

**1st MEETING OF THE AEWA WHITE-HEADED DUCK
INTERNATIONAL WORKING GROUP**
24-26 October 2016, Madrid, Spain

DRAFT SPECIES STATUS REPORT FOR THE WHITE-HEADED DUCK
Oxyura leucocephala

Introduction

The attached draft Species Status Report for the White-headed Duck has been prepared by SEO/BirdLife Spain as part of the EU LIFE project ‘Coordinated Efforts for International Species Recovery EuroSAP’(LIFE14 PRE UK 002).

The Status Report serves as a background document for the revision of the CMS/AEWA International Single Species Action Plan for the Conservation of the White-headed Duck, which is expected to be adopted at the 7th Session of the Meeting of the AEWA Parties and by the CMS Scientific Council in 2018.

Action requested from the AEWA WhD IWG

The Working Group is invited to take note of the Status Assessment provided by SEO.

LIFE project
Coordinated Efforts for International Species Recovery EuroSAP
(LIFE14 PRE UK 002)

DRAFT

Species Status Report for White-headed Duck *Oxyura leucocephala*



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EuroSAP is a LIFE preparatory project, co-financed by the European Commission Directorate General for the Environment, the African-Eurasian Migratory Waterbird Agreement (AEWA), and by each of the project partners, and coordinated by BirdLife International. [www. http://www.birdlife.org/europe-and-central-asia/project/life- eurosap](http://www.birdlife.org/europe-and-central-asia/project/life-eurosap)

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This is the first draft of the "Species Status Report for White-headed Duck *Oxyura leucocephala*" – all comments, corrections, missing/new information and contributions are welcome. Please send them to Jorge Fernandez Orueta at jorueta@seo.org for the incorporation into the 2nd draft of this report.

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1. BACKGROUND

White headed Duck (WhD) is a small chestnut brown stiff-tailed diving duck with a typical Palearctic distribution. The IUCN status for the species is endangered (EN). This status is justified because of the sharp and deep decline in their populations.

In some countries like Spain almost disappeared in 1970s, but, although this situation was reversed, the evolution in the rest of the area has been negative during decades, based on winter counts. A very rapid decline is estimated for the last ten years, which is expected to slow to a rapid decline over the next ten years. (BirdLife, 2015a). Recent records, either due to an incremental effort, by dispersion in the figures of wintering individuals, or to the gathering in new habitats (reservoirs, sewages) recommends to review in deep the situation in some areas.

WhD has been the object of SAP every ten years from 1996 (Green & Hughes, 1996; Hughes et al., 2006) so this would be the third SAP successive.

2. RATIONALE FOR POPULATION ASSESSMENT

The critical situation of WhD in Europe in the 1970s lead to the implementation of urgent conservation measures that lead to a manifest improvement of its population level in Spain. Strict protection of few small wetlands and protection from poaching allowed a significant increase. However, in the 1980s, a new threat appeared due to the expansion of a close relative species, introduced in the UK four decades before, the Ruddy duck, *O. jamaicensis*. In 1991 the first hybrids were detected in Spain and the new threat was faced with determination. In 1996, the first SSAP was draw to ensure the recovery of WhD in the whole global range of the species (Green & Hughes, 1996). Ten years later, AEWA prepared a new SSAP with the same global scope (Hughes et al. 2006). In parallel, the Bern Convention encouraged the writing and implementation of Ruddy duck eradication plans (Hughes et al 1999; Cranswick & Hall, 2010; CoE, 2016). The situation in the Eastern range shows also a negative tendency (BirdLife, 2015b). The main cause of this decline is habitat destruction due to drought and draining. The drying up of sites in Kazakhstan caused its redistribution in the region, forcing birds into the southern regions of the Aral Sea basin and onto previously unused irrigation water-reservoirs in Uzbekistan, and, perhaps, Turkmenistan. Many important sites for the WhD totally dried out, or their area and water level were greatly reduced. The long-term effects of drought and groundwater extraction on the viability of WhD populations are unknown although potentially critical. These affect to breeding sites in Turkey, Kazakhstan, Mongolia, Russia and Uzbekistan; wintering sites in Turkey, Pakistan, Iran and Turkmenistan; as well as on staging sites in Afghanistan, Kazakhstan, Uzbekistan, Iran, Turkmenistan and possibly Tajikistan (Li & Mundkur, 2003). Dams could also affect inversely the water level, driving to habitat destruction in several countries (Hughes et al., 2006).

3. GEOGRAPHIC RANGE

WhD range is the Palearctic, with two distinct subpopulations: one mainly migratory, breeding in Russia, Kazakhstan, Uzbekistan, Turkmenistan, China and Mongolia; and the other, sedentary in Spain, Morocco, Algeria, Tunisia, Turkey, Iran and Pakistan.

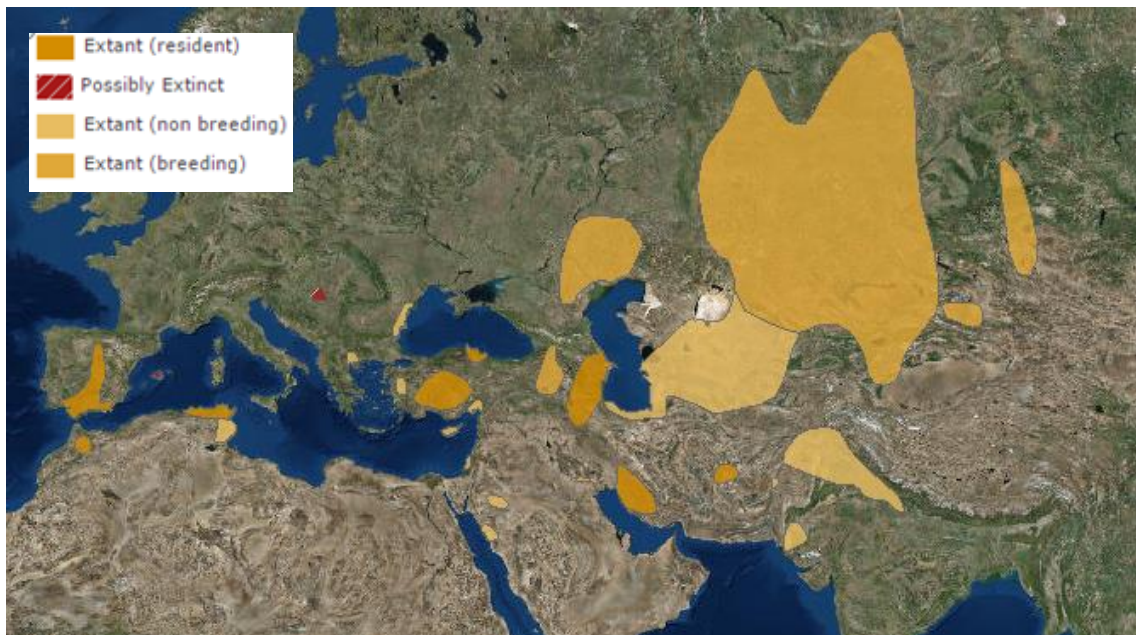


Figure 1 BirdLife International and NatureServe (2014) Bird Species Distribution Maps of the World. 2012. *Oxyura leucocephala*. The IUCN Red List of Threatened Species. Version 2016-2

Native:

Afghanistan; Algeria; Armenia (Armenia); Azerbaijan; Bulgaria; China; Cyprus; Georgia; Greece; India; Iran, Islamic Republic of; Iraq; Israel; Jordan; Kazakhstan; Kyrgyzstan; Mongolia; Morocco; Pakistan; Romania; Russian Federation; Spain; Syrian Arab Republic; Tajikistan; Tunisia; Turkey; Turkmenistan; Ukraine; Uzbekistan

Regionally extinct:

Hungary

Vagrant:

Albania; Austria; Belgium; Bosnia and Herzegovina; Denmark; Egypt; France; Germany; Italy; Libya; Malta; Netherlands; Poland; Portugal; Saudi Arabia; Slovakia; Slovenia; Switzerland

Present - origin uncertain:

Croatia; Macedonia, the former Yugoslav Republic of; Montenegro; Palestinian Territory, Occupied; Serbia (Serbia)

WhD is resident in Spain, Algeria and Tunisia. A larger population breeds primarily in Russia and Kazakhstan, and also Turkey, Iran, Afghanistan, Tajikistan (likely small and declining), Turkmenistan, Uzbekistan, Armenia, and Mongolia (believed to be increasing in this latter). Its status in China is unclear, but it appears to be rare. It

occurs on passage/in winter in the eastern Mediterranean, the Middle East, and central and south Asia.

4. BIOLOGY

Unless other source is mentioned, information is adapted from BirdLife (2015a) and Hughes et al. (2006).

Habitat

Breeding

It breeds on small, enclosed, semipermanent or temporary freshwater, brackish or eutrophic lakes with a fringe of dense emergent vegetation of helophytes, such as *Phragmites* or *Typha* species, and a covering of hydrophytes (like species of Potamogetonaceae). It is usually found where these conditions occur within larger wetland systems, and shows a preference for areas with extensive areas of shallow water.

Nonbreeding

During the winter the species inhabits larger, deeper alkaline or saline waters which often have less emergent vegetation than in the breeding season, but still support algae and pondweeds. Habitats include saline inland lakes, coastal lakes and lagoons, and even the coastal waters of inland seas, although it is not found on areas of coast that are subjected to heavy wave action. In the northeast of its range it is associated with water bodies which are sufficiently saline so as not to freeze over during winter. In Middle east, they frequent reservoirs and sewage ponds (Hadad & Moyal, 2007; Balmer & Murdoch, 2010).

Diet

Being a diving duck, its diet is omnivorous. It consists predominantly of benthic midge (Chironomidae) larvae, both for adults and for ducklings, at most sites. They consume also other aquatic invertebrates such as amphipods, isopods and polychaetes (especially in coastal wintering sites). Seeds and the vegetative parts of *Potamogeton* spp., *Ruppia* spp., *Scirpus* spp., as well as other helophytes and hydrophytes, are also consumed. The availability of chironomid larvae, and other food items (Murzakhanov *et al.*, 2009), is a key feature in habitat selection. Old literature overstates the importance of hard food items well preserved in the gizzard (in contrast to soft-bodied invertebrates). Thus wintering birds on Caspian Sea contained snails *Hydrobia*, red seaweed *Polysiphonia*, and stonewort *Chara*, and seeds of *Ruppia maritima*. Females from central Kazakhstan, in July contained seeds of *Potamogeton* and *Najas*, and water boatmen *Corixa* and *Micronecta*. Young birds caught at same time had only insects.

Breeding

The nest is constructed over water in emergent vegetation (usually *Phragmites* spp. or *Typha* spp.). It consists of a cupped platform of leaves and stems, over which a roof may be formed by bending down overhead leaves. It will also use old nests of coots or

ducks, and has been found to make use of nesting boxes in which it constructs a nest of twigs. The timing of breeding is variable, from April to early July

Migratory behaviour

Eastern populations (Central and Western Asia) are migratory while movements in the Western range (Spain and North Africa) are more dispersing than migratory.

Migrating birds breed from April to July. After breeding it undergoes a flightless moulting period lasting for 23 weeks. Large flocks of moulting individuals gather on certain sites (e.g. the Sudochie wetlands in Uzbekistan, and Lake Tengiz in Kazakhstan) before they begin the migration to their wintering grounds in late August to arrive September-October. In Central Kazakhstan, largest numbers occur in September, but birds leave the region completely by mid-October. In Uzbekistan, major passage through the Amu Darya delta in October. In Pakistan, birds first appear in October and leave by the end of March.

The return journey commences in February and all birds have returned to the breeding range by early May. The species is highly gregarious outside of the breeding season with more than 10,000 gathering at some winter sites, although individual flocks more usually contain less than 500 individuals. It breeds in single pairs.

In Mediterranean populations, although it forms congregations at certain sites outside breeding season, there is no overall direction to its seasonal movements and the location of such non-breeding sites varies among years. It is currently unknown whether there is interchange between the Spanish and North African populations. However, the recent increase in the number of WhDs in Morocco suggests that interchange does occur. Emigration of birds from Algeria or Tunisia was suggested as a possible explanation for the peak count of 4,489 birds in Spain in September 2002. However, as over 1,000 ducklings were hatched at El Hondo that year, it seems equally likely that these numbers could be explained by a bumper breeding year.

5. POPULATION SIZE

Population and conservation status

Some countries have recent and very accurate information about their populations, but in other cases information is fragmentary.

There's updated information on European breeding population (BirdLife International, 2015b) (Table 1).

Country	Size (individuals)	%	years	quality
Armenia	20-40	7	2002-2012	good
Georgia	Present	<1		
Russia	30-80	<1	2005-2008	poor
Spain	120-318	51	2008-2012	good
Turkey	82-168	30	2013	good

Table 1 WhD European breeding population (BirdLife International, 2015b)

For other countries outside Europe, breeding data are in general, older (BirdLife International, 2015a). Nevertheless, the important wintering population at least in Turkey, Israel, Syria and Azerbaijan (see below), seems to indicate that the breeding population in Central Asia is important, mainly in Asian Russia, Kazakhstan, Uzbekistan and Turkmenistan. Li et al. (2006) give few thousands birds in Kazakhstan (from Belyalov & Kovshar, 2004) where concentrations of up to 2000 birds were recorded in a single lake (Gavrilov & Gavrilov, 2006) as well as for Uzbekistan. The most recent post-breeding (September, 2016) census for Kazakhstan gave more than 20,000 birds (ACBK, 2016). Counts are very irregular depending on drought and flooding, which affects not only the distribution of the flocks but also the accessibility of the sites.

The information regarding the non-breeding population has been updated recently (BirdLife International, 2015b) (Table 2).

Country	Size (individuals)	%	years	quality
Albania	0	<1	2002-2012	
Azerbaijan	5,000-10,000	68	2014	good
Bulgaria	50-2,100	3	2000-2012	good
Cyprus	0-4	<1	2007-2012	good
Georgia	Present	<1	2012	?
Greece	1-102	<1	2007-2013	good
Romania	5-10	<1	2008-2013	medium
Serbia	0-1	<1	2008-2012	medium
Spain	1,562	15	2008-2012	good
Turkey	868-2,123	13	2002-2012	good
Ukraine	0-5	<1	1996-2009	medium

Table 2 WhD non-breeding population in Europe (BirdLife International, 2015b)

Table 3 show the evolution of the figures counted during the Midwinter Waterfowl Census, countries with winter counts under 15 individuals have been neglected. Those are Cyprus, France, The Netherlands, Romania, Russian Federation, Ukraine and United Kingdom. In order to appreciate priorities, colours indicate countries with counts between 1-5% (orange), 5-15% (yellow) and more than 15% (green).

NON BREEDING	2005 N %	2006 N %	2007 N %	2008 N %	2009 N %	2010 N %	2011 N %	2012 N %	2013 N %
ALGERIA	29 0,4	39 0,5	755 7,7	0,0	1410 42,2	603 13,9	0,0	0,0	818 17,6
AZERBAIJAN	669 9,5	2465 29,7	1089 11,1	110 1,6	257 7,7	60 1,4	0,0	2136 43,8	678 14,6
BULGARIA	271 3,8	372 4,5	0,0	4 0,1	4 0,1	146 3,4	184 5,4	61 1,3	0,0
GREECE	95 1,3	333 4,0	3 0,0	102 1,5	0,0	1 0,0	87 2,6	0,0	0,0
IRAN	388 5,5	80 1,0	3070 31,3	4225 60,1	0,0	770 17,8	1518 44,7	177 3,6	169 3,6
ISRAEL	1261 17,8	1183 14,2	2605 26,6	0,0	0,0	0,0	0,0	0,0	0,0
MOROCCO							0,0	0,0	231 5,0
SPAIN	2290 32,4	2065 24,8	1378 14,1	1477 21,0	1399 41,9	1392 32,2	102 3,0	311 6,4	716 15,4
SYRIA	751 10,6	350 4,2				65 1,5	0,0	572 11,7	0,0
TUNISIA		191 2,3	26 0,3	188 2,7	262 7,8	369 8,5	253 7,4	1616 33,1	386 8,3
TURKEY		1235 14,9	868 8,9	910 13,0	0	920 21,3	1251 36,8	0,0	1621 35,0

TURKMENISTAN	84	1,2				6	0,1											
UZBEKISTAN	1227	17,4				2	0,0	1	0,0									
TOTALS	7067	100	8313	100	9794	100	7026	100	3341	100	4327	100	3398	100	4875	100	4635	100

Table 3 Evolution of wintercounts in the area (data from Wetlands International, 2015)

The relative status of the European countries is quite consistent between the two sources. Furthermore, for non-European countries, there are some records that have not been detected in the winter counts. For instance, Balmer and Murdoch (2010) mention a minimum of 2300 WhD in Syria. Numbers in Israel have also increased recently, reaching up to 2605 in 2007 (Hadad & Moyal, 2007). Those records make this area extremely important to WhD during winter, when they can use wastewater reservoirs as they also do in Spain (Torres-Esquivias, 2008, 2009; Molina *et al.*, 2010) and Russia (Murzakhanov *et al.*, 2009).

After the census of more than 5,000 birds in Uzbekistan the numbers were considered underestimated (Li *et al.*, 2006). The recent census of more than 20,000 birds in Kazakhstan (ACBK, 2016) calls for a new revision of the global status.

6. POPULATION TREND

Population has been growing between the 1970s and 2000s in the Western range. In Spain, 2001 was a very favourable year, and the population has been stable since then (Torres-Esquivias, 2008, 2009).

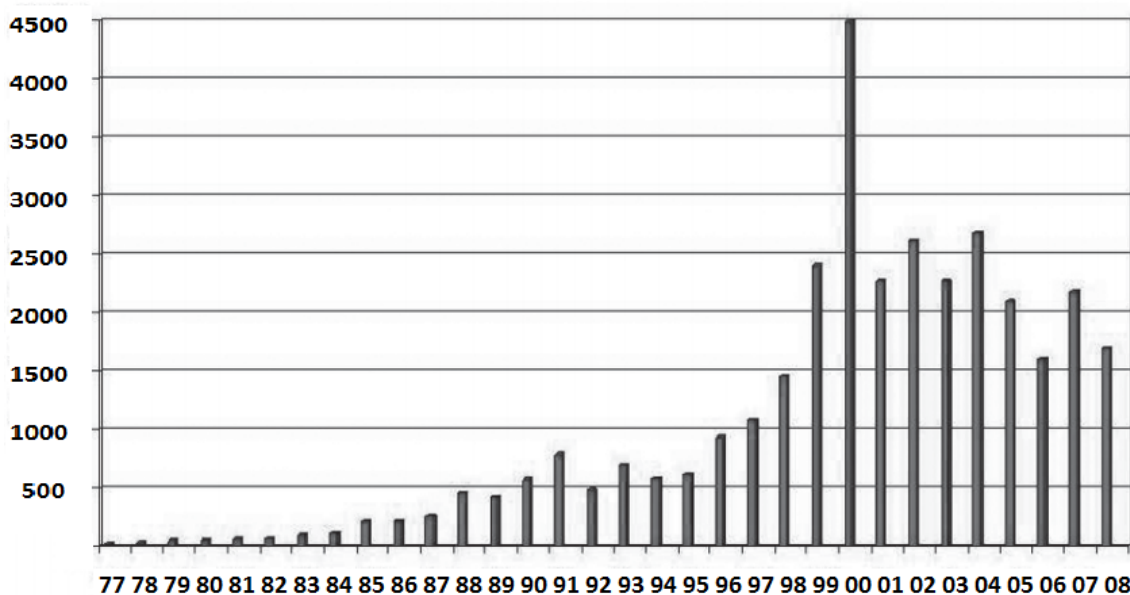


Figure 2. Evolution of WhD population in Spain (number of individuals) (Torres Esquivias, 2009)

The tendency is negative in the rest of the area. The status of the breeding population for Europe is decreasing (BirdLife, 2015b).

The global population of the WhD was probably over 100,000 in the early 20th century, falling to an estimated 20,000 individuals in 1996 (Green & Hunter 1996). BirdLife International (2000) estimated the world population as 2,500-10,000 individuals. The South Asia wintering population (mainly in Pakistan) decreased from 1,039 birds in 1968 and 733 in 1987 to less than 10 individuals in 2002 (Li & Mundkur 2003). The numbers of WhD in Turkey and Azerbaijan have fallen consistently at the end of the 20th century. In Turkey, numbers have fallen from 10,927 birds in January 1991 to about 1 000 birds in January 2000, 2001 and 2002, and in Azerbaijan, from 3,520 birds in January 1991 to 334 in January 2000. However, in the eastern Mediterranean, WhD numbers have apparently increased: 2,213 and 1,472 birds were recorded in Greece in January 1997 and 2000, respectively; 1,970 birds were recorded in Bulgaria in January 2001; and 520 birds were recorded in Romania in January 2001. This could suggest that the main wintering grounds of the WhD are shifting westwards (Li et al., 2006). The resident North African population (400-600 birds) is stable and the Spanish population has increased from 22 birds in 1977 to around 2,500 birds today. Surveys conducted between 2001 and 2003 by the Spanish WhD Working Group suggest the population may be beginning to stabilise.

Li & Mundkur (2003) assesses the global wintering population of 8,000-13,000 birds in 2002, that should be revised after the record of more than 5,000 WhD in Uzbekistan (Li et al., 2006).

The mentioned post-breeding record of 20,000 birds in Kazakhstan in 2016 implies that the whole figures should be revised.

7. CONSERVATION AND LEGAL STATUS

- EU Directive (79/409/EEC) on the Conservation of Wild Birds (Birds Directive)- Annex I
- Convention on Biological Diversity (Biodiversity Convention)
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)- Appendix II
- Convention on Migratory Species of Wild Animals (CMS) - Appendix II
- African-Eurasian Migratory Waterbird Agreement (AEWA)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

In addition to this, the following texts support general control of IAS and more precisely Ruddy Duck in Europe to protect WhD.

- EU Directive (79/409/EEC) on the Conservation of Wild Birds (Birds Directive)
- EU Directive (92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitats Directive)
- Convention on Biological Diversity (Biodiversity Convention)
- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)
- Convention on Migratory Species of Wild Animals (CMS)
- African-Eurasian Migratory Waterbird Agreement (AEWA)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

WhD is protected at national level in all the countries of its range (Hughes et al., 2006). Effectiveness of protection is very variable, but many countries claim the lack of law enforcement (Updated table to be provided when national questionnaires are fulfilled).

8. THREATS

Unless other source is mentioned, information is adapted from Hughes et al. (2006) and BirdLife (2015b).

The analysis of threats in the previous SSAP (Hughes et al., 2006) showed the hierarchy of categories (Table 4).

Threat	Migratory Central Asian Breeding	Migratory South Asian Wintering	Resident North African	Resident Spanish
Hybridisation with invasive alien species	CRITICAL	CITICAL	CRITICAL	CRITICAL
Climate change/drought	CRITICAL	CRITICAL	CRITICAL	CRITICAL
Groundwater extraction and infrastructure development	CRITICAL	CRITICAL	HIGH	CRITICAL
Arable farming	CRITICAL	CRITICAL	MEDIUM	MEDIUM
Over-hunting	HIGH	HIGH	HIGH	LOCAL
Inadequate wetland management	HIGH	-	-	HIGH
Pollution	MEDIUM	HIGH	MEDIUM	MEDIUM
Drowning in fishing nets	HIGH	LOW	LOCAL	LOCAL
Lead poisoning	MEDIUM	LOW	LOW	HIGH
Human disturbance	LOW	MEDIUM	LOW	LOW
Invasive alien species (directly impacting habitat)	LOW	LOW	LOW	LOW
Competition with invasive alien species	LOW	LOW	LOCAL	LOCAL
Livestock farming	LOCAL	LOCAL	LOCAL	-
Wildfire	LOCAL	LOCAL	LOCAL	-
Predation by Brown Rats	-	-	-	LOCAL

Table 4 Threat analysis (Hughes et al., 2006)

Since hybridisation was detected, the greatest long-term threat to the species survival has been thought to be reproductive competition and introgressive **hybridisation** (i.e.

genetic swamping) with the non-native North American Ruddy Duck *Oxyura jamaicensis* (Green & Hughes, 1996). The threat from the Ruddy Duck has been considered extremely serious, given that, if allowed to proceed beyond a certain point, the Ruddy Duck's spread across the Palearctic would become unstoppable, especially if the species was allowed to become established in WhD 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.

Climate change is thought to be causing more frequent droughts and drying out of many lakes in central Asia which may be a great threat to the survival of the species. Droughts in Kazakhstan and Uzbekistan may have caused poor breeding seasons in 2002 and 2003 (Li & Mundkur, 1993). Nearly 50% of breeding habitat has been drained during the 20th century. Remaining sites are vulnerable to drainage, filling, pollution and disturbance.

Groundwater extraction for agriculture and other uses has affected water levels in many important sites throughout the range. The main Pakistani wintering lakes, suitable habitat had decreased because of lowered water levels due to reduced water supply, and that fisheries had increased disturbance. In Turkey, dam construction is reducing or drying relevant wetlands (A. Gürsoy Ergen, *in litt.*, 2016).

The **development of infrastructures** leads to strong transformation by dams or for recreational purpose in such a way that the habitat is no longer available for the birds (Li & Mundkur, 2003).

Intentional drainage of wetlands for **arable farming** is the most significant factor in the past decline of the WhD. This has happened across the whole range, from Spain to Russia, mostly in the 20th century. Erosion around shallow wetlands still is an important factor of habitat losses encouraging further cultivation of the edges. This is still an issue in countries like Turkey (A. Gürsoy Ergen, *in litt.*, 2016).

The WhD is an incredibly easy bird to shoot given its lack of an escape response when facing hunters (Green *et al.* 1996) and **over-hunting** therefore undoubtedly played an important role in its decline. This was probably the main cause of the decline in Spain until hunting was banned. Illegal shooting or trapping has been reported in Azerbaijan, Bulgaria, Greece, Pakistan, Russia, Tunisia, Turkey, Turkmenistan and Uzbekistan.

From Spain to Central Asia, **poorly managed wetlands** dry out and also suffer the effects of pollution and eutrophication. Given that Chironomids are the main factor for habitat selection and that many species could live in sewage water, WhD are increasingly using wastewater reservoirs (Hadad & Moyal, 2007; Torres-Esquivas, 2008, 2009; Molina *et al.*, 2010), those places are easily unmanaged and could be a source of troubles due to water quality. Some of these polluted wetlands could be drained for public health reasons (Tashkinbayev *et al.*, 2015).

As many of the wetlands used by WhD are endorreic they are particularly vulnerable to hyper-eutrophication and **pollution**, from agricultural, domestic or industrial sources.

Diving ducks are prone to becoming trapped and **drown in fishing nets**, which in some instances can cause significant mortality, for example in Greece, Iran, Kazakhstan, Pakistan and Uzbekistan. Local cooperative in Vistonis Lake (the main wintering lake for the WhD in Greece) carries out the fishing activity far away from the area where the WhDs are distributed and doesn't allow the use of nets (S. Kavantzidis *in litt.*, 2016).

Another cause of death is **lead poisoning**, through ingestion of lead shots, which is still used legally in shotgun cartridges in many WhD range countries. As hunting is intense at many key sites, the ingestion of lead shot could result in significant mortality. Different tests proved that 32-50% of WhD had ingested lead and up to 80% of those had lethal concentrations. Lead persists in the wetlands' sediments years after the ban of this metal on ammunition, making it a long-term issue. Lead has been banned on relevant wetlands in some countries like Greece (S. Kavantzidis *in litt.*, 2016), in other countries the ban has been considered and the administration has adopted lead-free ammunition (O. Hatzofe, *n litt.*, 2016). But no reduction on the use of lead occurred in countries like Iran (Zahra Elahi Rad, *n litt.*, 2016), Syria (N. Ghazal Asswad, *in litt.*, 2016), Turkmenistan (E. A. Rustamov, *in litt.*, 2016) or Turkey (A. Gürsoy Ergen, *in litt.*, 2016).

Human disturbance due to hunting, fishing and boating activities during the breeding period, is thought to be a threat to the WhD in many countries, including Iran, Kazakhstan, Pakistan, and Turkmenistan (Li & Mundkur 2003).

Invasive alien species (IAS) impact on the habitat, through the destruction of edge and bottom vegetation and changes in the nutrients, making it inadequate to WhD. This has been mentioned for Muskrat *Ondatra zibethicus*, Common Carp *Cyprinus carpio*, Tilapia *Oreochromis* sp. and Grass Carp *Ctenopharyngodon idella* (Li & Mundkur 2003) in many countries of the range.

WhD can also suffer from **competition with IAS**, for instance for habitat and food with alien Ruddy Duck and carps.

Livestock farming in some countries overexploits reed beds by overgrazing or burning, resulting in the loss of nesting habitat for WhD. The harvest of reeds to build fences for protection of cattle has the same effect (Li & Mundkur 2003).

In Mongolia, **natural steppe fires** sometimes spread into reed beds and destroy WhD nesting habitat (Li & Mundkur 2003).

The presence of humans and their activities leads to an increase in the densities of **Brown Rats** *Rattus norvegicus* which can be major predators of nesting waterfowl.

In addition to this, the genetic diversity of the Western European population is low owing to its having suffered a **bottleneck** in the 1970s and early 1980s when only a few dozen individuals remained in the wild. This may lessen the adaptive potential of the population, rendering it less able to withstand environmental change.

9. FUNDED PROJECTS

WhD conservation has been the only or main target species in several international funded projects:

1.	Monitoring White-headed Duck in Kazakhstan	Committee of Forestry and Wildlife of the Ministry of Agriculture of Kazakhstan-OSME-Conservation Leadership Programme	2012-2016	KZ	Prospection, census and monitoring
2.	Support for the conservation of the White-headed Duck (<i>Oxyura leucocephala</i>) in Morocco	AEWA	2014	MO	Training, monitoring
3.	LIFE ALBUFERA - Integrated management of three artificial wetlands in compliance with the Water Framework, Bird ...	LIFE ₁₂ ENV/ES/000685	2012	ES	Habitat management
4.	HUMEDALES DE LA MANCHA - Restoration of salt flats around 27 endorheic wetland areas in La Mancha	LIFE ₁₀ NAT/ES/000563	2010	ES	Habitat restoration
5.	LOS TOLLOS - Project for the comprehensive restoration of the endorheic basin of Los Tollos (El Cuervo and J...	LIFE ₀₉ ENV/ES/000472	2009	ES	Habitat restoration
6.	OXYURA LEUCOCEPHALA-MURCI - Conservation of <i>Oxyura leucocephala</i> in the Murcia Region, Spain	LIFE ₀₉ NAT/ES/000516	2009	ES	Target species
7.	LIFE FOR THE BOURGAS LAKE - Ensuring Conservation of Priority Bird Species and Coastal Habitats at the Bourgas Natura 2000 ...	LIFE ₀₈ NAT/BG/000277	2008	BG	Habitat management
8.	ERDUK - Eradication of Ruddy ducks in the UK to protect the white-headed duck	LIFE ₀₅ NAT/UK/000142	2005	UK	IAS eradication
9.	Conservation of white-headed duck (<i>Oxyura leucocephala</i>) in Barabinskay lowland (Russia)	Conservation Leadership programme	2005	RU	Conservation research
10.	Humedales andaluces - Conservation and restoration of wetlands in Andalucia	LIFE ₀₃ NAT/E/000055	2003	ES	Habitat management

11.	Malvasia Valencia - White-headed duck preservation plan in the Valencian community	LIFE00 NAT/E/007311	2000	ES	Target species
12.	Albuferas de Adra - The 'Albuferas de Adra' (Almeria), conservation plan	LIFE98 NAT/E/005323	1998	ES	Habitat management
13.	Etang de Biguglia - Oxyura leucocephala's reintroduction on Biguglia's pond	LIFE97 NAT/F/004226	1997	FR	Reintroduction

Table 5 Most relevant projects funded for the conservation of WhD

Most of those projects have been financed in EU countries throughout LIFE projects. The study of the Asian populations have been the subject of recent projects in Russia (Murzakhanov et al., 2009) or Kazakhstan (ACBK, 2016), with the support of funds like the Conservation Leadership Programme. Other actions have been funded by international tools, like AEWA (2015).

10. STAKEHOLDERS

Relevant stakeholders in the species range are

- Environmental authorities in breeding, wintering and stopover countries: Armenia, Azerbaijan, Bulgaria, Cyprus, Greece, Iran, Israel, Kazakhstan, Mongolia, Morocco, Romania, Russian Federation, Spain, Syria, Tunisia, Turkey, Turkmenistan, Ukraine and Uzbekistan.
- Countries where Ruddy duck has been recorded as breeding species and where it should be controlled, namely: Belgium, France, Netherlands, Morocco, Spain and United Kingdom, and any other country where this species would be recorded.
- Hunters associations in the range states and in countries with presence of invasive Ruddy duck.
- BirdLife partners and other environmental NGOs
- Water catchment areas managers in range countries

11. CONSERVATION ACTIONS UNDERWAY

BirdLife International and the EC established the first International SAP for the species (Green & Hughes, 1996), and AEWA revised it in 2006 (Hughes *et al.*, 2006).

The species is legally protected in many range countries, and occurs in a number of protected areas. A conservation programme in Spain has resulted in a significant population increase. Reintroduction schemes were initiated in Corsica (France), Majorca (Spain) and Italy without reaching self-sustainable populations (Hughes *et al.*, 2006; BirdLife, 2015a).

Sport hunting was banned on two primary wintering lakes (Burdur Gölü and Yarisli Gölü) in Turkey where hunting from speedboats was threatening the WhD (Green *et al.* 1996).

Hybridisation has been tackled in Europe throughout international eradication plans (Hughes *et al.* 1999; Cranswick & Hall, 2010; CoE, 2016) in up to 15 countries, but with variable intensity. Culling resulted in a drastic reduction in UK, but to a lesser extent in other countries like France, Netherlands and Belgium (Cranswick & Hall, 2010). Action in Spain brought to the lack on hybrid sightings in recent years (APHA, 2015). The intensive action in UK has probably influenced the reduction in neighbour countries (FERA, 2011). Other countries continue monitoring to ensure early detection of Ruddy ducks (Hughes *et al.*, 2006). There are initiatives going on to wipe out the remaining Ruddy duck population in Western Palearctic. Action plans exist in several countries: Belgium (Bram D'hondt, *in litt.* 2016), France (J.-B. Mouronval & F. Lamarque, *in litt.* 2016), Spain (CoE. 2016), United Kingdom (I. Henderson, *in litt.* 2016), with different degree of execution.

In some cases, action plans are relying on European funds for implementation (J.-B. Mouronval & F. Lamarque, *in litt.* 2016)

Most key sites are protected in many different countries. As WhD are increasingly using non-natural water bodies, like wastewater reservoirs (Hadaad & Moyal, 2007; Torres-Esquivias, 2008, 2009; Murzakhanov *et al.*, 2009; Molina *et al.*, 2010), some areas could be unprotected.

	National Action Plan	National working group	National monitoring programme	National monitoring programme in PA	Routines for Informing the Responsible Authorities Regarding Nesting Areas and Nest Sites
Afghanistan	No	No	No	No	No
Algeria	No	No	No	No	No
Armenia	No	No	No	No	Yes
<u>Austria</u>	N/A	N/A	N/A	N/A	N/A
Azerbaijan	No	No	No	No	N/A
<u>Belgium</u>	N/A	N/A	N/A	N/A	N/A
Bulgaria	Yes	No	Yes	Yes	N/A
China	No	No	No	No	No
<u>Denmark</u>	N/A	N/A	N/A	N/A	N/A
<u>Finland</u>	N/A	N/A	N/A	N/A	N/A
France	No	Yes	No	Yes	No
Georgia	No	No	No	No	N/A
<u>Germany</u>	N/A	N/A	N/A	N/A	N/A
Greece	No	No	Yes	Yes	N/A
Hungary	N/A	N/A	N/A	N/A	N/A
<u>Iceland</u>	N/A	N/A	N/A	N/A	N/A
<u>Ireland</u>	N/A	N/A	N/A	N/A	N/A
Iraq	No	No	No	No	No
<u>Islamic Republic of</u>	No	No	Yes	Yes	No

Iran					
<i>Israel</i>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>N/A</u>
<i>Italy</i>	No	No			N/A
Kazakhstan	No	No	No	Yes	No
Mongolia	No	No	No	No	No
<i>Morocco</i>	No	No	Yes	Yes	No
<i>Netherlands</i>	N/A	N/A	N/A	N/A	N/A
<i>Norway</i>	N/A	N/A	N/A	N/A	N/A
Pakistan	No	No	Yes	Yes	N/A
<i>Portugal</i>	N/A	N/A	N/A	N/A	N/A
Romania	No	No	No	No	No
Russian Federation	No	No	No	No	No
<i>Slovenia</i>	N/A	N/A	N/A	N/A	N/A
<i>Spain</i>	Yes	Yes	Yes	Yes	Yes
<i>Sweden</i>	N/A	N/A	N/A	N/A	N/A
<i>Switzerland</i>	N/A	N/A	N/A	N/A	N/A
Syrian Arab Republic	No	No	No	No	N/A
Tunisia	In prep.	No	Yes	Yes	Yes
<u>Turkey</u>	<u>No</u>	<u>(informal 2016)</u>	<u>No</u>	<u>Yes</u>	<u>No</u>
<u>Turkmenistan</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
Ukraine	Yes	No	No	No	No
<u>United Kingdom</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
Uzbekistan	No	No	No	No	No

Table 6 Recent conservation measures for the WhD *Oxyura leucocephala* (Hughes *et al.*, 2006) WhD Range States in normal type, Ruddy Duck Range States in *italics*, WhD and Ruddy Duck Range States in ***bold italics***. N/A – not applicable. Updated with the available implementation reports (underlined).

12. CONSERVATION ACTIONS PROPOSED

The following actions are considered essential to contribute to the conservation of WhD. Prioritisation of these actions should be done with the participation of the stakeholders

- Implement global census of the species to define current status.
- Survey breeding and wintering grounds and migration sites.
- Enforce strict protection from hunting.
- Conduct comprehensive winter monitoring, and tracking studies to improve knowledge of migration routes and phenology
- Protect and manage key sites and their catchments, including monitoring of hydrology and water pollution
- Reduce disturbance by fisheries.
- Ensure legislative protection for this species in all range states
- Alleviate hunting pressure and ban lead shot throughout its range.
- Prevent drowning in fishing nets by regulating fisheries.
- Promote policies to control *O. jamaicensis* and hybrids.

13. RESEARCH AND MONITORING NEEDED

Population size and trends: Recent census results in regions that were probably not well prospected before (Murzakhanov et al., 2009; ACBK, 2016) have shown the gaps on the knowledge of the species.

Identification and monitoring of key sites: Many questionnaires show the lack of means to reach remote areas, as well as the lack of training for the staff.

Migration patterns: Big number of WhD recently censused during moulting or wintering need research on where those birds breed, in order to find the breeding sites. Genetic and stable isotope studies are probably needed.

Threats. Some threats that have been identified have not been addressed because of lack of funds or expertise. This has been highlighted in Greece (S. Kavantzidis, *in litt.* 2016), Iran (Z. Elahi Rad, *in litt.* 2016) or Turkey (A. Gürsoy Ergen, *in litt.* 2016)

New habitats: The increasing use of wastewater reservoirs associated to sewage treatment plants or wetlands polluted by urban effluents (Hadad & Moyal, 2007; Torres-Esquivas, 2008, 2009; Molina *et al.*, 2010; Murzakhanov *et al.*, 2009; Tashkinbayev *et al.*, 2015) could arise new threats, like risks linked to pollution, or draining for public health reasons.

Use of lead and impact on WhD. Most of the national implementation questionnaires have shown the lack of knowledge on the use of lead in wetlands, as well as the lack of quantification of its impact on WhD.

Other threats: fishing nets, pollution, diseases, poaching, etc.

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