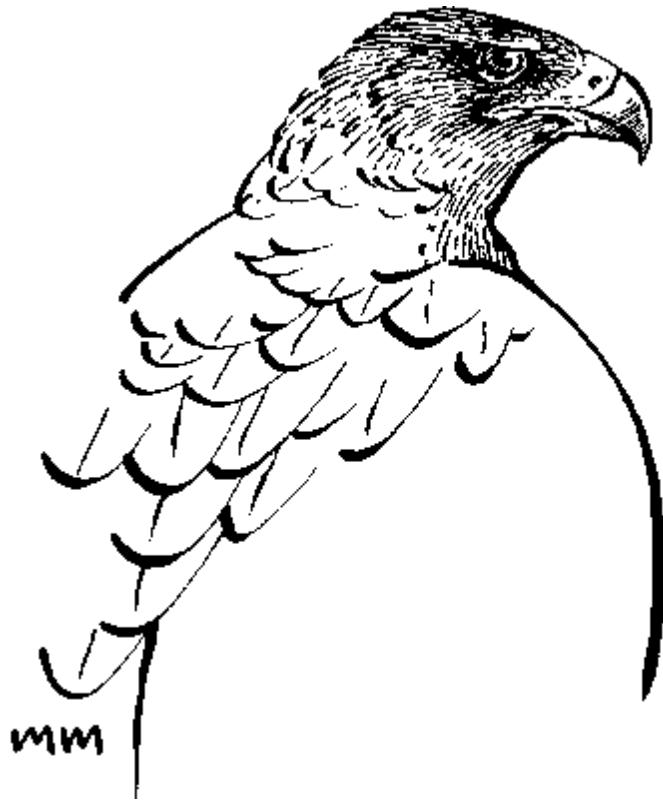


Lesser Spotted Eagle
(Aquila pomarina)



European Union Species Action Plan for Lesser Spotted Eagle (*Aquila pomarina*)

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Milestones in production of action plan

Workshop:	14-18 November 1996 (Kemeri, Latvia)
First draft:	May 1997
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Final draft:	November 1997

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 Lesser Spotted Eagle breeds or occurs on migration. However, given the significance of the Middle East for migration, 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), Former Yugoslav Republic of Macedonia, Georgia, Germany, Greece, Hungary, Israel, Latvia, Lebanon, Lithuania, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, Syria, Turkey, Ukraine.

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SUMMARY

The Lesser Spotted Eagle is classified as a 'SPEC 3' rare species in Tucker & Heath (1994), but according to current information it should be in SPEC category 2, indicating that it is a species whose breeding population is concentrated in Europe, but which has an unfavourable conservation status in Europe.

In Europe it occurs in the eastern part of central Europe, eastern and south-eastern Europe from North-east Germany and Estonia in the north to Greece in the south. The eastern border of the range in Russia and Ukraine is not well known and needs to be studied. The total number of pairs of the nominate race *A. p. pomarina* is unknown but has been estimated to be around 20,000 pairs (Meyburg 1996).

The number of pairs of the only other subspecies, *A. p. hastata*, is extremely low, probably below 100 pairs (Prakash 1996), It is therefore one of the most threatened raptors in the world.

The Lesser Spotted Eagle has shown major population declines in large parts of its (former) western range, e.g. in Germany, former Yugoslavia etc. During the 19th century it has disappeared or almost disappeared from several countries or areas where it bred, e.g. former West Germany, Austria, Czech Republic, large parts of Greece, in some cases only a few decades ago.

In many countries, data on Lesser Spotted Eagle breeding populations are still deficient. Our knowledge of the species' ecology also shows some gaps (e.g. definition of exact ecological requirements for breeding, its variation in different regions and its adaptability to changes in the environment). However, great advances have been made in recent years to understand home range sizes and habitat utilisation during the breeding cycle with the help of conventional telemetry. This extensive study still needs to be published. A comprehensive study of the migration and wintering behaviour and ecology using satellite telemetry has been started and some early results of this ongoing project have already been published (Meyburg et al. 1993, 1995).

Threats and limiting factors

- 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 Lesser Spotted Eagle is a migratory species. In Europe it has suffered a major decline in many countries, especially at the western and southern borders of its range. It is now very rare or extinct in many areas, e.g. Austria, Czech Republic, Germany, Serbia and large parts of Greece.

In November 1996, a second meeting of the International Lesser and Greater Spotted Eagle Working Group took place in Kemerli (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.

Annual counts of the almost total population migrating through Israel in autumn have exhibited a sharp decline since 1984, seeming to have declined by ca 30% or ca 30,000 birds (Alon 2000, Shirihai et al 2000). Apart from modification of habitat, the on-going hunting on the migratory flyways (it is apparently the favourite raptor hunted in Lebanon, where local information suggests killing of 100s and even 1,000s every autumn) has been one of the causes attributed to the decline.

2. Background Information

2.1. Distribution and population

The Lesser Spotted Eagle is distributed from central, eastern and south-east Europe, eastwards to Iran. In Europe it occurs as a breeding species in Albania, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Federal Republic of Yugoslavia (Serbia and Montenegro), Former Yugoslav Republic of Macedonia, Georgia, Germany, Greece, Hungary, Latvia, Lithuania, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, Turkey, Ukraine.

A population estimate is given in Table 1. It can be seen from this table, as well as from Tucker and Heath (1994), that there remains considerable variation in population estimates, reflecting a lack of detailed survey data (see also "Conservation Status and Recent Conservation Measures", below).

Another very rare subspecies - *A. p. hastata* - exists in parts of India and Bangladesh.

The Lesser Spotted Eagle is a migratory raptor, migrating through Turkey, Syria, Lebanon, Israel, Egypt, Sudan, Uganda and Tanzania to winter in Central and Southern Africa: southern Zaire, northern Namibia, Zambia, Zimbabwe, Mozambique, southern Angola, Botswana and northern South Africa (Meyburg et al. 1995, Danko et al. 1996, Christensen & Sorensen 1989, Van De Weghe 1978, Pearson & Meadows 1979).

In Turkey and Israel the Lesser Spotted Eagle is a passage migrant. Counts of numbers passing through Israel during the autumn migration between 1982 and 1996 have ranged from 50,000 to 140,000 birds (Dovrat 1980, 1982, 1986, Leshem & Yom-Tov 1996).

Important concentration points during migration (bottle-neck areas) include Burgas (Bulgaria), the Bosphorus, the Belen Pass (Turkey), Lebanon, Israel, Suez, and Borcka/Arhavi (Caucasus, Turkey).

TABLE 1: Breeding population estimates of the Lesser Spotted Eagle

Country	No. of Pairs	Meyburg (1996)
Armenia	35 - 40	(50)
Azerbaijan	100	
Georgia	85	
Belarus	3250 ± 100	
Bosnia	10	
Bulgaria	60 - 120 ??	(1300)
Croatia	200	
Czech Rep.	2 - 5	
Estonia	375	
FR of Yugoslavia (Serbia and Montenegro)	23-26	
FY Rep. of Macedonia	1-2	
Germany	130	
Greece	60-80	
Hungary	150	
Iran	no data	(500)
Latvia	2000 - 2800	
Lithuania	500-730	
Moldova	10	
Poland	1660-1850	
Romania	100???	(2000)
Russia (European)	min. 300 ???	
of which Kaliningrad	20-200	(200)
North Caucasus	50	(500)
Slovakia	more than 700	
Slovenia	3	
Turkey	300-500	(3000)
Ukraine	200-250	(800)

The population estimates have been based on data/estimates gathered during the workshop held in Latvia in November 1996. Estimates have also been given by Meyburg (1996) and by participants of the workshop at Zielonka (Poland, November 1991) (Meyburg et al. 1992). The estimates by Meyburg (1996) are given in brackets in some cases.

2.2. LIFE history

Taxonomic Status

The Lesser Spotted Eagle is taxonomically closely related to the Greater Spotted Eagle (*Aquila clanga*) (Bergmanis 1996, Meyburg 1974 a, Wendland 1959, Zhezherin 1969). 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 (Bergmanis et al. 1997).

There exists another subspecies, *A. p. hastata*, which breeds in parts of India and perhaps Bangladesh, Pakistan and Burma. It is extremely rare and little known. It is separated from *A. p. pomarina* by a large gap ranging from the Caspian Lowlands in north-western Iran to somewhere in Pakistan or India. Both forms have sometimes been described as separate species but are probably subspecies (Meyburg 1994, Prakash 1996).

Breeding

The Lesser Spotted Eagle builds a large nest of sticks on trees below the canopy, mostly in deciduous forest and only rarely in dry pine forest (von Dobay 1934, Gentz 1965, 1967, Glodushko 1959, Haraszthy et al. 1969, Hoffmann 1938, Meyburg 1970, 1973, 1994, Vlachos 1989, Wendland 1932 1951, 1958, 1959. Very exceptionally nests are built on rocks and on the ground (Pcola 1991, Reistetter 1991).

The clutch most often consists of 2, often of only 1, and very rarely of 3 eggs (Wendland 1959, Meyburg 1970, 1994). Breeding success is around 0.5 - 0.8 young per breeding pair (average 0,69 in 265 breeding attempts in Germany) (Meyburg 1970, 1973, 1994, Neubauer 1991, Rodziewicz 1996, Svehlik & Meyburg 1979). Breeding starts at laying of the first egg and takes 37-41 days (Scheller & Meyburg 1996, Kalaber 1974). After hatching chicks stay in the nest for 8 weeks (Meyburg 1970, Siewert 1932, Sladek 1957, Wendland 1959). There is a relatively high level of unsuccessful pairs. The species' breeding is characterised by

Cainism, whereby the older chick kills its sibling within the first 1 - 14 days after hatching (Wendland 1959, Meyburg 1970, 1974 a,b, 1978 a, Sladek 1959); only very exceptionally do two young eagles fledge from a brood (e.g. Danko 1986).

Adult plumage is acquired after several (probably 3-4) years. Lesser Spotted Eagles build their own nest, accept artificial nests or those of other large birds (e.g. Common Buzzard, Black Kite, Goshawk, Black Stork). Nests are changed frequently from one year to the other by most pairs but instances are known when eyries were occupied in up to ten consecutive years (Meyburg 1991). Successful captive breeding is known only from Riga Zoo (Matsone et al. 1996).

Feeding

The diet consists of small mammals *Apodemus*, *Microtus*, Hamster *Cricetus cricetus* and sometimes *Suslik Citellus citellus*. Also common in the diet are some species of frogs and other amphibians. In Greece the most important food is snakes and also lizards. Insects and several bird species are also taken (Geyr von Schweppenburg 1913, Golodushko 1958, 1959, 1961, Haraszthy et al. 1996, Palasthy & Meyburg 1973, Scheller & Meyburg 1996, Sladek 1959 b, 1993, Vlachos & Papageorgiou 1996).

Habitat requirements

The Lesser Spotted Eagle breeds in forest but feeds on adjacent pastures, cultivated areas and wet meadows. The breeding habitat consists of montane forest (in the Caucasus), hills, and lowland floodplain areas and also lowland forests. A very important factor in the choice of nest sites is the presence of open landscape near to the nest. It hunts over open fields and agricultural areas. Many types of open landscape are important, but tall crops such as maize or sunflowers inhibit access to prey. In lowlands important features of the feeding habitat are single standing trees or tree groups, hay stacks, masts or other vertical structures enabling successful hunting for the eagle in unfavourable weather conditions such as prolonged rain.

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 (Brooke et al. 1972, Meyburg et al. 1995).

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 or reforestation with exotic tree species
- selective cutting of old and large trees.

In several countries also:

- drainage of the forest
- disturbance during the breeding period by logging.

Importance: critical

Agricultural sector

In several countries, recent privatisation has led to intensive exploitation of feeding habitat. Natural regeneration of abandoned lands has caused the loss of important feeding habitats.

In feeding habitats the most important problems are:

- loss of landscape mosaic leading to loss of feeding areas that has caused the decline of the most important prey (amphibians, reptiles and other vertebrates)
- loss of grassland
- natural regeneration
- afforestation
- loss of water meadows
- intensification / monoculture
- creation of reservoirs
- cultivation of unsuitable crops

Importance: critical

Human disturbance

In several countries privatisation has resulted in many new landowners (many more than before). Also in privately owned forests and fields human activity is much greater than before.

Importance: medium

Nest robbing and illegal trade

The theft of chicks or eggs and illegal trade are only rare in the case of Lesser Spotted Eagles, although this might sometimes be a problem. There is no falconry interest in the species.

Importance: low

Shooting

Shooting is a problem in the Czech Republic, Slovakia, Romania and Greece; it also occurs in Latvia and Yugoslavia (Serbia) and perhaps other countries where the species breeds. In the Mediterranean region during migration, especially in Greece, north-east Turkey, Lebanon and Syria, the shooting of migrating birds of prey is a common practice. Especially the shooting of Lesser Spotted Eagles in Lebanon is one of the most serious threats to the species (Meyburg et al. 1995).

Out of four young Lesser Spotted Eagles fitted with satellite transmitters, only one reached Africa during its first autumn migration. One bird was definitely and another probably shot in the Lebanon, whereas the fourth one was probably shot in Greece (Meyburg et al. 1993, 1995).

Importance: critical

2.4. Conservation status and recent conservation measures

Albania

The population size is estimated to be 5-20 pairs with a small decrease during 1970-1990. (Tucker & Heath 1994). No further information is available.

Armenia

The Lesser Spotted Eagle is included in the Armenian Red Data Book. There are only a few breeding pairs, distributed in the mountain forest of northern and central - southern parts of the country. Information on the species is very scant. The total number

of the breeding pairs is unknown. A. Abuladze estimated 35 - 40 pairs.

Azerbaijan

The population is confined to western and central parts of the country, mostly in floodplain areas. Total number of breeding pairs unknown. A. Abuladze estimated 100 pairs.

Bulgaria

A large project has recently been started to map the distribution of all large raptors, including the Lesser Spotted Eagle, on a national scale and to monitor their populations in some regions such as the Eastern Rhodopi, Eastern Balkan range etc. Annual monitoring of eagles migrating along the Black Sea coast has been carried out in recent years. The maximum count of migrating birds per year was 25,794 (1990). The most important migration period is the end of September.

The breeding population was estimated at 60-120 pairs at the Kemerli meeting following evident decline during the last five years, but this is most probably far too low. The real population may well be 500-1000 pairs (Baumgart 1996) or even 1300 pairs (Meyburg 1996) since the species breeds in all parts of the country. The highest density is on Strandzha mountain, where about 60 pairs breed on approximately 3,000 sq. km. The eagle breeds from sea level up to 1,400 m, but mostly between 300 - 400 m.

The species is protected by the Law for the Conservation of Nature (1962) and is listed as threatened in the Red Data book of 1985. Some breeding sites are under legal protection, including the main breeding areas on Strandzha Mountain, but law enforcement is very weak.

Belarus

The Lesser 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 Lesser Spotted Eagle in category 3 (rare and threatened). The species breeds in Belarus in the wet lowland forests. (The highest point of the country is 300 m). The population is estimated at 3250 pairs (3000 -3500 pairs according to Ivanovsky & Tishechkin 1993), based on limited density data. The number of breeding pairs is stable.

The Belorussian Ornithological Society has had considerable success with artificial nests in young forest in the northern part of the country only.

Bosnia-Herzegovina

The breeding population is estimated at about 10 breeding pairs. No monitoring takes place in the country due to armed conflict.

Croatia

The Lesser Spotted Eagle is protected under the Law of Nature Protection of 1994. In Croatia the most important breeding habitat is floodplain forest with a mosaic of water meadows and fields. The present status is unknown, estimated to be about 200 pairs. In recent years the species was not monitored because of the armed conflict affecting the country.

Czech Republic

The Lesser Spotted Eagle is strictly protected by law in the Czech Republic. There are very few breeding birds. A small isolated population of 3-4 pairs in the Sumava mountains has recently not been confirmed. The maximum number of breeding pairs is 5. The species must formerly have been much more widespread.

Estonia

The Lesser Spotted Eagle and its breeding sites are protected by the Nature Conservation Law, but this law is regarded as too general. 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.

Estonia is on the northern border of the species' breeding range. It breeds in Estonia in the lowland forest (Volke 1996). The highest point in the country is 312 m. The average age of the breeding forest stands is 93 years. During the last 20-30 years the number of Lesser Spotted Eagles is said to have increased and today is perhaps higher than 100 years ago. However, this impression may be due to more intensive research. The total number of breeding pairs is estimated at 375, but is possibly two times greater.

Federal Republic of Yugoslavia (Serbia and Montenegro)

The Lesser Spotted Eagles is designated as a Natural rarity in Serbia (1993) and Montenegro. It is listed in the Preliminary Red Data Book of Birds of Serbia (1991). A permanent hunting prohibition is in force in Serbia (1993).

The total breeding population is estimated to be between 23 and 26 pairs, while 10 years ago it was 30-35 pairs. There are 6-8 pairs in Vojvodina and 17-18 pairs in the other regions of Serbia. The species no longer breeds in Montenegro. It probably became extinct a few decades ago.

Georgia

In Georgia the Lesser Spotted Eagle breeds between 200 - 1000 m, but most of the population is in the lowlands. The eagles breed mainly in old floodplain forest and on the gentle slopes of low mountains (Abuladze 1996). The breeding population is estimated at 85 pairs. The population has declined since 1930, due to loss of breeding habitat and recreational pressure. In the eastern part of the country there is a monitoring project, but in the western part there are no precise data.

Germany

The Lesser Spotted Eagle in Germany is legally protected by law as a strictly protected species; it is also included in the Red Data Book of Germany as an Endangered Species. It nowadays breeds only in lowland forest with fields, water meadows and agricultural mosaic. Formerly it also bred in mountains, e.g. in the Bayerische Wald and Böhmerwald in Bavaria.

The majority of the breeding population (97 pairs) is found in a 7780 sq km area in the east of Mecklenburg-Vorpommern (average 1.28 pairs/100 sq km) east of the Rostock-Berlin motorway. Within this area there are four key areas with densities of over 2 pairs per 100 sq km: area 1 (mainly the valleys of the rivers Recknitz and Trebel) (1310 sq km in size) with 48 pairs (3.66 pairs/100 sq km), area 2 (mainly the Mecklenburgische Schweiz) (649 sq km in size) with 13-18 pairs (2.0-2.8 pairs/100 sq km), area 3 (south of the river Peene) (800 sq km in size) with 28 pairs (3.5 pairs/100 sq km) and area 4 (river Randow basin) (275 sq km in size) with 8 pairs (3 pairs/100 sq km).

Some of these pairs breed in recently created nature reserves but many pairs are now threatened by the construction of a new motorway planned to come from Hamburg along the Baltic coast to join the motorway from Berlin to Szczecin.

The German population is well monitored (Gentz 1975, Langgemach & Sömmer 1996, Matthes & Neubauer 1977, 1987, 1989), with today 130 pairs. The breeding area is now restricted to north-east Germany (Scheller & Meyburg 1995). The species has become extinct in a large area of its former range (Schleswig-Holstein, Lower Saxony, Bavaria, western part of Mecklenburg-Western Pomerania, all of Brandenburg except the north-east). The number of breeding pairs decreased significantly in the last 100 years. In earlier decades this was due to direct persecution (shooting and egg-robbing). Loss of breeding and feeding habitat is supposed to be the most important factor in the recent decline, and also loss in quality of both, due to intensification of agriculture and loss of water meadows. However, areas with good habitat remaining are unoccupied today and losses during migration due to shooting are certainly also responsible for the lack of adult birds and thus absence of a population pressure which could lead to a re-colonisation of formerly lost areas.

Greece

Its breeding habitat range from sea level to 1200 m, but mostly between 50m and 300m. The breeding population of Greece is 67-90 pairs, of which Evros prefecture holds 30-34 pairs including 15-17 pairs in the Dadiá-Soufli forest reserve; this reserve should be extended to include all suitable habitat. In the past there was a great decline of the species population and range. The decline may have slowed down recent years but it is still apparent in the better known areas. In some cases pairs were found present in former areas after years of "absence" (eg following the establishment of artificial water-reservoir in the Thessalian plain - former Lake Karla).

Today the Lesser Spotted Eagle is protected by the Joint Ministerial Decision 41 4985/1985, and listed as a vulnerable species in the Greek Red Data Book. The main threats to the species are forest destruction and inappropriate management, habitat changes, new agricultural practices and the drastic decline of the most important

food: amphibians and reptiles (Hallmann 1986, Vlachos 1989).

Hungary

The species has been in the highest category of legal protection since 1954 and included in the Hungarian Red Data Book. It breeds in Hungary mainly in the northern mountain area between 100 - 500 m. In this region there are several protected areas, eight of them Important Bird Areas: Börzsöny 004, Zemplen 012 and Matra 030 (all three Landscape Protection Reserves) and Bükk 004 and Aggtelek 028 National Parks. As breeding habitat the eagles prefer oak and beech forests. They also breed in the floodplain and lowland forests. The population in the last 20 - 30 years has been stable, but previously (no exact data available) was higher. In the 19th century, after river control, Hungary lost over 2 million ha. of floodlands.

In Bükk National Park and Zemplen Landscape Protection Reserve the species is monitored. In other parts of the country only estimated numbers, based on the general survey of birds of prey, are available (Haraszthy et al. 1996).

Israel

The great majority of the population migrates through Israel. Regular counts have been taking place over many years, and these suggest an overall decline in the breeding population in Europe. However, European data do not reflect this. On the other hand nor do the breeding population estimates reflect the size of the autumn migrant population (143,000 individuals at Kfar Qassem in 1983; over 74,000 there in 1989 (Tsovel 1990, Shirihai and Christie, 1992), and it is possible that the European population remains under-estimated or that a significant population exists that has yet to be documented.

Key sites for the migrant population include the Jezre'el, Harod and Bet She'an valleys, an Important Bird area subject to intensifying agriculture and human disturbance.

Latvia

The Lesser Spotted Eagle is on the Red List (1993) as a rare bird (category 3). It is on the list of specially protected species.

The population is 2000-2800 pairs (Strazds et al. 1997). This population is higher than after the Second World War. Circa 100-120 pairs (4.6%) are estimated to breed in the currently established local nest site sanctuaries. The first list of sanctuaries designated after independence in 1996 comprised 51 areas with a total area of 931.6 ha especially for this species, ranging individually from 5.8 to 108.4 ha. Other pairs are present in sanctuaries created for other species (such as Black Stork), other types of protected areas (National Parks, Nature Reserves) or sanctuaries drafted for designation in 1997.

The species is monitored in three large areas in the country (Bergmanis et al. 1989, Strazds et al. 1997), yet taking into account the percentage of the population covered this monitoring is not sufficient.

The most important breeding habitat is various mixed and deciduous forest on rich soils, with only a low density in the coastal pine forest.

Lithuania

The Lesser Spotted Eagle is listed in the national Red Data list of species (1976) as rare, threatened species (category 3). Consequently, the species is under legal protection in Lithuania - any kind of physical intervention or destruction of nests is prohibited by law. Penalties for nest site destruction or killing the bird is up to 500 Litas (circa 110 US \$). Between 1988 and 1994 local protection zones have been created for 127 nests.

There is a survey covering a third of all forest - 650,000 ha (Drobelis 1996). The total population is estimated at 500 - 730 pairs. The population in the last 20 years has been stable. The species breeds throughout all the country.

Moldova

Only a very small number of breeding birds, estimated at 10 pairs. There are no more concrete data from this country at present and survey work may be required to ascertain the current situation

Poland

The species is listed as protected with a special form of protection for nest sites. The population is estimated at 1650 - 1800 pairs.

Breeding mostly in north-west, north, east, and south-east Poland. The population is stable if not slowly increasing. In other regions also there are breeding pairs, but the density is much lower. Since 1984 nest sites have been protected by two zones around the nest: the first 3-12.5 hectares are strictly protected. The population is well monitored (Rodziewicz 1996). There are annually more than 400 nests under surveillance. Most of the population breeds in the lowlands, with only 20% in mountain areas.

Romania

The Lesser Spotted Eagle has been protected by Hunting Law since 1976 and by the Bern Convention, signed in 1994.

There is little information about the species in Romania. According to the old literature the eagle has formerly been common and widespread. According to Uhlig (1996) The Lesser Spotted Eagle is still widespread throughout the country and inhabits primarily deciduous woodlands in the mountains between 300 and 1600 m a.s.l. It occurs above all along the edge of the whole Carpathian range and in the mountains of Transylvania. Uhlig (1996) estimates 400-600 pairs, Meyburg (1996) ca. 2000 pairs in view of the large size (237,500 square km) of the country.

Russian Federation

In Russia the Lesser Spotted Eagle is included in the draft of the second edition of the Red Data Book as a rare species with a limited range (category 3). The total Russian population is estimated at a minimum of 300 pairs including the Kaliningrad area and North Caucasus, but there is no monitoring in these very large areas. The eastern border of the species range is not well known and apparently further east than formerly described in handbooks.

The most important breeding areas are the lowland forests, maximum 500 m above sea level. In the North Caucasus the species breeds up to a maximum of 1100 m. The monitored population is stable or showing a slight increase. Some important breeding areas are protected but it is necessary to increase the number of local reserves ("zakaznik") in other important areas.

Slovakia

The Lesser Spotted Eagle is protected in the country - it is considered a vulnerable species in the list of endangered bird species of Slovakia. Penalty for its killing depends on the stage of development (egg, juvenile, adult) and location of the act (differentiated according to the site's degree of protection). It ranges from 250 DM up to 4000 DM.

The breeding population is stable. The number of breeding pairs is estimated to exceed 700. Areas with the highest density are located in the northern part of the country (Danko 1990). Most important breeding areas are lower than 500 m.a.s.l. The highest breeding place was found at 850 m.

The population has been monitored since 1986 (Group of Protection of Birds of Prey and Owls of Slovak Society for Ornithology) mostly in north-western, northern and eastern areas of the country.

Slovenia

The Lesser Spotted Eagle is a very rare breeding bird in Slovenia. There are only three known breeding pairs.

Turkey

Fully protected from hunting under Terrestrial Hunting Legislation No. 3167. There is no monitoring of the breeding population in the country. Meyburg (1996) estimated 3000 pairs and found high concentrations in some areas in the north-east of the country. There is no information about trends in the breeding population. This compares with the estimate in Tucker and Heath (1994) of 30-500 pairs; this range could be revised to 300-500 pairs (G. Magnin *in litt.*). Meyburg (1996) found concentrations of breeding pairs near large wetlands. There are, however, many areas destroyed by drainage so that a negative population trend must be anticipated.

Turkey is also a very important migratory area for this species. There are three important bottleneck areas: the Bogazici (Bosphorus), Dogu Karadeniz Daglari (Borcka) in the Caucasus and the Nur Daglari (Belen Pass) near Syria. Migrants can probably occur anywhere across central and south Anatolia but seem to follow a narrow corridor from the Bosphorus to the Belen Pass, according to results from satellite telemetry. There is some irregular

monitoring of migrants in the bottleneck areas, but no systematic collection and analysis of all data. It would be very important to try to collect all observations from the many different groups observing in the bottleneck areas.

Ukraine

The Lesser Spotted Eagle population has been estimated at 220-250 pairs for the whole of the country and 60 - 70 pairs for Western Ukraine (Gorban 1996). Taking into account the size of the country and other factors Meyburg (1996) estimated ca. 800 pairs for Ukraine.

There are no data from some breeding areas but on monitored sites the population is stable. The species breeds in humid forest and also in the mountain area up to a maximum of 1000 m a.s.l. (Bokotey & Sokolov 1994). It is included in the Ukrainian Red Data Book.

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 short term, to halt the population decrease and safeguard all existing breeding habitat.

In the medium to long term, to safeguard the distribution and numbers of the European population of the Lesser 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 Lesser Spotted Eagle

3.1.1.1. Forestry

Forest management has conflicted with Lesser Spotted Eagle conservation in all European countries. Governments should review their forestry policies to ensure that they are compatible with conservation of the Lesser Spotted Eagle. It is recommended that all national forest policies should include the following important elements:

- Provision for the protection of globally threatened, vulnerable and rare species
- Forestry activity should be prevented from the end of March to the end of September within 300 m of all active nests of all large raptors including the Lesser Spotted Eagle
- Precise guidelines for forest management in areas where sensitive species breed
- Co-operation with forest owners to secure successful breeding
- To restrict human activity in forests in nesting habitat between April and September
- Prevent any further loss of all kinds of humid forest

Priority: high

Timescale: medium

3.1.1.2. Farming and agriculture

Since the Lesser Spotted Eagle breeds in forest and open, agricultural-mosaic habitat, all kinds of open-hunting areas up to 2 km to the nest are very important, as are all kinds of solitary trees. However, there can be conflict with human activity leading to loss of breeding habitat or decline in breeding success. It is very important to create guidelines for farming which are compatible with the presence of this species as a traditional breeding bird. It is recommended that such policy should incorporate the following elements:

- to stop loss of all kinds of grassland
- to stop all kinds of state support for changes in breeding 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 (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia) should plan for the incorporation of agri-environment measures within their agriculture policies and target these measures at Lesser Spotted Eagle and other threatened species dependent on agricultural habitats.

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 Lesser Spotted Eagle breeds
- Conservation of remaining original forests, particularly all kinds of humid forest in central Europe, and all kinds of floodplain forest

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

Priority: high
Time-scale: short/medium

3.1.1.4. International co-operation

Co-operation and information exchange between conservationists working on the Lesser Spotted Eagle and its habitats should be promoted. As the species is relatively widespread among several countries, conservation successes and techniques should be shared. In particular, any experience to be gained through the approximation process leading to EU enlargement (such as, for example, development of Environmentally Sensitive Areas), should be shared.

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:

- the Lesser 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
- environmental impact assessments are made before afforestation, dam construction, or any other infrastructure which may have an impact on Lesser Spotted Eagle habitat
- all kinds of poisoning are strictly prohibited
- the national laws include protection of 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

For certain range states a detailed national action plan may need to be prepared 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 the Lesser Spotted Eagle habitat is in good condition to preserve all pairs*

3.2.1.1. Prevention of disturbance in breeding areas near the nest

- during the breeding season (April - September), all kinds of human activity should be prohibited within a 300 m radius round the nest
- to stop all kinds of human activity which would change the mosaic of the breeding and feeding habitat
- all kinds of human activity involving disturbance of the groundwater system should be restricted within 2000m. surrounding a nest (Scheller et al 1996)
- large scale building such as new roads, new powerlines, extension of towns etc. should be prohibited within a 3000m. radius around the nest (Scheller et al. 1997).

Priority: high
Time-scale: short

3.2.1.2. 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; in the southern part of the range (e.g. Greece) they should cease before the end of February. Trees with nests should never be cut down.

Priority: high
Time-scale: short/medium

3.2.1.3. Artificial nests

In several areas artificial nests could be important if feeding conditions are good and if there are no natural nest sites available. The artificial nests should be built before the breeding season.

3.2.1.4. Prevention of mortality by poisoning

The occurrence of poisoning must be banned to ensure that secondary poisoning does not affect the Lesser Spotted Eagle and other birds of prey species.

No rodenticides should be used in the forest sector.

Priority: low
Time-scale: short

3.2.1.5. Maintenance of the mosaic structure of the habitat (particularly patches of wetland) in the agricultural landscape

Priority: high
Time-scale: short/medium

3.2.1.6. Electrocutation

This may be important in some areas, and has been identified as a problem in Slovakia. The companies responsible for the powerlines need to adopt corrective measures in areas of high incidence.

Priority: medium
Time-scale: medium

3.2.2. *Designation and management of protected areas*

3.2.2.1. Breeding areas

All main breeding concentrations 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.

Within the EU (Germany and Greece), the IBAs of particular importance are SPAs or proposed SCIs under the Habitats Directive.

Priority: high
Time-scale: short/medium

3.2.2.2. To protect roosting places on the migratory route

The Lesser Spotted Eagle often migrates in large groups. Such groups annually follow the same route and use the same resting places. These should be identified and catalogued and appropriate action taken to ensure their integrity and freedom from disturbance during the migration period.

Priority: high
Time-scale: short

3.2.3. *Species protection and management*

3.2.3.1. Control of hunting

In many countries Lesser Spotted Eagles are still shot, especially on migration. Shooting of large raptors must be banned absolutely.

Priority: very high
Time-scale: long

3.2.3.2. Increase breeding success by saving the second chick

The Lesser Spotted Eagle has very strong Cainism. In the ornithological literature there have been described several methods of saving the second eaglet (Meyburg 1968, 1971, 1978 a,b, Haraszthy et al. 1996 b, Janossy 1985). Their application can be useful in the case of endangered populations. These otherwise lost chicks could also be used to help small isolated populations far away from the main population or to carry out reintroduction programmes without harming the wild population, if all the other conditions (e.g. food availability, suitable breeding habitat etc.) are present.

Priority: low
Time-scale: long

3.3. Monitoring and research

3.3.1. *Surveys of breeding populations*

In each country where the Lesser Spotted Eagle breeds it is necessary to build up a network of local ornithologists or conservationists to monitor the population. National surveys are needed to clarify the correlation of population trends and breeding success with data from migration routes.

Priority: high
Time-scale: medium/ongoing

3.3.2. *Study of migration and wintering*

The species is a long-distance migrant spending more than half of the year outside the breeding area. Almost all losses of adult, immature and juvenile birds occur during their absence from the breeding grounds. It has further recently become apparent that breeding success may be very low because of late arrival in the breeding area. Although the study of migration and wintering has well advanced in recent years due to the use of satellite telemetry, much remains still to be learnt about this important phase of the annual cycle and the dangers encountered

by the species. It is therefore important to continue the study of migration and wintering which should include the use of satellite telemetry.

Priority: high
Time-scale: medium/ongoing

3.3.3. *Research into limiting factors*

More research is necessary on the factors limiting Lesser Spotted Eagle populations, especially habitat requirements, food diversity and losses during migration. This research should take place in areas currently populated by Lesser Spotted Eagles as well as in areas which have been abandoned. It is also important to carry out research and monitoring on habitat management to ensure that the appropriate measures are being taken.

It is important to start a programme to study the losses during migration due to shooting and other factors. This project should aim to find out where the shooting occurs and how it could be stopped. Once this has been achieved measures should be taken to stop this shooting which may well be the most important negative factor for the species' survival.

Priority: high
Time-scale: medium

3.3.4. *Monitoring the numbers during migration*

Over 99 % of the population migrates through Israel during autumn, a unique opportunity to monitor the entire population. In view of the recent decline in numbers counted here it is important to continue to study the numbers of adult, immature and juvenile birds on migration in this country.

Priority: high
Time-scale: medium

3.3.5. *Roosting places*

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

Priority: high
Time-scale: short

3.3.6. *Migration in Greece*

A study of the number of migrating birds in Greece and their migration routes is needed. Some birds do not migrate over the Bosphorus but take an unusual route through southern Greece (Peloponnese, Crete). This migration route is little known.

Priority: low
Time-scale: long

3.3.7. *Whereabouts of non-breeders*

Very few birds in immature plumage are observed in the breeding grounds during the breeding season. It is therefore presumed that most of these birds remain in Africa. They are not seen, however, in the wintering areas. It is therefore important to study the movements of young birds before they start to breed and the problems they may encounter by means of satellite telemetry.

Priority: medium
Time-scale: long

3.3.8. *Reintroduction and recolonisation*

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

3.3.9. *Information exchange*

Co-operation and information exchange between research groups working on the Lesser 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 Lesser 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.

Many groups count migrating Lesser Spotted Eagles at concentration points such as the Bosphorus, the Belen Pass etc. These counts are, however, often conducted by groups from many different countries and the results buried in notebooks instead of being published. It would be important to try to systematically collect and analyse all these data.

Priority: medium
Time-scale: short/ongoing

3.4. **Public awareness and training**

The Lesser Spotted Eagle is little known even in countries where it is a common breeder. In several countries shooting of raptors including the Lesser Spotted Eagle still takes place. Therefore education of landowners, farmers and foresters on priority requirements of species and conservation needs is very important.

Priority: medium
Time-scale: short/ongoing

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5. ANNEX

Recommended conservation actions by country

Albania

- 3.1. Assess the current situation of the Lesser Spotted Eagle and start a monitoring programme if it as a breeding population.

those sites where the Lesser Spotted Eagle breeds.

- 2.3.1. Undertake a campaign against the shooting of the Lesser Spotted Eagle and all other birds of prey.

Armenia

- 1.1.1. Promote precise guidelines for forest management and establishment of buffer zones around nest sites for the Lesser Spotted Eagle and other sensitive species.

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

4. Undertake Education Campaigns about the threats of shooting birds of prey in Azerbaijan.

- 1.1.2, 2.2 Establish an IBA network including all important breeding areas of the Lesser Spotted Eagle Promote designation as Special Protection Areas of all those sites where the Lesser Spotted Eagle breeds.

Bulgaria

- 2.3.1. Undertake a campaign against shooting of the Lesser Spotted Eagle and all other bird of prey species.

- 1.1.1 Promote precise guidelines for forest management for areas where the Lesser Spotted Eagle breeds.

- 1.1.3 Promote protected areas covering all important breeding areas of the Lesser Spotted Eagles.

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

- 2.2 Promote conservation management plans in all protected areas where the Lesser Spotted Eagle breeds.

4. Undertake an Education Campaign about the threat of shooting birds of prey in Armenia.

- 3.1. Carry out a population survey and start regular monitoring.

- 3.4. Continue and extend the counting of migrating Lesser Spotted Eagle and identifying the most important roosting sites and areas during the migration period.

Azerbaijan

- 1.1.1. Promote precise guidelines for forest management in areas where the Lesser Spotted Eagle and other sensitive species breed.

Belarus

- 1.1.2, 2.2 Establish an IBA network including all important breeding areas of the Lesser Spotted Eagle Promote designation as Special Protection Areas of all

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

3.1. Continue and expand the monitoring programme.

Bosnia - Herzegovina

3.1. Undertake a national survey of the Lesser Spotted Eagle.

Croatia

1.1.3, 2.2 Promote appropriate conservation management in all protected areas where the Lesser Spotted Eagle and other sensitive birds of prey breed.

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

Czech Republic

1.1.1. Prepare precise guidelines for management in areas where the Lesser Spotted Eagle breeds.

4. Mobilise public awareness to support protection of the Lesser Spotted Eagle.

Estonia

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

1.1.2. Prepare precise guidelines for management in areas where the Lesser Spotted Eagle breeds, to preserve the mosaic of the breeding habitat.

2.1.1. Use the nest protection zone provision to promote restriction of human activities around nests.

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

Federal Republic of Yugoslavia (Serbia & Montenegro)

1.2. Promote legal protection of the Lesser Spotted Eagle and all other bird of prey species.

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

Georgia

1.1.1. Prepare precise guidelines for forest management and establishment of buffer zones around nest sites of the Lesser Spotted Eagle.

2.1.1. Promote restriction of human activities around nests.

2.3.1. Undertake a campaign against shooting the Lesser Spotted Eagle and all other birds of prey.

3.1. Continue and expand the existing monitoring programme for the Lesser Spotted Eagle.

4. Raise public awareness to support protection of the migratory passage of the Lesser Spotted Eagle.

Germany

1.1, 1.2 Large scale protection of extensively managed wet meadow landscapes, floodplain forests ("Bruchwälder") as well as short grass meadows within forests as feeding sites.

1.1, 2.1 Maintenance of breeding sites through large scale protection of an appropriate percentage of ancient forest stands; retention of individual large trees within managed forests; protection of semi-natural riverine forests.

2.1, 2.2 Prevention of disturbance in breeding areas through declaration of "Eyrrie Protection Zones" and restriction of public access to the most important feeding areas.

Greece

- 1.1.1. Establish regular contact with private landowners and prepare precise guidelines for forest management in the breeding areas, and establish buffer zones around nests and reduce all human activity in the breeding period.
- 2.2.1 Extend the protected area of Dadiá-Soufli to include appropriate management for all suitable habitat.
- 3.1. Continue and expand the existing monitoring.
4. Increase public awareness to reduce illegal hunting on the migration route of the Lesser Spotted Eagle.

Hungary

- 1.1.1., 2.1.1 Prepare precise guidelines for forest management in the breeding areas, establish buffer zones around nests and ensure reduction of all kinds of feeding habitat degradation.
- 3.1. Continue and expand the existing monitoring programme for the Lesser Spotted Eagle.

Latvia

- 1.1.1, 2.1.1 Establish regular contacts with new private landowners, prepare precise guidelines for forest management in the breeding areas and reduce all kinds of human disturbance in the breeding habitat.
- 2.1.5. Promote agricultural management in harmony with conservation on the feeding habitat of the Lesser Spotted Eagle.
- 3.1. Continue and expand the existing monitoring programme for the Lesser Spotted Eagle.
4. Raise public awareness and support for the protection of the Lesser Spotted Eagle; undertake an education

campaign for new landowners and foresters.

Lithuania

- 1.1.3 Design a specific methodical approach for conservation of old forest patches to establish a network of potential breeding sites.
- 2.2. Designate protected areas specifically for this species in Labunava, Kedainiai district.
- 3.1. Renew and continue the existing monitoring programme.
4. Undertake an education campaign for new landowners.

Moldova

- 3.1. Undertake a national survey of the Lesser Spotted Eagle and start a monitoring programme.
- 2.2 Identify an IBA network including all breeding habitats of the species, and designate protected areas accordingly.

Poland

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

Romania

- 1.2. Promote strengthening of existing legislation for the protection of rare birds of prey.
- 2.1.4. Promote a complete ban on use of poisoned bait.
- 3.1. Undertake a national survey of the Lesser Spotted Eagle and start a monitoring programme.

4. Raise public awareness and support for protection of the species.

Russian Federation

- 1.1.1. Prepare guidelines for forest management in all areas where the Lesser Spotted Eagle breeds.
- 2.1.4. Promote a complete ban on use of poisoned bait in open places.
- 3.1. Undertake a national survey of the Lesser Spotted Eagle and start a monitoring programme.
4. Raise public awareness and support for saving breeding and feeding habitat of the Lesser Spotted Eagle.

Slovakia

- 1.1.1. Prepare precise guidelines for forest management in all areas where the Lesser Spotted Eagle breeds.
- 2.1.1. Encourage restriction of human activities during the breeding period within 300 m. of nest sites.
- 3.1. Undertake a national survey and follow up the monitoring programme with inclusion of a breeding success record.
- 2.1.6 Identify critical areas for electrocution of birds of prey and urge the companies responsible for the powerlines to adopt corrective measures.

Slovenia

- 1.2.2 Initiate a long-term conservation programme based on a national action plan for the species.
- 3.1. Undertake a national survey of the status of the Lesser Spotted Eagle and start a monitoring programme.

Turkey

- 2.2 Promote designation as protected areas of those IBAs where the Lesser Spotted Eagle breeds.
- 3.1. Undertake a national survey of the status of the Lesser Spotted Eagle and start a monitoring programme.
- 3.2, 3.4 Monitor migrants regularly at three bottleneck IBAs.
- 3.5 Identify major roosting places, particularly at Bogazici (Bosphorus), Dogu Karadeniz Daglari (Borcka) and Nur Daglari (Belen Pass) IBAs.
4. Undertake an education campaign about the shooting of migratory birds of prey.

Ukraine

- 1.1.1. Promote designation of sanctuaries around nests.
- 1.2, 4 Raise public awareness and support for protection of the Lesser Spotted Eagles and its breeding habitat.
- 2.1.1, 2.1.2 Encourage restriction on human (forestry) activities during the breeding period (April-June) within 300 m of nest sites.
- 2.1.4. Promote a complete ban on the use of poisoned bait.
- 2.2. Promote designation as protected areas if those IBAs where the Lesser Spotted Eagle breeds.
- 3.1. Undertake a national survey of the Lesser Spotted Eagle and start a monitoring programme.
4. Undertake an education campaign about the shooting of the Lesser Spotted Eagle and other migratory birds of prey.