

# **Greater Spotted Eagle** ***(Aquila clanga)***





## European Species Action Plan for Greater Spotted Eagle (*Aquila clanga*)

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### Milestones in production of action plan

Workshop: 14-18 November 1996 (Kemeris, Latvia)  
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### Review

This action plan will be reviewed and updated every four years (first review due 2000). An emergency review will be undertaken if sudden major environmental changes, liable to affect the population, occur within the species' range.

### Geographical scope

This action plan is primarily targeted at those European countries where the Greater Spotted Eagle breeds or occurs on migration or in winter. However, given the significance of the Middle East for migration and wintering, and the conservation problems which affect migratory birds of prey in that region, the geographical scope of the action plan was extended to include the key countries of the Middle East as well.

The action plan needs active implementation in: Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Federal Republic of Yugoslavia (Serbia and Montenegro), Finland, France, Former Yugoslav Republic of Macedonia, Georgia, Germany, Greece, Hungary, Israel, Italy, Latvia, Lebanon, Lithuania, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, Syria, Turkey, Ukraine.



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# SUMMARY

The Greater Spotted Eagle is classified as a 'SPEC 1' endangered species in Tucker & Heath (1994), indicating that it is a threatened species whose breeding population is less than 2500 pairs and classified as a vulnerable species globally (Collar et al. 1994).

In Europe it occurs mainly in Belarus, Russia and Ukraine, but in small numbers also in eastern Poland, Lithuania, Latvia, Estonia and Moldova. Its breeding in Finland and Romania in recent years needs confirmation. The total number of pairs in Europe is unknown but has been estimated to be below 1000 pairs. There is a small wintering population in Greece and Turkey.

The Greater Spotted Eagle has shown major population declines in probably all parts of its range. It has disappeared or almost disappeared from much of its former western area of distribution in Bulgaria, Finland, Hungary, Latvia, Lithuania, Romania, former Yugoslavia and Israel as a breeding species. In Poland there is only one area regularly occupied by a certain number of pairs. It has apparently very much decreased in Ukraine and Russia, but this reduction in numbers has not been well described due to difficulties to monitor this species.

In all countries, data on Greater Spotted Eagle breeding populations are still deficient. Our knowledge of the species' ecology shows major gaps. It is, indeed, the least studied eagle species in Europe. Its exact ecological requirements for breeding and its adaptability to changes in the environment are still little known. However, a comprehensive study of the migration and wintering behaviour using satellite telemetry is in progress and has already yielded many surprising results (Meyburg et al. 1995, 1997).

## **Threats and limiting factors**

- Include habitat alteration and loss of nest sites caused by forestry operations
- Habitat alterations by drainage and loss of feeding habitat.
- Shooting and other negative impacts during migration are also important factors.

## **Conservation priorities**

Habitat conservation in the breeding areas

Further research into limiting factors in the breeding range, and during migration and wintering.

National surveys to clarify population status and breeding success and prevention of destruction during migration.

## 1. Introduction

The Greater Spotted Eagle is a migratory species. In Europe it has suffered a rapid decline in most of its range. In several countries it became extinct or almost extinct, e.g. Finland, Latvia, Lithuania, Hungary, Romania. In Israel it became extinct as a breeding species shortly after World War II because of destruction of the wetlands.

In November 1996, a second meeting of the International Lesser and Greater Spotted Eagle Working Group took place in Kemer (Latvia), hosted by the Latvian Ornithological Society and organised by BirdLife International and the World Working Group on Birds of Prey (WWGBP). Representatives from Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Germany, Greece, Hungary, Israel, Latvia, Lithuania, Poland, Russian Federation, Slovak Republic, UK and Ukraine were present. The Lesser and Greater Spotted Eagles' situation was thoroughly discussed and the most important actions to safeguard their future in Europe were outlined.

This action plan is based on the information gathered during that meeting, on the literature and the comments of other experts consulted. It is intended to provide a framework of action for statutory agencies, conservation organisations and individuals responsible for, or interested in, the conservation of the species.

Recently Belik (1999) suggested that the sharp decline of Greater Spotted Eagle numbers in the 1960s was caused by another reason – massive poisoning. In the 1950s-60s in many regions of Russia a massive increase of the Northern Water Vole *Arvicola terrestris* took place which was accompanied by tularaemia and Omsk haemorrhagic fever epidemics and other diseases. Zinc phosphide, a very strong poison, extremely toxic for all warm-blooded vertebrates, was widely used in the fight against the Water Vole, the main carrier of tularaemia and Omsk haemorrhagic fever in wetlands.

For example, in Novosibirsk and Omsk Regions, situated in the south of west Siberia, 155, 6 thousand ha of forest bogs were sprayed from the air at the rate of

5 kg/ha of a clean zinc phosphide preparation. The same method was then used for the extirpation of outbreaks of Water Vole numbers in Belarus and a series of other regions of the USSR.

Greater Spotted Eagles feed mainly on Water Voles, which are in mass the most available inhabitant of wet meadows and forest bogs. Greater Spotted Eagles swallow their prey whole and therefore all toxins which are on the rodents' fur or in their digestive tracts find their way together with the prey into the eagle's stomach. Thus zinc phosphide, which was dispersed over the bogs in the fight against the Water Vole, quickly permeated the organism of the eagles and led to their complete disappearance from the territories treated by this preparation.

In a permanent study area in Barabinskaja steppe the Greater Spotted Eagle, which at the beginning of August numbered 8 birds per 20 km of the count route, had completely disappeared only 10 days after the treatment of an experimental plot with zinc phosphide. However, on a control plot not treated its number during August fluctuated between 4 and 8 individuals per 20 km and did not indicate a trend towards decline.

Long-term counts of birds of prey numbers on other permanent observation plots in West Siberia clearly illustrate the influence of zinc phosphide on raptor populations. Extensive areas of fields and forest bogs were sprayed in the fight against the Water Vole in 1959, following which the numbers of all rodent-eating birds of prey, including Greater Spotted Eagle, sharply declined in the permanent study area. During the following 13 years of observations the Greater Spotted Eagle population failed to recover there.

The application of zinc phosphide in Russian agriculture has been officially prohibited since 1970. It is, however, sometimes still used locally as an extreme preventive measure in centres of plague and tularaemia. And field researches, carried out during 1996-98 in the main regions of the Greater Spotted Eagle's distribution in the Don River basin (Belik 1999) have shown that the species' population there had stabilised but was still at a low level. Study of the distribution of known breeding territories, which are mainly linked to swampy or flooded alder forests, and also an analysis of cartographic data on a scale of

1:200000 in Vorenezh, Volgograd and Rostov Regions permit an assessment of the Greater Spotted Eagle population in the steppe part of the Don River basin in an area of 100,000 sq km at 40-60 pairs (Belik & Vetrov 1988).

## 2. Background Information

### 2.1. Distribution and population

The Greater Spotted Eagle is distributed from eastern Poland and the Kaliningrad area to the Pacific Ocean, in southeast Siberia and Manchuria. In Europe it occurs as a breeding species in Belarus, Finland (?), Estonia, Latvia, Lithuania, Moldova, Poland, Romania (?), the Russian Federation and Ukraine. A Population estimate is given in Table 1.

The Greater Spotted Eagle is a migratory bird, wintering in southern Europe, southern Asia, the Middle East and Africa as far south as Uganda and Kenya (exceptionally Zambia). There is very little published information about its migration (e.g. Meyburg et al. 1995), but a publication summarising a recent study using satellite telemetry is under preparation (Meyburg 1997).

**TABLE 1: Breeding population estimates**

Country	No. of Pairs
Belarus	10-15
Estonia	5-15
Finland	0-2
Latvia	1-5
Lithuania	?
Moldova	3-5
Poland	15
Romania	?
Russia (European)	ca. 800-1000 ??
Russia (Asian)	ca. 2000 ??
Ukraine	40 - 60

The estimates for each of these countries have been given by participants of the Kemer workshop (Latvia, November 1996).

## 2.2 LIFE history

### *Taxonomic status*

The Greater Spotted Eagle is taxonomically closely related to the Lesser Spotted Eagle (*Aquila pomarina*). It has been supposed that a separation between the mitochondrial lineages of the two species could have occurred slightly less than one million years ago, assuming a substitution rate of 2% per million years for mitochondrial genes (Seibold et al. 1996). Although there is a large area of overlap of the two species there are only very few cases known where members of both species seem to have formed a mixed pair and produced hybrid youngsters (Bergmanis et al. 1997).

### *Breeding*

The Greater Spotted Eagle builds a large nest of sticks on trees below the canopy, mostly in deciduous forest and only rarely in coniferous forest (Galushin 1980, Glotov 1959, Hoffmann 1931, 1932, 1935, Ivanovskiy 1993 a,b, Kutshin 1959, Likhatchev 1957).

The clutch most often consists of two, often of only one, and very rarely of 3 eggs. Breeding success is around 0.6-0.7 young per breeding attempt. Breeding probably starts with the laying of the first egg and takes about six weeks. After hatching chicks stay in the nest for circa 63-67 days. There is a high level of unsuccessful pairs (Meyburg 1994, Maciorowski et al. 1996, Pugacewicz 1995). As with the Lesser Spotted Eagle the species' breeding is characterised by Cainism, whereby the older chick kills its sibling within the first weeks after hatching (Meyburg & Pielowski 1991).

Adult plumage is acquired after several (probably 4) years. There is one case known when a male reproduced successfully in partly juvenile plumage (Meyburg et al. 1997). Greater Spotted Eagles build their own nest, but often use nests of other large birds (e.g. Black Stork, Common Buzzard, Lesser Spotted Eagle).

The species is not known to have reproduced in captivity.

## **Feeding**

Very variable, depending on availability of prey species. Mainly small mammals, birds, amphibians, lizards, snakes, small fish, carrion and sometimes insects. In W Russia 53 % small mammals and 45 % birds, in Oka Reserve; and 58 % mammals, mostly voles (*Microtus arvalis*), 35 % birds, 3-6 % reptiles, near Tula (Russia). Diet generally similar to that of the Lesser Spotted Eagle, but often more and larger birds taken (Galushin 1962, 1980, Glotov 1959, Grote 1939, Kutshin 1959 b, Likhatchev 1957, Moltoni 1943, Pankin 1972, Priklonsky 1960, 1966).

## **Habitat Requirements**

Compared with the similar Lesser Spotted Eagle and other large raptors, the species is very poorly known. During the breeding season it is an essentially dispersed species nesting at very low densities (Malchevskiy and Pukinskiy 1983). At this time the species needs large wet forests bordering humid meadows, bogs, marshes and other wetlands. It mainly breeds in deciduous lowland forests, but sometimes in mountain forests, up to 1000 m above sea level.

During migration and wintering a variety of habitats is used - open landscapes, shrubland, and wetlands - but very little is known about habitat requirements and ecology during this period, which extends over half of the year. There may be regular concentrations of birds in certain wintering areas.

## **2.3. Threats and limiting factors**

### ***Habitat alteration caused by forestry***

Several types of forestry operation affecting breeding areas are the most important threat for reproduction. These consist of various activities that cause nest disturbance:

- opening up of new roads by forestry companies
- clear-felling
- selective cutting of old and large trees.

Importance: very high

## ***Habitat alteration by drainage***

This may lead to rapid abandonment of breeding, feeding and wintering areas. In Israel, the Greater Spotted Eagle became quickly extinct as a breeding species after World War II when the suitable habitat was drained.

Importance: very high

## ***Afforestation of former cultivated areas***

This leads to loss of the mosaic of breeding and feeding habitat that is characteristic of the species' habitat requirements.

Importance: critical

## ***Disturbance during the breeding season***

The Greater Spotted Eagle is very intolerant of permanent human presence in its breeding area or hunting range and consequently birds abandon their territories once people start to live and work nearby. In several countries privatisation has led to intensive exploitation of feeding habitat, and also of forests. Thousands of people work in the forest in early spring. There are more and more illegal forest activities.

Importance: high

## ***Nest robbing and illegal trade***

The robbing of chicks or eggs and illegal trade is rare, but has occurred several times in Poland.

Importance: low

## ***Shooting***

Shooting is a problem in Belarus, Poland, Russia and in the Mediterranean area. In Italy, Turkey and the Middle East (especially Lebanon) and on the Arabian Peninsula the shooting of migratory birds of prey is a common practice. In Greece shooting is considered the main threat to the species (since the foundation of the Hellenic Hospital for Wild Animals and Birds - 13 years ago - they have received about 15 Greater Spotted Eagles, all immature and all except one having been shot).

Importance: critical

## **Poisoning**

A possibly serious threat is poisoning, mainly lead poisoning (in Greece, the Greater Spotted Eagle is thought to feed in a large extent on birds -such as ducks and coots-injured or killed, but not retrieved, by hunters). Since the species also takes carrion, poisons put out to kill foxes and other "vermin" are also a threat to the species.

Importance: unknown

## **2.4. Conservation status and recent conservation measures**

### **Belarus**

The Greater Spotted Eagle is protected by the nature conservation law, but this law is regarded as too general. The Red Data Book of Belarus in 1993. includes the Greater Spotted Eagle in category 1. The species breeds in Belarus in the wet lowland forests. Only a few breeding pairs in the eastern part of Belarus are known. Recently breeding has also been discovered in the southern part of the country (Pripyat lowland marshes), but the population size and its extent is unknown. Relatively few data are available as regards breeding success and negative factors (Ivanovsky 1993 a, b, 1996).

### **Estonia**

The Greater Spotted Eagle and its breeding sites are protected by the Nature Conservation Law, but this law is too general to ensure the safeguarding of nests and nesting habitat. It is included in the Red Data Book of Estonia in Category 1 as a vulnerable species. There is a possibility of establishing protected zones of 100 m radius around nests. This has happened in recent years, but not in 1997, although there are proposals for two such zones for 1998.

The eagle breeds in the central part of the country with an estimated 5-15 breeding pairs.

### **Finland**

The Greater Spotted Eagle is now probably extinct or only an occasional breeding bird in the south of this country.

## **Greece**

The number of wintering individuals in Greece is c. 45-85 birds. This number is based mainly in the Midwinter Waterbird Counts but also in the recent (1996-97) survey in the IBAs. The minimum number is considered an underestimate since only the large wetlands are well covered.

**TABLE 2: The number of individuals recorded in the main wintering sites of the species**

Geographical area	Number of birds
Evros Delta and Dadia Forest	15-20
Porto Lagos	max. 5
Nestos Delta and Gorge	4-16
Lake Kerkini and surrounding mountains	8-13
Axios River and Delta	1-3
Kalamas Delta	6-7
Amvrakikos Gulf	2-6
Messologhi Lagoons	2-4

The table shows that the species is mainly associated with large wetlands and the number of wintering individuals varies from year to year.

The Greater Spotted Eagle is protected by the Joint Ministerial Decision 41 4985/1985 and classified as Endangered in the Greek Red Data Book. However, although nearly all the large wetlands are Ramsar sites, effective protection remains problematic. In Lake Vistonis recent plans for draining a marshy area are under way despite the fact that the area has been declared both an SPA and a National Park. Also, in a recent management study in Amvrakikos Gulf it was proposed that Mavrovouni hill, which is used for roosting by Greater Spotted Eagles and other raptors, to be excluded from the strictly protected zone. In Kalamas Delta a new road is being constructed in Mavrovouni hill that is the most important roosting area of *A. clanga*, *A. heliaca* and *Haliaeetus albicilla*.

### **Latvia**

The Greater Spotted Eagle is on the Red List (1993) as an endangered species (category 1). It is on the list of specially protected species. The last known breeding sites were under protection, yet due to poor enforcement one was partly logged and thereafter abandoned. The population is estimated to be 1-5 pairs. Both last known

breeding sites and one possible nest site are included in the currently established local nest site sanctuaries. The first list of sanctuaries designated after independence in 1996 comprises 3 areas especially for Greater Spotted Eagle ranging individually from 22.1 ha to 72.6 ha and covering a total of 150.9 ha.

Formerly known breeding sites have been inventoried and field surveys of two of them were carried out in 1997. This provided no evidence of birds, but one possible breeding pair was discovered in a previously unknown area.

### **Lithuania**

The Greater Spotted Eagle is listed in the national Red Data list of species (1976) as extinct or possibly extinct (category 0). There may possibly be a maximum of 2 breeding pairs.

### **Moldova**

There are no data from this country.

### **Poland**

The Greater Spotted Eagle is strongly protected by law, including 200 m protected zones around nests all the year, extended to 500 m during the breeding season. The breeding population is about 15 pairs. Data are based on fieldwork in the years 1992-1997.

### **Romania**

The species is protected by the Romanian Hunting and Game Protection Law of 1996. It is a rare passage migrant mainly passing through the eastern provinces of Moldavia and Dobrodja. Recorded breeding in the eastern Carpathians up until the 1970s (per L. Kalaber, ROS)

### **Russian Federation**

The species is classified as a species with rapid decline in numbers and habitat and will be included in the 2nd edition of the Red Data Book of Russia (under protection) in Category 2 (constantly decreasing). The estimated population in the European part of the country is 800-1000 pairs, and in the Asian part about 2000 pairs.

### **Turkey**

Fully protected from hunting under Terrestrial Hunting Legislation No. 3167.

The species is a regular winter visitor to a number of wetlands particularly in the western half of the country. The wintering population seems to be associated with wetlands. Major wintering sites are: Göksu Deltasi (up to 20 birds), Meric Deltasi (Turkish part of the Evros Delta), Kizilirmak Deltasi, Bafa Golu and Yesilirmak Deltasi.

### **Ukraine**

The species is included in the National Red List. The breeding population is estimated at 40-60 pairs. The species has apparently greatly decreased during recent decades.

### **International**

An International Lesser & Greater Spotted Eagle Working Group was founded several years ago in Germany under the umbrella of the WWGBP (World Working Group on Birds of Prey). It has held several meetings. The proceedings of the last international meeting in Poland have been published in a book ("Eagle Studies") published by WWGBP.

## **3. Aims and Objectives**

### **Aims**

In the short term, to halt the decline in the population and safeguard all existing breeding, roosting and wintering habitat.

In the long term, to safeguard the distribution and numbers of the European population of the Greater Spotted Eagle, restoring the range to what it was in 1920.

### **Objectives**

#### **3.1. Policy and legislation**

3.1.1. *To promote policies which ensure long-term conservation of all populations of the Greater Spotted Eagle*

#### 3.1.1.1. Forestry and wetland management

Wetland and forestry management conflict with conservation in several countries. Governments should review their wetland and forestry policy to ensure that this is compatible with the conservation of the Greater Spotted Eagle. It is recommended that all national forest and wetland policies should include the following elements:

- Priority for the protection of globally threatened, vulnerable and rare species
- All forestry activity should be forbidden in nesting habitat within 300 m of all nests of the Greater Spotted Eagle
- Precise guidelines for forest management in areas where sensitive species breed
- Co-operation with forest owners to secure successful breeding
- All forestry activity should be forbidden in nesting habitat between April and September
- Any further loss of all kinds of humid forest should be halted

Priority: high  
Timescale: medium

#### 3.1.1.2. Farming and agriculture

The Greater Spotted Eagle breeds in forest but feeds in open landscape, wet meadows and agricultural areas. The species prefers many types of wetlands. It is most important to preserve the mosaic of breeding-feeding habitat, yet in some breeding areas there is a conflict between human activity and the needs of the Greater Spotted Eagle.

It is important to create guidelines for farming compatible with the presence of this species as a traditional breeding bird. It is recommended that such a policy should incorporate the following elements:

- to stop loss of all kinds of wetlands
- to withdraw all kinds of state support for change in feeding areas
- to prevent all kinds of intensive farming methods in breeding areas and ensure that this also applies to new EU countries
- to ensure the EU Common Agricultural Policy includes adequate safeguards and opportunities for the species and its habitat
- to establish "Environmentally Sensitive Areas" in breeding areas

Countries that have embarked on the process of accession to the European Union (Latvia, Poland, Romania) should plan for the incorporation of agri-environment measures within their agriculture policies and target these measures at Greater Spotted Eagle and other threatened species dependent on agricultural habitats.

Priority: high  
Timescale: medium

#### 3.1.1.3. Protected areas policy

Protected areas policies and regulation should promote the following:

- Conservation management of all Important Bird Areas where the Greater Spotted Eagle breeds and winters, along with regular foraging and migration stop-over sites.
- Conservation of remaining original forests, particularly all kinds of wet forest and floodplain forest.

Countries that have embarked on the process of accession to the European Union (Latvia, Poland, Romania) should consider what opportunities exist to use the approximation process and any associated funding support to establish and manage a network of protected areas.

#### 3.1.1.4. International co-operation

Co-operation and information exchange between conservationists working on the Greater Spotted Eagle and its habitats should be promoted. Training on, *inter alia*, nest surveillance should be provided by those groups that are carrying out similar programmes with other large raptors.

Priority: medium  
Time-scale: short

#### 3.1.2. National strategies for conservation of the species

- ##### 3.1.2.1. To promote national legislation which adequately protects the species and its habitat

Where appropriate, a review and update of national laws and regulations relating to nature conservation should be encouraged, especially where these may fall short of the obligations contained in international treaties and conventions, or, for EU enlargement countries, in the "Birds" and "Habitats"

Directives. In particular, any revisions should ensure:

- that Greater Spotted Eagle enjoys the maximum level of protection, and make it a criminal offence to shoot, trap, take, poison or disturb any member of that species
- that environmental impact assessments are made before afforestation, dam construction, or any other infrastructure which may have an impact on Greater Spotted Eagle habitat
- that the national legislation safeguards the forest and feeding habitat, not only in the breeding season but all year round.

Priority: high  
Time-scale: short/medium

### 3.1.2.2. National Action Planning

All range states should consider preparing a detailed national action plan for the species. An appropriate body should be responsible for co-ordinating the implementation of the national action plan. Preparation of such plans will provide an opportunity to further develop objectives involving further integrated and interdisciplinary work as well as specific policies.

Priority: medium  
Time-scale: short

## **3.2. Species and habitat conservation**

### *3.2.1. To ensure that good quality Greater Spotted Eagle habitat is maintained through appropriate habitat measures*

#### 3.2.1.1. Forestry operation

Forest exploitation should not be allowed from the end of March to the end of September within 300 m of all nests. If forest management operations are necessary around the nest, these should be between early October and the end of March. Trees with nests should never be cut down.

Priority: high  
Time-scale: short/medium

#### 3.2.1.2. Prevention of disturbance in breeding areas near the nest

- during the breeding season, all kinds of human activity in breeding habitat should be restricted within 500 m radius round the nest.
- all kinds of human activity which alter the mosaic of the breeding and feeding habitat should be forbidden
- all kinds of human activity involving disturbances of the groundwater system should be restricted within 2000m. surrounding a nest.
- large scale building such as new roads, new powerlines, extension of towns etc. should be prohibited within a 3000m. radius around the nest.

Priority: high  
Time-scale: short

#### 3.2.1.3. Prevention of poisoning

The use of poison baits must be prohibited in breeding habitat to ensure that secondary poisoning does not affect the Greater Spotted Eagle and other birds of prey species. No rodenticides should be used in the forest sector.

Priority: medium  
Time-scale: short

### *3.2.2. Designation and management of protected areas*

In countries other than Russia, all breeding sites should be identified and protection measures taken. These should include, as a minimum, prevention of disturbance during the breeding season and any relative concentrations should be identified and designated as protected areas, with appropriate management. Such measures should be taken alongside general habitat measures outlined in 1.1 above.

In Russia large protected areas may effectively conserve the species as has been shown in the Oka Nature Reserve (Rjazan). All key breeding habitats should be identified and other protected areas need to be established where there are particular concentrations, including in some large areas such as in the Tver and Novgorod regions.

Wintering concentrations should be identified and appropriate designation and

management measures taken. Regular roosts should be strictly protected.

Priority: high  
Time-scale: short/medium

### 3.2.3. *Species protection and management*

#### 3.2.3.1. Control of hunting

Many Greater Spotted Eagles migrate through southern Europe and the Middle East, where the risk of being shot is very high for them, especially in the Lebanon. One of three adult eagles fitted with satellite transmitters in Poland was most probably shot in this country. It is therefore very important to try to stop the killing of raptors and other migrants in these countries, e.g. by campaigns and through better legislation and enforcement.

Measures to curb the shooting and associated disturbance in and around wetlands where the species winters, including creation of no hunting zones and better policing is required.

Priority: very high  
Time-scale: short

#### 3.2.3.2. Increase breeding success by saving the second chick

The Greater Spotted Eagle has a very strong tendency to Cainism. In the ornithological literature there has been described a method of saving the second eaglet for the wild population (Meyburg & Pielowski 1991). Their application can be useful in the case of endangered populations. Second hatched chicks could also be harvested for the purpose of captive propagation and/or reintroduction programs without harming the wild population (Meyburg 1978, 1983).

Priority: medium  
Time-scale: long

## 3.3. **Monitoring and research**

### 3.3.1. *Distribution and population*

#### 3.3.1.1. Surveys of breeding areas

In each country where the Greater Spotted Eagle breeds it is necessary to build up a network of local ornithologists and/or conservationists to monitor the population. National surveys are needed to establish

population trends and level of breeding success. Key breeding areas should be mapped and protected.

Priority: high  
Time-scale: medium/ongoing

#### 3.3.1.2. Migration and wintering

This species spends more than half of the year outside the breeding area, but its migration and wintering is still poorly known. Because of the low recovery rate and the rarity of the species, ringing is unlikely to increase our knowledge. Satellite telemetry has recently improved our knowledge considerably (Meyburg et al. 1995, 1997) and studies using this technique should be carried out in various populations. Surveys are needed to identify key wintering sites for protection and to establish wintering population trends.

Priority: high  
Time-scale: short/medium/ongoing

#### 3.3.1.3. Roosting places

It is important to identify all important roosting places on migration, especially in Syria, Lebanon, Turkey and Egypt and to study means of their protection.

Priority: high  
Time-scale: short

### 3.3.2. *Research into limiting factors*

#### 3.3.2.1. Habitat and food

More research is necessary on habitat and food requirements. This research should take place in areas currently populated by Greater Spotted Eagles as well as in areas that have been abandoned. It is also important to carry out research and monitoring on habitat management to ensure that appropriate practices are being taken.

Priority: high  
Time-scale: medium

#### 3.3.2.2. Hybridisation with the Lesser Spotted Eagle

Some cases described in the literature show possible hybridisation between the Greater and Lesser Spotted Eagles (Bergmanis et al. 1997). It is necessary to investigate such an eventuality where the ranges of both species

overlap and to assess any possible threat to the Greater Spotted Eagle.

Priority: low  
Time-scale: long

### 3.3.3. *Reintroduction and recolonisation experiments*

Reintroduction attempts should be carried out only where conditions are suitable in accordance with IUCN criteria. These experiments could, however, provide a unique opportunity to study the process of recolonisation of empty areas formerly inhabited and the establishment of new populations. Second-hatched nestlings, otherwise lost through Cainism, might possibly be used for this purpose.

Priority: low  
Time-scale: long

### 3.3.4. *Information exchange*

Co-operation and information exchange between research groups working on the Greater Spotted Eagle should be promoted, as well as exchange of workers. Training on research techniques and methodology should be provided by those groups that are carrying out intensive research programmes with the Greater Spotted Eagle. The ongoing work of the International Lesser & Greater Spotted Eagle Working Group within WWGBP should be intensified and supported by other organisations, and international meetings should be held at regular intervals.

Priority: medium  
Time-scale: short/ongoing

## 3.4. **Public awareness and training**

The Greater Spotted Eagle is a little known species. In several countries shooting of raptors including the Greater Spotted Eagle still takes place. Therefore education of decision-makers, landowners, farmers and foresters on priority requirements of the species and conservation needs is very important.

Priority: medium  
Time-scale: short/ongoing

## 4. References

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## 5. ANNEX

### Recommended conservation actions by country

#### Albania

4. Undertake an education campaign about the shooting of the Greater Spotted Eagle and other migratory birds of prey.

#### Belarus

- 1.1.1. Prepare precise guidelines for forest management in all areas where the Greater Spotted Eagle breeds and ensure successful breeding for all pairs.

- 2.1.2, 2.2 Identify and designate breeding sites as protected areas, and manage them to maintain an undisturbed mosaic of habitat.

- 3.1.1 Undertake a national survey of the Greater Spotted Eagle and start a monitoring programme.

#### Estonia

- 1.1.1, 2.1.1 Establish regular contact with new private landowners and ensure that human activity harmonises with habitat protection and with the successful breeding of the Greater Spotted Eagle.

- 1.1.2. Prepare precise guidelines for management in areas where the Greater Spotted Eagle breeds, to preserve the mosaic of the breeding habitat, using EU Regulation 2078/92 as a possible model.

- 1.2, 2.1.2 Review nature conservation legislation to ensure it is sufficiently precise as to afford the necessary protection from disturbance.

- 3.1 Undertake a national survey of the Greater Spotted Eagle and start a monitoring programme.

- 3.2.2 Collect and publish all possible data on hybridisation between the Greater Spotted and Lesser Spotted Eagle.

4. Raise public support for the protection of the Greater Spotted Eagle.

#### Finland

- 3.1 Undertake a national survey and start a monitoring programme if a population exists.

#### Greece

- 2.2, 3.1.2 Survey the IBAs holding regular wintering populations and ascertain any additional protection measures that may be required in key roosting sites.

- 3.1.3 Review EU-funded and other drainage and development plans in the Lake Vistonis SPA and National Park. Ensure in any review of conservation measures in Amvrakikos Gulf that Mavrovouni hill is not excluded from the strictly protected zone. Stop the construction of the road on Mavrovouni hill, Kalamas Delta.

- 2.3.1, 4 Increase public awareness to reduce illegal hunting on the migration route and wintering grounds of the Greater Spotted Eagle. Introduce measures to curb shooting and associated disturbance in and around wetlands, including creation of no hunting zones and better policing.

### **Latvia**

- 1.1.1 Prepare precise guidelines for forest management in the breeding areas.
- 2.1.1 Establish regular contacts with new private landowners and reduce all kinds of human disturbance in the breeding habitat.
- 1.1.3, 2.2 Promote designation of any newly discovered breeding sites to be included in legally protected areas.
- 3.1 Undertake a national survey of the Greater Spotted Eagle and start a monitoring programme.
- 4 Undertake an education campaign for new landowners and foresters and raise public awareness and support for the protection of the Lesser Spotted Eagle.

### **Lebanon**

- 2.3.1 Undertake an education campaign about the shooting of the Greater Spotted Eagle and other 4 migratory birds of prey.

### **Lithuania**

- 3.1. Undertake a national survey and start a monitoring programme if a population exists.

### **Moldova**

- 3.1 Undertake a national survey and start a monitoring programme if a population exists.

### **Poland**

- 1.1.1 Prepare precise guidelines for forest management in areas where the Greater Spotted Eagle breeds.
- 2.1.1 Establish contact with new landowners to preserve the mosaic of all Greater Spotted Eagle habitat.
- 3.1. Continue the national population and breeding success monitoring programme.

### **Romania**

- 4 Increase public awareness to reduce illegal hunting on the migration route.

### **Russian Federation**

- 1.1.1 Prepare guidelines for forest management in all areas where the Greater Spotted Eagle breeds.
- 2.1.3 Promote a complete ban on use of poisoned bait in open places.
- 1.1.3, 2.2 Promote designation of most important breeding sites to be included in legally protected areas.
- 3.1 Undertake a national survey of the Greater Spotted Eagle and start a monitoring programme.
- 4 Raise public awareness to reduce illegal hunting and support for saving breeding and feeding habitat of the Greater Spotted Eagle.

### **Turkey**

- 2.2, 3.1.2, 3.1.3 Survey wintering populations and ascertain any protection measures that may be required in key roosting sites.
- 2.3.1, 4 Increase public awareness to reduce illegal hunting on the migration route and wintering grounds of the Greater Spotted Eagle.

### **Ukraine**

- 1.1.1 Promote designation of sanctuaries around nests.
- 2.1.2 Encourage restriction on human (forestry) activities during the breeding period (April May) within 300 m of nest sites.
- 2.1.3 Promote a complete ban on the use of poisoned bait.

- 1.1.3, 2.2 Promote designation as protected areas of those IBAs where the Greater Spotted Eagle breeds.
- 3.1 Undertake a national survey of the Greater Spotted Eagle and start a monitoring programme.
- 4 Raise public awareness and support for protection of the Greater Spotted Eagles and its breeding habitat. Undertake an education campaign about the shooting of the Greater Spotted Eagle and other migratory birds of prey.