

A PRELIMINARY OVERVIEW OF MONITORING FOR RAPTORS IN PORTUGAL

Predhodni pregled monitoringa populacij ptic roparic na Portugalskem

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Portugal has a diverse assemblage of diurnal raptor and owl species, made up of the majority of species that occur in the Iberian Peninsula. 22 diurnal raptors and six owl species are accounted for as regular breeders, with a few others wintering or occurring as migrants or vagrants. Some of the breeding species are especially noteworthy, such as the Spanish Imperial Eagle *Aquila adalberti*, which is currently building up its numbers as a breeding bird after ca. 30 years of extinction as a breeder in Portugal, and the Bonelli's Eagle *A. fasciata*, whose fast growing tree-nesting population already sums about 100 pairs in the south of the country. Most of the raptors populations are currently recovering after a period of general decline during the 20th century. Only one species went extinct recently as a breeder, the Osprey *Pandion haliaetus*, but is now being reintroduced.

Main players

There are four main types of actors performing raptor and owl monitoring:

- (1) people working for environmental agencies and Natural Parks (involved in the management of protected areas and endangered species);
- (2) people working for private companies (carrying out EIA – environmental impact assessment studies, especially of wind farms, power lines and dams);
- (3) members of environmental NGOs (involved in EIA and conservation projects);
- (4) academic researchers.

As for the latter, monitoring has been part of some long-term scientific projects, namely of the Bonelli's Eagle tree-nesting population in the south of the country, and of shorter academic studies (BSc, MSc and PhD theses) covering several species such as the Eagle Owl *Bubo bubo*, the Bonelli's Eagle, the

Egyptian Vulture *Neophron percnopterus* or the Lesser Kestrel *Falco naumanni* among others. These studies have been carried out within universities and research centres, e.g. the Universities of the Algarve, Évora, Lisbon, Trás-os-Montes e Alto Douro and Porto, and the CIBIO (Research Centre in Biodiversity and Genetic Resources). Additionally, tree-nesting Bonelli's Eagles were also widely monitored during the 4.5 years of a LIFE Nature project (2008–2011), coordinated by NGO “Centro de Estudos da Avifauna Ibérica”.

Some collaboration has been established with Spain, concerning both state entities and NGOs, on the monitoring of cliff-nesting species (vultures, large eagles and Eagle Owls) in border areas, and of some endangered priority species (Spanish Imperial Eagle, Bonelli's Eagle and Black Vulture *Aegypius monachus*). Bonelli's Eagle research has been the subject of substantial scientific collaboration between Portugal, Spain and France, covering ecological, demographic and genetic issues. In turn, the Noctua-Portugal Programme, a monitoring scheme of owls and nightjars, coordinated by GTAN-SPEA (working group on nocturnal birds of the Portuguese Society for the Study of Birds), follows the same methodology of Noctua-Spain, allowing data to be analysed altogether for the Iberian Peninsula. Out of Europe, collaboration existed in the recent past with Cape Verde on the monitoring of the country's Osprey population.

Main users of the data obtained from monitoring are officials of the Institute for Nature Conservation and Biodiversity (including protected areas) and other environmental agencies for e.g. protected areas management, emergency conservation measures, evaluation of infrastructure projects and issue of permits (construction, hunting, recreation). Also NGOs (e.g. Quercus, LPN – Liga para a Protecção da Natureza, CEAI – Centro de Estudos da Avifauna Ibérica, ATN – Associação Transumância e Natureza) have used monitoring data for intervention in conservation emergencies and for the planning and development of conservation projects, as well as private environmental companies (e.g. STRIX, Bio3, Mãe d'Água, Oriolus, Profico Ambiente) for the EIA and monitoring of infrastructure and development projects.

Big companies, e.g. of the energy and industrial paper pulp sectors, which need up-to-date data on the distribution and breeding condition of species of higher conservation rank to incorporate impact preventive and mitigation measures on their production and management schemes are also regular users of monitoring data.

Research institutes (e.g. CCMAR – Centre of Marine Sciences, CIBIO) Universities (e.g. Algarve, Évora, Trás-os Montes e Alto Douro) and scientific societies (SPEA) also use monitoring in academic, research and conservation projects. For example, under the scope of long-term multidisciplinary research on tree-nesting Bonelli's Eagles, monitoring of the population was comprehensively and continuously carried out from 1991 to 2010. Only from 2011 onwards has it been patchily carried out. Also, both within the scope of research and conservation initiatives, Lesser Kestrel is another species that has been the object of regular monitoring since 1994.

National coverage

Traditionally, monitoring has been mostly restricted to areas with the richest cliff-nesting raptor communities or with top endangered species (e.g. Black Vulture, Egyptian Vulture, Spanish Imperial Eagle, Bonelli's Eagle, Lesser Kestrel). This has occurred mainly in areas of the north-east and central east along the Spanish border, and in the south-west uplands as well as in the open lowlands of the south-east. However, there is no formal national coordination or national network for raptor monitoring in Portugal.

Common raptor and owl species have been monitored in a few academic and research studies, and in some EIA studies. In this kind of studies, the Eagle Owl has been one of the most often surveyed species. Additionally, the *Common Bird Census* carried out by SPEA since 2004, although not specifically aimed at raptors and owls despite being a countrywide survey, has obtained some information on common raptor species like Black-winged Kite *Elanus caeruleus*, Black Kite *Milvus migrans*, Buzzard *Buteo buteo*, Booted Eagle *A. pennata*, Kestrel *F. tinnunculus* and Little Owl *Athene noctua*.

Currently, the only countrywide survey is the above mentioned owl monitoring scheme of GTAN-SPEA, which started in 2010. Another SPEA working group (especially dealing with the monitoring and conservation of Bonelli's Eagle in highly urbanised habitats) has recently expanded fieldwork to include common forest diurnal raptor species counts in suburban areas. SPEA has also regularly monitored Buzzards in the Azores and Madeira archipelagos, as well as Barn Owl *Tyto alba* in Madeira in partnership with Madeira National Park.

In recent years, monitoring has been carried out by some private environmental companies within the impact assessment of wind farms, infrastructures and development projects throughout mountainous areas of the western part of the country. A long-term study

of autumn raptor migration in Sagres area (south-western corner of the country) has been undertaken almost annually since 1990, at first organized by the local Natural Park staff, then by SPEA (1996–2001) and from 2005 onwards by STRIX, a private environmental company, linked with impact monitoring of local wind farms.

In summary, despite diurnal raptor and owl monitoring has been often though patchily carried out, Portugal lacks a long-term comprehensive and countrywide monitoring programme encompassing all of the country's raptor and owl species.

Key species and key issues

The key species addressed by monitoring for raptors in Portugal are primarily endangered species (Black Vulture, Egyptian Vulture, Spanish Imperial Eagle, Bonelli's Eagle, Lesser Kestrel), and secondly the rarer cliff-nesting species (besides Egyptian Vulture and Bonelli's Eagle, these include Griffon Vulture *Gyps fulvus*, Golden Eagle *A. chrysaetos*, Peregrine Falcon *Falco peregrinus* and Eagle Owl). Additionally, owls in general have been the aim of an increasing monitoring effort in Portugal during the last five years.

Threats addressed by monitoring are the potential impact of man-made structures (wind farms, power lines, dams, roads) in mortality, habitat loss and breeding impairment. Commonly, this monitoring has been carried out by technicians working for small private companies dedicated to EIA. In turn, the impacts of agriculture, forestry and hunting on nesting habitat degradation and breeding disturbance have been key issues addressed by monitoring within scientific studies or conservation projects (e.g. LIFE Nature projects) that target a few species, namely the Bonelli's Eagle.

International networking could be beneficial to the countrywide long-term monitoring of priority species, especially of those tree-nesting species with wide and sparse distributions (e.g. Spanish Imperial Eagle, tree-nesting Bonelli's Eagle), that despite being very important for conservation purposes is logistically difficult and expensive. Carrying out regular and coordinated Iberian censuses of these and other endangered species such as Egyptian and Black Vultures would also be an important measure. International collaboration would be most relevant in exchanging information and expertise with Spain, concerning all species. Additionally, international networking might help raising funds and get manpower support.

Strengths and weaknesses

The main strength of monitoring in Portugal is the

young biologists working for private companies or NGOs, who are fairly well trained (although in small numbers) for raptor monitoring. However, those working in private companies are mostly constrained to environmental assessment work and have few opportunities to participate in research or conservation monitoring. However, the number of available skilled observers could rise with some training effort. The main weakness is the lack of funding for wide range and especially long-term monitoring, and the lack of strategic planning and coordination. The lack of well-established monitoring methodologies is also noteworthy. Strong and coherent coordination and leadership could be relevant in establishing a comprehensive raptor monitoring scheme in Portugal.

Some major gaps in monitoring can be identified, among them the follow-up of the recovery of Spanish Imperial Eagle that although carried out since 2003 still does not cover the whole potential habitat and is ill-coordinated despite its conservation relevance and urgency. The population monitoring of the common raptor and owl species, as well as of less common and less known forest species (e.g. Short-toed Eagle *Circaetus gallicus*, Honey Buzzard *Pernis apivorus*, Booted Eagle, Long-eared Owl *Asio otus*, Scops Owl *Otus scops*) is another major gap throughout the country. However, even the better monitored species can suffer the consequences of the current economic crisis in the country.

Almost the entire western half of northern and central Portugal, a highly populated area, is almost unknown regarding the raptor community. Yet, some on-going regional studies have recently revealed fairly high densities of some species, including of previously under-detected ones such as Goshawk *Accipiter gentilis*.

The most ill-studied wide range threats are those linked with the increasing large scale forest degradation throughout the country; in the north and the centre, the extensive tree cover deterioration caused by frequent and recurrent wildfires; in the south, the high mortality rates observed throughout the extensive areas of oak parkland and forest (especially of Cork Oak *Quercus suber*) putatively driven by climatic change coupled with unsound understorey management, and the increasing mortality caused by an introduced Pinewood Nematode *Bursaphelenchus xylophilus* on Maritime Pine *Pinus pinaster* stands. Other threats presumably such as electrocution, collision with power lines, loss of habitat by wind farms, persecution, and poisoning seem of moderate global impact at present but are, nevertheless, worth of reference. Furthermore, a general drawback is

upstream of the threats, the great lack of scientific background knowledge of the population dynamics, ecological requirements and resource availability for most raptors and owls in the country.

Among the weaknesses and challenges for which Portugal might benefit from international sharing of best practice we can point out raptor conservation measures within forestry and game management.

Priorities, capacity-building

Fund raising, uniform methodology, strategic planning and national coordination are priority issues to strengthen monitoring for raptors in the country. Enhanced initiative, expertise and fund-raising ability could also help improving monitoring capacity in Portugal.

The main capacity building needs identified in raptor monitoring in Portugal are the training of technicians and nature wardens of environmental agencies and protected areas and field assistants on monitoring methods and techniques, as well as a well-established model for coordination of monitoring efforts, i.e. governmental *vs.* academic *vs.* non-governmental.

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