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**Action Plan for the conservation
of White-tailed Sea Eagle
(*Haliaeetus albicilla*)**



Document

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**BirdLife**
INTERNATIONAL

INTERNATIONAL Species Action Plan FOR THE WHITE-TAILED EAGLE (*Haliaeetus albicilla*)

*Final draft, May 2002
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Reviews

This action plan should be reviewed and updated every five years. 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 White-tailed Eagle breeds, which also includes the main migration and wintering areas in Europe: Austria, Belarus, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, Germany, Greece, Greenland (to Denmark), Hungary, Iceland, Latvia, Lithuania, the former Yugoslav Republic of Macedonia, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Turkey, Ukraine, United Kingdom and Yugoslavia (Serbia and Montenegro). However, it is also intended to serve as guidance for the conservation of populations in Asia.

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EXECUTIVE SUMMARY

The natural distribution of the White-tailed Eagle comprises most of Europe and central and northern Asia and extends to Greenland in the west. Of course, the population status and conservation status and the main threats to the species vary over this wide area, but there are conservation needs and priorities that will apply generally.

Historically, natural populations were greatly reduced over the species entire range as the result of persecution and the species was even entirely exterminated from a number of countries, notably in Europe. Legislative protection from killing enforced during the 20th century halted the decline of remaining populations in Europe but new human-induced threats emerged and increased in importance, such as land development and chemical pollution. Protective measures and the ban of some persistent, bio-accumulating chemicals during the last three decades of the 20th century eventually resulted in improved breeding success and increasing populations, especially in northern and central Europe. However, populations remain small in several countries and the species is currently classified as *critically endangered* in two, *endangered* in seven, and *vulnerable* in seven countries in Europe. The total number of pairs of the nominate race *Haliaeetus albicilla* is currently estimated at approximately 7,000 pairs (Table 1). The total number of pairs of the Greenland subspecies *H. a. groenlandicus* is estimated at only 150-170 pairs.

The following life history characteristics of the White-tailed Eagle are of great importance for the management and conservation of viable populations:

- The White-tailed Eagle is compensating for a low annual offspring production by high adult survival. This strategy makes the species very sensitive to increased adult mortality.
- The species is very faithful to its breeding sites, with the same sites being occupied by generation after generation of eagles. This long continuity places special concern and attention to the long-term conservation of breeding areas, especially in our time of rapid change.
- When nesting in trees this big eagle builds huge nests which are added to year by year, and therefore needs strong nest-trees; such trees are usually much older than the rotation period in modern forestry.
- White-tailed Eagles are strongly associated with aquatic habitats for hunting and feeding, which makes them vulnerable to any changes in the water systems that would have an impact on the prey base. This also includes a strong sensitivity to pollution with persistent, bio-accumulating chemical substances, which eventually turn up as contaminants in the fish and water birds that the eagles prey upon.

This Action Plan focuses on the following Conservation priorities

National legislation must adequately protect the species and its habitat, and be properly enforced

Implementation of international conventions and directives

National and international cooperation

Protection of nest-sites and habitat

Protection and restoration of feeding habitat

Reduce mortality caused by human activities (electrocution, collision with wires and traffic)

Stop the use of poisoned bait

Prevent the use of persistent bio-accumulating substances

Replace the use of lead with non-toxic material in hunting ammunition

Monitoring of contaminants

Nationwide surveys and annual monitoring of reproduction

Information and public education

It is recommended generally, as a minimum protective measure, that a *National White-tailed Eagle Action Plan* be completed for every country.

1. INTRODUCTION

In this Action Plan, *White-tailed Eagle* and *Sea Eagle* are used synonymously.

BirdLife International (2000) classifies the White-tailed Eagle as: *Lower risk/Near threatened, Criteria nearly met C2a*. According to Tucker and Heath (1994), status in Europe is *Rare, SPEC 3*.

Under international conventions and directives, the White-tailed Eagle is classified as follows:

EC Birds Directive: listed in Annex I (species to be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution)

Washington Convention (CITES): listed in Appendix I (trade in specimens of these species is permitted only in exceptional circumstances).

Bonn Convention: listed in Appendix I (endangered migratory species) and Appendix II (migratory species to be the subject of agreements)

Bern Convention: listed in Appendix II (strictly protected species).

An international conference, *SEA EAGLE 2000*, was held in Sweden in September 2000, with the participation of Sea Eagle experts from 18 nations (Belarus, Denmark, Estonia, Finland, Germany, Greenland, Iceland, Israel, Latvia, Lithuania, Netherlands, Norway, Poland, Russia (Europe and far east), Sweden, Ukraine, United Kingdom and the United States). The focus of the conference was on population status and management of viable populations. Outputs from that workshop (Helander *et al.* in press) have been extensively used for the compilation of this Action Plan.

The Geographical Scope of this Action Plan is primarily intended to cover Europe but the Aims and Objectives in the Plan could be applicable within the entire species range, although the lack of available information and practical feasibility in a number of countries may make its implementation in those areas rather difficult. The recent distribution of breeding populations in the world comprises the following countries: Austria, Azerbaijan, Belarus, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, Georgia(?), Germany, Greece, Greenland (to Denmark), Hungary, Iceland, Iran(?), Iraq(?), Israel, Japan, Kazakhstan, Latvia, Lithuania, the former Yugoslav Republic of Macedonia, Mongolia, Norway, Poland, Romania, Russia, Slovakia, Slovenia, Sweden, Turkey, Turkmenistan(?), Ukraine, United Kingdom, Uzbekistan, Yugoslavia. Countries where the species was known to breed formerly but from where it has vanished include Albania (<1975), Armenia (<1960), Egypt (<1900), Faeroes (to Denmark)(<1800), France (Corsica <1950), Ireland (<1910), Italy (Sardinia <1960), Malta, Moldova (<1975), Portugal, Spain and Syria (occasionally also in Algeria, 1975?, and Attu Island, West Aleutian Islands, USA 1982-83). A re-colonisation of these former breeding areas could be under the scope of national action plans.

Specific references are given in the text. Reference to standard works such as Bijleveld (1974), Glutz von Blotzheim *et al.* (1971), Newton (1979), Cramp (1980), Fischer (1982) and BirdLife International (2000, 2001) is not always given.

2. BACKGROUND INFORMATION

2.1. Taxonomic Status

Haliaeetus albicilla (Linnaeus, 1758). Monotypic. The population of White-tailed Eagles in Greenland has, based on its bigger size, been classified as a distinct subspecies, *Haliaeetus albicilla groenlandicus* (Brehm, 1831). Although this classification has been disputed (Vaurie 1965), measurements given by Salomonsen (1950, 1979) seem to support the proposal that the Greenland form should be regarded as a valid subspecies.

2.2. Distribution and Population

The White-tailed Eagle is distributed as a breeding bird over the northern Palearctic from Japan, Kamchatka and the Bering Strait in the east, to Germany, the United Kingdom and Iceland in the west, extending to Greenland in the Nearctic zone. In the North, its range extends from the Barents Sea coasts roughly along 70° N through Siberia. In the south, it occurs from Croatia to the Caspian Sea and between 30° and 40° eastwards to the Pacific.

Except for some northern populations, territorial pairs are mainly sedentary whereas younger birds are migrants or vagrants. Within Atlantic coastal populations, the younger birds are generally resident, although they may wander widely. Migration and wintering areas include all countries in Europe, but the most significant areas concur with the breeding range. In Asia, small numbers winter south to North Korea, South Korea, Taiwan, Pakistan and India.

Table 1. Breeding populations of White-tailed Eagle in 2001 (year in brackets if not 2001).

Country	Pairs ¹ (year)	Population trend 1990s	Range trend 1990s	Migration & wintering ²	Back-ground population ³	Reference
EUROPE, EU						
Austria	1	Resettled in 2001		70+	<20	5,24
Denmark	7	Resettled in 1995 Increasing (9 pairs in 2002)	Increasing	>30	50+	5
Finland	240	Increasing	Increasing	1000+		5
France	0	Extinct <1950 (Corsica)				4
Germany	360 (2000)	Increasing	Increasing	1700	Common ⁴	4, 5
Greece	6 ^{3,19}	Increasing	Stable	20-30	Common ⁴	4, 5, 19
Ireland	0	Extinct <1910				4
Italy	0	Extinct <1960 (Sardinia)				4
Sweden	310	Increasing	Increasing	1500+	500+	5
United Kingdom	23	Increasing	Increasing	80-100+	100+	5
EU, Total	947					
EUROPE, Non-EU						
Albania	0	Extinct c1975		4		5
Belarus	100-150	Increasing	Increasing	150-200+		5
Bulgaria	7-10 ⁵	Stable ⁵ (early1990s decreasing ⁷)	Stable ⁵ (early1990s decreasing ⁷)	7-16 ^{5,23}	Great numbers ⁴ , esp. along the Danube and the Black Sea ⁵	4, 5, 7, 23
Croatia	80-90 (2000)	Increasing	Stable	400+	100+	5
Czech Republic	25	Increasing	Increasing	100+		5
Estonia	80-90	Increasing	Increasing	100+		5, 18
Greenland (to Denmark; Nearctic)	150-170	Stable	Stable	600+	4 times bigger	5
Hungary	83 (2000)	Increasing	Increasing	240	200+	5
Iceland	48	Increasing	Increasing	150 (only residents)	150-200	5
Latvia	20-25 (2000)	Increasing	Increasing	20-50		5
Lithuania	65	Increasing	Increasing	< 170		5
Macedonia	0-2	Decreasing	Decreasing	5-10	none	5
Moldova	0	Extinct c.1975				8
Norway	1900-2200	Increasing	Increasing	8000+	2000+	5
Poland	500	Increasing	Increasing	2000+		5
Romania	15-20 ^{5,9}	Stable ⁵	Stable ⁵	? 100+	Numerous ⁴	4, 5, 9
Russia (European)	500 (2000) ^{5,6,20} [900-1000 (1994)] ⁷ *	Increasing	Increasing?			5, 6, 7, 20*
Slovakia	4	Increasing	Increasing	80		5
Slovenia	1 (year?) ⁷					7
Turkey, <i>see Asia</i>						
Ukraine	80-100 (2000)	Increasing		260-370	200-300	5
Yugoslavia (Serbia and Montenegro)	52-58 (2002-03)	Increasing	Increasing	140-220 (max. 250)	Numerous ⁴	5

Non-EU, Total	3710-4141+					
Europe, Total	4657-5088+					
ASIA	Pairs¹ (year)	Population trend 1990s	Range trend 1990s	Migration & wintering²	Back-ground population³	Reference
Armenia	0	Extinct <1960		4-5	6-10	11, 25, 26, 29
Azerbaijan	7-8 (1993-96)	Decreasing	Decreasing	54-70 (1993- 96)	50-100?	5
China	“rare” (1980s)					10
Georgia	0?	Extinct 1960s?				11
Iran	a few pairs (1980s)					12
Iraq	0?	Extinct?				13
Israel	1 (1998)			3-4		5
Japan	39 (1990- 1992)					14
Kazakhstan	95-110 (1990s) ²¹ [300 (c1990) ¹⁵]	Decreasing ²¹ [Increasing ¹⁵]	Decreasing (?) ²¹			15,21
Mongolia	50-60 (c1990)	Decreasing				16
Russia (Asian)	2000 ^{5, 6, 20*} [4000- 7000 ¹⁷]*					5, 6, 17, 20*
Syria	0	Extinct				13
Turkey	10-15 ⁵	Decreasing ^{5,7} Stable, 1990s ⁵	Decreasing ^{5,7} Stable, 1990s ⁵			5, 7, 27, 28
Turkmenistan	0? ¹⁰	Extinct? ¹⁰		50-70 ²²		10, 22
Uzbekistan	“extreme-ly rare” (1980s?)	Decreasing				10
Asia Total	2202-2233+					
World, Total	6859-7321+					

1) territorial pairs (year in brackets if not 2001), 2) individuals, 3) estimated early 19th century population, pairs, 4) Bijleveld 1974, 5) contributors to this SAP, 6) Conference Proceedings of “Sea Eagle 2000”, Helander *et al.*, in press (1), 7) Heath *et al.* 2000 and references therein, 8) Averin 1981, in Mizera 1999, 9) Tucker & Heath 1994, 10) Mizera 1999, Tab. 9, and references therein, 11) Abuladze and Eligulashvili 1996, 12) Neronov & Zabolotsky 1992, in Mizera 1999, 13) Cramp 1980, 14) Shiraki 1994, 15) Meyburg *et al.* 1991, 16) Sokolov & Bold 1996, in Mizera 1999, 17) V. Galushin, in Mizera 1999, 18) Löhmus 2001, 19) Alivizatos *et al.* 2002, 20) Ganusevich 2001, 21) Kovshar 1996, 22) Karavaev 1998, 1999, 23) Kostadinova and Dereliev 2001, 24) Probst 2003, 25) Movsesyan and Ayrumyan 1987, 26) Adamian and Klem 1999, 27) Kiziroglu 1993, 28) Bilgin 2002, 29) Leister and Sosnien 1942.

* **Note.** The figures in Table 1 of the estimated breeding population in Russia, both in the European and the Asian parts, are significantly lower than reported before, *e.g.* Mizera 1999, Heath *et al.* 2000.

2.3. Life History

The White-tailed Eagle is a long-lived, slow-reproducing raptor, compensating for a low annual offspring production by high adult survival. This makes the species most sensitive to a decrease in adult survival, compared with a decrease in juvenile survival or a temporary decrease in productivity. A reduction in productivity over many years, however, will threaten the population, as demonstrated by the critical situation in the Baltic region from the 1960s until the mid-1980s as a result of contamination with pollutants. A very similar situation occurred also for the closely related Bald Eagle *Haliaeetus leucocephalus* in North America.

Annual survival over the first two years was 90-95% for radio-tagged Sea Eagles in Norway (Nygård *et al.* 2000). For reintroduced Sea Eagles in Scotland, the annual survival has been estimated at 73-75% for young birds prior to settlement and at 94-97% thereafter (Green *et al.* 1996, Evans *et al.* in press). Annual survival over the first five winters based on resightings around the Baltic of Sea Eagles ringed in Finland was 86-98% (Sauola *et al.* in press). Longevity records up to 36 years in the wild and a mean lifespan of 17 years for adult breeding birds (>4 years old) have been documented in Germany, with an estimated overall life expectancy of 11.2 years (Struwe-Juhl 2002). Annual survival based on resightings of ringed adults in Sweden from year 6-21 was 91-98% (Helander in press). A high survival rate was also indicated from recoveries and resightings of ringed and wing-tagged Sea Eagles in former Yugoslavia (Ham *et al.* 1990).

2.3.1. Breeding

First reproduction usually from age 5 (6th calendar year), sometimes as early as 3 (Evans *et al.* in press, Struwe-Juhl 2002) or as late as 7+ (Evans *et al.* in press, Helander unpubl.). Territorial pairs are highly faithful, generally occupying the same territory throughout life, and territories tend to be occupied by succeeding generations of eagles (Helander 1988a, 1988b and in press, Stjernberg and Koivusaari 1995). Several territories have been occupied by Sea Eagles for a century or more. As populations increased again in recent years, old vacant territories were the first to be re-occupied by new eagles, after a pause of 20 – 40 years (Stjernberg 1995, Stjernberg and Koivusaari 1995). The nests are built in trees or on cliff ledges, or on the ground as locally in Greenland, Iceland, Norway and rarely elsewhere (Oehme 1961, Willgoths 1961, Olsson 1972, Christensen 1979, Sevcik 1997, Hauff 2001). Nesting also occurs rarely on pylons, towers (Mizera 1999, Hauff 2001, Stjernberg *et al.* 2001). In forested areas, tree-nesting is preferred and mature trees are clearly favoured to support the huge nests. The age of nest-trees are usually well above the rotation period in forestry (as long as such trees are available). In the taiga and sub-boreal forest region most nests are in pine *Pinus silvestris*, whereas in Central and Southern Europe nests are commonly found also in deciduous trees (*Fagus*, *Populus*, *Fraxinus*, *Quercus* etc.). Nests are generally placed in the top third of the tree. Normally, two or more alternate nests are found in a breeding territory.

Utilizing a mainly stable prey base, the breeding frequency is high (c90% in Swedish populations, Helander 1985a). The time of egg-laying varies with latitude and climate, starting in late January in southern Europe, mid-February in the Baltic Sea and late March or early April in the northern more continental areas. Most pairs in a population usually lay within a period of 3 – 4 weeks (Helander 1985a). Clutch size 1-3 (very rarely 4), mean 2.1 (Willgoths 1961, Helander 1985a) but lower in some northern populations (e.g. 1.6 in Swedish Lapland, Helander 1985a). Incubation period 35 - 38 days (Willgoths 1961, Fentzloff 1979), nestling period 70-86 days (Mori 1980, Helander 1985a). Nestlings grow from c80 - 95 g at hatch to 4-6 kg at fledging, the steepest gain in weight occurring during the first 5 weeks of life (Fentzloff 1979, Helander 1981, 1983a). Fledged young are usually dependent on the parents for food for 1 –2 months and disperse from the territory c2 – 3 months after fledging (Nygård *et al.* 2000). Annual breeding success (pairs rearing young) in healthy populations is usually c60-80% (Hansen 1979, Helander 1994, Mizera 1999, Struwe-Juhl 2002) and brood size 1.6 – 1.8 (Banzhaf 1937, Willgoths 1961, Helander 1994, Struwe-Juhl 2002).

2.3.2. Feeding

Usually closely associated with water, the White-tailed Eagle feeds mainly on fish and water birds (ducks, coots, grebes, gulls etc.). Fish prey is taken close to the water surface and most hunting for fish is in shallow waters. During early summer, fish dominates the food in most areas, whereas

birds increase in the diet later in the breeding season and in autumn and winter according to availability. Commercial fish-ponds are important feeding grounds for local populations in central and southern Europe. In some freshwater habitats, mammal prey is also readily utilised, e.g. muskrat *Ondatra zibethicus*. Birds are captured on the water and on the ground, rarely on the wing. Carrion is an important food source during winter. In some northern populations, carrion is an important source of food during the breeding season as well. Piracy of food, targeted at e.g. Osprey, gulls and cormorants, is often practiced. The White-tailed Eagle is quite capable both as a hunter and a fisher, although less agile than more specialised raptors. (Banzhaf 1937, Willgohs 1961, Oehme 1975, Helander 1983b, Wille and Kampp 1983, Watson *et al.* 1992, Struwe-Juhl 1996, Sulkava *et al.* 1997, Madders and Marquiss in press, Sulkava in press)

2.3.3. Habitat requirements

Within its wide range the White-tailed Eagle breeds in quite different habitats, from the treeless marine fjords in Greenland and the outer coast of Norway to the brackish, forested coasts of the Baltic, and from the northern taiga lakes and rivers of Fennoscandia and Russia to the alluvial forests and floodplains in central and southern Europe. As always, a sufficient prey base is crucial for reproduction. Shallow waters with high production are essential in most areas. In forested areas nests are exclusively built in trees, and mature tree stands are needed for nesting. Being sensitive to disturbance at the nest, the Sea Eagle requires breeding sites with low human activity. The nearest acceptable distance to potential sources of disturbance varies strongly between areas, being larger in open habitats with exposed nests than in more secluded sites. A gradual relaxation in sensitivity to human disturbance has been observed recently in some areas, probably as a result of less persecution.

2.4. Threats and Limiting Factors

Criteria

Critical: could lead to the extinction in 20 years or less

High: could lead to a decline of more than 20% in 20 years or less

Medium: could lead to a decline of less than 20% in 20 years or less

Low: affects only at a local level

Unknown: is likely to affect but it is unknown to what extent

The distribution of the White-tailed Eagle is wide and there is great variation in the significance of threats and limiting factors between regions or countries. Thus, a subdivision of areas has been applied when needed. There is also reason to consider the *potential* of some threats and limiting factors, based on evidence from the past and near present, in addition to their ranking based on the present situation. Examples of nationwide, holistic compilations are given in, e.g., Helander (1975), Stjernberg (1981), Love (1983), Struwe-Juhl (1998) and Mizera (1999).

2.4.1. Forestry

Forestry activities pose a threat to nest-sites in most areas, although the national ranking varies from critical (Greece [illegal as well as legal cutting], Latvia, Slovakia), medium to high (Czech Republic, Estonia, Finland, Norway, Sweden) to low. The clearing of mature tree-stands is a general problem in reducing the availability of suitable trees for nesting both now and in the future; in countries where the legislative protection of nests is weak it even poses a threat to nests in use. The lower rotation period in forestry as commonly applied today threatens the succession of suitable trees for nesting in the future. Furthermore, building roads for forestry increases access to previously secluded areas, thus increasing disturbance rates from the public and opening them up for other permanent human activities and development. Human disturbance from forestry activities (e.g. logging and the plantation of clearings) in the vicinity of occupied nests can threaten the success of breeding attempts.

Importance: *Medium to High*

2.4.2. Land exploitation for industries, housing etc.

Ranks from critical (Greece, Israel, Slovakia), medium to high (Czech Republic, Estonia, Finland, Iceland, Norway, Poland, Slovakia, Sweden, Ukraine, Yugoslavia) to low. Productivity tends to be considerably lower in Sea Eagle nests situated near roads, houses etc., as has been demonstrated in Norway (Storstad 2002, Folkestad in press). Coastal power plants and other industries, the building of summer houses, roads etc. can destroy vital nesting areas permanently and has the potential to be of high importance in most areas, although the suggested general ranking at the present time is one level below. Nevertheless, the continuity of Sea Eagle breeding sites over long time periods calls for a long-term approach in conservation strategy and there is a strong need to incorporate areas of vital importance for Sea Eagles in land-use planning generally.

Importance: *Medium to High*

2.4.3. River regulations and drainage projects

Relying primarily on fish and waterfowl for food especially during the breeding season, the White-tailed Eagle is sensitive to changes in aquatic ecosystems. River regulations and drainage of wetlands will generally have a negative impact on both breeding and wintering populations. In Armenia, the reduction in numbers of White-tailed Eagles was observed from the 1930s with the beginning of lowering the water level of Lake Sevan and adjacent Lake Gilli (Leister and Sosnin 1942, Ayrumyan *et al.* 1974). In Croatia, extensive river regulation projects are proposed by the authorities for navigation and hydro-electric dams (Schneider-Jacoby 2002) which, if realised, would pose a significant threat to populations there (rank high). Twelve of the 23 IBAs are potentially affected by water ways in Croatia, and 8 of those are directly affected (Schneider-Jacoby *in litt.*). The Pannonian population of White-tailed Eagles in Hungary has its main retreats in the large alluvial wetlands along the Drava and Danube rivers. In Hungary, all areas along the Danube are affected by the upgrading of the water ways (8 IBAs). In Poland, the Lower Wistula and the Oder are concerned (Fischer and Waliczky 2001). It is not known at present to what extent similar projects are planned in other countries, but the potential threat of such projects is great. The issue should be investigated further.

Importance: overall potential *Medium to High*

2.4.4. Disturbance of nests from tourism, recreation

Increased tourism and recreation (camping, canoeing, fishing, hunting, bird-watching, photographers, aerial sporting etc.) pose significant threats locally already today. As the White-tailed Eagle is sensitive to disturbance at the nest during breeding, this factor has the potential to be of increasing importance in years to come and needs to be managed. (The problem of disturbance of nests also includes activities from forestry, cf. 2.4.1.).

Importance (present): *Medium to Low* (potential = *High*)

2.4.5. Reductions in the prey base

Although largely being a food generalist, some populations rely on a narrow prey base and are vulnerable to reductions in their main prey. Food is clearly a limiting factor in some northern freshwater populations, and any decrease in the prey base there would be of high importance. Reductions in the prey base recently in Greenland, due to over-exploitation of fish resources and bird colonies (Hansen 2002) is probably the main reason for a drop in the productivity of the vulnerable Sea Eagle population there (importance = high). The importance of the closing of commercial fishponds and reductions in the prey base is ranked high in Croatia and medium in Bulgaria and Lithuania. Still, the overall ranking in Europe is lower but the problem deserves special attention in target areas.

Importance: *Low*, except in target areas (above)

2.4.6. Illegal killing, nest robbing and trade; negative attitudes

Persecution is still a significant problem in central and southern Europe and parts of Asia, where it is ranked medium to high (Austria, Croatia, Czech Republic, Greece, Israel /surrounding countries/, Kazakhstan (even nest destruction; Kovshar 1996), Slovakia, Turkey (?), Ukraine, Yugoslavia). In some northern populations (Swedish Lapland, Greenland), some persecution at the nests prevail and

may be of significance for those populations. Some illegal trade in dead specimens (for trophies), eggs (for egg collections) and live specimens (probably mainly from nest robbing) prevails but appears to be of a limited magnitude.

Based on the history of the White-tailed Eagle in Europe, the potential threat from persecution is high, or even critical regionally. For most of Europe, though, the present situation is not alarming (importance ranked as low). Attitudes towards the Sea Eagle vary and could be subject to rapid changes. As the species has become more common in several areas in recent years, there may be a recent tendency for more birds being shot. It is not clear whether this is just the result of increased availability, or of a change back towards a more negative attitude against the eagles among hunters and land-owners. The issue deserves further attention (cf. also 2.4.12.).

Illegal killing may also involve the use of poisoned baits (cf. 2.4.7).

Importance: *Low to Medium*, in southern Europe *Medium to High*

2.4.7. *Poisoned baits*

Poisoning from baits put out to kill wolves is a significant death cause locally in Russia (R. Sagitov, pers. comm.) and Kazakhstan (Kovshar 1996) and baits poisoned with carbofuran is considered a critical threat in Austria, where as many as 14 sea eagle casualties have been recorded in recent years. Deaths caused by Sea Eagles eating poisoned baits have also occurred recently in Germany (parathion, carbofuran; Krone *et al.* 2002) and UK (aldicarb, alphachloralose, carbofuran, phosdrin) and is suspected also in Greece where there is still widespread use of poisoned baits against wolves. Due to its habit of utilising carrion for food, the Sea Eagle is very susceptible to poisoned baits, which was used extensively for predator control in earlier times. (cf. also 2.4.9.2., secondary poisoning from rodenticides).

Importance: *Low to Medium*, potential for local populations *High to Critical*

2.4.8. *Secondary poisoning from lead ammunition*

Lead poisoning, from ingested gunshot and pellets carried by wounded prey, seems to be a more important threat to sea eagles than previously realised. Recent investigations showed that up to 28% of dead specimens from Germany and Austria (Kenntner 2002, Kenntner *et al.* in press, Krone *et al.* 2002) had died from lead intoxication, and the problem is highlighted also from Croatia, Finland, Greenland, Hungary, Poland (Falandysz *et al.* 1988), Norway, Slovakia and Sweden. In East Russia and Japan, lead poisoning also from rifle bullet fragments is a significant mortality factor for Steller's Sea Eagles (*Haliaeetus pelagicus*) and White-tailed Eagles (Kurosawa 2000).

2.4.9. *Secondary poisoning from pesticides and pollutants*

2.4.9.1. *Impaired reproduction*

This factor was the main threat to many European Sea Eagle populations from the 1950s to the 1980s. Following the ban of DDT and PCB during the 1970s in Western and Central Europe, reproduction improved during the 1980s and populations began to recover (see Stjernberg and Saurola 1983 and national reports in Helander *et al.* in press). At the present time, productivity is obviously well above critical levels for maintaining stable populations in most areas. However, the critical situation in the 1960s–1980s should be remembered and the potential of this threat for a top predator like the White-tailed Eagle, utilising mainly aquatic prey, must be recognised. It should also be noted that despite regulations of the use of PCBs, concentrations are no longer decreasing in the Baltic Sea (Bignert *et al.* 1998) and possibly elsewhere, and there are large quantities of PCBs still “hidden” in *e.g.* building materials. Brood size is still significantly below the background (pre-1950) level in the Baltic Sea region, probably as a result of PCB (Helander 2001). Furthermore, “new” organochlorine substances (*e.g.* flame retardants (PBDEs)) with chemical structures resembling those of DDE and PCB have been identified in Baltic biota, including Sea Eagles, and their effects on wildlife are as yet unknown.

Importance: *Low to Medium* (potential = *High*)

2.4.9.2. Mortality

Extensive mortality in wildlife caused by mercury occurred in Sweden and Finland in the 1960s (*e.g.*, Borg *et al.* 1969). Lethal concentrations of mercury in Sea Eagles found dead in the 1960s and 1970s were reported by Henriksson *et al.* (1966) from Finland, Jensen *et al.* (1972) from Sweden and Oehme (1981) from Germany. In Croatia six Sea Eagles were found dead in the Kopacki rit reserve in the spring of 1976; one was analysed and contained high mercury concentrations (Mikuksa 1989). Krone *et al.* (2002) reported lethal mercury concentrations in two sea eagles from the 1990s. Extremely high residue concentrations of DDTs and PCBs were found in carcasses of starved Sea Eagles during the 1960s in Sweden, with concentrations of DDT compounds that may have been lethal (Jensen *et al.* 1972). DDT as well as dieldrin has been implicated in the deaths also of Bald Eagles (*Haliaeetus leucocephalus*) in North America (Reichel *et al.* 1969). More recently, high residues of coplanar PCBs (dioxin-like) have been recorded in dead eggs and specimens of White-tailed Eagles from Poland, Finland and Sweden in the 1980s and 1990s (Falandysz *et al.* 1994, Koistinen *et al.* 1995, Helander *et al.* 2002). Restrictions in the use of those chemicals hitherto known to be the most harmful to wildlife have proved successful. Although direct proof of Sea Eagles dying from secondary poisoning from pollutants is largely lacking in recent years, the continued potential threat from hazardous chemicals in the environment to top predators like the White-tailed Eagle should be emphasized.

Non-accurate setting of grain baits for rodents in crop fields may lead to the poisoning of a variety of birds and mammals, which may be preyed upon by raptors. Several mortal cases of White-tailed Eagles due to this kind of secondary poisoning are known from Bulgaria from the early 1990s.

Importance: *Medium* (potential = *High*)

2.4.10. Accidental killing by collision and electrocution

Collision with wires, overhead cables (including electrocution) and collision with traffic (trains, cars) are significant mortality factors in most areas, comprising as much as 30% of all causes of death among specimens examined in Germany (Krone *et al.* 2002) and 40% in Sweden. In Norway, collision with cables and electrocution was the cause of death for as much as 71% of first year birds and >50% of subadults found dead. This is considered the most important mortality factor in Poland, where at least 17 Sea Eagles died from electrocution in 1983-1997 (Mizera 1999). With an increase in the construction of telephone towers and power-lines and an expected increase also in traffic, the importance of these mortality factors may increase even more.

Collision with wind turbine blades was found to increase the mortality of Golden Eagles (*Aquila chrysaetos*) in the Altamont Pass Wind Resource Area in California, USA, where >38% of the deaths of 61 radio-tagged birds were caused by wind turbine blade strikes; a further 16% of these birds were killed by electrocution (Hunt *et al.* 1998). Sea Eagles tend to be far more gregarious than Golden Eagles. The location of wind farms in coastal areas, where the density of breeding as well as non-breeding and wintering Sea Eagles is often much higher than the density of Golden Eagles in the cited study, would probably make Sea Eagles even more vulnerable to turbine blade strikes and contact with cables in such areas. Thus, the construction of wind farms would pose a potentially significant threat if being located in important breeding or wintering areas for Sea Eagles. Two White-tailed Eagles were struck by wind turbine blades in early 2002 in Germany (Krone and Scharnweber 2003).

The fact that populations in *e.g.* Germany, Norway, Sweden and Finland have increased strongly, in spite of the losses due to collisions and electrocution, still renders this threat a low ranking but with a potential to increase.

Importance: *Low to Medium*

2.4.11. Climate

Harsh climate in some northern areas sometimes has a strong effect on reproduction, but is a natural condition and is not considered further here. In Greenland, however, a gradual change since the 1970s towards a more rainy climate is a factor that has most likely had a considerable negative effect on breeding success. Although this is probably not a factor that can be addressed in a short time-scale, it should be identified here. Wild fires are considered a threat in Kazakhstan (Kovshar 1996).

Importance: *Low*, in Greenland *Medium* or *High*

2.4.12. Lack of knowledge

Information on the species, its life history and requirements, legislative status and conservation needs is an important prerequisite for successful management of the Sea Eagle. Lack of knowledge of such parameters by the authorities and ignorance among the public may thus be regarded as a potential threat to the species as is also stated for some countries in Table 4. The potential threat is clearly illustrated by the history of the Sea Eagle in Europe and elsewhere. (See also 2.4.6).

Importance: *Low* to *Medium*

2.5. Conservation Status and Recent Conservation Measures

In late September 2001, the compilers distributed a questionnaire to potential contributors in Europe. The answers on the topic 'Conservation status and recent conservation measures' are summarized in the three tables below.

2.5.1. Administration, status in national red data books and legislative status

Summarised in Table 2.

2.5.2. Protection of nest-sites and habitats

Summarised in Table 3.

2.5.3. Public awareness and recent conservation practices/measures.

Summarised in Table 4.

To get a comprehensive nationwide view of breeding populations, conservation status and recent conservation measures, the reader is recommended to consult Tables 1, 2, 3, 4 and Appendix 1 (Conservation needs for the future).

Table 2. Administration, status in national red data books, and legislative status (listed by contributors).

Country	Highest responsible national authority	Status in Red Data Book	Legal protection from killing since	Penalties for illegal killing or nest destruction	Legislative status of dead specimen. It belongs to:	Birds in captivity, in Zoos	Birds in captivity, by others
Albania	General Direction of Forestry and Pastures, (Ministry of Agriculture) & Ministry of Environment	CRIT	Fully, 1994		To land-owner	No	No
Armenia	Ministry of Nature Protection	END	Fully, 1981	450 Rubles in 1987	To finder	No	No
Austria	Provincial government ("Bundesländer")	EXT	Fully	Fine & temp. confiscation of hunting license	To local hunter	Not any longer	Ca 20
Azerbaijan	Ministry of Ecology and Natural Resources	Rare		10 Rubles in 1975		1+	
Belarus	Ministry of Natural resources and environmental protection	END	Fully, 1976?	200 EUR for killing, 600 EUR for destroying a nest, 33 EUR for an egg	To finder	5	?
Bulgaria	Ministry of Environment and Water	END	Fully	520 EUR for killing, 390 EUR for disturbance or nest destruction	Not regulated. Register proposed	No	No
Croatia	Ministry of Environmental Protection and Physical Planning	END	Fully, 1967	5350 EUR for shooting, 20-80% for disturbing	Not regulated	4-5	2
Czech	Ministry of the Environment	END	Partly, 1870, fully, 1956	For illegal killing and nest destruction up to 1500 EUR for physical person, up to 30000 EUR for killing by organisation	To finder	Ca 10	Ca 3
Denmark	Ministry of Environment, Department of Forest and Nature Conservancy	RARE	Fully, 1931	Fines	To state	No	10? (special permission)
Estonia	Ministry of Environment, Nature Conservation Department	RARE	Partly 1934, fully 1957	1000 DEM for killing	To state	6 (3 pairs)	No
Finland	(1) Finland excl. Åland: Ministry of the Environment, (2) Åland Islands: the Government of Åland (GoÅ)	(1) Finland: VUL (2000), (2) Åland: "espec. care demanding"	(1) Finland: fully, 1926, (2) Åland: fully, 1924	Finland: 7400 EUR for killing; penalties also for taking eggs, nestlings, and for destroying nests	Finland: To state, Museums of natural history have priority to dispose of dead specimens; Åland: to the GoÅ	1	No
Georgia							

Country	Highest responsible national authority	Status in Red Data Book	Legal protection from killing since	Penalties for illegal killing or nest destruction	Legislative status of dead specimen. It belongs to:	Birds in captivity, in Zoos	Birds in captivity, by others
Germany	Federal Ministry of Environment and Fed. Min. for Consumer Protection, Food and Agriculture; nature conservation and hunting departments of the Federal Ländern	VUL	Fully, 1934	Punishable offence because of Federal Hunting Act and Fed. Nature Conservation Act, high penalty	To land-owner, if he has a hunting license; to territorial hunting authority	Ca 50 including birds in captivity by others	Ca 50 including birds in Zoos
Greece	Ministry of Agriculture, Ministry of Environment, Physical Planning and Public Works	END	Fully, 1980	3 months up to 2 years imprisoning or 147-1467 EUR for killing, up to 10 days imprisoning for destroying nests (Ministerial Decision 414985/1985)	Forbidden to keep dead birds. Stuffed birds obtained until November 1985 should have been registered to the local forestry services until May 1986	No	Occasionally at Wildlife Rehabilitation Centres
Greenland	Greenland Home Rule	VUL	Fully	Fines, (seldom enforced)	To state	No	No
Hungary	Ministry of Environment, Nature Conservation Agency	Potentially endangered	Partly 1940 (shooting), Fully 1954	3900 EUR	To state. If collected before 1979, to finder	2	4
Iceland	Ministry for the Environment	END	Fully, 1914	From case to case	To state; dead specimens should be handled over to Icelandic Institute of Natural History	No	No
Israel		EXT	Fully		To state	10	No
Latvia	Ministry of Environmental Protection and Regional Development	END	Fully, 2000	max 6 years imprisonment and compensation for damage; "20 minimal salaries" for nest or bird	To state	6	No
Lithuania	Ministry of Environment	END	Partly 1959 (shooting) Fully, 2000	225-400 EUR	To state	3	No
Macedonia	Ministry of Environment	END	Fully, 1967	ca 1000 DEM	To state	No	No
Moldova							
Netherlands	Ministry of Agriculture, Nature Management and Fisheries	(not breeding)	Fully, 1934	Penalty of maximum 11,250 EUR; maximum two years imprisonment	Finder not allowed to keep dead bird; license may be obtained for keeping and preparation	5-10	1+
Norway	Ministry of Environment, Directory of Nature Management/	Care demanding (DC)	Fully, 1968	Fines, or sentence to be imprisoned for up to one year (occasionally two years). The penalty is decided from case to case	To state. Museums of natural history have priority to dispose of dead specimens	No	Only injured birds for rehabilitation and release

Country	Highest responsible national authority	Status in Red Data Book	Legal protection from killing since	Penalties for illegal killing or nest destruction	Legislative status of dead specimen. It belongs to:	Birds in captivity, in Zoos	Birds in captivity, by others
Poland	Nature Conservation Ministry	LC (least concern)	Pomerania., Fully, 1922; Poland: fully, 1927	Up to 3 years imprisoning for killing, up to 2 years for destroying eggs, nest, and secondly, penalties	To state. With permission from ministry (since 1999 local nature conservancy officer), specimens to University, State Forest Museums etc.	In 2000: 15. Annually 5-8 rehabilitated and released	5
Romania	Ministry of Environment, Commission for the Protection of Nature Monuments		1973	Fines	Not regulated	?	No
Russia		VUL (category 2)	Fully, 1964	Penalties, depends on the conservation status of the area	To state	Ca 40	Yes
Slovakia	Ministry of the Environment	CRIT	Fully, 1965	Penalty or imprisonment from 6 months to 8 years	To state	3	1
Slovenia							
Sweden	National Environment Protection Agency (NEPA)	VUL (2000)	Fully, 1924	Fines, or maximum 4 years imprisonment	To state. NEPA decides on the disposition, Swedish Museum of Natural History has priority of disposal	3	No
Turkey	Ministry of Forestry, General Directorate of Game, Wildlife and National Parks	CRIT	From killing and keeping (like all other raptors), 1979	250 EUR for killing (like all other eagles), 2500 EUR for trade and unauthorized keeping	Belongs to finder, however if stuffed and found in areas open to public it will be confiscated and a penalty may occur up to 2500 EUR	No	Not known (seems not probable)
Ukraine	Cabinet of Ministers	VUL	Fully, 1969	Near 3600 EUR	Not regulated	Near 10	No
United Kingdom	Scottish Executive/Scottish Natural Heritage (Department of Food and Rural Affairs (DEFRA UK) responsible for international conventions)	Red (Batten et al. 1990)	Fully, 1954	Scotland: 5000 UKP, England and Wales: 5000 UKP and/or 6 months	Belongs legally to no-one; finder may keep dead bird provided he can prove that it was not illegally killed	3+	1+
Yugoslavia (Serbia and Montenegro)	Ministry of Health and Environmental Protection; Institute for Nature Protection	VUL	Fully, 1947; as Natural rarity, 1993	Yes (but very low)	To state	9	2

Table 3. Protection of nest-sites and habitats (listed by the contributors).

* *Note.* “SPAs”, “IBAs” and “Other national protected areas” are often largely overlapping.

Country	Legal protection of nests and nest trees, since when?	Specified or unspecified zone around nests to be saved from cutting	Zone around occupied nests to be protected against disturbance from forestry activities	Zone around occupied nests to be protected against disturbance from other activities	Estimated percentage of population included in SPAs*	Estimated percentage of population included in IBAs*	Estimated percentage of population included in other national protected areas*	Is there a national protection plan for known nests
Albania	1994	(extinct c.1975)			100% (migrants)	100% (migrants)	100% (migrants)	No
Armenia	-	-	-	-	near 50% (migrants)	near 50% (migrants)	None	No
Austria	Yes, different in provinces (in practice hardly enforced)	None	None	None	100%	100%	Ramsar site; Naturschutz-gebiet	Only within protected zones
Azerbaijan					70%	near 100%		No
Belarus		None	None	None	40%	20%		No
Bulgaria	1967	None, case by case through forestry management plan	Only in agreement with foresters or incorporated in forestry management plan	None		85%		No
Croatia	Fully, since 1967	None	Only in agreement with foresters	None	0%	85%	50% in two Nature Parks and one Ornithological reserve	No
Czech Republic	Since 1956	300 m	300 m	300 m, every activity which can interfere	10%	70%	20%	No
Denmark	Since 1967	Not automatically by law, voluntary agreements arranged between NGOs (DOF) / the authorities and the land-owners, from 1.2 – 31.8	Not automatically by law, voluntary agreements arranged between NGOs (DOF) / the authorities and the land-owners, from 1.2 – 31.8	Not automatically by law, voluntary agreements arranged between NGOs (DOF) / the authorities and the land-owners, from 1.2 – 31.8	0%	0%	0%	No

Country	Legal protection of nests and nest trees, since when?	Specified or unspecified zone around nests to be saved from cutting	Zone around occupied nests to be protected against disturbance from forestry activities	Zone around occupied nests to be protected against disturbance from other activities	Estimated percentage of population included in SPAs*	Estimated percentage of population included in IBAs*	Estimated percentage of population included in other national protected areas*	Is there a national protection plan for known nests
Estonia	Since 1957	(Proposed 100 m on private land, 200 m on state owned land)	(Proposed 100 m on private land, 200 m on state owned land)	(Proposed 100 m on private land, 200 m on state owned land, against hunting and other disturbance)	(would be 100% after 2002)	80%	80%	Yes, but not yet adopted by the Ministry
Finland	(1) Finland: since 1926, (2) Åland: since 1924	(1) Finland: (a) state owned land: since 2000 zone radius not exactly defined; zone A, no activity allowed, (b) private-owned land: not in force until defined by Regional Environ. Centre (2) Åland: defined for each nest-site, from ca50 m to several 100 m	(1) Finland: (a) state owned land: since 2000 zone radius not exactly defined; zone A, no activity allowed, zone B, no forestry 15.2 – 31.7, in Lapland 15.3 – 31.7 (b) private-owned land: not in force until defined by Regional Environ. Centre (2) Åland: defined for each nest-site, ca 50 m to several 100 m	(1) Finland: (a) state owned land: since 2000 zone radius not exactly defined; zone A, no activity allowed, zone B, no forestry 15.2 – 31.7, in Lapland 15.3 – 31.7 (b) private-owned land: not in force until defined by Regional Environ. Centre. (2) Åland: defined for each nest-site, ca 50 m to several 100 m			Of 347 Sea Eagle nests in use at least once 1990-1999 12% in sanctuaries, 126 nests (36%) in proposed Natura 2000 areas or other protection programmes. 218 nests (63%) will remain outside existing or proposed sanctuaries (IBAs and SPAs not considered)	Yes, three regional plans for the Finnish mainland (from 1988, 1995 and 2000) and one for Åland (from the 1980's). All are, in principle, updated annually
Georgia								
Germany	Since 1973-1980 (jurisdiction on nature conservation different in the federal states)	100 m	300 m	300 to 500 m	50 %	60 %	83% including SPAs and IBAs	No

Country	Legal protection of nests and nest trees, since when?	Specified or unspecified zone around nests to be saved from cutting	Zone around occupied nests to be protected against disturbance from forestry activities	Zone around occupied nests to be protected against disturbance from other activities	Estimated percentage of population included in SPAs*	Estimated percentage of population included in IBAs*	Estimated percentage of population included in other national protected areas*	Is there a national protection plan for known nests
Greece	Since 1985: Destruction of nests and intentional disturbance during breeding season prohibited; trees or tree stands important for nesting can be saved from cutting	Provided by Law (although no specification of radius exists). It has not been applied for this species, because responsible authorities are uninformed	Provided by Law (although no specification of radius exists). It has not been applied for this species, because responsible authorities are uninformed	Provided by Law (although no specification of radius exists). It has not been applied for this species, because responsible authorities are uninformed	67%	100%	At least 33% of nest sites occur in Ramsar Sites, at least 17% of nest sites in Wildlife Refuges, 50% in proposed Sites of Community Importance (eligible SACs of Natura 2000 Network)	No
Greenland	Nests protected by law	No specific zone	No specific zone	No specific zone	0	0	0	No
Hungary	Since 1974 no forestry, since 1996 no disturbance	100 m	100 m (400 m)	400 m			53 % breeds on protected areas	Yes
Iceland	Since 1995	(Not applicable)	(Not applicable)	500 m zone should not be entered 15.3 – 15.8 without special permit from the Ministry of the Environment; landowners are allowed but are asked to minimise disturbance	(Not applicable)	85%	5%	Not yet
Israel	Trees are protected	None	None	None, but disturbance at nest site generally forbidden	100%			Not yet

Country	Legal protection of nests and nest trees, since when?	Specified or unspecified zone around nests to be saved from cutting	Zone around occupied nests to be protected against disturbance from forestry activities	Zone around occupied nests to be protected against disturbance from other activities	Estimated percentage of population included in SPAs*	Estimated percentage of population included in IBAs*	Estimated percentage of population included in other national protected areas*	Is there a national protection plan for known nests
Latvia	Nest not automatically protected; presupposes a proposal to establish a "micro-sanctuary", since 2000	Established micro-sanctuaries with a radius 400-800 m (50-200 ha)	In micro-sanctuaries, only the transport of logged trees are allowed 1.8 - 1.2, and only if no alternate road exist	All activities in micro-sanctuaries prohibited, except the building and repairing of roads and the use of hunting towers, 1.8 - 1.2		56%	33% (micro-sanctuaries)	No
Lithuania	Since 1999	200 m	200 m	Disturbance of eagles near nests are prohibited		30% will be approved as NATURA 2000 areas in 2003-2004	35% Regional parks, reserves	No
Macedonia	1967; nest tree not specifically protected, but "All wildlife, incl. eggs and nests are protected"	None	None	None	None	100%	100%	No
Moldova								
Netherlands	1936	Disturbance not allowed	Disturbance not allowed	Disturbance not allowed				
Norway	1968; nest tree not specifically protected, but "All wildlife, including eggs and nests are protected"	None	None	No, but "By all actions should be taken to avoid suffering of or harm to the wildlife and its eggs and nests."	Ca 1 %	10-12%	3%, (IBAs in Norway are not protected areas)	No
Poland	Since 1949	200 m	200 m the whole year, 500 m 1.1 – 31.7	200 m the whole year, 500 m 1.1 – 31.7 all human activity	Few %	Few %	Ca 20 pairs breed in National Parks, a few others in Nature reserves, most Polish pairs breed in commercial forest (state owned)	Yes

Country	Legal protection of nests and nest trees, since when?	Specified or unspecified zone around nests to be saved from cutting	Zone around occupied nests to be protected against disturbance from forestry activities	Zone around occupied nests to be protected against disturbance from other activities	Estimated percentage of population included in SPAs*	Estimated percentage of population included in IBAs*	Estimated percentage of population included in other national protected areas*	Is there a national protection plan for known nests
Romania	Not regulated					70%		No
Russia		Not specified	Not specified	Not specified				No
Slovakia	Since 1965, only nest is protected, trees are protected in some circumstances	Unspecified	Individual agreement	Unspecified	100%	100%	Protected Landscape area Dunajske luhy 100%	No
Slovenia								
Sweden	Since 1924	Not specified but equivalent to 50 m (Formerly 200 m)	Not specified, but disturbance not allowed according to forestry law	Not specified	Coastal and southern inland pop. ca 15% Lapland 0	Coastal and southern inland pop. ca 15% and Lapland ca 15%, including IBAs listed for other species	Coastal and southern inland pop. ca 25%, Lapland ca 30%	No
Turkey	Disturbance in any way (esp. breeding season) prohibited all year by 3167 coded Land Hunting Law Decisions of the Central Hunting Commission	Disturbance in any way (esp. breeding season) prohibited all year by 3167 coded Land Hunting Law Decisions of the Central Hunting Commission	Disturbance in any way (esp. breeding season) prohibited all year by 3167 coded Land Hunting Law Decisions of the Central Hunting Commission	Disturbance in any way (esp. breeding season) prohibited all year by 3167 coded Land Hunting Law Decisions of the Central Hunting Commission	10-40%	20-80%	0-20%	No
Ukraine	Since 1980,	None, only nesting tree	None	None		20-22%	10-15%	Yes

Country	Legal protection of nests and nest trees, since when?	Specified or unspecified zone around nests to be saved from cutting	Zone around occupied nests to be protected against disturbance from forestry activities	Zone around occupied nests to be protected against disturbance from other activities	Estimated percentage of population included in SPAs*	Estimated percentage of population included in IBAs*	Estimated percentage of population included in other national protected areas*	Is there a national protection plan for known nests
United Kingdom	Since 1954, only when occupied	None	None	No (the law protects birds only from deliberate disturbance and only at a nest containing eggs or young or while the nest is being built)	No SPAs designated for Sea Eagles, though nest sites and foraging habitats (17+%) may receive incidental protection from SPAs designated for other species	No IBAs delineated for Sea Eagles, though nest sites and foraging habitats of several pairs (<50%?) fall within IBAs listed for other species	At least 33% of nest sites occur on SSSIs notified for other reasons	No
Yugoslavia (Serbia and Montenegro)	1993	None (Specified zone in Natural reserves and other protected areas)	None (Sometimes, in special cases)	None (Sometimes viz. tourism, hunting, fishery)	0%	65%	40% in 2001	No

Table 4. Public awareness and recent conservation practices/measures (listed by contributors).

Country	General attitude towards the Sea Eagle	Is there a national Sea Eagle project/working group	Is there a survey/monitoring programme	Routines for information to the responsible authorities regarding nesting areas and nest-sites	Conservation efforts over the last ten years
Albania	Indifferent, Negative	No	No		
Armenia	Indifferent, Negative	No	No	None	No
Austria	Positive	Since 2000 (WWF)	Since 2000, but wintering birds also registered earlier in course of waterfowl counts	Working in protected zones (e.g. National Parks or SPAs), but not established for areas outside	Monitoring; artificial nests; winter feeding; anti-poisoning campaign; public awareness
Azerbaijan	Indifferent	No	No		
Belarus	Positive, Indifferent	No	Monitoring in northern Belarus since 1972	Inform a responsible authority of a nesting (authority ensures protection)	In northern Belarus: Monitoring, artificial nests, winter feeding, public awareness
Bulgaria	Positive	No	Yes, as part of the IBA monitoring. Wintering population monitored in main wintering areas	Registers of protected areas in Ministry of Environment and Water. Forest Services informed. No legal obligation for foresters, they must be convinced case by case	Artificial nests on Danube islands (not successful); monitoring; winter feeding; posters; protected areas established; data provided for management plans
Croatia	Positive	Not any more	Populations in Nature Parks are monitored by their staff, population in Pokupsko Basin by Institute of Ornithology, most other only partially	No routines. Information transferred to Ministry of Environmental Protection and Physical Planning (= MiEPPP) and Institute of Ornithology	Action plan, but not implemented; MiEPPP's negotiations with "Croatian forests", foresters take care of (but not legally responsible for) nests; MiEPPP's negotiations on fish-ponds
Czech	Indifferent	1978-1990	No	Inform a responsible authority of a nesting, (authority ensures protection)	Protected areas; "mostly controls of nests and works in their surroundings"
Denmark	Positive	Since 1991	No	DOF (Ornithological Society of Denmark) informs county authorities	Feeding programme; all nests monitored annually; negotiations to protect nest-sites; public education
Estonia	Positive	Since 1984 (NGO), renewed 1991	Since 1992	All information will be in the official database of the ministerial register of protected nature objects. All information is confidential	Action plan (2001), but not yet adopted; regular monitoring; new protected areas & SPAs
Finland	Positive	Since 1972	Since 1973	(1) Finnish mainland: three regional protection plans are annually updated by informing the regional authorities (2) Åland: authorities continuously informed of new nests; the authorities annually update the sets of maps held by local authorities responsible for land-use	Annual monitoring of breeding population & colour-ringing of nestlings; protection plans for nest-sites; winter feeding; winter eagle project; artificial nests; diet (breeding); public education; annual census reports; death-causes & chemical analyses of dead eagles; negotiations with electric power companies (insulation of pylons)
Georgia					

Country	General attitude towards the Sea Eagle	Is there a national Sea Eagle project/working group	Is there a survey/monitoring programme	Routines for information to the responsible authorities regarding nesting areas and nest-sites	Conservation efforts over the last ten years
Germany	Positive	Since 1990	Since 1980	Yes, on a state-wide level	Protected areas; Public awareness; research projects
Greece	Indifferent	No	Since 1980; recently a more comprehensive and regular monitoring of the species under the auspices of the Hellenic Ornithological Society (HOS), in co-operation with Evros Delta Environmental Information staff	Local forestry service has been informed of threatened nest sites since 2000. Local relevant authorities will be informed for the protection and restoration of threatened nest sites	Proposal to EC for the conservation of the species in Greece and EC, <i>c.f.</i> Jerrentrup <i>et al.</i> 1988; monitoring of most nests, especially during the last two years; monitoring of activities around nest-sites; cooperation of HOS with Ministry of Agriculture and local Forestry Service for the protection of the species; all but two sites are designated as SPAs
Greenland	Positive, Indifferent	No	No		Information to school children
Hungary	Positive, Indifferent	Since 1987	Since 1987	BirdLife Hungary Sea Eagle working group gives data to the authority	Artificial nests; insulation 20kV electric pylons; winter feeding; PR for Sea Eagle protection
Iceland	Positive	No	Since 1964	The Icelandic Soc. for the Protection of Birds and the Icelandic Inst. of Natural History (IINH) collaborate in gathering and storing all relevant information on eagle nest sites. A data base on eagle nest sites, productivity etc is handled by the IINH.	Regulation protecting eagle nest sites and limiting traffic within 500m of active eagle nests (1996); increased and more accurate monitoring efforts since 1994; designation of the Breidafjörður Bay as a Conservation Area (1995) - holds >60% of Iceland's sea eagle population
Israel	Positive	Yes, since 1992	Yes, since 1992	No such routines yet	Reintroduction (since 1992); insulation against electrocution; mitigate secondary poisoning
Latvia	Indifferent	Yes	No	According to CM regulations: "On rules of establishing, protecting and managing microreserves" any person or organisation may submit a proposal for establishing a microreserve. The proposal should contain 1) justification – description of the site, 2) map 1:10000, 3) written reference from State Land Service and State Forest service, and 4) written statement by an expert. Within 30 days the responsible authority approves (consulting with land owners) or rejects the microreserve	Artificial nests (30 since 1991); annual nest checks & ringing
Lithuania	Indifferent	No	No	Information to foresters on new nest sites (new nests must be included in microreserves – 200 m)	Monitoring; artificial nests; search for nests
Macedonia	Positive	No	Yes, since 2000	No such routine yet	Monitoring, artificial feeding at feeding sites for vultures and eagles since 2000

Country	General attitude towards the Sea Eagle	Is there a national Sea Eagle project/working group	Is there a survey/monitoring programme	Routines for information to the responsible authorities regarding nesting areas and nest-sites	Conservation efforts over the last ten years
Moldova					
Netherlands	Positive	Yes (WWF)	Yes (by SOVON)	BirdLife Netherlands informs authorities	Enlarging potential breeding habitat; improving wetland management; protection plans for marshland birds (benefits sea eagle)
Norway	Positive	Since 1974	Since 1974	For the Sea Eagle Project, run by the Norwegian Ornithological Society, at least information once a year after each breeding season, localised by GIS (UTM-grid system)	Survey/monitoring and research projects; public education; Sea Eagle removed from list of species harmful to livestock
Poland	Positive	Since 1981	Since 1981	Birdwatchers and laymen look for nests – inform forester and Local Nature Conservancy officer –local Government gives order for the protection of those nests – nests become legally protected	Eagle project (since 1981; rehabilitation (in Zoos); annual nest surveys; chemical analyses of dead eagles
Romania	Indifferent	No	Yes	No routines. The Danube Delta Institute is able to offer information	Building of nest platforms in the Danube Delta
Russia	Indifferent	No	Yes, in some areas	No routines	Local protected areas
Slovakia	Indifferent	Since 1996	Since 1998	1st step: discussion in responsible district authority. 2nd step: discussion with delegates of district authority, state nature conservancy of Slovak republic, NGO's and land owner, and assessment of requirements for nest protection. 3rd step: district authority delivers to land owner restrictions (with assessment requirements), which intend to eliminate all inappropriate activity	Prevent cutting; within the project "Monitoring and protection of White-tailed Eagle in Slovakia" implemented winter feeding in wintering areas (Danube, Northern Slovakia), building of artificial nests
Slovenia					
Sweden	Positive (only locally negative, with some nest sabotage)	Since 1971	Since 1964, run by the Swedish Society for Nature Conservation (SNF). Since 1989 the monitoring is included in the National Environment Monitoring Programme under the National Env. Protection Agency	Regional authorities have been informed of nests since the early 1970s by the SNF, continuously updated. Since the mid-90s the responsibility for forestry lies with the local Forestry Boards, but the responsibility for land-use planning remains with the County Administrative Boards.	Annual monitoring of breeding populations; nest-site protection; artificial nests; winter feeding; winter eagle project;; co-ordination of international colour-ringing programme; chemical analyses and research on contaminants & reproduction; national and international population genetics; public education; annual reporting
Turkey	Indifferent	No	No (two sites irregularly checked)	Inform General Directorate of National Parks and Game-Wildlife (GDNPGV) [under the Ministry of Forestry];	Hunter Education and Certification Programme started in 2000 by GDNPGV, esp. on protected species, habitats and legislation issues
Ukraine	Positive	No	Since 1992		Red Data Book (new ed. 1994); national action plan (1999); IBA program

Country	General attitude towards the Sea Eagle	Is there a national Sea Eagle project/working group	Is there a survey/monitoring programme	Routines for information to the responsible authorities regarding nesting areas and nest-sites	Conservation efforts over the last ten years
United Kingdom	Positive	Since 1975	Since 1975	Scottish Natural Heritage is responsible authority and represented on national project team	2 nd set of releases (1993-1998); monitoring; nest surveillance & protection from egg collectors; public viewing (2 sites, from 2000), limited management payments to farmers/landowners; diet research
Yugoslavia (Serbia and Montenegro)	Positive, Indifferent	Not at present (1985-1989 by Istvan Ham)	Since 1985	No routines	New protected areas: 5,5% of Serbia under nature protection in 2001; new research & monitoring projects; education; actions of NGO's against nest-robbing, smuggling etc.

3. AIMS AND OBJECTIVES

3.1. Aims

Short term: to maintain White-tailed Eagle populations at least at the present levels of population size and range.

Medium to Long term: to restore populations within the species former distribution range and to create an increase in areas with unsaturated populations.

3.2. Objectives

Criteria for Priority

Essential: needed to prevent large decline that could lead to the extinction

High: needed to prevent a decline of more than 20% in 20 years or less

Medium: needed to prevent a decline of less than 20% in 20 years or less

Low: needed to prevent local population declines

Criteria for Time-scale:

Immediate: completed within the next year

Short: completed within the next 1-3 years

Medium: completed within the next 1-5 years

Long: completed within the next 1-10 years

On-going: is currently being implemented and should continue

3.2.1. Policy and legislation

To promote national legislation which adequately protects the species and its habitat:

3.2.1.1. Review of legal protection

Full legal protection of the birds, their eggs, nestlings, nests and nest trees is fundamental for the conservation of the species and should be achieved in all range states. The protection should include active as well as alternate nests and old nest trees. The species should, where possible, be classified as belonging to the state, to ensure that all specimens and eggs are available for investigations and research, and to prevent private collection and trade. To ensure the secrecy of nest-site locations, national legislation should, where possible, allow for the classification of such information in archives as being strictly confidential. The legislative status on these terms should be investigated nationally and action taken where needed to fulfil these goals. Where national legislation gives no provision to regulate the classification of archives, secrecy regarding the location of nest-sites should nevertheless be promoted generally for protection against human disturbance, illegal collection and persecution.

As important as legislation in itself is its implementation in practice. Penalties for violations of legislative protection should be strong enough to be effectively deterrent and should be harmonised internationally as far as possible.

Priority: *High*

Time-scale: *Short*

3.2.1.2. Review of restrictions for forestry around nest-sites

Guidelines for forestry activities are essential for the protection of the Sea Eagle in Europe and are enforced in several countries already. Minimum protection zones around nests should be specified for forestry by all range states, including a zone to be protected from cutting and a wider zone where forestry activities should be avoided during the breeding period. Specified time-periods should be adopted nationally, including at least four weeks prior to first egg-laying dates and including the entire nestling period based on last egg-laying dates (periods will vary regionally due to differences in breeding phenology). Potential nest-trees should generally be left uncut and, where possible, be legally protected. The focus should be both on the immediate future and with a longer perspective, to ensure the succession of suitable trees for nesting. Such guidelines should be worked out on a national basis and be presented to the authorities for implementation. An implementation of nest-site protection in forestry certification and in forestry grant-aid conditions should be generally promoted.

Priority: *High*

Time-scale: *Short*

3.2.1.3 Ban of lead ammunition in hunting

The problem with lead poisoning is widespread and relates to many bird species besides the White-tailed Eagle. Action has been taken in some countries to regulate the use of lead ammunition in hunting (most recently in Greenland where lead ammunition is a human health problem) but the overall situation is far from satisfactory. The present information on lead being a significant death cause for Sea Eagles warrants action on behalf of this species. Responsible authorities should be urged to enforce a ban of lead in hunting.

Priority: *Medium*

Time-scale: *On-going*

To promote the implementation of international conventions and directives:

3.2.1.4. Implementation

The Bern, Bonn, Ramsar and Washington Conventions and the EU Birds Directive form a good basis for the conservation of the White-tailed Eagle and its habitat. All EU nations and all ratifying nations should be encouraged to implement these conventions and directives in full according to the suggestions given in this Action Plan.

Priority: *High*

Time-scale: *On-going*

To promote policies which ensure the long-term conservation of White-tailed Eagle populations:

3.2.1.5. Land-use planning

The long continuity of Sea Eagle breeding territories, spanning even over centuries, makes some of them very suitable for long-term protection as nature reserves without much risk that the money spent will miss the target. Establishing reserves will take its time, however, and far from all breeding territories can be protected as nature reserves. It is therefore essential that breeding territories are taken into account in national land-use planning, to secure vital areas from exploitation. Thus, it is recommended that the authorities in charge of land-use planning in range countries be contacted for agreements on action on this issue. It must be remembered in this context that the long continuity of eagle territories makes them especially vulnerable and that the locations should not be disclosed and available to the public. Instead, it is recommended that all information handed over to the authorities on the distribution of Sea Eagle territories and nests be strictly classified and kept confidential.

Priority: *High*

Time-scale: *Medium*

3.2.1.6. National action plans

All range states should compile national action plans for the conservation and management of Sea Eagle populations and habitats. The national plans should include all relevant information on the status and needs on a national scale, but also put in an international perspective for reference. Plans should include actions for the protection of nest-sites and habitats, the mitigation of human-induced death causes, outline census and monitoring activities, and put a focus on research relevant for conservation purposes. Also public information and education should be considered. Action plans should be implemented by the nature conservation authorities in all range states.

Priority: *High*

Time-scale: *Short*

3.2.1.7. National and international co-operation

Where not already in existence, the establishment of national Sea Eagle projects/working groups should be encouraged. International co-operation and exchange of experiences and data should be

promoted in order to optimise the conservation efforts on the national scale. Monitoring strategies, census methods, sampling practices, ringing activities and other research efforts should be internationally co-ordinated for optimising results.

Priority: *High*

Time-scale: *On-going*

3.2.2. *Species and habitat protection*

To promote site protection:

3.2.2.1. *Protection plans for nest-sites*

It is recommended that national protection plans for nest-sites be worked out in all range states. Ideally, a protection plan should be produced for each breeding territory, taking into account all nests present and the potential for new nests, and outlining different protection zones to be saved from cutting, human disturbance, and permanent constructions. This approach should be adopted at least in countries with small populations.

Priority: *High*

Time-scale: *Medium*

3.2.2.2. *Establishment of protected areas*

The establishment of nature reserves to ensure full protection for the most important breeding and wintering areas should be promoted in all range states. Such protected areas should also include important feeding grounds to ensure the long-term possibilities for successful reproduction. A network of the most important breeding sites in each state should be preserved as nature reserves and bird sanctuaries in order to ensure the long-term survival of a minimum population. The creation of protected areas can involve the action both from non-governmental organisations and national and international authorities and should be promoted generally.

Priority: *High*

Time-scale: *Long*

3.2.2.3. *Protection and restoration of feeding habitats*

The conservation and restoration of natural feeding habitats should be promoted in all range countries. River regulation and dam projects, drainage projects, oil prospecting and any other activities that could cause deterioration in aquatic feeding habitats should be carefully scrutinised.

Priority: *Medium*

Time-scale: *Long*

To promote survival:

3.2.2.4. *Supplementary feeding*

Feeding during winter has proved to be a powerful tool to increase the survival of juvenile and subadult Sea Eagles in the Baltic region (Helander 1985b, Sauola *et al.* in press) and probably has had an effect also on adult survival there. Winter-feeding is undertaken also in some other areas and should be promoted in order to enhance survival, thus creating better possibilities for a further increase and range expansion. Supplementary feeding activities have traditionally been performed largely on a voluntary basis and the feeding stations are used also for research purposes (annual counts, age distribution, reading of rings, food consumption). Supplementary feeding must be designed to meet the regulations in national legislation for this kind of activity. Specimens containing lead ammunition must not be used.

Priority: *Low*

Time-scale: *On-going*

3.2.2.5. Insulation of pylons and cables

To mitigate electrocution, insulation of pylons and cables should be promoted in all target areas. New pylons should be designed to be electrocution safe, and old pylons where eagles and other raptors have been electrocuted should be adjusted.

Priority: *Low to Medium*

Time-scale: *Medium, and On-going*

3.2.2.6. Take into account the existence of breeding, feeding and wintering areas in the planning of new wind turbines, power-lines and other cable structures

Collision with cable structures is a significant mortality factor that should be reduced. New stretches of power-lines under planning should take account of important wintering areas for Sea Eagles and of nesting areas generally, and be adjusted to avoid the nearness of such areas. The same is valid for the location of other structures with a high potential risk for fatal collision, such as towers supported by cables, and of wind turbines.

3.2.2.7. Removal of carcasses from roads and railroads

Road and railroad killed animals attract Sea Eagles for feeding and many eagles are killed by traffic in this way regionally. The removal of such carcasses is important in such areas and should be promoted.

Priority: *Low to Medium*

Time-scale: *Medium*

3.2.2.8. Prevent poisoning

The use of poison to control predators should be banned. The prohibition of the use of all kinds of poisoned bait left in the open and the prohibition of the marketing of poisons for the use as bait in the open should be promoted in all range countries. (See also 3.2.4.2.- regarding unintentional, secondary poisoning from lead in food brought to the eagles).

Priority: *High*

Time-scale: *Short*

3.2.2.9. Rehabilitation of sick or injured specimens

The rehabilitation and reintroduction to the wild of sick or injured White-tailed Eagles have proven successful in a number of cases. It should be promoted in all range countries to arrange for a readiness to take immediate care of such birds under professional veterinary attention. Sick or injured birds held for treatment should be placed in the care of licensed registered keepers and must not be displayed to the public, to ensure that they do not become imprinted or accustomed to human presence before release back to the wild.

Priority: *Low*

Time-scale: *Long, and On-going*

To promote breeding success:

3.2.2.9. Prevent the use of persistent bio-accumulating chemicals

Strict regulations of the use of chemicals (crop protection products as well as industrial products that could leak into the environment) and prohibitions both of the use of known persistent, bio-accumulating chemicals and of the introduction and marketing of any new chemicals without prior investigations of their properties and possible impacts on biota, should be promoted in all range states.

Priority: *Essential*

Time-scale: *On-going*

3.2.2.10. Mitigate disturbance of nests

Nests that become known to the public tend to be subject to disturbance leading to breeding failure, and in some cases even to robbing or destruction. The location of nests should therefore not generally be disclosed to the public. The wardening of nests locally to protect them from robbing or sabotage should be promoted where needed.

Priority: *Low*

Time-scale: *On-going*

To promote further range expansion:

Although the White-tailed Eagle has expanded its range recently, the species is still absent or rare in parts of its natural, former range in Europe and Asia. If reproduction remains high and mortality does not increase, a further expansion can be expected. In some areas, however, action has been taken to promote a re-establishment and range expansion.

3.2.2.11. Supplementary feeding

See under 3.2.2.4.

3.2.2.12. Artificial nests

To promote the (re-)establishment of Sea Eagles in vacant or new territories, artificial nests can be built (Helander 1975, Lipsbergs 1993, Mizera 1999, Ivanovsky 2000, Mecionis in press). This generally requires permission from the land-owner. Provision of artificial nests is also a useful management tool in territories where trees for nesting are scarce or where re-location is desirable or urgently needed. The acceptance of artificial nests by Sea Eagles has proven to be high (about 50% in Lithuania and Sweden) and as many as 23% of the pairs in Finland bred in artificial nests in 1998 (Stjernberg *et al.* 1999).

Priority: *Low*

Time-scale: *On-going*

3.2.2.13. Reintroduction projects

The successful reintroduction of Sea Eagles in Scotland (UK) has been based on translocations of nestlings from Norway for subsequent release within the former Scottish breeding range (Love 1983, Evans *et al.* in press). In Israel, reintroduction is based on releases from captive breeding (Hatzofe in press). The reoccupation of the Czech Republic in the 1980s was partly boosted by releases of birds bred in captivity (Mizera 1999). Attempts in such areas to further increase the range of local populations should be considered. Any reintroduction programme should follow strictly the IUCN guidelines (summarised by Evans *et al.* 1994).

Priority: *Low*

Time-scale: *On-going*

3.2.3. Monitoring and research

The conservation and management of populations and habitat need to be based on scientific data:

3.2.3.1. Nationwide surveys

Surveys to map the distribution of nest-sites and monitor the numbers of territorial pairs are essential for conservation purposes and for the monitoring of reproduction and population trends, and should be promoted in all range countries, with comparable data being collected.

Priority: *High*

Time-scale: *On-going*

3.2.3.2. Annual monitoring of reproduction

The White-tailed Eagle was among the very first species to provide evidence of the harmful effects of pollutants in the aquatic environment in Europe. In the Baltic Sea area, a strong decrease in

reproductive ability, which was later linked with pollutants, was first observed in the early 1960s (*e.g.*, Olsson 1963, Suominen 1967, Randle 1976, Koivusaari *et al.* 1980, Helander *et al.* 1982, 2002). Retrospective studies have demonstrated that the drop started as early as the 1950s in this area (Helander 1985a, 1994). A similar drop in reproductive success was observed both on the coasts and at inland freshwater sites in Germany and Poland, where it was also linked with environmental pollution (Oehme 1987, 1990, Falandysz *et al.* 1988, Mizera 1990, Hauff 1998, in press).

Being the top predator in aquatic food chains, the Sea Eagle has demonstrated a great potential as an indicator of environmental stress and has been included as such in the National Environment Monitoring Programme in Sweden. Two robust reproductive parameters are measured annually in Sweden: percent successfully breeding pairs, and brood size. The monitoring of reproduction also facilitates the collecting of eggshells for measurements of eggshell thickness and the sampling of dead eggs, feathers and blood from nestlings for the monitoring of chemical substances. Significant eggshell thinning has proven to occur at DDE concentrations far below those where reproductive impairments show up, and is thus a powerful early warning sign (*e.g.*, Nisbet 1989, Wiemeyer *et al.* 1993, Nygård and Skaare 1998, Helander *et al.* 2002). The use of the White-tailed Eagle as an indicator of environmental quality is in parallel with the use of the Bald Eagle as biosentinel in the Great Lakes area in the USA (Bowerman *et al.* in press), with comparable data being collected there. The inclusion of the White-tailed Eagle in environmental monitoring programmes should be promoted throughout the species range and efforts be co-ordinated in order to obtain directly comparable data. Breeding success and productivity should be assessed according to Postupalsky (1974) and Steenhof (1987).

Priority: *High*

Time-scale: *On-going*

3.2.3.3. *Monitoring of contaminants*

Persistent environmental pollutants pose a significant potential threat to Sea Eagle populations and the monitoring of residue concentrations should be promoted in all range states. The concentrations of known, harmful chemicals as well as “new” chemicals, *e.g.* flame retardants (PBDEs), in Sea Eagle eggs and carcasses should be monitored and their relationships to reproduction and health be investigated further. Where possible, analyses should include dead eggs, blood from nestlings and samples of muscle, liver, kidney and brain from dead eagle specimens, as well as samples from fish and birds representing the prey base. Inter-calibrated laboratories should be used for the comparability of results.

Priority: *High*

Time-scale: *On-going*

3.2.3.4. *International colour-ringing programme*

An extensive colour-ringing programme for Sea Eagles in Northern Europe was started in 1976 in order to obtain data on vital population parameters based on the re-sightings of ringed birds (Helander 1985c, in press). The programme focuses on survival estimates, age at first reproduction, homing and site tenacity, and migration and wintering areas. More than 9,000 eaglets have been ringed within the programme 1976-2001. It was recommended at the SEA EAGLE 2000 conference that the programme should be continued at least until 2007. At present the programme includes the following countries: Norway, Sweden, Finland, Russia, Estonia Latvia, Lithuania, Belarus, Poland and Germany, with 17 area codes in use altogether. The limited access to distinguishable colour combinations reduces the possibility to expand the programme further but a few options remain.

Priority: *Low*

Time-scale: *On-going*

3.2.3.5. *Radio-and satellite tracking*

Studies based on radio telemetry on movements and survival of juvenile White-tailed Sea Eagles have been conducted in Germany and Norway (Meyburg 1994, Nygård *et al.* 2000,). Further studies based on radio telemetry, as well as on satellite telemetry, are encouraged and should include adults as well.

Priority: *Low*

Time-scale: *Medium*

3.2.3.6. *Population genetics*

An investigation of the population genetics of Sea Eagles in Northern Europe and Greenland based on blood from nestlings was launched in 1996. Preliminary results indicate a separation between the Swedish populations on the Baltic coast and in Lapland (Cederberg *et al.* in press). Comparative studies including the samples from other populations are needed for further interpretations and are under way. The results are of importance for the identification of sub-populations and are of relevance also in reintroduction projects. The Sea Eagle in Greenland is presently classified as a subspecies and the genetic structure of this small, isolated population should be investigated also from a conservation perspective.

Priority: *Low*, for Greenland *High*

Time-scale: *Medium*, for Greenland, *Short*

3.2.3.7. *Mortality factors*

Investigations by autopsy and chemical analyses of dead Sea Eagles are needed to monitor causes of death and identify threats, and should be promoted in all range countries.

Priority: *Medium*

Time-scale: *Long*, and *On-going*

3.2.3.8. *Investigating changes in the prey base*

Information on the prey composition is important in conservation and investigations should be promoted. This is especially important in the few areas where there is a potential conflict from Sea Eagles feeding on livestock like lambs, reindeer fawns (Helander 1983b, Marquiss *et al.* in press) or where the eagles are accused of reducing populations of species of interest for hunters. Recent changes in the prey base in Greenland (Hansen 2001) and its impact on Sea Eagle reproduction there should be investigated shortly.

Priority: *Low*, in Greenland *High*

Time-scale: *Long*, in Greenland *Short*

3.2.4. *Public awareness*

To improve and maintain awareness, concern and support for the protection of the White-tailed Eagle and its habitat:

3.2.4.1. *Information to the authorities*

Where the monitoring of populations is performed by non-governmental organisations, the responsible authorities (both on the national and community level) should be informed at regular intervals on current status, distribution and conservation needs. To keep the responsible authorities well informed in this way will help to keep the species on their agenda, and will be of importance for the willingness to implement urgent conservation actions.

Priority: *High*

Time-scale: *On-going*, in areas where not in practice *Immediate*

3.2.4.2. *Public education*

The White-tailed Eagle is a spectacular bird species attaining great interest from the public. To maintain this interest and concern for the species, general information should be provided from working groups and from the authorities to the public on the species, its life history and requirements, current status and trends, and of any special events (*e.g.* Helander 1975, , Stjernberg 1981, Love 1983, Struwe-Juhl 1998, Mizera 1999, Helander *et al.* in press). National and local working groups are also encouraged to advertise themselves and their activities. Information should be provided through communication with media, via Internet through home pages, in lectures, and by publications, pamphlets, stickers and video cassettes.

Not seldom, hunters leave the remnants of shot animals in the open for eagles and other scavengers to feed on. Such carcasses or parts often contain lead shot or lead fragments from rifle bullets, which is a potential source of secondary poisoning. Information on this risk should be provided to the hunter's organisations and magazines for education to prevent secondary poisoning, with recommendations on how to handle the problem (may differ nationally).

Priority: *Medium to High*

Time-scale: *On-going*, in areas where not in practice *Immediate*

3.2.4.3. *Public viewing of Sea Eagles*

One of the most powerful tools to generate interest for the welfare of the species is through public viewing of the birds. This can be realised under control *e.g.* at favoured natural feeding sites or at feeding stations. Under special conditions this can even be realised at a nest. In the United Kingdom, limited public viewing from a hide at one nest and video surveillance of another nests has been performed with great success (MacLennan and Evans in press). It should be noted that public viewing of a nest must be undertaken with great caution and demands careful planning; if a breeding attempt would fail in connection with viewing, the potential for a strong backlash in media is apparent.

Priority: no general recommendation

Time-scale: -

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APPENDIX 1. *Conservation needs for the future*

It is recommended generally, as a minimum protective measure, that a National White-tailed Eagle Action Plan be compiled for every country, see 3.2.1 – 3.2.4

Country	Conservation needs for the future (listed by the contributors)
Albania	Conservation of the large wetlands complexes (IBAs) with forest core zones for breeding
Armenia	Identification of main wintering areas and establishing them as protected areas. Education of fishpond owners, hunters and the public. Increase the penalty for illegal killing. Organise a Sea Eagle working group with focus on reintroduction.
Austria	Limitation of disturbance at breeding and feeding sites; more efficient protection of nests sites (by legislation); stop of poisoning activities; improvement of feeding habitats (e.g. through river restorations); transfer from hunting to nature conservation legislation
Azerbaijan	Location and protection of all nest-sites and wintering areas; increasing the penalty for illegal killing; creation of a nationwide working group; preparing a national action plan
Belarus	National species action plan; legislation for protection of nest zones; public awareness; Sea Eagle project; monitoring; winter feeding programme; stop illegal taxidermy
Bulgaria	Nest site protection should be incorporated in forestry management plans for nests outside protected areas; nests in protected areas should be marked and monitored; strict control of the use of pesticides, not least of rodenticides, in agricultural land neighbouring breeding and wintering areas of the species; wardening of nests, and of hunting areas by fishponds; raising awareness among fishpond-managers; ban of the use of lead ammunition used by hunters in main wintering areas
Croatia	Implementation of the action plan; change of water management and the proposed regulation of the main rivers; preservation of the alluvial wetlands and restoration (Sava, Drava, Mura, Danube); programme to sustain the lowland carp fish farms; stop of bird hunting in the wetlands of international importance & IBAs; full protection of nesting sites
Czech	Protection of most nesting areas, nesting forests and most nest-sites; strong protection of nests on good localities (without tourism, without high forest cutting, etc.); stop of illegal shooting and persecution
Denmark	Law to protect nest-sites; official funding of monitoring and protection efforts
Estonia	More regular monitoring; SPAs in the near future; colour-ringing and observation of ringed birds
Finland	Updating the national action plan; protection of nest-sites according to the Nature Conservation Act; protection of natural habitats and feeding habitats of the Sea Eagle; annual monitoring of the population, of breeding and of nesting adults & survival; identification of ringed birds at feeding stations; annual monitoring of the Baltic environment for possible new harmful substances
Georgia	[National action plan]
Germany	Ban of lead gunshots (already accomplished in some Federal states); program to get 10% of country under conservation law; conservation program for old forests; Federal nest-site protection plans
Greece	Compile national species action plan, including protection plans for each breeding territory and nest-site, establish general protection zones in guidelines for forestry and land-use; implement protection plans in the national legislation; guidelines for considering the Sea Eagle's breeding and wintering habitats in land-use planning, <i>i.e.</i> forestry, road building, exploitation of breeding and feeding habitats for other purposes; prohibition of hunting on breeding and feeding grounds of the species; ban of lead ammunition in hunting; stop use of poisoned baits; annual monitoring of reproduction and population; research on mortality factors and contaminants; public awareness; ensure the secrecy of nest-site locations; international conventions and directives should be implemented and promoted; national legislation (Ministerial Decision 414985/1985 should be harmonised to the Birds Directive)
Greenland	Information; annual monitoring; investigate prey base; investigate lead poisoning; population genetics
Hungary	Artificial nests (in trees); insulation of 20 kV electric pylons; winter feeding; PR for protection
Iceland	Protection of nesting areas from encroachment (road construction, summer houses); reduce disturbance to nesting eagles; educate land-owners and the general public on the need to protect eagles; investigate genetic status of the population, which may have gone through a bottleneck in the 20 th century

Israel	Completing the implementation of the power lines protection to prevent electrocution (insulate 3000 pylons & cables); prevent the use of pesticides; education and cooperation with specific sectors in the population and with neighbouring countries; continue the reintroduction of up to 50 fledglings in a short time
Latvia	Prevent deforestation; prevent deliberate killing; continue annual monitoring and the protection of nest-sites and habitats
Lithuania	Establish a national monitoring programme and management plan; public education
Macedonia	Completing national action plan for conservation; continue the supplementary feeding of vultures and eagles and the monitoring on feeding sites and wetlands; increasing public awareness and education of local people
Moldova	[National action plan]
Netherlands	Enlarge areas with potential breeding habitats; limitation of disturbance in potential breeding habitats; changing forestry activities towards increase of suitable nesting trees; changing water management to benefit Sea Eagles
Norway	Urgent need for regulation of land-use and activities under the Planning and Building Act; national plan for protection of nest-sites by law; regulation of activities around the nesting sites (e.g. forestry, organized outdoors activities, photographing)
Poland	Monitoring of the population; manage problems with electrocution; manage problems with lead shots; monitoring of PCBs, DDE, etc.
Romania	[National action plan]
Russia	Legislation; special protection status of the Sea Eagle; regulation of forestry & recreation & other kinds of human activities in nesting territories; establish national Sea Eagle project & working group; carry out nationwide survey of the nesting Sea Eagle population
Slovakia	Eliminate recreation in nesting areas; eliminate fishing from potential nesting areas; preserve natural flood-plain forests and forests around large water reservoirs in Northern Slovakia; feeding Sea Eagles in wintering areas in Northern Slovakia; educate on protection of the Sea Eagle; enforce the protection of nests into legislation
Slovenia	[National action plan]
Sweden	National Action Plan; continued annual monitoring of reproduction and contaminants; re-population of vacant coastal and freshwater habitats; continued co-ordination of international colour-ringing; winter feeding and identification of ringed birds at feeding stations; review of present guidelines for forestry in relation to nest protection; evaluation of forestry certification programmes as tool for nest-site protection.
Turkey	Locate and monitor the breeding population; provide full legislative and practical protection for the nesting sites by excluding harmful activities such as forestry operations and recreation; carry out research on nest site selection, diet and mortality; launch an anti-poisoning campaign; compile a National Action Plan within two years
Ukraine	Monitoring of breeding pairs; surveys for new nests; establish protection zones around nests; ban lead gunshots
United Kingdom	Continued population monitoring; improve legislation to protect birds and nests; education (including public viewing) and increased community involvement; appropriate management agreements/payments; continued wardening of vulnerable nests; consider further translocations to expand range into areas with more diverse food supply
Yugoslavia (Serbia and Montenegro)	Prepare and implement management action plan; full protection of nesting and feeding sites; change of water and forest management in wetlands and alluvial plains; reduce illegal persecution, illegal collecting as well as disturbance from hunters, foresters and fishermen