**A. Proposal**

Proposal to include the entire population of White-headed Duck *Oxyura leucocephala* in Appendix I of the Bonn Convention.

**B. Proponent**

Government of Spain (subject to approval within the European Union)

**C. Supporting statement**

**1. Taxonomy**

1.1 *Aves*
1.2 *Anseriforms*
1.3 *Anatidae*
1.4 *Oxyura leucocephala* (Scopoli,1769).
1.5 White-headed Duck, Erismature à tête blanche, Malvasía.

**2. Biological Data**

**2.1 Distribution (current and historical)**

The past and present distribution of the White-headed Duck is shown in Fig. 1. Counts of the species have been received from about 130 wetlands since 1980. Fig. 2 shows 32 wetlands on which flocks of 100 or more birds have been recorded since 1980. Nine wetlands where flocks of 500 or more birds have been recorded since 1980 are individually labelled. 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. The bulk of this latter population breeds in Kazakhstan and the Russian Federation within the former Soviet Union and winters in Turkey.

WEST MEDITERRANEAN

Spain
Spain has a resident population and Andalucia is thought to be the only area in Spain where the species has been well established, at least this century. 200 pairs were reported to breed in the Marismas del Guadalquivir in the 1950s (Amat & Sanchez 1982). The population declined to 22 individuals in the 1977 census, with these birds resident in lagoons of southern Cordoba province (Torres et al. 1986). Since then, an extensive conservation programme by the Andalucian authorities, along with a series of wet years, has allowed the population to recover, with breeding occurring in many lagoons in Cadiz, Seville and Cordoba provinces and a peak census count of 580 on 30 October 1991 (Agencia de Medio Ambiente in litt. 1991). This follows a particularly good breeding year in 1990 after heavy rains, with birds breeding at several new sites (e.g. Fuente de Piedra, Malaga). Breeding success was high in the Lagunas de Cadiz, with 124 chicks hatching and 23 fledging (J. Hidalgo in litt. 1991). As numbers increase, the species is now regularly recorded in other regions, particularly Madrid, Castilla-La Mancha and Valencia, having recently bred in the last two (Garcia et al. 1991). Notable recent counts include 358 at Laguna de Medina, December 1988 (Sharrock 1990), 131 at La Coronela and 107 at Salada de Zorilla in January 1989 (A.M.A. in litt. 1989), 151 at Albufera de Adra in January 1990 (A.M.A. in litt. 1991) and 97 at Dulce,

Malaga in March 1991 (S. Pickering pers. comm. 1991).

| COUNTRY | FY | TS | PT | PC | PS |
|---|---|---|---|---|---|
| Spain | 1968 | 23 | 428 ('89) | 131 ('89) | La Coronela |
| Algeria | 1972 | 5 | 101 ('88) | 98 ('88) | Lac Oubeira |
| Tunisia | 1967 | 23 | 1312 ('69) | 1300 ('69) | Lac de Tunis |
| Greece | 1970 | 2 | 423 ('90) | 423 ('90) | Lake Vistonis |
| Bulgaria | 1970 | 7 | 40 ('83/'88) | 38 ('88) | Vaya Complex |
| Romania | 1969 | 3 | 37 ('69) | 30 ('71) | Lake Techirghiol |
| Turkey | 1967 | 16 | 9204 ('88) | 9200 ('88) | Burdur Gölü |
| Cyprus | 1967 | 2 | 6 ('85) | 6 ('85) | Larnaca Lake |
| Israel | 1967 | 7 | 303 ('88) | 302 ('88) | Jordan Valley |
| Azerbaijan | 1991 | 2 | 3620 ('91) | 3100 ('91) | Aggol Lake |
| Turkmenia | 1968 | 9 | 850 ('74) | 600 ('74) | Kelifskiye Lakes |
| Iran | 1967 | 9 | 628 ('88) | 455 ('88) | Lake Parishan |
| Pakistan | 1967 | 8 | 1039 ('68) | 1005 ('68) | Khabbaki Lake |
| TOTALS | - | 116 | 17991 | 16688 | - |

Table I. Details of IWRB International Waterfowl Census data on White-headed Duck. FY = first year when any White-headed Duck counts were covered in the IWRB mid-winter census; TS = total number of sites where White-headed Duck has occurred at least once; PT = peak total count for any one year (year in brackets); PC = peak count at any one site (year in brackets); PS = site where peak count was made.

Algeria

Algeria has a resident population and the El Kala wetland complex (Lac Tonga, Lac des Oiseaux, Lac Oubeira) in the north-east is 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 drained in the 1930s (Heim de Balzac & 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 probably also in Marais de la Mekhad. 36 nests were located in 1991 (A. Boumezbeur in litt. 1991). Non-breeders and wintering birds occur on Lac des Oiseaux and Lac Oubeira (Chalabi 1990). There is no evidence of a population decline, and the highest count ever recorded was 220 on Lac Oubeira on 1 January 1984 (M. Smart in litt. 1989). Notable recent counts are 98 at Lac Tonga in June 1989, 125 at Lac des Oiseaux in March 1989 and 155 in March 1990 (Chalabi 1990).

Tunisia

The White-headed Duck winters regularly in northern Tunisia, but breeding has only been occasionally recorded, suggesting exchange of birds with Algeria and possibly further afield. The first breeding record, near Gabes in 1957 (Castan 1958), was during an unusually wet year. Winter numbers have declined after over 500 birds were recorded in IWRB censuses in each of 1968, 1969, 1971 and 1973 (Tables I, II) 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 of Northern Tunisia (M. Smart in litt. 1989). Breeding was confirmed at three sites in 1990, a wet year; Barrage El Houareb, Barrage Sidi Abdelmoneim and Menzel Bourguiba lagoon (F. Maamouri in litt. 1991). Notable recent counts are 107 at Gdir el Ghoul, December 1988, 95 at Lac Ichkeul in January 1989 (T. Rigaux in litt. 1989) and 136 at Mornaguia in October 1989 (F. Maamouri in litt. 1991).

Other countries

The White-headed Duck bred in northern Morocco at the turn of the century and was not regarded as rare (Heim de Balsac & Mayaud 1962; Thevenot in litt. 1989). Only vagrant birds have been recorded since the 1950s (Louette 1973). In France, small numbers were recorded breeding on Lake Buguglia and other Corsican wetlands until the 1960s (P. Dubois in litt. 1989). In Italy, breeding and wintering was formerly recorded in Puglia, Sardinia and probably Sicily (E. Grandi & C. Violani in litt. 1989). The last breeding record was from Oristano, Sardinia in 1976 (Schenk 1976) and only vagrant birds are now recorded.

EAST MEDITERRANEAN

Turkey

Turkey has the largest wintering population of the White-headed Duck and a smaller breeding population. The Southern Coastlands and Central Plateau hold major breeding and wintering sites, while Eastern Turkey holds breeding and passage sites. Wintering is also recorded in the Black Sea coastlands and Western Anatolia (see Beaman 1986 for regions). The wintering population is at least 11,000 birds, while Green and Moorhouse (1989) estimated the number of resident birds at 750 with 150 to 200 breeding pairs. The number of Turkish breeding pairs is likely to be higher than this figure, as G. Kirwan (in prep.) found evidence that the breeding population in 1991 was about 150 pairs in the Central Plateau alone.

The most important site in Turkey is Burdur Gölü which may hold over 50% of the world population during winter (Table II). In February 1991 there was a record count of 10,927 birds on the lake (Berrevoets & Erkman 1991). 2,054 birds were still present when the lake was counted in early April 1991, an unusually high number for so late in the year (G. Magnin in litt. 1991). These data suggest that reduced disturbance following recent protection of the site may be having a positive effect on the White-headed Duck. Alternatively, it may simply reflect a more accurate count than in previous years, as the large size of the lake, access problems and weather conditions make accurate counting difficult (L.J. Dijksen in litt. 1991) and even the record count may have been an underestimate (Berrevoets & Erkman 1991). Other remarkable recent counts include 900 at Akyatan Gölü in January 1990 (IWRB), c.800 at Arin Gölü and c.400 at Kulu Gölü in September 1988 and c.750 at Arin Gölü in August 1990 (I.A. Green & C.N. Moorhouse in litt. 1991), 508 at Eregli Marshes in March 1990 (G. Magnin in litt. 1991) and 354 at Hotamis Marshes in April 1991 (G. Kirwan in prep.).

There is no historical evidence of a decline in the Turkish population. The IWRB International Waterfowl Census counts have been particularly thorough in Turkey and for eight years since 1971 (71-73 and 86-90 inclusive), 11 sites have been counted each year. There is no evidence of a decline in

numbers at Burdur Gölü or the other sites over this period (Spearman Rank Correlations: for Burdur Gölü vs. year rs = +0.48 NS; for other sites combined vs. year rs = +0.19 NS). There is however a significant negative correlation between the numbers at Burdur Gölü and the numbers at the other sites combined (Spearman Rank Correlation = -0.643, N = 8, P = 0.05). This suggests that in years when the Burdur Gölü count is high, the Turkish population is highly concentrated at this lake, while in years when the Burdur Gölü count is low, more birds have dispersed to other lakes. However, this correlation may be a chance effect as the variation in count on Burdur Gölü between years may be more a reflection of changes in counting conditions than in real changes in numbers (L.J. Dijksen in litt. 1991).

| COUNTRY | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 |
|---|---|---|---|---|---|---|
| Spain | 215 (14) | 108 (16) | 157 (17) | 428 (23) | - | - |
| Algeria | 10 (4) | 78 (4) | 104 (4) | 90 (4) | 13 (3) | - |
| Tunisia | 19 (13) | 67 (15) | 175 (6) | 182 (11) | 28 (19) | - |
| Greece | 0 (1) | 85 (2) | 405 (2) | 266 (2) | 423 (2) | 170 (2) |
| Bulgaria | 1 (2) | 2 (5) | 40 (6) | 28 (5) | - | - |
| Romania | - | - | 6 (2) | 11 (3) | 18 (2) | - |
| Burdur Gölü | 4450 | 6400 | 9200 | 6700 | 6483 | 10927 |
| Other Turkey | 442 (12) | 230 (12) | 4 (11) | 326 (13) | 1043 (13) | - |
| Cyprus | 0 (1) | 0 (2) | 0 (2) | 0 (2) | 1 (2) | - |
| Israel | 70 (6) | 186 (1) | 620 (6) | 396 (4) | - | 410 (1) |
| Azerbaijan | - | - | - | - | - | 3620 (2) |
| Turkmenia | 619 (7) | 102 (8) | 358 (6) | 0 (4) | 0 (4) | 223 (7) |
| Iran | 38 (4) | 0 (2) | 628 (8) | 0 (8) | 0 (8) | 19 (8) |
| Pakistan | 325 (6) | 733 (6) | 286 (7) | 187 (6) | 76 (7) | 42 (7) |
| TOTAL COUNT | 6189 | 7991 | 11983 | 8357 | 8085 | 15411 |
| TOTAL SITES | 64 | 75 | 78 | 92 | 64 | 28 |

Table II. Total mid-winter counts of White-headed Duck in recent years, by country. All data from IWRB's International Waterfowl Census, with the exception of data for one site in Israel, provided by D. Allon (in litt. 1991) and 1991 data from Burdur Gölü provided by DHKD, Turkey. The number in brackets is the number of sites counted in that year where White-headed Duck has previously been recorded in at least one census. Dashes indicate years in which no data were received.

Israel

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 in 1984, Tishlovet Hakishon. The numbers have increased steadily each winter, from a peak count of 70 in 1986 to 410 in 1991 (Table III, D. Allon in litt. 1991). It is unknown whether these increasing numbers reflect a genuine increase in population size or simply a movement of birds

from other wetlands in Israel or elsewhere.

Greece
Cramp & Simmons (1977) report that the White-headed Duck may have bred in Greece in the 1950s. In recent years, a significant wintering population has developed in Porto Lago, and Lake Vistonis has become a major wintering site, with a peak count of 423 in January 1990 (G. Handrinos in litt. 1991, Table III).

Romania
The White-headed Duck formerly bred in the lakes of Transylvania, with the last record from Săulia in 1908. 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 (R.A. Grimmett in litt. 1991). The last previous breeding record in the Danube Delta was from Lake Agigea in 1957 (D. Munteanu in litt. 1989). The Danube Delta has been used as a wintering site since at least the 1960s and there is no evidence of a decline (Table III). The delta is also an important site for autumn passage (D. Munteanu in litt. 1989) and 218 were counted on Lake Techirghiol in November 1982 (D.A. Scott in litt. 1983).

Bulgaria
From the 1890s to 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). There are no recent records from the west but small numbers continue to winter along the Black Sea coast (Table II).

Other countries
The White-headed Duck was not recorded in Yugoslavia until the 1880s when wintering birds were observed in coastal Hrvatska, coastal Bosnia/Hercegovina and Vojvodina. Small numbers were recorded breeding between the 1930s and 1965 in Vojvodina at lakes Ludas, Palic and Saskopo (J. Mikuska in litt. 1989) but only winter vagrants are now recorded. Breeding was recorded in Hungary from 1853 onwards around the northern Danube and between the Danube and the Tisza (Schmidt 1967; Bauer & Glutz von Blotzheim 1969). The last confirmed breeding was at Lake Kondor in 1961 (Molnár 1987) although breeding may have occurred at Lake Nádas in 1971 (L. Molnár in litt. 1990). Since then only vagrants have been recorded. In Albania, breeding occurred at Lake Shkodra (Scutari) in the 1920s (F. Lamani in litt. 1989), but only vagrants have since been recorded. In Egypt, the White-headed Duck was "tolerably plentiful" in winter at Lakes Maruit and Menzaleh in the Nile wetland complex in the last century. 40 birds were shot in the area in 1925 (Meinertzhagen 1930) but there have been no recent records. Small numbers have recently been recorded wintering in Cyprus (Table I, II).

COMMONWEALTH OF INDEPENDENT STATES AND ASIA

COMMONWEALTH OF INDEPENDENT STATES
The former Soviet Union holds most of the world breeding population of the White-headed Duck and a significant part of the wintering population. The current breeding population has been estimated at 10,000 birds with 900-1,200 pairs (V. Krivenko & V.V. Morozov in litt. 1989), but there have been no systematic counts and these figures are open to a wide margin of error. The differences between former and present breeding distributions are unclear, but the following summary is largely based on Dementiev & Gladkov (1952), IZASK (1978), Ivanov (1983), Borodin (1984), Bakkal et al. (1990),

Stepanyan (1990) and Krivenko & Morozov (in litt. 1989). Breeding is concentrated in the steppes of Kazakhstan and the Russian Federation. In Kazakhstan, breeding areas include: the Aktyubinsk Steppe and lower Ilek river in the north-west; lower Turgai and Irgiz north of the Aral sea; Kurgaldzhin and Tengiz lakes in the central north; Balkash Alakol Depression in the east; middle and lower Syr Darya in the south (breeding may no longer occur here). In the Russian Federation, breeding used to occur in the Sarpa lowlands between Volgograd and the Caspian and in the Volga/Ural steppes. It has also been recorded along the Upper Yenesei near Krasnoyarsk and in the Tuva and Ubsu Nura Depressions on the Mongolian border. Breeding continues on wetlands between the Tobol and Ishim rivers in West Siberia. The species has also been recorded in the northern Caucasus and along the western coast of the Caspian. On the border between West Siberia and Kazakhstan breeding occurs to the east of the Urals around Kustanai and possibly in the Chelyabinsk Oblasts. The most important breeding area is now thought to be further east along this border, in the Kulunda and Baraba forest steppes. Breeding was formerly recorded in the lake Sevan area of Azerbaijan, along the lower Amu Darya and Tedzhen/Murgab rivers in Turkmenia and on the Afghanistan border in Tadjikistan. Breeding was recently confirmed at Lake Sultandag, South Turkmenia, where breeding pairs were recorded in 1989 (A. Poslavski in litt. 1991). The species has been recorded in the Ukraine as far west as the west coast of the Sea of Azov.

Birds have wintered in South Turkmenia along the Caspian Sea, lower Amu Darya, Tedzhen and Murgab rivers since at least the 1950s. Recently received Turkmenian mid-winter counts back to 1968 (Table I, II) record White-headed Duck at nine sites and flocks of 200 or more at five of them (Fig. 2; Khauzhkhan reservoir; Kelifskiye lakes; Lake Sultandag; Lake Kyzylburun; Krasnovodsk and North-Cheleken Bays). The peak count for the region was 850 in 1974, with 600 at Kelifskiye lakes. The last notable count was 223 at Krasnovodsk and North-Cheleken Bays in 1991.

In the late 1960s, the White-headed Duck was recorded wintering in South-east Kazakhstan on the Middle Syr Darya (Isakov 1970). In 1991 over 3,100 birds were counted in Lake Aggol and 520 in Kirov Bay in Azerbaijan (Fig. 2). This makes Lake Aggol by far the most important wintering site for White-headed Duck 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 Kirov Bay in the 1960s (M. Patrekeev in litt. 1991). Use of Aggol and neighbouring sites is perhaps dependent on the severity of the winter. Improved monitoring of this region is clearly required.

The Manych valley in the Russian Federation is a major spring and autumn migration site for the species, probably for birds wintering in Turkey (Ivanov 1983). On 27.10.80, 1,200 White-headed Duck were counted on a 100km transect bisecting the saline Lake Manych and Lake Manych-Gudilo (Linkov 1984).

Iran

There is a resident population of White-headed Duck in Southern Zagros and the Persian Gulf (Fars and Bushire Provinces), a breeding population in Azerbaijan Province in the north-west and a wintering population on the south-east coast of the Caspian (Mazandaron and Gorgan Provinces, D.A. Scott in litt. 1989). There is also a wintering population in the wetlands of the Seistan lowlands (Seistan Province) that continue across the Afghanistan

border, but these wetlands flood and dry out for several years at a time and in dry years the ducks winter elsewhere (D.A. Scott in litt. 1991). The wintering population in the Caspian is higher in more extreme winters as birds move south from states of the former USSR (D.A. Scott in litt. 1989). However, there is no evidence that the total Iranian wintering population has ever exceeded 1,000 birds (Table I). Few birds have been recorded in the mid-winter census since 1988, when 455 were counted on Lake Parishan and 173 in Hele region (Table II). 232 were counted at Lake Parishan in October 1991 (B. Behrouzi-Rad pers. comm. 1991).

Pakistan

Pakistan regularly holds White-headed Duck during the winter, concentrated in the Salt Range lakes of Punjab Province with occasional records from Sind, Baluchistan, North West Frontier Province and Capital Federation Territory. Although there are records from Punjab since at least 1921, there were no reports of large numbers until censuses began in the 1960s when a peak of 1,039 were counted in 1968 (Table I, Savage 1965, 1968). Numbers have recently been falling steadily (Table II, III), with no notable mid-winter counts since January 1989, when 100 were counted at Ucchali Lake (IWRB). However, 105 were seen in November 1990 at Jahlar Lake (A.A. Chaudhry in litt. 1991), and 142 at Khabbekki Lake in December 1991 (A.J. Green pers. obs.). An unusual sighting of six during the breeding season was made at Jahlar Lake in May 1990 (D.A. Scott in litt. 1990).

| COUNTRY | NS | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | Trend |
|---|---|---|---|---|---|---|---|---|
| Spain | 10 | 215 | 55 | 81 | 285 | - | - | +0.4 |
| Algeria | 2 | 10 | 78 | 101 | 90 | 13 | - | +0.3 |
| Tunisia | 4 | 0 | 49 | 175 | 161 | 7 | - | +0.3 |
| Greece | 1 | - | 85 | 405 | 266 | 423 | 170 | +0.3 |
| Bulgaria | 2 | 1 | 1 | 2 | 28 | - | - | +0.95 |
| Romania | 2 | - | - | 6 | 11 | 18 | - | +1.0 |
| Turkey | 9 | 4892 | 6630 | 9204 | 7026 | 7526 | - | +0.7 |
| Israel | 1 | 70 | 186 | 317 | 396 | - | 410 | +1.0 ** |
| Turkmenia | 3 | 579 | 43 | 358 | 0 | 0 | 0 | -0.88 * |
| Iran | 3 | - | - | 628 | 0 | 0 | 19 | -0.32 |
| Pakistan | 4 | - | 733 | 286 | 187 | 76 | 42 | -1.0 ** |

Table III. Mid-winter counts of White-headed Duck for constantly counted sites (those counted in each year from 1986 to 1991 with some birds present in at least one year). NS is the number of these sites. Trends analyzed with Spearman Rank Correlation. All data from IWRB's International Waterfowl Census, with the exception of data for the site in Israel (D. Allon in litt. 1991). Dashes indicate years in which the sites were not counted.

* $P < 0.05$

** $P = 0.01$

Other countries

Small numbers of White-headed Duck have been recorded in winter in Saudi

Arabia at Doumat Al Jandal, Tabuk and Yanbu (P. Symens pers. comm. 1991). Small numbers have formerly been recorded wintering in Iraq in the Euphrates/Tigris wetland complex, which contains huge areas of apparently suitable habitat that have never been properly surveyed (Georg & Savage 1970; D.A. Scott in litt. 1991). In Afghanistan, the species was resident in Seistan wetlands near the Iran border at the turn of the century, and was still wintering there in the 1970s (D.A. Scott in litt. 1991). Birds were seen from March to August in the 1970s at Ab-e-Estada on the Pakistan border and at Kole Hashmat Khan near Kabul (Sayer & van der Zon 1981). Breeding has been recorded in China in the Junggar Basin and Tienshan Mountains in Xinjiang Uygar Autonomous Region near the Kazakhstan border. The one wintering record is from Honghu Lake, Hubei province (Cheng Tso-hsin 1987). Breeding was recorded in northern Mongolia in the 1940s in the Ubsa Nur depression (Dementiev & Gladkov 1952). In northern India, the species is regularly reported in winter at Harike Lake in Punjab (Scott 1989). Small numbers have formerly been recorded wintering in Kashmir, Delhi District and Uttar Pradesh (Ali & Ripley 1968).

## 2.2 Population

On the basis of recent winter counts (Tables I & II), the present world wintering population of White-headed Duck can be conservatively estimated at 19,000 birds. The West Mediterranean population can be estimated at 1,000 (600 in Spain and 400 in North Africa) with a 1989 count of 700. The East Mediterranean wintering population can be estimated at 13,000 (12,000 for Turkey and neighbouring countries; 1,000 for the Israel area) with a 1991 count of 11,507. The South-west Asian wintering population can be conservatively estimated at 5,000, with a 1991 count of 3,904. Many potential wintering sites in South-west Asia still have an unknown fauna, particularly in Iraq, Afghanistan and the former USSR, and this population is likely to be underestimated.

The range of the White-headed Duck has contracted markedly this century (Fig. 1). However, there is are few data to assess the changes in the total population size resulting from this decline in range. The historical evidence suggests that many of the extinct populations were probably very small, and the disappearance of breeding populations from Morocco, Egypt, Israel, France, Italy, Yugoslavia, Hungary and Albania may have resulted in the loss of less than 1,000 birds in total. A decline in the main population breeding in the former Soviet Union is suggested by anecdotal reports of up to 50,000 birds wintering in the South-east Caspian in the 1930s (Dementiev 1952). There have been no records of over 1,000 White-headed Duck in the Caspian sea since the 1960s. A similar decline has occurred in the population of Red-breasted Geese *Branta ruficollis* wintering in the South-west Caspian. 40,000 in the 1950s declined to only a few hundred since 1970, following a shift in wintering grounds to Black Sea coasts (Krivenko 1983).

There is very little evidence for a current decline in the size of the White-headed Duck populations. Analysis of trends in count data for sites counted consistently in recent winters shows no evidence of a present decline in the West Mediterranean population (Table III), with Spain, Tunisia and Algeria all showing a slight positive trend. Likewise, there is no evidence of a present decline in the East Mediterranean population (Table III), with Turkey, Greece, Romania, Bulgaria and Israel all showing a positive trend. In contrast, in South-west Asia, winter counts in Turkmenia, Iran and Pakistan all show a negative trend (Table II, III). In

Iran and Turkmenia there is no evidence that these figures reflect a genuine decline. They are likely to result from incomplete data that do not truly reflect the size of the wintering population, as White-headed Ducks typically change sites from one winter to a next and only a small proportion of these sites are counted. In addition, many sites are very large and impossible to count accurately. In Pakistan the trend probably reflects a genuine decline in the size of the wintering population, as the three most important lakes (Khabbakki, Ucchali and Jahlar) have all been severely degraded in recent years by over-grazing, fish introductions and increased hunting and are decreasing in size following the diversion of rain water for irrigation (Scott 1989; A.A. Chaudhry in litt. 1991).

It is difficult to establish to what extent the changes in distribution and population size observed in the White-headed Duck over the past two centuries result from natural oscillations. Some of the changes are explained by the fact that the White-headed Duck is dependent on wetlands subject to major fluctuations in water level between years. The White-headed Duck is an opportunistic species able to utilise ephemeral wetlands as and when they appear. Thus, some breeding populations in former range countries may have been only marginal populations that appeared and later disappeared as a result of these fluctuations. Variation in rainfall between years plays a major part in determining distribution, breeding success and population size in Spain (Amat & Raya 1989), Tunisia (M. Smart in litt. 1989) and elsewhere. There is some evidence that a drying in climate this century has caused a shrinkage of the main breeding range in the former USSR as well as a shift in the range to the north and east (Krivenko 1990).

### 2.3 Habitat

The White-headed Duck *Oxyura leucocephala* is largely dependent on shallow, productive, brackish to saline wetlands, particularly "endorreic" wetlands having a closed basin hydrology and found in arid to semi-arid areas of gentle relief (Cramp & Simmons 1977; Anstey 1989). Many of these wetlands are temporary or semi-permanent, leading to fluctuations in distribution and population size in response to climatic changes and annual fluctuations in rainfall.

### 2.4 Migrations

Most of the worlds White-headed Ducks are found in the east of its range where the species is largely migratory, breeding in the steppe lakes of Kazakstan and West Siberia in the Russian Federation and wintering in Turkey, Iran, Azerbaijan and Pakistan. An estimated 80 percent of the worlds population is migratory. Small local resident populations are located in Turkey, Iran and China. In the western range the species is largely resident.

## 3. Threat Data

### 3.1 Direct threat of the population

The greatest threat to the survival of the White-headed Duck is from hybridisation and competition with the North American Ruddy Duck *O. jamaicensis* introduced into the UK in the 1950s and now spreading across the continent as it undergoes exponential population growth (Hudson 1976; Hughes 1991). The Ruddy Duck appears well able to exploit a wide range of wetland types and has already been recorded in at least 15 European

countries (Hughes 1991). Breeding has been recorded in several countries, including France, Belgium, the Netherlands and Spain. The number of Ruddy Ducks and hybrids seen in the areas of Spain occupied by the White-headed Duck is increasing rapidly and by March 1993 at least 28 Ruddy Ducks and 18 hybrids had been shot at White-headed Duck sites (A.M.A. pers. comm. 1993). Hybrids between the two species have been produced at The Wildfowl & Wetlands Trust, UK, where they have been shown to be fertile and able to interbreed successfully with each other and with White-headed Duck. Some of the hybrids shot in Spain are thought to be of at least second generation (ICONA pers. comm. 1992). While the Spanish population is under imminent threat, in the long term the Ruddy Duck could become an abundant species across the whole of the White-headed Duck's range and the gene pools of the two species could merge. Indeed, there have been records of the Ruddy Duck from Morocco and the Ukraine, suggesting that contact with the north African and eastern populations of White-headed Duck may soon commence.

Hunting of White-headed Duck still occurs across most of the range, and is a particular threat where the species occurs in small numbers. Hunting and egg collection was probably the final cause of extinction in France, Italy, Yugoslavia and Egypt. Effective protection from illegal hunting in Spain has played a vital role in the recent recovery of the Spanish population (Amat & Raya 1989) and action to control hunting is now being taken elsewhere in the range. A recent education programme by IWRB, The Wildfowl & Wetlands Trust and Doğal Hayati Koruma Derneği (Turkish Society for the Protection of Nature) led to a hunting ban at Burdur Gölü and Yarisli Gölü in Turkey from December 1990 onwards. However, a survey in February and March 1993 found intense illegal hunting at Burdur Gölü with an estimated 500-1,000 birds shot over the whole winter. At the time of writing, we expect to achieve an effective permanent hunting ban at the site. In 1989, WWF Pakistan and the Punjab Government launched a three year project to protect the White-headed Duck at three sites, providing guards and launching public awareness campaigns (A.A. Chaudhry in litt. 1990).

### 3.2 Habitat destruction

Human influence has undoubtedly contributed to the reduction in the White-headed Duck's range and probably also to declines in population size within the current range. Drainage and degradation of wetlands of former importance for breeding and wintering has occurred across the range. This has included degradation of large areas of wetlands in the steppe-lands of the former USSR through water management schemes and conversion for agriculture (Borodin 1984; Bakkal et al. 1990), and drainage of 60% of lagoons in Andalucia this century (A.M.A. pers. comm. 1991). At the time of writing, Burdur Gölü is threatened by a new proposal for construction of a large industrial complex and airport on the lake's shore.

### 3.3 Indirect threat

The fact that many of the wetlands used by White-headed Duck are endorreic makes them particularly vulnerable to degradation through pollution. This is of particular concern at Burdur Gölü, where large quantities of human and industrial effluent are currently discharged into the lake (DHKD in litt. 1991). In some Spanish wetlands, breeding success of the White-headed Duck has been adversely affected by introductions of carp, eels and of Louisiana Crayfish *Procambarus clarkii* thought to affect food supply by direct competition and by causing turbidity.

### 3.4 Threat connected especially with migrations

The North American Ruddy Duck is essentially a migratory species in Europe, with the spread of the species southwards occurring mainly in winter and the spread northwards occurring mainly in summer. For example, most records in countries north of the UK such as Norway, Sweden and Iceland are in summer while most records from countries south of the UK such as Belgium and France are in winter (M. Grussu and B. Hughes in prep.). Hence the current increase in the Ruddy Duck population in non-White-headed Duck range states carries a high threat of extinction to the White-headed Duck in the long term.

Furthermore, the major, eastern White-headed Duck population is migratory and although the site by site details of the migration routes adopted are largely unknown, the birds are sure to face threats from hunting and habitat loss on these routes.

## 4. Protection status and needs

### 4.1 National Protection Status

4.1.1 Turkey - legally protected.

4.1.2 Former Soviet Republics - was a protected species in the USSR and listed under Category IV (rare, little-studied species) in the Red Data Books of the USSR, RSFSR and Kazakhstan SSR.

4.1.3 Iran - protected by law since 1985.

4.1.4 Pakistan - protected by law.

4.1.5 Spain - legally protected.

4.1.6 Algeria - ????

4.1.7 Tunisia - protected under law from hunting.

### 4.2 International Protection Status

To be completed.

CITES Appendix II.

### 4.3 Additional Protection Needs

The highest priority for action to conserve White-headed Duck must now be to prevent the Ruddy Duck from becoming fully established on the European continent by any means available, in particular implementation of the recommendations of the international *Oxyura jamaicensis* workshop of 1-3 March 1993.

While the White-headed Duck currently appears to be stable or increasing in numbers across much of its range, the species and its habitat is poorly protected in many areas and there remains a need for conservation action to prevent future declines. Burdur Gölü (Turkey) and Lake Aggol (Azerbaijan) should be granted effective protection from habitat degradation and hunting. Effective habitat protection is urgently required in the Salt Range of Pakistan, where the White-headed Duck population could

potentially go extinct within a few years.

More detailed monitoring of White-headed Duck is required during the breeding season, particularly in the former Soviet Union where current distribution is very unclear. Without this information it will not be possible to ensure conservation of the main population by providing effective protection on its wintering grounds. Similarly potential wintering sites in Afghanistan and Iraq should be surveyed as soon as it becomes possible.

A flyway management plan would be a very valuable tool for maintaining the current range and abundance of White-headed Duck and allowing for possible expansion. Flyway conservation is particularly appropriate for this species owing to its frequent movements between different breeding or wintering sites within a flyway. Such a plan is called for in the draft Western Palearctic Waterfowl Agreement (Boere & van Roomen 1991), which would provide a suitable forum for its successful implementation.

## 5. Range states

[ R = resident, B = breeding, W = wintering, M = migration, FB = formerly bred, FW = formerly wintered ].

5.1 Spain - R.
5.2 Algeria - R.
5.3 Tunisia - W, occasional B.
5.4 Greece - W.
5.5 Bulgaria - W.
5.6 Romania - B, W.
5.7 Turkey - large number W, small number B.
5.8 Cyprus - W.
5.9 Israel - W.
5.10 Azerbaijan - W.
5.11 Turkmenia - B, W
5.12 Kazakhstan - B, W.
5.13 Russian Federation - B, M.
5.14 Uzbekistan - M.
5.15 Ukraine - M.
5.16 Iran - R, W.
5.17 Pakistan - W.
5.18 Other countries - occasional winter records and historical records from Morocco (FB), France (FB), Italy (FB,FW), Yugoslavia (FW), Hungary (FB), Albania (FB), Egypt (FW), Saudi Arabia (W), Iraq (W - no recent survey), Afganistan (R, W - no recent survey), China (B, W - has been recorded), India (W), Tadjikstan (B - no recent survey), Mongolia (FB - no recent records).

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FIG. 1 Past and present distribution of the White-headed Duck. Light shading shows past distribution, dark shading shows present distribution and ? indicates areas where present status is unclear.

FIG. 2 32 wetlands where at least one count of 100 or more White-headed Duck has been made since 1980. Hollow circles are wintering sites, solid circles breeding sites, solid triangles are sites where the species is resident and hollow triangles passage sites. Nine wetlands where at least one count of 500 or more has been made are as follows:

1 Burdur Gölü, Turkey
2 Akyatan Gölü, Turkey
3 Arin/Sodali Gölü, Turkey
4 Eregli Marshes, Turkey
5 Lake Sultandag, Turkmenia
6 Kirov Bay, Azerbaijan
7 Lake Aggol, Azerbaijan
8 Ucchali Lake, Pakistan
9 Lake Manych/Manych-Gudilo, Russian Federation