored transnationally between Austria and Italy, embracing several important Natura 2000 areas (www.aquilalp.net; WINDING & LINDNER 2005).

For the long-term Lammergeier reintroduction programme, collaboration with several other countries has been implemented as well. Since the first release in 1986 in Salzburg (Figure 1), this project has developed into one of the most significant raptor conservation projects in Europe, although the project suffered certain losses now and then (Figure 2). Until now, 170 captive bred vultures have been released, and since 1997 this vulture species has been breeding again in the Alps (http://www.wild.uzh.ch/bg/frame.php?bi=0&bg=0&ya=0&la=e&th=proj&st=0&su=0; IZQUIERDO & ZINK 2011). The journal *Bartgeier-News* reports regularly on the activities and project news.

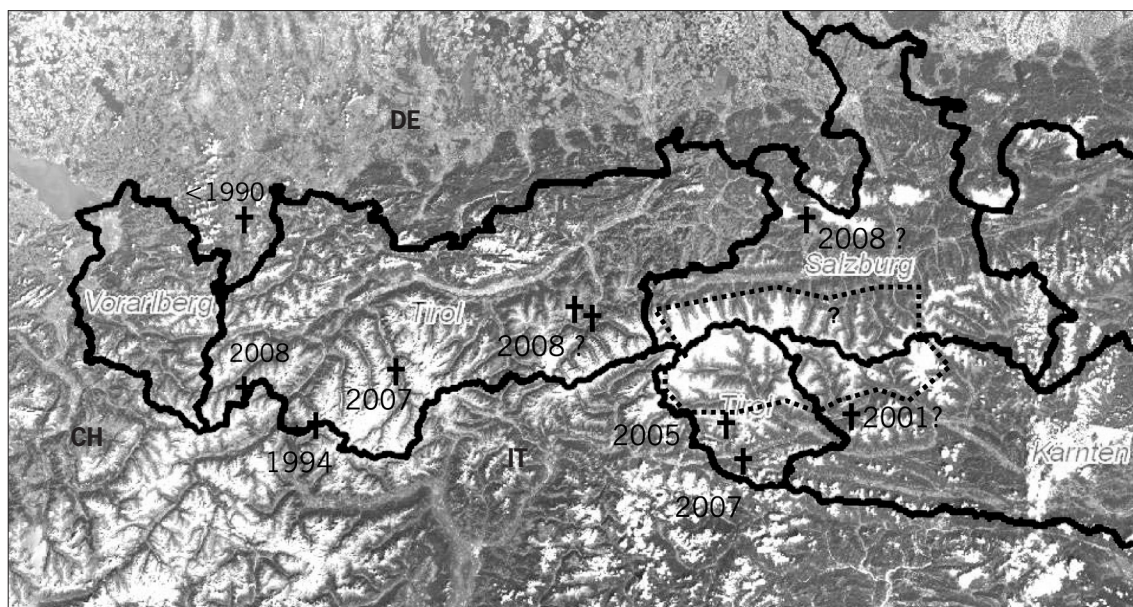
Main data users of the monitoring projects are separate state governments, NGOs and scientific institutions (universities, museums). Main purposes for raptor monitoring are conservation issues (Red Lists; BERG 1997, DVORAK *et al.* 2010), faunistic



**Figure 1:** Michael Knollseisen with a young Lammergeier *Gypaetus barbatus* before releasing as part of the reintroduction programme in the National Park Hohe Tauern (photo: National Park Hohe Tauern)

**Slika 1:** Michael Knollseisen z mladičem brkatega sera *Gypaetus barbatus* pred njegovo izpustitvijo v okviru programa ponovne naselitve te vrste v Narodnem parku Visoke ture (foto: Narodni park Visoke ture)

and atlas projects (WICHMANN *et al.* 2009) as well as scientific projects (e.g. McGRADY & PENNERSDORFER 2006, SUMASGUTNER *et al. in print, submitted A & B*).



**Figure 2:** Documented Lammergeier *Gypaetus barbatus* losses in the Austrian Alps between 1996 and 2009. Crosses denote locations of lost individuals with exact or presumable years given, while dotted line delineates the boundary of National Park Hohe Tauern, where reintroduction programme has been carried out (by courtesy of M. Knollseisen).

**Slika 2:** Dokumentirane izgube brkatih serov *Gypaetus barbatus* v avstrijskih Alpah med letoma 1996 in 2009. Križci označujejo lokacije poginulih osebkov z navedenimi natančnimi oziroma domnevnimi letnicami, črtkana črta pa ponazarja mejo Narodnega parka Visoke Ture, kjer poteka program ponovne naselitve (z dovoljenjem M. Knollseisna).

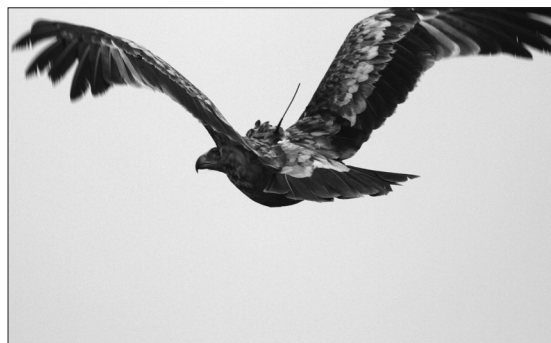
### 3. National coverage

In Austria, neither national co-ordination nor official national network for raptor monitoring is available at the moment. Thus, there is no national network for monitoring for raptors. Nevertheless, until now four diurnal raptor and owl specific meetings have been organized, in which monitoring played a major part (proceedings were published in *Egretta* special issues 1992 and 1999; GAMAUF & BERGER 1996, GAMAUF & BERG 2006). Knowledge about raptor populations across the country is limited to the last few decades and raptor monitoring was and is distributed only patchily in Austria. Projects follow very different time periods and are very diversely distributed in various landscapes. So population estimations are of different quality. Most of these monitoring programmes are financed by contract work to compile Red Lists and to investigate raptor density in protected areas. Thus census duration is often limited to three years, and is rarely extended over longer periods.

### 4. Key species and key issues

Monitoring efficiency varies among raptor species dependent on their size, rarity and habitat preferences. In general, the best and detailed population estimations are available of medium-sized to large raptor species living in open habitats. About small species and forest living taxa, knowledge is more limited. The key species addressed by monitoring for raptors are the Lammergeier, Golden Eagle, White-tailed Eagle, Imperial Eagle, Montagu's Harrier, Peregrine Falcon *F. peregrinus*, Saker Falcon and Red-footed Falcon.

The first monitoring project was focused on Lammergeier, starting in 1986 to reintroduce this species to the Alps and Austria, respectively (FREY & WALTER 1989, ZINK 2004). It is still in progress and has been expanded in the meanwhile to other Alpine countries. This project is supported by numerous national and international organisations, including WWF. The Golden Eagle is another comparatively well studied large species (LEDITZNIK 1999, STEINER 1999B, WINDING & LINDNER 2005, LEDITZNIK & LEDITZNIK 2006, MCGRADY & PENNERSTORFER 2006). WWF Austria initiated and funded a long-term survey of wintering and breeding population of the White-tailed Eagle ([www.wwf.at/seeadler](http://www.wwf.at/seeadler); PROBST 2002 & 2009), which still continues. After the natural resettlement of the Imperial Eagle in Austria in 1999 (RANNER 2006), its populations are monitored year-round. Additionally, other aspects like distribution, dispersal study by satellite telemetry



**Figure 3:** One of the Imperial Eagles *Aquila heliaca* satellite-tagged in Lower Austria in the course of the trans-border CORO-SKAT Project (photo: R. Katzinger)

**Slika 3:** Eden izmed kraljevih orlov *Aquila heliaca*, opremljenih z napravo za satelitsko spremljanje, v Spodnji Avstriji med potekom čezmejnega projekta CORO-SKAT (foto: R. Katzinger)

and feeding ecology are included (BERG *et al.* 2008, CORO-SKAT; SCHMIDT 2013) (Figure 3). Currently, a three-year transnational monitoring programme focused on conservation management is carried out together with Slovakia (BirdLife Austria, CORO-SKAT see above). Saker Falcon, Montagu's Harrier, Black Kite *Milvus migrans* and Red Kite *M. milvus* are also included in the project. For Saker Falcon and Montagu's Harrier, monitoring had started earlier (BERG 2000, SACHSLEHNER 2004, 2006, 2011 & 2012, SACHSLEHNER *et al. in print*). For the Peregrine Falcon, the country-wide monitoring data underline its wide distribution as well as its relative stable population size over a longer time period (JIRESC 1997, LEDITZNIK & LEDITZNIK 2006, GAMAUF *et al.* 2009).

The more common species like Buzzard, Honey Buzzard *Pernis apivorus*, Sparrowhawk, Goshawk *Accipiter gentilis* and Kestrel are taken into consideration less frequently (GAMAUF & HERB 1993, ZUNA KRATKY & KÜRTHY 1999, STEINER & DESCHKA 2006, SUMASGUTNER & THOBY 2011) and mostly for short-term periods only. Long-term surveys are available from a few areas only, like in Upper Austria (STEINER 1999A, STEINER & DESCHKA 2006) and Lower Austria (C. FRIEDL *pers. comm.*). Monitoring of common urban Kestrels in the city of Vienna was started in 2009 and still continues (SUMASGUTNER *et al. in print*) (Figure 4). All these examples concern the bird's breeding population.

Monitoring of wintering populations, on the other hand, has been carried out to a similar extent (GAMAUF 1987, SAMWALD & SAMWALD 1993, SACKL & SAMWALD 1994, BIERINGER & LABER 1999, MÜLNER 2000,

LABER & ZUNA-KRATKY 2005, BRADER & WEISSMAIR 2006, DVORAK & WENDELIN 2008). Much work, however, remains to be done in the Alpine regions of the country, especially in western Austria.

Austria is a country with no distinctively pronounced migration routes. Migration is not funnelled in places where large raptor numbers could migrate (such as straits, promontories or some other sites in the Western Alps). Therefore, census of raptor migrants played only a minor role in the past. However, rather recently, monitoring of migrating diurnal raptors carried out at some more or less exposed points with prominent raptor emergence revealed good numbers of crossing migrants in parts of Carinthia (LABER 2006, SACHSLEHNER 2006, SCHMID & PROBST 2006; Carinthian Migration Camp 2007–2011: [www.birdlife.at/kaernten/raptorcamp/2010/index.html](http://www.birdlife.at/kaernten/raptorcamp/2010/index.html)). Quite unknown remains the situation in other Austrian Alpine regions, where raptor migration is in fact known, but no systematic counts have been organised until now, like at Pfänder, Vorarlberg, Inn valley, Tyrol and northern edge of the Alps (KARNER & RANNER in SACKL & ZECHNER 1995). The satellite-tagged raptors of different species have let us know that they do not cross here. Instead, they demonstrate broad-front migration.

The key issues addressed by these monitoring programmes are to census the populations in order to identify population development and potential threats of population decline. In Austria, especially in game-hunting areas and habitats densely populated by humans in the eastern part of the country, illegal persecution is a regionally serious problem. Not only common raptors like the Buzzards are killed by shooting, trapping and poisoning, but also rare species like eagles and large falcons. In Lower Austria, it is even legal to kill a certain number of Buzzards and Goshawks each year. Besides the nonsensical killing of raptors for sports and “control” reasons, the numbers killed cannot be controlled. The bill that allows killing of large numbers of these two species is endangering other raptor species as well, as shown by many examples in the meanwhile (GAMAUF 2009). Additionally, the loss of fallow land and other open semi-natural habitats and changing land-use practices have brought species like harriers and Red-footed Falcon in serious troubles (BERG & DVORAK 2010, SACHSLEHNER 2011).

International networking is beneficial particularly for those raptor species, which occur in eastern Austria along the border with the Czech Republic, Slovakia and Hungary (White-tailed Eagle, Imperial Eagle, Saker Falcon), as these countries are strongholds of



**Figure 4:** PhD student Petra Sumasgutner during fieldwork on her Kestrel *Falco tinnunculus*-project in the city of Vienna. Here she is taking morphometric measurements and comparing the colour of the soft body parts (cere, eye-ring, feet) with a standardised colour chart (photo: A. Gamauf).

**Slika 4:** Doktorska študentka Petra Sumasgutner med terenskim delom v okviru projekta preučevanja postovke *Falco tinnunculus* na Dunaju. Petra tu opravlja morfometrične meritve in primerja barve mehkih telesnih delov ptice (voščenice, očesnega obroča, nog) s standardizirano barvno karto (foto: A. Gamauf).

these species and a main source for natural resettlement and population recruitment. The same is the case with the Lammergeier and Golden Eagle, which share their isolated occurrence in the Alps with other countries (Germany, Switzerland, Italy, France).

## 5. Strengths and weaknesses

The main strength of monitoring for raptors in Austria is the good data set of population development in rare species. But weaknesses, on the other hand, predominate. In comparison to some other countries (e.g. Germany, MAMMEN & STUBBE 2009; Finland, SAUROLA 2008), Austria has only a small number of amateur ornithologists involved in raptor monitoring. Recruitment of new volunteers is therefore needed. It is also necessary to raise interest in raptors in university students. Furthermore, certain gaps exist in other fields as well. Regarding raptor species, we often miss data on common and widespread taxa, relationships between breeding and wintering populations, information on non-breeders and, in general, long-term studies to recognize population dynamics. Gaps at the regional level are found mainly in the Alpine region, which is difficult to explore due to topographic reasons and the low numbers of active ornithologists. Threats coming from electrocution, wind farms and

persecution (illegal and legal) need to be thoroughly assessed at the national level as well.

## 6. Priorities and capacity-building

Priorities to strengthen monitoring for raptors in Austria are manifold. It would be desirable to motivate people to conduct raptor monitoring also outside the key areas, in mountainous regions as well as outside the breeding ranges and during the winter season. Furthermore, it would be important to accomplish a base to estimate realistic population sizes and to monitor long-term population developments. Additionally, more science-related topics should be investigated (e.g. feeding ecology, habitat use, migration, population genetics). Desirable, but difficult to achieve at the moment, is Austria's needs for uniform national conservation and hunting laws. Currently, nine state governments are responsible for these fields. As a federal republic, Austria is divided into nine states, which have some legislative authority distinct from the federal government, including nature conservation and hunting issues. These circumstances often impede conservation efforts and scientific work as well.

## 7. Povzetek

Avstrija se lahko pohvali z bogato favno ptic roparic 34 dokumentiranih vrst, med katerimi jih 18–20 tod tudi gnezdi. Glavni protagonisti pri dejavnostih, ki zadevajo monitoring ptic roparic, so nevladne organizacije, agencije za okolje in zasebni pobudniki. Območja monitoringa so razkropljena po vsej državi, vendar so skoncentrirana v vzhodnem delu Avstrije. Glavni namen monitoringa ptic roparic so naravovarstvena vprašanja, kot na primer Rdeči seznam vrst, favnistični projekti in atlasi ter tudi znanstveni projekti, povezani z univerzami in muzeji. Čeprav država nima nacionalnega omrežja za monitoring ptic roparic, pa dobro poteka izmenjava podatkov o teh pticah. Učinkovitost monitoringa se razlikuje glede na velikost in redkost vrst in njihovo izbiro habitata. Naboljše in najpodrobnejše populacijske ocene so na voljo o ključnih srednje velikih in velikih pticah roparicah, živečih v odprtih habitatih. Znanje o majhnih vrstah in vrstah, ki živijo v gozdovih, pa je bolj omejeno. Poglavitni cilj programov monitoringa so popisati populacije ptic roparic z namenom, da se ugotovijo trendi in dejavniki ogrožanja, ki utegnejo povzročiti upad populacij. Vrzeli obstajajo glede pogostih in splošno razširjenih taksonov, odnosov med gnezdečimi in prezimujočimi populacijami, informacij

o negnezdilcih in, na splošno, glede dolgoročnih študij za ugotavljanje populacijske dinamike. Takšne vrzeli na regionalni ravni je najti predvsem v alpski regiji, ki jo je težko raziskovati zaradi topografskih vzrokov in majhnega števila aktivnih ornitologov. Zelo zaželen je nacionalni naravovarstveni zakon, saj so za te zadeve trenutno odgovorne le deželne vlade, kar zelo otežuje dejavnosti, povezane z naravovarstvom in znanstvenim delom.

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