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Status report on Raptors in the African-Eurasian Region

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Food and Rural Affairs

Assessment of the merits of an Instrument under the Convention on Migratory Species covering Migratory Raptors

Review of the Status of Migratory Raptors in Africa and Eurasia

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LIST OF ABBREVIATIONS

AEWA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds.
CITES	Convention on International Trade in Endangered Species
CMS	(Bonn) Convention on Conservation of Migratory Species of Wild Animals
DEFRA	Department for Environment, Food and Rural Affairs
EC DG	European Commission Directorate General
ETS	European Threat Status, as defined by Birdlife International
EU	European Union
FAO	UN Food and Agriculture Organisation
FCS	Favourable Conservation Status, as defined under CMS (see 2.1)
GROMS	Global Register of Migratory Species
IBA	Important Bird Area, as defined by Birdlife International
IGO	Intergovernmental Organisation
IUCN	World Conservation Union (International Union for Conservation of Nature and Natural Resources)
JNCC	Joint Nature Conservation Committee
MEA	Multi-lateral Environmental Agreement
NGO	Non-governmental Organisation
SPEC	Species of European Conservation Concern, as defined by Birdlife International (see 2.3.1)
UCS	Unfavourable Conservation Status, as defined under the CMS (see 2.1)
WWGBP	World Working Group on Birds of Prey and Owls

1 SUMMARY

In January 2005, Defra commissioned a study to assess whether or not an international agreement to conserve migratory raptors (including owls) should be established under the auspices of the Convention on Conservation of Migratory Species (CMS) in the African-Eurasian region. This Status Report contributes to that study (available separately from Defra) by reviewing the current conservation status of each species of migratory raptor within the region, the principal threats to those with an Unfavourable Conservation Status (as defined by the Convention) and the international actions being taken for raptors of the region under existing multi-lateral environmental agreements (MEAs).

From a review of the available literature and data in Birdlife International's World Bird Database, it is clear that at least 32 of the 60 migratory raptors assessed have an Unfavourable Conservation Status, and many of these are showing rapid or long-term population declines. Furthermore, since the conservation status of many species in Africa, Asia and the Middle-east is poorly known, other species in these regions may also be declining.

Although there are many documented threats to migratory raptors in the region, available data proved inadequate to quantify population level impacts. Nevertheless, for the majority of species the most important threats are probably the result of human induced habitat loss and degradation (including impacts from pesticide use and other forms of pollution). Climate change is also expected to exacerbate these habitat-related problems profoundly across the entire African-Eurasian region. For some species accidental poisoning, persecution, shooting for sport and trapping may also be key or contributory factors causing population declines (or long-term reductions in range), but the impacts of these losses on populations require further studies.

2 INTRODUCTION

2.1 BACKGROUND

There is widespread concern over the deteriorating conservation status of many birds, especially regarding increasing risks of global extinction (Birdlife International 2004c), but also in terms of regional range contractions and declines, e.g. in Europe (Birdlife International 2004a). Raptors[1] and owls may be particularly at risk because they are generally large, long-lived species with low rates of reproduction: characteristics that appear to be associated with high risks of extinction (Bennett & Owens 1997). Species with low fecundity are particularly susceptible to factors that increase their adult mortality rates (Newton 1979). Furthermore, species with slow reproduction take a long time to recover from losses, which lengthens the time over which reduced populations may be at risk from catastrophic chance events. Also, as predators, many species are naturally scarce, which further exacerbates their vulnerability to threats.

Raptors are known to be susceptible to many threats. The most important concern land use practices that reduce prey availability and suitable breeding habitat, but pollution, poisoning, hunting, persecution, illegal taking and trade (e.g. for falconry), collisions and electrocution from overhead power-lines, and general disturbance all impact on their welfare (Thiollay 1994; White *et al.* 1994). Moreover, migratory raptors face additional problems because they need adequate networks of suitable habitat along their migration paths, and many species tend to congregate at land-bridges, mountain passes and along coastlines where they are especially susceptible to intensive hunting and trapping (Zalles & Bildstein 2000).

The cumulative evidence of national or regional declines of raptors, increasing pressures on their populations, and apparent failings in current conservation measures to redress the situation, has led to calls for better conservation action, especially for the migratory species. As a result, the VI World Conference on Birds of Prey and Owls convened in Budapest, 18-23 May 2003, by the World Working Group on Birds of Prey and Owls (WWGBP) adopted a resolution (see Annex 1) proposing the establishment of a new multilateral agreement for African-Eurasian migratory raptors, under the Convention on Migratory Species of Wild Animals[2] (CMS).

The WWGBP resolutions were subsequently considered by the CMS Scientific Council, who endorsed a proposal from the UK Government's Department for Environment, Food and Rural Affairs (DEFRA) to study the possibility of developing a new instrument on raptors, and to present a report at the next Conference of Parties to be held in Nairobi, 16-25 November 2005.

In January 2005, the NatureBureau was commissioned to carry out the study, and this report contributes to the study (the final report of which is available separately from Defra).

[1] In this study "raptor" refers to all birds of prey, including owls, i.e. species in the Orders Falconiformes and Strigiformes.

[2] Also known as the Bonn Convention

2.2 OBJECTIVES

This report reviews available literature and other known data sources to assess the status of migratory raptors in the African-Eurasian region, and establish the scope for further conservation measures (including relevant research and monitoring). In particular, the review aims to:

- establish the conservation status of each species in the region; and
- identify the threats to each species and the principal generic threats to raptors across the region; and
- assess urgent key actions needed to deliver an immediate conservation benefit for the raptors concerned.

2.3 GEOGRAPHICAL COVERAGE

The study began by considering the global status of all raptors regularly occurring in Palearctic and Afrotropical realms, as defined in Newton (2003). Then a more detailed assessment was made of migratory raptor populations that regularly occur at some point in their annual cycle within the Afrotropical Realm or Western Palearctic, as defined by Cramp *et al.* (1977-93). The aggregate Afrotropical and Palearctic range of this group of species[3] would represent the potential area of any CMS instrument, which comprises all Afrotropical and Western Palearctic countries, plus Afghanistan, China (mainland only), Iran, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan and Uzbekistan. This range is referred to hereafter in this report as the African-Eurasian region.

2.4 DEFINITION OF MIGRATORY SPECIES

It was envisaged that a CMS raptor instrument would be applicable to any raptor species that met the CMS migratory definition i.e. “Migratory species means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries”.

However, for practical reasons, in this study the list of species was restricted to those defined as “True Migrants” and listed in the Global Register of Migratory Species (GROMS) database. These include partial migrants (species in which only part of the population migrates, with the rest remaining in the breeding areas) but excludes those listed as “nomadising” or “range extensions” (see Annex 2). It also excludes species that technically meet the CMS migratory species definition because they regularly cross one or more national boundaries, but are short-distance migrants, travelling less than 100 km.

It was anticipated that the chosen species would include a sufficient number and diversity of raptors and range of coverage that the additional listing of short-distance (‘technical’) migrants would be of little additional benefit. It was assumed that many short-distance migrants would benefit from actions proposed for other migratory raptors. Nevertheless, it is

[3] For practical reasons, this excludes countries outside the Palearctic that the Amur Falcon (*Falco amurensis*) passes through on migration

expected that this assumption would be investigated further if a CMS raptor instrument is eventually brought into force.

It should also be recognised that our knowledge of the migratory status of many Africa raptors is incomplete, and many species that are currently listed by GROMS as non-migratory may, with better knowledge in the future, turn out to be at least partial migrants. The migratory status of African raptors should therefore also be subject to further investigation if a CMS raptor instrument is developed and implemented.

3 STUDY METHODS AND DATA SETS

3.1 TAXONOMY AND NOMENCLATURE

The study follows the taxonomy, scientific nomenclature and English names used by Birdlife International since it is the IUCN Red Data Book authority for birds. Birdlife International maintains its own taxonomic list of all the world's bird species because there are so many different global, regional, national, site and family taxonomic checklists, and thus many differences of opinion and much confusion over the taxonomic rank of certain species. The Birdlife International list is based on:

- well recognised and established sources adopted by the Birdlife International Taxonomic Working Group (BTWG) − each year, these sources are reviewed and, where possible and appropriate, updated or revised (see below for the principle sources used for species referred to in this study);
- peer-reviewed papers (published in the major ornithological journals) which have themselves been reviewed by the BTWG;
- original taxonomic research conducted by Birdlife International researchers and published in the Red Data Books and, more recently, by the BTWG, notably concerning particularly controversial and complex taxa (usually where there are important conservation considerations);
- some deviations from the adopted sources where treatment is judged to be mistaken and/or controversial.

Birdlife International's preparation of a standardised list of all the world's bird species remains in progress and much work remains to be done, including taxonomic review of some 400 potential species, taxonomic verification of Extinct species, and documentation of the decisions taken for over 200 species. However, few of these remaining considerations are likely to affect the species and their nomenclature contained in this report.

The principle sources used for the species covered in this study were:

- Global: Sibley and Monroe (1990, 1993).
- Western Palearctic: Cramp, S. *et al.* (1977-1994).
- Afrotropical: Dowsett, R. J. and Forbes-Watson, A. D. (1993).

The nomenclature used by Birdlife International aims to follow David and Gosselin (2002) for consistent gender agreement of scientific names, which may contradict the taxonomic sources. Otherwise, scientific names usually follow the agreed sources, as above, although global consistency is taken into account (e.g. where generic names are changed regionally but not consistently for the whole group). Where species limits are recognised by more than one source, but different nomenclature is used, global consistency is again taken into account.

The names and sequence of orders and families follows Morony *et al.* (1975) while the species sequence within these families follows Sibley and Monroe (1990, 1993). Common names for each species are taken from the source used to determine the scientific name, following the order of precedence outlined above. No attempt has been made to ensure global consistency.

3.2 ASSESSMENT OF POPULATIONS AND FAVOURABLE STATUS

Due to data limitations and other practical considerations it was not feasible within this study to attempt the assessment of the status of each species according to subpopulations, although in some cases this would be desirable. The study therefore operated at the taxonomic level of species.

One of the principal aims of this study is to examine the status of migratory raptors, to establish if these groups are particularly threatened and therefore warrant new and urgent measures under the CMS in comparison with other groups. Comparisons are also made within raptors between regions and between migratory and non-migratory species. The analysis initially focuses on the threat of global extinction, but another important conservation aim is the maintenance of species' ranges and populations. Therefore the study also examines conservation status in broader terms. In particular we focus on Unfavourable Conservation Status as defined under the CMS.

According to the CMS text "conservation status" will be taken as "favourable" when:

(1) population dynamics data indicate that the migratory species is maintaining itself on a long-term basis as a viable component of its ecosystems;
(2) the range of the migratory species is neither currently being reduced, nor is likely to be reduced, on a long-term basis;
(3) there is, and will be in the foreseeable future, sufficient habitat to maintain the population of the migratory species on a long-term basis; and
(4) the distribution and abundance of the migratory species approach historic coverage and levels to the extent that potentially suitable ecosystems exist and to the extent that is consistent with wise wildlife management.

This definition has been interpreted with respect to available data and existing conservation assessments. Accordingly, in this study species are considered to have an Unfavourable Conservation Status if they are:

- Globally Threatened or Near Threatened (i.e. not assessed as being of Least Concern), according to Birdlife International's World Bird Database; or
- a Species of European Conservation Concern (SPEC) according to Birdlife International (2004a); or
- considered in this report to be declining in population or range by more than 1% per annum in Asia, the Middle-East or Africa; or
- are considered in this report to be regionally threatened by reduced population size or imminent substantial habitat loss.

As a result of data limitations, assessments of population status in Asia, the Middle-East and Africa are mostly based on extrapolation of available data and subjective overall assessments.

3.3 DATA SOURCES

The study has reviewed the key relevant literature on raptors, including the following publications by WWGBP: *Raptors in the Modern World* (Meyburg & Chancellor 1989), *Raptor Conservation Today* (Meyburg & Chancellor 1994), *Raptors at Risk (Chancellor & Meyburg 1998)*, *Raptors in the New Millennium* (Yosef *et al.* 2002), *Raptors Worldwide (Chancellor & Meyburg 2003)*; and Birdlife International: *Threatened Birds of the World* (Birdlife International 2004c), *Birds in Europe* (Tucker and Heath 1994, Birdlife International 2004a), *Important Bird Areas in Europe* (Heath & Evans 2000), *Important Bird Areas in the Middle East* (Evans 1994), *Important Bird Areas in Africa* (Fishpool & Evans 2001); as well as others, e.g. *Handbook of the Birds of the World* (del Hoyo *et al*. 1994, 1999), *Birds of Africa* (Brown *et al.* 1982) and *Raptors of the World* (Ferguson-Lees & Christie 2001). Key journals have also been checked for relevant papers, and searches have been carried out using internet bibliographic databases, including the Raptor Information System (http://ris.wr.usgs.gov/about.asp)..

However, much of the quantitative analysis in this study has used data from Birdlife International's World Bird Database (WBD), which includes detailed data on the global population status of birds, and for Globally Threatened species, information on conservation actions and threats.

3.4 GEOGRAPHICAL TERMINOLOGY

Bird populations within Europe include those in the Atlantic archipelagos of the Azores, Madeira, and the Canary Islands, as well as western Russia (east to the Ural mountains and Ural River), Greenland, Svalbard, Iceland, the Faroe Islands, Turkey, Cyprus and the Caucasus states of Georgia, Armenia and Azerbaijan.

The Middle-East refers to Bahrain, Islamic Republic of Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Sultanate of Oman, Qatar, Kingdom of Saudi Arabia, Syria, Palestinian Authority territories, United Arab Emirates and Yemen.

Africa here includes Madagascar and the archipelagos of Cape Verde, Comores and Seychelles.

Asia only refers to the Asian countries within the African-Eurasian region as listed above under 2.3.

4 THE STATUS OF AFRICAN-EURASIAN RAPTORS

Using the area and species criteria set out 2.3 and 2.4, there were found to be 211 species of raptors occurring in the African and Palearctic realms (see Annex 3). Of these, 60 (51 diurnal raptors and 9 owls) were treated as African-Eurasian migrants. An assessment of the conservation status of each raptor species of the African-Eurasian region is provided in Table 1, and discussed further below.

4.1 GLOBALLY THREATENED SPECIES

4.1.1 Comparisons of the global status of African-Eurasian raptors, between areas and according to migratory behaviour

Examination of the global status of all raptor species occurring within the Afrotropical and Palearctic realms reveals that of the 211 species concerned (see Annex 1), 28 (13.3%) are Globally Threatened, i.e. classified as Vulnerable (VU), Endangered (EN) or Critical (CR) by Birdlife International (Birdlife International World Bird Database, www.birdlifeinternational.org accessed 20 June 2005) according to the current IUCN criteria (IUCN 2001). This ratio is close to the average proportion of Globally Threatened species across all birds, which is about 12.4% of all extant species (Birdlife International 2004b).

It is also considerably lower than some highly threatened groups such as albatrosses (95% threatened), cranes (60%), parrots (29%), pheasants (26%) and pigeons (23%). This is somewhat unexpected given that species with large bodies and low reproductive rates, which would include many raptors, have a relatively high probability of being threatened (Bennett & Owens 1997). Nevertheless, 13% of raptor species classified as Globally Threatened and a further 5.2% as Near Threatened is an undesirably high proportion that warrants conservation intervention.

Further examination reveals a difference between the status of diurnal raptors, as some 17.4% of owls are Globally Threatened, compared to 11.3% of diurnal raptors (Table 2). However, a comparison between migrant and non-migrants reveals that this is largely due to a relatively high proportion (i.e. 24.4%) of non-migratory Afrotropical and Western Palearctic owls being Globally Threatened. In contrast, none of the seven species of migratory owls occurring in the Afrotropical and Western Palearctic realms are Globally Threatened. Similarly the one migratory African-Eurasian owl that also occurs only in the Eastern Palearctic is not threatened. Thus, including owls in any new CMS conservation instrument might only marginally serve the purpose of preventing global extinctions (though there may be a case with respect to regional population declines: see below).

Another aim of this study is to establish if migratory species are particularly threatened, and if species in the Eastern Palearctic merit conservation measures as well as those in the Western Palearctic. Table 2 shows that there is no substantial difference between the Eastern and Western Palearctic/Afrotropical species, and between migratory and non-migratory species as regards the proportions of raptors that are Globally Threatened.

Table 1: The status of African-Eurasian migratory raptors

Key

Species with an Unfavourable Conservation Status according to CMS (see Section 4.1) at a global or regional level are indicated in bold.

Global Status: CR = Critical; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern (see Annex 4 for details of Global Threat categories).

European Status: European Species of Conservation Concern (SPEC), SPEC 1 = Species of Global Conservation Concern (i.e. classified as Globally Threatened, Near Threatened or Data Deficient); SPEC 2 = Species that are concentrated in Europe and have an unfavourable conservation status; SPEC 3 = Species that are not concentrated in Europe but have an unfavourable conservation status. European Threat Status: CR = Critical; EN = Endangered; VU = Vulnerable; D = Declining; R = Rare; H = Depleted; S = Secure.

Status in Africa, Asia and the Middle-East: UCS = Unfavourable Conservation Status; FC = Favourable Conservation Status; ? = unknown status, or uncertain status if combined with UCS or FC. UCS criteria: d = declining in numbers or range; r = rare or depleted population; h = threatened by habitat loss.

Status refers to breeding population. b = Breeding population, m = only occurs on migration, w = occurs in winter (non-breeding season) and on migration, wss = wintering population in sub-Sahara.

Species	English Name	Global Status	European SPEC	European Threat Status	Asia*	Middle-East	Africa	Refs
Aviceda cuculoides	African Baza	LC	-	-	-	-	?	
Pernis apivorus	European Honey-buzzard	LC	N	(S)	?	m	w	
Pernis ptilorhyncus	Oriental Honey-buzzard	LC	m	m	?	m	-	
Chelictinia riocourii	African Swallow-tailed Kite	LC	-	-	-	-	UCSd	7
Milvus milvus	Red Kite	NT	2*1	D	-	-	UCSr	
Milvus migrans	Black Kite	LC	3	(VU)	UCS?	FC?	UCd?	7
Haliaeetus albicilla	White-tailed Eagle	LC	1*1	R	FC?	?	-	1
Neophron percnopterus	Egyptian Vulture	LC	3	EN	?	FC?	?	
Gyps fulvus	Eurasian Griffon	LC	N	S	FC?	?	?	
Aegypius monachus	Cinereous Vulture	NT	1	R	?	w	w	1,2
Circaetus gallicus	Short-toed Snake-eagle	LC	3	(R)	?	?	b? wss	
Circus aeruginosus	Western Marsh-harrier	LC	N	S	FC	m	m	
Circus maurus	Black Harrier	VU	-	-	-	-	UCSrh	1,4

Species	English Name	Global Status	European SPEC	European Threat Status	Asia*	Middle-East	Africa	Refs
Circus cyaneus	Northern Harrier	LC	3	H	?	w	w	
Circus macrourus	Pallid Harrier	NT	1	(EN)	?	w	w	1,9
Circus pygargus	Montagu's Harrier	LC	N	S	FC?	m	b? w	
Accipiter badius	Shikra	LC	N	(S)	?	m	FC?	
Accipiter brevipes	Levant Sparrowhawk	LC	2	(VU)	FC?	m	w	
Accipiter ovampensis	Ovampo Sparrowhawk	LC	-	-	-	-	FC?	
Accipiter nisus	Eurasian Sparrowhawk	LC	N	S	FC?	w	b? wss	
Accipiter gentilis	Northern Goshawk	LC	N	S	FC	-	?	
Butastur rufipennis	Grasshopper Buzzard	LC	-	-	-	-	?	
Buteo buteo	Common Buzzard	LC	N	S	?	w	w	
Buteo oreophilus	Mountain Buzzard	LC	-	-	-	-	FC?	
Buteo rufinus	Long-legged Buzzard	LC	3	(VU)	?	?	?	
Buteo lagopus	Rough-legged Hawk	LC	N	(S)	FC?	-	-	
Buteo auguralis	Red-necked Buzzard	LC	-	-	-	-	FC?	
Aquila pomarina	Lesser Spotted Eagle	LC	2	(D)	UCSd ?	m	w	6
Aquila clanga	Greater Spotted Eagle	VU	1	EN	?	w	w	1,2
Aquila rapax	Tawny Eagle	LC	-	-	-	?	UCSd	5,7,8
Aquila nipalensis	Steppe Eagle	LC	3	(EN)	UCSd ?	w	w	6
Aquila adalberti	Spanish Imperial Eagle	EN	1	(EN)	-	-	w	
Aquila heliaca	Imperial Eagle	VU	1	R	UCSd ?	w	w	1,2
Aquila chrysaetos	Golden Eagle	LC	3	R	?	?	?	
Aquila wahlbergi	Wahlberg's Eagle	LC	-	-	-	-	FC?	

Species	English Name	Global Status	European SPEC	European Threat Status	Asia*	Middle-East	Africa	Refs
Hieraaetus pennatus	Booted Eagle	LC	3	(R)	?	m	b? w	
Pandion haliaetus	Osprey	LC	3	R	?	UCS?	FC?	
Falco naumanni	Lesser Kestrel	VU	1	H	?	UCSr	w	1,2
Falco tinnunculus	Common Kestrel	LC	3	D	UCSd ?	?	?	
Falco alopex	Fox Kestrel	LC	-	-	-	-	FC?	
Falco vespertinus	Red-footed Falcon	NT	3*1	(VU)	?	m	w	
Falco amurensis	Amur Falcon	LC	-	-	FC?	-	w	
Falco eleonorae	Eleonora's Falcon	LC	2	D	-	m	b? w	
Falco concolor	Sooty Falcon	LC	-	-	?	FC?	FC?	
Falco columbarius	Merlin	LC	N	(S)	?	w	w	
Falco subbuteo	Eurasian Hobby	LC	N	(S)	?	m	w	
Falco biarmicus	Lanner Falcon	LC	3	VU	-	FC?	UCd?	5,7
Falco cherrug	Saker Falcon	EN	1	EN	UCSd	w	w	2,3
Falco rusticolus	Gyrfalcon	LC	3	(R)	?	-	-	
Falco peregrinus	Peregrine Falcon	LC	N	S	?	?	?	
Falco pelegrinoides	Barbary Falcon	LC	N	S	-	?	?	
Otus brucei	Pallid Scops-owl	LC	3	CR	?	?	-	
Otus scops	Common Scops-owl	LC	2	(H)	?	m	b? w	
Nyctea scandiaca	Snowy Owl	LC	3	(R)	?	-	-	
Strix uralensis	Ural Owl	LC	N	(S)	?	-	-	
Strix nebulosa	Great Grey Owl	LC	N	(S)	?	-	-	
Surnia ulula	Northern Hawk Owl	LC	N	(S)	?	-	-	
Aegolius funereus	Boreal Owl	LC	N	(S)	?	-	-	
Asio otus	Long-eared Owl	LC	N	(S)	?	?	?	

Species	English Name	Global Status	European SPEC	European Threat Status	Asia*	Middle-East	Africa	Refs
Asio flammeus	Short-eared Owl	LC	3	(H)	?	w	w	

Source. Global Threat Status: Birdlife International World Bird Database (www.birdlifeinternational.org, accessed 20 June 2005). European Threat Status: Birdlife International (2004c).
Other regions - general: del Hoyo *et al.* (1994, 1999), Ferguson-Lees *et al.* (2001). Specific species references (see table code): 1 Birdlife International (2004a); 2 Birdlife International (2001); 3 Galushin (2004); 4 Curtis *et al.* (2004); 5 Barnes (2000); 6 Shirihai *et al.* (2000); 7 Thiollay (in press-c); 8 Simmons & Brown (2005); 9 Galushin *et al.* (2003).

Note. *1 Global status changed since publication of Birdlife International 2004c.

The latter observation is interesting because it has often been claimed (e.g. Owen & Black 1991; Salathe 1991) that migratory species are particularly vulnerable as a result of threats they face on migration. However, the relatively high proportions of threatened non-migratory raptors and especially owls may be due to a significant number of them having small ranges, because birds with small ranges tend to be more likely to qualify as Globally Threatened (Birdlife International 2004b). It might also be partly due to a high proportion of owls being restricted to primary tropical forest habitats, which are amongst the most highly threatened habitats (Groombridge & Jenkins 2002). Thus, if we were to compare species with comparable ranges and habitats, we might find that the proportion of Globally Threatened species is indeed higher amongst migratory species than non-migratory species. However, interesting though this analysis would be, it is beyond the scope of this present study.

4.1.2 Globally Threatened and Near Threatened migratory raptors of the African-Eurasian region

The ten migratory raptors of the African-Eurasian region that are currently considered to be Globally Threatened or Near Threatened, are listed in Table 3, together with summaries of their current range and migratory behaviour. Countries where these species regularly occur are listed in Annex 5. One of the most obvious facts from examination of the list is that all but one, i.e. Black Harrier (*Circus maurus*), breed primarily within the Palearctic. However this might partly reflect inadequate knowledge of the population status of some inter-African migrants and the migratory behaviour of some threatened species.

In conclusion, it appears that there is no special need to focus conservation measures for Globally Threatened species on migratory raptors compared to non-migratory species. Nor is there a biological reason for focussing measures on the Afrotropical realm and Western Palearctic flyway, though there may well be practical reasons for doing so.

Table 2: Global threat comparison between migratory / non-migratory raptor species occurring in the Afrotropical / Western Palearctic and Eastern Palearctic Realms

Group	East Palearctic	Afrotropical / West Palearctic	Afrotropical / Palearctic
ALL RAPTORS (including owls)			
No. Species	44	167	211
No. Species Globally Threatened	4	25	28
% Species Globally Threatened	9.1%	15.0%	13.3%
Migratory			
No. Species	14	61	74
No. Species Globally Threatened	2	6	7
% Species Globally Threatened	14.3%	9.8%	9.5%
Non-migratory			
No. Species	30	106	137
No. Species Globally Threatened	2	19	21
% Species Globally Threatened	6.7%	17.9%	15.3%
DIURNAL RAPTORS			
No. Species	29	113	142
No. Species Globally Threatened	3	14	16
% Species Globally Threatened	10.3%	12.4%	11.3%
Migratory			
No. Species	13	52	64
No. Species Globally Threatened	2	6	7
% Species Globally Threatened	15.44%	11.5%	10.9%
Non-migratory			
No. Species	16	61	78
No. Species Globally Threatened	1	8	9
% Species Globally Threatened	6.3%	13.1%	11.5%
OWLS			
No. Species	15	54	69
No. Species Globally Threatened	1	11	12
% Species Globally Threatened	6.7%	20.4%	17.4%
Migratory			
No. Species	1	9	10
No. Species Globally Threatened	0	0	0
% Species Globally Threatened	0%	0%	0%
Non-migratory			
No. Species	14	45	59
No. Species Globally Threatened	1	11	12
% Species Globally Threatened	7.1%	24.4%	20.3%

Source. Birdlife International World Bird Database (www.birdlifeinternational.org, accessed March 2005)

Table 3: Globally Threatened and Near Threatened African-Eurasian migratory raptors

See Table 1 for global threat status categories

Species	English Name	Breeding Range	Migratory Behaviour	Global Threat Status
Milvus milvus	Red Kite	Nominate race: S Sweden E to Ukraine and S through C Europe to W & C Mediterranean basin, Wales, Caucasus. *M.m. fasciicauda*: Cape Verde Islands.	Mainly migratory in N and C Europe, although increasing tendency to winter in these areas. Populations in S of range and Wales sedentary with varying degree of dispersal of juveniles. The vast majority of migrants winter in S France and especially Iberian Peninsula	NT
Aegypius monachus	Cinereous Vulture	Large Palearctic range from Spain, Balearic Is and Balkans through Turkey, Caucasus, Iran and Afghanistan to S Siberia, Mongolia, N China and extreme N India.	Partial – mainly intercontinental: In S Europe adults non-migratory, in C Asia semi-resident, often following nomads and their domestic herds. Partly migratory in Asia: most birds leave Mongolia and other N breeding areas for winter; migrants winter from NE Africa and Middle East through N India to Korea; some birds reach Arabia and S China.	NT
Circus maurus	Black Harrier	South Africa and N W Namibia, most in S Cape region.	Partial – intracontinental: Most birds migrate N in winter to dry grassland areas of S Namibia, S Botswana and N and C South Africa.	VU
Circus macrourus	Pallid Harrier	E. European Russia, S Asiatic Russia and N. Kazakhstan E to NW China; irregularly breeds farther N and W.	Intercontinental: Migratory, wintering mainly in sub-Saharan Africa, Indian Subcontinent, Sri Lanka and Burma; rare, or much less common, in Mediterranean Basin, Middle East, Arabia, Iran and S & E China; some birds may remain in S of breeding range. Migrates on broad front.	NT
Aquila clanga	Greater Spotted Eagle	EC Europe E through Russia to S far east, isolated populations in N Iran and NC India.	Intercontinental: winters in S Europe, Middle East, NE Africa and S Asia.	VU
Aquila adalberti	Spanish Imperial Eagle	C, W & S Spain, formerly more widespread, occurring in Portugal and Morocco	Partial: Adults sedentary. Young birds, when independent, disperse from natal areas in all directions and up to 350 km, especially to NW Africa.	VU
Aquila heliaca	Imperial Eagle	C Europe and Turkey E through S Russia to Lake Baikal and Mongolia.	Mostly migratory, intercontinental. Birds migrate to S Turkey, Iran, Israel, Syria, Iraq, Egypt, Arabia, and northeast Africa, and to Pakistan, India, Laos and Vietnam.	VU

Species	English Name	Breeding Range	Migratory Behaviour	Global Threat Status
Falco naumanni	Lesser Kestrel	SW Europe and N Africa E through E Europe, Asia Minor, Caucasus, Iran, Jordan, Israel, Kazakhstan, S Russia to Mongolia and N China.	Intercontinental: Mainly trans-Saharan migrant, although some birds winter in NW Africa and in various regions of S Europe and S Asia. Most birds migrate to S Africa. Nomadic movements in winter related to local concentrations of insects. Migrates across broad front.	VU
Falco vespertinus	Red-footed Falcon	E Europe and Hungary, E through NC Asia to extreme NW China and upper R Lena	Intercontinental: Travels great distances from Palearctic breeding areas across the Mediterranean and through Africa to S African wintering areas.	NT
Falco cherrug	Saker Falcon	C and SE Europe, Turkey, Russian Federation, Kazakhstan, Uzbekistan, Turkmenistan, Kyrgyzstan, Afghanistan, Iran, Iraq, Pakistan, China and Mongolia	Intercontinental: migratory or partially migratory; sedentary or dispersive in S and SW of breeding range. Only occurs in winter in N Pakistan, Arabia, Africa (Sudan, Ethiopia, Niger and N Kenya) and parts of Middle East and China.	EN

Sources. Range: Snow and Perrins (1998). Migration behaviour: adapted from GROMS based on del Hoyo *et al.* (1994). Global Threat: Birdlife International World Bird Database (www.birdlifeinternational.org accessed 20 June 2005).

4.2 THE REGIONAL STATUS OF AFRICAN-EURASIAN RAPTORS

4.2.1 The status of raptors in Europe

The status of birds in Europe is relatively well known as a result of fairly extensive and detailed atlas surveys and monitoring programmes, and two recent pan-European assessments of available data (Birdlife International 2004a; Tucker & Heath 1994). It is thus possible to review the status of raptor populations in detail and with some confidence, although trends in some species, such as Levant Sparrowhawk (*Accipiter brevipes*), remain relatively poorly known.

On the basis of the 1994 assessment, Stroud (2003) noted that a high proportion of European raptors have an unfavourable status in Europe (defined in the publication as being species that are declining, rare or localised). This showed that nearly 80% (30 of 38) of diurnal raptors were in an unfavourable conservation status, whilst almost half of the owls (six of 13 species) were similarly categorised.

In this study, we have reviewed the Birdlife International (2004) assessment of each species of raptor, and compared overall population trends between the periods 1970-90 and 1990-2000. The European conservation status and European Threat Status (ETS) of each raptor species is given in Annex 4 and summarised for the group as a whole in Table 4 below.

Table 4: The conservation status of African-Eurasian migratory raptors in Europe

SPEC = Species of European Conservation Concern. See Table 1 for details of the status of individual species.

	Migratory raptors		**All European species**	
SPEC Category	Number	%	Number	%
1	8	17.0%	40	7.6%
2	5	10.6%	45	8.5%
3	16	34.0%	141	26.8%
Total SPECs	*29*	*61.7%*	*226*	*43.0%*
Non-SPEC	18	38.3%	300	57.0%
TOTAL	47		526	
European Threat Status				
Critical (CR)	1	2.1%	9	1.7%
Endangered (EN)	6	12.8%	20	3.8%
Vulnerable (VU)	5	10.6%	38	7.2%
Declining (D)	4	8.5%	62	11.8%
Rare (R)	9	19.1%	33	6.3%
Depleted (H)	4	8.5%	51	9.7%
Other (localised, data deficient, not evaluated)	0	-	12	2.3%
Secure (S)	18	38.3%	301	57.2%
Species with uncertain ETS	25	53.2%		

Source. Birdlife International (2004a).

Birdlife International defines the following three categories of Species of European Conservation Concern (SPEC):

- SPEC 1 – Species of Global Conservation Concern, i.e. classified as Globally Threatened, Near Threatened or Data Deficient (Birdlife International 2004c; IUCN 2001).
- SPEC 2 – Species that are concentrated[4] in Europe and have an unfavourable conservation status.
- SPEC 3 – Species that are not concentrated in Europe but have an unfavourable conservation status.

A species is considered to have an unfavourable conservation status by Birdlife International if its European population is considered to be any of the following:

- small and non-marginal;
- declining more than moderately (i.e. > 1% per year);
- depleted following earlier declines; or
- highly localised.

[4] i.e. more than 50% of its global breeding or wintering population or range occurs in Europe.

As discussed above, we would consider that these species also have an Unfavourable Conservation Status according to the CMS definition. Depending on various levels of decline, population size and localisation, Birdlife International defines 10 categories of European Threat Status (ETS). The following 7 are categories of species in unfavourable conservation status: Critically Endangered, Endangered, Vulnerable, Declining, Rare, Depleted, and Localised. In addition a species may be considered to be Secure (i.e. in favourable conservation status), Data Deficient or Not Evaluated.

Comparison of the proportions of all European migratory raptors that fall into each SPEC and ETS category clearly indicates that a particularly high proportion of these species have an unfavourable status in Europe. Overall, some 62% of migratory raptors have an unfavourable conservation status compared to 43% of all 526 regularly occurring European species. Furthermore a relatively large proportion (41%) of these are in high threat categories, with one Critical (Pallid Scops-owl *Otus brucei*), six Endangered and five Vulnerable.

Despite the critical threat status of Pallid Scops-owl, migratory owls overall appear to be less threatened in Europe than raptors, with 44% of owls with an unfavourable status compared to 66% of diurnal raptors.

A summary and comparison of recent trends in European populations of migratory raptors is provided in Table 5. This indicates that nearly a third are declining by more than 1% per year. Furthermore, 21% have shown large declines, averaging over 3% per year, in the last 10 years. Although this is a slightly lower percentage of species showing large declines than over the 1970-90 period, the proportion of species showing moderate declines has increased, and the overall proportion of species that have undergone moderate or large declines is unchanged. Thus, there has been relatively little improvement in the status of European raptor populations since 1990.

4.2.2 The status of raptors in other regions

Unfortunately, our knowledge of the current status of raptors in Asia, the Middle-East and Africa is much less complete and reliable than in Europe. Few countries in these regions have prepared bird atlases or established bird monitoring schemes. Where atlases have been produced they have yet to be repeated, and where monitoring schemes have been established they have not been undertaken for long enough to establish trends over a meaningful period. Further systematic monitoring and research is required over huge areas before reliable assessments of population status can be made for most species.

Intensive surveys and monitoring of diurnal raptor migration has been undertaken in some areas of the Middle-East, especially in Israel for several decades. These surveys have established population counts for some species that are difficult to census on their breeding grounds, such as Levant Sparrowhawk (*Accipiter brevipes*). They have also built up a considerable amount of data on migrant numbers, which have recently been analysed for trends (e.g. see Shirihai *et al.* 2000 for review). These counts have noted sharp declines in Lesser Spotted Eagle (*Aquila pomarina*) and Steppe Eagle (*Aquila nipalensis*) that accord with observed declines in Europe, and may suggest that declines also occurred in Asia.

Table 5: European population trends in African-Eurasian migratory raptors

	% of raptors (n = 47) in trend class	
Trend*1	**1970-90**	**1990-2000**
Large increase (≥3 % per year)	15%	6%
Moderate increase (1-3% per year)	8%	13%
Small increase*2 (<1% per year)	na	6%
Stable*3	40%	23%
Small decline*2 (<1% per year)	na	6%
Moderate decline (1-3% per year)	2%	10%
Large decline (≥3 per year)	29%	21%
Fluctuating	0%	8%
Unknown	4%	4%
Total % in moderate or large decline	**31%**	**31%**

Sources. 1970-1990 trends: Tucker and Heath (1994). 1990-2000 trends: Birdlife International (2004a).
Notes: *1 Based on worst case scenario calculation taking into account the effects of calculations using minimum and maximum population estimates. *2 This trend category was not distinguished in 1994. *3 Only distinguished in 1990-2000 if <10% decline and < 10% increase, and worst-case and best-case scenario trends are in opposite directions.

However, information on numbers and trends of breeding populations in the Middle-East is very fragmentary and incomplete, although recoveries have been documented of some species' populations since the widespread reduction of use of persistent pesticides.

Information on the status of raptor populations (breeding and wintering) is particularly scarce and incomplete for much of Asia and Africa. Although there are numerous counts of raptors at particular sites, it is difficult to assimilate these and deduce likely population trends in most species. Detailed studies have been carried out in some areas, such as in South Africa (e.g. Tarboton & Allan 1984), or from atlasing (e.g. Harrison *et al.* 1997) or from road counts (e.g. Herremans & Herremans-Tonnoeyr 2001) where population trends have been established for breeding species and some highly aggregated wintering populations, e.g. Lesser Kestrel (*Falco naumanni*). In parts of West Africa Thiollay (in press-a; in press-b; in press-c) has repeated roadside counts some 30 years later to measure population changes. But care needs to be taken in extrapolating trends from such relatively well studied areas to other parts of Africa. Nevertheless, observed declines are a cause for concern and, in accordance with the precautionary principle, justify the need for conservation actions now. The results of many of these studies also highlight the need for further monitoring of raptor populations in areas of Africa that are less well known.

In parts of Asia, detailed studies have been carried out of some species of high conservation importance, such as Saker Falcon (*Falco cherrug*) (Galushin & Moseikin 2000; Galushin 2004; Gott *et al.* 2000; Levin *et al.* 2000; Shijirmaa *et al.* 2000). But the status of most species is very poorly understood in most areas of the Asian Palearctic.

For this study we have assessed the status of African-Eurasian migratory raptor species populations in Asia, the Middle-East and Africa on the basis of available information, and present our results in Table 1. These assessments use the criteria for Unfavourable Conservation Status as described in Section 3.2. However, these assessments should be treated with caution, unless they are based on detailed referenced studies. They are subjective assessments and mostly based on general references (some of which are now over 10 years old) or studies of relatively small parts of the species' range, which may not be representative of the region.

An overall summary of our status assessments of African-Eurasian migratory raptor populations in Asia, Middle-East and Africa is provided in Table 6. This analysis confirms that it is not possible within the scope of this study to reliably assess the status of most of the species' breeding populations in these regions using readily available published studies. However, a number of Asian populations are known or suspected to be in an Unfavourable Conservation Status, including some Globally Threatened or Near Threatened species such Pallid Harrier (*Circus macrourus*), Saker Falcon (*Falco cherrug*) and probably Imperial Eagle (*Aquila heliaca*). In general we are unsure of the status of most intra-African migrants, though there is evidence of declines in some, including Tawny Eagle (*Aquila rapax*), African Swallow-tailed Kite (*Chelictinia riocourii*) and the Globally Threatened Black Harrier (*Circus maurus*) (Birdlife International 2004c; Curtis *et al.* 2004; del Hoyo *et al.* 1994; Ferguson-Lees & Christie 2001; Harrison *et al.* 1997).

Table 6: The status of breeding populations of African-Eurasian migratory raptors in Asia, the Middle-East and Africa

Conservation Status (according to CMS definition)	Asia		Middle-East		Africa	
Unfavourable	1	2.2%	1	5.9%	4	12.9%
Unfavourable (uncertain)	5	11.1%	1	5.9%	2	6.5%
Favourable	2	4.4%	0	0%	0	0%
Favourable (uncertain)	7	15.6%	4	23.5%	8	25.8%
Unknown	30	66.7%	11	64.7%	17	54.8%
Total	**45**		**17**		**31**	

5 THREATS TO AFRICAN-EURASIAN RAPTORS

5.1 INTRODUCTION

There are many well known and documented threats to raptors in the African Eurasian region (e.g. Chancellor & Meyburg 1998; Meyburg & Chancellor 1989, 1994; Newton & Chancellor 1985; Salathe 1991; Thiollay 1994; Tucker & Evans 1997; Tucker & Heath 1994; White *et al.* 1994; Zalles & Bildstein 2000). These are briefly described below, but it is not the intention in this study to discuss these in detail. Instead we have attempted to establish which threats are most likely to be having significant detrimental population-level impacts on species with an Unfavourable Conservation Status (as identified in 3.2). We have also attempted to distinguish between threats that apply to species whilst breeding and whilst on migration / wintering. An important aim of this is to establish which species are subject to impacts at an international scale, and would therefore benefit from coordinated international conservation actions.

Being mostly long-lived species with generally low annual productivity and slow maturity, raptors are particularly vulnerable to any threats that may increase mortality rates. However, although there is much general information on habitat loss and pollution, and many documented cases of persecution e.g. from hunting, there are few demographic studies that have established the effects on mortality and productivity rates, and hence overall population level impacts (e.g. Newton 1979). Furthermore, where such studies have been carried out, the results may not be widely applicable to other regions and habitats. And in some cases threats may have changed since the studies were carried out. For example, many studies have documented the impacts of toxic pesticides on raptors through egg-shell thinning. But the levels of such pesticides have since declined substantially in most areas, and previous studies may therefore be of little value in predicting future impacts.

There is also a paucity of published information on threats to migratory raptors in Asia, the Middle-East and Africa. Therefore, the assessment of threats to species in these regions should be treated with caution, because we have only considered documented threats, rather than those that we may suspect occur (e.g. those that could be inferred from known habitat change).

We have coded identified threats according to the primary threat categories used by Birdlife International, which is based on the IUCN Authority File for threat types (see www.RedList.org), and defined sub-categories that are relevant to raptors in the region.

Table 7 lists for each species the threats that we have identified as probably having a significant population impact. These threats are further described below and a summary of their overall importance to raptors is presented in Table 8.

Table 7: Threats to Africa-Eurasian migratory raptors that have an Unfavourable Conservation Status

GS = Global status: see Table 2.1 for codes. **S = Season**: B = breeding; N (shaded) = non-breeding (migration and wintering areas).

Habitat Loss/Degradation: ai = loss to agriculture & agricultural intensification; aa = abandonment; og = over-grazing; fm = forest management and loss; af = afforestation (e.g. Eucalyptus, Poplar and conifer plantations); w = wetland loss and degradation; b = burning / fire; is = Infrastructure development.

Taking = taking of birds i.e. harvesting / hunting: t = trapping and trade (zoos, collections, falconry); e = egg-collection; s = shooting for sport.

Accidental mortality: C = collision; e = electrocution on power lines; p = poisoning; nd = nest destruction by agricultural machinery.

Per = Persecution (i.e. control of predators / pests) including deliberate poisoning.

Pollution (affecting habitat and/or species): l = Land pollution (other than pesticides); w = water pollution (other than pesticides); p = pesticides (i.e. direct and secondary toxicity effects, not indirect effects through food availability).

Dist = Disturbance (human).

Other: av = invasive alien vegetation; ls = lead-shot poisoning through ingestion of prey with high lead content; ns = nest site loss in old buildings; de = desertification from drought and over exploitation of wood; ip = introduced predators (e.g. rats and cats); pd = prey disease, i.e. myxomatosis and other diseases in rabbits.

				Habitat loss / degradation								Taking			Accidents				Per	Pollution			Dist	Other	Refs
Species	**English Name**	**GS**	**S**	**ai**	**aa**	**og**	**fm**	**af**	**w**	**b**	**is**	**t**	**e**	**s**	**c**	**e**	**p**	**nd**		**l**	**w**	**p**			
Chelictinia riocourii	African Swallow-tailed Kite	LC	B	x		x																x		de	
			N	x		x																x		de	
Milvus milvus	Red Kite	NT	B	x	x												x		x			x	x		10, 31
			N	x	x												x		x			x		ls	10, 31
Milvus migrans	Black Kite	LC	B	x	x				x						x	x			x	x		x	x		
			N											*x*			*x*			*x*		*x*			
Haliaeetus albicilla	White-tailed Eagle	LC	B						x				x		x		x		x		x	x	x		3
			N												x						x	x			
Neophron percnopterus	Egyptian Vulture	LC	B														x		x						
			N											x			x								

				Habitat loss / degradation								Taking			Accidents				Per	Pollution			Dist	Other	Refs
Species	**English Name**	**GS**	**S**	**ai**	**aa**	**og**	**fm**	**af**	**w**	**b**	**is**	**t**	**e**	**s**	**c**	**e**	**p**	**nd**		**l**	**w**	**p**			
Aegypius monachus	Cinereous Vulture	NT	B	x	x			x		x	x						x								1b
			N											x			x								16
Circaetus gallicus	Short-toed Snake-eagle	LC	B	x	x			x		x						x			x				x		
			N											x											
Circus maurus	Black Harrier	VU	B	x						x												x	x	av	4,21
			N																						
Circus cyaneus	Northern Harrier	LC	B	x				x	x	x									x						17
			N																						
Circus macrourus	Pallid Harrier	NT	B	x	x	x			x								x		x			x			33,
			N	x		x								x								x		de	5,6, 33
Accipiter brevipes	Levant Sparrowhawk	LC	B	x																					
			N	x																					18
Buteo rufinus	Long-legged Buzzard	LC	B	x												x	x		x				x		
			N											x			x								
Aquila pomarina	Lesser Spotted Eagle	LC	B	x	x		x	x	x					x					x				x		22
			N	x																					16,18, 20,22,23
Aquila clanga	Greater Spotted Eagle	VU	B				x	x	x					x			x		x				x		24
			N											x											24
Aquila nipalensis	Steppe Eagle	LC	B	x												x			x			x	x		8,18,25,26

				Habitat loss / degradation								Taking			Accidents				Per	Pollution			Dist	Other	Refs
Species	**English Name**	**GS**	**S**	**ai**	**aa**	**og**	**fm**	**af**	**w**	**b**	**is**	**t**	**e**	**s**	**c**	**e**	**p**	**nd**		**l**	**w**	**p**			
			N	x													x					x			20
Aquila rapax	Tawny Eagle	LC	B	x		x											x					x		de	5,20
			N	x										x			x					x		de	5,20
Aquila adalberti	Spanish Imperial Eagle	VU	B	x				x								x	x		x	x		x	x	ls,pd	1d,12,13
			N																						
Aquila heliaca	Imperial Eagle	VU	B	x			x	x				x				x	x		x				x		1c
			N											x			x								
Aquila chrysaetos	Golden Eagle	LC	B					x	x				x			x	x		x						11,14,15
			N												x		x								
Hieraaetus pennatus	Booted Eagle	LC	B	x			x			x						x			x			x			
			N											x			x					x			6
Pandion haliaetus	Osprey	LC	B				x		x				x		x				x		x	x	x		32
			N											x	x				x		x	x			
Falco naumanni	Lesser Kestrel	VU	B	x	x			x			x		x	x										ns	1a
			N	x		x																			6,7
Falco tinnunculus	Common Kestrel	LC	B	x										x		x									
			N									x		x										de	
Falco vespertinus	Red-footed Falcon	NT	B	x					x													x			
			N	x					x					x											6
Falco eleonorae	Eleonora's Falcon	LC	B																				x	ip	27

				Habitat loss / degradation								Taking			Accidents				Per	Pollution			Dist	Other	Refs
Species	**English Name**	**GS**	**S**	**ai**	**aa**	**og**	**fm**	**af**	**w**	**b**	**is**	**t**	**e**	**s**	**c**	**e**	**p**	**nd**		**l**	**w**	**p**			
			N																						
Falco biarmicus	Lanner Falcon	LC	B	x								x	x						x				x		28
			N									x					x								16,20
Falco cherrug	Saker Falcon	EN	B	x	x			x				x	x			x			x			x			2a,b,9,19,25, 26,29, 30
			N									x													
Falco rusticolus	Gyrfalcon	LC	B									x	x						x				x		
			N																						
Otus brucei	Pallid Scops-owl	LC	B																						
			N																						
Otus scops	Common Scops-owl	LC	B	x																		x			
			N																						
Nyctea scandiaca	Snowy Owl	LC	B																				x		
			N																						
Asio flammeus	Short-eared Owl	LC	B	x				x	x																
			N																						

Sources. General: Birdlife International (2004c); Brown, Urban & Newman (1982), del Hoyo *et al.* (1994, 1999), Ferguson-Lees *et al.* (2001); Tucker & Heath (1994); Tucker & Evans (1997).
Specific species references: 1a Biber (1996); 1b Heredia (1996a); 1c Heredia (1996b); 1d Gonzalez (1996); 2a (Barton 2002); 2b Birdlife International (2001); 3 Krone (2003); 4 Harrison *et al.* (1997); 5 Barnes (2000); 6 Thiollay (1989); 7 Pepler (1996); 8 Flint *et al.* 1983, Lopushkov 1988; 9 Galushin (2004); 10 Mateo *et al.* (2003); 11 Whitfield *et al.* (2001); 12 Pain *et al.* (2005); 13 Ferrer (2003); 14 Watson (1992); 15 Marquis, Ratcliffe & Roxburgh (1985); 16 Shirihai *et al.* (2000); 17 Tucker (2003); 18 Zalles & Bildstein (2000); 19 Chancellor & Meyburg (1998); 20a Hartley *et al.* (1996); 20b Hartley (1998); 21 Curtis *et al.* (2004); 22 Meyburg *et al.* (1999b); 23 Meyburg *et al.* (1995) 24 Meyburg *et al.* (1999a); 25 Fox (2004); 26 Batdelger & Potapov (2002); 27 Ristow (1999); 28 Gustin *et al.* (1990); 29 Karyakin *et al.* (2004); 30 Gombobaator *et al.* (2004); 31 (Ntampakis & Carter 2005); 32 (Saurola 1997); 33 Galushin *et al.* (2003).

Table 8: Summary of threats to migratory raptors of the African-Eurasian region that have an Unfavourable Conservation Status

Key. Magnitude of impacts: **L**ow = unlikely to cause detectable population impacts in most species; **M**oderate = likely to cause local population impacts in most species, or population declines in some species; **H**igh = likely to cause population declines in most species. Blank = threat currently unknown in region.

Threat type (primary and secondary types)	% of species impacted*1		Magnitude of impacts*2			
	Breeding	Non-breeding	Europe	Asia	Middle-East	Africa
Habitat Loss/Degradation						
Loss to agriculture & agricultural intensification	72	28	H	M	M?	H
Abandonment	25	3	M	M	?	-
Over-grazing	9	9	L	L	M?	H?
Forest loss & management	16	0	M	L	L	M
Afforestation	34	0	M	-	-	-
Wetland loss and degradation	31	3	M	M	H	M
Burning / fire	16	0	M	-	-	M
Infrastructure development	6	0	M	-	M	-
Taking of birds (harvesting / hunting)						
Trade (collections, falconry)	13	9	L	M	M	L
Egg-collection	22	0	L	L	L	-
Shooting and trapping	12	41	M	L	H	L
Accidental mortality*3						
Collision with man-made structures	9	9	L	L	L	L
Electrocution on power lines	31	0	M	H	L	L
Poisoning (e.g. by baits for other species)	34	34	L	M	M	L (H in parts)
Nest destruction	0	0	L	L	-	L
Persecution	59	6	L	M	M	L
Pollution						
Land pollution*4	6	3	L	L	L	-
Water pollution*4	6	6	L	L	L	L
Toxic pesticides	44	28	L	M?	M?	M?
Disturbance (human)	50	0	H	L	M	M
Other						
Invasive alien vegetation	3	3	L	?	?	?
Lead-shot poisoning	3	3	L	-	?	-
Nest site loss in old buildings	3	0	L	-	-	-
Desertification	6	13	-	-	?	M
Introduced predators	3	0	L	-	L	L
Prey disease	3	0	L	-	-	-

Notes: *1 From Table 3.1. *2 A subjective assessment for the next 10 years, of the likely average impacts on impacted species' African-Eurasian population, taking into account each threat's average extent, severity and predicted trends. *3 Individuals are killed accidentally (but see Pollution where this may also be the case) rather than intentionally (see Hunting, Persecution). *4 Other than pesticides.

5.2 HABITAT LOSS / DEGRADATION

Habitat loss and degradation are the most frequent threats to raptor populations, and are probably the root causes of Unfavourable Conservation Status in most species. However, the form and importance of these threats varies greatly between species and regions.

In Europe, the most profound habitat change impacts on bird populations have resulted from agricultural intensification since the 1970s, particularly in western Europe (Newton 2004; O'Connor & Shrubb 1986; Pain & Pienkowski 1997; Tucker & Evans 1997). The driving force behind this intensification was new agricultural technology (machinery, agro-chemicals and plant breeding) combined with supportive agricultural policies, in particular the Common Agricultural Policy (CAP) in the EU. This led to not only to the loss of uncultivated semi-natural habitats, such as moorlands and wetlands, but also to profound changes in farming practices on existing agricultural land. Intensification resulted in farm and field amalgamation which involved loss of hedgerows, woodlands and other important ecological features. Farms also tended to specialise with a consequent decline in mixed farming. There were also marked switches in crop types and a substantial decrease in the area of unimproved pasture and hay meadows. On the remaining semi-natural grasslands, particularly in the uplands, CAP support policies and socio-economic, technological and structural changes to farming systems have led to increased stocking rates in many areas of Europe. Such changes have undoubtedly reduced prey resources for raptors, and in some cases the availability of suitable nesting sites.

Intensification also resulted in a massive increase in the use and variety of agrochemicals (especially inorganic fertilisers, herbicides and pesticides) on farmland particularly on arable habitats. Pesticides have had profound impacts on the populations of some raptors as a result of their toxicity (see below), and they continue to have widespread indirect effects. Non-crop plants and invertebrates have declined massively as a result of their use (Aebischer 1991; Donald 1998), with almost inevitable, indirect impacts on birds (Campbell *et al.* 1997; Newton 2004).

The biodiversity impacts of these agricultural changes have been well documented and have included major population declines in many farmland birds, e.g. in the UK (Gregory *et al.* 2004), and in fact across most of Europe (Donald *et al.* 2001). Migratory raptors that are known to have been particularly affected by these changes include Steppe Eagle (*Aquila nipalensis*), Imperial Eagle (*Aquila heliaca*), Pallid Harrier (*Circus macrourus*) Long-legged Buzzard (*Buteo rufinus*), Lesser Spotted Eagle (*Aquila pomarina*), Saker Falcon (*Falco cherrug*), Lesser Kestrel (*Falco naumanni*) and Common Kestrel (*Falco tinnunculus*).

To date, intensification has been most widespread in western Europe, and the consequent impacts on raptors have been most severe in these regions. However, with the dissolution of the Soviet Union and the recent accession of several eastern and central European countries to the EU, there is great concern that similar impacts will spread to these areas and perhaps

threaten some of the most important European populations of several raptor species, such as Lesser Spotted Eagle (*Aquila pomarina*) and Greater Spotted Eagle (*Aquila clanga*).

In contrast, agricultural abandonment is a significant problem in parts of Europe. Semi-natural grasslands are particularly at risk, such as in some hill farming areas and in the Mediterranean region, but especially in Eastern Europe. This is detrimental to many raptors, as the grassland that supports voles and other favoured prey is replaced by taller shrubby vegetation, which supports fewer and less accessible prey. For example, widespread abandonment of grazing in the eastern European and Asian steppes has led to vegetation changes that have reduced the density and availability of small rodents such as *Citellus* spp, which has contributed to declines in the Imperial Eagle (*Aquila heliaca*), Steppe Eagle (*Aquila nipalensis*) and Saker Falcon (*Falco cherrug*) (Galushin 2004; Heredia *et al.* 1996).

Forest loss is unlikely to be a significant threat to raptors in most of Europe, because forest cover is generally increasing (Stanners & Bourdeau 1995). In fact afforestation of open habitats, such as in the uplands of the UK and the steppe areas of Spain and Portugal (Tucker & Evans 1997), is more likely to be a problem for most raptor species. It is widely considered that eagles in particular tend to avoid forested landscapes and may thus be affected by large-scale afforestation schemes in open areas, such as tundra, moorland and steppe. The impacts of afforestation on Golden Eagles (*Aquila chrysaetos*) have been well studied in Scotland. Although it was found that increased commercial afforestation reduces breeding success (Marquiss *et al.* 1985; Watson 1992) impacts on breeding densities and range occupancy are less clear (Whitfield *et al.* 2001).

Forest management is, however, an important conservation issue affecting raptors in much of Europe. More intensive commercial forest management results in the loss of old-growth semi-natural forests and their replacement with more uniform and denser forests with reduced species and structural diversity, and fewer nest-cavities. This in turn may reduce raptor prey densities and the number of very large trees that are required by many raptors for nesting. Commercial forestry also results in high levels of disturbance, which is a major problem for sensitive species such as the *Aquila* eagles.

Fire is a natural process in many ecosystems and plays an important role in the maintenance of some open grassland and shrubland habitats, on which many species of raptor depend. Fires also release nutrients and stimulate new vegetation growth which in turn can increase invertebrate and small mammal numbers to the benefit of raptors. However, inappropriate burning management or large wildfires may be a problem for some species, such as Hen Harrier (*Circus cyaneus*) and Merlin (*Falco columbarius*) in the UK (Tucker 2003), Short-toed Eagle (*Circaetus gallicus*) and Cinereous Vulture (*Aegypius monachus*) in the Mediterranean region (Tucker & Heath 1994) and Black Harrier (*Circus maurus*) in South Africa (Harrison *et al.* 1997).

Wetland drainage has declined in many parts of Europe over recent decades (Stanners & Bourdeau 1995), mainly because there is much less to drain, but drainage remains a threat in some areas, especially in the Mediterranean regions of Europe.

Information on habitat related threats to raptors in the Asian part of the Palearctic Realm is much less readily available. Nevertheless, there have been well known large-scale losses of steppe grasslands in Russia and Kazakhstan as a result of the Soviet Union’s centralised

programmes of arable conversion. The resulting arable habitats are unsuitable for many steppe raptors such as the Steppe Eagle (*Aquila nipalensis*), Imperial Eagle (*Aquila heliaca*), Saker Falcon (*Falco cherrug*) and Pallid Harrier (*Circus macrourus*) (Galushin 2004; Sanchez-Zapata *et al.* 2003). Many of these areas are now being abandoned, but the likely impacts of on raptor populations are uncertain and need to be further studied. Abandonment of existing steppe grasslands though, as mentioned above, is likely to be a serious threat.

There is also concern over the intensification of forestry operations in Asia. Many of the forests known to be the most extensive and pristine in the Palearctic are increasingly being opened up to commercial logging companies, resulting in forest loss and the intensification of forestry management, with the associated detrimental impacts as described above.

The impacts of habitat change on raptors in the Middle-East also appear to be poorly documented in the scientific literature. It is likely that agricultural intensification is a problem in many parts of the region, but the most extensive cause of habitat degradation is probably overgrazing of the sensitive arid grasslands and deserts. For example, in Syria overgrazing is widespread and causing damage to the steppe and desert vegetation (Baumgart *et al.* 1995, 2003). Overstocking is partly a result of water supplies now being provided to livestock, where before livestock numbers were limited by natural water sources. In turn these irrigation projects result in further habitat degradation through wetland drainage and impoundment, especially in the vicinity of human settlements. On the other hand, the creation of large irrigation schemes across the arid zone, often using diverted rivers or groundwater abstraction, can increase the abundance of insects, reptiles, passerines and small mammals to the benefit of raptors. But such food resources may also attract migrant raptors, which may then be at risk of being shot, trapped or killed by poison baits or toxic pollutants (see relevant sections below).

Within Africa most migrant raptors are reliant on grasslands and open woodland savannah habitats rather than closed-canopy forests. Such habitats support high densities of invertebrates, including termites and locusts, which form a key food resource for many Palaearctic and Afrotropical migrant raptors (Brown 1971, Brown *et al.* 1982). Thus over most of the continent the principal threat to these species is probably the loss and degradation of the remaining grasslands and savannahs (Bildstein *et al.* 2000; Thiollay 2000, 2001, in press-a; Zalles & Bildstein 2000). For example, in the Sahel zone of West and Central Africa, widespread declines in many African and Palearctic migrant raptors have been observed, almost certainly as a result of extensive habitat degradation through intense woodcutting (for firewood and timber), overgrazing and frequent burning, leading to desertification in many areas (Thiollay in press-a, b, c). Similarly, in Botswana most raptors have been found to occur at considerably reduced densities in the degraded grasslands that are outside protected areas, probably because of over-grazing and the associated depletion of potential prey (Herremans 1998; Herremans & Herremans-Tonnoeyr 2000).

Large areas of grassland savannah are also threatened by continued conversion from natural grazing ecosystems to row-crop agriculture and cattle and wild-game ranching (Frank *et al.* 1998). Land use data from the Food and Agriculture Organisation (Table 9) indicates that there has been a substantial increase in the area under arable and permanent agriculture over the last decade or so, with particularly significant increases in Benin, Burkina Faso, Ghana, Guinea-Bissau and Malawi amongst others. Data presented in Table 9 on manufactured fertiliser consumption per unit area of arable and permanent cropped land (a

good indicator of agricultural intensity), also suggests that there has been widespread intensification of agricultural practices (though trends are more mixed than land use changes). Such intensification has also continued in countries that have undergone extensive agricultural development in previous decades and use relatively high rates of fertiliser, such as Egypt, Kenya, Malawi and South Africa. The resulting impacts of agricultural intensification on raptors are probably exacerbated by intensive pesticide use, which will further reduce prey availability for many species, and may lead to toxicity impacts in some (Keith & Bruggers 1998; Mullie *et al.* 1991a; Thiollay 2001, in press-a, b).

Intensification of arable agriculture has been shown to be a particular problem in South Africa, where large monoculture fields and high levels of pesticide use are commonplace, threatening such species as Black Harrier (*Circus maurus*) as a result of reduced prey availability and degraded breeding habitat (Curtis *et al.* 2004). Data on the actual impacts on raptors of habitat loss from agricultural expansion and intensification elsewhere in Africa is extremely limited. However, it is thought that such habitat changes may be having significant impacts on species such as Lesser Kestrel (*Falco naumanni*), Lesser Spotted Eagle (*Aquila pomarina*), Steppe Eagle (*Aquila nipalensis*) and Levant Sparrowhawk (*Accipiter brevipes*) (Brown 1971; Virani & Watson 1998; Zalles & Bildstein 2000). Thiollay (1989) considered that in West Africa, the species most obviously affected by degradation of Sahelian grasslands and the conversion of southern savannahs to pesticide treated cropland were Pallid Harrier (*Circus macrourus*), Montagu's Harrier (*Circus pygargus*), Red-footed Falcon (*Falco vespertinus*) and Lesser Kestrel: all consumers of locusts in the dry savannah belt.

Table 9: Changes in land use and fertiliser use in Africa between 1992 and 2002

	% of land as arable or permanent agriculture			Inorganic fertiliser use metric ton per 1,000ha		
	1992	2002	change as % of 1992 area	1992	2002	change as % of 1992 use
Algeria	3.4%	3.5%	2.1%	12.0	11.9	-0.9%
Angola	2.8%	2.6%	-5.7%	2.6	0.0	-100.0%
Benin	15.8%	25.4%	61.3%	8.8	17.0	93.5%
Botswana	0.7%	0.7%	-9.1%	2.2	12.1	462.2%
Burkina Faso	12.9%	16.1%	24.8%	6.1	0.4	-93.7%
Burundi	50.6%	52.6%	3.9%	4.0	1.9	-53.0%
Cameroon	15.4%	15.4%	0.0%	2.9	4.9	67.0%
Central African Republic	3.2%	3.2%	0.2%	0.5	0.3	-45.6%
Chad	2.7%	2.9%	7.7%	3.0	4.8	61.2%
Congo, Dem Republic of	3.5%	3.4%	-1.3%	0.3	1.3	362.9%
Congo, Republic of	0.6%	0.7%	20.0%	10.0	1.0	-90.2%
Côte d'Ivoire	19.5%	21.7%	11.3%	6.0	15.8	164.7%
Egypt	2.8%	3.4%	20.1%	310.1	373.2	20.4%
Equatorial Guinea	8.2%	8.2%	0.0%	0.0	0.0	-

	% of land as arable or permanent agriculture			Inorganic fertiliser use metric ton per 1,000ha		
	1992	2002	change as % of 1992 area	1992	2002	change as % of 1992 use
Gabon	1.8%	1.9%	7.6%	1.1	0.6	-44.2%
Gambia	16.2%	25.5%	57.4%	4.9	3.1	-36.5%
Ghana	19.0%	27.8%	46.6%	2.3	4.9	109.6%
Guinea	5.5%	6.3%	13.7%	0.4	2.1	456.4%
Guinea-Bissau	14.8%	19.5%	31.4%	0.6	4.4	673.8%
Kenya	8.3%	9.1%	9.4%	21.6	27.7	28.1%
Lesotho	11.1%	11.0%	-0.6%	17.0	33.8	99.4%
Liberia	6.3%	6.2%	-0.8%	0.0	0.0	-
Libya	1.2%	1.2%	-0.7%	39.8	28.8	-27.6%
Madagascar	5.8%	6.1%	5.3%	2.3	2.6	12.5%
Malawi	20.7%	25.9%	25.1%	37.8	79.1	109.0%
Mali	1.8%	3.9%	113.3%	12.4	8.9	-27.9%
Mauritania	0.4%	0.5%	16.8%	17.0	5.8	-65.9%
Morocco	21.8%	20.8%	-4.5%	29.9	43.0	43.5%
Mozambique	4.8%	5.7%	18.3%	1.3	5.6	329.7%
Namibia	0.8%	1.0%	23.9%	0.0	0.4	-
Niger	3.3%	3.6%	7.1%	0.3	1.1	231.3%
Nigeria	35.6%	36.2%	1.7%	13.6	5.0	-62.8%
Rwanda	48.1%	56.1%	16.7%	0.6	11.0	1800.3%
Senegal	12.2%	13.0%	6.6%	7.2	13.4	84.7%
Sierra Leone	7.5%	8.4%	11.1%	2.6	0.5	-80.7%
Somalia	1.7%	1.7%	2.7%	0.0	0.5	-
South Africa	12.3%	12.9%	5.4%	49.2	61.4	24.9%
Sudan	5.5%	7.0%	26.7%	4.5	4.2	-7.8%
Swaziland	11.1%	11.0%	-0.5%	64.9	36.8	-43.3%
Tanzania	5.1%	5.8%	13.3%	10.6	1.4	-86.8%
Togo	40.4%	48.4%	19.8%	5.6	6.5	16.4%
Tunisia	31.4%	31.6%	0.6%	21.5	20.8	-3.4%
Uganda	35.2%	36.5%	3.7%	0.1	1.3	1021.2%
Zambia	7.1%	7.1%	0.3%	16.0	12.3	-23.1%
Zimbabwe	8.0%	8.7%	8.4%	36.8	32.8	-10.7%

Source. FAOSTAT data (2005) http://faostat.fao.org/faostat/form?collection=LandUse&Domain=Land&servlet=1&hasbulk=0&version=ext&language=EN

Notes. No data are available for Eritrea or Ethiopia. Djibouti and Western Sahara omitted as no recorded arable or permanent agriculture. Arable Land: land under temporary crops (double-cropped areas are counted only once), temporary meadows for mowing or pasture, land under market and kitchen gardens and land temporarily fallow (less than five years). The abandoned land resulting from shifting cultivation is not included in this category.

Data for "Arable land" are not meant to indicate the amount of land that is potentially cultivable. Permanent Crops: land cultivated with crops that occupy the land for long periods and need not be replanted after each harvest, such as cocoa, coffee and rubber; this category includes land under flowering shrubs, fruit trees, nut trees and vines, but excludes land under trees grown for wood or timber.

Forest loss has been extensive in many parts of Africa, and now only the Democratic Republic of Congo, Popular Republic of Congo, Gabon and Guinea retain more than half of their original forest cover (Zalles & Bildstein 2000). Moreover, the remaining forest areas are under growing pressure. Further losses will undoubtedly threaten many closed-canopy forest raptors, as for example observed by Thiollay (2000) in Côte d'Ivoire. A high proportion of forest raptors are Globally Threatened, but these do not include any of the migratory species considered in this review. In fact some migratory species, such as Red-necked Buzzard (*Buteo auguralis*), Marsh Harrier (*Circus aeruginosus*) and Lanner Falcon (*Falco biarmicus*), may benefit from forest clearance as they require open habitats (Ferguson-Lees & Christie 2001; Thiollay 2000).

5.3 HARVESTING / HUNTING

The harvesting or hunting of raptors remains a significant threat in many areas of the African-Eurasian region despite its illegality in most places. This takes three main forms: (1) the taking of eggs for collections; (2) the taking of birds for pets, zoos and private collections, or more frequently for falconry, either from the nest or by trapping; and (3) the shooting of raptors for sport (not control of predators / pests – see persecution below). Raptors are also occasionally taken for food, traditional medicines and cultural rituals in Africa − but numbers of migratory raptors taken for these purposes is small and unlikely to have any potential population level impacts, though the numbers of birds taken for food may be rising (G. Rondeau pers com.).

Although egg collecting still takes place over much of Europe, it is a relatively rare activity and therefore egg losses are unlikely to lead to significant population impacts in most species. It also appears to be gradually declining as an activity. However, care does need to be taken, because the incentive for a collector to obtain eggs of a particular species increases with rarity, and endangered species will therefore be particularly susceptible to this threat.

Traditional falconry is still used for hunting in some parts of Central Asia from Iran to Mongolia using Golden Eagles (*Aquila chrysaetos*) and Imperial Eagles (*Aquila heliaca*) (Thiollay 1994). Falconry clubs also exist across Europe and in some African countries (such as Zimbabwe and South Africa). But the numbers of birds used for these purposes is very small and many are captive bred.

In contrast, falconry is a particularly widespread and institutionalised sport in Arabian Gulf countries. Falconry in the Middle-East primarily depends on large numbers of Saker Falcons (*Falco cherrug*) and Peregrine Falcons (*Falco peregrinus*), the majority of which are wild-caught. However, there is some evidence that the number of birds being supplied by captive breeding is increasing due to improved breeding techniques and an increasing demand for powerful Gyrfalcon (*Falco rusticolus*) / Peregrine Falcon hybrids (Barton 2000). But in more traditional Arabic countries such as Saudi Arabia and Kuwait wild caught birds are still

popular (A Dixon pers comm. 2005). The larger female Saker falcons are used for hunting Houbara Bustard (*Chlamydotis undulata*) but some Sakers are used for hunting Arabian Hares (*Lepus capensis*). Smaller male Peregrine Falcons are more suited for catching Stone Curlews (*Burhinus oedicnemus*). Other African-Eurasian migratory falcons that are occasionally taken for falconry include Lanner Falcon (*Falco biarmicus*) and Barbary Falcon (*Falco pelegrinoides*).

It is has been estimated that there may be some 8,600 Saker Falcons (*Falco cherrug*) and Peregrine Falcons (*Falco peregrinus*) in captivity across the Middle-East as a whole (Riddle & Remple 1994). More recently Barton (2002) carried out an analysis using records from falconry clinics (which most falcons are taken to at the start of each season) of the demand for wild caught Sakers across the whole Middle-East, and estimated that a minimum of 6,400 individuals are trapped annually and exported to region. Barton also suggested that records from Dubai indicate that there has been a huge increase in falconry in recent years: 73 falcons being brought to the hospital in 1983-84 compared to 2,594 in 1997-98 (Barton 2000). However, these data should be treated with caution as the increase in clinic visits may be due to other factors, such as a greater knowledge of and willingness to use such facilities.

Falcons are trapped for falconry from as far as eastern China to the Red Sea Coast, and the falcon trade constitutes an important business in the Middle-East (Bijlsma 1990), probably resulting in significant losses to some raptor populations. For example, at the migratory bottleneck site of Bab al Mandab in the Yemen, Bedouin trappers annually trap up to 85 Peregrine (*Falco peregrinus*), Lanner (*Falco biarmicus*), and other falcons in a season (David Stanton in lit. to Birdlife International 2005). Quoted estimates of annual national numbers taken include 30-40 large falcons, or 100 in a good year, in Egypt (Goodman & Meininger 1989), and 100 Lanner Falcons in the Yemen (David Stanton in *The Lammergeier*, cited in Shirihai *et al.* 2000).

Birds are also taken outside the Middle-East for the falconry trade, and this is a cause of particular concern for Saker Falcons (*Falco cherrug*), with adults and young being caught in Russia, Mongolia (Shijirmaa *et al.* 2000), Kazakhstan (Levin *et al.* 2000) and the Kyrgyz Republic (Gott *et al.* 2000). Various estimates indicate that some 6,000-8,000 female Sakers were taken annually during the 1990s in the Asiatic part of its range (Galushin 2004): this is comparable to the estimated demand for falcons, as discussed above, and close to estimates of the known world population of breeding pairs. Thus, even taking into account the obvious fact that there must be errors in the trapping and/or population estimates, it is inevitable that trapping will cause a serious population crash in the near future. Indeed population modelling by Potapov (unpublished 2002, cited in Barton 2002) using an assumed world population of 5,000 breeding pairs of Saker suggests that annual trapping scenarios of a) 1,000 adult females and 4,000 juveniles, b) 300 adult females and 2,000 juveniles and c) 1,000 juvenile females would all be unsustainable, with declines to extinction after 5, 10 and just over 30 years respectively. As a result of the observed declines in Saker Falcons and high trapping pressures, the species is now considered to be globally Endangered (Birdlife International World Bird Database, www.birdlifeinternational.org).

Shooting of diurnal raptors for sport and trophies is also a significant threat for many species. Soaring migratory raptors are particularly vulnerable to shooting because they are large and relatively slow flying, and therefore obvious and easy targets, and because they may congregate at predictable times of year in large numbers at bottleneck sites (Zalles &

Bildstein 2000). Although the shooting of raptors is generally illegal, huge numbers have undoubtedly been routinely shot in many countries, particularly in the Mediterranean region and parts of the Middle-East for sport and trophies. For example in Calabria, Sicily and Malta, thousands of harriers, buzzards and falcons (including the endangered Lesser Kestrel *Falco naumanni*), are routinely shot by local inhabitants (Giordano *et al.* 1998; Portelli 1994), with estimates of 60,000 raptors being killed annually in Malta (Fenech 1992). Bijlsma (1990) observed intense hunting in Turkey, and estimated that thousands of raptors were being shot annually in the north-east alone. Some tens of thousands have been annually shot in Lebanon, and foreign hunters have been estimated to shoot 10,000 – 100,000 birds per year in Syria as a result of a lack of birds in their own countries (Evans 1994). The Syrian military have also been reported to use migrating raptors for target practice (Baumgart *et al.* 1995, 2003).

Magnin (1991) estimated that, at that time, one-million birds were killed annually in the Mediterranean region including 100,000 raptors. However, this estimate was largely speculative; being primarily inferred from an estimate of the average hunting activity and success of an estimated 9-10 million hunters and 1 million trappers in the region. No further information is given on the claim that 100,000 of these would be raptors.

Hunting and trapping is also likely to be a significant threat in some eastern European and Asian countries. For example, in Georgia hunting and trapping is a common and traditional activity, with recent estimates of 1,500 – 3,000 birds being killed annually (van Maanen *et al.* 2001).

Unfortunately, there is a considerable lack of quantitative data on the numbers of raptors currently being shot within the region. However, it is likely that hunting levels have decreased since some of these studies were conducted, as a result of greater public awareness, protection under the Wild Birds Directive in EU countries and better enforcement of national laws. For example, in Lebanon in 1993 new legislation was ratified banning all hunting of birds between 15th March and 15th September, which should have reduced the impact on raptors considerably (Evans 1994). And in Kuwait, Gregory *et al.* (2001) note that there appears to have been a gradual decrease in shooting due to measures taken by the authorities to exclude hunters from some important ornithological sites, publicity in the media and educational programmes. However, the authors had no data to quantify the impact on bird shooting.

Nevertheless, despite some apparent declines in hunting pressure, hunting of migratory diurnal raptors remains widespread and largely indiscriminate. Although population level impacts have not been quantified in any species, the numbers taken annually are probably sufficient to have significant population level impacts in some species. Many shot birds are adults and this is of considerable concern because increased adult mortality has a much greater effect on populations of long-lived slow-reproducing species, such as raptors, than either reduced productivity or increased mortality/loss of juvenile age classes. Some species that are routinely shot in large numbers, e.g. Common Buzzard (*Buteo buteo*) and Honey Buzzard (*Pernis apivorous*) appear to have mainly stable breeding populations, which suggests that hunting may not be a significant mortality factor. But some species that are subject to high hunting pressures are declining, such as Lesser Spotted Eagle (*Aquila pomarina*) and hunting is thought to be contributing to this species' decline (Meyburg *et al.* 1995).

5.4 ACCIDENTAL MORTALITY

Raptors are known to be killed by a wide variety of accidental causes, but three of the most common appear to be collisions, electrocution and poisoning.

As many migratory raptors spend a considerable amount of time flying they have a relatively high risk of colliding with aerial structures such as power and telephone-lines, wireless communication aerials, tower support wires and wind turbines. Indeed, many of these structures are typically placed on ridges, which is where many raptors are likely to soar and congregate. Large and less manoeuvrable species such as *Aquila* eagles and vultures are particularly susceptible to accidental impacts. For example, in a staging area in Kazakhstan, casualties reported from a 11 km section of powerline in October 2000 included 200 Kestrels (*Falco tinnunculus*), 48 Steppe Eagles (*Aquila nipalensis*), 2 Imperial Eagles (*Aquila heliaca*), 1 White-Tailed Eagle (*Haliaeetus albicilla*) and 1 Black Vulture (*Aegypius monachus*) (Haas *et al.* 2003). Collision with powerlines is likely to be particularly significant in industrialised / urban environments with high densities of aerial structures, and in areas frequently used by large raptors (e.g. close to breeding colonies and favoured feeding areas, along ridges on migratory routes and near migration bottle-necks).

Collision risks are also high over parts of the Middle-East and North Africa due to the concentrations of migrating raptors along ridges and at bottleneck sites. Furthermore, expansion of the power supply industry and increases in power-line construction have been noted in Egypt (M. Baha El Din and S. Baha El Din *in litt.* to Birdlife International, 2005), and this is probably occurring over much of the region.

Collisions are unlikely to be a significant problem in the rest of Africa, due to the relatively low density of aerial structures at present. At present, even in the more developed areas, such as South Africa, collisions with powerlines and their supports are not a major cause of raptor mortality (van Rooyen 2000).

There is currently a great expansion of the wind energy industry across much of Europe, particularly in coastal areas. This will inevitably increase collision risks for some coastal raptors, such as White-tailed Eagle (e.g. Krone 2003) and birds migrating along coastal flyways. For example, the Bulgarian Government has recently approved three wind-farm developments comprising at least 80 turbines at Cape Kaliakra, a key Important Bird Area for pelicans, cranes, buzzards, eagles, and storks (Heath & Evans 2000).

Although the majority of studies indicate that collision mortality rates per turbine are low, this does not necessarily mean that collision mortality is insignificant, especially for rarer longer-lived species, and where wind farms comprise several hundreds or thousands of turbines (Langston & Pullan 2003).

Furthermore, relatively high collision rates have been recorded at several large, poorly sited wind farms where large raptors and other large soaring species congregate, most notably the Altamont Pass in California, but also Tarifa and Navarra in Spain. At these sites the numbers of deaths resulting from collisions are high, notably of Golden Eagle (*Aquila chrysaetos*) at the Altamont Pass, and Eurasian Griffon (*Gyps fulvus*) in Spain. It therefore seems likely that collision mortality at such poorly sited wind farms may have population level effects, and

cumulative mortality from multiple wind installations may also contribute to population declines in susceptible species. According to Langston and Pullan (2003) susceptible species are likely to include Red Kite (*Milvus milvus*), White-tailed Eagle (*Haliaeetus albicilla*), Lammergeier (*Gypaetus barbatus*), Eurasian Griffon (*Gyps fulvus*), Imperial eagle (*Aquila heliaca*), Golden Eagle (*Aquila chrysaetos*) and Bonelli's Eagle (*Hieraaetus fasciatus*).

Parts of the Middle-East, such as along Gulf of Suez and northern Red Sea coast, have a high wind energy resource, and wind farms are being developed or planned in the region (M. Baha El Din and S. Baha El Din *in litt.* to Birdlife International, 2005). If not carefully located these could place large numbers of the above vulnerable raptors, and other similar species such as Lesser Spotted Eagle (*Aquila pomarina*) and Steppe Eagle (*Aquila nipalensis*) at risk.

The electrocution of raptors as they perch on power-lines is well known and a significant cause of mortality in a number of larger species (Bevanger 1998; Haas *et al.* 2003). In particular, certain types of medium-voltage poles commonly used in Hungary and in Russia are a high mortality factor for all birds of prey, with the exception of harriers, which seldom perch or roost on power poles. For example, in the steppe areas of eastern Europe and Asia, electrocution of Steppe Eagles (*Aquila nipalensis*) and Long-legged Buzzards (*Buteo rufinus*) appears to be substantial, with past reports of an average of 15 casualties being found under every 10 km of power-line (Flint *et al.* 1983; Lopushkov 1988). More recently Moseikin (2003, cited in Birdlife International 2004b) reported at least 311 raptor electrocutions over a 100-km section of 10 kV power line in Kazakhstan over one year. Electrocution is also a significant problem elsewhere in Europe, such as in the Doñana National Park in south-west Spain (Ferrer *et al.* 2003), and in the Middle-East (Bahat 1997).

According to Hass *et al.* (2003) such losses can be high enough to cause population declines or extinctions. For example, electrocution is the commonest form of non-natural death in the endangered Spanish Imperial Eagle (*Aquila adalberti*), with 10-20 mainly juvenile and immature birds killed annually (Gonzalez 1996; Tucker & Heath 1994). In central Mongolia electrocution appears to be the primary cause of adult mortality in Saker Falcons (*Falco cherrug*) (Gombobaatar *et al.* 2004).

It is the combination of badly engineered insulator and conductor constructions and of the attractiveness of power poles for many birds that explains the high risk posed to birds. In particular, if the spacing of the energised wires (phases) is especially small, if only very short upright insulators are used or if protective gaps (arcing horns for lightning protection) are installed on a power pole, birds down to the size of Starlings (*Sturnus vulgaris*) or even smaller can often be electrocuted (Haas *et al.* 2003). Progress has been made in improving power line designs to avoid electrocution, but many old fashioned structures still remain.

The use of poison baits for the control of predators such as Red Fox (*Vulpes vulpes*), Wolf (*Canis lupus*), jackals (*Canis* spp.) and feral dogs is a widespread activity over much of the African-Eurasian region that often results in the accidental death of scavenging raptors, such as eagles, kites and vultures. For example, since 1991 more than 50% of mortality of Spanish Imperial Eagles (*Aquila adalberti*) from birds in breeding pairs has been attributed to illegal use of poison against predators (Ferrer *et al.* 2003). Accidental poisoning of raptors at rubbish tips is also a particular serious cause for concern in the Middle-East, due to the large

numbers of migrating raptors in the region, the large number of open tips and the practice of leaving poison baits out for feral dogs (R. Porter pers. com.). There is also a high risk of poisoning in parts of Africa. In particular in South Africa, where many scavenging birds, particularly vultures and Tawny Eagles (*Aquila rapax*), have declined as a result of direct poisoning by strychnine and benzene hexachloride (Barnes 2000), and migratory visitors are probably at risk there as well.

A threat that is not currently known in Africa or the Middle-East, but which could potentially cause devastating declines, is the poisoning of vultures which feed on Diclofenac-treated livestock. Diclofenac is an anti-inflammatory drug which is widely used in much of the Indian subcontinent for veterinary purposes, and has been found to be the cause of the recent catastrophic decline in vultures in the region (Oaks *et al.* 2004; Shultz *et al.* 2004). Diclofenac is lethal to *Gyps* vultures at concentrations found in carcasses of normally treated livestock. Other avian scavengers may be just as susceptible, but this has not been tested. Recent investigations made in West Africa, indicate that Diclofenac is used in Mali, though its use in other countries is uncertain and is being investigated (G. Rondeau pers. com.). Diclofenac is also used by vets in southern Africa in small quantities (R. Simmons pers com.).

5.5 PERSECUTION

Historically, human persecution has been a widespread cause of population declines and range contractions in many raptors. Farmers, game managers and gamekeepers have attempted to reduce perceived losses of livestock and game species to raptors through often intensive trapping, poisoning, egg and nest destruction and shooting. However, as a result of legal protection of most if not all raptors in almost all developed countries, deliberate killing has been greatly reduced over most of Europe (Thiollay 1994). Nevertheless, persecution continues in many European countries with otherwise well developed conservation legislation. For example, in the UK the Hen Harrier (*Circus cyaneus*) is especially heavily persecuted by grouse-moor gamekeepers (Holmes *et al.* 2000), and as a result they are completely absent from large areas of otherwise suitable habitat (Potts 1998).

Legal protection is particularly poorly enforced in many Mediterranean countries and in the Middle-East. For example, although protected by law, persecution is considered to have been one of the main causes of severe declines in many raptor populations in Israel over the past 50 years, and the extinctions of Greater Spotted Eagle (*Aquila clanga*), White-tailed Eagle (Haliaeetus albicilla), Lappet Faced Vulture (*Torgos tracheliotus*) and Lammergeier. (*Gypaetus barbatus*) (Bahat 2001).

In most tropical countries, raptors tend to be ignored by the law and are occasionally killed to protect poultry (Keran 1981; Thiollay 1994).

5.6 POLLUTION

Persistent organic pollutants (POPs) are now widespread in the environment, especially in industrialised and agricultural areas. They include industrial chemicals such as polychlorinated biphenyls (PCBs), pesticide residues and unwanted by-products such as dioxins, and many pose a particular threat to predators at high trophic levels because they can accumulate in the fat of their prey and then become further concentrated through the

food chain. Consequently, the widespread use of organochlorine pesticides, such as DDT, and other toxic pesticides had massive, well documented impacts on many raptors species. For example, the widespread post-1955 declines in European Peregrine Falcon (*Falco peregrinus*) populations were caused by food-chain contamination with POPs, mainly from agricultural organochlorine insecticides introduced during the 1940s-50s, though organo-mercury fungicides and industrials PCBs were probably also contributory factors (Newton *et al.* 1988; Ratcliffe 1993). Once such environmental impacts were identified, these persistent toxic pesticides were phased out over most of the developed world, and residues in raptors slowly declined. For example, in the UK organochlorine and mercury-based pesticide residues showed clear downward trends from the early 1960s to the 1990s, resulting in a simultaneous recovery in the breeding success and population size of most affected raptor species (Newton *et al.* 1993).

However, POP problems are not over in the African-Eurasian region. In Israel, for example, pesticide problems have decreased, since the 1980s, but there are still cases of raptor mortality from pesticides, including the death of 30 Eurasian Griffons (*Gyps fulvus*) in a single day in the north of Israel in 1998 (Bahat 2001; Shlosberg & Bahat 2001). The use of toxic pesticides is a particular problem in many developing countries, where they continue to be manufactured and widely used (Thiollay 1994). According to the FAO and WHO (cited in Mullie & Diop 2001) 30% of pesticides marketed in developing countries contain hazardous substances and impurities that have already been banned or severely restricted elsewhere, and the problem is particularly great in sub-Saharan Africa. For example, Mullie et al (1991b) observed extensive use of toxic pesticides in West Africa in rice-farming areas, and in the Sahel for locust control. DDT is widely used in Africa for mosquito control and Zimbabwe has recently resumed using it for tsetse fly control (R. Watson pers. com.).

But despite this, there is little evidence of impacts on raptors. There are documented cases of deaths of large numbers of non-target species, including raptors resulting from the control of Quelea and other granivorous bird pests in breeding colonies using fenthion (Keith & Bruggers 1998). However, Keith in Bruggers (1988) report that that many pesticide applications do not cause serious mortality. Only minimal raptor losses were reported following applications of malathion, fenitrothion, chlorpyrifos and other insecticides to control locusts and grasshoppers scattered over about 14 million hectares of north Africa. Similarly, applications of zinc phosphate bait on 430,000 hectares of the Sudan did not cause any known loss of raptors.

But care must be taken in drawing conclusions from this, because our understanding of pesticide use and its impacts on survival rates and breeding productivity in raptors in the Middle-East and especially Africa is very poor, and considerably more research is required into this issue. Similarly, further studies are required in the African-Eurasian region on many other toxic POPs, such PCBs, which are particularly widespread, as well as inorganic pollutants such as lead, mercury and cadmium, which can kill or incapacitate raptors when they reach high levels (Thiollay 1994).

There is good cause for concern over the recent use of bromdialone poisoned grain to control Brandt's Voles (*Microtus brandti*) in Mongolia (Batdelger & Potapov 2002). Batdelger and Potopov report a huge programme of poisoning covering at least 2/3 of Mongolia, and have observed deaths of large numbers of Demoiselle Cranes (*Anthropoides virgo*), from eating the poisoned grain, and raptors including Black Kite (*Milvus migrans*), Golden Eagle

(*Aquila chrysaetos*), Upland Buzzard (*Buteo hemilasius*) and Saker Falcons (*Falco cherrug*), presumably from secondary poisoning from the contaminated voles. A later report from Fox (2004) suggests that the widespread use of this poison has killed large numbers of Steppe Eagles (*Aquila nipalensis*), Upland Buzzards, and Saker Falcons. In fact the poisoning of Saker Falcons is considered to have had a bigger impact on their populations than all the illegal trapping and other factors put together, and contributed to a recorded drop off of 27% of the Saker population in Mongolia in 2003.

The ingestion of lead shot imbedded in carcasses is also a significant threat to scavenging raptors such as kites, harriers, buzzards, vultures and some *Aquila* eagles, including the Globally Threatened Spanish Imperial Eagle (*Aquila adalberti*) (Mateo *et al.* 2003; Miller *et al.* 2002; Pain & Amiardtriquet 1993; Pain *et al.* 2005; Pain *et al.* 1995). However, although elevated lead levels have been found in a wide range of species, these are usually a small proportion of individuals and levels are not usually sufficiently high to be likely causes of problems.

Another possibly significant but little researched cause of adult mortality in migrating raptors may be from oil contamination. Clark (1987) found oil-based asphalt on 55 individuals of nine species out of 1,052 raptors (5·2%) captured and examined in the spring of 1985 and 1986 at Eilat, Israel. Some were extensively contaminated and probably succumbed to the effects of ingested asphalt. The birds probably became contaminated while drinking water from pools with surface oil. Although the possible impact on populations is unclear it could be significant if such a high percentage of birds are affected.

5.7 DISTURBANCE

Many raptors, such as most *Aquila* eagles, are sensitive to human disturbance near to their nesting sites. And this can be a particular problem for raptors that nest in the close vicinity of man, such as in coastal areas and in other popular tourist areas. Thus disturbance from tourists is thought to be a problem at some nesting colonies of Eleonora's Falcon (*Falco eleonorae*) (Ristow & Wink 1985). Unrestricted rock-climbing during the breeding season can also be a problem for this and other cliff nesting species.

And as mentioned previously, forestry operations can disturb some species, such as Greater Spotted Eagle (*Aquila clanga*), which is particularly sensitive to such activities (Meyburg *et al.* 1999a).

In many areas, and especially parts of Africa, human populations continue to increase rapidly, which will lead to widespread increases in general disturbance levels. And in some countries, such as Zimbabwe and Kenya, this is being compounded by policies to redistribute land to small-holdings, which further spreads people across the landscape, leading to further disturbance and probably associated persecution of raptors.

5.8 CLIMATE CHANGE

Although this has been rarely mentioned in previous reviews of the threats to raptors (and is therefore not listed in Table 7), it is becoming increasingly clear that the most important future threat to these species, and all others, is climate change. The Inter-governmental Panel on Climate Change (IPCC) has now stated that there is no significant doubt that the

world's climate is changing as a result of human activities, and in particular the release of carbon dioxide and other 'greenhouse gases' into the atmosphere (IPCC 2001). The impacts of climate change on the world's ecosystems and habitats, and associated species are, however, much less certain.

Nevertheless, it is becoming clear that climate change will result in considerable changes in ecosystems, particularly in polar and temperate regions. As a result there will be profound detrimental impacts on associated species (Green *et al.* 2001). For example, one recent modelling study using projections of species distributions from future climate scenarios (based on mid-range climate change predictions) predicted that between 18% and 35% of global species are likely to go extinct (Thomas *et al.* 2004).

The future impacts of climate change on African-Eurasian migratory raptors are uncertain at the moment, but there is growing evidence that they are likely to be significantly impacted. For example, Wichmann *et al.* (2003) have modelled the probable impact of climate change on Tawny Eagle (*Aquila rapax*) populations in arid savannah regions of southern Africa, and predicted that even a slight change in rainfall would have significant impacts. With projected rainfall declines of 10% by 2010, as predicted for southern Africa by the IPCC (2001) the model predicted a survival time for the population of less than 100 years. Even a more optimistic model scenario with sustained long-term average rainfall but an increase in inter-annual variation in rainfall predicted a severe decrease in survival time. Overall they conclude that there will be substantial impacts from climate change in arid areas on raptor population dynamics and survival.

Simmons *et al.* (2004) have also pointed out that migratory species may be particularly vulnerable to climate change for two reasons. Firstly, because bird migration is genetically controlled, birds displaced to a new breeding locality as a result of climate change may migrate to an inhospitable non-breeding area. This risk would be greatest for long-lived species, such as some raptors, as a result of their longer generation times and hence slower adaptive evolutionary response.

Secondly, if migration timing is under photoperiodic control while food availability is influenced by spring temperature, then the two may fall out of synchrony, in which case migrants may arrive on their breeding grounds after the emergence of their main food resources. Recent studies suggest that such decoupling in temperate regions may be reduced or avoided by changes in migratory behaviour. But species migrating into Africa will have to contend with increased temperatures, reduced rainfall (and the insect events strongly associated with them) and more unpredictable weather events (IPCC 2001). Many Palearctic migrant raptors arriving in Africa depend on flushes of insects and small mammals that are triggered by rains. If these become less dependable, as predicted by the IPCC, food availability may become decoupled, with a potential consequent increase in mortality rates or reduced breeding condition.

On the other hand, it might be that migratory species will be better able to find and therefore colonise alternative suitable habitats in the future; but as with other climate change impacts, this is largely speculative. It is therefore appropriate to take a precautionary approach and assume that their migratory strategies will be detrimentally disrupted. Climate driven habitat change will also exacerbate existing human induced changes, which as described above, are already the most significant threats to most migratory raptors in the African-Eurasian region.

5.9 THREATS TO KEY SITES

For over 25 years Birdlife International has been developing a global programme of identifying Important Bird Areas (IBAs), which are sites of particular importance for birds, that should therefore be protected to some degree. The original European criteria for identifying IBAs (Grimmett & Jones 1989) have been updated and expanded globally. IBAs are now sites that are important for threatened species, congregatory species, assemblages of restricted-range species and assemblages of biome-restricted bird species. Sites qualify as IBAs if they meet any of the standard global criteria (Class A criteria) or regionally specific criteria (Class B criteria) (Heath & Evans 2000).

Of particular importance to raptors are the IBAs that are identified as being 'bottle-neck sites' i.e., where raptors (and other soaring birds) congregate to pass by a particular obstacle (e.g. to minimise a sea-crossing or avoid a high mountain range). Such IBAs may qualify as being of global importance for migratory raptors according to either Criteria A4.iv (a 'bottleneck' site where at least 20,000 storks, raptors, or cranes pass during spring or autumn migration); or they may qualify as being of European (or regional) importance under Criteria B4.iv (a 'bottleneck' site where over 5,000 storks, or over 3,000 raptors or cranes regularly pass on spring or autumn migration).

In addition IBAs may qualify as being of global importance for species of global conservation concern (Criteria A1) if the site regularly holds significant numbers of Globally Threatened species, or other species of global conservation concern.

Appendix 6 provides a list of all IBAs currently identified by Birdlife International for Europe, the Middle-East (including Iran and Afghanistan) and Africa that qualify as bottleneck migration sites of global or regional importance for raptors according to the above criteria. Those that also hold significant numbers of Globally Threatened raptors on passage are also indicated. This list of 100 sites should, however, be treated as a minimum list of internationally important areas requiring protection for migratory raptors. Other sites of equal or greater importance may be discovered with further knowledge.

The table also provides a summary of the national and international protection levels of each site, which is summarised below in Table 10. This indicates that a rather low proportion of these IBA sites currently enjoy a satisfactory level of protection; indeed, 42% of the sites have no legal protection at all.

Table 10: A summary of sites, and their protection status, in Europe, the Middle-East and Africa that qualify as Important Birds Areas for migratory raptors

(see Annex 6 for individual site data)

Site protection level	Percentage of 100 sites	
	National protection	International protection
High (H)	20	9
Partial (P)	29	13
Low (L)	9	2
None (N)	42	76

6 CONCLUSIONS

Despite the data limitations discussed above, it is clear that at least 32 species (53%) of the 60 species of migratory raptor that occur in the African-Eurasian region have an Unfavourable Conservation Status at a global or regional level in some part of their range (see Table 11), and 10 of these are Globally Threatened or Near Threatened. Furthermore, a high proportion of these 32 species are in continued long-term or rapid population declines.

Analysis of the known threats to raptors suggest that there are a substantial number and variety of factors causing Unfavourable Conservation Status, though for the majority of species the most important are probably the result of human induced habitat loss and degradation (including impacts from pesticide use and other forms of pollution). This is an almost universal threat to European populations, but also seems to be a widespread threat in Africa. Climate change is expected to exacerbate these habitat-related problems profoundly across the entire African-Eurasian region.

For some species accidental poisoning (e.g. from baits poisoned with strychnine), persecution, shooting for sport and trapping may also be key or contributory factors causing population declines (or long-term reductions in range), but the impacts of these losses on populations requires further study. Hunting, trapping and persecution levels are probably declining for most species, but the trapping of Saker Falcons (*Falco cherrug*) for falconry has greatly increased in the last decade and is now unsustainable.

We therefore conclude that most migratory raptors in the region are affected by a number of threats that would benefit from internationally coordinated action, as recommended by the World Working Group on Birds of Prey.

Table 11: Migratory raptors of the Africa-Eurasian region that have Unfavourable Conservation Status and that are priority species for further international conservation measures

See Table 1 for Global Status codes

Species	English Name	Global Status
Chelictinia riocourii	African Swallow-tailed Kite	LC
Milvus milvus	Red Kite	NT
Milvus migrans	Black Kite	LC
Haliaeetus albicilla	White-tailed Eagle	LC
Neophron percnopterus	Egyptian Vulture	LC
Aegypius monachus	Cinereous Vulture	NT
Circaetus gallicus	Short-toed Snake-eagle	LC
Circus maurus	Black Harrier	VU
Circus cyaneus	Northern Harrier	LC
Circus macrourus	Pallid Harrier	NT
Accipiter brevipes	Levant Sparrowhawk	LC
Buteo rufinus	Long-legged Buzzard	LC
Aquila pomarina	Lesser Spotted Eagle	LC
Aquila clanga	Greater Spotted Eagle	VU
Aquila nipalensis	Steppe Eagle	LC
Aquila rapax	Tawny Eagle	LC
Aquila adalberti	Spanish Imperial Eagle	VU
Aquila heliaca	Imperial Eagle	VU
Aquila chrysaetos	Golden Eagle	LC
Hieraaetus pennatus	Booted Eagle	LC
Pandion haliaetus	Osprey	LC
Falco naumanni	Lesser Kestrel	VU
Falco tinnunculus	Common Kestrel	LC
Falco vespertinus	Red-footed Falcon	NT
Falco eleonorae	Eleonora's Falcon	LC
Falco biarmicus	Lanner Falcon	LC
Falco cherrug	Saker Falcon	EN
Falco rusticolus	Gyrfalcon	LC
Otus brucei	Pallid Scops-owl	LC
Otus scops	Common Scops-owl	LC
Nyctea scandiaca	Snowy Owl	LC
Asio flammeus	Short-eared Owl	LC

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ANNEX 1

VI WORLD CONFERENCE ON BIRDS OF PREY AND OWLS
Budapest, Hungary, 18-23 May 2003

Resolution 3

RECALLING that the Convention on the Conservation of Migratory Species of Wild Animals 1979 (CMS) encourages international cooperative action to conserve migratory species;

CONSIDERING that migratory raptors constitute an important part of the global biological diversity which, in keeping with the spirit of the Convention on Biological Diversity 1992 and Agenda 21, should be conserved for the benefit of present and future generations;

AWARE of the environmental, ecological, genetic, scientific, aesthetic, recreational, cultural, educational, social and economic values of raptors in general;

CONSCIOUS that migratory raptors are particularly vulnerable because they migrate over long distances, with many species being reliant upon land-bridges and/or networks of fragile habitats that are declining in extent and becoming degraded through unsustainable human activities;

RECOGNISING the need to take immediate action to halt the decline of migratory raptor populations and their habitats in the geographic area of the African-Eurasian raptor migration systems;

CONVINCED that a multilateral agreement and its implementation through coordinated and concerted action would contribute significantly to the conservation of migratory raptors and their habitats in the most effective manner, and would deliver ancillary benefits for many other species of animal and plant;

URGES the CMS Secretariat and other bodies of CMS, notably the Scientific Council, urgently to consider establishing a multilateral agreement on the conservation of African-Eurasian migratory raptors;

ACKNOWLEDGES that effective implementation of such an agreement would require assistance to be provided to some range states for research, training and monitoring of migratory raptor species and their habitats, for the management of those habitats as well as for the establishment or improvement of scientific and administrative institutions for the implementation of such an agreement; and

FURTHER URGES all range states within the African-Eurasian geographic area actively to embrace this proposal and to work together to establish, ratify and implement such an agreement as a matter of urgency.

ANNEX 2

CLASSIFICATION OF MIGRATORY BEHAVIOUR AS USED IN THE GLOBAL RESISTER OF MIGRATORY SPECIES

For CMS, a migratory species has to cross political boundaries, while GROMS focuses on 'true migrants' covering more than 100 km. A species with intracontinental migration is not necessarily a CMS migrant, as migration might occur within one range state. Therefore, the respective category is put in brackets (+).

Category	Explanation	CMS-migrant	GROMS-migrant (> 100 km)
Major category			
Non-migratory	Non-migratory	–	–
GROMS migrant	Migratory according to GROMS definition	(+)	+
Technical migrant	Movements across borders by members of populations living in contiguous areas on either side of one or more national boundaries (border taxa)	+	(+)
Partial	Minor part of population migratory	(+)	(+)
Possibly migratory	Some references indicate possible migration		
Data deficient	Possible migrant for theoretical reasons, but no data available		
Subdivisions of GROMS migrants			
Intracontinental	Within continents	(+)	+
Intercontinental	Between continents	+	+
Nomadising	Following resources, often without predictable temporal patterns.	(+)	–
Emigration	Mass migrations after population explosions	–	–
Range extension	E.g. post-breeding dispersal of birds or bats	(+)	(+)

Species not listed as migratory in GROMS, but listed as migratory by Birdlife International WBDB

Aquila rapax Tawny Eagle

GROMS text: Resident in most areas but perhaps some seasonal movement into more arid areas in SW and NE Africa during the rainy season; also some birds perform seasonal N-S movements in W Africa. Often mixes with flocks of migrant *A. nipalensis*. Rare vagrant to Bangladesh, NW Thailand and perhaps Sri Lanka. (del Hoyo J Elliott A, Sargatal J (eds) 1994)

Conclusion: Migrant (although only some populations)

***Falco pelegrinoides* Barbary Falcon**
GROMS text: Not listed. Treated as a sub-species in del Hoyo *et al.*
Conclusion: Migratory status uncertain, but in the absence of any further information, follow Birdlife International and treated as a migrant.

***Milvus lineatus* Black-eared Kite**
GROMS Text: None, presumably because treated as subspecies of *Milvus migrans* by del Hoyo *et al.* 1994. But Del Hoyo state in text that subspecies *lineatus* is migratory.
Conclusion: Migratory (follow WBDB)

***Asio flammeus* Short-eared Owl**
GROMS Text: Not listed
Conclusion: Migratory (GROMS error)

ANNEX 3

RAPTORS THAT REGULARLY OCCUR IN THE AFROTROPICAL AND PALEARCTIC REALMS, THEIR MIGRATORY BEHAVIOUR AND GLOBAL CONSERVATION STATUS

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
SAGITTARIIDAE				
Sagittarius serpentarius	Secretarybird	Af	not a migrant	LC
ACCIPITRIDAE				
Aviceda cuculoides	African Baza	Af	full migrant (G)	LC
Aviceda madagascariensis	Madagascar Baza	Af	not a migrant	LC
Aviceda jerdoni	Jerdon's Baza		full migrant	LC
Aviceda leuphotes	Black Baza		full migrant	LC
Pernis apivorus	European Honey-buzzard	Af WP	full migrant	LC
Pernis ptilorhyncus	Oriental Honey-buzzard	WP	full migrant	LC
Macheiramphus alcinus	Bat Hawk	Af	not a migrant	LC
Elanus caeruleus	Black-winged Kite	Af WP	not a migrant (G)	LC
Chelictinia riocourii	African Swallow-tailed Kite	Af	full migrant	LC
Milvus milvus	Red Kite	Af WP	full migrant	NT
Milvus migrans	Black Kite	Af WP	full migrant	LC
Milvus lineatus	Black-eared Kite		full migrant (BL)	LC
Haliastur indus	Brahminy Kite		not a migrant	LC
Haliaeetus leucogaster	White-bellied Fish-eagle		not a migrant	LC
Haliaeetus vocifer	African Fish-eagle	Af	not a migrant	LC
Haliaeetus vociferoides	Madagascar Fish-eagle	Af	not a migrant	CR
Haliaeetus albicilla	White-tailed Eagle	WP	full migrant	LC
Haliaeetus pelagicus	Steller's Sea-eagle		full migrant	VU
Ichthyophaga humilis	Lesser Fish-eagle		not a migrant	NT
Gypohierax angolensis	Palm-nut Vulture	Af	not a migrant	LC
Gypaetus barbatus	Lammergeier	Af WP	not a migrant (G)	LC
Neophron percnopterus	Egyptian Vulture	Af WP	full migrant	LC
Necrosyrtes monachus	Hooded Vulture	Af	not a migrant	LC
Gyps africanus	White-backed Vulture	Af	not a migrant	LC
Gyps bengalensis	White-rumped Vulture		not a migrant	CR
Gyps rueppellii	Rueppell's Griffon	Af	not a migrant	LC
Gyps himalayensis	Himalayan Griffon		not a migrant (G)	LC
Gyps fulvus	Eurasian Griffon	Af WP	full migrant	LC

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
Gyps coprotheres	Cape Griffon	Af	not a migrant (G)	VU
Aegypius monachus	Cinereous Vulture	Af WP	full migrant	NT
Torgos tracheliotus	Lappet-faced Vulture	Af WP	not a migrant	VU
Trigonoceps occipitalis	White-headed Vulture	Af	not a migrant	LC
Sarcogyps calvus	Red-headed Vulture		not a migrant	NT
Circaetus gallicus	Short-toed Snake-eagle	Af WP	full migrant	LC
Circaetus cinereus	Brown Snake-eagle	Af	not a migrant	LC
Circaetus fasciolatus	Southern Banded Snake-eagle	Af	not a migrant	NT
Circaetus cinerascens	Banded Snake-eagle	Af	not a migrant	LC
Terathopius ecaudatus	Bateleur	Af	not a migrant	LC
Spilornis cheela	Crested Serpent-eagle		not a migrant	LC
Dryotriorchis spectabilis	Congo Serpent-eagle	Af	not a migrant	LC
Eutriorchis astur	Madagascar Serpent-eagle	Af	not a migrant	EN
Circus aeruginosus	Western Marsh-harrier	Af WP	full migrant	LC
Circus ranivorus	African Marsh Harrier	Af	not a migrant	LC
Circus spilonotus	Eastern Marsh-harrier		full migrant	LC
Circus macrosceles	Madagascar Harrier	Af	not a migrant	VU
Circus maillardi	Réunion Harrier	Af	not a migrant	EN
Circus maurus	Black Harrier	Af	full migrant (G)	VU
Circus cyaneus	Northern Harrier	WP	full migrant	LC
Circus macrourus	Pallid Harrier	Af WP	full migrant	NT
Circus melanoleucos	Pied Harrier		full migrant	LC
Circus pygargus	Montagu's Harrier	Af WP	full migrant	LC
Polyboroides typus	African Harrier-hawk	Af	not a migrant	LC
Polyboroides radiatus	Madagascar Harrier-hawk	Af	not a migrant	LC
Kaupifalco monogrammicus	Lizard Buzzard	Af	not a migrant	LC
Melierax metabates	Dark Chanting-goshawk	Af WP	not a migrant	LC
Melierax poliopterus	Eastern Chanting-goshawk	Af	not a migrant	LC
Melierax canorus	Pale Chanting-goshawk	Af	not a migrant	LC
Melierax gabar	Gabar Goshawk	Af	not a migrant	LC
Accipiter trivirgatus	Crested Goshawk		not a migrant	LC
Accipiter tachiro	African Goshawk	Af	not a migrant	LC
Accipiter castanilius	Chestnut-flanked Sparrowhawk	Af	not a migrant	LC
Accipiter badius	Shikra	Af WP	full migrant	LC
Accipiter brevipes	Levant Sparrowhawk	Af WP	full migrant	LC

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
Accipiter soloensis	Chinese Goshawk		full migrant	LC
Accipiter francesiae	Frances's Sparrowhawk	Af	not a migrant	LC
Accipiter erythropus	Red-thighed Sparrowhawk	Af	not a migrant	LC
Accipiter minullus	Little Sparrowhawk	Af	not a migrant	LC
Accipiter gularis	Japanese Sparrowhawk		full migrant	LC
Accipiter virgatus	Besra		full migrant	LC
Accipiter madagascariensis	Madagascar Sparrowhawk	Af	not a migrant	NT
Accipiter ovampensis	Ovampo Sparrowhawk	Af	full migrant (G)	LC
Accipiter nisus	Eurasian Sparrowhawk	Af WP	full migrant	LC
Accipiter rufiventris	Rufous-chested Sparrowhawk	Af	not a migrant	LC
Accipiter melanoleucus	Black Goshawk	Af	not a migrant	LC
Accipiter henstii	Henst's Goshawk	Af	not a migrant	NT
Accipiter gentilis	Northern Goshawk	WP	full migrant	LC
Urotriorchis macrourus	Long-tailed Hawk	Af	not a migrant	LC
Butastur rufipennis	Grasshopper Buzzard	Af	full migrant (G)	LC
Butastur teesa	White-eyed Buzzard		not a migrant	LC
Butastur liventer	Rufous-winged Buzzard		not a migrant	LC
Butastur indicus	Grey-faced Buzzard		full migrant	LC
Buteo buteo	Common Buzzard	Af WP	full migrant	LC
Buteo oreophilus	Mountain Buzzard	Af	full migrant (G)	LC
Buteo brachypterus	Madagascar Buzzard	Af	not a migrant	LC
Buteo rufinus	Long-legged Buzzard	Af WP	full migrant	LC
Buteo hemilasius	Upland Buzzard		full migrant	LC
Buteo lagopus	Rough-legged Hawk	WP	full migrant	LC
Buteo auguralis	Red-necked Buzzard	Af	full migrant	LC
Buteo augur	Augur Buzzard	Af	not a migrant	LC
Buteo archeri	Archer's Buzzard	Af	not a migrant	LC
Buteo rufofuscus	Jackal Buzzard	Af	not a migrant	LC
Ictinaetus malayensis	Black Eagle		not a migrant	LC
Aquila pomarina	Lesser Spotted Eagle	Af WP	full migrant	LC
Aquila clanga	Greater Spotted Eagle	Af WP	full migrant	VU
Aquila rapax	Tawny Eagle	Af WP	full migrant (BL)	LC
Aquila nipalensis	Steppe Eagle	Af WP	full migrant	LC
Aquila adalberti	Spanish Imperial Eagle	WP	full migrant	VU
Aquila heliaca	Imperial Eagle	Af WP	full migrant	VU

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
Aquila chrysaetos	Golden Eagle	Af WP	full migrant	LC
Aquila verreauxii	Verreaux's Eagle	Af WP	not a migrant	LC
Aquila wahlbergi	Wahlberg's Eagle	Af	full migrant (G)	LC
Hieraaetus fasciatus	Bonelli's Eagle	Af WP	not a migrant	LC
Hieraaetus spilogaster	African Hawk-eagle	Af	not a migrant	LC
Hieraaetus pennatus	Booted Eagle	Af WP	full migrant	LC
Hieraaetus ayresii	Ayres's Hawk-eagle	Af	not a migrant	LC
Hieraaetus kienerii	Rufous-bellied Eagle		not a migrant	LC
Polemaetus bellicosus	Martial Eagle	Af	not a migrant	LC
Lophaetus occipitalis	Long-crested Eagle	Af	not a migrant	LC
Spizaetus africanus	Cassin's Hawk-eagle	Af	not a migrant	LC
Spizaetus nipalensis	Mountain Hawk-eagle		full migrant	LC
Stephanoaetus coronatus	Crowned Hawk-eagle	Af	not a migrant	LC
PANDIONINAE				
Pandion haliaetus	Osprey	Af WP	full migrant	LC
FALCONIDAE				
Polihierax semitorquatus	Pygmy Falcon	Af	not a migrant	LC
Microhierax caerulescens	Collared Falconet		not a migrant	LC
Microhierax melanoleucos	Pied Falconet		not a migrant	LC
Falco naumanni	Lesser Kestrel	Af WP	full migrant	VU
Falco tinnunculus	Common Kestrel	Af WP	full migrant	LC
Falco newtoni	Madagascar Kestrel	Af	not a migrant	LC
Falco punctatus	Mauritius Kestrel	Af	not a migrant	VU
Falco araea	Seychelles Kestrel	Af	not a migrant	VU
Falco rupicoloides	Greater Kestrel	Af	not a migrant	LC
Falco alopex	Fox Kestrel	Af	full migrant (G)	LC
Falco ardosiaceus	Grey Kestrel	Af	not a migrant	LC
Falco dickinsoni	Dickinson's Kestrel	Af	not a migrant	LC
Falco zoniventris	Banded Kestrel	Af	not a migrant	LC
Falco vespertinus	Red-footed Falcon	Af WP	full migrant	NT
Falco amurensis	Amur Falcon	Af	full migrant	LC
Falco eleonorae	Eleonora's Falcon	Af WP	full migrant	LC
Falco concolor	Sooty Falcon	Af WP	full migrant	LC
Falco columbarius	Merlin	WP	full migrant	LC
Falco subbuteo	Eurasian Hobby	Af WP	full migrant	LC

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
Falco cuvierii	African Hobby	Af	not a migrant	LC
Falco severus	Oriental Hobby		not a migrant	LC
Falco biarmicus	Lanner Falcon	Af WP	Full migrant (G)	LC
Falco jugger	Laggar Falcon		not a migrant	NT
Falco cherrug	Saker Falcon	Af WP	full migrant	EN
Falco rusticolus	Gyrfalcon	WP	full migrant	LC
Falco peregrinus	Peregrine Falcon	Af WP	full migrant	LC
Falco pelegrinoides	Barbary Falcon	Af WP	full migrant (BL)	LC
Falco fasciinucha	Taita Falcon	Af	not a migrant	NT
TYTONIDAE				
Tyto soumagnei	Madagascar Red Owl	Af	not a migrant	EN
Tyto alba	Barn Owl	Af WP	not a migrant	LC
Tyto capensis	African Grass-owl	Af	not a migrant	LC
Tyto longimembris	Eastern Grass-owl		not a migrant	LC
Phodilus prigoginei	Congo Bay-owl	Af	not a migrant	EN
Phodilus badius	Oriental Bay-owl		not a migrant	LC
STRIGIDAE				
Otus icterorhynchus	Sandy Scops-owl	Af	not a migrant	LC
Otus ireneae	Sokoke Scops-owl	Af	not a migrant	EN
Otus spilocephalus	Mountain Scops-owl		not a migrant	LC
Otus hartlaubi	São Tomé Scops-owl	Af	not a migrant	VU
Otus brucei	Pallid Scops-owl	WP	full migrant	LC
Otus scops	Common Scops-owl	Af WP	full migrant	LC
Otus senegalensis	African Scops-owl	Af	not a migrant	LC
Otus sunia	Oriental Scops-owl		not a migrant	LC
Otus elegans	Elegant Scops-owl		not a migrant	NT
Otus magicus	Moluccan Scops-owl	Af	not a migrant	LC
Otus insularis	Seychelles Scops-owl	Af	not a migrant	EN
Otus rutilus	Malagasy Scops-owl	Af	not a migrant	LC
Otus pembaensis	Pemba Scops-owl	Af	not a migrant	LC
Otus capnodes	Anjouan Scops-owl	Af	not a migrant	CR
Otus moheliensis	Moheli Scops-owl	Af	not a migrant	CR
Otus pauliani	Grand Comoro Scops-owl	Af	not a migrant	CR
Otus bakkamoena	Collared Scops-owl		not a migrant	LC
Otus leucotis	White-faced Scops-owl	Af	not a migrant	LC

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
Bubo bubo	Eurasian Eagle-owl	Af WP	not a migrant	LC
Bubo ascalaphus	Pharaoh Eagle-owl	Af	not a migrant	LC
Bubo capensis	Cape Eagle-owl	Af	not a migrant	LC
Bubo africanus	Spotted Eagle-owl	Af	not a migrant	LC
Bubo poensis	Fraser's Eagle-owl	Af	not a migrant	LC
Bubo vosseleri	Usambara Eagle-owl	Af	not a migrant	VU
Bubo nipalensis	Spot-bellied Eagle-owl		not a migrant	LC
Bubo shelleyi	Shelley's Eagle-owl	Af	not a migrant	NT
Bubo lacteus	Verreaux's Eagle-owl	Af	not a migrant	LC
Bubo coromandus	Dusky Eagle-owl		not a migrant	LC
Bubo leucostictus	Akun Eagle-owl	Af	not a migrant	LC
Ketupa blakistoni	Blakiston's Fish-owl		not a migrant	EN
Ketupa zeylonensis	Brown Fish-owl	Af WP	not a migrant	LC
Ketupa flavipes	Tawny Fish-owl		not a migrant	LC
Scotopelia peli	Pel's Fishing-owl	Af	not a migrant	LC
Scotopelia ussheri	Rufous Fishing-owl	Af	not a migrant	EN
Scotopelia bouvieri	Vermiculated Fishing-owl	Af	not a migrant	LC
Nyctea scandiaca	Snowy Owl	WP	full migrant	LC
Strix leptogrammica	Brown Wood-owl		not a migrant	LC
Strix aluco	Tawny Owl	WP	not a migrant	LC
Strix butleri	Hume's Owl	WP	not a migrant	LC
Strix uralensis	Ural Owl	WP	full migrant	LC
Strix nebulosa	Great Grey Owl	WP	full migrant	LC
Strix woodfordii	African Wood-owl	Af	not a migrant	LC
Jubula lettii	Maned Owl	Af	not a migrant	LC
Surnia ulula	Northern Hawk Owl	WP	full migrant	LC
Glaucidium passerinum	Eurasian Pygmy-owl	WP	not a migrant	LC
Glaucidium brodiei	Collared Owlet		not a migrant	LC
Glaucidium perlatum	Pearl-spotted Owlet	Af	not a migrant	LC
Glaucidium tephronotum	Red-chested Owlet	Af	not a migrant	LC
Glaucidium sjostedti	Sjostedt's Owlet	Af	not a migrant	LC
Glaucidium cuculoides	Asian Barred Owlet		not a migrant	LC
Glaucidium capense	African Barred Owlet	Af	not a migrant	LC
Glaucidium castaneum	Chestnut Owlet	Af	not a migrant	LC
Glaucidium albertinum	Albertine Owlet	Af	not a migrant	VU

Scientific name	Common name	W Pal & Afro-tropical	Migratory behaviour	Global status
Athene noctua	Little Owl	Af WP	not a migrant	LC
Athene brama	Spotted Owlet		not a migrant	LC
Aegolius funereus	Boreal Owl	WP	full migrant	LC
Ninox scutulata	Brown Hawk-owl		full migrant	LC
Ninox superciliaris	White-browed Hawk-owl	Af	not a migrant	LC
Asio otus	Long-eared Owl	WP	full migrant	LC
Asio abyssinicus	Abyssinian Owl	Af	not a migrant	LC
Asio madagascariensis	Madagascar Owl	Af	not a migrant	LC
Asio flammeus	Short-eared Owl	Af WP	full migrant (BL)	LC
Asio capensis	Marsh Owl	Af WP	not a migrant	LC

ANNEX 4

THE CURRENT (VERSION 3.1) IUCN RED LIST CATEGORIES FOR GLOBAL THREAT STATUS

Full details of the current IUCN Red List Categories and criteria are provided in IUCN (2001). They can also be obtained together with guidelines on their use at http://www.redlist.org/info/categories_criteria.html

GLOBALLY THREATENED

Critically Endangered (CR): A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered, and it is therefore considered to be facing an extremely high risk of extinction in the wild. Criteria A to D relate to numerical thresholds for species in rapid decline, with small, fragmented, declining or fluctuating ranges, or with very small populations or ranges. Criterion E is an unfavourable PVA indicating a probability of extinction >50% within 10 years or 3 generations (whichever is longer).

Endangered (EN): A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to D for Endangered, and it is therefore considered to be facing a very high risk of extinction in the wild. Or under Criterion E, a PVA indicating a probability of extinction >20% within 20 years or 5 generations.

Vulnerable (VU): A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to D for Vulnerable, and it is therefore considered to be facing a high risk of extinction in the wild. Or under Criterion E, a PVA indicating a probability of extinction >10% within 100 years.

NOT GLOBALLY THREATENED

Near Threatened (NT): A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (LC): A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.

Data deficient (DD): A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.

ANNEX 5

COUNTRIES WHERE GLOBALLY THREATENED AND NEAR THREATENED AFRICAN-EURASIAN MIGRATORY RAPTORS REGULARLY OCCUR

	Aegypius monachus	*Aquila adalberti*	*Aquila clanga*	*Aquila heliaca*	*Circus macrourus*	*Circus maurus*	*Falco cherrug*	*Falco naumanni*	*Falco vespertinus*	*Milvus milvus*	*Grand Total*
Afghanistan	+		+	+	+		+	+			6
Albania			+		+			+	+	+	5
Algeria					+			+	+	+	4
Angola					+			+	+		3
Armenia	+		+	+	+		+	+	+		7
Austria			+				+		+	+	4
Azerbaijan	+		+	+	+		+	+	+		7
Bahrain					+		+	+			3
Belarus			+		+		+		+	+	5
Belgium										+	1
Benin					+			+			2
Bosnia and Herzegovina			+	+				+	+	+	5
Botswana					+	+		+	+		4
Bulgaria	+		+	+	+		+	+	+	+	8
Burkina Faso					+			+	+		3
Burundi					+			+	+		3
Cameroon					+				+		2
Cape Verde										+	1
Central African Republic					+			+			2
Chad					+			+	+		3
China (mainland)	+		+	+	+		+	+			6
Congo								+			1
Congo, The Democratic Republic of the					+			+	+		3
Côte d'Ivoire					+			+	+		3
Croatia	+		+	+	+		+	+	+	+	8
Cyprus				+	+		+	+	+		5
Czech Republic				+	+		+		+	+	5
Denmark					+				+	+	3
Djibouti			+	+	+			+			4
Egypt			+	+	+		+	+	+	+	7
Eritrea			+		+			+			3
Estonia			+						+		2
Ethiopia			+	+	+		+	+	+		6
Finland			+		+				+		3
France			+		+			+	+	+	5
Gabon								+			1
Gambia					+			+			2
Georgia	+		+	+	+			+	+	+	7
Germany					+				+	+	3
Ghana					+						1

	Aegypius monachus	*Aquila adalberti*	*Aquila clanga*	*Aquila heliaca*	*Circus macrourus*	*Circus maurus*	*Falco cherrug*	*Falco naumanni*	*Falco vespertinus*	*Milvus milvus*	*Grand Total*
Gibraltar (to UK)								+		+	2
Greece	+		+	+	+		+	+	+	+	8
Guinea								+			1
Guinea-Bissau					+						1
Hungary			+	+			+		+	+	5
Iran, Islamic Republic of	+		+	+	+		+	+	+	+	8
Iraq			+	+	+		+	+	+		6
Israel	+		+	+	+		+	+	+		7
Italy			+		+		+	+	+	+	6
Jordan			+	+	+		+	+	+		6
Kazakhstan	+		+	+	+		+	+	+		7
Kenya			+	+	+		+	+	+		6
Kuwait			+	+	+		+	+			5
Kyrgyzstan	+						+		+		3
Latvia			+						+	+	3
Lebanon	+		+	+	+			+		+	6
Lesotho						+		+	+		3
Liberia					+			+	+		3
Libya					+		+	+	+	+	5
Liechtenstein									+	+	2
Lithuania			+							+	2
Luxembourg										+	1
Macedonia, the former Yugoslav Republic of			+	+	+			+	+	+	6
Malawi					+			+	+		3
Mali					+			+	+		3
Malta					+		+	+	+		4
Mauritania					+		+	+	+		4
Moldova			+	+	+		+	+	+	+	7
Mongolia	+		+	+	+		+	+			6
Morocco			+					+	+	+	4
Mozambique					+			+			2
Namibia					+	+		+	+		4
Netherlands										+	1
Niger					+			+			2
Nigeria					+			+	+		3
Oman			+	+	+		+	+	+		6
Palestinian Authority Territories					+			+			2
Poland			+						+	+	3
Portugal								+		+	2
Qatar			+		+			+			3
Romania				+	+		+	+	+	+	6
Russia	+		+	+	+		+	+	+	+	6
Rwanda					+			+	+		3
Saudi Arabia	+		+	+	+		+	+			6

	Aegypius monachus	*Aquila adalberti*	*Aquila clanga*	*Aquila heliaca*	*Circus macrourus*	*Circus maurus*	*Falco cherrug*	*Falco naumanni*	*Falco vespertinus*	*Milvus milvus*	*Grand Total*
Senegal					+			+	+		3
Serbia and Montenegro	+		+	+	+		+	+	+	+	8
Sierra Leone					+			+			2
Slovakia			+	+	+		+		+	+	6
Slovenia			+		+				+	+	4
Somalia					+			+			2
South Africa					+	+		+	+		4
Spain	+	+	+	+			+	+		+	7
Sudan	+		+	+	+		+	+	+		7
Swaziland					+						1
Sweden									+	+	2
Switzerland									+	+	2
Syria	+		+	+	+		+	+	+		7
Tajikistan	+						+		+		3
Tanzania			+	+	+			+	+		5
Thailand	+		+	+							3
Togo					+			+			2
Tunisia					+		+	+	+	+	5
Turkey	+		+	+	+		+	+	+	+	8
Turkmenistan	+			+				+	+	+	5
Uganda					+			+			2
Ukraine	+		+	+	+		+	+	+	+	8
United Arab Emirates			+	+	+		+	+			5
United Kingdom									+	+	2
Uzbekistan	+			+			+	+	+		5
Yemen			+	+	+		+	+			5
Zambia					+			+	+		3
Zimbabwe					+			+	+		3
Total	38	1	67	57	92	4	49	89	76	45	518

Source. Birdlife International's World Bird Database, www.birdlifeinternational.org (accessed 23 June 2005).

ANNEX 6

SITES IN EUROPE, THE MIDDLE-EAST AND AFRICA THAT QUALIFY AS IMPORTANT BIRD AREAS FOR MIGRATING RAPTORS AND THEIR PROTECTION STATUS

This should be treated as a minimum list of internationally important areas requiring protection for migratory raptors. Other sites of equal or greater importance may be discovered with further knowledge and appropriate protection measures will also be required for nationally and regionally important sites.

Key:
"X" indicates that sites qualifies according to the criteria.
Protection levels: H = High; P = Partial; L = Low; N = None; ? = uncertain; blank = not mentioned, and therefore probably none.
Types: NR = Nature Reserve; NP = National Park; NGR National Game Reserve; WR = Wildlife Refuge; SPA = EU Special Protection Area; Zap = Zapovednik; BR = Biosphere Reserve; R = Ramsar Site; WHR = World Heritage Site.

Country / IBA International name	Qualifying level and criteria			National protection		International protection	
	Global spp (A1)	Global (A4iv)	Regional (B4iv)	Level	Type	Level	Type
Bulgaria							
Atanasovo lake	X	X	X	H	NR	P	R
Mandra-Poda complex			X	P		N	
Denmark							
Gilleleje area			X	N		N	
Hellebæk			X	N		N	
Korshage, Hundested and surrounding sea area			X	L		H	SPA
Marstal Bugt and the coast of south-west Langeland			X	L		H	SPA
Skagen			X	N		N	
Stevns		X	X	N		N	
Djibouti							
Kadda Guéïni - Doumêra		X	---	N		N	
Egypt							
Ain Sukhna	X	X	---	N		N	
El Qa plain	X	X	---	N		N	
Gebel El Zeit	X	X	---	N		N	
Ras Mohammed National Park	X	X	---	H	NP	N	
Suez	X	X	---	N		N	
Finland							
Merenkurkku archipelago			X	N		P	R

Country / IBA International name	Qualifying level and criteria			National protection		International protection	
	Global spp (A1)	Global (A4iv)	Regional (B4iv)	Level	Type	Level	Type
France							
Basses Corbières		X	X	L		N	
Col de l'Escrinet		X	X	N		N	
Col de Lizarrieta			X	N		N	
Etangs de Leucate et Lapalme		X	X	L		N	
Etangs Narbonnais			X	P		N	
Gorges de la Dordogne			X	N		N	
Haute chaîne du Jura: défilé de l'écluse, Etournel et Mont Vuache		X	X	H		N	
Haute Soule : Forêt d'Irraty, Organbidexka et Pic des Escaliers		X	X	N		N	
Hautes Corbières			X	L		N	
Hautes garrigues du Montpellierais			X	N		N	
Massif du Canigou-Carança		X	X	P		P	
Montagne de la Clape			X	N		P	SPA
Montagne de la Serre			X	N		N	
Monts et Plomb du Cantal			X	L		P	SPA
Pointe de Grave			X	N		N	
Val d'Allier : Saint-Yorre-Joze			X	P		N	
Val de Drôme: Les Ramières-printegarde			X	P		P	SPA
Vallée de la Nive des Aldudes-Col de Lindux		X	X	N		N	
Georgia							
Kolkheti		X	X	H	NP	H	R
Meskheti	X		X	P	NR	N	
Gibraltar (to UK)							
Rock of Gibraltar	X	X	X	H		H	
Greece							
North, east and south Kithira island			X	P	WR	L	SPA
Iraq							
Samara dam			X	N		N	
Israel							
Cliffs of Zin and the Negev highlands			X	P		N	
Hula valley	X	X	X	H	NR	N	
Jezre'el, Harod and Bet She'an valleys	X	X	X	L	NR	N	
Judean desert	X		X	H	NR NP	N	
Judean foothills	X		X	N		N	

Country / IBA International name	Qualifying level and criteria			National protection		International protection	
	Global spp (A1)	Global (A4iv)	Regional (B4iv)	Level	Type	Level	Type
Northern Arava valley		X	X	P	NR	N	
Northern lower Jordan valley		X	X	P	NR	N	
Southern Arava valley and Elat mountains	X	X	X	P	NR	N	
Western Negev	X	X	X	P	NR	N	
Italy							
Aspromonte			X	P	NP	N	
Cape Otranto			X	N		N	
Costa Viola	X		X	N		N	
Maritime Alps			X	P	NR NP	N	
Mount Beigua			X	P	NP	N	
Mount Conero			X	H	NP	N	
Mount Grappa			X	N		N	
Peloritani mountains		X	X	N		P	SPA
Piave river			X	N		N	
Jordan							
Aqaba mountains	?	X	X	N		N	
Jordan valley			X	N		N	
Petra area			X	P	NP	L	WHR
Wadi Dana - Finan	X	X	X	H	NR	N	
Wadi Mujib			X	H	NR	N	
Kuwait							
Al-Jahra Pool Nature Reserve	X		X	P	NR	N	
Latvia							
Slitere Nature Reserve		X	X	H	NR	N	
Lebanon							
Ammiq swamp			X	H	NR	H	R
Lithuania							
Kuronian spit		?	X	H	NP	N	
Malta							
Buskett and Wied il-Luq			X	H	NR	N	
Morocco							
Cap Spartel - Perdicaris		X	---	H		N	
Jbel Moussa		X	---	N		N	
Palestinian Authority Territories							
Jericho	?	?	X	N		N	
Northern Lower Jordan Valley		X	X	P	NR	N	
Portugal							
South-west coast of Portugal			X	H	NP	H	SPA

Country / IBA International name	Qualifying level and criteria			National protection		International protection	
	Global spp (A1)	Global (A4iv)	Regional (B4iv)	Level	Type	Level	Type
Russia (European)							
Caucasus Biosphere Reserve			X	H	Z	H	BR
Chudsko-Pskovski Lake and adjacent areas		X	X	P	Z	P	R
Delta of the River Don	X		X	P	Z	N	
Irendyk ridge		X	X	N		N	
Teberdinski Nature Reserve	X		X	H	Z	N	
Saudi Arabia							
Taif escarpment			X	N		N	
Wadi Jawwah	X		X	N		N	
Wadi Rabigh springs			X	N		N	
Spain							
Bujeo, Ojén, del Niño and Blanquilla mountain ranges		X	X	H	NP	H	SPA
Cabras, Aljibe and Montecoche mountain range		X	X	H	NP	H	SPA
Cadí mountains			X	P	NGR NP	P	SPA
Ceuta	X	X	X	N		N	
De la Plata mountain range		X	X	N		N	
Guadalquivir marshes		X	X	P	NP	P	SPA R BR WHS
La Janda		X	X	N		N	
Roncesvalles-Irati-Abodi mountain range			X	L	NR	P	SPA
Tarifa	X	X	X	L		N	
Sweden							
Bay of Skälderviken			X	P	NR	P	SPA
Falsterbo-Bay of Foteviken		X	X	P	NR	P	SPA R
Switzerland							
Pre-alpine region of Gurnigel			X	P		N	
Syria							
Jabal Slenfeh			X	N		N	
Tunisia							
Djebel el Haouaria		X	---	P	HR	N	
Turkey							
Bosphorus		X	X	P	NR	N	
North-east Turkey		X	X	P	NR NP	N	
Nur mountains		X	X	P	NR	N	

Country / IBA International name	Qualifying level and criteria			National protection		International protection	
	Global spp (A1)	Global (A4iv)	Regional (B4iv)	Level	Type	Level	Type
Yemen							
Al-Kadan area	X		X	N		N	
Bab al-Mandab - Mawza		X	X	N		N	
Mafraq al-Mukha	X		X	N		N	
Wadi Rijaf			X	N		N	

Source: Birdlife International World Bird Database (accessed March 2005).

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