

Restoration of sea eagle population : A review

Josef RAJCHARD^{1*} , Jan PROCHÁZKA²

1. University of South Bohemia , Faculty of Agriculture , Department of Biological Disciplines , Studentská 13 , 370 05 České Budějovice , Czech Republic

2. Agency for Nature Conservation and Landscape Protection of the Czech Republic , Administration of the Kokořsko Protected Landscape Area , Česká 149 , 27601 Mělník , Czech Republic

Abstract The population density of the white-tailed sea eagle *Haliaeetus albicilla* is very low in many countries. In last twenty years , the sea eagle population in South Bohemia was restored by strict protection subsidized by reintroduction. The active help consisted of feeding during winter and building of artificial nests. A new sea eagle breeding population arose in the Třeboň basin area in the early 1980 's. Until this time sea eagles had used former breeding places only for wintering , probably coming from the Baltic. The South Bohemian sea eagle population is very unique : it exists in a densely man-occupied landscape , mainly in areas with very intensive carp breeding in artificial fishponds and was partly artificially (help to wintering birds and reintroduction of some individuals) restored. The experience from South Bohemia may have importance for populations of the sea eagle in other areas of its occurrence , primarily in the continental conditions [*Current Zoology* 55 (5) : 315 – 318 , 2009].

Key words Sea eagle , *Haliaeetus albicilla*

1 Introduction

The white-tailed sea eagle *Haliaeetus albicilla* Linnaeus 1758 (hereafter sea eagle) is a species with a Palaearctic distribution. It lives mainly in parts of Europe , central and northern Asia , and in the west it may reach up to Greenland (Cramp and Simmons , 1980 ; Fischer , 1982 ; Helander and Stjernberg , 2002). Eagles which breed in the Scandinavian area form the basis of the European population. In central Europe , the most numerous populations live in Germany and Poland , represented by about 400 and 500 pairs , respectively (Andreska et al. , 1987 ; Helander and Stjernberg , 2002 ; Mizera , 2002).

Sea and freshwater coasts , lake areas , big river basins and fishpond areas are ecological niches favoured by the sea eagle. The size of the breeding territory corresponds with the structure of the area. In most European countries , a breeding pair hunted at the distance of 15 to 40 km from its nest , while under optimal food conditions on the Norwegian coast a breeding pair hunted in the distance of 3 to 4 km from the nest. These distances are valid primarily during the breeding season ; however , during the winter season the range size is strongly influenced by the availability of food (Cramp and Simmons , 1980 ; Fischer , 1982 ; Ferguson-Lees and Christie , 2001).

Adult eagles of the central European populations are mainly residents and in most cases spend the winter in the

neighbourhood of their breeding locality. After fledging , the majority of young eagles wander over a wide area during migration time and winter. The wanderings of young eagles often resemble a migration (Hudec and Černý , 1977).

Fish , birds and mammals which live in wetland ecosystems and their neighbourhoods represent the main component of the eagle's trophic niche. Niche composition is subject to change during the year with fish representing a substantial part of their food until spring , whereas in winter wasted , hurt or dead animals are consumed , all being further influenced by local conditions (Fischer , 1982). Along the Danube and in the Balkans , fish constitute more than 40% of their food while it is only 32% in Norway (Černý , 1961 ; Fischer , 1982).

2 Decline of sea eagle population density during the 19th Century

Due to direct persecution and losses of eligible biotopes , the sea eagles were completely exterminated at the end of the 19th century in Great Britain (1911) , Denmark , Austria , Egypt , Corsica (1959) , Sardinia , Algeria , Bohemia and Slovakia (1964) and the species also retreated from many former breeding places in others areas (Hudec and Černý , 1977). The numbers of breeding pairs were decreasing in other countries as well. Remnant populations which survived in many countries reached 10% to 30% of their former numbers (Fentzloff ,

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* Corresponding author. E-mail : rajchard@zf.jcu.cz

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1979 ; Helander and Stjernberg , 2002 ; Kollmann et al. , 2002).

The Sea eagle had bred in Bohemia until the middle of the 19th century when the last solitary breeding places in the South Bohemian fishpond basin were eliminated (Černý , 1961). In South Moravia , it was still breeding in the 1920s (Hudec and Černý , 1977), however , extinction seemed to be inevitable in the territory of the present Czech Republic (Ševčík , 1987).

3 Protection , restoration of population and its problems

Legislative protection of the species , which had been established during the 20th century in most of Europe , stopped the decline of the remaining populations in Europe (Helander and Stjernberg , 2002). In countries such as Norway , Sweden , Finland , Germany and Poland where populations had survived , recolonization proceeded relatively slowly (Kollmann et al. , 2002).

Unfortunately , during the first recolonization , when the number of breeding pairs was increasing , the effect of chemicals (DDT , PCB , mercury) on the food chain and landscape exploitation stopped this growth (Dornbusch , 1979 ; Helander et al. , 1982 , Falandysz et al. , 1988 , Falandysz et al. , 1994 ; Mrlík , 1997 ; Helander and Stjernberg , 2002). Due to the impact of these new factors , the numbers of breeding Sea eagles decreased again and their breeding success went into a dramatic decline. Only 60 % of the northern population were breeding and only 22 % of these pairs bred successfully (Helander , 1985). Chemical stress had the strongest impact on populations living at the sea coast , since these localities have the highest cumulative level of chemical poisons (Falandysz , 1994 ; Olssen and Bergman , 1995). The inland-living populations were influenced mainly by direct persecution and losses of suitable localities due to increased exploitation of the landscape by humans .

After the use of DDT was banned in most European countries in the 1970s , a second stage of recolonization started thanks to new increased breeding success . It began particularly in Scandinavia , the northern part of Germany and Poland , where remnant populations were still surviving . This stage was faster than the first one . At first , conventional breeding places were reoccupied . These localities offered optimal conditions for the reproduction of sea eagles and soon they started to expand into neighboring localities . In this period , the first breeding was attempted in countries where eagles had already become extinct (Helander and Stjernberg , 2002 ; Kollmann et al. , 2002).

In connection with the repeated colonisation of former breeding places in central European countries ,

namely in the Ukraine (Gorban and Salyga , 1996) , Poland (Mizera and Szymkiewicz , 1991) , and Hungary (Tevely , 1996) , a population of sea eagles were introduced into the present territory of the Czech Republic in the early 1980s (Ševčík , 1997).

4 Comeback of sea eagles to Czech localities

The first sea eagle population breeding in the Czech Republic occurred in the Třeboň basin . Until this time , eagles had been using former breeding places only for wintering , and these eagles most likely came from the Baltic Sea (Černý , 1961 ; Hlášek , 1979 ; Andreska et al. , 1987). Regular censuses of wintering eagles , which has been conducted in the Třeboň basin area since 1982 , showed that there were about 20 wintering sea eagles . Such a number qualified this area as among the most important wintering places in central Europe (Andreska et al. , 1987). In fact , only the Hortobágy bent area in Hungary , 100 km north of Berlin , with 40 – 50 wintering eagles , can be considered as a more important wintering place (Ševčík , 1997).

In order to maintain a steady increase of wintering eagles and to prolong the leaving time , an active program started to be implemented . It consisted of improved food supplies during winter with the intention to prolong the stay of the birds until the spring months . At the same time , artificial nests were built in well-selected forest locations . However , the construction of artificial nests gradually ended in the Třeboň Basin area , because only one nest out of ten was used and just once . Eagles unambiguously prefer their own original nests or build new ones (Andreska et al. , 1987 ; Ševčík , 1987). Following the reintroduction activities in some European countries (Sweden , Schleswig-Holstein in Germany) , eagles bred in captivity were released in order to support the wild population . In the Třeboň basin , nine full-grown sea eagle fledglings were released between 1978 and 1985 (Andreska et al. , 1987). One of these birds was trapped in a steel trap in Austria and one was shot . The project of releasing Sea eagles bred in captivity can be considered as successful mostly because it has been documented that one pair of released eagles bred at least 12 young (Ševčík 1985* , 1997).

Wintering sea eagles began to gradually delay the commencement of nesting to February and/or March , most likely due to improving and sustainable conditions , and their spreading from former breeding areas . The first breeding attempt took place as early as 1971 , but was unsuccessful at the stage of clutch incubation by falling of the nest (Hlášek , 1979 ; Ševčík , 1997). This attempt was connected with the first stage of recolonization in

* Ševčík J , 1985 . Sea Eagle in Třeboň Area , Problems of Wintering and Nesting . Raptors 1985 . Collection of Contributions , Ornithological Conference Pířerov 14 . – 16 . 11 . 1985 (In Czech).

Europe and with primary attempts to increase the numbers of Sea eagles. During the following years, no breeding attempt was documented as a consequence of the gradual decrease of numbers throughout Europe, as a consequence of the negative factors described above. The next breeding was not confirmed until 1984. Finally, the first breeding attempts probably started in northern Bohemia and southern Moravia in 1984. In 1988, two young successfully fledged the nest; this memorable event was the first successful fledgling in the last 150 years (Martiško, 1994; Kurka 1997).

The number of breeding pairs gradually increased since the mid-1980s (Ševčík, 1997). In the Czech Republic, four pairs bred in 1990, ten pairs in 1995, and already about 20 and 30 pairs in 2000 and 2004, respectively. Yet only one stable population exists in southern Bohemia composed of 15 to 18 pairs. Two neighboring areas have four breeding pairs, while in other localities there is only a single breeding pair.

In southern Bohemia, about 80% of the nests are being built in forest stands older than 100 years and up to 500 m from the margin of a water body. About 56% of the nests were built on Scots pine and 32% on common spruce (Procházka, 2000; 2002). In most cases, eagles prefer to build nests on trees growing at the edges of the forest, eventually at the edge of a group of tall trees, which mark the surrounding stands (Kurka, 1997; Ševčík, 1997; Procházka, 2000; 2002). Such a place is easily accessible for the adult birds.

Based on direct observations and field experience obtained during winter feeding, it is evident that the food structure in the Třeboň basin area is similar to that in the freshwater inland areas where fish is a dominant component (Fischer, 1982; Procházka, 2000). Remnants of prey under the nests regularly include the common carp *Cyprinus carpio*, mallard *Anas platyrhynchos*, coot *Fulica atra* and black-headed gull *Larus ridibundus* (Procházka, 2000, 2002).

From the above-mentioned data, it is evident that the breeding population of sea eagles in the Czech Republic increased in the period of dynamic population increase in the whole of Europe. During this time, eagles began to spread from their former breeding areas and the remaining stable populations to places where they had become extinct in the past. Primarily, it was the wintering eagles that provided the basis of the new population. The colonisation of central and eastern Europe was markedly supported by the increased numbers of sea eagles in the western and northern parts of this species' distribution.

Currently, eagles are nesting in the entire territory of the Czech Republic, in numbers exceeding 50 – 60 pairs, while the number of wintering eagles is higher than 100 individuals. At first, the former breeding places were confined to areas where sustainable conditions have been

retained, but at present, as a consequence of their increasing number, eagles have started to expand to new areas.

The population of sea eagle can now be considered stable. Unfortunately, sporadic shootings and cases of raptor poisoning, including sea eagles, have been documented in the Czech Republic within the last few years. When a breeding eagle dies in a locality with a low number of pairs, the population may vanish over the course of several years. Near the town of Česká Lípa, where four pairs had bred, the number of breeding pairs dropped to just two pairs after two eagles were shot and the population became unstable. The sea eagle and its breeding localities are fully protected by law. Moreover, an action plan is now available for the management of its population. Continual monitoring of this species is important not only because the sea eagle is a threatened species, but also because it is an important bioindicator of changes in the ecosystem. Information about restoration of the South Bohemian sea eagle population can be used as model of successful management of sea eagle protection in similar continental conditions.

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