

**ACTION PLAN FOR THE WHITE-HEADED DUCK
(*Oxyura leucocephala*) IN EUROPE**



Compiled by:

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- B. HUGHES (The Wildfowl & Wetlands Trust, U.K.)

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Timetable

Workshops: September 1994 - Córdoba, Spain
December 1994 - Strasbourg, France
First draft: September 1994
Second draft: December 1994
This version: March 1996

Reviews

This action plan should be reviewed and updated every four years. An emergency review will be undertaken if sudden major environmental changes, liable to affect the population, occur within the species' range. As far as possible, this action plan is intended to achieve the aims of the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (currently under development under the Bonn Convention) for the species. This Agreement is likely to influence the need for and timing of future reviews.

Geographical scope

The action plan needs implementation in the following range-states of the White headed Duck: Algeria, Azerbaijan, Bulgaria, Greece, Israel, Romania, Russian Federation, Spain, Tunisia, Turkey and Ukraine. In addition, it should be implemented in the following range-states of the introduced North American Ruddy Duck *Oxyura jamaicensis*: Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Italy, Morocco, Norway, Netherlands, Portugal, Sweden, Switzerland, United Kingdom. Implementation is also required in any other countries where the Ruddy Duck is found in captivity.

CONTENTS

SUMMARY - 4 -

INTRODUCTION..... - 6 -

PART 1. BACKGROUND INFORMATION..... - 7 -

Distribution and population..... - 7 -

Life history - 8 -

 Breeding - 8 -

 Feeding - 8 -

 Moulting - 8 -

 Habitat requirements..... - 8 -

Threats and limiting factors..... - 9 -

 Introduction of the North American Ruddy Duck..... - 9 -

 Habitat loss..... - 9 -

 Habitat degradation..... - 10 -

 Hunting..... - 10 -

 Introduction of other species - 11 -

 Trapping in fishing nets - 11 -

 Lead poisoning..... - 11 -

 Warfare..... - 11 -

Conservation status and recent conservation measures - 12 -

 White-headed Duck range-states..... - 12 -

 Ruddy Duck range-states with no White-headed Duck - 21 -

PART 2. AIMS AND OBJECTIVES - 23 -

AIMS - 23 -

OBJECTIVES..... - 23 -

1. POLICY AND LEGISLATIVE..... - 23 -

2. SPECIES AND HABITAT PROTECTION - 25 -

3. MONITORING AND RESEARCH..... - 29 -

4. PUBLIC AWARENESS AND TRAINING - 31 -

REFERENCES - 33 -

ANNEX 1. RECOMMENDED CONSERVATION ACTIONS BY COUNTRY - 36 -

 White-headed Duck range-states..... - 36 -

 Ruddy Duck range-states..... - 42 -

ANNEX 2. IWRB OFFICIAL RUDDY DUCK CONTACTS. - 45 -

SUMMARY

The White-headed Duck *Oxyura leucocephala* has undergone a considerable decline in range and population size this century, with the destruction and degradation of habitat and hunting being the causes. The Spanish population has recently recovered rapidly after being near to extinction in the 1970s. There has been considerable attention paid to the species in Turkey since 1989 which has led to conservation measures being taken at Burdur Gölü, a site that holds most of the world population in winter. Numbers appear to be roughly stable in most countries, but many key sites are not effectively protected, and the threats to them have the potential to cause rapid population declines in the near future. The species is incredibly easy to shoot, making hunting a much more significant threat than for most waterbirds.

In recent years, it has become clear that the spread of introduced North American Ruddy Ducks (*Oxyura jamaicensis*) poses the most severe threat to the White-headed Duck, owing to the free hybridisation between the two species. A concerted, cooperative international effort is urgently required to stop and reverse the spread of the Ruddy Duck across the Western Palearctic before this becomes impossible. The species has now been recorded in 20 countries, with the United Kingdom holding by far the largest population, and hybridisation is already posing a serious problem in White-headed Duck sites in Spain. The extinction of the White-headed Duck is only likely to be prevented if rapid action is taken to control Ruddy Ducks (which may include eradication) in all countries where it occurs. Both action in the field to remove wild individuals, and in captivity to prevent the escape of more birds, is essential.

The conservation of the White-headed Duck in Europe also requires the effective conservation of wetlands of importance for the species, together with the effective control of hunting on these wetlands.

Threats and limiting factors

- * **Introduction of the North American Ruddy Duck - critical**
- * **Habitat loss - high**
- * **Habitat degradation - high**
- * **Hunting - high**
- * **Introduction of other species - low**
- * **Trapping in fishing nets - low**
- * **Lead poisoning - unknown**
- * **Warfare - unknown**

Conservation priorities at European level

- * **Promote and develop national and international policies to control (which can include eradication) the Ruddy Duck - essential**
- * **Control Ruddy Ducks and Ruddy Duck x White-headed Duck hybrids - essential**
- * **Promote adequate protection for key sites - essential**
- * **Postpone reintroductions of White-headed Duck until the Ruddy Duck problem has been solved - essential**
- * **Improve national and international monitoring of the status and distribution of the Ruddy Duck - essential**
- * **Monitor and improve effectiveness of suitable control measures for Ruddy Duck - essential**
- * **Monitor the number of stifftails kept in captivity - essential**
- * **Increase awareness of the need to control the spread of the Ruddy Duck - essential**
- * **Promote national and international policies which specifically favour the protection of the White-headed Duck and its habitat - high**
- * **Actively prevent hunting of White-headed Duck at key sites throughout its range - high**
- * **Develop and implement national and international programmes to monitor the status and distribution of the White-headed Duck - high**
- * **Increase awareness of the need to protect the White-headed Duck and its habitat - high**

INTRODUCTION

The White-headed Duck *Oxyura leucocephala* is a globally threatened species classified as Vulnerable by IUCN (Groombridge 1993) and BirdLife International (Collar *et al.* 1994). It is listed on Annex I of the EU Wild Birds Directive. It has recently been placed on Appendix I of the Bonn Convention, and it is listed on Appendix II of the Bern Convention and on Appendix II of CITES. It is listed as Endangered at European level by BirdLife International (Tucker & Heath 1994).

The White-headed Duck is the only stiff-tail (Oxyurini) indigenous to the Palearctic, and has attracted a great deal of interest from the international conservation community in recent years. Concern over marked declines of the species led to the production of national (Spanish) and international conservation plans in the late 1980s.

In recent years, there has been growing concern about the threat posed to the species by the introduced North American Ruddy Duck *O. jamaicensis jamaicensis* which has brought the species to the forefront of conservation issues in many countries, particularly in Spain and the United Kingdom. An international workshop into the problem posed by the spread of the Ruddy Duck was held at Arundel (U.K.) in March 1993 and the relevant recommendations from that meeting are incorporated into this action plan. Another workshop on the Ruddy Duck problem took place on 29–30 September 1994 at Córdoba (Spain), and was organised by the Andalusian Agencia de Medio Ambiente.

On 8 December 1994, a workshop, organised by the Wildfowl and Wetlands Trust and IWRB, took place at Strasbourg (France) to discuss the action plan for the White-headed Duck in Europe. It was attended by experts from Bulgaria, Denmark, Germany, Greece, Israel, Italy, Morocco, Netherlands, Pakistan, Romania, Spain, Switzerland, Tunisia, Turkey and United Kingdom. This action plan is based on discussions held during this workshop, on conclusions of other workshops organised on the Ruddy Duck problem, and on further information received by correspondence before and after the workshop. A great deal of background information used in this document has previously been compiled for other publications on the White-headed Duck (e.g. Anstey 1989, Green & Anstey 1992, Green 1994). Information on the number of Ruddy Duck records comes largely from a database managed by the Wildfowl and Wetlands Trust, and from Martí (1993).

A limitation of this plan is that its scope does not include western Asia, which probably holds the majority of the remaining world population of the White-headed Duck during the breeding season, including most of the birds wintering in Turkey and other parts of the eastern Mediterranean. Successful implementation of this plan thus cannot guarantee effective conservation of the east Mediterranean population. In addition, the separate population wintering in Pakistan is highly threatened and urgently requires conservation attention. Another weakness of this plan is that we have failed to gain the active involvement of representatives from Azerbaijan and the Russian Federation, two countries within the scope of this plan that support important populations of the species.

PART 1. BACKGROUND INFORMATION

Distribution and population

The present distribution of the White-headed Duck is fragmented, with a small resident population in the west Mediterranean (Spain, Tunisia, Algeria) and a larger, mainly migratory population in the east Mediterranean and Asia (Green & Anstey 1992). The majority of the birds in this latter population breed outside the western Palearctic in Kazakhstan and the Russian Federation and winter inside the western Palearctic in Turkey (Table 1).

Table 1. Estimates of current sizes of White-headed Duck wintering and breeding populations in Europe, North Africa and the Middle East. The years of peak winter counts are given in brackets.

? historical records only, current status unclear.

* mainly important as a passage area.

| Country | Peak winter count (1984–1994) | No. of breeding females |
|--------------------|----------------------------------|----------------------------|
| Algeria | 220 (1984) | 40+ |
| Azerbaijan | 3,620 (1991) | |
| Bulgaria | 233 (1993) | |
| Greece | 850 (1994) | |
| Iran | 628 (1988) | 100+ |
| Iraq | ? | ? |
| Israel | 620 (1988) | |
| Romania | 18* (1990) | occasional |
| Russian Federation | ?* | 50+ |
| Spain | 786 (1992) | 100–200 |
| Syria | 35 (1994) | |
| Tunisia | 182 (1989) | occasional |
| Turkey | 10,927 (1991) | 200–300 |
| Ukraine | ?* | ? |

Within the western Palearctic, there has been a drastic historical decline in range. Former breeding populations have become extinct in Italy, Corsica (France), Morocco, Hungary, Albania, Serbia (former Yugoslavia), Greece, Israel and Egypt, and probably also the Ukraine and Armenia (Phillips 1923, Green & Anstey 1992).

There are now at least two subpopulations, one being centred around the western Mediterranean and the other centred around the eastern Mediterranean and the coasts of the Black Sea and

Caspian. The nature of movements within each of these regions is very poorly understood, with a total lack of ringing data, and it is possible that there are more than two subpopulations isolated from each other by a lack of interchange. The global population was probably over 100,000 originally. Concentrations of about 50,000 wintering on the Caspian coast of Turkmenistan until the 1930s have since disappeared (Poslavski 1992). On the basis of recent mid-winter counts, the present world wintering population of White-headed Duck can be conservatively estimated at 19,000 birds (Green & Anstey 1992). The west Mediterranean winter population can be estimated at 1,000 with a 1992 count of 836. The wintering population in countries bordering the eastern Mediterranean and Black Sea can be estimated at 13,000 with a 1991 count of 11,507. The wintering population in countries further east can be conservatively estimated at 5,000, with a 1991 count of 3,904, 3,620 of these being found within the western Palearctic (Azerbaijan).

Like all animal populations, the size of the White-headed Duck population must fluctuate, and the above figure represents a minimum estimate for the peak of these fluctuations (i.e. the size of the population in a very good year). The coverage of wetlands during mid-winter counts is too incomplete in most areas to be able to assess the nature and extent of fluctuations with confidence. However, the count of only 3,576 in Turkey in 1993, including an extremely low but certainly accurate count of 3,010 at Burdur Gölü (Green *et al.* 1993), suggests that the world wintering population of White-headed Ducks could be well under 19,000 in some years.

Life history

* **Breeding**

The mating system is polygamous, and nesting occurs in dense reedbeds, often on top of old Coot *Fulica atra* nests (Amat & Sánchez 1982, Torres *et al.* 1986). The timing of breeding is variable, with 4–9 eggs laid from April to early July. Incubation takes 22–24 days and fledging occurs within 8–9 weeks (Anstey 1989).

* **Feeding**

Chironomid larvae are probably the major component of the diet, both for adults and ducklings (Torres & Arenas 1985, Green *et al.* 1993), but a variety of other invertebrates is eaten, as well as seeds and vegetative parts of *Potamogeton*, *Ruppia* and other plants (Anstey 1989).

* **Moulting**

Flightless moult occurs twice a year, after breeding and in late winter (Anstey 1989).

* **Habitat requirements**

White-headed Ducks prefer freshwater or brackish, alkaline, eutrophic lakes, which often have a closed basin hydrology and are frequently semi-permanent or temporary. Breeding sites have dense emergent vegetation around the fringes and are small or are enclosed areas within larger wetland systems. They typically have extensive areas of 0.5–3 m depth (Matamala *et al.* 1994). Stable water-levels during the incubation period are vital for successful breeding. Wintering sites are generally larger, deeper and often have little emergent vegetation (Anstey 1989). Freshwater habitats are used more in winter than in the breeding season. The availability of chironomid larvae is likely to be a key feature in habitat selection (Green *et al.* 1993).

Threats and limiting factors

* **Introduction of the North American Ruddy Duck**

The greatest threat to the survival of the White-headed Duck is undoubtedly that resulting from hybridisation and competition with the North American Ruddy Duck introduced into the United Kingdom in the 1950s and now spreading across the western Palearctic as it undergoes population growth in the U.K. (Hughes 1991, Arenas & Torres 1992, Green & Anstey 1992, Pintos & Rodríguez de los Santos 1992, Anon. 1993, ICONA 1993, Rose 1993, Torres *et al.* 1994a,b). The population in the U.K. increased tenfold between 1975 and 1990 and is now estimated at over 3,500 birds in winter, with the number of records on the European continent and the species' distribution increasing in parallel as birds spread outwards from the U.K. The spread of the Ruddy Duck is also partly due to continuous escapes from waterfowl collections in the Netherlands and probably other countries (Rose 1993). The Ruddy Duck has now been recorded in 20 west Palearctic countries (including the U.K.) plus an unconfirmed record from Ukraine; breeding has been confirmed in six countries. This introduced species threatens to drive the White-headed Duck to extinction through hybridisation, which readily occurs between them. The hybrids are fully fertile: second-generation birds have already been collected in Spain (Urdiales & Pereira 1993) and third-generation hybrids have been bred in captivity at the Wildfowl and Wetlands Trust, Slimbridge. The majority of hybrids shot in 1993 and 1994 were young birds, showing that the continuing intensive control efforts in Spain are not sufficient to prevent hybridisation.

The threat from the Ruddy Duck is extremely serious, given the nature of the problem and the fact that, if allowed to proceed beyond a certain point, the Ruddy Duck's spread across the Palearctic will become unstoppable. This would certainly be the case if the species was allowed to become established in White-headed Duck range-states such as Algeria, Turkey or the Russian Federation, where the huge size and area of the wetlands and their infrequent monitoring would make control impossible.

Importance: critical

* **Habitat loss**

Drainage of numerous shallow lakes, marshes and other wetlands of former importance for breeding and wintering has occurred across the range (Green & Anstey 1992), and it has been estimated that the area of suitable breeding habitat has been roughly halved this century (Anstey 1989). Whole wetland systems have been transformed in the former Soviet Union. More quantitative information is available for Spain, where 60% of the endorreic lagoons in Andalucía have been drained this century. Amongst the most recent sites to be destroyed is Çorak Gölü in Turkey, an important wintering site which has been permanently dry since 1987.

In some areas (e.g. Spain, Tunisia) the White-headed Duck is now making extensive use of artificial lagoons and reservoirs and these are partially compensating for the loss of natural habitats. In 1993, about a third of the ducklings recorded in Spain were bred on wetlands of a completely artificial nature (Matamala *et al.* 1994), a particularly high figure owing to drought conditions affecting many natural, temporary sites.

Importance: high

* **Habitat degradation**

Many important wetlands have been severely degraded, reducing their value for the White-headed Duck without being totally destroyed. The fact that many of the wetlands are endorreic makes them particularly vulnerable to hyper-eutrophication and pollution. Fortunately, the species seems to be more resistant to eutrophication than many other waterbird species (Green *et al.* in press).

The range of threats facing sites important for the White-headed Duck is well illustrated by the existing threats from industrial, domestic and agricultural pollution, sedimentation and water extraction from the catchment that face the most important wintering site, Burdur Gölü (Anon. 1993b, Green *et al.* 1993, in press). Furthermore, the construction of an international airport has started on the shores of the lake, and there are plans to build a huge industrial complex of 160 factories (mainly textiles) without assessment of their impact on the lake. Similar factors threaten to destroy or degrade numerous important sites in most major range-states of the White-headed Duck (Anstey 1989). Some further examples follow.

The construction of dams and other hydrological work carried out within the catchments of Hotamis marshes and Eregli marshes in Turkey has led to them both being reduced drastically in size, and caused the Sultan marshes to be completely dry in 1991 (DHKD *in litt.* 1994). At Lake Vistonis in Greece, there are plans for the construction of a large dyke to reclaim the marshes adjacent to the south-east part of the lake where the White-headed Ducks winter (Handrinos 1995). Plans to raise the water levels at Lake Kerkinî will have unknown effects on the species. In Tunisia, upstream barrages have severely affected the breeding site Sebkha Kelbia, increasing the frequency of desiccation by two and a half times (Hughes & Hughes 1992). Severe pollution has led to the recent abandonment of Menzel Bourguiba, another breeding site, and reed-cutting is severely limiting the area of vegetation available for nesting, e.g. at Barrage Sidi Abdelmonaam (Z. Benaïssa *in litt.* 1994).

Importance: high

* **Hunting**

The White-headed Duck is an incredibly easy bird to shoot given its lack of an escape response when facing hunters (Torres *et al.* 1986, Green *et al.* 1993, in press). Hunting has therefore undoubtedly played an important role in its decline. Hunting and egg-collection were probably the final causes of extinction in France, Italy, former Yugoslavia and Egypt. Hunting is still a major threat across most of the species' range, although its impact has rarely been quantified. An investigation into illegal hunting at Burdur Gölü in winter 1993 found that an estimated 4.5 birds a day were being shot within a limited study area that held 25% of the lake's White-headed Duck population. This kill rate almost certainly exceeded the limits of "sustainable harvest" of the lake's population (Green *et al.* 1993, in press). The White-headed Duck formerly suffered significant hunting pressure in Spain, and Torres *et al.* (1986) considered hunting to be "the principal cause of the drastic decline in numbers prior to 1978". Hunting is no longer a threat in Andalucía, although it still applies in the newly colonised areas of Castilla-La Mancha (Esparvel 1993) and Valencia (Dolz *et al.* 1991). White-headed

Ducks are shot in Greece each winter (Handrinos 1995) and are often shot in Bulgaria (Iankov 1994). Numerous birds were shot at Menzel Bourguiba lagoon in Tunisia in April 1985 (Z. Benaïssa *in litt.* 1994). White-headed Ducks are regularly shot at Lake Saraesy, Azerbaijan (M. Patrikeev *in litt.* 1995).

Importance: high

* **Introduction of other species**

In the lagoons of Córdoba, Spain, breeding success is thought to have been adversely affected by the introduction of carp which are believed to affect the birds' foraging success through direct competition for food and by causing ecological change. The removal of carp from Laguna del Rincón led to a dramatic recovery in White-headed Duck numbers and breeding success (Torres *et al.* undated).

Importance: low

* **Trapping in fishing nets**

White-headed Ducks have been found trapped in fishing nets in Iran (D. A. Scott *in litt.* 1995), and this is possibly a widespread problem.

Importance: low

* **Lead poisoning**

There are no data on the importance of lead poisoning as a cause of mortality, but hunting is intense at many key sites, and the ingestion of lead shot could result in significant mortality (see Pain 1992).

Importance: unknown

* **Warfare**

War is having an unknown effect on the species in Azerbaijan, where the area of warfare in 1992–1993 is very close to the key site of Lake Aggel (M. Patrikeev *in litt.* 1994).

Importance: unknown

Conservation status and recent conservation measures

White-headed Duck range-states

* **Algeria**

There is no national Red Data Book. The White-headed Duck is fully protected under Decree no. 83–509 of 20/8/83.

Algeria has a resident population of White-headed Duck in the El Kala wetland complex in the north-east, which is also thought to have been the main area for the species in the last century. However, the species probably also bred in Lac Fetzara (Annaba region) and Lac Holloula (Alger region) before these sites were transformed in the 1930s (Heim de Balsac & Mayaud 1962, van Dijk & Ledant 1983). The White-headed Duck is currently breeding in Lac Tonga, Lac des Oiseaux and Lac de Ben Azzouz, and c.37 nests were located in 1991 (Boumezbeur 1992). Breeding probably also occurs in Marais de la Mekhad. Non-breeders and wintering birds occur on Lac des Oiseaux and Lac Oubeira (Chalabi 1990). The highest count ever recorded was 220 on Lac Oubeira in January 1984 (M. Smart *in litt.* 1989) with 209 on Lac des Oiseaux in March 1992 (Boumezbeur 1992).

Key sites are Lac des Oiseaux (unprotected), Lac Tonga (National Park and Ramsar site), Lac Oubeira (National Park and Ramsar site) and Lac Ben Azzouz (unprotected).

No specific conservation programmes have been conducted for the species. There are no Ruddy Duck records.

* **Armenia**

Breeding was formerly recorded in the Lake Sevan area (Dementiev & Gladkov 1952). There are no recent records. The legal status and status in national Red Data Books for the species are unclear. There are no Ruddy Duck records.

* **Azerbaijan**

The species is listed in the Red Data Book of Azerbaijan published in 1990 (no details available). The species was fully protected in the former U.S.S.R., but its current legal status in Azerbaijan is unclear.

Breeding may have occurred in lakes of the southern Mugan and Kura valley until the early part of this century, but there is no evidence of breeding in recent years (M. Patrikeev *in litt.* 1995). In winter, Azerbaijan is of major importance for the species, at least in some years, and in 1991 over 3,100 birds were counted in Lake Aggel and 520 in Kizil Agach Bays (IWRB's International Waterfowl Census, IWC). Lake Aggel thus seems to be the most important wintering site for the species after Burdur Gölü, although there is no mention of the species from previous censuses at the site in the 1960s. There is however an unconfirmed record of 5,000 birds in Kizil Agach Bays in 1962 (M. Patrikeev *in litt.* 1991).

Key sites are Lake Aggel (State Reserve), Kizil Agach Bays (State Reserve and Ramsar site) and Lake Saraesy (unprotected).

No specific conservation programmes have yet been conducted for the species. There are no Ruddy Duck records.

* **Bulgaria**

The White-headed Duck has been fully protected under the Law since 1962. It is listed as Rare in the national Red Data Book (Botev & Peshev 1985).

From the 1890s to the 1940s the White-headed Duck was recorded wintering or on passage in the west of Bulgaria (around Sofia) and along the Black Sea coast (Botev & Peshev 1985). Important numbers continue to winter along the Black Sea coast with record counts of 214 at Lake Durankulak in January 1983 (B. Ivanov *in litt.* 1994) and 233 birds on 29–30 November 1993 (188 at Lake Mandra complex and 45 at Lake Burgas). The birds arrive in November and are sometimes recorded until the end of March (B. Ivanov *in litt.* 1994).

Key sites are Lake Mandra, especially the Uzungeren zone (unprotected), Poda (Protected Site), Lake Burgas (partly protected) and Lake Durankulak (Natural Monument and Ramsar site).

The species is included in a poster on globally threatened waterbirds produced by the Bulgarian Society for the Protection of Birds, but no other specific conservation programmes have yet been conducted for the species. There are no Ruddy Duck records. The Ruddy Duck is not legally protected, and is not found in private waterfowl collections. The identification guide to Ruddy Ducks and hybrids (Urdiales & Pereira 1993) has been circulated by the BSPB, and the need to search for these birds has been stressed in the BSPB magazine *Neophron*. BSPB has taken the first steps towards active guarding at Uzungeren zone near Burgas.

* **France**

Small numbers of White-headed Ducks were recorded breeding on Lake Biguglia and other Corsican wetlands until the 1960s (P. Dubois *in litt.* 1989). Recent proposals for a reintroduction project in Corsica have been postponed (Perennou & Cantera 1993).

There are a total of 85 Ruddy Duck records, mainly during the winter, plus two breeding records from 1988 and 1993. Breeding probably now takes place annually in small numbers. An informal working group made up of the Ministry of the Environment, the Office National de la Chasse (ONC) and various NGOs was established in December 1994 to address the Ruddy Duck problem. No control measures against Ruddy Ducks have yet been implemented. A ministerial decree needs to be issued before control measures are legal.

* **Greece**

The White-headed Duck is listed as Endangered in the national Red Data Book (Handrinos 1992). It is legally protected by Joint Ministerial Decision 414985/85.

In the last century, the White-headed Duck was reported to be common in Epirus and resident in the Louros delta, Amvrakikos, although no nest has ever been found (Handrinos 1995). Cramp and Simmons (1977) reported that breeding may have occurred in Greece in the 1950s, but this is open to question (Handrinos 1995). In recent years, a significant wintering population has developed in Macedonia and Thrace, with a peak mid-winter count of 423 in January 1990 (G. Handrinos and IWRB International Waterfowl Census). A record count of 850–900 was made at Lake Vistonis on 12 December 1994 (P. Pergantis and S. Grigoropoulos verbally to G. I. Handrinos 1994). All records since 1960 are for December to early April, although the birds probably start to arrive in November. Since 1982, there has been the trend for wintering numbers to increase, to spread to the west and to become more concentrated in Lake Vistonis (Handrinos 1995). It is not known whether these birds come from the north (through Bulgaria) or from Turkey, and the shooting of a female in December 1991 on Lesbos supports the latter possibility.

Key sites are Lake Vistonis (Ramsar site and SPA), Lake Ismaris/Mitrokou (Ramsar site and SPA) and Lake Kerkini (Ramsar site and SPA). Hunting is permanently banned at Kerkini (Ministry of Environment *in litt.*), but is permitted at Vistonis and Ismaris. There are significant threats to the habitat at all three sites (Handrinos 1995).

No specific conservation programmes have yet been conducted for the species. There are no Ruddy Duck records.

* **Hungary**

Strictly Protected, and listed in the Hungarian Red Data Book. Breeding of the White-headed Duck was recorded in Hungary from 1853 onwards around the northern Danube and between the Danube and the Tisza. The last confirmed breeding was at Lake Kondor in 1961 although breeding may have occurred at Lake Nádas in 1971 (Green & Anstey 1992). The species is now considered extinct as a breeding bird in the country, although there are records for 1995 of vagrants.

A reintroduction of the White-headed Duck in Hungary was conducted in 1988 by the Hungarian Ornithological Society and the Wildfowl and Wetlands Trust, but this failed to establish a population in the wild (Anstey 1989). There is one unconfirmed record of a Ruddy Duck, from November 1994. No action has yet been taken to control Ruddy Ducks. The legal status of the Ruddy Duck is unclear, but plans exist for enlisting hunters in agreement with the hunting authorities to prevent Ruddy Ducks becoming established should they arrive in the country (Min. Environment *in litt.*).

* **Israel**

There is no Red Data Book in Israel, but there is an official report on the status of all vertebrates, which lists White-headed Duck (no details available). The species is fully protected under the 1955 Wildlife Protection Law.

In the last century the White-headed Duck was considered a common resident on Lakes Tiberias and Hula, but breeding has not been recorded for at least 50 years (Paz 1987). A wintering population has remained, and the known wintering population increased markedly following the creation of a reservoir, Tishlovet Hakishon, in 1984. Numbers have increased steadily each winter, from 70 in 1986 to 514 in 1994 (D. Alon verbally 1994). It is likely these increasing numbers reflect a relocation of birds from other wintering sites in the Middle East. The breeding grounds of these birds are unknown, but could be eastern Turkey.

Key sites are Tishlovet Hakishon, Ma'ale Kishon reservoir, Yesodot reservoir and Hula valley (including Hula Reserve), and data from IWRB International Waterfowl Census supplied on a regional level show there are important numbers wintering in the wetlands of the valley of Yesreel, northern Negev, Jordan valley, foothills of Judea and the Galilee coastal plain.

No specific conservation programmes have yet been conducted for the species in Israel. There is one Ruddy Duck record from April 1983. The legal status of the Ruddy Duck is unclear.

* **Italy**

The White-headed Duck is strictly protected under Law no. 157 of 11/2/92. It is listed as Endangered in the national Red Data Book (Schenk 1976).

Breeding and wintering of White-headed Ducks was formerly recorded in Puglia, Sardinia and probably Sicily until 1977 (Brichetti *et al.* 1992), but the species is now only a vagrant. There are currently two plans to develop reintroduction projects, coordinated separately by WWF Italy (Vitaloni 1994) and Lega Italiana Protezione Uccelli (LIPU).

There have been eight Ruddy Duck records, all in winter. No actions have yet been taken to control Ruddy Ducks, although conservationists and aviculturalists have already held meetings to discuss the Ruddy Duck issue in relation to plans to reintroduce the White-headed Duck. There are plans to set up a working group and to introduce a monitoring system for captive stifftails (M. Grussu *in litt.* 1994).

* **Morocco**

There is no national Red Data Book. The White-headed Duck is fully protected (M. Dakki verbally 1994).

The White-headed Duck bred in northern Morocco at the turn of the century and was regarded as "common" (Phillips 1923). Only vagrant birds have been recorded since the 1950s (Louette 1973). There is no evidence that birds from the currently expanding Spanish population have dispersed to Morocco.

Groups of up to 12 Ruddy Ducks have been present regularly since November 1992 and all year round in 1994, mainly at Merja Barga and Merja Haloufa. There is a growing awareness among Moroccan ornithologists and government of the need to take action to deal with this problem. Two adult males were shot at Merja Barga by Eaux et Forêts

guards in March 1994. The Ruddy Duck is effectively granted legal protection because the protective legislation cites “les erismatures” without specifying the species.

* **Romania**

There is no national Red Data Book. The species is not currently protected, but a proposed new hunting law would list the species as fully protected. This new law has yet to be approved by parliament.

The White-headed Duck formerly bred in the lakes of Transylvania, with the last record of breeding from Sculia in 1908 (D. Munteanu *in litt.* 1989). Breeding was recorded in the Danube delta, Dobrodja, in May 1986, when eight adults and three young were seen on channels between Crisan and Maliuc (D. Ilhes *in litt.* 1991). It is possible that breeding occurs regularly, although the last previous breeding record in the Danube delta was from Lake Agigea in 1957 (D. Munteanu *in litt.* 1989). Lake Techirghiol and the Danube delta have been used as wintering sites since at least the 1960s with up to 37 birds in midwinter (1969), Lake Techirghiol being the major site. These sites are also important for passage (D. Munteanu *in litt.* 1989), with autumn passage beginning about 10 October and probably ending about the end of November, and spring passage occurring in March (D. Munteanu *in litt.* 1994). The highest numbers recorded are 218 on Lake Techirghiol in November 1982 (D. A. Scott *in litt.* 1983), with 75 seen on 25 November 1993 (D. Munteanu *in litt.* 1994).

Key sites are the Danube delta (Ramsar site, Biosphere Reserve, World Heritage site) and Lake Techirghiol (unprotected).

No specific conservation programmes have yet been conducted for the species. There are no Ruddy Duck records. The Ruddy Duck is not legally protected.

* **Russian Federation**

The White-headed Duck is listed as Category IV: Rare in the Russian Federation Red Data Book (Ivanov 1983). The species was fully protected in the former U.S.S.R., but its current legal status in the Russian Federation is unclear.

In that part of the Russian Federation which lies within the scope of this action plan, the species was formerly a common breeder in the Sarpa lowlands between Volgograd and the Caspian and in the Volga/Ural steppes (Dementiev & Gladkov 1952). The species has also been recorded historically in the northern Caucasus and along the western coast of the Caspian. In 1992, breeding occurred in one to three sites alongside the Volga and Uzen rivers in the Volga delta area, when 40–70 adults and three broods were recorded (V. Moseikin verbally to G. Tucker 1993). The Manych–Gudilo reservoirs are major spring and autumn migration sites for the species, probably for birds wintering in Turkey. In October 1980, 1,200 birds were counted at these lakes (Ivanov 1983, Linkov 1984).

Key sites identified so far are Manych–Gudilo reservoirs and the Volga delta. Specific sites within these large wetland complexes and their precise legal status have yet to be identified.

No specific conservation programmes have yet been conducted for the species. There are no Ruddy Duck records.

* **Spain**

Spain holds a secure, resident population of White-headed Ducks which has recovered from a low point of only 22 birds recorded in 1977 to 786 birds in January 1992. The majority of the population has always been found in Andalucía. However, the increase in numbers has been accompanied by an expansion in distribution both within and beyond the former strongholds of lagoons in the Córdoba, Cadiz, Sevilla and Huelva provinces of Andalucía (Torres *et al.* 1986, AMA Córdoba 1991, Green 1994, Matamala *et al.* 1994), and nowadays the species can also be found in the provinces of Almería, Ciudad Real, Toledo, Madrid, Alicante and Mallorca.

Since 1984, breeding has been recorded in Málaga and for the first time in Almería and Jaén provinces. Breeding has also been recorded outside Andalucía in Alicante province (Valencia) and Toledo and Ciudad Real provinces (Castilla-La Mancha). Since 1992, the majority of breeding birds have been in Almería, mainly due to the severe drought which has affected most of the traditional breeding sites in western Andalucía. Since 1984, birds have also been recorded in Cuenca (Castilla-La Mancha), Madrid and Santander (Cantabria).

The White-headed Duck has been protected from hunting across Spain under national law since 1973. It is listed as Endangered in the Spanish Red Data Book (Blanco & González 1992). The White-headed Duck is also listed as Endangered in the National Catalogue of Threatened Species (Royal Decree 439/90) and hence it is compulsory to prepare regional Recovery Plans under Law 4/89.

A highly effective conservation programme initiated in Andalucía in 1979 has led to the dramatic population recovery. This programme involved the protection of all the major Andalusian sites for White-headed Ducks (AMA Córdoba 1991, ICONA 1993). In the early 1980s, ICONA (now DGN) initiated a working management plan. Since 1992, DGN has led a series of technical coordination seminars in which all Communities where White-headed Ducks are recorded have participated. No Communities have satisfied their legal requirement by developing their own Recovery Plans. Effective protection from illegal hunting in Andalucía has undoubtedly played the most important role in the population recovery. Other habitat protection measures taken include the removal of introduced fish (from Laguna del Rincón and Laguna de Zoñar, Córdoba), the control of pollution and sedimentation, and the regeneration of the natural surrounding vegetation. The species has recently become established in Valencia and Castilla-La Mancha. The principal site in Valencia, El Hondo, was declared a Paraje Natural in 1988. Of five sites important for the species in Castilla-La Mancha, only one is protected, as a hunting refuge (ESPARVEL 1993). However, over 75% of the Spanish population occurs in protected areas at any one time. Since 1982 there has been a captive breeding programme for the White-headed Duck run by DGN, with 79 birds being released into the wild by the end of 1990 (Pereira 1991) and at least 85 additional birds released since then (ICONA 1993). In 1993, an additional 36 birds were released in Mallorca with eight birds still present in the area after nine months (Mayol 1994).

The shooting of North American Ruddy Ducks and hybrids began in 1989 and has usually been conducted independently by the environmental agencies of each autonomous community. However, from June to December 1993, DGN contracted a specialised team to control the birds on a national level. DGN has published an identification guide with the aim of aiding the detection of Ruddy Ducks (Urdiales & Pereira 1993). In 1993, SEO/BirdLife prepared a report commissioned by EU (DG XI) and DGN which compiled data on the spread of the Ruddy Duck in Spain and beyond and suggested conservation measures (Martí 1993). Data on the spread of the Ruddy Duck are also presented by Matamala *et al.* (1994) and Torres *et al.* (1994a,b). In Spain, the incidence of hybridisation has increased very rapidly since hybrids were first recorded in 1991, and a total of 53 hybrids and Ruddy Ducks had been shot at White-headed Duck sites by the end of 1994. In order to prevent escapes of Ruddy Ducks from collections within Spain, the individuals and organisations holding the bird in captivity have been identified and contacted individually to request that all reproduction and escape of the species is prevented (Rose 1993). In the Balearic Islands the trade in and possession of live birds or eggs of any species of *Oxyura* (apart from *O. leucocephala*) has been prohibited.

Numerous small wetlands are important sites (e.g. breeding recorded in 23–27 wetlands since 1984), and for a list see Matamala *et al.* (1994). However, the key sites are Albufera de Adra (IBA 230, SPA, Ramsar site, Natural Reserve), Salinas de Cerrillos (IBA 230, SPA, Nature Reserve), Cañada de la Norias (SEO/BirdLife Ornithological Reserve), Veta la Palma (IBA 247, Natural Park), Lebrija-Las Cabezas complex (IBA “U”, Nature Reserve), Embalse de la Coronela (unprotected), Laguna del Gosque (IBA 267, Nature Reserve), Laguna de Arjona (Nature Reserve), Lagunas del Tarelo (IBA 247, Natural Park), Puerto de Santa María complex (IBA 250, Nature Reserve, SPA), Espera complex (IBA 249, Nature Reserve, SPA), Laguna de Medina (IBA 252, SPA, Nature Reserve), Laguna Amarga (IBA 242, SPA, Nature Reserve), Laguna de Zoñar (IBA 242, SPA, Nature Reserve), Laguna del Rincón (IBA 243, SPA, Nature Reserve), Embalse de Malpasillo (IBA 243, Ramsar site, Natural Site), Laguna Honda (Nature Reserve), Laguna del Acebuche (IBA 247, Natural Park), Dehesa de Monreal (IBA 084, unprotected), Laguna de Pedro Muñoz (IBA 082, Hunting Reserve, SPA) and Embalse de El Hondo (IBA 215, SPA, Natural Site).

* **Syria**

The status of the White-headed Duck in any national Red Data Book is unclear, as is its legal status.

There is one June record of White-headed Duck from 1994 (G. Kirwan *in litt.* 1994, *Orn. Soc. Middle East Bull.* 33). There appears to be a regular wintering population, and at Lake Quattine 30 were recorded in 1993 and 35 in 1994 (IWRB International Waterfowl Census). Lake Quattine (unprotected) is the only key site identified so far.

No specific conservation programmes have yet been conducted for the species. There are no Ruddy Duck records.

* **Tunisia**

There is no national Red Data Book. The White-headed Duck is fully protected.

The species winters regularly in northern Tunisia, but breeding has only been occasionally recorded, suggesting exchange of birds with Algeria. The first breeding record, near Gabès in 1957 (Castan 1958), was during an unusually wet year. Winter numbers have declined after over 500 birds were recorded in the IWRB censuses in each of 1968, 1969, 1971 and 1973 and a flock of 1,550 was recorded at Lac de Tunis in February 1969 (M. Smart *in litt.* 1989). Following major floods in 1969, the winter distribution expanded to southern Tunisia as more wetlands became available, but from the late 1970s the range has been restricted to the north-east (M. Smart *in litt.* 1989). Breeding is irregular and in small numbers and since 1980 has been recorded at Barrage El Houareb, Barrage Sidi Abdelmoneim, Barrage Besbessia and Menzel Bourguiba lagoon (Green & Anstey 1992, Z. Benaïssa *in litt.* 1994).

Key sites are Lake Ichkeul (National Park, World Heritage Site, Biosphere Reserve, Ramsar site), Barrage el Haouareb (Hunting Reserve), Lake Tunis (National Reserve), Gdir El Ghoul 1 (unprotected), Gdir El Ghoul 2 (unprotected), Barrage Lebna (unprotected), Barrage Sidi Abdelmoniem (unprotected), Sebkha Kelbia (Natural Reserve), Barrage Besbessia (unprotected), Salines de Soliman (unprotected), Oued El Kebir (unprotected), Barrage Mornaguia (unprotected), Barrage Mlaabi (unprotected), Menzel Bourguiba lagoon (unprotected) and Lake Hammam Jedidi (unprotected).

The distribution of educational booklets summarising the previous action plan (Anstey 1989) in French in 1990 is reported to have brought clear benefits in educating Eaux et Forêts guards responsible for controlling hunting on reservoirs occupied by the species (F. Maamouri verbally 1993). No other specific conservation programmes have yet been conducted for the species in Tunisia. There are no Ruddy Duck records.

* **Turkey**

There is no national Red Data Book. The *Draft Red List of Threatened Animals of Turkey* published by the Ministry of Environment in 1990 gives the status of the White-headed Duck as Vulnerable to Endangered (see Porter 1991). The species has had full legal protection since the 1984/85 hunting season, when the Bern Convention came into force.

Turkey has the largest wintering population of the White-headed Duck of any range-state, and also holds a major breeding population. The southern coastlands and central plateau have major breeding and wintering sites, eastern Turkey has breeding and passage sites, and the Black Sea coastlands hold major passage sites. Wintering is also recorded in the Black Sea coastlands and western Anatolia (see Beaman 1986 for definitions of regions). The peak wintering population is at least 11,000 birds, while Green *et al.* (1989) estimated a total of 150–200 breeding pairs. The number of Turkish breeding pairs is likely to be higher than this figure, as in 1991 the breeding population was c.150 pairs in the central plateau alone (Kirwan *in press*).

The most important site in Turkey is Burdur Gölü which often holds over 50% of the known world population during winter. In February 1991 there was a record count of 10,927 birds on the lake (Berrevoets & Erkman 1991), but numbers fluctuate markedly and only 3,010 were recorded in February 1993 (Green *et al.* 1993, *in press*). About 500 birds were recorded on 27 July 1994 (J. Petit *in litt.* 1994), and the lake is probably vitally important all year round. Other recent counts include 1,246 at Cernek Gölü in the

Kizilirmak delta in March 1992 (Hustings & van Dijk 1994), which is an extremely important passage site.

Key sites are Çukurova delta (particularly Akyatan Gölü and Akyayan Gölü, Hunting Reserve and unprotected respectively), Arin Gölü (unprotected), Burdur Gölü (Ramsar site and Hunting Reserve), Hotamis marshes (Natural Heritage Site), Eregli marshes (Natural Heritage Site), Kizilirmak delta (particularly Cernek Gölü, Hunting Reserve), Kulu Gölü (Natural Heritage Site), Marmara Gölü (unprotected), Salda Gölü (Natural Heritage Site), Sultan marshes (Strict Nature Reserve, Natural Heritage Site and Ramsar site), Van Gölü (unprotected), Van marshes (unprotected), Horkum Gölü (unprotected), Edremit marshes (unprotected), Bendimahı marshes (unprotected), Uyuz Gölü (unprotected), Yarisli Gölü (unprotected), Kozanlı Saz Gölü (unprotected), Hirfanlı reservoir (unprotected) and Akkayı Barajı (unprotected). Many important sites for the species have been destroyed and most other sites have been degraded. Several former key sites listed by Anstey (1989) seem to have lost their importance for the species due to habitat degradation (Karamik Gölü, Corak Gölü, Eber Gölü, Cavuscu Gölü).

Considerable conservation work on the species has already been done by DHKD, the Wildfowl and Wetlands Trust and the Burdur Municipality, using the species as a successful flagship for wetland conservation. Distribution of educational booklets summarising the previous international action plan for White-headed Duck (Anstey 1989) in Turkish led to the imposition of temporary hunting bans at Burdur Gölü and Yarisli Gölü from December 1990 onwards. An international symposium on Burdur Gölü and the White-headed Duck was organised in December 1991 (DHKD & Burdur Municipality 1993), and DHKD produced an attractive poster in Turkish and English in 1993. The steps necessary to prepare a management plan have been identified (Salathé & Yarar 1992), and a detailed ecological study of White-headed Ducks was completed at the lake in 1993 (Green *et al.* 1993, in press). In 1993, the lake was declared a Game and Waterbird Conservation Area and Ramsar site principally to protect the species. The White-headed Duck is now being used as a flagship in the current campaign against development proposals at the lake, and has become a symbol for nature conservation in Turkey. There is one record of a Ruddy Duck from April 1988. The Ruddy Duck is not legally protected.

* **Ukraine**

The White-headed Duck is included in the national Red Data Books published in 1980 and 1995, but details are not known. Its legal status is unclear.

Both breeding and wintering were historically recorded in the Azov Sea area (Valkh 1900, Phillips 1923) and passage was recorded in the Crimean region (Nikolskyi 1891). In the past 100 years there have been only 19 records of the species from the Ukraine, mainly of single birds (Lysenko 1991, I. Gorban *in litt.* 1995), but it seems extremely likely that important numbers of birds seen on passage in Romania and wintering in Bulgaria and Greece pass through the Ukraine along the Black Sea coast.

No specific conservation programmes have yet been conducted for the species. There is one unconfirmed Ruddy Duck record from 1992. The legal status of the Ruddy Duck is unclear.

Ruddy Duck range-states with no White-headed Duck

- * **Austria**
There are two winter records of Ruddy Ducks, both from Lake Constance. No action has yet been taken to control Ruddy Ducks and the legal status of the species is unclear.
- * **Belgium**
Most of the 79 Ruddy Duck records refer to winter, plus two breeding records from 1991 and 1993. A small number of breeding attempts are now known to take place annually. No action has been taken to control Ruddy Ducks although aviculturalists have been informed of the need to prevent their escape.
- * **Denmark**
There have been eight Ruddy Duck records, mainly in summer. No action has yet been taken to control Ruddy Ducks and the legal status of the species is unclear.
- * **Finland**
There have been three Ruddy Duck records, mainly in summer. No action has yet been taken to control Ruddy Ducks and the legal status of the species is unclear.
- * **Germany**
Ruddy Ducks have been recorded on 41 occasions throughout the year and throughout the country. No action has yet been taken to control Ruddy Ducks despite the committed actions of conservationists to raise awareness of the problem. There would be considerable difficulties in introducing country-wide control measures for the Ruddy Duck due to the fact that current national laws do not give clear directives on how to treat the species (Bauer 1994). Federal laws may be applicable, though these differ considerably between the 16 federal ministries, suggesting that negotiations over the introduction of control measures may be time-consuming and complicated.
- * **Iceland**
Ruddy Ducks migrate to Iceland to breed, with a total of 21 records by the end of 1994 (with a combined total of 42 birds). Three confirmed breeding attempts are known, the first of which took place in 1990 (Nielsen 1994, 1995). The first young were successfully fledged in 1994. No measures to control Ruddy Ducks have yet been taken although the species is well monitored and the distribution and status are well known.
- * **Ireland**
There are c.30 Ruddy Ducks wintering annually and five breeding records. It is likely that one or two pairs breed every year. No measures to control Ruddy Ducks have yet been taken although conservationists are well informed of the problem.
- * **Netherlands**
Ruddy Ducks occur mainly in winter, with at least 175 records to date. Records throughout the summer since 1988 (when two pairs are known to have bred successfully) suggest that a small number of pairs breed annually. There is currently a proposal to

designate the Ruddy Duck under article 54 of the Hunting Law which will allow licensed control of the species (A. Binsbergen *in litt.* 1994). There are also plans to designate the Ruddy Duck under article 24a of the Nature Conservation Act which would prohibit trade in, the release of, and/or the keeping of the species. No control measures against Ruddy Ducks have yet been implemented.

* **Norway**

There have been 20 Ruddy Duck records, mainly in summer. No action has yet been taken to control the species, and its legal status is unclear.

* **Portugal**

Two Ruddy Ducks have occurred in winter, and, despite this small number of records, the Portuguese have already acted positively by setting up a Ruddy Duck control team which is prepared to control any Ruddy Ducks which occur on nature reserves. There are four records of White-headed Duck (L. Costa pers. comm. 1994). The Ruddy Duck is not legally protected.

* **Sweden**

There have been 24 Ruddy Duck records, mainly in summer. No action has yet been taken to control Ruddy Ducks. The Ruddy Duck is legally protected, since it is not listed in the hunting legislation.

* **Switzerland**

There have been at least nine Ruddy Duck records, mainly in winter. No action has yet been taken to control Ruddy Ducks. The legal status of the species is unclear.

* **United Kingdom**

The current Ruddy Duck population is estimated at 3,500 wintering birds and at least 700 breeding pairs (Hughes & Grussu 1994). Realising the potential threat which the U.K. Ruddy Duck population posed to the White-headed Duck, the U.K. set up a Ruddy Duck Working Group (RDWG) in September 1992. This group, comprising representatives from government, conservation and research organisations, and aviculturalists, has the role of devising a strategy for dealing with the Ruddy Duck problem in the U.K. (Holmes & Galbraith 1994). The RDWG immediately identified the need for research into possible control measures for Ruddy Ducks in the U.K., and this work, which is being carried out by the Wildfowl and Wetlands Trust, funded mainly by the U.K. government, started in 1993. The research has shown that shooting (with shotguns and rifles) and nest-trapping of breeding females are effective control measures (Hughes & Grussu 1994). The RDWG therefore plans to proceed to a phase of regional control in two areas of the U.K. in order to assess the practicality of controlling Ruddy Ducks throughout the U.K. The other major role of the RDWG is to raise awareness of the Ruddy Duck problem both nationally and internationally, and a national public relations strategy is currently being implemented.

The Ruddy Duck is legally protected by the 1981 Wildlife and Countryside Act, and prior to November 1995 killing was only possible under scientific licence. Recent changes remove all legal constraints to organised control for the purposes of conserving

White-headed Duck. Other changes mean that a licence is now required to trade in captive-bred Ruddy Ducks, thus restricting this trade.

PART 2. AIMS AND OBJECTIVES

AIMS

In the short term, to maintain the current population and area of occupancy of the White-headed duck throughout its range. In the medium term, to promote the population increase of the White-headed Duck within its current range. In the long term, to promote the expansion of the White-headed Duck breeding population to other suitable areas. In addition, to prevent hybridisation of the White-headed Duck by eradicating the introduced North American Ruddy Duck in the western Palearctic.

OBJECTIVES

1. POLICY AND LEGISLATIVE

1.1. To promote and develop national and international policies to control (which can include eradication) the Ruddy Duck

1.1.1. Promote and develop national control strategies in all western Palearctic countries supporting Ruddy Ducks

All countries should be encouraged to follow the lead of Spain and the U.K. in formulating their own national strategies for the control of Ruddy Ducks.

Priority: essential

Time-scale: ongoing

1.1.2. Encourage national legislation which permits the control of Ruddy Ducks in all western Palearctic countries

In some countries, there are currently legal barriers to the control of Ruddy Ducks, which urgently need to be removed.

Priority: essential

Time-scale: ongoing

1.1.3. Promote national legislation in all western Palearctic countries which prohibits the escape or release of Ruddy Ducks from captivity

It is imperative that populations of Ruddy Ducks in the wild are not augmented by escapes from captivity. Ruddy Ducks from captive collections are still being allowed to fly free in a number of European countries, even though this is illegal in some of them. It is currently unclear in which countries the release of Ruddy Ducks has been made illegal, but they include the U.K.

Priority: essential

Time-scale: ongoing

1.1.4. To develop strategies to prevent the escape of Ruddy Ducks from collections

Making the escape or release of Ruddy Ducks illegal will not be sufficient to prevent it from happening, and other policies are required. It is recommended that legally enforceable registers for captive individuals of all stiff-tail species should be established. Legislation to prohibit the keeping of Ruddy Ducks in captive waterfowl collections should also be considered since this would provide a guarantee that no birds could escape. Trade in Ruddy Ducks should be phased out, and waterfowl keepers should be encouraged to phase out Ruddy Ducks from their collections.

Priority: essential

Time-scale: ongoing

1.1.5. Involve international conventions in solving the Ruddy Duck problem, particularly the Bonn, Bern and Biodiversity Conventions

All contracting parties to the Bonn Convention should provide the legislative means for the control of Ruddy Ducks in order to comply with Article III (4c) which states that “to the extent feasible and appropriate, [contracting parties should endeavour] to prevent, reduce or control factors that are endangering or are likely to further endanger the [White-headed Duck], including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species”.

Article 11 (2b) of the Bern Convention requires Contracting Parties “to strictly control the introduction of non-native species”.

Article 8 (h) of the Convention on Biodiversity requires Contracting Parties to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species”.

Priority: medium

Time-scale: medium

1.2. To promote national and international policies which specifically favour the protection of the White-headed Duck and its habitat

1.2.1. Promote the full protection through national and international legislation of the White-headed Duck and its habitat

Priority: high

Time-scale: short

1.2.2. Involve international conventions in protecting the White-headed Duck and its habitat, especially the Ramsar, Bonn and Bern Conventions

All key sites for the White-headed Duck should be designated as Ramsar sites. Parties should be encouraged to sign the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (under the Bonn Convention), which will provide for further protection to White-headed Duck.

Priority: medium

Time-scale: medium

1.2.3. Promote the development and implementation of national and regional action plans and recovery programmes

Range-states and regions are encouraged to follow the timely lead of the Spanish Autonomous Region of Castilla-La Mancha, which has given statutory approval for a recovery plan for the species, citing an earlier draft of this European Action Plan (Decreto 183/1995 of 28 November 1995).

Priority: high
Time-scale: short

1.3. To promote the integrated management of wetlands and ensure that broad policies such as agriculture, transport, tourism, etc., do not have a negative impact on the White-headed Duck and its habitat

It is recommended that all range-states should develop and implement an effective national wetland conservation strategy. Such a strategy should set clear targets and priorities for the protection and integrated management of White-headed Duck habitat. National policies and legislation on agriculture, transport and tourism should all be finely tuned to the needs of wetland conservation.

Priority: medium
Time-scale: medium

2. SPECIES AND HABITAT PROTECTION

2.1. To control Ruddy Ducks and Ruddy Duck x White-headed Duck hybrids

2.1.1. Reduce the size of the U.K. Ruddy Duck population as quickly as possible

In order to safeguard the White-headed Duck, in the long term it is essential that the spread of North American Ruddy Ducks from the U.K. to the European continent is stopped completely. However, given the large size and wide distribution of the U.K. population, the only realistic objective for the four-year duration of this action plan is to reduce the size of this population as quickly as possible.

Priority: essential
Time-scale: ongoing

2.1.2. Eliminate all small populations of Ruddy Ducks from the western Palearctic

Every effort should be made to remove the small numbers of Ruddy Ducks present in other countries in the western Palearctic in order to prevent the establishment of further self-sustaining populations. The EU should promote the adoption of a common approach to stopping and reversing the spread of the North American Ruddy Duck within the EU. The first priority is to prevent feral breeding populations from becoming established outside the U.K. However, in order to ensure that no Ruddy Ducks reach White-headed Duck populations, all individuals need to be controlled. It is more important to control adult birds than juveniles, female birds than males, and hybrids than pure birds. It is more important to control long-staying than short-staying individuals.

It takes time to develop the necessary national control strategies, which often require careful planning and negotiation and/or legislative changes. Given the urgency of the current situation, those countries which cannot introduce unconditional control immediately should attempt to implement control in stages. For example, measures to prevent breeding (e.g. by nest destruction or the coating of eggs with liquid paraffin) could be undertaken immediately, proceeding to the

control of all adult birds as soon as possible. The general objectives, in order of priority, should be:

(a) Total prevention of breeding.

(b) Control of all Ruddy Ducks which occur between March and September inclusive and thus have the potential to breed. Note that it is preferable to control potential breeding birds in April while they are in conspicuous courtship display and before the females begin incubation.

(c) Control of all Ruddy Ducks which occur between October and February inclusive.

Priority: essential

Time-scale: ongoing

2.1.3. Eliminate all Ruddy Duck x White-headed Duck hybrids

Where hybrids are recorded, they should be controlled in the same way as Ruddy Ducks. This is in fact even more important.

Priority: essential

Time-scale: ongoing

2.2. To promote adequate protection for key White-headed Duck sites

2.2.1. Seek protected-area designation for all sites regularly holding White-headed Ducks

Priority: essential

Time-scale: medium

2.2.2. Prevent destruction or degradation of all sites regularly holding White-headed Ducks

Legal protection should be enforced where it exists, and developments damaging the hydrology, vegetation, water quality, etc., of key sites should be prevented. Full environmental impact assessments should be conducted for any new development schemes at these sites.

Priority: essential

Time-scale: ongoing

2.3. To manage habitats to increase White-headed Duck breeding success and reduce mortality

Wetland management can readily increase breeding success, e.g. by providing more emergent vegetation for nesting, by maintaining stable water-levels at artificial breeding sites or by reducing disturbance. The reduction of fish densities reduces competition for food and increases duckling survival. These needs should be addressed by the production and implementation of management plans for key sites, which include specific objectives and prescriptions for the White-headed Duck.

Priority: medium

Time-scale: ongoing

2.4. To create new breeding and wintering habitat for the White-headed Duck

Many artificial wetlands are now important for the species, and if new wetlands are being created within the range they should be designed so as to provide suitable habitat for the species.

Priority: low

Time-scale: ongoing

2.5. To actively prevent the hunting of White-headed Ducks at key sites throughout the range

2.5.1. Seek permanent hunting bans at sites where the species is regularly recorded

The White-headed Duck is one of the easiest of all waterbirds to shoot and hunting pressure is still high at many important wintering sites.

Priority: high

Time-scale: short

2.5.2. Increase wardening at key sites and apply penalties to offenders

In many parts of the range, where legal protection of the species and/or hunting bans at sites are not very effective in preventing hunting, active guarding is essential if hunting is to be minimised. Wardens should enforce hunting bans or, at sites where hunting is permitted, ensure that no White-headed Ducks are shot.

Priority: high

Time-scale: ongoing

2.5.3. Where permanent hunting bans cannot be achieved, use other methods to minimise the number of White-headed Ducks shot

It will be politically impossible to ban hunting totally at all sites where White-headed Ducks occur regularly. Various mechanisms can reduce the number of White-headed Ducks shot, including effective hunter education (see 4.2.3), restricting the number of hunters and restricting the hunting season to periods when the number of White-headed Ducks present is minimal.

Priority: high

Time-scale: ongoing

2.5.4. Secure financial support for countries with less funds to aid the implementation of their hunting laws

This is particularly important for countries in the eastern Mediterranean region.

Priority: high

Time-scale: ongoing

2.5.5. Harmonise hunting seasons between neighbouring range-states

The hunting season in Bulgaria ends at the end of January, while it continues for a month or more in neighbouring Romania and Turkey. Reducing the hunting season to a minimum period in all states would help to lower the hunting pressure on White-headed Ducks.

Priority: low

Time-scale: short

2.6. To phase out the use of lead shot at all key sites throughout the range

It is important to *minimise* the threat to the White-headed Duck resulting from lead poisoning, using voluntary bans where possible.

Priority: medium

Time-scale: ongoing

2.7. To postpone any reintroductions of the White-headed Duck until the Ruddy Duck problem has been solved

Although there have been proposals to reintroduce White-headed Ducks in France and Italy, it is essential that these do not proceed until Ruddy Ducks have been successfully eliminated in these countries and controlled in other countries. Such reintroductions would simply increase the possible zone of hybridisation between the two species and thus escalate the problem of identifying and removing these hybrids. Ruddy Ducks have already been recorded at sites in

Corsica and Sardinia. Experience in Spain suggests that Ruddy Ducks concentrate at sites where White-headed Ducks are present, hence it can be predicted that releases of White-headed Ducks would increase the number of Ruddy Ducks recorded at these sites. All future reintroduction programmes should follow the IUCN guidelines for reintroductions (Black 1991, Kleiman *et al.* 1994).

Priority: essential

Time-scale: ongoing

3. MONITORING AND RESEARCH

3.1. To improve national and international monitoring of the status and distribution of the Ruddy Duck

Although international and national mechanisms to monitor the Ruddy Duck have been in place since the Arundel meeting, there is still work to be done to improve these. For example, experience in Morocco and Turkey shows that records from holidaying birdwatchers are not reaching the “national focal points” appointed at the Arundel meeting to monitor the status of Ruddy Ducks in each country. There is a need to ensure that birdwatchers are aware of the need to look for Ruddy Ducks and are informed of the focal point or person to whom the relevant information should be reported. In some countries, records of Ruddy Ducks have not been submitted as they were viewed as escapes from captivity.

Priority: essential

Time-scale: ongoing

3.2. To monitor and improve the effectiveness of suitable control measures for Ruddy Ducks

The U.K. Ruddy Duck research programme has shown that shooting with rifles and shotguns, nest-trapping of breeding females, and the dipping of eggs in liquid paraffin can all be used to control Ruddy Duck populations. This research should remove the need for other countries to assess control methods independently.

Priority: essential

Time-scale: ongoing

3.3. To develop and implement national and international programmes to monitor the status and distribution of the White-headed Duck

3.3.1. Conduct regular breeding surveys in known breeding sites

While many wintering sites are censused annually in mid-winter during the IWRB International Waterfowl Census, less attention is given to breeding surveys, and data on breeding numbers and distribution are collected in an unsystematic and uncoordinated fashion. Regular monitoring would allow the calculation of trends in breeding numbers for each site, and would help identify local declines in time to address the causes.

Priority: high

Time-scale: ongoing

3.3.2. Conduct breeding surveys at possible breeding sites

Potential additional breeding sites in Turkey, the Russian Federation and elsewhere in the range are not likely to be discovered unless a special effort is made to locate them. Obviously, any such sites cannot be conserved until they are located.

Priority: high

Time-scale: ongoing

3.3.3. Extend the International Waterfowl Census to cover all sites where the White-headed Duck is recorded

There are many known or potential wintering sites that are not covered in the midwinter census on a regular basis.

Priority: medium

Time-scale: ongoing

3.3.4. Identify major passage sites

In most of the range, many wetlands are only censused in midwinter, and the route between breeding and wintering sites remains unclear. Autumn and spring surveys should be organised in possible passage areas.

Priority: high

Time-scale: short

3.3.5. Monitor key sites throughout the year

In many cases, key sites have always been monitored at the same time of year (typically midwinter) and their importance during other seasons remains unclear. Regular surveys at different times will improve our understanding of seasonal distribution and movements.

Priority: high

Time-scale: ongoing

3.3.6. Encourage foreign birdwatchers submit their records

Foreign birdwatchers can be encouraged to survey White-headed Duck sites where the status of the species is uncertain, and to submit their records to national organisations (e.g. BirdLife Partner organisations) or to the IWRB/IUCN Threatened Waterfowl Research Group at the Wildfowl and Wetlands Trust or to IWRB. In Turkey, visiting birdwatchers are successfully being encouraged to visit designated or possible Important Bird Areas and send their observations to DHKD; this could be done in many other White-headed Duck range-states.

Priority: medium

Time-scale: ongoing

3.4. To promote biological and other scientific research useful for the conservation of the White-headed Duck

3.4.1. Undertake studies of the biology of captive-bred, released White-headed Ducks in Spain in order to aid and evaluate possible future reintroduction programmes for this and other duck species

Priority: medium

Time-scale: short

3.4.2. Promote a better understanding of the movements of White-headed Ducks by marking and monitoring individuals

There are very few data on the movements of White-headed Ducks, and the nature of migration routes and movements between range-states remains very unclear. For example, it is not known whether there are movements between Spain and North Africa, or if the birds wintering in Greece are migrating through the northern Black Sea or through Turkey. An effective and harmless method of marking (once found) will allow a much greater understanding of the nature of these movements. Satellite transmitters should be developed to reduce their size, and such

transmitters could be applied to White-headed Ducks in the eastern Mediterranean region (subject to available funds).

Priority: medium

Time-scale: medium

3.4.3. Undertake studies of the species' ecology and habitat requirements

A reasonable amount of ecological research has already been conducted in Spain and Turkey, but local studies will provide an important aid to the development of site management plans, etc.

Priority: low

Time-scale: medium

3.4.4. Provide blood or tissue samples from Ruddy Ducks for DNA analysis to attempt to identify their place of origin

All countries should send blood or tissue samples from Ruddy Ducks and hybrids taken from the wild to Leicester University for DNA analysis in order to attempt to identify their place of origin (see Rose 1993 for more details).

Priority: essential

Time-scale: ongoing

3.4.5. Undertake applied studies of hydrology, pollution impacts, socioeconomic needs, etc., at key sites

At many key sites, the nature and significance of threats are poorly understood, and specific research is needed to assess changes to the hydrology, the impact of agrochemicals or the use of the site by local people. The results of all these studies should be incorporated in management plans for the sites (see 2.2).

Priority: medium

Time-scale: ongoing

3.5. To monitor the number of stifftails kept in captivity

Such monitoring is important to assessing the numbers and distribution of Ruddy Ducks and other stifftails in captivity, and hence the extent to which escapes or releases may be a problem now or in the future. It is also important for assessing progress of objective 1.1.4.

Priority: essential

Time-scale: ongoing

4. PUBLIC AWARENESS AND TRAINING

4.1. To increase awareness of the need to control the spread of the Ruddy Duck

Priority: essential

Time-scale: ongoing

4.2. To increase awareness of the need to protect the White-headed Duck and its habitat

4.2.1. Ensure development of a strong network of organisations and individuals committed to the conservation of the White-headed Duck

People interested in the species have already contributed to a series of publications (e.g. Anstey 1989, Green & Anstey 1992) and are recipients of the biannual newsletter of the IWRB/IUCN

Threatened Waterfowl Research Group, which is an ideal forum for the exchange of information between researchers, etc. Contacts between scientists and technical staff (including representatives of hunters' organisations) working in different White-headed Duck range-states should be improved, e.g. through the IWRB/IUCN Threatened Waterfowl Research Group and the BirdLife network.

Priority: high
Time-scale: ongoing

4.2.2. *Use the White-headed Duck as a flagship species to enhance protection of wetlands*

This has already been done successfully in Spain (particularly in Andalucía) and Turkey (particularly around Burdur Gölü).

Priority: high
Time-scale: ongoing

4.2.3. *Conduct education programmes to promote and inform about the White-headed Duck*

Educational programmes should be carried out, using posters, stickers, T-shirts, etc. Such programmes are particularly important in and around key sites. An educational booklet on the conservation of the White-headed Duck should be produced in all major languages within the range of the species. Wide and effective distribution of this booklet should be done by national organisations.

An international education campaign is required to educate hunters in all White-headed Duck range-states as well as hunters from other countries who visit range-states to shoot ducks. Hunters need to be educated about the importance of the White-headed Duck and how to identify it. The Conseil International de la Chasse et de la Conservation du Gibier (CIC) should assist in promoting such a campaign through national, regional and local hunting organisations. A hunter education programme should use means such as a video, translated into all major languages (e.g. Turkish, Spanish, Arabic, English, French, Italian), emphasising the status and plight of the species across the whole Mediterranean. A practical brochure for hunters could also be prepared. This could be combined with similar programmes to reduce the hunting pressure on other globally threatened waterbirds occurring in the same region, particularly the Marbled Teal *Marmaronetta angustirostris* and the Ferruginous Duck *Aythya nyroca*.

Priority: high
Time-scale: ongoing

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ANNEX 1. RECOMMENDED CONSERVATION ACTIONS BY COUNTRY

White-headed Duck range-states

*** Algeria**

- 2.2.1. Promote the official protection of Lac des Oiseaux and Lac Ben Azzouz.
- 3.1./
- 2.1.2./2.1.3. Given the presence of Ruddy Ducks in neighbouring Morocco, close monitoring of the White-headed Duck is essential to ensure the detection of hybrids and Ruddy Ducks.
- 3.3.1./3.3.2. Breeding surveys of key sites and other wetlands that could be important for the species (e.g. Garaet El Mekhada).
- 3.3.5. Constant monitoring of the population in the El Kala wetlands.
- 4.2.2./4.2.3. A public awareness campaign should be conducted, using the White-headed Duck as a flagship for wetland conservation.

*** Azerbaijan**

- 1.2.1. Promote full legal protection for the species.
- 1.2.2. Promote designation of Lakes Aggel and Saraesy as Ramsar sites.
- 1.3./
- 2.2.2./3.4.5. Promote improved water management at a national level. Chemical pollution from cotton fields surrounding the Kizil Agach marshes and Lake Aggel should be investigated and controlled. It is recommended that water extraction for irrigation from Lake Aggel should be prevented. The original links between the Kura river and the lake should be restored to ensure a clean supply of water. A water supply should be provided to the western part of Lake Aggel (Kichik Aggel or Malyi Aggel) which is now drained.
- 2.2.1./2.5.2. At Lake Aggel it is recommended that the protected area should be extended well beyond the edges of the lake, and facilities for and training of the reserve guards should be improved.
- 2.2.2./2.5.2. Encourage protection of all key sites from poaching and habitat degradation.
- 2.5.2. Hunting restrictions should be tightly enforced.
- 3.3.2./3.3.3. Winter surveys of key sites and other possible sites are needed to establish current status. Breeding surveys are also required.

* **Bulgaria**

- 2.2.1. Promote the protection of Uzungeran (Lake Mandra).
- 2.5.2. It is recommended that guards should be employed to prevent hunting of White-headed Ducks at Durankulak, Mandra/Uzungeren and Poda.
- 3.3.4./3.4.2. A collaborative monitoring programme should clarify numbers and distribution, and study the nature and timing of movements between Bulgaria, Romania, Greece and Turkey.
- 4.2.2. Use the White-headed Duck as a flagship for the conservation of key sites, using posters, badges, etc.
- 4.2.3. A hunter education programme centred around the key sites.

* **Greece**

- 2.2.1./2.3. Promote the adequate protection of all key sites by definition of their boundaries, development of management plans and adequate wardening.
- 2.2.2. It is recommended that the proposed reclamation of the marshes in the south-east of Lake Vistonis should be cancelled.
- 2.5.1. It is recommended that hunting on the eastern shore of Lake Vistonis should be prohibited immediately.
- 2.5.2. Illegal hunting should be stopped at all key sites.
- 3.3.3./
3.3.4./3.3.5. The White-headed Duck should be monitored regularly at all key sites, with additional surveys to locate important passage sites (e.g. possibly Lesbos) and possibly further wintering sites.
- 3.3.4./3.4.2. A collaborative monitoring programme is required to establish the nature and timing of movements between Greece, Bulgaria, Romania and Turkey.
- 3.4.3. Research should be conducted into wintering ecology (e.g. diet).
- 3.4.5. All key sites should be closely monitored to detect possible changes in their ecological character.
- 4.2.2./4.2.3. Education programme for the species at all key sites, targeting hunters, fishermen, etc.

* **Israel**

- 2.2.1. Promote the declaration of Tishlovet Hakishon as Nature Reserve and the designation of key sites as Ramsar sites.

* **Italy**

- 2.2.1. The Gargano complex (including Lago di Lesina and Varano) in Apulia and the Po delta in Emilia Romagna and Veneto were historically important sites for the White-headed Duck and consideration should therefore be given to declaring them National Parks.
- 2.2.1. Promote the protection of historical breeding sites in Apulia (Daunia Risi, Valle Carapelle and S. Floriano) and in Sicily (Lentini, Gela and Catania).
- 2.7. No reintroductions of the White-headed Duck should be carried out until the Ruddy Duck problem has been solved. Any reintroductions should be organised through a national and international agreement.

* **Morocco**

- 1.2.1. The White-headed Duck should not be deleted from the list of legally protected species.
- 2.2.1. Promote the effective protection of the Moulouya delta to allow its possible future recolonisation by White-headed Ducks.

* **Romania**

- 1.2.1. Promote the legal protection of the White-headed Duck.
- 2.2.1. Promote the legal protection of Lake Techirghiol.
- 2.5.3. Promote the reduction of the hunting season to that operating in Bulgaria.
- 3.3.1. A summer survey of the Danube delta should be conducted to clarify the breeding-season status of the species.
- 3.3.4./3.4.2. Autumn and spring surveys are needed in order to clarify the nature and timing of passage movements through Lake Techirghiol and the Danube delta. A collaborative monitoring programme should establish the nature and timing of movements between Bulgaria, Greece, Romania and Turkey.
- 4.2.2./4.2.3. Education programme in the Danube delta using posters, etc., targeted at hunters.

* **Russian Federation**

- 3.3.1./3.3.2. Breeding survey of suitable wetlands in the Volga delta to clarify breeding numbers and identify key sites.
- 3.3.3. Increased participation in the International Waterfowl Census should be promoted if the resources become available.
- 3.3.4./3.3.5. Spring and autumn surveys of the Manych–Gudilo reservoirs are needed to clarify the numbers and distribution of White-headed Ducks during passage.

* **Spain**

- 1.1.3./1.1.4. Legal mechanisms should be promoted to prohibit the trade in and possession of Oxyurini other than the White-headed Duck, as has already been effected in the Balearic Islands.
- 1.2.3. Promote legal implementation of Recovery Plans in all Communities with regular presence of White-headed Ducks. Coordination between DGN and Autonomous Communities should be improved. NGOs (such as SEO/BirdLife) should be official participants in such coordination meetings.
- 2.2.1./
2.2.2./2.3. Promote the conservation of all sites with regular presence of White-headed Ducks. Both legal protection measures and effective implementation of management plans are required.
- 2.5.3. Temporary banning of hunting when White-headed Ducks are recorded at sites where hunting is normally permitted, particularly at Dehesa de Monreal and El Hondo should be encouraged.
- 3.4.1. A thorough programme to monitor White-headed Ducks released from captivity should be carried out and the results published. Further research should assess how well the captive-bred released White-headed Ducks have integrated into the wild population. A broad assessment of the role of captive breeding should be carried out, including the need to diversify the captive population and the size of this population required to maintain genetic diversity in the long term.

* **Syria**

- 3.3.2. Conduct surveys of potential breeding sites.
- 3.3.3. Promote the extension of the International Waterfowl Census to cover all potential wintering sites.

* **Tunisia**

- 2.2.1. Promote the declaration as protected areas of key sites, particularly breeding sites.
- 2.3. Promote management of emergent vegetation at key sites which increases the area of nesting habitat.
- 2.5.1./2.5.2. Promote the tight control of hunting at all key sites, particularly breeding sites.
- 3.3.1./3.3.2. A survey of all known and potential breeding sites is required.
- 4.2.2./4.2.3. Education programmes should be carried out around key sites and targeted at schools, colleges, farmers and hunters, using posters and other media.

* **Turkey**

- 2.2.1./2.2.2. Promote the effective protection of all the key sites.
- 2.2.2. Promote the improvement of the conservation status of existing Ramsar sites (Burdur Gölü and Sultan marshes).
- 2.2.2./
2.5.2./3.4.5. The following conservation measures are urgently recommended at Burdur Gölü:
- Complete environmental impact assessment of the various existing pollution problems. Modern treatment plants should be incorporated in the Burdur sewage system and in factories dumping waste into the lake.
 - The hunting ban should be tightly enforced throughout the year.
 - Improved sedimentation control is required, e.g. with afforestation schemes and restrictions on grazing.
 - A detailed hydrological study is required at Burdur Gölü to identify the reasons for the drop in water-level.
- 2.5. Promote improved enforcement of hunting legislation.
- 2.5.3./
4.2.2./4.2.3. Education programmes should be continued in order to raise the awareness of the species among hunters.
- 3.3.1. Detailed surveys should be carried out at all breeding sites to assess the status of the population.
- 3.3.2. Search for further breeding sites in eastern Turkey.
- 3.3.4. Detailed surveys should be carried out to identify all important passage sites.
- 3.3.4./
3.4.2./4.2.1. A collaborative monitoring programme is required to establish the nature and timing of movements between Bulgaria, Greece, Romania and Turkey.

- 3.3.5. Monitoring of all waterbirds at Burdur Gölü should be improved, with at least four complete counts a year.
- 3.3.6. Visiting birdwatchers should be encouraged to visit key sites and to submit records to DHKD using their standard Site Recording Forms.

* **Ukraine**

- 3.3.4. Autumn and spring surveys should be conducted to identify passage sites for birds moving to and from Romania, Bulgaria and Greece.

Ruddy Duck range-states

* **Countries with large populations: United Kingdom**

- 1.1.3. The U.K. government should ensure enforcement of Section 14 (1b) of the Wildlife and Countryside Act which prohibits the release or escape of Ruddy Ducks into the wild.
- 1.1.4. The U.K. government should consider adding the Ruddy Duck to Schedule 4 of the Wildlife and Countryside Act 1981 which requires the ringing and registration of all birds kept in captivity.
- 2.1.1. The U.K. should undertake its planned regional control programme as soon as possible. This control programme will attempt to control two different regional populations of Ruddy Ducks. If the results suggest that it is possible to control Ruddy Ducks on a large scale, the U.K. should undertake country-wide control measures for Ruddy Ducks as soon as possible.
- 3.2. The current U.K. Ruddy Duck research programme should proceed and the process of making the results available to all countries considering control measures should continue.
- 3.5. The U.K. government should consider whether there should be monitoring of captive Ruddy Ducks if the option of placing the bird on Schedule 4 is discounted.
- 4.1. The U.K. RDWG should continue its public relations strategy to inform the British public of the necessity for Ruddy Duck control.

* **Countries with small populations: Austria, Belgium, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Morocco, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and Ukraine.**

These countries can be divided into five different categories depending on the status and pattern of occurrence of Ruddy Ducks. These categories are listed in order of priority in terms of the urgency with which the actions listed below need to be implemented:

- (a) Countries with annual breeding attempts: Belgium, France, Iceland, Ireland, Netherlands and Spain.
- (b) Countries where birds have been present throughout the year: Germany and Morocco.
- (c) Countries where birds have been present for prolonged periods (two months or more) during the summer: Norway and Sweden.
- (d) Countries where birds have been present for prolonged periods (two months or more) during winter: Italy.
- (e) Countries with fewer than 10 records (of birds present for short periods): Austria, Denmark, Finland, Hungary, Israel, Portugal, Switzerland, Turkey and Ukraine.

The following recommendations apply to all the above countries. Countries where action is needed most urgently are mentioned by name.

- 1.1.1. All 20 countries are encouraged to develop national control strategies for Ruddy Ducks. This is most urgent for Belgium, Germany, Iceland, Ireland and Morocco. Norway and the other Scandinavian countries should also address the issue of Ruddy Duck control as there are indications that birds are remaining for long periods during the breeding season.
- 1.1.2. All 20 countries are encouraged to ensure provision for control of Ruddy Ducks under national laws as quickly as possible. The German government should urgently investigate possible legal mechanisms to allow the country-wide control of Ruddy Ducks.
- 2.1.2. All 20 countries are encouraged to take active control measures as soon as possible. Only Spain is carrying out such measures at present. The target should be to control all Ruddy Ducks which occur, but the highest priority should be the control of breeding birds and long-staying individuals.
- 3.1. All countries are encouraged to establish and maintain national monitoring systems to record the status and distribution of Ruddy Ducks throughout the year. Such monitoring systems should contain the following information: geographical coordinates and name of site, number, sex and age of individuals, date, habitat, protected status of site, evidence and outcome of breeding, recorder and degree of reliability of record. Where necessary, technical assistance for the establishment and maintenance of national schemes can be sought from IWRB.
- 3.1. All countries are encouraged to report annually the results of national monitoring schemes to IWRB which collates an international summary for dissemination to the appropriate body within each country.
- 3.1. Encourage the submission of winter records of Ruddy Ducks through the International Waterfowl Census network (IWRB).

- 3.1. Encourage birdwatchers to submit records of Ruddy Ducks from their own country to national rarities committees or official Ruddy Duck contacts (see Annex 2), especially in those countries where submission of records has not taken place through confusion over the feral status of Ruddy Ducks.
- 3.2. Any control measures undertaken should be adequately monitored and the results and outcome should be reported annually to IWRB for dissemination to the appropriate body within each country.
- 3.4.4. All countries are encouraged to send blood or tissue samples from Ruddy Ducks and hybrids taken from the wild to Leicester University for DNA analysis in order to attempt to identify their place of origin (see Rose 1993).
- 4.1. All countries are encouraged to increase public awareness of the need to control the spread of the Ruddy Duck through the development and implementation of national public relations strategies. Experiences gained through public relations exercises should be disseminated to other countries.

* **All western Palearctic countries (including those above)**

- 1.1.4. All countries where Ruddy Ducks are found in collections are encouraged to seek to reduce as much as possible the keeping of Ruddy Ducks in captivity. Consideration should also be given to introducing a legally enforceable register for captive individuals of Ruddy Ducks as well as considering restrictions on trade in Ruddy Ducks where appropriate.
- 1.1.4. In countries where Ruddy Ducks are not held in collections, consideration should be given to prohibiting the importation of the species and the keeping of it in collections.
- 1.1.4. Waterfowl keepers in all countries should be encouraged to follow a code of conduct for keeping stiffetails, as outlined in a booklet produced by the U.K. Ruddy Duck Working Group. This booklet advises the pinioning and ringing of all birds and the keeping of accurate records.
- 3.1. Encourage birdwatchers travelling to foreign countries to submit records of Ruddy Ducks to national rarities committees or official Ruddy Duck contacts (see Annex 2).
- 3.5. Those countries where stiffetails are kept in collections are encouraged to establish an annual monitoring scheme for these populations.

ANNEX 2. IWRB OFFICIAL RUDDY DUCK CONTACTS.

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