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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

Standing Committee

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**International single species Action plan
for the conservation of the Ferruginous Duck
(*Aythya nyroca*)**



**CMS Technical Series No. 12
AEWA Technical Series No. 7**

This Single Species Action Plan has been prepared to assist fulfilment of obligations under:

*Convention on the Conservation of Migratory Species of Wild Animals (CMS)
Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA))*

Compiled by James A. Robinson^{1,2} & Baz Hughes¹

¹ The Wildfowl & Wetlands Trust, Slimbridge, Glos. GL2 7BT, UK. E-mail: baz.hughes@wwt.org.uk

² Current address: RSPB Northern Ireland, Belvoir Forest Park, Belfast, BT8 4QT, UK. E-mail: james.robinson@rspb.org.uk

With contributions from: Omar Al-Saghier, Hichem Azafzaf, Nicola Baccetti, Luba Balian, Carolien Borggreve, Axel Braunlich, Joost Brouwer, Simba Chan, Sergey Dereliev, Michael Dvorak, Gadzhibek Dzamirzoev, Kiraz Erciyas, Wouter Faveyts, Lexo Gavashelishvili, Dimitar Georgiev, Andy Green, Marco Gustin, George Handrinos, Tony Htin Hla, Petar Iankov, Bojidar Ivanov, Pavol Kačuch, Drazen Kotrozan, Jelena Kralj, Elena Kreuzberg-Mukhina, Lars Lachmann, Ravindra Lal, David Li, Jamshid Mansoori, Luca Melega, Yoshihiko Miyabayashi, Vladimir Morozov, Oliver Nasirwa, Otars Opermanis, Samuel Pacenovski, Nikolai Petkov, Lybomir Profirov, Slobodan Puzovic, Ghassan Ramadan, Dragan Radovic, Attila Sandor, Darko Saveljic, Martin Schneider-Jacoby, Jakob Smole, Peter Spierenburg, Elchin Sultanov, Jozef Szabo, Bertrand Trollet, Marko Tucakov, Zsolt Vegvary, Lyuba Vergeichyck, Maria Wieloch, Sergey Yerokhov, M. Zafar-ul Islam, Mikhail Zhmud, Zsolt Zhmud, and Stamatis Zogaris.

Milestones in the Production of the Plan

Workshop: 11-14 October 2002, Sofia, Bulgaria

First draft: July 2003, presented to experts

Second draft: February 2005, presented to experts

Third draft: April 2005, presented to the Range States and to the AEWA Technical Committee

Final draft: August 2005, approved by the AEWA 3rd Meeting of Parties in October 2005 and the CMS 13th Scientific Council Meeting in November 2005

Geographical Scope

This International Single Species Action Plan requires implementation in the following countries regularly supporting Ferruginous Duck: Afghanistan, Albania, Algeria, Armenia, Austria, Azerbaijan, Bangladesh, Belarus, Belgium, Bhutan, Bosnia and Herzegovina, Bulgaria, Cameroon, Central African Republic, Chad, China, Croatia, Cyprus, Czech Republic, Egypt, Eritrea, Ethiopia, France, Gambia, Georgia, Germany, Greece, Hungary, India, Iran (Islamic Republic of), Iraq, Israel, Italy, Jordan, Kazakhstan, Kenya, Latvia, Lebanon, Libyan Arab Jamahiriya, Lithuania, Macedonia (Former Yugoslav Republic of), Mali, Malta, Mauritania, Moldova (Republic of), Mongolia, Morocco, Myanmar, Nepal, Netherlands, Niger, Nigeria, Oman, Pakistan, Poland, Portugal, Romania, Russian Federation, Saudi Arabia, Senegal, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sudan, Switzerland, Syrian Arab Republic, Tajikistan, Thailand, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Viet Nam, and Yemen.

Reviews

This International Single Species Action Plan should be revised in 2015. An emergency review will be undertaken if there are sudden major changes liable to affect the population.

Credits

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Foreword by Mr Robert Hepworth, Executive Secretary, Convention on the Conservation of Migratory Species of Wild Animals (CMS)

The Convention on the Conservation of Migratory Species of Wild Animals (CMS) aims to conserve terrestrial, marine and avian migratory species throughout their range. It is one of a small number of intergovernmental treaties concerned on a global scale with the conservation of wild animals and the habitats on which they depend. The 98 Parties to CMS cooperate to conserve migratory species and their habitats by providing protection for the endangered migratory species listed in Appendix I of the Convention; by concluding multilateral Agreements for the conservation and management of migratory species listed in Appendix II and by undertaking co-operative research activities.

CMS has a unique role to play in focussing attention on and addressing the conservation needs of the endangered species presently listed in Appendix I. With a view to formalizing the implementation of the Convention's provisions relative to the conservation of Appendix I species, the Conference of the Parties (COP) to CMS established, at its 3rd Meeting, the instrument of "Concerted Actions for Appendix I species". Through appropriate resolutions, the COP encourages the Parties and instructs the Secretariat to develop concerted actions and prepare review reports on priority species included in Appendix I. Concerted Actions have so far materialized in an array of initiatives on several species, ranging from field research and conservation projects to the establishment of technical and institutional frameworks for action.

The Ferruginous duck (*Aythya nyroca*) is included in both Appendix I and II of CMS, and was designated for Concerted Actions under the Convention by the 6th Meeting of the COP (Cape Town, Nov. 1999). The species is covered, for a major part of its range, under the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), the most ambitious Agreement concluded so far under the auspices of CMS. The incomplete coverage of the species' range by AEWA, and its general value as indicator of over-exploitation and loss of biodiversity in its migration range are the main reasons requiring the active involvement of the Convention in the conservation efforts for the species. The present Single Species Action Plan (SSAP) for the Ferruginous Duck *Aythya nyroca* is the main output of a more comprehensive initiative, co-ordinated by BirdLife International and the Bulgarian Society of the Protection of Birds (BSPB) and jointly supported by CMS and AEWA, which includes as other main components field surveys for the species, the convening of an international workshop, the establishment of a network of experts, the preparation of an updated report on the status of the species.

The UNEP/CMS Secretariat hopes that the publication and dissemination of this document will contribute to an increased awareness on the status of the species, encouraging further research and monitoring in the field and stimulating effective and coordinated conservation actions by governments, local communities and dedicated non-governmental organizations.

The UNEP/CMS Secretariat wishes to express its thanks to the many people and organizations that made the workshop and this publication possible. These include first of all the compilers of the document, James A. Robinson (RSPB, UK) and Baz Hughes (WTT, UK), for their excellent and patient work, and the numerous other experts that made contributions to the document. A special thank you goes to the Bulgarian Society of the Protection of Birds, BirdLife International – European Division Office, the Wildfowl and Wetlands Trust (WWT) and the IUCN-SSC/Wetlands International Threatened Waterfowl Specialist Group, for their support in the process of compilation and revision of the document.

The UNEP/CMS Secretariat is confident that the joint efforts of all stakeholders will eventually succeed in ensuring the restoration and long-term conservation of this charismatic species.



Robert Hepworth
CMS Executive Secretary

Foreword by Mr. Bert Lenten, Executive Secretary, Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)

During their life cycle, migratory waterbirds cover considerable distances in order to find the best ecological conditions and habitats for feeding, breeding and raising their young. However, migration is a perilous journey, presenting a wide range of threats. Only a small number of birds are actually threatened by natural events. Sad but true, human activities are the source of most dangers migrating birds are exposed to. Flying over long distances means crossing many international borders and entering different political areas with their own environmental politics, legislation and conservation measures. It is clear that international cooperation between governments, NGOs and other stakeholders is needed along the whole flyway of a species in order to share knowledge and to coordinate conservation efforts. The necessary legal framework and coordinative instruments for such international cooperation is provided by international agreements such as Agreement on the conservation of African-Eurasian Migratory Waterbirds (AEWA).

One of these coordinative instruments in conservation of biological diversity is International Single Species Action Plans (SSAP). They are being developed to find out more about populations of species with an unfavourable conservation status throughout their whole range, to identify underlying threats and, more importantly, to roster all necessary conservation measures in a systematic and structured way. This information is crucial to tackling the problems that have caused and are still causing decline of these species and to allow action to be taken to improve their status in the long term. Such International SSAPs can only be developed and effectively implemented in close cooperation with Governments, Intergovernmental Organizations and NGOs.

AEWA together with CMS has therefore initiated this International Single Species Action Plan for the Ferruginous Duck. The drafting of the plan was carried out to BirdLife International and has been compiled by Dr. James Robinson (RSPB, UK) and Dr. Baz Hughes (WWT, UK). The plan was adopted under Resolution 3.12 at the Third Session of the Meeting of the Parties to AEWA in Dakar, Senegal, October 2005.

The Ferruginous Duck is a relatively small diving duck and a partial migrant, widely distributed in Europe, Asia and Africa. But since the second half of the 20th century its population has undergone a global large, long-term decline. On the IUCN Red List of Threatened Animals it is listed as "Near Threatened". Main known threats to the Ferruginous Duck are habitat loss and degradation, climate change/drought, and over-hunting. Therefore, the Ferruginous Duck needs special attention.

I strongly hope that the Range States involved will make every effort to implement this Single Species Action Plan and that they will transform it into National Action Plans and work together to halt the decline in the Northern Bald Ibis population in the future. I very much believe that if the measures described in these plans are implemented in reality, this will trigger the recovery of the population of this bird to a favourable conservation status.



Bert Lenten
AEWA Executive Secretary

PREFACE

This International Single Species Action Plan for the Conservation of the Ferruginous Duck *Aythya nyroca* was commissioned to BirdLife International. It has been compiled by James Robinson currently of RSPB (UK) and Baz Hughes of WWT (UK). An action-planning workshop was organised by the Bulgarian Society for the Protection of Birds/BirdLife Bulgaria. The drafts of the plan went through rigorous consultations and in the final approved version are reflected comments received from a large number of experts, governmental officials from the range states, the AEWA Technical Committee. Financial support for the preparation of this Action Plan was provided by the Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA). The Action Plan follows the format for Single Species Action Plans approved by the AEWA 2nd Meeting of Parties in September 2002.

EXECUTIVE SUMMARY

The Ferruginous Duck is a little studied, partial migrant, widely distributed in Europe, Asia and Africa. During the first quarter of the 20th century, it was described as one of the most plentiful *Anatidae* species over a great part of its range. Since then, it has undergone a large, long-term decline globally. The species is regularly recorded in 77 countries and in at least 26 others as a vagrant.

The most important known countries for breeding birds are Romania (5,500-6,500 pairs), Azerbaijan (1,000-3,000 pairs), Croatia (2,000-3,000 pairs) and Kazakhstan (2,000-3,000 pairs). In winter, significant numbers of birds have been counted in Bangladesh (70,000 birds), Turkmenistan (21,000 birds), Mali (up to 14,300 birds), Kazakhstan (10,500 birds), Uzbekistan (>7,000 birds), Sudan (>5,000 birds), Egypt (7,500 birds), and Azerbaijan (1,000-9,000 birds).

Simply adding the national population estimates for the 35 countries with data on numbers of breeding pairs resulted in an estimated global breeding population of 14,000-23,000 pairs. Assuming winter numbers = breeding pairs x 3, this would equate to a wintering population of 42,000-69,000. Such calculations are fraught with difficulty, and taking into account recent winter counts of 70,000 birds in Pakistan, 21,000 in Turkmenistan, 14,000 in Mali, and 8,530 in Chad, it does seem that the global population is somewhat higher than the previous estimate of 50,000 birds. A minimum of at least 100,000 birds seems likely, but the true value may be even higher.

The Ferruginous Duck is thought to breed in 45 countries worldwide. Of the 43 countries with trend data, no estimate of population trend was available for 16 (37%) countries. Most (13 or 48%) of the remaining 27 countries had decreasing numbers of breeding Ferruginous Ducks over the last seven year period and only two (Greece and Italy) had increasing numbers. Six of the 27 countries (22%) experienced declines of at least 50%, and seven (26%) declines of 20-49%. In eight countries (30%) breeding numbers were stable and in four (15%) numbers fluctuated with changes of at least 20%, but with no clear trend since 1995. Trends in wintering numbers are unclear. Of 69 countries thought to hold wintering Ferruginous Ducks, no estimate of population trend was available for 52 (70%) countries. Of the 17 countries for which data were available, 10 countries (56%) had fluctuating numbers. Of the seven remaining countries, two experienced declines of at least 50%, three declines of 20-49% and two an increase of 20-49%.

The Ferruginous Duck is listed as Near Threatened on the IUCN Red List of Threatened Animals. The species nearly qualifies for listing under criteria A1c and A2c. It is also listed on Annex I of the European Union Directive on the Conservation of Wild Birds (79/409/EEC) (Birds Directive), on Appendix III of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), on Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), and in Table 1, Column A of the African-Eurasian Waterbird Agreement action plan. The principal known threats to the Ferruginous Duck are habitat loss and degradation, climate change/drought, and over-hunting. Others include lead poisoning, drowning in fishing nets, pollution, introduction of non-native species (particularly Grass Carp *Ctenopharyngodon idella* and Wels Catfish *Silurus glanis*), and human disturbance.

This International Single Species Action Plan provides a framework for the conservation for the Ferruginous Duck and is based on the format for the AEWA International Single Species Action Plan prepared by BirdLife International. Successful implementation of this plan will require effective international co-ordination of organisation and action. The broad aim of this Action Plan will be to remove the Ferruginous Duck from the IUCN Red List of Threatened animals. In the short-term, the aim of the plan is to maintain the current population and range of the species throughout its range, and in the medium to long-term to promote increase in population size and range. The plan has been developed using internationally agreed standards for identifying actions and has been prepared specifically to facilitate the monitoring and evaluation of subsequent implementation, linking threats, actions and measurable activities.

This plan will need implementation in 77 countries. The 30 activities identified in this Action Plan focus on measures to prevent further habitat loss and degradation; to reduce direct mortality of adults and improve reproductive success; and to increase knowledge on the Ferruginous Duck. These measures include protecting the Ferruginous Duck and its habitats, appropriate management of key

sites, and increasing public awareness of the need to conserve the Ferruginous Duck. Each country within the range of the Ferruginous Duck should be committed to implement this plan and to develop National Action Plans and establish Ferruginous Duck Working Groups to help facilitate this.

1. BIOLOGICAL ASSESSMENT

General Information	<p>The Ferruginous Duck <i>Aythya nyroca</i> is a little studied, partial migrant, widely distributed in Europe, Asia and Africa. The species is regularly recorded in 77 countries and in at least 26 others as a vagrant. It breeds in at least 45 countries. It is listed as Near Threatened by the IUCN because its global population has declined markedly over recent decades (BirdLife International 2000, IUCN 2004).</p> <p>An International Species Review by Robinson & Hughes (2003) has been produced which provides detailed information on abundance, trends, population delimitation, ecology and threats across the range of this species. It is an essential companion document to this International Single Species Action Plan.</p> <p>The first international workshop held for this species was convened in Tokaj (Hungary) in October 1996 and resulted in the production of a European Species Action Plan (Callaghan 1999). A second meeting was convened in Sofia, Bulgaria, in October 2002. Experts attended from throughout the range of the Ferruginous Duck and gave various presentations on the biology of the species and its conservation needs. The proceedings of this meeting have been published (Petkov <i>et al.</i> 2003), the content of which have been drawn upon extensively during the production of the International Species Review and this Action Plan.</p>
Taxonomy	<p>Phylum: <i>Chordata</i> Class: <i>Aves</i> Order: <i>Anseriformes</i> Family: <i>Anatidae</i> Species: <i>Aythya nyroca</i> (Güldenstädt 1770) Synonym: <i>Nyroca nyroca</i></p> <p>Monotypic. Considered by some to form superspecies with <i>A. australis</i>, <i>A. baeri</i> and <i>A. innotata</i>. Hybridisation recorded with various species of <i>Aythya</i>, <i>Anas</i> and <i>Netta</i>.</p>
Population Development	<p>The Ferruginous Duck is a little studied, partial migrant, widely distributed in Europe, Asia and Africa. During the first quarter of the 20th century, it was described as one of the most plentiful <i>Anatidae</i> species over a great part of its range. Since then, it has undergone a large, long-term decline globally. The species is regularly recorded in 77 countries and in at least 26 others as a vagrant.</p> <p>The most important known countries for breeding birds are Romania (5,500-6,500 pairs), Azerbaijan (1,000-3,000 pairs), Croatia (2,000-3,000 pairs) and Kazakhstan (2,000-3,000 pairs). In winter, significant numbers of birds have been counted in Bangladesh (70,000 birds), Turkmenistan (21,000 birds), Mali (up to 14,300 birds), Chad (8,530), Kazakhstan (10,500 birds), Uzbekistan (>7,000 birds), Sudan (>5,000 birds), Egypt (7,500 birds), and Azerbaijan (1,000-9,000 birds).</p> <p>Simply adding the national population estimates for the 35 countries with data on numbers of breeding pairs resulted in an estimated global breeding population of 14,000-23,000 pairs. Assuming winter numbers = breeding pairs x 3, this would equate to a wintering population of 42,000-69,000. Such calculations are fraught with difficulty, and taking into account recent winter counts of 70,000 birds in Pakistan, 21,000 in Turkmenistan, and 14,000 in Mali, it does seem that the global population is somewhat higher than the previous estimate of 50,000 birds. A minimum of at least 100,000 birds seems likely, but the true value may be even higher.</p> <p>The Ferruginous Duck is thought to breed in 45 countries worldwide. Of the 43 countries with trend data, no estimate of population trend was available for 16 (37%) countries. Most (13 or 48%) of the remaining 27 countries had decreasing numbers of breeding Ferruginous Ducks over the last seven year period and only two (Greece and Italy) had increasing numbers. Six of the 27 countries (22%) experienced declines of at least 50%, and seven (26%) declines of 20-</p>

	<p>49%. In eight countries (30%) breeding numbers were stable and in four (15%) numbers fluctuated with changes of at least 20%, but with no clear trend since 1995. Trends in wintering numbers are unclear. Of 69 countries thought to hold wintering Ferruginous Ducks, no estimate of population trend was available for 52 (70%) countries. Of the 17 countries for which data were available, 10 countries (56%) had fluctuating numbers. Of the seven remaining countries, two experienced declines of at least 50%, three declines of 20-49% and two an increase of 20-49%.</p>		
Distribution Throughout The Annual Cycle	<p>Paleartic, with a fragmented breeding distribution extending east from western Europe to western China (Xinjiang and northern Szechuan) and western Mongolia, and north from Iran to Lithuania (<i>Figure 1</i>).</p> <p>It is primarily a migratory species, although some southern breeding birds are thought to be resident. An accurate list of the countries used by the species through the annual cycle is presented in <i>Table 1</i>.</p>		
Survival and Productivity	<p>Given the paucity of ringing information there are no known data on survival rates. Productivity data are also sparse.</p>		
Life History	<p>Breeding: The species forms monogamous pair bonds of seasonal duration. The nest is usually located on the ground close to water, or above water or on floating rafts of dense reeds and other aquatic vegetation. A single clutch is laid containing 7-10 eggs. Incubation begins from late May to late June in southern Europe, and up to a month later further north. Eggs hatch after 25-28 days. Only one brood is reared per year. Brood size varies from 3-12 ducklings. Fledging takes 55-60 days.</p>	<p>Feeding: The species is omnivorous, but plant material predominates in analyses of stomach contents. Areas of shallow water close to dense littoral vegetation are favoured feeding areas.</p>	<p>Post-breeding: Moult movements are poorly understood, but large flocks of moulting individuals gather regularly, often in several larger deltas of eastern Europe (e.g. Volga, Dnestr and Danube). A number of Croatian fishponds support post-breeding flocks of several hundred to thousands of birds. Departure from breeding localities begins in September and peaks in October. The first birds arrive back in the wintering areas south of the Sahara in late October.</p>

Habitat Requirements	Habitat Type*	Breeding	Non-breeding
	5. Wetlands (inland)		
	5.1. Permanent Rivers/Streams/ Creeks [includes waterfalls]	■	■
	5.2. Seasonal/Intermittent/Irregular Rivers/Streams/Creeks	■	■
	5.3. Shrub Dominated Wetlands	■	■
	5.4.2. Marsh Wetland	■	■
	5.5. Permanent Freshwater Lakes [<8ha]	■	■
	5.6. Seasonal/Intermittent Freshwater Lakes [<8ha]	■	■
	5.7. Permanent Freshwater Marshes/Pools [<8ha]	■	■
	5.8. Seasonal/Intermittent Freshwater Marshes/Pools [<8ha]	■	■
	5.9. Freshwater Springs and Oases	■	■
	5.13. Permanent Inland Deltas	■	■
	5.14. Permanent Saline, Brackish or Alkaline Lakes	■	■
	5.15. Seasonal/Intermittent Saline, Brackish or Alkaline Lakes and Flats	■	■
	5.16. Permanent Saline, Brackish or Alkaline Marshes/Pools	■	■
	5.17. Seasonal/Intermittent Saline, Brackish or Alkaline Marshes/Pools	■	■
	9. Sea		
	9.2. Shallow [usually <6m deep at low tide; includes sea bays and straits]		■
	10. Coastline		
	10.3. Estuarine Waters	■	■
	10.6. Coastal Brackish/Saline Lagoons	■	■
	10.7. Coastal Freshwater Lagoons	■	■
	12. Artificial – Aquatic		
	12.1. Water Storage Areas (over 8ha)	■	■
	12.2. Ponds (below 8ha)	■	■
	12.3. Aquaculture Ponds	■	■
	12.4. Salt Exploitation Sites	■	■
	12.6. Wastewater Treatment Areas	■	■
	12.9. Canals and Drainage Channels, Ditches	■	■

* The number preceding each descriptor is the GLCC classification number, see: <http://edcdaac.usgs.gov/glcc/glcc.html>

Figure 1. Global distribution of the Ferruginous Duck Aythya nyroca. Reproduced with kind permission from del Hoyo et al. (1992).

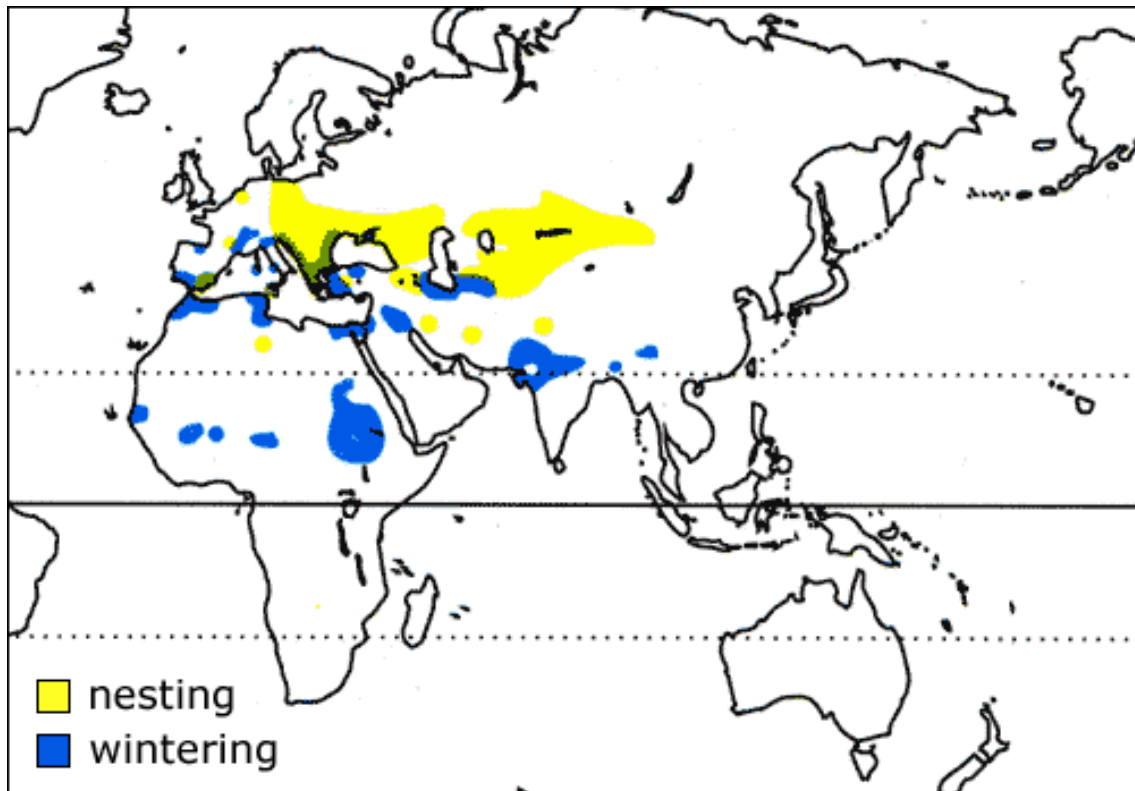


Table 1. Geographical distribution of the Ferruginous Duck Aythya nyroca during the annual cycle. Note country names follow those used by the International Organization for Standardization (ISO). Excludes the following countries where the species only occurs as a vagrant (Bahrain, Benin, Bhutan, Burkina Faso, Cape Verde, Denmark, France, Finland, Ghana, Hong Kong, Ireland, Japan, Kuwait, Liechtenstein, Luxembourg, Maldives, Norway, Qatar, Seychelles, Sierra Leone, Sweden, Togo, Uganda, United Arab Emirates, United Kingdom and Viet Nam. Updated from Robinson & Hughes (2003).

Breeding season (45 countries)	Non-breeding season (69 countries)	
Afghanistan	Afghanistan	Malta
Albania	Albania	Mauritania
Algeria	Algeria	Mongolia
Armenia	Armenia	Morocco
Austria	Azerbaijan	Myanmar
Azerbaijan	Bangladesh	Nepal
Belarus	Belgium	Niger
Belgium	Bosnia and Herzegovina	Nigeria
Bosnia and Herzegovina	Bulgaria	Oman
Bulgaria	Cameroon	Pakistan
China	Central African Republic	Poland
Croatia	Chad	Portugal
Czech Republic	China	Republic of Moldova
Georgia	Croatia	Romania
Germany	Cyprus	Russian Federation
Greece	Czech Republic	Saudi Arabia
Hungary	Egypt	Senegal
India	Eritrea	Serbia & Montenegro
Islamic Republic of Iran	Ethiopia	Slovakia
Israel	Gambia	Slovenia
Italy	Georgia	Spain
Kazakhstan	Germany	Sudan
Latvia	Greece	Switzerland
Lithuania	Hungary	Syrian Arab Republic
Mongolia	India	Tajikistan
Morocco	Iraq	Thailand
Poland	Islamic Republic of Iran	The FYR Macedonia
Portugal	Israel	The Netherlands
Republic of Moldova	Italy	Tunisia
Romania	Jordan	Turkey
Russian Federation	Kazakhstan	Turkmenistan
Saudi Arabia	Kenya	Ukraine
Serbia & Montenegro	Lebanon	Uzbekistan
Slovakia	Libyan Arab Jamahiriya	Yemen
Slovenia	Mali	
Spain		
Switzerland		
Tajikistan		
The FYR Macedonia		
The Netherlands		
Tunisia		
Turkey		
Turkmenistan		
Ukraine		
Uzbekistan		

2. AVAILABLE KEY KNOWLEDGE

The most contemporary information on the numbers and trends for the Ferruginous Duck across its range is presented in *Table 2*. More detailed information on the populations, demography and ecology of the species and gaps in knowledge are presented in Robinson & Hughes (2003).

Table 2. Numbers and trends for the Ferruginous Duck Aythya nyroca in individual range states (in alphabetical order). Grey cells represent periods when the species is probably not present in the country. Excludes the following countries where the species only occurs as a vagrant (Bahrain, Benin, Bhutan, Burkina Faso, Cape Verde, Denmark, France, Finland, Ghana, Hong Kong, Ireland, Japan, Kuwait, Liechtenstein, Luxembourg, Maldives, Norway, Qatar, Seychelles, Sierra Leone, Sweden, Togo, Uganda, United Arab Emirates, United Kingdom and Viet Nam. Updated from Robinson & Hughes (2003).

Country	Breeding Season						Winter				
	No. Breeding (pairs)	Quality	Year(s) of Estimate	Trend	Quality	Year(s) of Estimate	No. Migrating or Non-breeding (individuals)	Quality	Year(s) of Estimate	Trend	Quality
Afghanistan	?	-	-	?	-	-	>100	3	2002	?	-
Albania	10-30	2	1996-2002	-1	3	1970-90	100-2,000	3	-	?	3
Algeria	>600	3	1997-2002	?	-	-	<2,000	1	2002	?	-
Armenia	5-30	1	1985	0	1	1990-2000	>500	1	1990-2000	?	?
Austria	50-150	1	1998-2002	0	2	1970-90	0-5	1	1992-93	?	-
Azerbaijan	1,000-3,000	2	1996-2000	0	2		1,000-9,000	-	1996	?	-
Bangladesh							70,000	2	2002	?	-
Belarus	50-200	2	1997-2001	0	2	1970-90					
Belgium							10-35	1	1993-2003	F	2
Bosnia and Herzegovina	8-10	3	1999-2000	0	3	-	0-500	2	1997	?	-
Bulgaria	125-225	2	1998-2002	-1	2	1990-2000	0-100	2	1998-2002	F	2
Cameroon							<100	3	2002	?	-
Central African Republic							<100	3	2002	?	-
Chad							8,530	2	2003	?	-
China	?	-	-	?	-	-	>2,000	3	2002	?	-
Croatia	2,000-3,000	2	2004	-2	F	2004	10,000 (post breeding), <100 (winter)	2	2004	F	2
Cyprus							1-100	1	1992-93	?	-
Czech Republic	0-3	1	2000	?	1	2000	5-10	1	2000	?	-
Egypt							7,500	3	1996	?	-
Eritrea							<100	3	1996	?	-
Ethiopia							<100	3	1996	?	-
Gambia							<100	3	2002	?	-
Georgia	10-1,000	3	1997	?	-	-	100-200	3	1997	?	-
Germany	0-3	2	1995-1999	-2	3	1970-90	20-100	2	1992-93	F	2
Greece	130-250	2	2002	+1	3	2002	50-300	2	1987-91	F	2
Hungary	550-1,000	2	1997-2002	0	2	1997-2002	1	1	1991	?	-
India	?	-	-	?	-	-	>3,000	3	2002	?	-
Iraq							>1,000	3	2002	?	-
Islamic Republic of Iran	<5	?	1998-2002	?	-	-	1,000-1,300	2	1998-2002	?	-
Israel							150-300	2	2002	?	-
Italy	70-100	2	2003	+1	2	2003	100-400	2	1983-2002	2	2
Jordan							?	-	-	?	-
Kazakhstan	2,000-3,000	3	2002	0	-	-	10,000	3	2002	0	-

Country	Breeding Season						Winter				
	No. Breeding (pairs)	Quality	Year(s) of Estimate	Trend	Quality	Year(s) of Estimate	No. Migrating or Non-breeding (individuals)	Quality	Year(s) of Estimate	Trend	Quality
Kenya							<50	-	1996	?	-
Latvia	0-5	1	1999-2000	?	1	1999-2000					
Lebanon							<100	3	2002	?	-
Libyan Arab Jamahiriya							?	-	-	?	-
Lithuania	10-30	2	1999-2001	F	2	1999-2001					
Mali							7,800-14,300	2	1999-2001	?	-
Malta							<100	3	2002	?	-
Mauritania							30-80	2	1998-2001	?	-
Mongolia	?	-	-	?	-	-	?	2	1999	?	-
Morocco	?	-	-	?	-	-	>30	3	2002	?	-
Myanmar							>1,000	2	1995	?	-
Nepal							?	-	-	?	-
Niger							200-300	-	-	?	-
Nigeria							>2,000	2	1999-2000	?	-
Oman							10-40	3	1995-96	?	-
Pakistan							1,000-2,000	2	?	?	-
Poland	30-40	2	2000-2003	-2	2	2000-2003	5-300	2	1980-98	F	2
Portugal	0-2	2	2002	?	?	?	1-10	1	1991	?	-
Republic of Moldova	70-150	2	1999-2000	-2	2	1999-2000	300-1,000	2	1997	?	-
Romania	5,500-6,500	3	1996-2002	-1	3	1996-2002	1,000-4,000	2	1992-93	-1	2
Russian Federation	500-1,150	2	1990-2000	-1	3	1990-2000	350-570	2	2002	?	-
Saudi Arabia	1-3	3	1994	?	?	-	95	2	1991	?	-
Senegal							10-50	2	1999-2001	?	-
Serbia & Montenegro	450-600	2	1998-2003	-1	2	1995-2003	20-50	1	1998-2003	F	2
Slovakia	5-20	1	1980-1999	-2	2	1980-1999	5-15	2	2002	F	2
Slovenia	0-10	3	1999-2000	F	3	1999-2000	0-5	2	1992-93	?	-
Spain	1-10	2	1998-2002	F	3	1998-2002	1-40	2	1992-93	-2	2
Sudan							>5,000	3	1990s	?	-
Switzerland	0-1	1	1990-2000	0	1	1990-2000	10-30	1	1981-91	F	1
Syrian Arab Republic							>320	2	2002	?	?
Tajikistan	>20	-	-	?	-	-	?	-	-	?	-
Thailand							<100	3	2002	?	-
The FYR Macedonia	20-50	2	1999-2000	-1	3	1999-2000	?	-	-	?	-
The Netherlands				F	2	1970-90	12-55	1	1989-1998	F	1
Tunisia	80	-	1998-2002	?	-	-	2,500-3,000	2	1998-2005	1	2
Turkey	800-1,200	2	2001	-1	2	2001	1,000-1,500	2	2002	-1	2
Turkmenistan	>30	-	-	?	-	-	21,000	3	2002	-1	3
Ukraine	300-600	2	1999-2000	0	2	1999-2000	15-20	2	1988	-2	2
Uzbekistan	>30	2-	1997	-2	2	1997	>7,000	3	1992	?	-
Yemen							40-60	1	1995-2002	-1	3

Quality: Data quality is assessed by assigning one of the following categories: **1** Reliable quantitative data (e.g. atlas data or monitoring data) are available for the whole period and region in question; **2** Species generally well known, but only poor or incomplete quantitative data available; and **3** Species poorly known, with no quantitative data available.

Trend: Trend in numbers is assessed by assigning to one of the following categories: **+2** Large increase of at least 50% between 1995 and 2002; **+1** Small increase of 20-49% between 1995 and 2002; **0** Stable, with overall change less than 20% between 1995 and 2002; **-1** Small decrease of 20-49% between 1995 and 2002; **-2** Large decrease of at least 50% between 1995 and 2002; and **F** Fluctuating with changes of at least 20%, but no clear trend since 1995.

3. THREATS

The Ferruginous Duck faces various threats throughout its range. In this section, a comprehensive description of the threats facing the Ferruginous Duck at a global scale, together with information on special cases, and the relative importance of each threat for the global population, is presented. In addition, a complete list of the threats facing the species in the breeding and non-breeding seasons, and their relative importance, is presented in *Table 3. Annex 1* states these threats according to categories listed in the IUCN Species Survival Commission Species Information System Threats Authority file.

The criteria used to assess threats in this review are:

Critical	a factor causing or likely to cause very rapid declines (>30% over 10 years);
High	a factor causing or likely to cause rapid declines (20-30% over 10 years);
Medium	a factor causing or likely to cause relatively slow, but significant, declines (10-20% over 10 years);
Low	a factor causing or likely to cause fluctuations ;
Local	a factor causing or likely to cause negligible declines ;
Unknown	a factor that is likely to affect the species but is not known to what extent.

3.1. Description of Threats

Source: Robinson & Hughes (2003).

Habitat Loss/Degradation

Importance: Critical

Together with habitat degradation, the loss of wetland habitat from human developments is probably the most significant factor in the decline of the Ferruginous Duck. For example, 60% of wetlands in Greece and over 90% in Bulgaria have been drained since 1900, most of which would have been prime habitat for the species. In particular, canalisation of rivers and flood defence works has caused the loss of most European floodplain wetlands, most of which were prime habitat for the Ferruginous Duck. To some extent, this has been compensated by the creation of extensively managed fishponds, for example on the Danube Floodplain in Bulgaria. Increased aridity in the climate of central Europe may also have caused widespread loss of some important wetlands. In contrast, irrigation projects in the Middle East appear to be creating suitable habitat.

Many wetlands important for the Ferruginous Duck have been degraded without being destroyed. The species' dependence on highly structured wetlands with rich macrophyte and emergent plant growth makes it particularly sensitive to habitat alterations. The most important negative alterations include degradation of emergent vegetation, disruption of water regimes (when this causes a reversion to a less structured wetland or succession to scrub), siltation, and increased turbidity (causing loss of macrophytes). Agents of these changes include intensification of agriculture/fisheries, over-grazing, general development, recreation (particularly water-based), inadequate sewage treatment, dam and barrage constructions, and excessive water abstraction. In Serbia, the abundance and range of the Ferruginous Duck have decreased in natural marsh habitats due to accelerated overgrowth and eutrophication.

Of particular note, however, is the degradation of extensively managed fishponds by abandonment (causing succession to scrub) or intensification (causing reversion to open water with little or no plant growth). For example, about 60% of the Ferruginous Ducks in Romania breed on fishponds where >50% of fishponds have been abandoned since 1989. Similar, large-scale abandonment has occurred in Bulgaria, Hungary, Russia, Lithuania, Bosnia and Herzegovina, Tajikistan, Turkmenistan and Uzbekistan. Intensification is also a major problem in some countries, and is often subsidised by foreign aid. For example, a complex of over 70 fishponds in south-east Germany was formerly an important breeding area, but following intensification only 1-2 pairs nest annually. In Serbia, nesting habitat is destroyed by mowing or burning of emergent vegetation.

Climate Change/Drought**Importance: Critical**

Reduced precipitation, and over the last three years a serious drought, in central Europe, central and southwest Asia, has caused widespread loss and reduction of wetland habitats. This has probably caused a corresponding decline in Ferruginous Duck numbers. Central and Southwest Asia represents the largest region of persistent drought over the past three years anywhere in the world. Significant shortfalls in precipitation have led to widespread social and economic impacts, particularly in Iran, Afghanistan, Western Pakistan, Tajikistan, Uzbekistan and Turkmenistan. Agriculture, animal husbandry, water resources, and public health have been particularly stressed throughout the region. Preliminary analysis suggests that the drought is related to large-scale variations in the climate across the Indian and Pacific Oceans, including the recent "La Niña" in the eastern Pacific.

Conditions on the wintering grounds in north and west Africa are determined by the amount of late summer rain. For almost thirty years, from the 1960s to 1990s, this region experienced a very dry period, with nearly all annual rainfalls below average. Although rainfall was higher in 1998 and 1999, drought conditions are expected to increase in severity over the longer term with significant decreases in rainfall predicted.

The potential long-term effects of climate change on the distribution and behaviour of the Ferruginous Duck remain unclear, but potentially catastrophic. Any positive effects also remain unclear.

Over-hunting**Importance: High**

Between 1950 and 1970 the Ferruginous Duck was commonly hunted in south-east Kazakhstan in the Balkhash-Alakol region. During the spring hunting season of 2003 (10 calendar days) in two administrative oblasts in Kazakhstan (Almatynsky and Dzhambulsky) Ferruginous Ducks comprised 2.9% of the hunting bag (16 from 545 ducks of 16 species). Large numbers of Ferruginous Ducks (between 1,500 and 2,500) are shot on autumn passage through the Volga Delta, while on the wintering grounds in Africa and southern Asia the Ferruginous Duck is a common quarry of native and foreign hunters.

In most European countries, the species is now protected, but illegal hunting is an important problem. Law enforcement is often poor. Also, this species nests relatively late and many broods are not independent before the onset of the hunting season in most European countries (which generally begins in August). Illegal hunting mortality can be very high – at one fish farm in Croatia, 458 Ferruginous Ducks were killed in one season, despite the fact that fines for illegal hunting in Croatia are high (about 1,500 Euro per duck). There are also reports of at least 100 birds being killed by Italian hunters in Bosnia and 65 birds being killed illegally in Albania. In Uzbekistan the Ferruginous Duck is one from the most easy accessible species for hunters during migration, because it occurs earlier than many other species during the first wave of migration at the end of August – September when the hunting season has just opened. No evaluation of the hunting bag has been conducted over last decade, but hunters are thought to take 2 to 5 Ferruginous Ducks during hunting in September.

Lead Poisoning**Importance: Medium**

Diving ducks are prone to lead shot ingestion, which is still used legally in gun shot cartridges in most European countries and probably elsewhere. Although there are no recorded instances of lead poisoning in the Ferruginous Duck, it undoubtedly occurs. Accidental hunting mortality owing to confusion with other ducks, particularly *A. fuligula* and *A. ferina*, is a common problem. The latter problem is accentuated by the fact that Ferruginous Ducks commonly mix with other *Aythya* species during the non-breeding season.

Drowning in Fishing Nets**Importance: Medium**

Diving ducks are prone to becoming trapped in fishing nets, which in some instances can cause significant mortality. Although this has only been noted as a problem for the Ferruginous Duck in Romania and Bulgaria (Srebarna Lake), it is, no doubt, a more widespread problem.

Pollution**Importance: Medium**

Although the effects of eutrophication on the Ferruginous Duck have never been measured quantitatively, the species is regarded as a good indicator of trophic status and acute eutrophication is an acknowledged threat. For example, rapid succession as a result of continued input of nutrient and

sediment rich water from agricultural areas neighbouring the Göksu Delta (Turkey) is seriously threatening the site's continued international importance for the Ferruginous Duck. The situation in Uzbekistan is thought to be similar, although the impact of pollution on breeding and migratory waterbirds has not been studied.

Competition with Invasive Alien Species

Importance: Medium

Introduction and stocking of the Grass Carp *Ctenopharyngodon idella* across Europe has probably fuelled the decline of the Ferruginous Duck, for example in north-east Slovenia. Introduction of the fish usually causes substantial reductions in macrophyte biomass and corresponding declines in species dependent on these plant communities. However, although these fish caused a massive reduction of macrophyte biomass at Lake Neusiedl (Austria/Hungary), a substantial breeding population of the Ferruginous Duck remains, although effects on productivity and long-term viability are unknown. In Kazakhstan, the Wels Catfish *Silurus glanis*, introduced in about 1970, predated Ferruginous Duck ducklings in the Ilye River Delta. In Bulgaria, the introduced shrub Desert False Indigo *Amorpha fruticosa* has invaded wetlands used by Ferruginous Duck, changing their ecological character. Numbers of Ferruginous Duck in the Aral Sea region declined after the introduction of the Muskrat *Ondatra zibethicus*.

Human Disturbance

Importance: Medium

Disturbance from human activities on and around wetlands can, for example, reduce waterbird productivity, habitat availability and even cause local extinctions. Although it is commonly perceived to be a problem facing the Ferruginous Duck, particularly during the breeding period, the effects and impacts of recreational disturbance are notoriously difficult to measure. However, at Lake Constance, Germany, a moulting group of about 20 birds has developed since reductions in disturbance during the post-breeding period (together with increasing numbers of other species). At two key sites in Bulgaria, the species has become extinct in recent years with the only change apparent being more intensive use of sites by anglers and water-sports. In Serbia, where more than 60% of population situated on fishponds, human disturbance is a major problem on intensive carp fishponds. Disturbance from boats and fishermen is a common problem for Ferruginous Ducks at Tanguar Haor in Bangladesh.

Competition with Native Species

Importance: Unknown

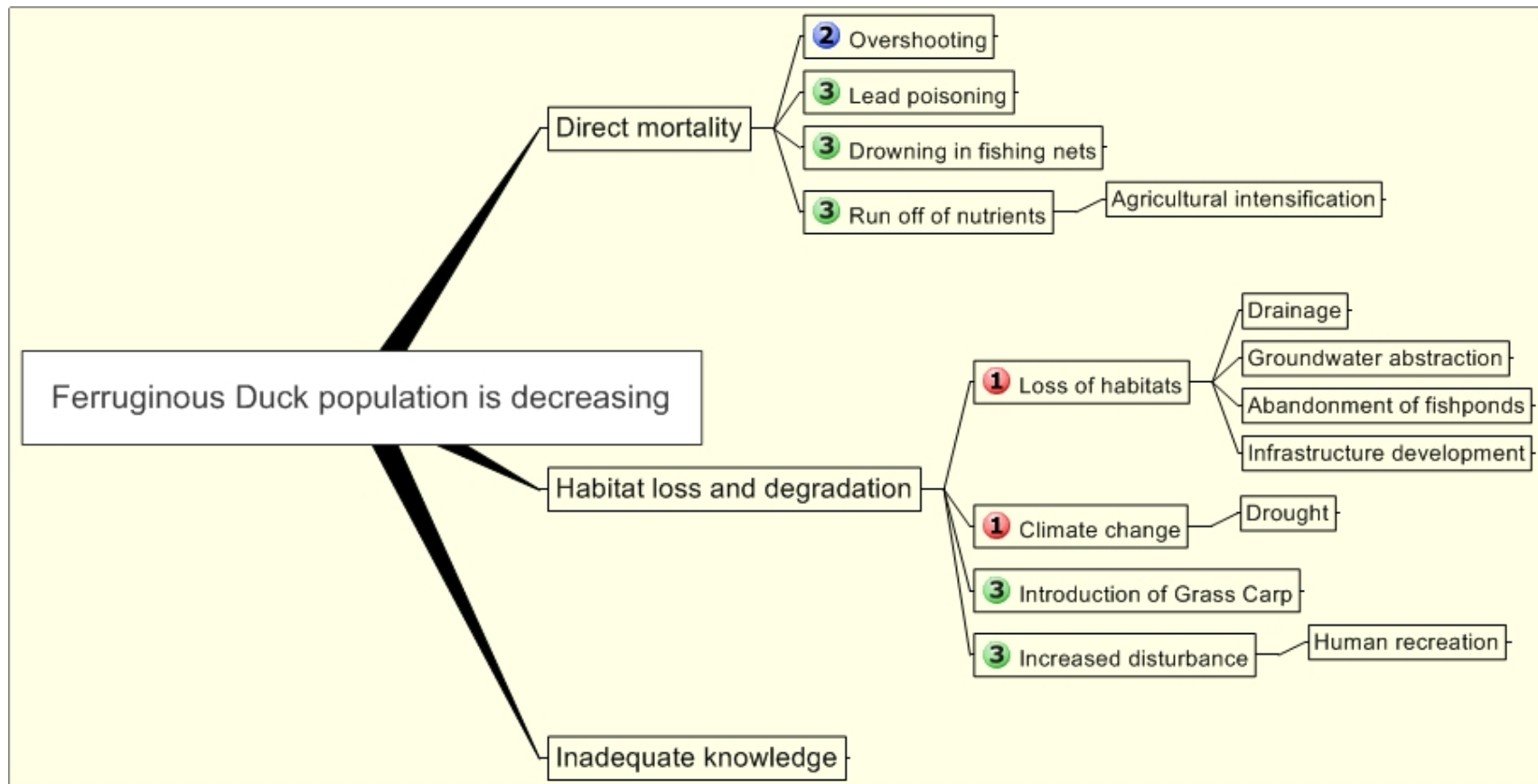
Declines in the numbers and range of the Ferruginous Duck in some countries, such as Poland and Slovakia, have been accompanied by increases in the numbers of other *Aythya* species that use similar habitats. The role of interspecific competition has, however, yet to be investigated.

Table 3. Relative importance of threats to the Ferruginous Duck Aythya nyroca in the breeding and non-breeding season. High and Critical threats in bold type. Updated from Robinson & Hughes (2003).

Threat	Global Importance	Breeding Season	Non-breeding Season
Habitat Loss/Degradation	Critical	Critical	Critical
Climate change/drought	Critical	Critical	Critical
Over-hunting	High	Medium	High
Lead poisoning	Medium	Low	Medium
Drowning in fishing nets	Medium	Medium	Medium
Pollution	Medium	Medium	Medium
Competition with Invasive Alien Species	Medium	Medium	Medium
Human disturbance	Medium	Local	Medium
Competition with native species	Unknown	Unknown	Unknown

A 'Problem tree' for the Ferruginous Duck is shown in Fig. 2. It has been produced to explain how the threats affect the population and how they are related. The root causes of the problems facing the species are shown on the right hand side of the tree.

Figure 2. Problem tree for the Ferruginous Duck *Aythya nyroca*. Priority: 1 – CRITICAL, 2 – HIGH, 3 – MEDIUM.



4. POLICIES AND LEGISLATION RELEVANT FOR MANAGEMENT

4.1. International Conservation and Legal Status of the Species

Table 4 shows the status of the Ferruginous Duck under the main international legislative instruments for conservation.

Table 4. International conservation and legal status of the Ferruginous Duck Aythya nyroca. Note: Headers in grey relate to measures relevant to European countries only). Updated from Robinson & Hughes (2003).

World Status (IUCN)	Europe Status	SPEC Cat.	EU Birds Directive Annex	Bern Convention Annex	Bonn Convention Annex	African-Eurasian Migratory Waterbird Agreement	Convention On International Trade in Endangered Species
LR/nt	Vu	SPEC 1	Annex I	Appendix III	Appendix I (15/07/97) Appendix II (as an <i>Anatidae</i> spp.) (15/07/97)	West Mediterranean/ North & West Africa (A 1a 1c) Eastern Europe/ E Mediterranean & Sahelian Africa (A 1a 3c) Western Asia/ SW Asia & NE Africa (A 1a 3c) (01/01/03)	Appendix III Ghana (26/02/76) (Originally listed as <i>Anatidae</i> spp.)

4.2. Member States/Contracting Parties Obligations

The obligations/commitments of Member States/Contracting Parties under various Directives/Conventions are presented in *Annex 2*.

EU Directive (79/409/EEC) on the Conservation of Wild Birds (Birds Directive)

As the Ferruginous Duck listed on Annex I of the EU Directive (79/409/EEC) on the Conservation of Wild Birds (Birds Directive), the species should be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution. Member States should classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species.

Convention on Biological Diversity (Biodiversity Convention)

Article 8 of the Convention on Biological Diversity (Biodiversity Convention) states that “Each Contracting Party shall, as far as possible and as appropriate:

- (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;
- (d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- (f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies”.

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

As the Ferruginous Duck listed on Appendix III of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), Contracting Parties should take appropriate and necessary legislative and administrative measures to ensure the protection of the Ferruginous Duck. Any exploitation of wild fauna specified in Appendix III shall be regulated in order to keep the populations out of danger, taking into account the requirements of Article 2. Measures to be taken should include: a) closed seasons and/or other procedures regulating exploitation; b) the temporary or local prohibition of exploitation, as appropriate, in order to restore satisfactory population levels; c) the regulation as appropriate of sale, keeping for sale, transport for sale or offering for sale of live and dead wild animals.

Convention on Migratory Species (Bonn Convention)

As the Ferruginous Duck is listed on Appendix I of the Convention on Migratory Species (Bonn Convention), Range States should endeavour: a) to conserve and, where feasible and appropriate, restore those habitats of the species which are of importance in removing the species from danger of extinction; b) to prevent, remove, compensate for or minimize, as appropriate, the adverse effects of activities or obstacles that seriously impede or prevent the migration of the species; and c) to the extent feasible and appropriate, to prevent, reduce or control factors that are endangering or are likely to further endanger the species, including strictly controlling the introduction of, or controlling or eliminating, already introduced exotic species.

African Eurasian Waterbird Agreement (under the Bonn Convention)

As the Ferruginous Duck is listed in Table 1, Column A of the action plan to the African-Eurasian Waterbird Agreement, Parties should: a) prohibit the taking of birds and eggs of those populations occurring in their territory; b) prohibit deliberate disturbance in so far as such disturbance would be significant for the conservation of the population concerned; c) prohibit the possession or utilization of, and trade in, birds or eggs, or any readily recognizable parts or derivatives of such birds and their eggs; d) cooperate with a view to developing and implementing international single species action plans; e) prepare and implement national single species action plans; and f) phase out the use of lead shot for hunting in wetlands.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Ferruginous Duck is listed on Appendix III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The export of any Ferruginous Duck from Ghana shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met: (a) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora; and (b) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment.

4.3. National Policies, Legislation and Ongoing Activities

The legally protected status of the Ferruginous Duck in the 77 countries where it regularly occurs is shown in *Table 5*.

4.4. Site (and Habitat) Protection and Research

The complete list of IBAs identified for the Ferruginous Duck, together with their co-ordinates, the numbers of birds they support, the season for which they are important and the criteria used to identify the site, are shown in *Annex 3.1* (as of July 2002). The protection status of each of these IBAs is shown in *Annex 3.2*, together with the appropriate designations. If we accept that the global population estimate is roughly 100,000, then the IBA network currently supports 8% during the breeding season, 15% during passage periods and 27% during the winter. Of the 185 IBAs identified for the Ferruginous Duck, only 11% are known to be fully protected and 16% have management plans prepared (*Annex 3.2*). *Table 6* presents a summary of the proportion of Ferruginous Ducks in the IBA suite of each country in the range during the breeding and non-breeding seasons. The proportion of the national total protected by the IBA suite in the breeding and non-breeding seasons is also presented for each country.

Of the 35 countries in the breeding range where IBAs have been fully documented, 46% did not have any IBAs identified for the Ferruginous Duck and 34% had 75-100% of the national total within the IBA suite. Of the 59 countries in the non-breeding range where IBAs have been fully documented, 54% did not have IBAs identified for the Ferruginous Duck and 31% had 75-100% of the national total within the IBA suite. Of the most important countries during the breeding season, 75-100% of the 5,500-6,500 pairs in Romania, 0% of the 1,000-3,000 pairs in Azerbaijan, and <25% of the 2,000-3,000 pairs in Croatia, occurred within each of the IBA suites in those countries. Of the most important countries during the non-breeding season, 50-75% of the 14,300 birds in Mali, 75-100% of the 8,500 birds in Chad, 0% of the 5,000 birds in Sudan, <25% of the 7,500 birds in Egypt, and 0% of the 1,000-9,000 birds in Azerbaijan occurred within each of the IBA suites in those countries. There are no IBAs in Bangladesh, Turkmenistan, Kazakhstan or Uzbekistan, yet all these countries have supported >5,000 Ferruginous Duck during the non-breeding season (*Table 1*). Identification of IBAs in these countries should, therefore, remain a priority for conservation action.

Table 5. Protection of the Ferruginous Duck Aythya nyroca under national legislation, by country. Updated from Robinson & Hughes (2003).

Country	Legal Protection	Country	Legal Protection
Afghanistan	No info	Lithuania	No info
Albania	No info	Mali	No info
Algeria	No info	Malta	No info
Armenia	No info	Mauritania	No info
Austria	Yes	Mongolia	No info
Azerbaijan	No info	Morocco	No info
Bangladesh	Yes	Myanmar	Yes
Belarus	Yes	Nepal	No info
Belgium	Yes	Niger	No info
Bhutan	Yes	Nigeria	No info
Bosnia and Herzegovina	No	Oman	No info
Bulgaria	Yes	Pakistan	No info
Cameroon	Yes	Poland	Yes
Central African Republic	No info	Portugal	No info
Chad	No info	Republic of Moldova	Yes
China	No info	Romania	Yes
Croatia	Yes	Russian Federation	Yes
Cyprus	No info	Saudi Arabia	No info
Czech Republic	Yes	Senegal	No info
Egypt	No info	Serbia & Montenegro	Yes
Eritrea	No info	Slovakia	Yes
Ethiopia	No info	Slovenia	Yes
France	Yes	Spain	Yes
Gambia	Yes	Sudan	No info
Georgia	No	Switzerland	Yes
Germany	Yes	Syrian Arab Republic	No info
Greece	Yes	Tajikistan	No
Hungary	Yes	Thailand	No info
India	No info	The FYR Macedonia	Partial (1 March-31 July)
Iraq	No info	The Netherlands	Yes
Islamic Republic of Iran	Yes	Tunisia	Yes
Israel	No info	Turkey	Yes
Italy	Yes	Turkmenistan	No
Jordan	No info	Ukraine	Yes
Kazakhstan	Yes	United Arab Emirates	No info
Kenya	No info	Uzbekistan	Yes
Latvia	No info	Viet Nam	No info
Lebanon	Yes	Yemen	No
Libyan Arab Jamahiriya	No info		

Table 6. Knowledge on occurrence of the Ferruginous Duck *Aythya nyroca* in Important Bird Areas. Grey cells represent periods when the species is probably not present in the country. The breeding season includes estimates of breeding and resident bird numbers and the non-breeding season includes estimates of passage and wintering bird numbers.

	Number of IBAs where the species breeds ¹	Estimated % of national population in IBAs ²	Estimated % of population in protected IBAs during the breeding season ³	Number of IBAs where the species occurs in the non-breeding season ¹	Estimated % of national population in IBAs ²	Estimated % of population in protected IBAs during non-breeding season ³
Afghanistan	0	0	0	1	75-100	0
Albania	0	0	0	0	0	0
Algeria	2	75-100	75-100	4	75-100	?
Armenia	1	75-100	?	2	75-100	<25
Austria	2	75-100	75-100	0	0	0
Azerbaijan	0	0	0	0	0	0
Bangladesh				-	-	-
Belarus	2	75-100	75-100 (Partial)			
Belgium				0	0	0
Bhutan				-	-	-
Bosnia and Herzegovina	2	0	0	0	0	0
Bulgaria	12	50-75	25-50	30	75-100	25-50
Cameroon				0	0	0
Central African Republic				0	0	0
Chad				1	75-100	75-100
China	-	-	-	-	-	-
Croatia	9	<25	<25 (Partial)	3	75-100	75-100
Cyprus				0	0	0
Czech Republic	0	0	0	0	0	0
Egypt				5	<25	?
Eritrea				0	0	0
Ethiopia				4	50-75	?
France				0	0	0
Gambia				0	0	0
Georgia	2	0	0	0	0	0
Germany	0	0	0	0	0	0
Greece	9	75-100	75-100 (Partial)	8	75-100	75-100 (Partial)
Hungary	10	75-100	25-50 (Full) 25-50 (Partial)	1	75-100	75-100 (Partial)
India	-	-	-	-	-	-
Iraq				5	75-100	0
Islamic Republic of Iran	9	75-100	?	12	75-100	?
Israel				2	<25	?
Italy	3	25-50	<25 (Full) 25-50 (Partial)	11	75-100	75-100
Jordan				0	0	0
Kazakhstan						
Kenya				0	0	0

	Number of IBAs where the species breeds ¹	Estimated % of national population in IBAs ²	Estimated % of population in protected IBAs during the breeding season ³	Number of IBAs where the species occurs in the non-breeding season ¹	Estimated % of national population in IBAs ²	Estimated % of population in protected IBAs during non-breeding season ³
Latvia	0	0	0			
Lebanon				1	<25	?
Libyan Arab Jamahiriya				0	0	0
Lithuania	0	0	0			
Mali				5	50-75	?
Malta				0	0	0
Mauritania				2	75-100	?
Mongolia	-	-	-	-	-	-
Morocco	0	0	0	0	0	0
Myanmar				-	-	-
Nepal				-	-	-
Niger				0	0	0
Nigeria				1	75-100	?
Oman				4	75-100	?
Pakistan				-	-	-
Poland	5	75-100	75-100	0	0	0
Portugal	1	75-100	0	0	0	0
Republic of Moldova	0	0	0	0	0	0
Romania	4	75-100	25-50 (Full) <25 (Partial)	3	25-50	25-50
Russian Federation	4	75-100	75-100 (Partial)	3	50-75	25-50 (Partial)
Saudi Arabia	3	75-100	?	2	75-100	?
Senegal				1	50-75	?
Serbia & Montenegro	14	50-75	25-50	15	?	?
Slovakia	0	0	0	0	0	0
Slovenia	0	0	0	0	0	0
Spain	0	0	0	0	0	0
Sudan				0	0	0
Switzerland	0	0	0	0	0	0
Tajikistan	-	-	-	-	-	-
Thailand				-	-	-
The FYR Macedonia	0	0	0	0	0	0
The Netherlands				0	0	0
Tunisia	2	<25	?	7	75-100	?
Turkey	15	50-75	<25 (Full) 45 (Partial)	5	50-75	<25 (Full) 25-50 (Partial)
Turkmenistan	-	-	-	-	-	-
Ukraine	5	<25	<25	1	75-100	0
United Arab Emirates				0	0	0
Uzbekistan	-	-	-	-	-	-
Viet Nam				-	-	-
Yemen				1	75-100	?

¹ Estimates of the number of IBAs where the species breeds or spends part of the non-breeding season were obtained from data held in the BirdLife International World Bird Database (data extracted July 2002).

² Estimates of the % of the population present in the IBA suite of an individual country were calculated using information on maximum population sizes presented in Table 1 and maximum site totals from the BirdLife International World Bird Database (data extracted July 2002) presented in Annex 3.1.

³ Estimates of the % of the national population present in protected IBAs were calculated using information on maximum population sizes presented in Table 1 and maximum site totals and protection status information from the BirdLife International World Bird Database (data extracted July 2002) presented in Annexes 3.1 and 3.2.

4.5. Recent Conservation Measures

Recent conservation measures for the Ferruginous Duck over the last ten years are described in Table 7.

Table 7. Research and conservation efforts for the Ferruginous Duck Aythya nyroca over the last ten years. Updated from Robinson & Hughes (2003).

Country	Recent Conservation Measures
Austria	A study of habitat requirements, food and behaviour of the Ferruginous Duck was conducted at Lake Neusiedl in 1995, and a full census was carried out in 1996.
Azerbaijan	A study to assess the number, distribution and ecology of the Ferruginous Duck in Azerbaijan was undertaken in the late 1990s by the Azerbaijan Ornithological Society. Surveys of threatened waterfowl in Azerbaijan in September 1997 and February - March 1998, conducted by The Wildfowl & Wetlands Trust (UK) in collaboration with the Azerbaijan International Oil Consortium, and the Azerbaijan Ornithological Society, located the Ferruginous Duck at six sites.
Bangladesh	Management plans have been produced for key sites, such as Tanguar Haor where data has also been collected on behaviour and disturbance.
Bulgaria	National censuses of the species were conducted by BSPB/BirdLife Bulgaria in 1996/97 and 2002. The most important breeding sites (Mechka, Orsoya and Kalimok Fishponds, Srebarna and Durankulak Lakes) are protected. Management plans have been completed for the most important breeding areas, including the most important along the Black Sea coast and Srebarna Lake. A National Action Plan has also been prepared. BSPB have been actively raising public awareness about the species in Bulgaria and counter training is ongoing. A PhD study on the distribution and ecology of the species has been carried out revealing important details of the species ecology (Petkov 2004).
Croatia	The status and ecology of the Ferruginous Duck was studied at Draganić Fishponds between 1991 and 1994. A monitoring project of breeding and non-breeding Ferruginous Ducks started in 2003 in the Pokupsko basin, one of the most important areas in Croatia for Ferruginous Duck. Research projects were undertaken at various fishponds, including Crna Mlaka, Draganić, Lipovljani, Poljana, Končanica, Donji Miholjac etc. The German NGO Euronatur co-financed surveys at three of these fishponds. Euronatur has also conducted a number of site-based conservation projects on the Ferruginous Duck, including lobbying for greater protection of their fishpond habitat, and has investigated the distribution and ecology of the species and the impact of hunting in Croatia. A research project on the Ferruginous Duck has just begun on fishponds in Donji Miholjac, near the Drava River.
France	An unsuccessful re-introduction was carried out in the 1970s in Villars des Dombes. Currently, a re-introduction is being attempted at Le Marais de Ganne (Saint Andre des Eaux), where an open enclosure of pinioned birds is used to breed fully-winged juveniles. If 50 wild breeding pairs are not established within ten years of the start of this project, it will be terminated. In 1996, ten pinioned birds raised ten fully-winged individuals.
Germany	The small German breeding population of the Ferruginous Duck is monitored annually by the "Ornithologische Arbeitsgemeinschaft (Ornithological Working Group) Bodensee".
Greece	A census of the Ferruginous Duck in Crete is currently being undertaken by the Natural History Museum of Crete. Ecology and habitat use were investigated at Amvrakikos in 2001 during a Life-Nature Project.
Hungary	The first full census of breeding numbers and research was undertaken by the Hungarian Waterbird Specialist Group in the late 1990s. More recently, there have been censuses undertaken since 1997. A national action plan was published in 2003.
India	An effort to monitor the Ferruginous Duck in the Brahmaputra valley in Assam was initiated in 1990 by Gauhati University.
Italy	Ecological research on the species was undertaken in Northern Italy during the late 1990s. There have been around 20 reintroduction programmes in Italy over the past decade. Although most have been unsuccessful, apparently self-sustaining breeding populations were established at the Eastern Bologna Plain and Alviano Lake. Within the framework of the Italian Action Plan for the species, a survey was carried out in 2002 to obtain an updated estimate of the Italian breeding population.

Country	Recent Conservation Measures
Kazakhstan	In collaboration with the National Avian Research Centre (United Arab Emirates) and the Institute of Zoology (Almaty), The Wildfowl & Wetlands Trust surveyed six sites in south-east Kazakhstan in July 1999, locating a total of 570 Ferruginous Ducks including 40 broods. Management plans for key wetlands and basins will be developed under ongoing conservation programmes (e.g. GEF/UNDP, and IBA programmes). Between 2000 and 2003, the Institute of Zoology have monitored the number of Ferruginous Ducks on the main sites in south and south-eastern Kazakhstan.
Morocco	A project investigating the ecology of the Ferruginous Duck in Morocco was initiated in the mid 1990s by various Moroccan organisations and the Estación Biológica de Doñana.
Poland	Studies of breeding ecology were undertaken in the 1980s at Milicz Fishponds. Data on habitat selection and population trends have been collected. A national action plan will be prepared shortly.
Russian Federation	Recent censuses and studies of the ecology of the Ferruginous Duck have been undertaken in the Prekavkazye and Daghestan regions. Public awareness schemes, aimed primarily at hunters, have been initiated in these areas.
Serbia & Montenegro	In recent times, habitat conditions have been improved in important areas such as Obedska bara, Carska bara and Ludaško jezero (Ramsar sites), including sanitation, habitat restoration projects and improvement to the hydrological regime. In 2001, the Society for Protection and Study of Birds of Vojvodina began a project to educate fishponds workers and managers throughout Vojvodina in order to improve the protection of birds, particularly the Ferruginous Duck.
Slovenia	Censuses have been conducted by The Bird Watching and Bird Study Association of Slovenia (DOPPS).
Spain	A re-introduction programme was launched by the Instituto para la Conservación de la Naturaleza (ICONA) in south-west Spain in 1992. In the Acebuche-Huerto-Pajasarea of the Guadalquivir Marshes, 49 individuals were released in 1992 and 1993, from which three pairs bred in 1993. A further 45 were released in south-west Spain during 1994 and 1995, and over 30 in 1996.
Tunisia	The breeding and wintering population of the Ferruginous Duck is monitored annually by the "Groupe Tunisien d'Ornithologie (Association "les Amis des Oiseaux").
Turkey	A study of the ecology of the Ferruginous Duck was made at the Gösku Delta in the mid 1990.
Uzbekistan	Surveys of the Bukhara and Kashkadarya regions of south-west Uzbekistan were undertaken by the Uzbekistan Zoological Society in 1997. Winter status was assessed by several projects between 2000 and 2005, which found very low numbers of Ferruginous Ducks (few dozens or hundreds).
West and Central Africa	Aerial counts of the Ferruginous Duck were undertaken in the Inner Niger Delta and the Lake Chad Basin between 1970 and 2003.

5. FRAMEWORK FOR ACTION

This section of the document identifies and defines the Goal, the Purpose, and Results of the action plan and describes Objectively Verifiable Indicators, and Means of Verification made in its implementation. The Goal is the higher level of objective to which the action plan will contribute in the longer term. The Purpose is the objective or effect of the plan by 2015. The Results are the changes that will need to have been brought about by the plan if the Purpose is to be realised. The Objectively Verifiable Indicators (OVIs) are the targets by which the impact of the Results will be measured. Means of Verification are the means of justification of the OVIs. The Goal, Purpose, and Results of this plan have been designed to be Specific, Measurable, Agreed, Realistic and Time-bound following internationally agreed process.

5.1 Ferruginous Duck Action Plan Goal, Purpose, and Results

A Priority for each Result is given, according to the following scale:

- Essential:** a Result that is needed to prevent a large decline in the population, which could lead to extinction.
- High:** a Result that is needed to prevent a decline of more than 20% of the population in 20 years or less.

Medium: a Result that is needed to prevent a decline of less than 20% of the population in 20 years or less.

Low: a Result that is needed to prevent local population declines or which is likely to have only a small impact on the population across the range.

Timescales are attached to each Result using the following criteria:

Immediate: completed within the next year.

Short: completed within the next 1-3 years.

Medium: completed within the next 1-5 years.

Long: completed within the next 1-10 years.

Summary of Objectives / Activities	Objectively Verifiable Indicator	Means of Verification
Goal Restoration of the Ferruginous Duck to favourable conservation status	Ferruginous Duck re-moved from the IUCN red list by 2050	IUCN Red List World Bird Database
Project Purpose Maintain global population and range of the Ferruginous Duck.	Ferruginous Duck global population stable by 2020 Ferruginous Duck global range stable by 2020	IUCN Red List World Bird Database Wetlands International Waterbird Population Estimates
Results		
1. Further habitat loss and degradation prevented Priority: Essential Timescale: Long	All key Ferruginous Duck sites protected and maintained in favourable conservation status by 2020	Natura 2000, Ramsar and Emerald Network databases National government reports to the European Commission, the Bonn, Bern, Biodiversity and Ramsar Conventions, and AEWA International and national Ferruginous Duck working group reports BirdLife International IBA reports
2. Direct human-induced mortality of adults prevented and reproductive success increased Priority: High Timescale: Long	No human-induced adult mortality reported on IBAs by 2020 Mean fledging success on IBAs maintained above 3 chicks per female by 2020 Ferruginous Duck numbers on >70% of IBAs stable or increasing by 2020	National government reports to the European Commission, the Bonn, Bern, Biodiversity and Ramsar Conventions, and AEWA International and national Ferruginous Duck working group reports NGO reports and scientific papers BirdLife International IBA monitoring reports Monitoring reports from key sites published in TWSG News
3. Knowledge gaps filled Priority: Essential Timescale: Long	Key knowledge gaps filled by 2020	Papers in internationally refereed journals International and national Ferruginous Duck working group reports

6. ACTIVITIES BY COUNTRY

This section identifies Activities needed to implement the Results of this Ferruginous Duck action plan. Activities are given at the generic level (to address the threats identified in the Problem Tree) whilst specific Activities are also identified at the individual Range State level. Where possible, Responsible Organisations are also identified for each Activity.

A **Priority** for each Activity is given, according to the following scale:

- Essential:** an Activity that is needed to prevent a large decline in the population, which could lead to extinction.
- High:** an Activity that is needed to prevent a decline of more than 20% of the population in 20 years or less.
- Medium:** an Activity that is needed to prevent a decline of less than 20% of the population in 20 years or less.
- Low:** an Activity that is needed to prevent local population declines or which is likely to have only a small impact on the population across the range.

Timescales are attached to each Activity using the following criteria:

- Immediate:** completed within the next year.
- Short:** completed within the next 1-3 years.
- Medium:** completed within the next 1-5 years.
- Long:** completed within the next 1-10 years.
- Ongoing:** an action that is currently being implemented and should continue.
- Completed:** an action that was completed during preparation of the action plan.

Result	National Activities	Priority	Timescale	Responsible Organisations
1. Further habitat loss and degradation prevented	1.1 Produce and implement national Ferruginous Duck action plan	Essential	Short	National governments/NGOs
	1.2 Form national Ferruginous Duck working group	Essential	Short	National governments/NGOs
	1.3 Designate all key sites for the species (including IBAs) as SPAs in EU member states or as Ramsar Sites or protected areas outside of the EU	High	Short	National governments
	1.4 Protect all Ferruginous Duck IBAs under national legislation and ensure this legislation is enforced	High	Short	National governments
	1.5 Implement appropriate assessments for all projects and plans affecting these sites, with special attention to agricultural development, drainage, diversion of rivers, abstraction of water and building of dams. In the case of SPAs these assessments shall be carried out according to the requirements of Article 6 of the Habitats Directive	Essential	Ongoing	National governments
	1.7 Introduce legislation to prohibit the introduction, and allow the control and eradication of Grass Carp	Low	Long	National governments
	1.8 Identify all key Ferruginous Duck sites where Grass Carp occurs and eradicate it	Low	Short	National governments
	1.9 Introduce public awareness schemes to promote conservation of the Ferruginous Duck and its habitat and circulate this information to relevant policy makers, interest groups (e.g. hunters, fishermen, reserve managers) and local people; provide information on identification of protected species	Low	Ongoing	National governments/NGOs
2. Direct mortality of adults prevented and reproductive success increased	2.1 Provide legal protection for Ferruginous Duck including the general protection of its habitat outside of protected areas	Essential	Short	National governments
	2.2 Provide adequate wardening of all key sites	Medium	Long	National governments and regional administrations, NGOs and other landowners
	2.3 Develop management and zonation plans to regulate human activities at key sites, with special regard to hunting, fishing and boating, in order to reduce causes of disturbance and direct mortality, and increase breeding success	Medium	Ongoing	National governments/NGOs/BirdLife International/FACE
	2.4 Develop national strategies for the management and subsequent use of fishponds by identifying 'best practice guidelines', focusing on habitat creation and management. These to include financial subsidy/accreditation schemes for 'wise use' of fishponds and incentives for maintaining/ reverting to extensive fishpond management. EU Member States shall cover SPAs selected for the species by aqua-environmental measures proposed in the new Fisheries Fund Regulation	Essential	Short	National governments
	2.5 Create new breeding and wintering habitat for the Ferruginous Duck	Medium	Ongoing	National governments/NGOs
	2.6 Ban use of lead shot for hunting waterfowl and over wetlands, monitor lead shot use by hunters and lead shot ingestion by Ferruginous Ducks	Medium	Short	National governments
	2.7 Ensure strict enforcement of hunting regulations and policing of foreign hunters	Essential	Ongoing	National governments

Result	National Activities	Priority	Timescale	Responsible Organisations
	2.8 Promote strict spatial and temporal hunting regulations that reduce the probability of hunting mortality	Essential	Ongoing	National governments and regional administrations, NGOs and other landowners
	2.9 Introduce systems to monitor by-catch and fishing activity in relation to Ferruginous Duck feeding distribution	Medium	Long	National governments/NGOs
	2.10 Develop fishing techniques sympathetic to the conservation of the Ferruginous Duck	Medium	Long	National governments/NGOs
3. Knowledge gaps filled	3.1 Identify all key sites and document their conservation status	Essential	Medium	National governments, NGOs, BirdLife International, Wetlands International
	3.2 Monitor all key sites annually during the winter International Waterbird Census	Essential	Ongoing	National governments, NGOs, Wetlands International
	3.3 Conduct national censuses during the breeding season and migration	Essential	Ongoing	National governments, NGOs
	3.4 Conduct studies of migratory movements	Medium	Long	National governments, NGOs, Research Institutions
	3.5 Conduct studies to determine factors affecting survival and reproductive rates	Medium	Long	National governments, NGOs, Research Institutions
	3.6 Conduct studies of habitat requirements and feeding ecology, especially on the wintering grounds and during periods of migration	Low	Long	National governments, NGOs, Research Institutions
	3.7 Conduct studies on the effects of Grass Carp on the Ferruginous Duck and its habitat	Medium	Medium	National governments, NGOs, Research Institutions
	3.8 Quantify the impact of bycatch mortality in fishing nets	High	Short	National governments, NGOs, Research Institutions
	3.9 Conduct studies of the rate of exposure to lead shot and the effect on mortality	Medium	Medium	National governments, NGOs, Research Institutions
	3.10 Conduct studies on the economic and environmental impacts of fishpond management on the Ferruginous Duck	High	Short	National governments, NGOs, Research Institutions
	3.11 Investigate the potential benefits of dam construction in some countries, e.g. in North Africa and the Middle East	Medium	Medium	National governments, NGOs, Research Institutions

7. IMPLEMENTATION

This section provides a framework for the implementation of the action plan focusing on the role of the Ferruginous Duck Conservation Team (FDCT), country actions and a timetable for monitoring, evaluation and communication.

7.1. BirdLife International Ferruginous Duck Conservation Team

The Ferruginous Duck Conservation Team is the International Species Working Group (ISWG) for implementation of this action plan, endorsed by the AEWa Technical Committee. This group comprises representatives of each National Species Working Group (NSWG), governmental representatives (where NSWGs have not yet been created) and representatives of relevant international interest groups, including each of the relevant treaties (e.g. AEWa Technical Committee) and several technical advisors.

AEWA Range States have a responsibility to monitor the national populations of the species and its habitat, as well as the actions taken, including their impact on the species/habitat, successes and problems. This should be done by NSWG as recommended by the AEWa Conservation Guidelines No. 1 (National Single Species Action Plans). To ensure lessons are learnt and shared internationally, this information then needs to be communicated to the Ferruginous Duck Conservation Team and thus to other Range States, including via the relevant international treaties.

To improve action for the species, the Ferruginous Duck Conservation Team aims to catalyse and co-ordinate the collection of improved conservation-relevant information on the species, including on population biology (e.g. details of breeding population size and range, migration habits, wintering range) and ecology (e.g. habitat use and diet).

Thus, the role of the Ferruginous Duck Conservation Team will include work to:

- Develop guidelines for population censusing and monitoring.
- Develop guidelines for habitat management practices.
- Assist in and co-ordinate the process of National Action Plan preparation.
- Co-ordinate and facilitate information exchange between Range States (NSWG) and between the AEWa and the Range States.
- Collect country data and annual reports on the implementation of the Action Plan from the NSWGs.
- Monitor implementation of the Action Plan through the preparation of an annual international report by the ISWG.
- Organise intermediate meetings with groups of Range States (training, emergency measures, etc.).
- Prepare and organise the triennial review meeting with Range States.
- Prepare and submit a review of the Action Plan to the triennial Range States' meeting and to the AEWa.

Detailed Terms of Reference based on the above description of activities will be prepared by the AEWa Technical Committee, and endorsed by the Range States to assist the Ferruginous Duck Conservation Team with its work.

7.2. Country Actions

To assist implementation of the Action Plan, the Range States should commit themselves to, at least:

- Establish a National Species Working Group (a member will be selected as national representative of the Ferruginous Duck Conservation Team; in the absence of a selected member the FDCT will co-opt a member for the country).

- Report to the AEWa Secretariat, via its member on the Ferruginous Duck Conservation Team, about relevant issues in the country, at least through contributing information for the preparation of the annual report by the ISWG.
- Prepare within one year a National Action Plan, in co-operation with the NSWG, based on this International Action Plan (see AEWa Conservation Guidelines No. 1).
- Prepare a review of National Action Plans every three to five years.
- Maintain and further develop adequately-funded conservation, research and monitoring programmes to deliver key data in accordance with Section 6 of the action plan.

8. REFERENCES AND THE MOST RELEVANT LITERATURE

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- Petkov, N. 2004. Comparative ecological studies on the Ferruginous Duck *Aythya nyroca* and Pochard *Aythya ferina* during the breeding season in Bulgaria. PhD thesis, Central Laboratory of General Ecology, Sofia. 256pp.
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9. ANNEXES

Annex 1. Relative importance of threats to the Ferruginous Duck Aythya nyroca in the breeding and non-breeding season scored according to categories listed in the IUCN Species Survival Commission Species Information Service Threats Authority files. Source: Robinson & Hughes (2003).

Threat Category	Breeding Season	Non-breeding Season
1. Habitat Loss/Degradation (human induced)		
1.1. Agriculture		
1.1.1. Crops		
1.1.1.1. Shifting agriculture	HIGH	HIGH
1.1.1.3. Agro-industry farming	CRITICAL	CRITICAL
1.1.7. Freshwater aquaculture	CRITICAL	CRITICAL
1.3. Extraction		
1.3.6. Groundwater extraction	HIGH	HIGH
1.4. Infrastructure development		
1.4.2. Human settlement	HIGH	HIGH
1.4.3. Tourism/recreation	HIGH	UNKNOWN (potentially HIGH)
1.4.5. Transport – water	UNKNOWN (potentially HIGH)	UNKNOWN (potentially HIGH)
1.4.6. Dams	HIGH	HIGH
1.5. Invasive alien species (directly impacting habitat)	MEDIUM	MEDIUM
3. Harvesting [hunting/gathering]		
3.1. Food		
3.1.1. Subsistence use/local trade	HIGH	HIGH
3.6. Other (Illegal recreational harvesting)	HIGH	HIGH
4. Accidental mortality		
4.1. Bycatch		
4.1.1. Fisheries-related		
4.1.1.3. Entanglement	UNKNOWN (potentially MEDIUM)	UNKNOWN (potentially MEDIUM)
4.1.1.5. Poisoning	UNKNOWN (potentially HIGH)	UNKNOWN (potentially HIGH)
4.1.2. Terrestrial		
4.1.2.2. Shooting	HIGH	HIGH
4.1.2.3. Poisoning	UNKNOWN (potentially LOW)	UNKNOWN (potentially LOW)
6. Pollution (affecting habitat and/or species)		
6.3. Water pollution	HIGH	HIGH
7. Natural disasters		
7.1. Drought	CRITICAL	CRITICAL
8. Changes in native species dynamics		
8.1 Competitors	UNKNOWN	UNKNOWN
10. Human disturbance		
10.1. Recreation/tourism	UNKNOWN (potentially MEDIUM)	UNKNOWN (potentially MEDIUM)

Annex 2. Contracting parties to international conventions, agreements and directives that are relevant for conservation of the Ferruginous Duck Aythya nyroca (acc. – accession only; sig. – signatory only; app. – approved only). Source: Robinson & Hughes (2003).

Country	Ramsar	CMS	AEWA	Bern	EU	CBD	CITES
Afghanistan						•	•
Albania	•	•	•	•		(•) acc.	
Algeria	•					•	•
Armenia	•					(•) acc.	
Austria	•			•	•	•	•
Azerbaijan	•			•		(•) app.	•
Bangladesh	•					•	•
Belarus	•	•				•	•
Belgium	•	•	(•) sig.	•	•	•	•
Bhutan						•	•
Bosnia and Herzegovina	•					(•) acc.	
Bulgaria	•	•	•	•		•	•
Cameroon		•				•	•
Central African Republic		•				•	•
Chad	•	•				•	•
China	•					•	•
Croatia	•	•	•	•		•	•
Cyprus	•	•		•		•	•
Czech Republic	•	•		•		(•) app.	•
Egypt	•	•	•			•	•
Eritrea						(•) acc.	•
Ethiopia						•	•
France	•	•	•	•	•	•	•
Gambia	•	•	•			•	•
Georgia	•	•	•			(•) acc.	•
Germany	•	•	•	•	•	•	•
Greece	•	•	(•) sig.	•	•	•	•
Hungary	•	•	•	•		•	•
India	•	•				•	•
Iraq							
Islamic Republic of Iran	•					•	•
Israel	•	•	•			•	•
Italy	•	•		•	•	•	•

Country	Ramsar	CMS	AEWA	Bern	EU	CBD	CITES
Jordan	•	•	•			•	•
Kazakhstan	• (acc)	• (acc)				•	•
Kenya	•	•	•			•	•
Latvia	•	•		•		•	•
Lebanon	•		•			•	
Libyan Arab Jamahiriya	•	•				•	
Lithuania	•	•	•	•		•	•
Mali	•	•	•			•	•
Malta	•	•		•		•	•
Mauritania	•	•				•	•
Mongolia	•	•				•	•
Morocco	•	•	(•) sig.			•	•
Myanmar						•	•
Nepal	•					•	•
Niger	•	•	•			•	•
Nigeria	•	•	•			•	•
Oman						•	
Pakistan	•	•				•	•
Poland	•	•		•		•	•
Portugal	•	•		•	•	•	•
Republic Of Moldova	•	•	•	•		•	•
Romania	•	•	•	•		•	•
Russian Federation	•					•	•
Saudi Arabia		•				(•) acc.	•
Senegal	•	•	•	•		•	•
Serbia & Montenegro	•					•	•
Slovakia	•	•	•	•		(•) app.	•
Slovenia	•	•	•	•		•	•
Spain	•	•	•	•	•	•	•
Sudan			•			•	•
Switzerland	•	•	•	•		•	•
Syrian Arab Republic	•	•	•			•	
Tajikistan	•	•				(•) acc.	
Thailand	•					•	•
The FYR Macedonia	•	•	•	•		(•) acc.	•

Country	Ramsar	CMS	AEWA	Bern	EU	CBD	CITES
The Netherlands	•	•	•	•	•	(•) acc.	•
Tunisia	•	•	(•) sig.	•		•	•
Turkey	•			•		•	•
Turkmenistan						(•) acc.	
Ukraine	•	•	•	•		•	•
United Arab Emirates						•	•
Uzbekistan	•	•	•			(•) acc.	•
Viet Nam	•					•	•
Yemen						•	•

Annex 3. Important Bird Areas of relevance for the Ferruginous Duck Aythya nyroca.

Annex 3.1. Data from the BirdLife International World Bird database (July 2002).

Country	International name	Area (ha)	Location		Population		Year	Season	Criteria
			Lat (N)	Long (E)	Min	Max			
Afghanistan	Hamun-i-Puzak	35000	31.60	61.80	100		1976	winter	A1, B2
Algeria	Complexe de zones humides de la plaine de Guerbes-Sanhadja	42100	36.88	7.27	35	35	1987	winter	A1, A4i
	Lac des Oiseaux---Garaet et Touyour	70	36.78	8.12			2001	winter	A1
	Lac Oubeira	2200	36.83	8.38	15	15	1992	winter	A1
	Lac Tonga	2700	36.85	8.50	600	600	1992	breeding	C6
	Lac Tonga	2700	36.85	8.50	717	717	1997	non-breeding	A1
	Marais de Mekhada	8900	36.80	8.00			2001	breeding	A1
Armenia	Armash fish-farm	2795	39.75	44.77	25	30	0	breeding	A1, B2
	Armash fish-farm	2795	39.75	44.77	1	700	1995	non-breeding	A1, B2
	Lake Sevan	150000	40.33	45.33	0	60	1995	non-breeding	B2
Austria	Neusiedler See	23272	47.82	16.77	150	200	1996	resident	A1, B2
	Southern Seewinkel and Zitzmannsdorfer Wiesen	14000	47.75	16.83	10	15	1996	breeding	A1, C1, C6
Belarus	Beloe fish-farm	5700	52.28	27.73	0	22	1991	breeding	A1, C1, C6
	Mid-Prityat	100000	52.15	27.00	50	150	1995	breeding	A1, C1
Bosnia and Herzegovina	Bardaca	700	45.12	17.45			0	breeding	A1, B2
	Hutovo blato	6144	43.05	17.77			0	breeding	B2
Bulgaria	Atanasovo lake	1950	42.57	27.48	2	88	1996	passage	B2
	Durankulak lake	2000	43.67	28.55	60		2001	unknown	B2
	Kalimok complex	1000	44.00	26.47	6	20	1996	breeding	B2
	Mandra-Poda complex	2270	42.42	27.38	60		2001	unknown	B2, C6
	Mechka fish-ponds	800	43.73	25.82	10	30	1996	breeding	A1
	Mechka fish-ponds	800	43.73	25.82	100	3,000	1996	passage	A1, A4i, B1i, B2
	Orsoya fish-ponds	360	43.78	23.12	20	20	1996	breeding	A1
	Orsoya fish-ponds	360	43.78	23.12	48	79	1996	passage	A1
	Shabla lake complex	3100	43.57	28.57	10	88	1996	passage	A1
	Srebarna lake	1445	44.12	27.07	60		2001	unknown	A1
Chad	Lake Fitri	195000	12.83	17.50	3,800	3,800	1999	winter	A1
Croatia	Alluvial wetlands of the River Danube	37111	45.67	18.83	1,000	1,000	1994	passage	A1
	Alluvial wetlands of the River Danube	37111	45.67	18.83	50	50	1991	breeding	A1
	Alluvial wetlands of the River Drava	68002	45.92	17.25	100	200	0	breeding	A1
	Alluvial wetlands of the River Sava	210000	45.50	17.00	20		2001	breeding	A1, B2
	Donji Miholjac fish-ponds	981	45.75	18.20	10	40	1993	breeding	A1, B2
	Grudnjak fish-ponds	1020	45.67	18.05	20	50	1993	breeding	A1
	Jelas field	10000	45.08	17.75	11	52	1996	winter	A1, A4i, B1i, B2
	Jelas field	10000	45.08	17.75	120	160	0	breeding	A1
	Koncanica fish-ponds and surrounding area	10000	45.67	17.07	10	50	0	breeding	B2
	Nasicka Breznica fish-ponds	1345	45.58	18.22	20	50	1993	breeding	B2
	Pokupsko depression	10000	45.62	15.70	3,200	5,200	0	passage	A1, B2
	Pokupsko depression	10000	45.62	15.70	70	120	0	breeding	A1
Egypt	Aswan reservoir	1500	24.00	32.90				winter	A1
	Lake Burullus Protected Area	46000	31.48	30.83				winter	A1
	Lake Nasser	540000	23.10	32.73				winter	A1, B2
	Upper Nile	15000	25.15	32.72	730	730		winter	A1, A4i, B1i, B2

Country	International name	Area (ha)	Location		Population		Year	Season	Criteria
			Lat (N)	Long (E)	Min	Max			
	Wadi El Rayan Protected Area	71000	29.22	30.37				winter	A1
Ethiopia	Bishoftu lake	93	8.80	39.00	3	5		winter	A1, B2
	Chelekleka lake and swamp		8.85	38.97	3	5		winter	A1, B2
	Green Lake	54	8.85	39.10	4	5		winter	A1, B1i, B2
	Lake Ashenge		12.58	39.50	30		1995	winter	A1, B2
Georgia	Javakheti Plateau	200000	41.50	43.67			1996	breeding	B2
	Kolkheti	150000	42.17	41.83			1996	passage	A1
Greece	Amvrakikos gulf	25000	39.00	21.00	25	100	1996	breeding	A1, B2
	Lake Chimaditis and Lake Zazaris	5390	40.62	21.55	30	60	1996	breeding	A1, B2
	Lake Distos	2600	38.35	24.13	10		1988	breeding	B2
	Lake Kalodiki, Margariti and Karteri marshes	1650	39.33	20.45	10	15	1997	breeding	A1, B2
	Lake Kastoria (Orestiada)	3400	40.52	21.30	0	30	1993	breeding	B2
	Lake Kerkini	12000	41.20	23.15			1995	resident	A1, B2
	Lake Mitrikou (Ismarida)	6500	40.97	25.28			0	resident	A1
	Lake Stymphalia	1309	37.85	22.47	2	10	1996	breeding	A1, B2
	Lakes Trichonida and Lysimachia	14279	38.57	21.47	0	225	1989	winter	A1
	Nestou delta and coastal lagoons	22000	40.97	24.80			0	passage	A1
	North, east and south Kithira island	18000	36.23	23.05	5	70	1996	passage	A1, B2
	Porto Lagos, Lake Vistonis, and coastal lagoons (Lakes of Thrace)	15300	41.02	25.08			0	resident	A1
	Reservoirs of former Lake Karla	1200	39.53	22.70	40		1996	passage	A1
	Sperchios valley and delta-Maliakos gulf	34000	38.85	22.53			0	passage	A1, B2
Hungary	Biharugra fish-ponds	16000	46.97	21.57	30		1994	breeding	A1, B2
	Bodrog flood-plain	10000	48.25	21.33	15		1993	breeding	A1, B2
	Hortobágy	136300	47.62	21.07	50	70	1996	breeding	A1
	Inner Somogy	216300	46.22	17.30	50		1996	breeding	A1, B2
	Kis-balaton	14745	46.67	17.22	100	200	1996	breeding	A1, B2
	Nagyberek	19400	46.73	17.55	27	30	1995	breeding	B1i
	Pacsmag fish-ponds	487	46.58	18.38	50	60	1996	breeding	B1i
	Pusztaszer Landscape Protection Area	22320	46.25	20.17	60		1996	breeding	B1i, B2
	Sárvíz valley	14700	47.00	18.55	80	100	1993	passage	B1i
	Sárvíz valley	14700	47.00	18.55	18	18	1993	breeding	B1i
	Vértes Mountains and Zámoly Basin	29400	47.42	18.33	10	20	1996	breeding	A1, B1i, B2
Iran, Islamic Republic of	Anzali Mordab complex	15000	37.42	49.47	130		1977	passage	A1
	Anzali Mordab complex	15000	37.42	49.47	51		1977	winter	A1
	Cheghakor marsh	1600	31.83	50.83	103		1992	winter	A1, B1i, B2
	Dasht-e Arjan and Lake Parishan	52800	29.57	51.88	150		1977	winter	A1
	Dasht-e Arjan and Lake Parishan	52800	29.57	51.88	4		1977	breeding	A1, C1
	Dez river marshes and plains	20000	31.83	48.63	11		1977	winter	A1, A4i, B1i, C1, C2
	Gandoman marsh	1500	31.83	51.10	140		1992	winter	A1, C1
	Gori Gol	120	37.83	46.67	4		1977	breeding	A1, C1
	Gori Gol	120	37.83	46.67	40		1977	passage	A1, C1
	Hamoun-i Sabari and Hamoun-i Hirmand	250000	31.17	61.17	5	10	1977	breeding	A1, C1
	Hashelan marsh and Doh Tappeh plains	10050	34.55	46.92	130		1977	winter	A1, C1
	Hashelan marsh and Doh Tappeh plains	10050	34.55	46.92	4		1977	resident	C6
	Lake Kobi	1200	36.95	45.50	4		1977	breeding	A1
	Lake Uromiyeh	483000	37.50	45.50	4		1977	breeding	A1
	Lake Zaribar	1550	35.53	46.12	20	50	1977	breeding	A1
	Lake Zaribar	1550	35.53	46.12	250		1977	passage	A1
	Seyed Mohalli, Zarin Kola and Larim Sara	1600	36.75	53.00	185		1977	passage	A1
	Shadegan marshes, Khor-al Amaya, Khor Musa	425140	30.17	48.67	4		1977	breeding	B1i

Country	International name	Area (ha)	Location		Population		Year	Season	Criteria
			Lat (N)	Long (E)	Min	Max			
	Shadegan marshes, Khor-al Amaya, Khor Musa	425140	30.17	48.67	10		1977	winter	A1, B1i
	Shur Gol, Yadegarlu and Dorgeh Sangi lakes	2500	37.02	45.52	4		1977	breeding	A1, B1i, B2
	South end of the Hamoun-i Puzak	14900	31.33	61.75	30		1977	winter	B1i
Iraq	Voshmigr dam	500	37.20	54.75	15		1977	winter	A1, B1i, B2
	Attariya plains	50000	33.42	44.92	13		1979	winter	A1, B1i, B2
	Baquba wetlands	2000	33.92	44.83	515	1,000	1968	winter	B1i
	Haur Al Sa'adiyah	140000	32.17	46.63	30		1967	winter	B1i
	Mahzam and Lake Tharthar	455000	34.33	43.37	10		1992	winter	B1i
Israel	Samara dam	20000	34.25	43.83	25		1992	winter	B1i, B2
	Jezre'el, Harod and Bet She'an valleys	40000	32.53	35.33	9		1991	resident	A1, B1i, B2
	Jezre'el, Harod and Bet She'an valleys	40000	32.53	35.33	20		1991	winter	B1i, B2
	Judean foothills	60000	31.75	34.92	20		1991	winter	B1i, B2
	Biviere and Plain of Gela	28052	37.02	14.33	0	1,500	1986	passage	B1i
Italy	Brabbia peatland and Lake Varese	2437	45.78	8.75	4	6	1996	breeding	B1i
	Gargano Promontory and Capitanata Wetlands	207378	41.42	15.92	1,000	1,000	1985	winter	B2
	Oristano wetlands and Cape San Marco	22595	39.87	8.48	0	210	1995	passage	B1i, B2
	Ponte Buriano-Lago della Penna	200	43.52	11.75	1	10	1995	passage	A1
	Pools of Florence plain	1000	43.80	11.07	0	20	1996	passage	A1
	Punte Alberete and Valle della Canna, Pineta San Vitale and Pialassa della Baiona	4152	44.50	12.25	0	20	1996	breeding	A1
	Simeto mouth and Biviere di Lentini	3398	37.40	15.10	280	280	1998	passage	A1
	Simeto mouth and Biviere di Lentini	3398	37.40	15.10	67	67	1995	winter	A1, A4i
	Simeto mouth and Biviere di Lentini	3398	37.40	15.10	15	20	1997	breeding	A1, A4i, B1i
	Stagnone di Marsala and Trapani salt pans	4454	37.78	12.50	10	10	1992	winter	A1
	Valli di Argenta	2000	44.57	11.83	12	12	1989	winter	A1
	Valli di Comacchio and Bonifica del Mezzano	44013	44.62	12.17	95	95	1976	winter	B2
	Venice lagoon	68982	45.37	12.47	3	33	1994	winter	A1
	Vico lake	4000	42.33	12.17	4	4	1995	winter	A1
Kazakhstan	Alakol-Sasykkol lake,s system	68 70000	46.23	81.19	100	600	2002	spring	
	Alakol-Sasykkol lake,s system	68 70000	46.23	81.19	70	150	2002	breeding	
	Alakol-Sasykkol lake,s system	68 70000	46.23	81.19	1000	2000	2002	passage	
	iLye river Delta	8000000	45.26	74.18	700	3000	2003	summ.autumn	
	Lepsuy-river Delta	4000	46.16	78.16	50	400	2003	summer	
	Kapshagay Reservoir	210000	43.47	77.41	300	500	2001	breeding	
	Kapshagay Reservoir	210000	43.47	77.41	1500	2000	2002	passage	
	Akkol Lake	4500	43.23	70.41	30	50	2003	breeding	
	Sorbulak reservoir	6000	43.46	76.35	30	50	2000	breeding	
	Sorbulak reservoir	6000	43.46	76.35	100	300	2003	passage	
	Shoshkakol Lake	95000	42.58	68.24	2000	3000	2003	passage	
Lebanon	Ammiq swamp	280	33.77	35.77	1	2	1974	non-breeding	B1i, B2
Mali	Lac Faguibine	45000	16.75	-4.00	300	300	1983	winter	A1, B2
	Lac Fati	13500	16.20	-3.68	2,150	2,150	1985	winter	A1, B2
	Lac Horo	18900	16.22	-3.92	5,600	5,600	1987	winter	A1, B2, C1, C6
	Lac Télé	5600	16.55	-3.75	300	300	1984	winter	A1, B2, C1, C6
	Séri	40000	14.83	-4.67	350	350	1986	winter	C6
Mauritania	Lac d'Aleg	4275	17.10	-13.98	120	120	1999	winter	B2, C6
	Sawana--Oum Lellé	1200	16.33	-9.28	85	85	2000	winter	A1, B2, C1, C6
Nigeria	Hadejia-Nguru wetlands	300000	12.65	10.55	1,594	1,594	1988	winter	C6
Oman	Khawr ad Dahariz	150	17.02	54.18	16			passage	B2
	Khawr Dhirif	100	18.93	57.35	15			passage	B1i, B2

Country	International name	Area (ha)	Location		Population		Year	Season	Criteria
			Lat (N)	Long (E)	Min	Max			
	Khawr Rawri	1100	17.03	54.43	30			winter	B1i, B2
	Wadi Darbat	78000	17.10	54.45	17			winter	B1i, B2
Poland	Barycz river valley	25700	51.53	17.42	40	130	1994	breeding	A1, A4i, B1i
	Przemków ponds	1046	51.57	15.82	4	6	1990	breeding	A1
	Solska Forest Landscape Park	28980	50.38	23.13	4	6	1995	breeding	A1
	Tysmienica river valley	14500	51.60	22.82	3	8	1993	breeding	A1, A4i
	Woniesc reservoir	900	51.98	16.73	5	11	1988	breeding	A1, A4i, B1i, B2
Portugal	Pera marsh	170	37.10	-8.33	2	2	2001	breeding	A1, C1
Romania	Balta Alba, Amara and Jirlau lakes	2680	45.25	27.25	0	1,000	1995	passage	A1, C1
	Cefa fish-ponds and Radvani wood	1000	46.92	21.68	2	20	1996	breeding	A1
	Danube Delta and Razelm-Sinoe complex	442000	44.93	29.20	3,000		1996	breeding	A1, B1i, C1, C2
	Lake Comana	800	44.17	26.10	20	30	1993	breeding	A1, B1i, C1, C2
	Lake Strachina	1050	44.67	27.60	20		1993	breeding	C6
	Mehedinti fish-ponds-Izvoarele	210	44.35	22.67	20		1996	breeding	A1, C1
	Murani lake and Pischia forest	1500	45.92	21.33	6	41	1997	breeding	A1, B1i, C1, C2
	Portile de Fier reservoir	32000	44.57	22.20	2	850	1996	passage	A1, A4i, B1i
	Satchinez marsh	236	45.97	21.07	40	50	1996	breeding	A1, A4i, B1i
	The Little Island of Braila	14862	44.92	27.92	46	50	1993	breeding	A1
	Vadeni-Mata-Cârja-Radeanu wetlands	380	46.07	28.12	19	40	1996	breeding	A1
Russian Federation	Achikol'skiye lakes	20000	43.78	47.17	250	300	1982	breeding	A1
	Dadynskiye lake	45000	45.27	45.07	70		1996	non-breeding	A1, B1i, B2
	Delta of the River Don	53800	47.17	39.42	100	150	1997	passage	B1i
	Delta of the River Don	53800	47.17	39.42	25	30	1997	breeding	A1, B1i, B2
	Lake Adzhi	2000	42.32	48.08	17	25	1997	breeding	A1, B1i, B2
	Mouth of Samur river	7000	41.87	48.50	10	100	1989	passage	B1i, B2
	Volga Delta	1150000	46.00	48.50	0	1,000	1996	breeding	B1i, B2
Saudi Arabia	Al-Ha'ir	2500	24.50	46.83				resident	A1, B1i, B2
	Al-Ha'ir	2500	24.50	46.83	36	69	1991	winter	A1, B1i, B2
	Al-Hasa lagoons	7500	25.50	50.00				breeding	B2
	King Faisal Airbase, Tabuk		28.38	36.63	4	9		breeding	A1, B1i, B2
	Malaki dam	2500	17.05	42.97	45	83	1992	winter	A1
Senegal	Djoudj wetlands	56000	16.33	-16.25	12	50	1992	winter	A1, B2
Serbia & Montenegro	Carska bara	9300	45.27	20.42	30	50	1997	breeding	A1, A4i
	Dubovac-Ram	12000	44.82	21.27	30	40	1996	breeding	A1, A4i
	Gornje Podunavlje	30000	45.62	18.97	30	50	1997	resident	A1, A4i
	Jegricka	5400	45.33	20.17	50	70	1997	breeding	A1, A4i
	Lake Skadar	40000	42.18	19.25	20	30	1998	breeding	A1, A4i
	Subotica lakes and sandy terrain	20000	46.07	19.82	15	25	1997	breeding	A1
	Uzdin fish-pond	5500	45.22	20.63	100	150	1997	breeding	A1, A4i
	Mala Vrbica fish-pond	2000	44.36	22.39	7	10	2001	breeding	
	Durmitor (mountain lakes)	33000	43.07	19.01	10	15	2001	breeding	
Syrian Arab Republic	Bahrat Homs	5300	34.62	36.53	250	300	1982	passage	A1
	Bahrat Homs	5300	34.62	36.53				winter	A1
	Tual al-'Abba	30000	36.42	39.33	20			passage	A1
Tunisia	Douz Laâla	100	33.47	8.97	5	10	1996	breeding	B2
	Ghidma	100	33.43	8.80				winter	A1, B2
	Ichkeul	12600	37.17	9.67	20	90	1991	winter	A1
	Lebna reservoir	1000	36.70	10.93	200	300		passage	A1, B2
Turkey	Akdogan lake	2000	41.73	39.15	20	20	2001	breeding	A1, B1i, B2
	Aksehir and Eber lakes	53600	38.60	31.30	10	10		breeding	B1i, B2

Country	International name	Area (ha)	Location		Population		Year	Season	Criteria
			Lat (N)	Long (E)	Min	Max			
	Çorak lake	1150	37.68	29.77	100	100	1970	winter	A1, B1i, B2
	Eregli marshes	37000	37.53	33.75	10	10		breeding	A1
	Göksu delta	14480	36.30	33.97	30	30	1995	breeding	A1, C1
	Hotamis marshes	16500	37.58	33.05	89	89	1994	unknown	A1, C1
	Isikli lake	7300	38.23	29.92	97	97	1992	winter	A1, A4i, B1i, C1, C2, C6
	Karakaya Reservoir	30000	38.33	38.56	60	100	1997	winter	C6
	Karakuyu Marshes	800	38.08	30.16	20		1996	breeding	B2, C6
	Karamik marshes	4500	38.43	30.83	10	10		breeding	C6
	Kesikköprü Reservoir	1500	39.37	33.33	20		1997	breeding	A1, B2
	Kizilirmak delta	16110	41.60	36.08	150	150		breeding	B1i
	Kocaçay delta	4200	40.38	28.48	70	70		breeding	B1i, B2
	Kulu lake	860	39.08	33.15	10	10		breeding	A1, B1i, B2
	Marmara lake	6800	38.62	28.00	25	25	0	breeding	A1
	Mogan lake	1500	39.77	32.80	150	200	1994	winter	A1
	Mogan lake	1500	39.77	32.80	10	10		breeding	A1
	Salda lake	4370	37.55	29.67	400	400	1990	winter	A1
	Sultansazligi	39000	38.33	35.27	20	20		breeding	A1
	Terkos lake	5850	41.32	28.53	20		2000	breeding	A1
	Uluabat lake	13500	40.17	28.58	0	32	1998	breeding	A1, A4i
Ukraine	Kagul lake	10500	45.22	28.43	30	50	1999	breeding	A1, A4i
	Kugurluj and Kartal lakes	19200	45.28	28.65	30	60	1999	breeding	A1
	Latorytsya river valley near Chop	7000	48.47	22.30	40	60	1997	breeding	A1
	River Danube	2500	45.38	29.12	10	30	1999	breeding	A1
	Shats'ki lakes	32850	51.55	23.82	20		1994	breeding	A1
	Snake island	17	45.25	30.20	50	100	1999	passage	A1, A4i
Yemen	Ta'izz wadis	11000	13.65	44.00	72			passage	A1
	Ta'izz wadis	11000	13.65	44.00	10	150	1992	winter	A1

Criteria: the following criteria were used to identify IBAs for *Aythya nyroca*:

Category A1 Species of global conservation concern: The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.

Category A4 Congregations: i) The site is known or thought to hold, on a regular basis, $\geq 1\%$ of a biogeographic population of a congregatory waterbird species.

Category B1 Congregations: I) The site is known or thought to hold $\geq 1\%$ of a flyway or other distinct population of a waterbird species.

Category B2 Species with an unfavourable conservation status in Europe: The site is one of the 'n' most important in the country for a species with an unfavourable conservation status in Europe (SPEC 2, 3) and for which the site-protection approach is thought to be appropriate.

Category C1 Species of global conservation concern: The site regularly holds significant numbers of a globally threatened species, or other species of global conservation concern.

Category C2 Concentrations of a species threatened at the European Union level: The site is known to regularly hold at least 1% of a flyway population or of the EU population of a species threatened at the EU level (listed on Annex 1 and referred to in Article 4.2 of the EC Birds Directive).

Category C6 Species threatened at the European Union level: The site is one of the five most important in the European region (NUTS region) in question for a species or subspecies considered threatened in the European Union (i.e. listed in Annex 1 of the EC Birds Directive).

Annex 3.2. Protection status of Important Bird Areas for the Ferruginous Duck Aythya nyroca.

Country	International name	Protection status	Protected areas name	Management Plan
Afghanistan	Hamun-i-Puzak	(None)		no
Algeria	Complexe de zones humides de la plaine de Guerbes-Sanhadja	?		no
	Lac des Oiseaux---Garaet et Touyour	(Partial)	Unknown	no
	Lac Oubeïra	(Full)	Unknown	no
	Lac Tonga	(Full)	Unknown	no
	Marais de Mekhada	(None)		no
Armenia	Armash fish-farm	?		no
	Lake Sevan	Full	Lake Sevan (Ramsar)	no
Austria	Neusiedler See	Full	Neusiedler See-Seewinkel (National Park, Special Protection Area (SPA)), Neusiedlersee, Seewinkle & Hansag (Ramsar)	no
	Southern Seewinkel and Zitzmannsdorfer Wiesen	Full	Neusiedler See-Seewinkel (National Park, SPA), Neusiedlersee, Seewinkle & Hansag (Ramsar), Neusiedler See (National Park)	no
Belarus	Beloe fish-farm	None		no
	Mid-Prpyat	Partial	Mid-Prpyat State Landscape Zakaznik (Ramsar), Nizovie Jaseldy (Zakaznik), Nizovie Sluchi (Zakaznik), Prostyr (Zakaznik), Ustie Lani (Zakaznik)	no
Bosnia and Herzegovina	Bardaca	Partial	IBA BA003 (Ornithological reserve)	no
	Hutovo blato	Full	Hutavo Blato (Ramsar), IBA BA001 (Ornithological reserve)	no
Bulgaria	Atanasovo lake	Partial	Atanasovo Lake (Buffer zone, Ramsar, Reserve)	no
	Durankulak lake	Partial	Durankulak lake (National Monument, Ramsar)	no
	Kalimok complex	Partial	Bezimenen Island (Protected Landscape)	no
	Mandra-Poda complex	Partial	Izovorska Mouth (Protected Landscape), Poda Lagoon (Protected Landscape)	no
	Mechka fish-ponds	None		no
	Orsoya fish-ponds	None		no
	Shabla lake complex	Partial	Shabla Lake (Protected Landscape, Ramsar)	no
	Srebarna lake	Partial	Srebarna (Ramsar, Reserve, World Heritage Site)	no
Chad	Lake Fitri	(Full)	Unknown	no
Croatia	Alluvial wetlands of the River Danube	Partial	Kopacki Rit (Nature Park, Ramsar, Special Reserve)	no
	Alluvial wetlands of the River Drava	None		no
	Alluvial wetlands of the River Sava	Partial	Krapje Dol (Ornithological Reserve), Lonjsko Polje and Mokro Polje (Ramsar), Rakita (Ornithological Reserve)	no
	Donji Miholjac fish-ponds	None		no
	Grudnjak fish-ponds	None		no
	Jelas field	None		no
	Koncanica fish-ponds and surrounding area	None		no
	Nasicka Breznica fish-ponds	None		no
	Pokupsko depression	Partial	Crna Mlaka (Ramsar, Special Reserve)	no
Egypt	Aswan reservoir	(Partial)	Unknown	yes
	Lake Burullus Protected Area	(Full)	Unknown	yes
	Lake Nasser	(None)		no
	Upper Nile	?		yes
	Wadi El Rayan Protected Area	(None)		no
Ethiopia	Bishoftu lake	?		no
	Chelekleka lake and swamp	?		no
	Green Lake	?		no

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	Lake Ashenge	?		yes
Georgia	Javakheti Plateau	Partial	Borjomi-Kharagauli National Park (National Park)	no
	Kolkheti	Partial	Ispani II Marshes (Ramsar), Kolkheti Nature Reserve (Zapovednik), Wetlands of Central Kolkheti (Ramsar)	no
Greece	Amvrakikos gulf	Partial	Amvrakikos gulf (Ramsar), Amvrakikos Kolpos (SPA), Limnothalassa Tsoukalio kai Valtos Rodias (Game Refuge)	no
	Lake Chimaditis and Lake Zazaris	Partial	Hintsko-Heimadi/Limnohorion (Game Refuge), Limnes Cheimaditida-Zazari (SPA)	no
	Lake Distos	Partial	Argiro- Pr. Hlias-Panagia/Aliveriou-Argirou-Pra (Game Refuge)	no
	Lake Kalodiki, Margariti and Karteri marshes	Partial	Elos Kalodiki (Site of conservation importance), Valtos Kalodikou/Margaritiou-Eleftheriou-Spath (Game Refuge)	no
	Lake Kastoria (Orestiada)	Partial	Limni, Vouno Kastorias (Game Refuge)	no
	Lake Kerkini	Partial	Artificial Lake Kerkini (Ramsar), Techniti Limni Kerkinis (SPA)	no
	Lake Mitrikou (Ismarida)	Full	Lake Mitrikou (Protected area), Lake Vistonis, Porto Lagos, Lake Ismaris & adj. La (SPA, Ramsar), Mavromatiou-Limni Mitrikou/Imerou-Mavromatiou (Game refuge)	no
	Lake Stymphalia	Partial	Gidomandra/Laukas (Game refuge)	no
	Lakes Trichonida and Lysimachia	Partial	Limnes Trichonida kai Lysimachia (Site of conservation importance)	no
	Nestou delta and coastal lagoons	Partial	Dasohorion (Font tis Amerikis)/Erasmion (Game refuge), Dasos Nestou (Kotza Orman) (Game Refuge), Deltan Nestou (SPA), Nestos Delta & adjoining lagoons (Ramsar), Nestou delta and coastal lagoons (Protected area)	no
	North, east and south Kithira island	Partial	Nisides Kythron: Prasonisis, Dragonera, Antidragon (SPA), Thalaria Kythron (Game Refuge)	no
	Porto Lagos, Lake Vistonis, and coastal lagoons (Lakes of Thrace)	Partial	Fanariou/Porto Lagos (Game Refuge), Lake Vistonis, Porto Lagos, Lake Ismaria & adj. la (Ramsar, SPA), Porto Lagos, Lake Vistonis, and coastal lagoons (Protected area)	no
	Reservoirs of former Lake Karla	None		yes
	Sperchios valley and delta-Maliakos gulf	Partial	Ekvoles Sperchiou (Game Refuge), Ygrotopos Ekvolon Sperchiou (SPA)	yes
Hungary	Biharugra fish-ponds	Partial	Biharugra Fishponds (Ramsar), Koros-Maros (National Park)	yes
	Bodrog flood-plain	Partial	Bodrogzug (Ramsar), Long-erdo (Nature Conservation Area), Tokaj-Bodrogzug (Landscape Protected Area)	no
	Hortobágy	Partial	Hortobagy (National Park, Ramsar), Hortobagy Natyional Park (Biosphere Reserve)	no
	Inner Somogy	Partial	Balata-to (Nature Conservation Area), Boronka melleki (Landscape Protected Area), Csokonyavisontai fasno legelo (Nature Conservation Area), Duna-Drava (National Park), Rinyaszentkiralyi erdo (Nature Conservation Area)	no
	Kis-balaton	Full	Balaton-felvideki (National Park), Kis-Balaton (Ramsar)	no
	Nagyberek	Partial	Nagyberek Feherviz (Nature Conservation Area)	
	Pacsmag fish-ponds	Full	Pacsmag Fishponds (Ramsar), Pacsmagi-tavak (Nature Conservation Area)	no
	Pusztaszer Landscape Protection Area	Full	Pusztaszer (Ramsar), Pustaszeri (Landscape Protected Area)	no
	Sárvíz valley	Partial	Retszilás Fishponds (Ramsar), Retszilasi-tavak (Nature Conservation Area), Sarviz-volgy (Landscape Protected Area)	no
	Vértes Mountains and Zámoly Basin	Partial	Vertesi (Landscape Protected Area)	no
Iran, Islamic Republic of	Anzali Mordab complex	(Full)	Unknown	no
	Cheghakor marsh	?		yes
	Dasht-e Arjan and Lake Parishan	(None)		no
	Dez river marshes and plains	(Partial)	Unknown	no
	Gandoman marsh	(None)		no
	Gori Gol	(Full)	Unknown	no
	Hamoun-i Sabari and Hamoun-i Hirmand	(Full)	Unknown	yes
	Hashelan marsh and Doh Tappeh plains	(None)		no
	Lake Kobi	(Full)	Unknown	yes
	Lake Uromiyeh	(Full)	Unknown	no
	Lake Zaribar	(None)		yes

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	Seyed Mohalli, Zarin Kola and Larim Sara	(None)		no
	Shadegan marshes, Khor-al Amaya, Khor Musa	(Partial)	Unknown	no
	Shur Gol, Yadegarlu and Dorgeh Sangi lakes	(Full)	Unknown	yes
	South end of the Hamoun-i Puzak	(Partial)	Unknown	yes
	Voshmigr dam	(None)		yes
Iraq	Attariya plains	(None)		yes
	Baquba wetlands	(None)		yes
	Haur Al Sa'adiyah	(None)		yes
	Mahzam and Lake Tharthar	(None)		no
	Samara dam	(None)		yes
Israel	Jezre'el, Harod and Bet She'an valleys	?		no
	Judean foothills	?		no
Italy	Biviere and Plain of Gela	Partial	Biviere and Plain of Gela (SPA), Biviere di Gela (Ramsar, Regional Nature Reserve)	no
	Brabbia peatland and Lake Varese	Full	Lago di Biandronno (Regional Nature Reserve), Palude Brabbia (Ramsar, Regional Nature Reserve), V. del Mincio, Paludi di Ostiglia, Torbiere d'Iseo (SPA)	yes
	Gargano Promontory and Capitanata Wetlands	Partial	Saline di Margherita di Savoia (Ramsar)	no
	Oristano wetlands and Cape San Marco	Partial	Stagno di C. bras (Ramsar), Stagno di Corru S'Ittiri, Stagni di San Giovanni e (Ramsar), Stagno di Mastrassano (Ramsar), Stagno di Pauli Maiori (Ramsar), Stagno di S'Elena Arrubia (Ramsar), Stagno di Sale Porcus (Ramsar)	no
	Ponte Buriano-Lago della Penna	Partial	Ponte Buriano-Lago della Penna (Wildlife Reserve)	yes
	Pools of Florence plain	None		yes
	Punte Alberete and Valle della Canna, Pineta San Vitale and Pialassa della Baiona	Partial	Delta del Po (Regional Nature Park), Pialassa della Baiona e Risega (Ramsar), Pineta di Ravenna (San Vitale) (Nature Reserve), Punta Alberte (Ramsar), Punte Alberte e Valle della Canna (SPA), Valle Gorino, Bertuzzi, Comacchio, Ortazzo, Baiona (SPA)	yes
	Simeto mouth and Biviere di Lentini	Partial	Oasi del Simeto (Regional Nature Reserve), Simeto mouth and Biviere di Lentini (SPA)	yes
	Stagnone di Marsala and Trapani salt pans	Partial	Isole dello Stagnone di Marsala (Regional Nature Reserve), Saline di Trapani e Paceco (Regional Nature Reserve), Stagnone di Marsala and Trapani salt pans (SPA)	no
	Valli di Argenta	Partial	Delta del Po (Regional Nature Park), Valle Campotto e Bassarone (Ramsar), Valle Santa (Ramsar), Valle Sant'Anna e Val Campotto (SPA), Valli Argenta e Marmorta (Wildlife Reserve)	yes
	Valli di Comacchio and Bonifica del Mezzano	Partial	Delta del Po (Regional Nature Park), Destra foce fiume Reno (Statae nature Reserve), Foce fiume Reno (Statae Nature Reserve), RN Sacca di Bellocchio e Foce Fiume Reno (SPA), Sacca di Bellocchio (Ramsar), Sacca di Bellocchio I (Nature Reserve), Sacca di Bellocchio II (Nature Reserve), Sacca di Bellocchio III (Nature Reserve), Valle Gorino, Bertuzzi, Comacchio, Ortazzo, Baiona (SPA), Valli residue dell comprensorio di Comacchio (Ramsar)	yes
	Venice lagoon	Partial	Barene di S. Guiliano (Wildlife Reserve), Boschi di Ca Savio-Punta Sabbioni (Wildlife Reserve), Ca Romano (Wildlife Reserve), Casse di Colmata (Wildlife Reserve), Dune delgi Alberoni (Wildlife Reserve), Isolotto petrolchimico e Laguna Viva (Wildlife Reserve), Laghetti Decal (Wildlife Reserve), Laguna di Venezia: Valle Averte (Ramsar), Le Vignole-Le Certosa (Wildlife Reserve), Pineta di Ca Ballarin (Wildlife Reserve), Seca del Bacan (Wildlife Reserve)Valle Averte (SPA), Valle Millecampo (State Nature Reserve)Vallesina-Canale Casson (Wildlife Reserve)	no
	Vico lake	Partial	Lago di Vico (Regional Nature Reserve)	no
Lebanon	Ammaq swamp	?		no
Mali	Lac Faguibine	?		no
	Lac Fati	?		no
	Lac Horo	(Full)	Unknown	no
	Lac Télé	?		no
	Séri	?		no

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Mauritania	Lac d'Aleg	?		no
	Sawana--Oum Lellé	?		no
Nigeria	Hadejia-Nguru wetlands	?		no
Oman	Khawr ad Dahariz	?		no
	Khawr Dhirif	?		no
	Khawr Rawri	?		no
Poland	Wadi Darbat	?		no
	Barycz river valley	Full	Dolina Baryczy (Landscape Park), Las Pardolinski (Nature Monument), Stawy Milickie (Nature Reserve), Stawy Milickie Nature Reserve (Ramsar), Wydymacz (Nature Reserve), Wzgorza Ostrzeszowskie I Kotlina Odolanowska (Protected Landscape Area), Biebrza National Park (Ramsar), Biebrzanski Park Narodowy (National Park)	no
	Przemków ponds	Full	Przamski Park Krajobrazowy (Landscape Park)	no
	Solska Forest Landscape Park	Full	Puszcza Solska (Landscape Park)	no
	Tysmienica river valley	None		no
Portugal	Woniesc reservoir	None		no
	Pera marsh	None		no
Romania	Balta Alba, Amara and Jirlau lakes	Partial	Lake Amara (Nature Reserve), Lake Balata Alba (Nature Reserve), Visani Bird Sanctuary (Nature Reserve)	no
	Cefa fish-ponds and Radvani wood	Partial	Radvani Wood Mixed Heron Colony (Bird Sanctuary)	no
	Danube Delta and Razelm-Sinoe complex	Full	Danube Delta (Ramsar), Danube Delta Biosphere Reserve (Biosphere Reserve, World Heritage Site)	no
	Lake Comana	Partial	Gradinari Wood (Nature Reserve)	no
	Lake Strachina	None		no
	Mehedinti fish-ponds-Izvoarele	None		no
	Murani lake and Pischia forest	Partial	Mlastinile Murani (Nature Reserve)	no
	Portile de Fier reservoir	None		no
	Satchinez marsh	Partial	Satchinez Bird Reserve (Nature Reserve)	no
	The Little Island of Braila	Partial	Little island of Braila (Nature Reserve)	no
	Vadeni-Mata-Cârja-Radeanu wetlands	None		no
	Achikol'skiye lakes	None		no
Russian Federation	Dadynskiye lake	None		no
	Delta of the River Don	Partial	Azovski Uchastok Opytnogo Okhotkhozaystva (Zakaznik), Donskoiy rybnii (Zapovednik), Girlovskiyiy	yes
	Lake Adzhi	None		yes
	Mouth of Samur river	Partial	Samursky (Zakaznik)	yes
Saudi Arabia	Volga Delta	Partial	Astrakhanskiy (Zapovednik), Astrakhanskiy Zapovednik (Biosphere Reserve), Volga Delta (Ramsar)	yes
	Al-Ha'ir	(Partial)	Unknown	no
	Al-Hasa lagoons	?		yes
	King Faisal Airbase, Tabuk	(None)		no
Senegal	Malaki dam	(None)		no
	Djoudj wetlands	(Full)	Unknown	no
Serbia & Montenegro	Carska bara	Partial	Stari-Begej-Carska Bara (Special Nature Reserve), Stari Begej/Carska Bara Special Nature Reserve (Ramsar)	no
	Dubovac-Ram	Full	Deliblato Sand (Special Nature Reserve)	no
	Gornje Podunavlje	Partial	Gornje Podunavlje (Regional Nature Park)	no
	Jegricka	Partial	Jegricka (Strict Nature Reserve)	no
	Lake Skadar	Partial	Skadarsko Jezero (National Park, Ramsar)	no
	Subotica lakes and sandy terrain	Partial	Ludasko Jezero (Special Nature Reserve), Ludasko Lake (Ramsar), Palic (Regional Nature Park), Selevenisko pustare (Special Nature Reserve)	no

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	Uzdin fish-pond	None		no
	Mala Vrbica fish-pond	None		
	Durmitor	Partial	Durmitor National Park	
Syrian Arab Republic	Bahrat Homs	(None)		no
	Tual al-'Abba	(None)		no
Tunisia	Douz Laâla	Full	Zone humide de Douz Laala	no
	Ghidma	Full	Zone humide de Ghidma	no
	Ichkeul	Full	Parc National de l'Ichkeul	no
	Lebna reservoir	Full	Barrage Lebna	no
Turkey	Akdogan lake	None		no
	Aksehir and Eber lakes	Partial	Aksehir & Eber Golu (SIT)	no
	Çorak lake	None		no
	Eregli marshes	Partial	Eregli Sazligi (Nature Reserve, SIT)	no
	Göksu delta	Full	Gosku Delta Game Reserve (Game Reserve), Gosku Delta Ramsar (Ramsar), Gosku Delta (SIT), Gosku Delta SPA (SPA)	no
	Hotamis marshes	Partial	Hotamis Sazligi SIT (SIT)	no
	Isikli lake	None		no
	Karakaya Reservoir	None		no
	Karakuyu Marshes	None		no
	Karamik Marshes	Partial	Karamik Golu (SIT)	no
	Kesikköprü Reservoir	None		no
	Kizilirmak delta	Partial	Kizilirmak Deltasi (Game Reserve, Ramsar), Kizilirmak Delta SIT (SIT)	no
	Kocaçay delta	None		no
	Kulu lake	Partial	Kulu Golu (SIT)	no
	Marmara lake	None		no
	Mogan lake	Full	Mogan Golu (SPA)	no
	Salda lake	Partial	Salda Lake SIT (SIT)	no
	Sultansazligi	Full	Sultan Sazligi (Game Reserve, Nature Reserve), Sultansazligi (Ramsar, SIT)	no
	Terkos lake	None		no
	Uluabat lake	Partial	Uluabat Golu (Ramsar)	no
Ukraine	Kagul lake	None		no
	Kugurluj and Kartal lakes	Partial	Kartal Lake (Ramsar), Kugurlui Lake (Ramsar)	no
	Latorytsya river valley near Chop	None		no
	River Danube	None		no
	Shats'ki lakes	Partial	Shatsk (National Park), Shatsk Lakes (Ramsar)	no
	Snake island	None		no
Yemen	Ta'izz wadis	?		no

Protection status: Protection Status categories shown without parentheses are based on the degree of overlap between protected areas and IBA boundaries (i.e. **Full:** Protected area falls within IBA boundary; **Partial:** Part of protected area falls within IBA boundary; **None:** None of the protected area fall within the boundary of the IBA. Those shown within parentheses are based on assessments by Scott & Rose (1996) and do not necessarily relate to the amount of overlap with current IBA boundaries.