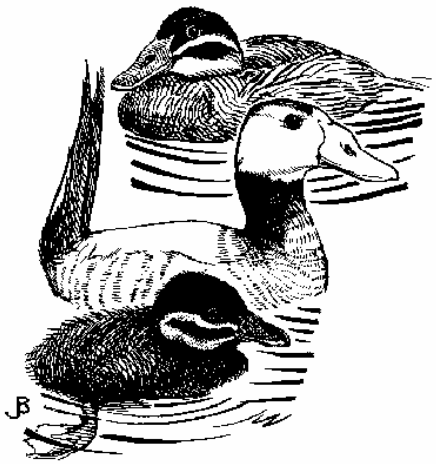
TWSG NEWS

The bulletin
of the

THREATENED WATERFOWL SPECIALIST GROUP



No. 13, December 2001

ABOUT THE GROUP

The Threatened Waterfowl Specialist Group (formerly Threatened Waterfowl Research Group) was established in October 1990 and is co-ordinated from The Wildfowl & Wetlands Trust at Slimbridge, UK, as part of the IUCN-SSC/Wetlands International Waterbird Network. The TWSG and its bulletin aim to identify Anatidae taxa that are threatened with extinction, to gather and exchange information on these taxa and to promote their conservation. We also cover other waterbird families not covered by other Specialist Groups (Anhimidae, Heliornithidae, non-marine Laridae). Membership is worldwide and includes 880 organisations, groups and individuals who are active or interested in threatened waterfowl research and conservation. Addresses of TWSG members, further information about the TWSG, this bulletin, and/or membership can be obtained from Baz Hughes at the address below.

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TWSG-Forum: list-server of the Threatened Waterfowl Specialist Group

The TWSG-Forum list-server, maintained by The Wildfowl & Wetlands Trust from Slimbridge, UK, provides a vehicle for the on-line exchange of information about globally threatened or near threatened Anseriformes (ducks, geese, swans and screamers). To subscribe, e-mail *majordomo@wwt.org.uk* with "subscribe twsg-forum" (without quotes) in the body of your e-mail message. To unsubscribe, simply replace the word “subscribe” with “unsubscribe”. To circulate a message to the Forum, send it to: *twsg-forum@wwt.org.uk*. When submitting information please note that we may include such items in future issues of TWSG News.

TWSG Web Site: *http://www.wwt.org.uk/threatsp/twsg/*

This issue of TWSG News was edited by Baz Hughes with assistance from John Fullard. Illustrations from the WWT image library are by Joe Blossom, Mark Hulme, Paul Johnsgard, Libby Millington, Peter Scott and Helen Shackleton and Baz Stewart.

EDITORIAL

Since the last issue of TWSG News 16 months ago, our membership has grown from 735 contacts in 115 countries to 880 in 137 countries. This has followed two rounds of strategic invitations, to known threatened waterfowl conservationists who were not already TWSG members, and to all BirdLife International Partners, Partner-Designates and Representatives. During the same time, membership of the TWSG-Forum list-server has grown from 85 to 290. On the administrative front, we have finally taken the plunge and switched our databases to Microsoft software, however from the number of computer viruses I now receive (the joys of running a global list server!), we probably won't be following suit with our e-mail client!

We continue our efforts to provide information and assistance to threatened waterfowl conservationists worldwide, especially those in global hotspots for threatened waterfowl, such as South America, Eastern Europe, Far-east and South-east Asia. As part of the Wetlands International initiative to implement a target driven, objective-led approach to working, we have produced a work plan for the next three years outlining our forward strategy. This includes ongoing support for White-headed Duck, Marbled Teal, Ferruginous Duck, and White-winged Duck, and a major new initiative with BirdLife International to save the Brazilian Merganser. We will be working closely with BirdLife, Wetlands International and the Ramsar Bureau on a project to identify key sites for threatened waterfowl and to provide Ramsar Contracting Parties with guidance on designating such sites for threatened species. We will also complete the IUCN Anseriformes Action Plan in 2002 (at last!).

Sincere thanks to TWSG Assistant Coordinators Andy Green, Murray Williams and Tom Rothe who continue to provide much appreciated assistance and support. We also owe a debt of gratitude to WWT volunteer Graham Lawton who has single-handedly rebuilt the TWSG and WWT threatened species web sites (see *http://www.wwt.org.uk/threatsp*). Finally, I would like to thank all contributors to this issue of TWSG News, without whom it simply would not exist. The participants of the workshop on White-headed Duck conservation and reintroduction held in Italy in May 2001 kindly allowed us to publish their workshop contributions. Nancy Drilling continues her ground-breaking work on White-winged Duck in Sumatra and we include important contributions on the status and distribution of threatened waterfowl from Africa, Eastern Europe, Russia and various CIS countries. Special thanks to Stephen Garnett who allowed us to publish an extract from his action plan for Australian birds.

Very best wishes for 2002. Do get in touch if I can provide any advice or assistance.

Baz Hughes

THREATENED WATERFOWL SPECIES AND SUBSPECIES

In the following list of globally threatened and near threatened Anseriformes species and subspecies, species categorisations follow the 2000 Red List (BirdLife International 2000) whilst sub-species were categorised during the compilation of the IUCN-SSC Anseriformes Action Plan (still in draft form but due to be completed in 2002). The TWSG would welcome comment on this list of threatened Anseriformes, especially notification of new data which may lead to re-categorisation of any taxa.

SPECIES

COMMON NAME	LATIN NAME
EXTINCT SINCE A.D. 1600	
New Zealand Swan	*Cygnus sumnerensis*
Mauritius Sheldgoose	*Alopochen mauritania*
Réunion Island Sheldgoose	*Mascarenachen kervazoi*
Chatham Island Shelduck	*Pachyanas chathamica*
Mauritius Duck	*Anas theodori*
Amsterdam Island Duck	*Anas marecula*
Labrador Duck	*Camptorhynchus labradorius*
Auckland Islands Merganser	*Mergus australis*
CRITICALLY ENDANGERED	
Crested Shelduck	*Tadorna cristata*
Campbell Island Teal	*Anas nesiotis*
Pink-headed Duck	*Rhodonessa caryophyllacea*
Madagascar Pochard	*Aythya innotata*
Brazilian Merganser	*Mergus octosetaceus*
ENDANGERED	
White-headed Duck	*Oxyura leucocephala*
Swan Goose	*Anser cygnoides*
White-winged Duck	*Cairina scutulata*
Hawaiian Duck	*Anas wyvilliana*
Meller's Duck	*Anas melleri*
Madagascar Teal	*Anas bernieri*
Brown Teal	*Anas chlorotis*

SPECIES

COMMON NAME	LATIN NAME
VULNERABLE	
West Indian Whistling-duck	*Dendrocygna arborea*
Lesser White-fronted Goose	*Anser erythropus*
Hawaiian Goose	*Branta sandvicensis*
Red-breasted Goose	*Branta ruficollis*
Blue Duck	*Hymenolaimus malacorhynchos*
Salvadori's Duck	*Salvadorina waiguensis*
Eaton's Pintail	*Anas eatoni*
Laysan Duck	*Anas laysanensis*
Philippine Duck	*Anas luzonica*
Auckland Island Teal	*Anas aucklandica*
Baikal Teal	*Anas formosa*
Marbled Teal	*Marmaronetta angustirostris*
Baer's Pochard	*Aythya baeri*
Scaly-sided Merganser	*Mergus squamatus*
LOW RISK (NEAR THREATENED)	
Northern Screamer	*Chauna chavaria*
Emperor Goose	*Anser canagicus*
Blue-winged Goose	*Cyanochen cyanopterus*
Orinoco Goose	*Neochen jubata*
White-headed Steamer-duck	*Tachyeres leucocephalus*
Hartlaub's Duck	*Pteronetta hartlaubi*
Bronze-winged Duck	*Anas specularis*
Ferruginous Duck	*Aythya nyroca*

SUB-SPECIES

EXTINCT SINCE A.D. (1600)	
Coue's Gadwall	*Anas strepera couesi*
Mariana Mallard	*Anas platyrhynchos oustaleti*
Rennell Island Grey Teal	*Anas gibberifrons remissa*
Chatham Island Teal	*Anas chlorotis ssp. nov.*
Niceforo's Pintail	*Anas georgica niceforo*
CRITICALLY ENDANGERED	
Borrero's Cinnamon Teal	*Anas cyanoptera borreroi*

SUB-SPECIES

COMMON NAME	LATIN NAME
ENDANGERED	
Madagascar White-backed Duck	*Thalassornis leuconotus insularis*
New Zealand Grey Duck	*Anas superciliosa superciliosa*
Tropical Cinnamon Teal	*Anas cyanoptera tropica*
Andaman Teal	*Anas gibberifrons albogularis*
Galapagos Pintail	*Anas bahamensis galapagensis*
Crozet Islands Pintail	*Anas eatoni drygalskii*
Colombian Ruddy Duck	*Oxyura jamaicensis andina*
VULNERABLE	
Recherche Cape Barren Goose	*Cereopsis novaehollandiae grisea*
Middendorf's Bean Goose	*Anser fabalis middendorffi*
Thick-billed Bean Goose	*Anser fabalis serrirostris*
Tule Greater White-fronted Goose	*Anser albifrons gambelli*
Dusky Canada Goose	*Branta canadensis occidentalis*
Peruvian Torrent Duck	*Merganetta armata leucogenis*
Colombian Torrent Duck	*Merganetta armata colombiana*
Australian Cotton Pygmy Goose	*Nettapus coromandelianus albipennis*
Merida Teal	*Anas andium altipetens*
Kerguelen Pintail	*Anas eatoni eatoni*
LOW RISK (NEAR THREATENED)	
American Comb Duck	*Sarkidiornis melanotus sylvatica*
Florida Duck	*Anas fulvigula fulvigula*
Australian Black Duck	*Anas superciliosa rogersi*
Lesser Grey Duck	*Anas superciliosa pelewensis*
Andean Teal	*Anas andium andium*
South Georgia Pintail	*Anas georgica georgica*
South American Pochard	*Netta erythropthalma*

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NEWS ROUNDUP

2000: A BOOM YEAR FOR THE LAYSAN DUCK

The last wild population of Hawaii's endemic Laysan Duck exists on Laysan Island National Wildlife Refuge (171°45'N, 25°45'E). The Laysan Duck has the most restricted range of any duck species, and is among the most highly threatened of birds. A three-year study of the foraging behaviour, population status and the feasibility of re-establishing populations to additional Hawaiian islands is under way. Individual colour-marking, intensive monitoring, and radio telemetry techniques are used to monitor reproductive success.

Data from 2000 indicates the Laysan Duck had a very successful breeding season. Since the first brood sighting of the year on 28 March, 111 broods were produced. Although duckling mortality was high, 76 juveniles are known to have fledged. This is especially good news since the population was making such a slow recovery after the die-off in 1993 (David & Hunter 1994). In 1997, an El Niño drought year, the population of 288 (95% CI 232-434) ducks produced only 10 broods. Only four ducklings survived to fledge! The 2000 adult population estimate was 322 (95% CI 290-354) (US Geological Survey and US Fish & Wildlife Service data). The variability in reproductive success is related to both the carrying capacity of Laysan Island and environmental factors. Food and water availability varies with weather, and reproductive failure is more likely during drought years on Laysan.

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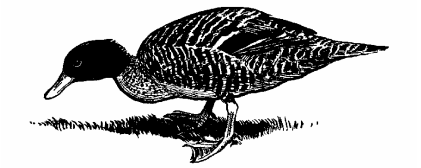
SALVADORI'S DUCK RESEARCH

Salvadori's Duck is the sole endemic waterfowl species on the island of New Guinea and one of only four duck species adapted to life on fast-flowing mountain streams. Some of these rivers and the watersheds that protect them are currently threatened by human activities, such as mining and logging activities known to degrade the water quality of streams and lead to the loss of aquatic biodiversity. Salvadori's Duck, which primarily inhabits riverine habitats and feeds on aquatic invertebrates, also may be adversely affected by watershed development activities. The species is listed as Vulnerable by IUCN and populations may be declining. However, in the absence of any comprehensive survey data, current distribution and population numbers are unknown.



Through the Conservation Biology Institute, I recently received funding from St. Louis Zoo and the World Nature Association to develop a two-year project to gather population and distribution information as well as basic natural history data for Salvadori's Duck. Beginning in January 2002, we will undertake an extensive survey of rivers in the central highlands of Papua New Guinea, and a study of the basic biology of the species. Our results will allow us to determine what impact human activities have on the birds, and to provide basic ecological data that can be used in conservation and management.

Sufficient funding for the first field season is in place and will be conducted from January through May 2002. However, additional funding is being sought for the second season that will run from October 2002 through April 2003. Names and contact information of potential donors or other funding sources would be greatly appreciated.

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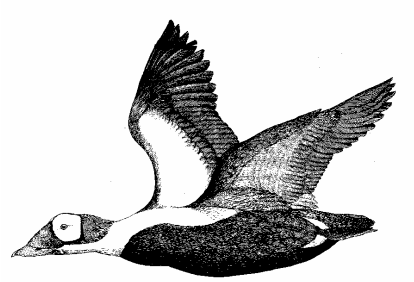
ALASKA SEA DUCKS' HABITAT GIVEN FEDERAL PROTECTION

Federal officials have designated stretches of the western Alaska coastline and waters as protected zones for two species of sea ducks listed as threatened under the Endangered Species Act. The US Fish & Wildlife Service classified about 39,000 square miles (100,000 square km) as critical habitat for the Spectacled Eider *Somateria fischeri*, a species that has suffered a 96% decline since the 1970s in south-western Alaska's Yukon-Kuskokwim River Delta. The US Fish & Wildlife Service also classified 2,830 square miles (7,330km^2) as critical habitat for the Steller's Eider *Polysticta stelleri*, which have dwindled substantially from an Alaska population that once may have numbered some thousands.



The Alaska population of the Spectacled Eider, believed to be suffering in part from lead poisoning, predation and over-hunting, was listed as threatened under the Endangered Species Act in 1993. The Steller's Eider was listed as threatened in 1997. The vast majority of the designated critical habitat is in areas already owned and managed by the federal government. The new designation mandates that government actions must not further harm the species. Conflicts between the protections and economic activities are unlikely. There are concerns about the effects of marine shipping in the area, including small oil spills or other discharges of contaminants.

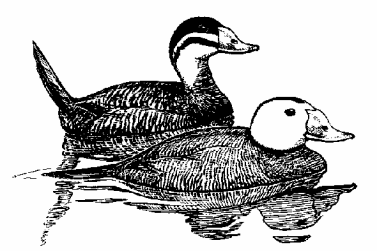
The decision to designate critical habitat was prompted by lawsuits filed by the Southwest Center for Biological Diversity and Christians Caring for Creation. The designations were more modest than proposals last February and March to include vast areas of Alaska's North Slope, site of the nation's biggest oil fields, as part of the critical habitat.

Yereth Rosen

WHITE-HEADED DUCKS IN SPAIN IN 2000

The Spanish national White-headed Duck census on 13 September 2000 found 4,489 birds - an increase of more than 2,000 birds over 1999. This included 3,107 birds at El Hondo Natural Park, Alicante, 1,028 in Andalucia, 298 in Castilla la Mancha, 44 in Castilla León, 6 in Cataluña and three in Euskadi and Baleares.

Breeding was recorded at 23 sites in 11 provinces and four autonomous regions. More than 1,000 young may have been reared at El Hondo. White-headed-Ducks were recorded for the first time in the provinces of Salamanca, Palencia, Alava and Navarra and at new sites in Valencia (Albufera) and Tarragona (Delta del Ebro). In total, White-headed Ducks have now been recorded from 57 wetlands of 17 provinces belonging to eight autonomous regions. Furthermore, accompanying the peak count in Spain there were observations of at least 13 White-headed Ducks, including nine drakes, in France between late August and early October.



Ruddy Duck control continued in Spain in 2000 with 16 pure individuals and 6 hybrids shot. Most birds occurred at two localities, El Hondo Natural Park, Alicante, and the Ullibarri Dam, Alava. The principal threat to the White-headed Duck remains hybridisation with Ruddy Ducks *Oxyura jamaicensis*. The continued presence of Ruddy Ducks in Morocco (see Torres *this issue p.43*) can only worsen the situation.

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WHITE-HEADED DUCKS IN CENTRAL KAZAKHSTAN

A survey of White-headed Ducks in the Tengiz area of Central Kazakhstan in summer/autumn 1999 found more than 2,000 individuals. Lars Lachmann from Germany has subsequently counted more than 3,000 birds, including 1,500 at one lake. The population in Central Asia is higher than previously thought. The last official population estimate was about 500 individuals in the Tengiz region (Red Data Book of Kazakhstan). In May 2000, I found a few hundred "pairs" in potential breeding places. The Tengiz area is therefore important for White-headed Ducks during breeding, moulting, and autumn migration. Data during spring migration are still lacking.

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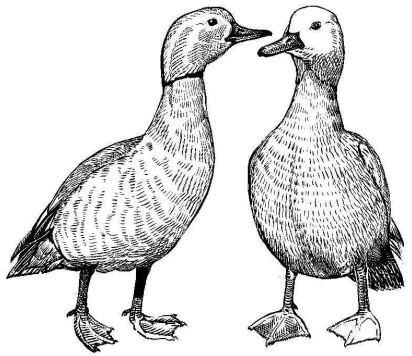
HABITAT LOSS AFFECTS THREATENED WATERFOWL IN MOROCCO

A recent study shows that 25% of the area of selected Moroccan wetlands studied in 1978 had been destroyed by 1999 (Green *et al. In press*). This loss was concentrated in wetlands of low salinity, with a 98% loss of seasonal mesohaline wetlands, 41% loss of mountain lakes and 33% loss of seasonal *Phragmites/Scirpus lacustris* marshes. Degradation has occurred at all wetlands due to hydrological impacts, overgrazing or excessive reed-cutting, sedimentation, urban development, pollution, introduction of exotic fish and other causes.



Natural, freshwater wetlands most affected by wetland loss are of great value for threatened waterbirds, such as Marbled Teal, Ferruginous Duck, Ruddy Shelduck *Tadorna ferruginea* and especially Crested Coot *Fulica cristata*. Most of the surviving key sites for these species are unprotected, and measures to conserve them are urgently required (Green 2000, Green *et al. In press*).

Furthermore, the latest news indicates that the situation is even more serious than these studies suggest. By September 2001, visits by Mohamed El Agbani and Jacques Franchimont showed that two more Middle Atlas lakes of enormous importance were completely dry: Aguelmam Afennourir, a Ramsar site holding up to 650 Ruddy Shelduck and 1,113 Crested Coot, and Dayet 'Awa which held 1,200 Marbled Teal and 878 Crested Coot in 1999. This status of the Atlas lakes could not be more worrying, and detailed studies are urgently required to establish to what extent this latest loss is "natural" due to reduced precipitation and to what extent increased water extraction for agriculture is responsible. Snowfall in the Middle Atlas mountains is reported to have reduced greatly in recent years. Nobody seems to know if this is associated with global climate change, or related to deforestation in the mountains themselves. Can anybody help?

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MARBLED TEAL IN SPAIN IN 2001

A LIFE project for Marbled Teal in the Valencian region was completed in early 2001, allowing some major advances in conservation measures at El Hondo Natural Park, the most important breeding site for this species in Europe. Firstly, ramps were fitted to the canal where a large proportion of broods used to get trapped (Navarro *et al*. 1995, Green *et al*. 1999), allowing them to climb out with ease. Many broods still use the canal, probably because it provides a particularly high abundance of insect food. Secondly, new habitat has been created close to the existing wetlands, with two shallow lagoons of 18 and 6Ha being designed specifically for the species. Encouragingly, a pair of birds appeared the day the first lagoon was flooded in spring 2001, and up to 60 were present by September. Furthermore, restoration at Marjal del Moro, a separate wetland much further north, has led to the establishment of a regular breeding population at that site (Yuste 2000, see

http://www.terra.es/personal3/birder). In addition, the hunting ban in the central reservoirs at El Hondo has been renewed on an annual basis since the 1996/1997 season, a measure that has also brought immense benefits to the White-headed Duck, which reached a national peak of 4,489 birds in Spain in September 2000 (see Torres *this issue p.7*).

Despite these measures, numbers of Marbled Teal, White-headed Duck and other birds breeding at El Hondo have declined markedly in 2001 owing to the worsening water quality. Water is pumped into the reservoirs from the River Segura (the most polluted river in Spain), and this year it has been hyper-eutrophic and loaded with suspended solids, preventing all growth of submerged vegetation. Plans to install a huge reed bed filter at the site urgently need to be implemented.

The Marbled Teal LIFE project was also used to finance a regional workshop in September 2001 at Guardamar del Segura, in which participants from Tunisia, Morocco and Spain discussed ways to cooperate in the study and conservation of this species. Although no participants from Algeria could make it, this should be the first step to developing coordinated counts and research projects. The need for further surveys in the breeding season to locate breeding sites used by the thousands of birds wintering in Tunisia and Morocco was particularly stressed. For a copy of the conclusions of the workshop (in French or Spanish), contact José Luis Echevarrias *josel.echevarrias@cma.m400.gva.es*, the joint coordinator of the national censuses for the Marbled Teal in Spain.

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WHITE-HEADED DUCKS AT LAKE VAYA, BULGARIA

The Bourgas Wetlands Project team is continuing to conduct twice-monthly counts of waterbirds at the Bourgas wetlands. On 10 December 2000 at Lake Vaya we counted 1,970 White-headed Ducks in five separate flocks (450, 200, 770, 330 and 220 birds). Other waterbirds included 7,410 Pochard *Aythya ferina*, 1,190 Mallards *Anas platyrhynchos*, 1,300 Shoveler *Anas clypeata* and 135 Dalmatian Pelicans *Pelecanus crispus*. The first White-headed Ducks arrived in late November, the same as in previous years. Subsequent counts included 1,367 birds on 1 December 2000, 100 on 15 January 2001, and 1,700 on 15 March 2001.

During the 2001/2002 winter, White-headed Ducks arrived at Bourgas on 3 November. Subsequent counts at Vaya Lake included 393 birds on 16 November, 358 on 17 November and 545 birds on 18 November. Benthic samples taken from Vaya Lake on 3-4 November 2001 showed a domination of *Chironomus* larvae. Disturbance from fishing boats and nets, and from hunting is higher in 2001 than in previous years.

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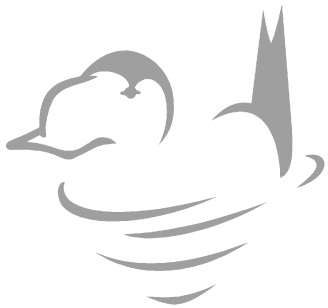
WHITE-HEADED DUCK AND PYGMY CORMORANT IN THE BALKANS



In March 2001, a new initiative for the conservation of globally threatened birds began in the Balkans. The project is coordinated by the Hellenic Ornithological Society and is carried out by BirdLife International partners in Romania (Romanian Ornithological Society (ROS)), Turkey (Society for the Protection of Nature (DHKD)) and Bulgaria (Bulgarian Society for the Protection of Birds (BSPB)). The project aims to increase populations of Pygmy Cormorant *Phalacrocorax pygmaeus* and White-headed Duck in Greece, Romania, Bulgaria, and Turkey, by tackling threats and taking protection measures. The project is funded by the Hellenic Ministry of Environment, Land Planning and Public Works, through the "Development Assistance and Cooperation Fund".

Field work is being carried out in all four countries. A complete survey of breeding Pygmy Cormorants was conducted in the Danube Delta between April and June 2001 and a survey of breeding White-headed Ducks was carried out in central, north-eastern and eastern Turkey from 27 June to 17 July 2001. A total of 110 sites (53 wetlands) were visited and 156 species of birds were observed. Small numbers of White-headed Ducks were found breeding at 11 wetlands. Further monitoring of migrating and wintering populations will take place until February 2002 at key wetlands in all four countries. The results will be presented at a meeting organized by the Hellenic Ornithological Society and the Biology School of the Aritotelian University of Thessaloniki, Greece, in February 2002.

Workshops are being organised in all countries. On 15-16 October, the seminar "Monitoring of the White-headed Duck and Pygmy Cormorant - Methodology and Goals" was held at the PODA Centre, Bourgas, Bulgaria. On 29 October, the workshop "Cooperation on Wetland Conservation in the Balkans" was organised at Burdur, Turkey. On 1-2 December, a seminar called "Nature Conservation Tools in EU Accession Countries" was held in Tulca, Romania. Printed material for the project (posters, stickers, and banners) has been distributed to all countries and related web pages are now under construction.

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ORINOCO GEESE IN VENEZUELA

As part of my PhD program, I have been studying three aspects of the breeding biology of the Orinoco Goose in south-western Venezuela: 1) nesting and nest availability; 2) pair and family behaviours; and 3) forage quality.

As a cavity nesting species, it has been suggested that deforestation is the biggest factor limiting the reproductive success of the Orinoco Goose (Gomez-Dallmeier and Cringan 1989). Surveys at my study site have found only a few suitable cavities, with hatching success below 15%. Artificial nest boxes constructed during 2000 were readily

used in 2001. However, these same nests were also heavily parasitized, resulting in one containing 29 eggs. Nest boxes will continue to be evaluated during the 2002 field season.

My project is also focused on making comparisons between true geese of the Tribe Anserini and Orinoco Geese. As grazers, geese rely on high-quality forage on the breeding grounds. The tropics, however, are generally considered to contain plants that are nutrient-poor. As such, it was believed that geese could not invade the tropics. Orinoco Geese, therefore, represent a paradox. To address this paradox, I am evaluating the availability of, and nutrient concentrations of, forage consumed by the Orinoco Geese during the breeding season. I am also conducting behavioural observations of pairs and family groups to discern how these "geese" allocate their time and resources. While I have just begun to evaluate the data, it is my hope that the results of this project will enable us to characterize the type of habitat utilized by Orinoco Geese, as well as help us to explain how this "goose" evolved to survive in the tropics.

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SCALY-SIDED MERGANSER IN CHINA

The April 2000 issue of Da Ziran (China Nature) magazine (2000.4) reports that a wintering population of 100 Scaly-sided Mergansers has been discovered east of Poyang Lake in north-eastern Jiangxi province. The birds were found in winter 1999 in Yiyang county on a 10km long stretch of the Xinjiang River which flows into Poyang Lake. The area is sparsely populated and unpolluted and has been made into a nature reserve, the report says. This would appear to be the world's biggest known concentration of wintering Scaly-sided Merganser, larger than the flock of up to 76 reported in Heilongjiang in September 1997.

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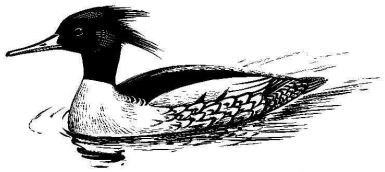

THREATENED WATERFOWL IN TUNISIA IN 2001

In October 2001, the Association "Les Amis des Oiseaux" - Groupe Tunisien d'Ornithologie (G.T.O) made the following observations in Tunisia:

13 October 2001
Barrage Oued El Rmal (36°21'N, 10°21'E)
1,613 Marbled Teal, 1,682 Ferruginous Duck, 186 White-headed Duck.

13 October 2001
Barrage Jdidi (36°25'N, 10°27'E)
2 Ferruginous Duck.

14 October 2001
Barrage Lebna (36°42'N, 10°56'E)
1,053 Marbled Teal.

14 October 2001
Barrage Oued El Hajar (36°52'N, 11°2'E)
1,600 Marbled Teal, 269 Ferruginous Duck.

Thus a total of 4,266 Marbled Teal and 1,953 Ferruginous Duck were seen, the latter probably the most ever in Tunisia.

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MARBLED TEAL IN TUNISIA IN 2001

I have recently made two visits to the main wetlands in the Cap Bon, especially Barrage Lebna and Barrage Oued El Khatf (where 4,000 Marbled Teal were counted in October 1999). Although there were very low water levels in the dams due to the unusual dry season and intensive use of water by farmers and factories, the population of Marbled Teal remains quite high. Around 3,500 birds were counted during the two visits, mainly on Barrage O. El Khatf. This again confirms the importance of this barrage during autumn migration.

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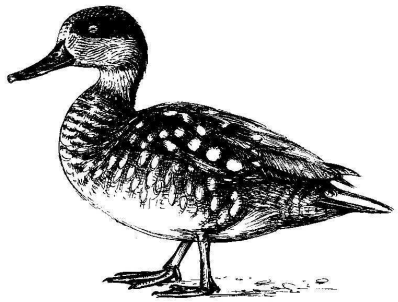

REINTRODUCTION OF THE CRESTED COOT IN EASTERN SPAIN

The Crested Coot became extinct in the Valencian region of Spain by the 1950s. In 1999, the Valencian government (Conselleria de Medio Ambiente, Generalitat Valenciana) obtained financial aid from the LIFE-NATURE program of the European Union to implement a project aiming to reintroduce this rallid into three protected wetlands (EU SPAs) within the boundaries of the Valencian region: Albufera de Valencia, Marjal del Moro and El Hondo. The ultimate aim of the project is to foster the recolonization of the former breeding range of the species in the Iberian Peninsula.

Overall, 149 individuals have been released so far. All have been marked with darvic collars which can be read from a distance and 22 have been equipped with radio transmitters. These are providing valuable information on between site movements. All individuals released are being monitored and we know that at least five pairs (producing nine fledglings) have already bred in the wild. Conservation actions under way include habitat management, education campaigns to increase the awareness of local population (especially children and hunters), and genetic studies to ensure that birds from captive breeding are genetically healthy.

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THREATENED WATERFOWL ON THE WEB

BOURGAS WETLANDS
http://www.pomonet.bg/bourgaslakes

The main goal of the Bourgas Wetlands project is to establish a sustainable working structure for managing and protecting the Bourgas Wetlands. Project activities include developing and implementing management plans for the Atanasovsko Lake reserve, Poda Lagoon and Vaya Lake. The latter has held over 2,000 White-headed Ducks (TWSG News 11:18).

TRANSLATIONS OF RUSSIAN ORNITHOLOGICAL PUBLICATIONS
http://my.tele2.ee/birds/

Jevgeni Shergalin now has a website which includes an exhaustive list of titles and abstracts of papers on birds of Eastern Europe and Northern Asia.

EL MARJAL DEL MORO (THE MORO MARSH)
http://www.terra.es/personal3/birder/

Marcial Yuste has produced a wonderful new website on El Marjal del Moro. The site includes a wealth of information on the Moro Marsh, including detailed bird lists, information on scientific studies, and many photographs of Marbled Teal. The latest news section reports the following breeding records for 2001: Crested Coot - four broods (with three, three, one, and one chicks); Marbled Teal - four broods (with 18, 17, 12 and 11 chicks); Ferruginous Duck - one pair (with six chicks).

AFRICAN-EURASIAN MIGRATORY WATERBIRD AGREEMENT WEB SITE
http://www.unep-wcmc.org/AEWA

The AEWA web site has been upgraded. It includes the text of the Agreement (in four languages), maps of the agreement area and the contracting parties, species fact sheets for all AEWA species, and an Interactive Map Service containing detailed distribution maps for 40 waterbirds.

ASIA PACIFIC MIGRATORY WATERBIRD LIST-SERVER

The Asia Pacific Migratory Waterbird List-server has been recently launched. The aim is to provide a forum for non-government and government organisations and individuals with an interest in sharing information and ideas to promote the conservation of migratory waterbirds in the Asia-Pacific region. It will also serve as a mechanism for sharing information on the waterbird site networks and support implementation of waterbird conservation activities of the *Asia-Pacific Migratory Waterbird Conservation Strategy*.

Subscription to this unmoderated discussion group is open to all interested parties. The discussion group is supported by Environment Australia as part of its initiatives to promote the conservation of migratory waterbirds in the Asia-Pacific region.

To subscribe to the list-server send an e-mail to: *majordomo@erin.gov.au*. Leave the subject line empty. In the message say: subscribe apmw.

To send a message to the discussion group address it to: *apmw@erin.gov.au*.

We look forward to your active participation in this forum and in our efforts to promote the conservation of migratory waterbirds and their wetland habitats. If you require further information about the group contact: *doug.watkins@ea.gov.au*.

FEATURES

ECOLOGY AND CONSERVATION OF THE WHITE-WINGED DUCK IN SUMATRA

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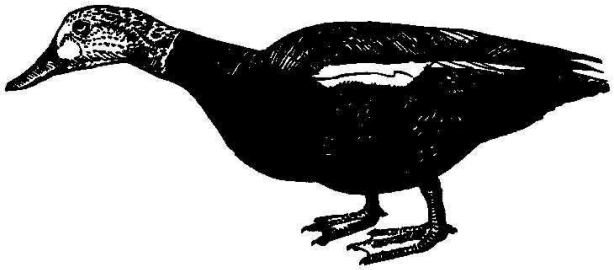
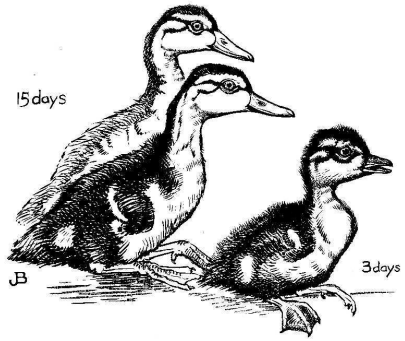
The White-winged Duck is a secretive, rare inhabitant of tropical lowland forests in South-east Asia. The species was once widespread throughout South-east Asia, including India, Bangladesh, Myanmar, Thailand, PDR Laos, Cambodia, Vietnam, Malaysia and Indonesia. In the past 50 years, the massive destruction and fragmentation of the species' forest habitat has caused a drastic reduction of duck numbers. The current estimated world population in the wild is less than 5,000 individuals (Green 1993) and the species is listed as globally Endangered by IUCN (BirdLife International 2000).

Biologists know virtually nothing about the biology of White-winged Ducks in the wild, because the birds are secretive and live in low numbers in dense tropical forest. Until this project, no-one had the time or funding to spend months in the forest to develop appropriate research techniques and gather basic biological data. Lack of information on such topics as habitat preferences, distribution, breeding biology, dispersal, and causes of mortality have impeded efforts to protect the species. Therefore, the primary objective of this project was to collect data that will contribute to the conservation and recovery of the White-winged Duck. The main question was: what limits White-winged Duck populations in the wild? Field research focused on collecting basic data on the breeding biology, habitat use, adult and juvenile survival, and dispersal of wild White-winged Ducks. This information then can be used by managers to develop management recommendations and by policy-makers to help guide their decisions. This research involved training Indonesian students in environmental field research techniques.



The study site, Way Kambas National Park in southern Sumatra, has the largest known population of White-winged Ducks in the world, with an estimated 30-100 individuals. During three breeding seasons, we encountered more than 155 ducklings in 26 broods (1999 – four broods, 29 ducklings; 2000 - 20 broods, 120+ ducklings; 2001 – two broods, 10 ducklings). The breeding season in all years began in December. In 1999, nesting and brood rearing extended from early February to October, in 2000, from late January to August, and in 2001, from mid-January to June. We observed copulations in December, and females prospecting for potential nest sites in tree cavities in December and March. We found one active nest located in a large cavity 13m high in the trunk of a *Gluta rengas* tree. The nest was destroyed by an unknown predator around three weeks into incubation. Usually, the female took care of the ducklings, but often the male or other females helped. Broods spent daytime in flooded swamp forest and often moved to open water marshes or ponds to sleep at night. The overall home range of one brood over 12 weeks was 123.5Ha. At least some adult ducks underwent a complete wing moult at the end of the breeding season (June-July).

Both ducklings and adult birds were most active (moving about and feeding in open habitats) at dawn and dusk. These birds spent the day in the swamp forest, feeding and resting in trees or on logs in the water. White-winged Ducks preferred slow-moving or still water, usually <1m deep, for swimming and feeding. They either slept in trees or on the ground on the banks of open water ponds. When they perched in trees, these ducks required a sturdy, horizontal branch. However, they showed no preference for certain tree species or for live trees versus dead snags. We captured ten ducks using specially-made bird nets and attached necklace-style radio transmitters to monitor their movements. The overall home range size of breeding females was 122-144Ha. One non-breeding female had a home range size (252Ha) similar to that of males (230, 284Ha). The range from which a radio transmitter could be detected varied from 300-2,000m, depending on habitat.



Two steps are needed to ensure the continued viability of the White-winged Duck population at Way Kambas National Park. First, known high concentration areas of ducks must be protected from disturbance by fishermen or poachers. A high-priority location within the park is the upper reaches of the Way Kanan River which seems to be a prime breeding area. Second, adequate amounts of good habitat, especially swamp forest, must be preserved. The major threat is frequent forest fires which prevent early successional forest to develop into mature forest preferred by the ducks. Ideally, various types of wetlands should be protected so that the ducks can move site when water levels fluctuate.

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PILOT NEST-BOX PROJECT FOR WHITE-WINGED DUCKS IN SUMATRA

Nancy Drilling

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INTRODUCTION

Not only is the total number of White-winged Ducks in the wild critically low, but most populations are in small, isolated patches of suitable habitat and have fewer than 25 individuals. As a rule of thumb, populations with fewer than 50 individuals are in grave danger of extinction from a variety of factors, such as catastrophic weather events (e.g. drought), excessive human disturbance (e.g. fires, poaching), or too few individuals for breeding. Assuming that conservationists will not be able to increase this species' swamp forest habitat in South-east Asia anytime soon, the best management option is to try to increase population size within remaining habitat patches. Any management technique that can increase the size of these small populations will greatly improve the chances they will persist.

White-winged Ducks usually nest in tree cavities and in captivity these ducks lay their eggs in nest-boxes built by humans (Ounsted 1985). Managers have had success increasing populations of other cavity-nesting duck species by erecting human-built nest-boxes in the wild (e.g. Gauthier 1988, Savard 1988, McCamant & Bolen 1979). Large-scale erection of nest-boxes is credited with being the key factor which drove the recovery of the Wood Duck *Aix sponsa* in North America (McLaughlin & Grice 1952, Doty & Kruse 1972). Given the success of these programs, the White-winged Duck Action Plan has recommended trying this method in wild populations (Ounsted *et al*. 1994). Erecting nest-boxes is a simple, relatively inexpensive management option for increasing population size that, if successful, may pay great dividends for the White-winged Duck. Thus, in April 2000, we began a small-scale nest-box project in Way Kambas National Park, Sumatra, Indonesia. The goal of this project was to determine if providing artificial nest-boxes in the wild is a viable option for increasing the population size of White-winged Ducks. The specific objectives were:

1. To determine methods of building and erecting nest-boxes.
2. To identify potential nest predators by monitoring boxes containing domestic chicken eggs.
3. Once the potential predators were identified, to determine what method would keep them out of nest-boxes.
4. To identify other animal species that may use nest-boxes for nesting or roosting.
5. To determine if White-winged Ducks will use nest-boxes for nesting.

MATERIALS, METHODS & RESULTS

Building and Erecting Nest Boxes

A total of 25 nest-boxes were built of wood from local wood shops - mostly wood from the durian tree. We used nails and wood glue to attach the bottom, sides and front to each other. The top was attached with hinges so that we could more easily monitor the interior. For the first box, we used the measurements and shape from published reports of boxes used in captive breeding - 60 x 52 x 54/56 cm (length x width x height). We decided that this box was unnecessarily large and difficult to carry into the field and erect. Therefore, we reduced the size of the remaining boxes, basing the longest dimension (the length) on the

length of a female White-winged Duck. The final dimensions were 53 x 43 x 48/41cm, with an entrance hole size of 20 x 17cm. We put four small holes in the bottom to allow water to drain out. In addition, we stapled a 10 x 10cm piece of hardware cloth below the hole in the inside of the nest box so that the ducklings would have a rough surface to climb when they left the nest. Inside, the bottom was covered with dried grass clippings. Each box took about five hours for one person to build. The first ten boxes cost approximately US$4.40 per box to build, including cost of tools, materials, and hauling the wood to the park. An undergraduate university student volunteered to build the first 10 boxes. We hired two professional carpenters to build the final 15 boxes and thus, the cost increased to approximately US$7.94 per box.

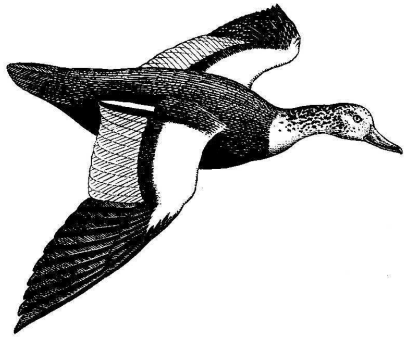
The nest boxes were erected in swamp forest or at the edges of small ponds in lowland forest. All boxes were located in areas where broods had been seen previously, or where there were high densities of adults. We mounted the boxes 1.5-4m above the ground on trees, using hardwood 5 x 5cm batons to support the box. The basic siting requirements were that the box needed to be in shade, there had to be a clear flight path to the entrance, and the box had to be over water during the breeding season. To decrease the chance of human poaching, we attempted to mount the boxes in areas rarely visited by poachers. However, in Way Kambas, there is no such thing as a site totally safe from poachers; we could only put the boxes in less visible areas and hope that they would not be disturbed. Each box took one to two hours to erect, depending on water depths.

Identification of Potential Predators

The most critical factor for the success of a nest box program is to provide safe nesting sites. Potential nest predators in Way Kambas include snakes, squirrels, rats, civet cats, crows, elephants, and primates (including humans). To discover potential nest predators, we placed three domestic chicken eggs in ten boxes and monitored for predators every two days over a three week period during the breeding season. Five of the boxes were in swamp forest or marsh edge habitat, and thus the box was surrounded by water, while five boxes were on the banks of forest ponds. In the swamp forest boxes, all eggs disappeared from one box and one egg disappeared from another. There was no sign of what may have taken the eggs (nesting material not disturbed). Possibilities include rodents, snakes, primates, or humans. Other potential predators, such as monitor lizards or civet cats, would have disturbed the nesting material or left some other sign. In the forest pond boxes, all eggs disappeared from one box and one egg was broken in another, again no signs. Probably the single egg was broken by a small rodent. In a third forest pond box, a mouse buried the eggs in the process of building a nest. We assume that rodents would not be a factor if this were an actual duck nest.

Duck Nests

In the 2001 nesting season (January-May), no White-winged Duck nested in any nest-box. We never observed a duck enter a nest-box; typically, females survey potential nest holes before choosing a nest site (*pers. obs*.). However, as females visit potential nest cavities for less than two minutes, we may have missed some visits. No other bird species utilized the boxes for nesting. Small mice were the only mammal species that we encountered and only in nest-boxes erected on trees that were not completely surrounded by water. Spiders, ants, small snakes, small lizards, and scorpions also frequently inhabited the nest-boxes. None of these small animals would be a deterrent to a duck that wanted to nest in a box.



CONCLUSIONS & RECOMMENDATIONS

Although no White-winged Ducks used the nest-boxes during this monitoring period, artificial nest-boxes may still be a useful management tool. Managers erecting nest-boxes for other duck species frequently note that it can take several years for ducks to begin to use the boxes. We only monitored for one breeding season and it is entirely possible that the ducks will use the boxes in the future.

As a result of this pilot project, we make the following recommendations:

1. A nest-box project is perfect for undergraduate students, or other volunteers, to gain hands-on field experience and learn about conservation and wildlife management. The project can be broken up into short phases (building, erecting, monitoring), each lasting one-four weeks so that busy volunteers can help.
2. Wood in tropical climes decays very rapidly. To extend the life of the nest-box, we recommend using a water- and insect-resistant hardwood species and coating the outside surface with several layers of varnish. In addition, if the box touches the tree, rapid decay occurs because of ant and termite action as well as moisture and fungus. However, even with these actions, nest-boxes in the tropics probably need to be fixed and replaced more frequently than those in temperate areas.
3. Our observations of females entering natural cavities indicate that, although they will enter holes as small as those of our boxes, they seem to prefer huge holes that they can fly straight into. Thus, a better nest-box design may be to leave the upper half of the front panel open instead of having an entrance hole.

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SURVEY METHODS FOR WHITE-WINGED DUCKS

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White-winged Ducks are notoriously difficult to survey, either to accurately determine presence in an area or to assess population size. This is because they live in dense and often inhospitable forest habitat, occur in low densities, generally are solitary or in pairs, and are quiet while resting or feeding. Lack of accurate data on distribution and population size has been a serious impediment to conservation efforts. To date, two methods have been used to determine White-winged Duck presence and population size - questioning local villagers and hunters, or direct survey by walking or boating along waterways.

Between December 2000 and June 2001, I conducted research into methods for direct surveys to detect presence and estimate population size using a radio-marked population of White-winged Ducks in Way Kambas National Park, Sumatra. To determine the best travel method and time of day to conduct surveys, we conducted mock surveys at the same time that we searched for radio-collared ducks. We tested two travel methods - canoeing and walking. The mock surveys were conducted during morning (0530-0800hrs), mid-day (0800-1600hrs) and evening hours (1600-1830hrs). The surveys were conducted over 2.5-3km routes along the upper section of the Way Kanan River. Habitat types through which we conducted the surveys included dense swamp forest, open burned swamp forest, and open marsh habitat.

To analyse the probability of detecting ducks that we knew to be present (because they were wearing radio transmitters), I include only those mock surveys in which the radio-collared ducks were within 150m of our route. Beyond 150m, it may have been difficult to see or hear a duck, especially in denser habitat. The results are summarized in Table 1. The probability of detecting at least one duck during a survey (when we knew that ducks were present within 150 meters) was higher when canoeing (overall - 44.4%) versus walking (33.3%) and higher during early morning (48.6%) or evening (50.0%) versus mid-day (30.4%). During the rainy season, canoeing is quieter than walking; these results may be different during the dry season when the land is dry and we would not have to splash through water up to 1m deep. Higher detection rates during early morning and evening agrees with our observation that these ducks move about most when the sun is below the horizon.

In addition to detection rate, we recorded when a radio-collared duck moved silently away from us, possibly due to our presence. Almost all of these 'silent moves' were by females with broods, which shows the White-winged Duck's sensitivity to disturbance during brood-rearing.

These data also illuminate the accuracy of estimating population size from a direct survey. In 144 surveys, we never detected the entire population during one survey and thus, simply counting the ducks was not adequate for determining population size. As a result of the low detection rates, our estimate of the number of ducks along the survey route (0-4 ducks) was much lower when only based on the birds we saw or heard than the actual population size (10-12 ducks).

Thus, any population estimate based on direct surveys needs to be interpreted with great caution.

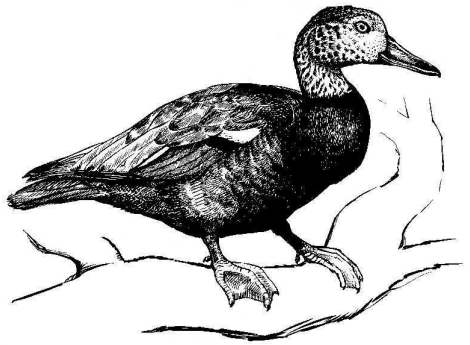
Conditions in other areas undoubtedly will be different from Way Kambas (habitat more or less dense, ducks more or less wary, etc.). However, I believe that the general result obtained at Way Kambas - a relatively low detection rate that varies by time of day, holds for most areas within the White-winged Duck's range. Thus, to increase the chances of detecting ducks and more accurately estimate local population size, I recommend that surveyors choose the most quiet travel method possible and concentrate surveys in early morning and late afternoon hours.

There are also likely seasonal differences in detectability, although this study was not able to test this. At Way Kambas, adults were more vocal and more likely to use open habitats at the beginning of the breeding season (beginning of rains, November - January); possibly this would be a good time to survey. Adults were totally silent and deep within dense forest during flightless moult (end of breeding, May - August); possibly this would be a poor time to survey. In contrast, juveniles were quite tame and tended to flock together when about 3-5 months old (April-August) and this may be a good time to monitor breeding success. Finally, at the height of the dry season, water can be scarce, forcing all ages to congregate, another potentially good opportunity for surveys.

Table 1. Results of mock surveys along upper Way Kanan river, Way Kambas National Park.

Time	Method	N	% See Duck	% Hear Duck	% Flush Duck	% Radio Moves Without Seeing/Hearing	Total % Detect At Least 1 Duck*
morning	Canoe	28	42.9	32.1	17.9	13.6	50.0
mid-day	Canoe	36	22.2	13.9	27.8	33.4	33.3
evening	Canoe	26	34.6	38.5	38.5	9.5	53.8
morning	Walk	7	28.6	14.3	28.6	14.3	42.9
mid-day	Walk	33	12.1	18.2	15.2	20.0	27.3
evening	Walk	14	28.6	14.3	14.3	7.1	42.9

* "Detect" = see, hear calling, or flush a duck, whether marked or unmarked.



STATUS OF THE BAIKAL TEAL IN THE LOWER INDIGIRKA BASIN, SIBERIA

Christoph Zöckler[1] & E.E. Syroechkovski, Jr[2]

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INTRODUCTION

The Baikal Teal is the rarest dabbling duck in Northern Asia and some regard it to be the nicest duck in the Palaearctic. However, we know very little about it due to its restricted breeding distribution in eastern Siberia. Its population is estimated at around 210,000 birds (Miyabayashi & Mundkur 1999). The Baikal Teal is listed as Vulnerable in the 2000 Red List of Threatened Birds (BirdLife International 2000) and still considered as threatened, although numbers recently seemed to have increased (e.g. Lethaby *et al*. 2000). The major reason for the original decline is hunting in all range countries, but particularly in China, as well as mortality from poisoned grain on the wintering grounds in China and Korea.

Degtyarev & Perfilyev (1998) described the situation at wintering and staging sites in Yakutia, but very little is known from breeding sites. In summer 1999, an ornithological expedition, under the lead of E.E. Syroechkovski from the Russian Academy of Science, carried out a survey of one of the few remaining unknown areas in terms of bird distribution in the Russian Arctic - the middle basin of the Indigirka River. Our observations throw further light on the status of the species in the breeding grounds and suggest action for its protection.

DISTRIBUTION

Miyabayashi & Mundkur (1999) give a brief sketch of the known distribution of Baikal Teal showing three distinct areas: Southern Yakutia east to Kamtchatka, the Middle Lena basin, and the Yano-Indigirka-Kolyma Plain. Although Miyabayashi & Mundkur (1999) indicate that the latter area extends to the north coast of Russia, we did not find any Baikal Teal in the Indigirka Plain further north than 69ºN. However, this was somewhat unexpected as we previously observed the species well into the delta region along the Yana River (Syroechkovski & Zöckler 1997). We did not visit the upper reaches of the Indigirka River, so are unable to provide any information on the southern boundary of the Baikal Teal's distribution here.

One of the major breeding grounds of the Baikal Teal in the Yana-Indigirka Plain is situated in the Abijskij Region at about 68ºN, 146ºE. The species is also found in the floodplains of the smaller tributaries, such as the Suturocha and Uyandyna Rivers. However, the largest population in 1999 was found far from any river, in the plain near the village of Abij, an area dominated by large and smaller lakes, of which some have been drained for agricultural purposes.

HABITATS

The two most important sites for Baikal Teal were Abij 1 and Taalakhtakh situated 120km west of the Indigirka River near the village of Abij (Table 1). Abij 1 is quite unusual for the Arctic as it is largely under human influence. Larger lakes in the area have been converted into farmland for cattle and horses. Vast areas of open land have been created and maintained in a region which is forested by northern boreal taiga. Huge areas of former lakes have been converted into

wet grassland, small lakes and swampy sites, surrounded by reeds of *Calamagrostis* and *Glyceria* grasses. Many small lakes and artificial ditches provide ideal habitat for seven *Anas* duck species, fairly common among them the Baikal Teal. Most of the area is still very wet and includes lakes of various shapes and sizes with different water depths interspersed with wet grassland and small river channels. The Baikal Teal prefers the edges of smaller lakes with lush vegetation. It is rarely found on the open water and most common on lakes highly vegetated with *Phalaris*, *Glyceria* and *Carex* tussocks. The habitat at Taalakhtakh was similar to Abij 1, but lacked shallow lakes with diverse submerged and emergent vegetation.

BREEDING POPULATION ESTIMATES NEAR ABIJ

We encountered single males or pairs at seven different sites along the Idigirka River between 68º20'N and 69º0'N. Most birds were found along the river itself and at small lakes nearby. Pairs were found mainly on small lakes where they were displaying. The largest flock of males consisted of 13 birds in a swampy area of a former lake at Abij 1 (Table 1) with several pairs present in the wider area. The population size here was estimated at 25-35 pairs. Tallatakh, a slightly larger site with a similar landscape contained 7-10 pairs. Overall, we saw some 41-60 pairs although this represents a minimum estimate.

THREATS AND TRENDS

Hunting

Hunting is a common and widespread threat to all ducks and geese in Northern Siberia. Places close to small settlements are particularly vulnerable to heavy hunting pressure. Spring hunting is very common in Siberia and Yakutia, and most men in northern settlements hunt. In Abij, a small settlement of 600 people, according to local people there are 150 hunters, but only 30 are active. The official season for geese takes place in May, and for ducks between 1 and 9 June. Unofficially, hunting often continues into late June. On average, some 150 ducks are shot per hunter each spring, giving a total hunting bag of almost 4,500 birds. The most numerously hunted species are, in decreasing order of importance, Long-tailed Duck *Clangula hyemalis*, Velvet Scoter *Melanitta fusca stejnegeri* and Tufted Duck *Aythya fuligula*. Baikal Teal is the least common species hunted in spring, comprising less than 1% of the total bag. In autumn the proportion can be higher - up to 10% of all hunted ducks, although more detailed information is not available. Generally, hunting activities have declined in recent years due to the increased cost of cartridges. One cartridge at the time of our visit cost five roubles, almost half a US$. The number of cartridges each hunter can afford each year has thus decreased from 1,000 to only 200-300.

Table 1. Baikal Teal encountered along the Indigirka River during summer 1999.

Site Name	Surface Area (Km^2)	Birds Counted	Population Estimate (pairs)
Djergamudnik 1 (Indigirka)	10	1-2 males/pairs	3-5
Suturocha	12	2-3 males/pairs	5-10
Abij 1	12	15-18 males	25-35
Tallatakh	10	5-6 males	7-10
Cerganakh (Uyandyna)		0	0
Djergamudnik 3 (Indigirka)	> 10	1 female	1-2
Total		25-30	41-62

Trends
All hunters we spoke to confirmed that Baikal Teal have increased in recent years, but the timing of increase differed between hunters, varying from 1987 to 1995. One hunter with long-term hunting experience confirmed an increase of Baikal Teal in the annual hunting bag from one or two per hunter in 1987 to 20 since 1994. The species became very rare in the 1970s when the hunter remembered the settlement elder calling for a ban on hunting with the words "What is spring without the call of Mordok!" - the local name of the Baikal Teal. His advice was heeded for many years into the 1980s.

Asked about the causes of the Baikal Teal's initial decline, two hunters demonstrated an impressive knowledge and mentioned hunting pressure in China and chemical poisoning. They did not think that their hunting practice in spring had any significant impact on the population. They were aware of the teal's threatened status and jointly acted among the community to prevent spring hunting extending into the breeding season. They also monitored the population using hunting bags and personal observations, and were able to respond to declines through voluntary hunting bans.

Small local hunting communities in Siberia are very distant from any governmental control. Hunted waterbird species, including globally and regionally threatened species, rely for their well-being on the self regulation of remote hunting communities. Interviewed hunters showed a profound knowledge of Baikal Teal, its population status, and the causes of their past decline. Whether this knowledge is shared by other communities in the region and beyond in Northern Siberia needs verification. Empowered local communities seem to be able to effectively regulate hunting activities, as observed in the Abij region. Further expeditions to the Baikal Teal's breeding grounds should aim to investigate the duck's status and the level of local knowledge of the species in other communities.

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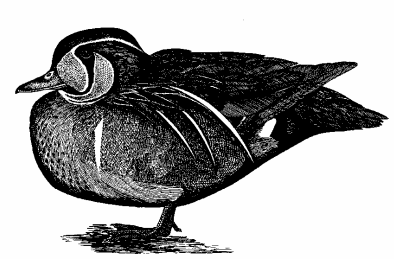

SPATIAL DYNAMICS OF THE RUDDY DUCK AND ITS IMPACT ON THE WHITE-HEADED DUCK

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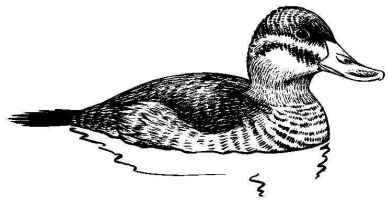
BACKGROUND
Native to North America, the Ruddy Duck escaped from captive collections in the UK in 1953 and first bred in the wild in 1960 (King 1976). The population has been increasing ever since and in the UK now numbers about 5,000 birds (Musgrove *et al*. 2001). In the 1960s the Ruddy Duck's range started to spread beyond the UK to mainland Europe and in 1983 the first Ruddy Duck was recorded in Spain, posing a threat to the Spanish population of White-headed Ducks through hybridisation. Hybrids were first recorded in Spain in 1991 and it is thought that introgression of Ruddy Duck genes into the White-headed Duck gene pool may threaten the survival of the White-headed Duck as a species.



AIMS
The UK and other EU states are obliged under international conventions to control non-native species where they threaten native biodiversity, and thus to reduce the spread of the Ruddy Duck. In order to evaluate the effectiveness of suggested UK Ruddy Duck control strategies, a method is needed of:

1. Assessing the threat posed to the White-headed Duck by different levels of Ruddy Duck immigration.
2. Predicting the effect that a range of control regimes in the UK would have on the number of Ruddy Ducks reaching Europe.

The aim of this project is to address the above through a combined experimental and modelling approach.

METHODS
White-Headed Duck Genetics Model
An individual-based life-history and genetic model is being developed for the White-headed Duck. This will assess the impact of different levels of Ruddy Duck introgression on the gene pool of the White-headed Duck. Two approaches are being taken to gain information on mate choice rules for input into the model:

a) Mate Choice in Captive Birds
A series of experimental pens were set up in 2000 and 2001 containing different combinations of white-headed and Ruddy Ducks. Courtship behaviour within and between the two species was recorded and eggs collected in order to investigate mating systems and mate preference in the two species.

b) Parentage of Hybrids Shot in Spain
A series of photographs have been taken of 38 hybrids culled since 1991 as part of the Spanish Ruddy Duck control program. Digital image analysis of plumage colouration plus discriminant analysis of biometric data taken by Carlos Urdiales (Doñana National Park) will be used to gain information on the parentage of these hybrids. A DNA analysis of the same birds, currently being conducted by the Estación

Biológica de Doñana, will provide further information (see Muñoz *this issue p.28*).

Ruddy Duck Population Dynamics and Dispersal Model

A spatially-explicit, individual-based model is being developed to simulate the spread of the Ruddy Duck in the UK and corresponding dispersal to Europe in relation to a range of control regimes. The model simulates the life history of individual ducks from birth to death and allows for movement of ducks between sites within a GIS-based habitat map. Fecundity and mortality are age and sex-specific and are modelled stochastically at the level of the individual.

The rate of spread of Ruddy Ducks in the UK is being quantified using Wetland Bird Survey data from 1960-2000 and breeding survey data in a Geographical Information System. This will also provide information on dispersal behaviour for input into the model.

ACKNOWLEDGEMENTS

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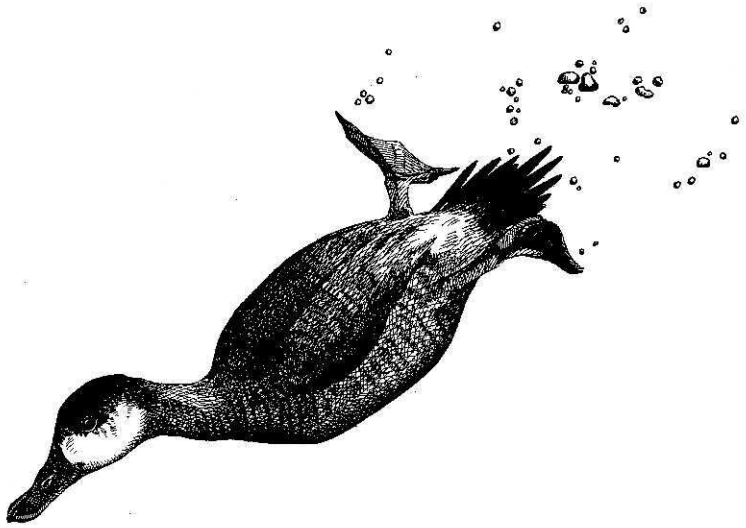

POPULATION VIABILITY ANALYSIS FOR WHITE-HEADED DUCK REINTRODUCTIONS

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INTRODUCTION

In preparation for a workshop on White-headed Duck reintroduction in Italy in May 2001 (see Brunner & Andreotti *this issue p.33*), we ran a population viability analysis for the White-headed Duck to determine the population parameters and release strategies most likely to affect the success of any reintroduction programme.

MODEL STRUCTURE

The model was stochastic and individual-based, simulating age-specific fecundity and mortality for each animal year by year. Different release strategies were investigated in terms of frequency of release events and number of birds released per event. The model also had the capacity to include catastrophic events although these were not included here. The model was run for 20 years and outputted the population size at the end of this time.

INPUT PARAMETERS

Breeding was assumed to occur once per year; juvenile mortality was modelled as occurring as they are recruited into the adult population; and adult mortality after breeding. The input parameters used are given in Table 1. There are no data available for White-headed Duck adult or juvenile mortality, so values used were those for Ruddy Duck in the UK (Hughes 1996). Values for fecundity represented the number of fledged young produced per female per year and were calculated as a product of nesting success, brood size at hatching and percentage survival to fledging. Values for brood size at hatching and percentage survival to fledging were obtained from Green & Hughes (2001). There is no detailed data available for White-headed Duck nesting success, so data for Ruddy Duck was used (Hughes 1996). Females were assumed not to breed until their second year and an equal sex-ratio was assumed for each release event.

SENSITIVITY ANALYSIS

In order to investigate the impact of variation in life-history and release strategies, the model was run 100 times, with each run using a different suite of input parameters. These parameter sets were selected from the ranges in Table 1 using Latin Hypercube Sampling. Since the model was stochastic, 20 replicate runs were conducted for each suite of parameters. Generalized Linear Modelling (GLM) was then used to relate the predicted population size after 20 years to the input parameters (Table 2). The predicted population was log-transformed prior to analysis to ensure that the errors in the GLM were normally distributed.

The results of the GLM (Table 2) indicate that adult mortality, fecundity, number of birds released per release event and release frequency all had a significant effect on final population size, with fecundity having the greatest effect. The effect of juvenile survival was not significant. The release frequency had a far greater effect on final population size than the number of birds released (T = -11.29 and 2.39, respectively).

Table 1. Ranges for input parameters in the White-headed Duck population viability analysis.

Variable	Minimum	Maximum	Source
Adult mortality (%)	0.2	0.3	Hughes (1996)
Juvenile mortality (%)	0.35	0.45	Hughes (1996)
Fecundity	0.98	3.8	Green & Hughes (2001) Hughes (1996)
Release frequency (years)	1	10	
Number released	10	20	

Table 2. Analysis of variance table for GLM, relating the predicted number of White-headed Duck in the population (log) at 20 years after initiation of release scheme against life history variables and frequency and number of birds released.

Source	DF	Seq SS	Adj SS	Adj MS	F	P
Adult mortality	1	28.654	23.037	23.037	65.02	0.000
Fecundity	1	112.952	99.235	99.235	280.10	0.000
Number released	1	0.594	2.029	2.029	5.73	0.019
Release frequency	1	44.579	44.579	44.579	125.83	0.000
Error	95	33.657	33.657	0.354		
Total	99	220.435				

Term	Coef	St Dev	T	P
Constant	6.667	0.694	9.61	0.000
Adult mortality	-16.846	2.089	-8.06	0.000
Fecundity	1.654	0.099	16.74	0.000
Number released	0.050	0.021	2.39	0.019
Release frequency	-0.269	0.023	-11.22	0.000

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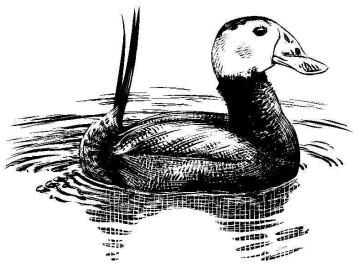

GENETIC INTROGRESSION OF RUDDY DUCKS IN WILD POPULATIONS OF WHITE-HEADED DUCKS

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BACKGROUND

The White-headed Duck is a globally threatened species ("Endangered" according to IUCN criteria). Its distribution is fragmented and its world population declining (Green & Anstey 1992). Two main populations survive: the west Mediterranean population (Spain, Tunisia, Algeria) and the population extending from the eastern Mediterranean (Turkey, Greece, Israel) to Central Asia (Kazakhstan, Russia, Mongolia, etc.). In Spain, the stronghold of the species has long been the autonomous community of Andalusia. The population in Spain grew from an estimated 22 birds in 1977 to 1,700 in 1998 and 4,500 in 2000, in response to conservation measures implemented in Andalusia (especially the protection of wetlands where the species is present, perhaps most importantly banning from hunting).

Ten years ago, the species started to become threatened by continuous arrival of Ruddy Ducks, an American species introduced to Great Britain in the fifties. In Great Britain, Ruddy Ducks comprise a population of around 5,000 individuals, (Musgrove *et al*. 2001) and there are also small breeding populations in France, Belgium and the Netherlands. Ruddy Ducks constitute a common species in captive waterfowl collections from which several individuals may escape each year in countries such as the Netherlands. The two species hybridise and hybrids are fertile, causing genetic introgression of Ruddy Duck genes in the wild population of White-headed Ducks.

For several years now, a considerable effort has been made to locate and eliminate both hybrids and pure Ruddy Ducks in Spain. Up to September 2000, 56 hybrids and 86 pure Ruddy Ducks have been eliminated (Torres & Moreno-Arroyo 2000). Recently, control programmes have also started in Great Britain and France. Genetic introgression of Ruddy Ducks in White-headed Duck populations is receiving a considerable amount of attention by both international (BirdLife International, WWF, IUCN) and national organisations (e.g. Ministerio de Medio Ambiente, CSIC). Hybridisation with the introduced North American Ruddy Duck has been identified as the most serious threat to the White-headed Duck in the European White-headed Duck Action Plan (Green & Hughes 1996).

So far, research has been conducted on White-headed Duck diet, threats posed to its habitat, habitat selection, diel activity, etc. (e.g. Green *et al*. 1996, Green *et al*. 1999, Sánchez *et al*. 2000), but many further questions could be answered by a genetic study: in particular, uncertainties exist regarding interspecific hybridisation. It is not known whether male Ruddy Ducks breed with White-headed Duck females and vice versa; whether both hybrid males and females are fertile; whether the wild White-headed Duck population in Spain is already contaminated with Ruddy Duck genes; and whether Ruddy Ducks in Spain come from the United Kingdom or if there is another source (escapes from captive collections from other countries).

A genetic study of this type will be extremely useful to aid the management of both wild and captive populations of White-headed Ducks in Spain and other countries. We aim to clarify the genetic

introgression rate between the two species, design a molecular assay to identify hybrids (see e.g. Negro *et al*. 2001) and determine the best strategy to maintain a captive White-headed Duck population free of Ruddy Duck genes, but with enough genetic variability in the long term.

OBJECTIVES

1. Develop molecular markers to discriminate hybrids from pure White-headed Ducks.
2. Identify maternal line, i.e. species of the hybrid's mother and compare to parentage suggested by plumage characteristics (Urdiales & Pereira 1993).
3. Compare genetic variability of Ruddy Ducks in Spain, France and Great Britain with those from North America and thus determine the origin of Ruddy Ducks in Spain.
4. Determine the effect of the bottleneck in the Spanish population of White-headed Ducks: comparing genetic variability in samples prior and after the bottleneck.
5. Determine whether western and eastern White-headed Duck populations are different subspecies (genetic distance measurements).
6. Study genetic variability of captive White-headed Duck populations and assess whether they are viable and healthy for reintroduction projects.

METHODOLOGY

Samples from pure White-headed Ducks will be obtained from Spain and Greece, plus skins from zoological collections. Pure Ruddy Ducks will be obtained from the UK, USA, France and Spain. Hybrids will be sourced from Spain, England and Italy.

Randomly Amplified Polymorphic DNA (RAPDs)

The objective is to find species specific markers, i.e. present in one species but absent in the other. In this way, it is possible to identify hybrids depending on the bands that appear on an agarose gel. More or less bands typically belonging to each pure species will appear, depending on which species has been involved more in the matings. Therefore, it is possible to identify hybrids and distinguish between first and second generation hybrids.

Control Region of Mitochondrial DNA

The control region will be sequenced and sequences compared among individuals. In this way, it is possible to:

1. Identify the maternal line, as mitochondrial DNA is clonally and usually maternally inherited (Randi 2000).
2. Determine genetic distances among different populations of White-headed Ducks.
3. Determine genetic distances to identify unique or multiple origin of Ruddy Ducks in Spain.

Microsatellites

The objective is to find microsatellites that work for White-headed Ducks and Ruddy Ducks. The use of microsatellites in hybridisation cases is receiving growing interest, especially to detect the extent, dynamics, direction and level of introgression among species.

Work plan (first phase 2001-02)

1. Obtain and organise samples.
2. DNA extraction.
3. Apply molecular methods: identify RAPD markers, sequence Control Region (mitochondrial DNA), apply RAPD markers to hybrids, phylogeographic analysis of Control Region.

ACKNOWLEDGEMENTS

This work was conducted as part of a PhD studentship under the supervision of Dr. Andy Green and Dr. Juan Jose Negro. Thanks to La Junta de Andalucía, for sponsoring this study, and to the following people for providing samples: Celia Sánchez, Parque Nacional de Doñana, Spain; Carlos Urdiales, Parque Nacional de Doñana, Spain; Cati Gerique, Generalitat Valenciana, Spain; Baz Hughes, The Wildfowl & Wetlands Trust, Slimbridge, UK; Esther Signer, University of Leicester, UK; Iain Henderson, Central Science Laboratory, UK; Maria Panayotopoulou, Ornithological Hellenic Society, Greece; Kevin McCracken, University of Alaska, USA; Luc Barbier, Office National de la Chasse et de la Faune Sauvage, France.

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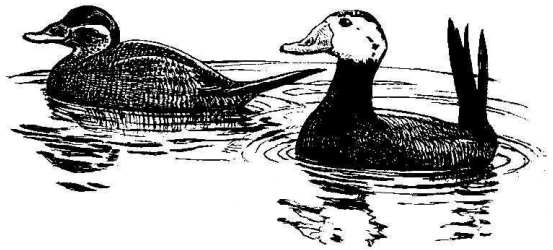

COMPETITION WITH CARP MAY LIMIT WHITE-HEADED DUCK POPULATIONS IN SPAIN

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The Spanish population of the globally threatened White-headed Duck is now showing a notable increase both in size and range after a minimum population size of 22 individuals in 1977 (Torres & Moreno-Arroyo 2000). In spite of this fact, negative impacts still operate at local scales that prevent the species from establishing in some places. One example of this is the interspecific interaction between the White-headed Duck and the Carp (*Cyprinus carpio*), a conservation problem scarcely mentioned in the literature though common in some places during the last 20 years (Almaraz 2000).

The Carp, an invasive fish from the Black and Caspian Seas, has been introduced by humans in some wetlands in Spain in order to support fishing activities. This fish, which can reach high population densities (see below), feeds primarily on benthic fauna such as *Chironomidae* larvae. The Carp's feeding behaviour also stirs up bottom sediments, causing dramatic increases in water turbidity and thus decreases in the amount of light reaching the benthos resulting in a much reduced macrophyte community (review in Almaraz 2000). Since benthic Chironomid larvae are the major component of the diet of the White-headed Duck, and diving constitutes its primary feeding behaviour (Green & Hughes 2001), both processes lead to the local disappearance of the White-headed Duck from those places holding Carp populations (Almaraz 2000).

Such a disappearance took place three years ago in a wetland of south-western Spain, the Laguna Salada del Puerto (33.6Ha, 36º39'N, 6º14'W). This site was designated as a Ramsar site in 1990 owing to its breeding populations of White-headed Duck, Crested Coot and Marbled Teal, among others. In November 1997, a few Carp entered the wetland presumably from an irrigation channel near the lagoon. Local populations of White-headed Duck then slowly decreased until January 1998, when the last observation of two individuals was made. From this date to November 2000, the lagoon lost its diving duck community, caused by Carp over-population, cloudy water (minimum Secchi depth 16cms in August 1999 *pers. obs*.), and probably a depletion in Chironomid larvae. In August 2000, the water level in the lagoon dropped to only 50cm. producing highly anoxic conditions which resulted in a large Carp mortality. A survey of the shore of the lagoon collected a minimum of 35,000 dead Carp, and a similar number remained uncollected (R.G. Costales *pers. obs*.). This would equate to a population density of 2,000 Carp per hectare.

One month after the mass Carp mortality at Laguna Salada, 11 White-headed Ducks were observed at the site along with six pairs of Red-crested Pochard *Netta rufina*. Few Carp have been observed after that date, and by April 2001, 46 White-headed Ducks (22 adult males) were observed in Laguna Salada displaying courtship behaviour. They are expected to breed again at the site after an absence of three years.

Competition between White-headed Ducks and Carp has taken place in many Spanish wetlands during the last 20 years (review in Almaraz 2000). Such competition, although operating on a local scale, may limit White-headed Duck populations especially when habitat is limiting, such as during drought periods (Almaraz 2000), or when large local assemblages of White-headed Ducks occur, as in El Hondo Natural Park in 2000 (Torres & Moreno-Arroyo 2000).

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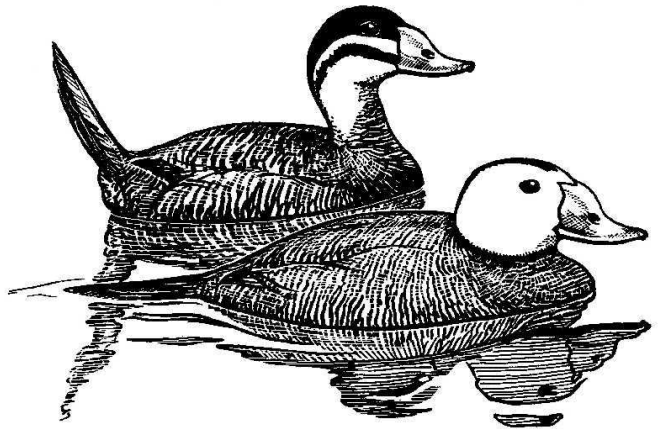

WHITE-HEADED DUCK REINTRODUCTION IN EUROPE

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The workshop "White-headed Duck conservation and reintroduction projects and their role in the conservation of the species", held from 23-24 May in the Gargano National Park in Puglia region, South East Italy, was attended by 23 participants from five countries and 13 organisations (see Table 1).

The first day began with presentations on national and international conservation initiatives, including the status and conservation of White-headed Duck in Spain (see Torres *this issue p.7*) and Tunisia (see Azafzaf *this issue p.37*); DNA analysis of White-headed Ducks to investigate introgression of Ruddy Duck genes (see Muñoz *this issue p.28*); White-headed Duck conservation at El Hondo, Valencia; Western Palearctic Ruddy Duck eradication strategy; Ruddy Duck control in the UK). Reintroduction techniques relating to the Italian reintroduction programme were then discussed before the production of a series of workshop recommendations (reproduced below). The second day was spent visiting Lesina Lagoon, the Capitanata wetlands (Margherita di Savoia saltpans) and the release site and project facilities at Daunia Risi - Lago Salso wetland. Ten White-headed Ducks had been released by May 2000. The need to eradicate the Ruddy Duck was highlighted as the most important objective for White-headed Duck conservation. Ongoing reintroduction projects, and the Puglia project in particular, as well as habitat enhancement aimed at increasing the carrying capacity of breeding sites, were acknowledged as useful and effective conservation measures. Urgent research needs were also identified.

WORKSHOP RECOMMENDATIONS

RUDDY DUCK

- The spread of Ruddy Duck represents, at present, the main threat to the conservation of the White-headed Duck in Europe.
- Ruddy Duck eradication in the UK, where the species' main population is concentrated and from where birds disperse into continental Europe, represents the most important short-term priority.
- Ruddy Duck control and eradication are important also in other European and North African countries, in particular in those where important nuclei of Ruddy Duck are already forming (Netherlands, Belgium, Germany) and in those that possess White-headed Duck populations (Spain, Morocco, Tunisia). Special attention is requested from those countries where reintroduction projects are ongoing or planned (France, Italy).
- Large captive populations and free trade in Ruddy Ducks also represent an important threat to the White-headed Duck. A ban on trade in the species in the European Union and a regulation on keeping existing specimens are thus needed.

REINTRODUCTIONS

- Reintroduction can be a useful conservation tool in the recovery of the White-headed Duck and for the restoration of continuity between fragmented populations still present in the Mediterranean.

Table 1. Participants of the White-headed Duck reintroduction workshop, Gargano National Park, Puglia region, SE Italy, 23-24 May 2001.

Name	Organisation
Alejandro De La Vega	P Conselleria de Medio Ambiente, Generalitat Valenciana, Spain
Alessandro Andreotti	Istituto Nazionale per la Fauna Selvatica, Italy
Antonio Bernardoni	LIPU - BirdLife Italy
Ariel Brunner	LIPU - BirdLife Italy
Baldomero Moreno Arroyo	Junta de Andalucía
Baz Hughes	WWT, UK
Fulvio Fraticelli	Bioparco di Roma, Italy
Gabriella Vaschetti	Centro Cicogne e Anatidi di Racconigi, Italy
Hichem Azafzaf	AAO – BL Tunisia
Iain Henderson	Central Science Laboratory, UK
John Clorley	Dept of Environment, Food & Rural Affairs, UK
Jose Antonio Torres- Esquivias	Junta de Andalucía, Spain
Jose Luis Echevarrias Escuder	Conselleria de Medio Ambiente, Generalitat Valenciana, Spain
Lucy Lovett	Newcastle University, UK
Mar Gallego	LIPU - BirdLife Italy
Mauro Canziani	LIPU - BirdLife Italy
Michela Ingaramo	LIPU - BirdLife Italy
Michele Bux	LIPU - BirdLife Italy
Sergio Fasano	Centro Cicogne e Anatidi di Racconigi, Italy
Simone Montonati	LIPU - BirdLife Italy
Umberto Gallo- Orsi	BirdLife International, Holland
Vincenzo Rizzi	LIPU - BirdLife Italy
Violeta Muñoz	Estación Biológica de Doñana, Sevilla, Spain

- On the other hand, it must be guaranteed that hybridisation does not increase with the expansion of the species' range. To this end, any Ruddy Duck that appear in the countries where reintroductions are being carried out should be eradicated (France, Italy).
- The Majorca experience suggests that the best reintroduction method involves captive breeding (possibly on site) and release after acclimatisation in a fenced area.
- The recovery of the Spanish population would allow modest taking (principally of eggs) from the wild in order to enhance the genetic variability of captive bred nuclei, thus increasing the probability of success of reintroduction efforts.

HABITAT ENHANCEMENT

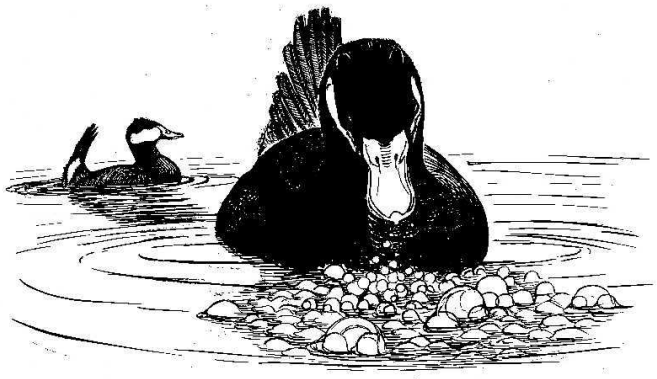
- Over-hunting and poaching represent major factors leading to the decline of the White-headed Duck and still constitute important limiting factors in many areas. The species recovery in Spain has been attributed to the conservation of key sites and to the total protection of the species. It is thus of primary importance to guarantee adequate protection and effective surveillance of actual and potential sites used by the species.
- Densities in breeding sites can be increased significantly by modifying the structure of reed beds (creating

pools of free water, diversifying vegetation) and adequately managing water levels.
- Nest predation by rats, which can substantially reduce White-headed Duck reproductive success, can be reduced by the creation of islands and the use of artificial nesting platforms. The latter can also solve the problem of sudden water fluctuations during nesting.
- In Spain, a strong negative relationship has been observed between the presence of Carp and White-headed Duck, including the total abandonment of sites (see Almarez *this issue p.31*). Further research into the number and effect of Carp at the release site is thus needed as well as precautionary measures of integrated control of this and possibly other fish species.
- In order to reduce mortality from lead poisoning, the use of lead shot should be phased out at all key sites throughout the White-headed Duck's range. This could include voluntary bans where necessary. Contaminated sediments should also be removed from key sites after identification of the most heavily contaminated areas.
- Fishing installations and power lines can increase the accidental mortality rate. Actions mitigating these threats should be evaluated.

RESEARCH ACTIVITIES
- A good knowledge of optimal trophic conditions during the breeding period (structure and biomass of submerged vegetation, invertebrate availability, turbidity and water nutrient charge) is needed for optimal management of key sites.
- Habitat use and survival of released birds should be studied using appropriate means, such as internal satellite transmitters and nasal saddles.
- Standardising census methods is a basic requirement for time-series monitoring of Mediterranean White-headed Duck populations and for identification of key sites for the species. To this end, the creation of a specialist working group is recommended for the production of a common methodological protocol based on existing experience.
- The correct management of White-headed Duck needs a better genetic characterisation of the species, taking into account genetic bottleneck effects, hybridisation with Ruddy Duck and the differentiation between the various (now disjunct) populations. One question that must be addressed is the possibility of using individuals from the Asian and Spanish populations in order to increase genetic variability of captive stock used in reintroduction projects. A useful instrument for the genetic studies is the inventory of skins preserved in museum collections.
- The origin of the Tunisian wintering population must be determined, as well as the real size of the North African breeding population.
- Ecological studies on White-headed Duck, vital for its correct management, should be carried out at sites of major importance for the species.
- A correct management policy for the species must include an effective awareness and education campaign aimed at creating, among the public of the species' range countries, a strong sense of ownership in relation to the White-headed Duck. It is equally important to raise public awareness of the problem posed by the Ruddy Duck in Europe, thus facilitating understanding and, consequently, acceptance of control and eradication operations.

In the light of the above considerations, the participants invite:

1. The European Union to ban commerce in Ruddy Ducks and to take actions to reduce the number of birds held in captive collections. To this end it is requested that the Ruddy Duck be added to Annex B of the Regulation implementing CITES in Europe, as requested by the UK government.
2. The UK government to proceed quickly to eradicate the Ruddy Duck, thus building on the excellent results obtained so far during the control trial.
3. The governments of other European and North African countries to pursue an active Ruddy Duck control policy. A pressing invitation is addressed to Belgium, the Netherlands, Germany and Morocco where the problem is already present and where no countermeasures have been taken so far, as well as to Italy and France - in order to guarantee the success of current reintroduction projects.
4. The organisations in charge of the ongoing reintroduction projects (Majorca, Corsica, Puglia) to put in place the above mentioned habitat enhancement activities in order to increase the chances of success.
5. The Italian government to create the legal framework necessary to tackle the problem of invasive alien species.
6. The Puglia Region and the Gargano National Park to produce a management plan for the region's wetlands, taking into consideration the conservation needs of the White-headed Duck.



WHITE-HEADED DUCKS IN TUNISIA

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INTRODUCTION

The White-headed Duck winters regularly in Tunisia. The peak count of 1,550 birds was at Lac de Tunis in February 1969 (M. Smart *in litt.* 1989). In recent times, significant wintering concentrations have occurred at Barrage Oued El Kebir (450 birds), Barrage El Haouareb (334 birds), Barrage Oued El Khatf (122 birds), and Barrage Mornaguia (58 birds) (Table 1, Figure 1). The species breeds irregularly and only in small numbers with the first breeding record in 1957 (Castan 1958). White-headed Ducks have occurred on at least 24 sites in Tunisia (Table 1, Figure 1) with breeding season records at 12 and confirmed breeding at three.

Tunisia has an extraordinary diversity of wetlands and a long history of reliance upon water resources and water management (Hughes *et al*. 1997). During the last 40 years, increasing agricultural production and demand has necessitated the development of water supply schemes, such as reservoirs and irrigation channels, and the drainage of wetlands for agricultural land. Consequently many of Tunisia's wetlands have been degraded or have disappeared and others, like water storage reservoirs, have been created. Since 1881, 28% of Tunisian wetlands have disappeared, representing a reduction in wetland area of 15%. Conversely, 22,400Ha of reservoirs have been created since 1945, and the trend has therefore been from productive shallow marshes to unproductive deep-water habitats. The main causes of wetland loss are drainage, urbanization and dam building on rivers (Hughes *et al*. 1997). Table 1 shows that the White-headed Duck is adapting to this changing situation and that most large freshwater reservoirs are regularly visited by wintering White-headed Ducks. From four confirmed breeding sites, three are artificial wetlands and it seems that the breeding population may increase due to the increased availability of artificial wetlands.

THREATS

Although the White-headed Duck is fully protected in Tunisia, the species is indirectly threatened by habitat degradation and loss, and other human activities, like hunting and reed cutting. Degradation by pollution is another important problem: 27% of Tunisia's lakes and marshes, and 21% of rivers are polluted. This is undoubtedly an underestimate, as much information regarding water pollution is not documented or is unavailable (Hughes *et al*. 1997). Reed cutting affects White-headed Duck breeding success, both through disturbance and transformation of breeding habitat. Most Tunisian wetlands suffer high hunting pressure. This affects the White-headed Duck indirectly through disturbance and directly through poaching and through birds being shot by mistake.

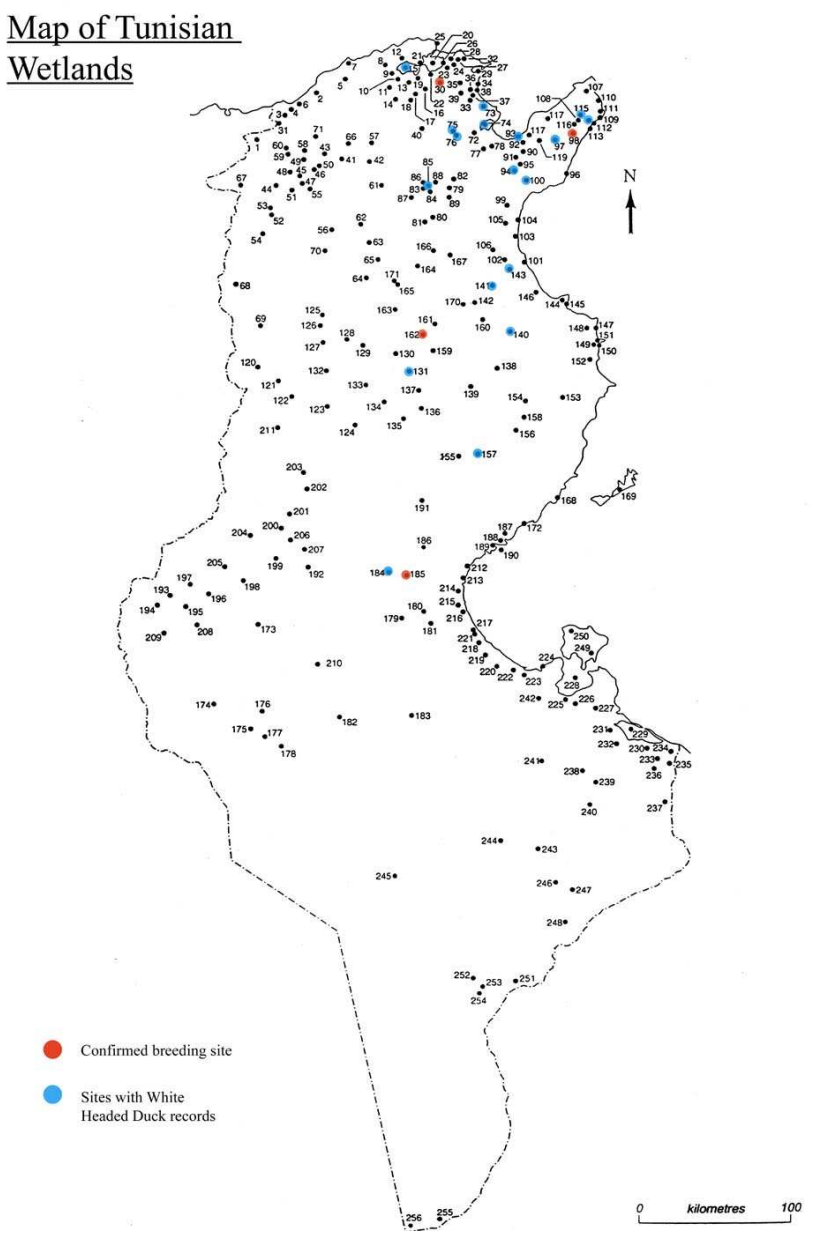
Tunisian wetlands are inadequately protected. Although the country is a contracting party of the Ramsar Convention, only one wetland, Garaet Ichkeul, has been designated as a Ramsar Site. Few wetlands are protected as nature reserves: for example, Sebkha Kelbia, one of the White-headed Duck's breeding sites is unprotected. Some sites are partly and temporarily protected through designation as reserves from hunting (Hughes *et al*. 1997).

Table 1. Tunisian wetlands with White-headed Duck records (see Figure 1 for geographical location of sites).

Site Name (Region)	Type of Wetland	Map No. (IBA No.)	Protected Status	Max No. of Birds (Year) Reference	Breeding Confirmed (Year Last Recorded)	Breeding Period Records
Garaet Ichkeul (Nord)	Large permanent freshwater - brackish lake	015 (002)	National Park	600 (1977) Smart (1977) cited in Hughes *et al*. (1997)	-	Y
Barrage Besbassia (Nord)	Large water storage reservoir	030 (-)	-	3 (1984) Hughes *et al.* (1997)	Y (1987)	Y
Sebkhet Ariana (Nord)	Permanent brackish to saline lake	073 (-)	-	2 (1986) Gaultier (1986)		
Lac de Tunis (Nord)	Large permanent brackish lake	074 (009)	Hunting Reserve (including Île de Chikly Nature Reserve)	1,550 (1969) Smart (1989) cited in Green (1996)	-	-
Barrage Gdir El Goulla (Nord)	Large water storage reservoir	075 (-)	-	107 (1988) Gaultier & G.T.O. (1989)	-	Y
Barrage Mornaguia (Nord)	Large water storage reservoir	076 (007)	-	58 (1999) Azafzaf *pers. comm*. (1999)	-	-
Barrage Oued El Kebir (Nord)	Permanent river/large water storage reservoir	080 (-)	-	450 (1999) Amari *pers. comm*. (1999)	-	-
Garaet El Kebira (Nord)	Permanent freshwater lake	085 (-)	-	At least 1 (1977) Hughes *et al*. (1997)	-	-
Lagune de Soliman (Nord)	Brackish to saline lagoon	093 (011)	-	16 (1986) Gaultier (1986)		
Barrage Masri (Nord)	Large water storage reservoir	094 (015)	-	2 (1998) Azafzaf *pers. comm*. (1998)	-	-
Barrage Chiba (Nord)	Large water storage reservoir	097 (-)	-	25 (1980) Hughes *et al*. (1997)	-	Y

Site Name (Region)	Type of Wetland	Map No. (IBA No.)	Protected Status	Max No. of Birds (Year) Reference	Breeding Confirmed (Year Last Recorded)	Breeding Period Records
Barrage Lebna (Nord)	Large water storage reservoir	098 (012)	-	At least 2 (1988) Gaultier & G.T.O. (1989)	Y (2001)	Y
Barrage Sidi Djedidi (Nord)	Large water storage reservoir	100 (-)	-	33 (1994) Hughes *et al*. (1997)	-	Y
Barrage Mlaabi (Nord)	Large water storage reservoir	114 (006)	Hunting Reserve	18 (1989) Hughes *et al*. (1997)	-	Y
Barrage Sidi Abdelmonaâm (Nord)	Large water storage reservoir	115 (008)	Hunting Reserve	25 (1983) Hughes *et al*. (1997)	-	Y
Barrage Sidi Saad (Center)	Large water storage reservoir	131 (-)	-	20 (1998) Mighri p*ers. comm*. (2000)	-	Y
Sebkha Sidi El Hani (Center)	Seasonal - permanent brackish to saline lake	140 (024)	-	55 (1975) Hughes *et al*. (1997)	-	-
Sebkha Kelbia (Center)	Seasonal - permanent brackish to saline lake	141 (020)	Nature Reserve	10 (1989) Azafzaf p*ers. comm*. (1989)	-	Y
Oued Sed (Center)	Seasonal / irregular river	143 (018)	-	14 (1977) Hughes *et al*. (1997)	-	-
Gareat El Fertass (Center)	Seasonal - permanent brackish to saline lake	157 (-)	-	5 (1975) Hughes *et al*. (1997)	-	-
Barrage El Haoureb (Center)	Large water storage reservoir	162 (023)	-	334 (2000) Azafzaf *pers. comm*. (2000)	Y (1990)	Y
Sebkha Sidi Mansour (Center)	Seasonal - permanent brackish to saline lake	184 (033)	-	600 (1971) Hughes *et al*. (1997)	-	-
Garaet Zograta (Center)	Seasonal freshwater lake	185 (-)	-	At least 2 (1957) Hughes *et al*. (1997)	Y	Y
Barrage Oued El Khatf (Nord)	Large water storage reservoir	- (-)	-	122 (2000) Amari & Azafzaf (2000)	-	-

Figure 1. Tunisian wetlands with White-headed Duck records.



THE TUNISIAN IBA-PROJECT AND THE NATIONAL ACTION PLAN FOR THREE THREATENED WATERBIRD SPECIES

Forty-five Important Bird Areas (IBA) have been identified for Tunisia following the BirdLife International IBA criteria: 38 sites are wetlands and 13 of them have held White-headed Ducks (Amari & Azafzaf 2000). Since the beginning of the Tunisian IBA-project, the number of temporary protected wetlands (hunting reserves) has increased thanks to project activities. The Association "Les Amis des Oiseaux" (A.A.O.) is currently producing a national action plan for three threatened water bird species: White-headed Duck, Marbled Teal and Ferruginous Duck. This action plan includes awareness raising, promotion of habitat protection, prevention of further habitat degradation and loss, and a program aiming to increase breeding success in a sub-set of already known and potential breeding sites of the three species.

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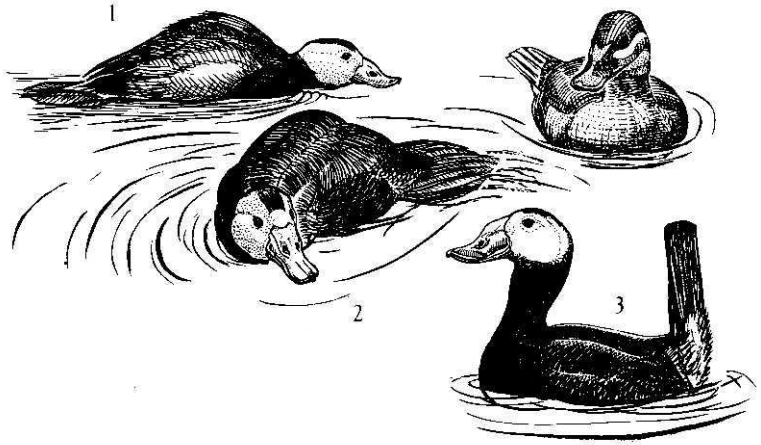

NEW RECORDS OF WHITE-HEADED DUCK FROM MOROCCO

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A small population of White-headed Ducks is now present in Morocco after an absence of 25 years. White-headed Ducks were first recorded in Morocco by Favier (Irby 1895) who suggested that the species was common in the north of the country. Vaucher considered the White-headed Duck a regular breeder in wetlands near Tánger. Phillips (1923), Bruhn & Jeffrey (1958) and Torres-Esquivias (1996) noted the species in various areas before Louette (1973) made the last sighting in July 1971 at Sidi Bou Rhaba, near Kenitra. Many authors then recorded the White-headed Duck as being extinct in Morocco, including Pineau & Giraud-Audine (1979), Mayaud (1982), Finlayson (1992) and Schollaert & Franchimont (1996).

In 1997, the species was rediscovered - on 30 May and 28 June we observed a male White-headed Duck on Mergha Bargha (Catro *et al*. 1997). Subsequently, up to 12 males and 12 females have been seen annually at Douyièt, near Fez, and breeding was confirmed in July 2000 with the observation of a brood of five ducklings (Franchimont *pers. comm*.). The small dam of Douyièt is within the private property of the King of Morocco, thus access is extremely limited. The subsequent lack of disturbance may have allowed the White-headed Duck to re-establish itself in Morocco.

Unfortunately, the North American Ruddy Duck has also colonised Morocco, and both pure birds and hybrids have been recorded at Douyìet (Franchimont *pers. comm*.). Up to six Ruddy Duck (four males and two females on 21 June 2000) and six hybrids (three males and three females on 13 July 1999) have been seen (Franchimont *pers. comm*.). As there are currently no plans to control Ruddy Ducks in Morocco, they present a further source of birds which can hybridise with the White-headed Duck and thus threaten its future existence, not only in Morocco but in key populations elsewhere in North Africa, in Spain and in Asia.

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STATUS OF WHITE-HEADED DUCKS IN AZERBAIJAN

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There are historical records of White-headed Ducks wintering in Azerbaijan in the Lankeran valley (Radde 1885, Loudon 1909, Tugarinov & Kozlova-Pushkaryova 1938) and on the lakes of the Mugan valley (Satunin 1912). There are more recent records of individuals and small groups of birds at Sarysu and Shilyan Lakes, Agzybir Lake, passing the Kura River estuary and along the Caspian shore (Tuayev 1965, 1975). At Kyzyl Agach, two birds were reported in mid-October (Vinogradov & Chernyavskaya 1965) and another two at Mahmudchala in winter 1989 (Babayev 1991).

In January 1991, 3,000 White-headed Ducks were counted at Lake Aggel and another 520 at Kyzyl Agach (Patrikeev 1991). In 1996, only one bird was seen at Sarysu Lake (Paynter *et al*. 1996a, 1996b), but the number present could have been higher amongst the 300,000 waterfowl there. Other observations during 1990s include: 960 birds at Lake Hajigabul in February 1998; 320 there in November 1999 (Sultanov *et al*. 1999); ten birds at the Babur-Gutan Island system in February 1997 (Musayev & Sultanov 1999); 135 birds at Red Lake (on the outskirts of Baku city) in January 1996; 200 birds there in February 1997; and 140 in March 1998.

During winter 1999/2000, we counted 257 White-headed Ducks at Hajigabul; in February 2000, 39 at Lake Sarysu; and on 15 January 2000, at least 38 birds during bad weather at Red Lake. Numbers at Sarysu and Red Lake may have been much higher.

As a rule, birds arrive in Azerbaijan in October and leave in March with maximum counts at Hajigabul, Red Lake and Agzybir in November-December and February-March during migration.

Although few data are available, White-headed Duck numbers and distribution in Azerbaijan appear to vary from year to year. Some new sites have been discovered, while the species may now be absent from historic sites, such as Lake Aggel and the Kura Estuary. In 1991, M. Patrikeev counted >3,500 birds on only two sites - Aggel and Kyzyl Agach, whilst between 1996 and 1999, most of 1,200-1,300 birds counted were on Lake Hajigabul.

We estimate that some 3-5,000 White-headed Ducks probably winter in Azerbaijan, mainly at Lakes Aggel, Hajigabul, and Sarysu, and in the Kyzyl Agach State Reserve. Several hundred birds may also be present along the Caspian coast, including the lakes closest to sea (Red Lake and others).

Unfortunately, the White-headed Duck is still not included in the Azerbaijan Red Data Book and may still be an occasional victim of hunters.

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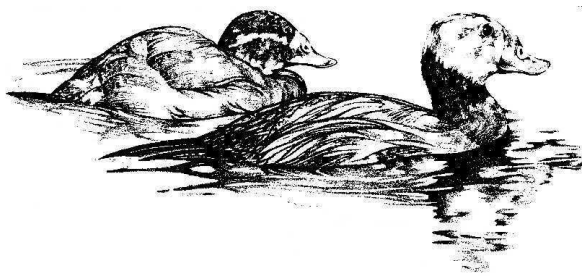

STATUS AND DISTRIBUTION OF THE WHITE-HEADED DUCK IN UZBEKISTAN

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Historically, the White-headed Duck has been recorded in Uzbekistan on migration, whilst breeding was thought to occur on several water areas (Kashkarov 1987). The species was common in the neighbouring areas of Turkmenistan, on the lakes of the Murgab, and nesting in the Amudarya River basin, near Chardjou (Yaschenko 1891, Zarudny 1896). In the Syrdarya River basin in Kazakhstan, White-headed Ducks were recorded migrating and breeding between the Aral Sea and the town of Turkestan (Dolgushin 1960).

In Uzbekistan, during spring migration White-headed Ducks were recorded in March on the Syrdarya River, near Chinaz, and in April in the Zeravshan River basin and the Fergana valley (Figure 1). During autumn migration, it was observed in October on lakes near Khoresm, in the middle reaches of the Syrdarya River and in the Golodnaya Steppe (Kashkarov 1987).

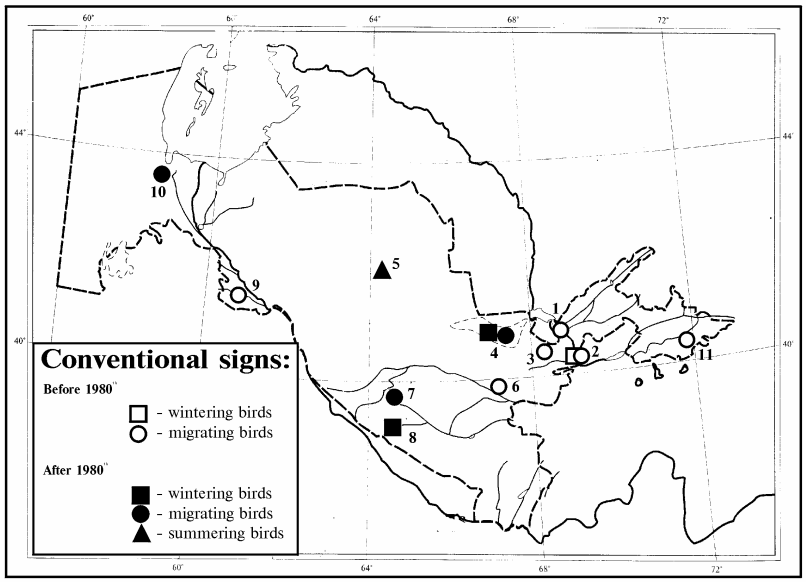
There is only one historic wintering record of White-headed Duck in Uzbekistan - a bird shot in the middle reaches of the Syrdarya River near Dalverzin whose skin is preserved in the scientific collection of the Tashkent State University. However, in recent years, small flocks of White-headed Duck have been wintering on Lake Aydarkul (Nazarov *unpubl. data*).

Few breeding season records exist - an adult female was found at Lake Rogatoye in the central Kyzylkum Desert near the town of Uchkuduk on 17 August 1982 (Minaev 1987).

In the Uzbek SSR Red Data Book (1983), the White-headed Duck was recognized as "rare and insufficiently known, perhaps disappearing in Middle Asia and Kazakhstan". In the Red Data Book of Kazakhstan (1996), it is included in Threat Category I: a species with “sharply reduced numbers and mosaic-like distribution". Assessments of total number are unavailable in both Red Data Books.

In autumn 1999, a GEF project was initiated at Lake Sudochie with the aim of restoring the lake’s natural ecosystems. This has included detailed ecological monitoring, including an expedition to the lake between 12 and 30 October 1999 which located previously unknown migratory flocks of White-headed Duck. On 17 October, a flock of 40 feeding White-headed Ducks was observed off the shore of Lake Akushpa, one of four water reservoirs of the Sudochie wetland. On 20 October, during a boat census of waterfowl in the eastern part of Lake Akushpa, more than 450 White-headed Ducks were recorded gathered in small flocks of 7-30 individuals. On the next day, 21 October, during a complete boat census of the lake, about 4,300 White-headed Ducks were found in the centre of the lake. Small flocks and groups of 7-30 individuals were recorded in small, inner, reed-fringed bays in the east of the lake, but large flocks of 800-1,500 birds were observed in more open, highly saline western and eastern parts.

Figure 1. Wetlands of historic and current importance for White-headed Ducks in Uzbekistan.



During a survey in April 2000, the White-headed Duck was again recorded on Akushpa Lake. All 1,166 ducks counted were observed from boats in the inner isolated bays of the lake. Alongside the 2km road from the channel to the camp, 145 birds were counted on 16 April, 37 on 19 April, and 118 on 19 April. All were in small groups, and sometimes in pairs. Important breeding concentrations also occur at Lake Akushpa - in July 2000, we counted more than 35 White-headed Duck broods and 2,835 birds in total. During autumn 2000 fewer birds (1,370) were counted, due both to the wetland drying up, and to the onset of autumn migration.

Of the four lakes of the Sudochie wetland, White-headed Ducks occur only on Lake Akushpa. Only this lake has vast shallow bays with reed islands and scrub. The water mineralization fluctuates within 6.4-29.2 g/l.

The Sudochie wetland appears to be a key staging area for White-headed Ducks, although more information is needed on the bird's status and distribution. This will be provided during the remaining two years of the current GEF project. Lake Akushpa qualifies as a Ramsar site for White-headed Duck and should therefore be specially protected. On 7-8 April 2000, three White-headed Ducks (one male and two females) were observed at Lakes Aidar and Tudakul on small filtrated pools along the edge of the main waterbodies (S. Busuttil, E. Kreuzberg-Mukhina *pers. obs*.).

Wintering flocks of White-headed Ducks have also been found recently at Dengizkul Lake, a water-reservoir in the Bukhara region which was designated as Uzbekstan's first Ramsar Site in 1998. Lake Dengizkul is one of the oldest lakes in the plains of southern Uzbekistan, but lately its hydrology has become dependent on human activities. During an

aerial survey of Lake Dengizkul on 11 January 2000, 1,137 White-headed Ducks were found on the lake, in groups of 575, 200 and 107 in one bay, and 175 and 85 in another. Within each larger aggregation, birds were distributed in small groups of 12-50 ducks. On 3 February, a second aerial census located 185 White-headed Ducks, most of which were found in one bay in small groups of 48, 35, 30, 24, 30, 12 and six).

The ecology of the sites where White-headed Duck were found at Lake Dengizkul differed significantly from those at Lake Akushpa. The birds at Dengizkul were found in areas entirely lacking in emergent vegetation at a distance of 50-100 m from steep banks. Although White-headed Ducks were observed at Lake Dengizkul for the first time in 2000, the species may well have occurred there in the past. It is located close to Sultandag Lake in Turkmenistan where White-headed Ducks have been observed during migration and breeding (Shirekov & Poslavsky 1990.

Lake Akushpa is located on the main Siberian-Caspian-North-African flyway whilst Dengizkul Lake is located on the Siberian-Indo-Pakistan flyway. Thus birds from two different populations may be using Uzbekistan. Overall, our research has shown that the White-headed Duck is a breeding, migratory and wintering species in Uzbekistan. But its status needs further clarification. Wintering birds occur mainly in the wetlands of southern Uzbekistan whilst breeding sites are located in the Amudarya River delta, near to the Aral Sea. The current distribution and number of breeding ducks within this area is unknown.

Before its demise, the Aral Sea acted as an important staging post for waterbirds migrating from Western Siberia and Kazakhstan to winter in the Caspian and Africa. Subsequently, the importance of nearby wetlands, including Sudochie Lake, has increased. New reservoirs built during the last few decades in the central and southern Amudarya and Syrdarya Basins, including the Tudakul and Aydar-Arnasai water systems, now attract many migratory, wintering and breeding waterfowl species. These sites could now hold significant numbers of White-headed Ducks and surveys are urgently needed.

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FERRUGINOUS DUCKS AT DURANKULAK LAKE COMPLEX, BULGARIA, 1995 - 2001

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INTRODUCTION

The Ferruginous Duck has been recently lowered from globally threatened "Vulnerable" status (Collar *et al*. 1994) to Low risk/Near threatened (BirdLife International 2000). Nevertheless many of the threats, especially for its European population, remain. In Bulgaria, the Ferruginous Duck is a breeding and migratory species listed in the Red Data Book. During the breeding season, it is concentrated mainly along the Danube River with smaller numbers along the Black Sea coast and in inland areas (Petkov 1997, 1998a). Durankulak Lake is a protected area declared as a Natural Monument since 1980. Previous studies have identified it as the most important breeding site for Ferruginous Duck along the Black Sea coast (Petkov 1998b). At present, a project funded by the Bulgarian-Swiss Biodiversity Conservation Programme (BSBCP) has developed a Management Plan for the site and some management activities are being implemented. This wetland is a significant staging site for migrating and wintering birds, being famous for its wintering concentrations of White-fronted Geese *Anser albifrons* and Red-breasted Geese.

STUDY SITE

Durankulak Lake is a natural wetland situated in North-Eastern Bulgaria close to the border with Romania (Figure 1). The lake is about 0.5m a.s.l. with a surface area of about 350Ha, of which about 250Ha is open water. The lake represents about 4% of the surface area of natural wetlands in Bulgaria. The lake has a closed basin hydrology, the water level regime relying mostly on underground waters, as surface inflow is very low. The mean salinity is 0.2‰ (ranging from 0.2-0.4‰) due to infiltration of seawater. The average depth of the wetland is 1.4m with a maximum depth of 6m (Ivanov 1994).

Hydrological and hydrobiological studies in recent years define the wetland as eutrophic to hypereutrophic, caused largely by anthropogenic activities over the last 30 years, especially the inflow of polluted underground and surface water from surrounding agricultural fields and villages. The marsh vegetation at the site is composed of about 80% Common Reed *Phragmites australis*, either in monoculture or co-dominated with Reedmace *Typha angustifolia*.

Three more or less separate waterbodies form the Durankulak wetland complex (Figure 2): Durankulak Lake (DL), Eagle Marsh (EM) and the marshland in the south-eastern part of the lake (SEM). Durankulak Lake, which covers most of the wetland complex, has steep banks and sparse lakeshore vegetation. The largest hygrophyte stands are in the lake tail ends (TE) with large stands of *Phragmites australis* and *Typha angustifolia*. Eagle Marsh is separated from the lake by an old dike (now broken and allowing water exchange) and most mixed hygrophyte associations are present.

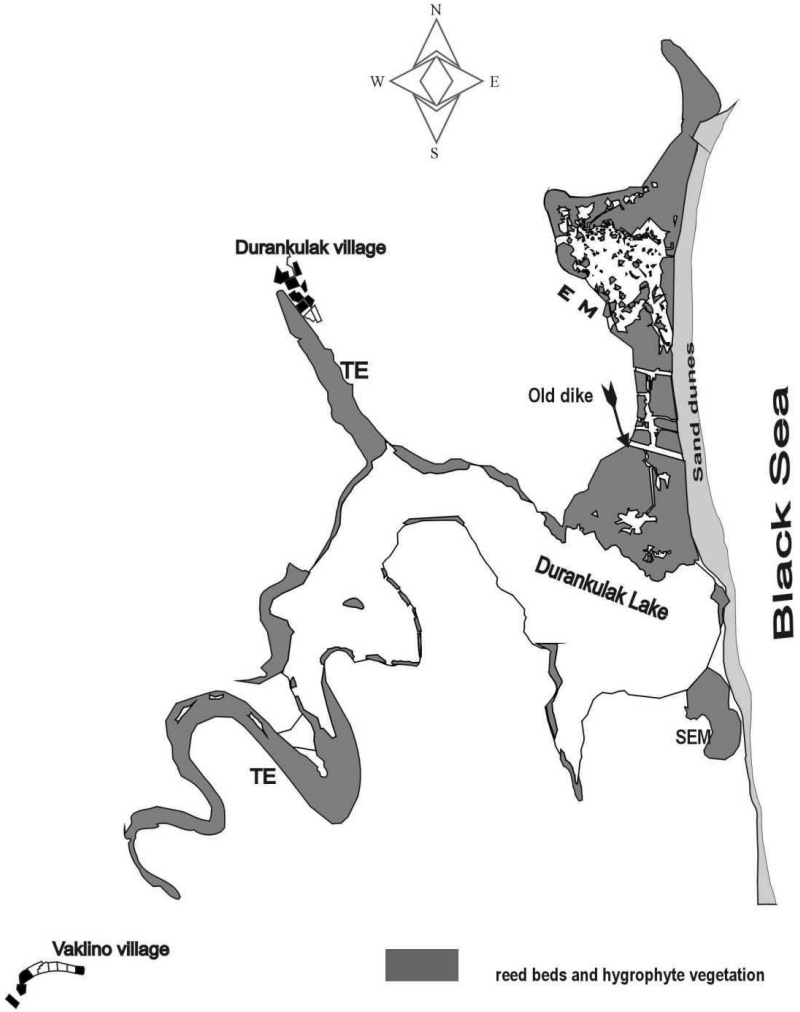
Figure 1. Geographical location of Durankulak Lake, North-Eastern Bulgaria.

Typical are *Ph. australis-Bolboschoenus maritimus*, *Typha angustifolia-Ph. australis*, *B. maritimus-Schoenoplectus lacustris-Juncus gerardii* and *Schoenoplectus lacustris* (one of the largest in the country) with *B. maritimus* and *Butomus umbellatus*. Water depth in Eagle Marsh is 1-1.5m and some dry areas and floating reed beds occur as well.

The third wetland body, SEM, is covered by *Ph. australis -T. angustifolia*, *Ph. australis-Bolboschoenus maritimus*, *Schoenoplectus lacustris*, *B. maritimus*, and other mixed plant associations. It is very shallow - about 0.5-1m deep. Hydrophytes are found mostly in Eagle Marsh, and include large stands of *Utricularia vulgaris*, *Ceratophyllum demersum*, *Myriophyllum spicatum*, *Rannunculus aquatilis*, mixed and pure associations of *Potamogeton natans*, *P. pectinatus* and *P. crispus*.

Past studies of the zoobenthos at Durankulak Lake found an overall biomass density of 23g/m² dominated by Chironomidae larvae - about 78% (Ivanov 1994). A more recent study reported a lower mean biomass density of 18.4g/m², with *Chironomidae* still dominating. The average biomass of the zoobenthic community in Eagle Marsh is much lower at 5.4g/m². The zoobenthic community is more diverse in shallower lake shore areas and on macrophytes which provide good feeding areas for birds and fish (Georgiev 2001).

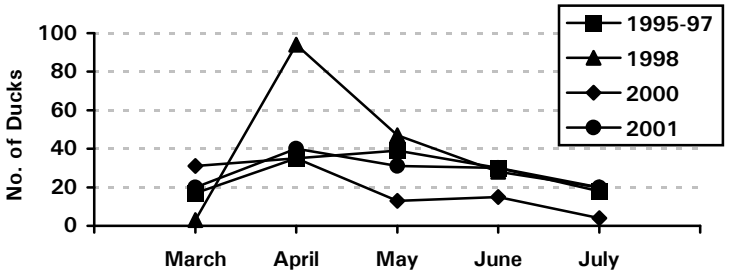
Figure 2. Durankulak wetland complex (© BSBCP Dobrudga Project).



METHODS

This paper is based on data collected from April to July, 1995 to 2001. The study was conducted using 10x and 8-20x binoculars and 15-45x and 27x telescopes. In 2000 and 2001, Eagle Marsh was surveyed on foot and from boats. Much of the data on ecological characteristics has been produced by the BSBCP Dobrudga Project. Breeding population estimates were expressed as the total number of females (pairs plus individual females) and breeding success is discussed in terms of the number of breeding pairs and number of broods.

Figure 3. Numbers of Ferruginous Ducks at Durankulak Lake, 1995-2001.



BREEDING STATUS

Ferruginous Ducks were first recorded breeding at Durankulak in the 1950s (Petrov & Zlatanov 1955). Subsequent information is scarce - Donchev (1967) saw 20 birds on 10 June 1965, whilst Robel *et al*. (1978) noted the species presence. During the 1990s, Ferruginous Ducks have been regularly registered at Durankulak, though there has been no confirmation of breeding for over 34 years (Ivanov 1994).

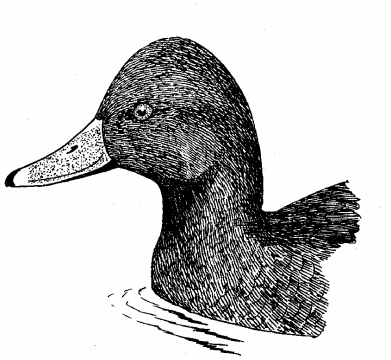
Systematic studies on the species started in 1995 as part of the BSBCP Dobrudga project (formerly the Northern Coastal Wetlands Project). Further research conducted by BSPB/BirdLife Bulgaria has led to a much better understanding of the status of Ferruginous Ducks at Durankulak. From 1995 to 1997, there was an increase in breeding pairs - from 3-5 in 1995 to 10-12 in 1996 and 25 pairs in 1997 (Petkov 1997). Only 5-7 pairs were present in 1998 (Petkov 2000), 10 pairs in 2000 (Mittev *unpubl.*) and 13 pairs in 2001. It therefore appears that 10-15 pairs of Ferruginous Duck usually breed at Durankulak.

Ferruginous Ducks appear in March, numbers peak in April before gradually declining through June and July (Figure 3). An absence of Ferruginous Ducks at Durankulak in July probably means that the species does not moult here, although ducks are very secretive at this time of year. Observations at other wetlands in Bulgaria show that moulting Ferruginous Ducks spend most of the day resting, either in secluded pools surrounded by reeds, or in large flocks in open water. No such moulting concentrations have been recorded at Durankulak.

HABITAT SELECTION

Ferruginous Ducks occur mainly in the marshy parts of the Durankulak complex, in Eagle Marsh and nearby areas of the lake, the SEM, and the Lake Tail Ends. These areas hold a diverse mosaic of microhabitats, including vegetated water bodies with mixed hygrophyte vegetation, open water, dry reed beds, dense reed beds with patches of shallow or deep open water, shallow banks with vegetated mudflats, and shallow waters with floating and submerged vegetation. Eagle Marsh offers the most appropriate conditions for nesting - its thick mixed or monoculture reed beds along the old dike, as well as the eastern bank and northern part, offer good concealment for nests for up to 5-6 pairs. Some patches of vegetation along the western and northwest part of Eagle Marsh also provide good conditions for 1-3 pairs. Unfortunately, most of Eagle Marsh is disturbed by poachers.

The SEM includes only a small nesting area suitable for 1-3 pairs. It is extremely exposed to disturbance by anglers and grazing cattle. In 1996-1998 it was, however, a favoured area for feeding and courtship activity for up to half of the Ferruginous Duck present in the wetland. Unfortunately, the SEM is now almost entirely covered by vegetation, so no longer attracts such big numbers of feeding ducks. The north and east of Durankulak Lake, between SEM and Eagle Marsh, probably consists of similar habitat to Eagle Marsh, and could hold 3-4 pairs of Ferruginous Ducks; however this has not yet been confirmed due to access difficulties to the centre of the reed beds where the pools are located.



The Tail Ends of Durankulak Lake have similar habitat to Eagle Marsh and SEM. They are heavily vegetated with *Phragmites* and *Typha* but offer only small pools of open water. The Tail End at Vaklino village, which has three open water patches, held one pair of Ferruginous Ducks in 1997 and 1999, but it is overpopulated with Coypus *Myocastor coypus* which cause disturbance to the birds. The Tail End at Durankulak village did hold 1-2 pairs of Ferruginous Duck, but is presently overgrown with vegetation. In July 2001, this area was completely dry. Breeding Ferruginous Ducks at Durankulak rarely use the open water areas, preferring instead the shallower marshy sections.

BREEDING SUCCESS

Searching for Ferruginous Duck nests in the dense reed beds of Durankulak Lake is a difficult and time-consuming activity. Since 1995, we have never recorded more than 4-5 broods in the area, even in 1997 when 22-25 pairs were present. In 2000, a detailed study found no broods or juveniles. This could be because broods remained concealed in small pools in the reed beds, but may also be due to a lack of suitable nest sites (Mittev *unpubl*.), or to disturbance from (fish) poachers and holidaymakers. Despite a wardening scheme in the area, poachers still enter the wetland in late evenings between April and June, especially when fish are spawning. Such disturbance may result in poor physical condition in females such that they do not breed, or may cause direct nest abandonment (Korschgen & Dahlgren 1992).

In 2001, during exhaustive surveys of nesting habitat taking 4-5 days we found only one Ferruginous Duck nest. This was located in a reed bed in Eagle Marsh and contained 8 eggs. From an estimated 13 breeding pairs, only five broods were recorded. This result may not be unexpected taking into account that over 10% of diving duck pairs may not breed (Johnson *et al*. 1992); that mortality in the first week may approach 60% (Street 1977); and that 20-50% of broods may be lost entirely before fledging (Ringelman 1992). Low food availability of benthic invertebrates in Eagle Marsh (biomass 5.4g/m²) may have contributed to the low breeding success in 2001. This may be supported by the fact that Ferruginous Ducks unusually chose to feed on water fleas *Daphnia* spp.. However, it is more likely that poor breeding success was caused by a low availability of nesting habitat. Low water levels in 2001, especially in the Tail Ends and the SEM, caused by a lack of rainfall from late May to the end of July 2001, meant that suitable nesting habitat was

limited to Eagle Marsh and the north part of the lake south of the old dike.

CONCLUSIONS

Ferruginous Ducks at Durankulak Lake complex are found mainly in the marshy parts of the wetland, especially Eagle Marsh and the South-eastern Marshland. These areas have mixed and mosaic vegetation that offers a diversity of habitat. In recent years, the wetland has been affected by an inflow of bioorganic elements and by water level fluctuations which have suppressed zoobenthic and plankton communities and reduced the suitability of the site for Ferruginous Ducks. During 2000-2001, reduced water levels meant that Ferruginous Duck were only found in the north of Durankulak Lake and in Eagle Marsh.

Annual monitoring for the past seven years suggests a breeding population of 10-15 pairs with a peak of 25 pairs in 1997. In 2001, five broods hatched from 13 pairs present, whilst none hatched in 2000. Ferruginous Ducks are thought not to moult at Durankulak as most birds leave the site in July. A wardening scheme has reduced disturbance from holidaymakers and anglers, but the area still faces significant disturbance from local poachers of fish.

Durankulak Lake complex is still the major breeding site for Ferruginous Ducks along the Black Sea coast. Improvement/restoration of wetland conditions (as planned by the BSBCP Dobrudga project) which could increase the Ferruginous Duck population should take place during implementation of the management plan for the site.

ACKNOWLEDGEMENTS

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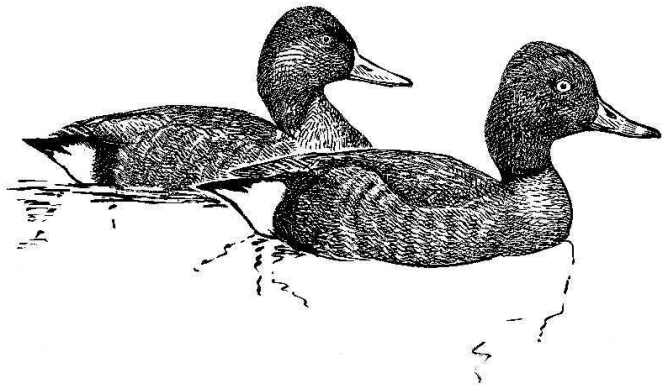

RECORD COUNTS OF FERRUGINOUS DUCK IN SAHELIAN AFRICA

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Aerial counts of waterbirds were carried out in the Inner Niger Delta (Mali) in January 1999, 2000 and 2001, and in the Lake Chad basin (Chad, Cameroon, Nigeria, Niger) in February and December 1999. The previous complete aerial counts in the Inner Niger delta were in the late 1970s/early 1980s. Since the mid-1980s, midwinter waterbird counts have been conducted almost annually, but many have been partial. Most years no Ferruginous Ducks were counted and the maximum number was 6,400 in 1985 (Monval & Pirot 1989), which corresponds to the maximum number counted in tropical Africa (6,450 in 1985). In the Lake Chad basin, the only previous aerial counts were in 1984, 1986 and 1987, with peak counts of Ferruginous Ducks of 500 in 1987 on Lake Fitri (Chad) and 2,200 in 1969 at the Hadejia-Nguru wetlands (Nigeria) (Perennou 1991). The current estimated wintering population in the West Mediterranean and West and Central Africa is 10,000 birds (Scott & Rose 1996).

In the Lake Chad basin, we observed only one Ferruginous Duck during the 1998-1999 winter, on Lake Fitri. During 1999-2000, 3,830 birds were counted, including a single concentration of 3,800 birds in a flooded wooded area west of Lake Fitri.

In the Inner Niger delta, 7,800 Ferruginous Ducks were estimated in 1998-1999, more than 13,000 in 1999-2000 and 14,300 in 2000-2001. In January 2000 and 2001, all birds were recorded in dry areas north of 15°30'N on large shallow lakes with extensive emergent vegetation.

In January 2000, 3,900 birds were counted on Lake Horo (or Oro), previously thought to be the most important site in West Africa for Ferruginous Ducks (del Hoyo *et al.* 1992). We found the largest concentrations north-west of Niafounké town, with 7,250 birds in January 1999 and *ca*. 8,000 in January 2000. In January 2001, only 275 birds were on Lake Horo, and again the biggest groups (5,130, 3,650 and 2,000) were north of the Niger River. Such concentrations, exceeding a few hundred birds, seem exceptional (Madge & Burn 1988). In Senegal and Mauritania, counts do not exceed some tens of birds (Schricke *et al.* 1999, V. Schricke *pers. comm*.).

The total number of Ferruginous Ducks counted in 1999-2000 in West and Central Africa neared 17,000 birds. This number, and the January 2001 count of 14,300 birds in Mali, exceed previous peak numbers, as well as the current population estimate. These results emphasize the importance of Inner Niger delta and Lake Fitri for this previously vulnerable species and suggest the population estimate should be increased to at least 15,000 birds.

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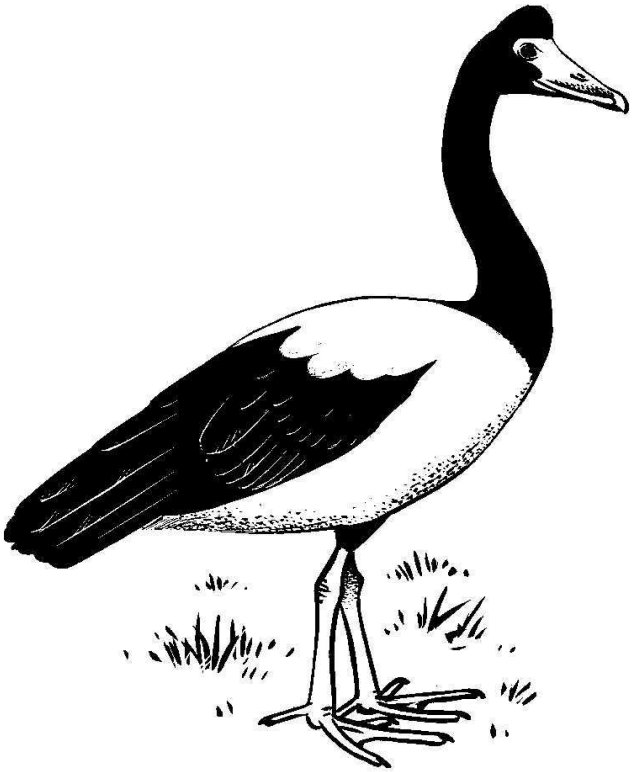

ACTION PLAN FOR AUSTRALIAN BIRDS

Stephen Garnett & G.M. Crowley

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MAGPIE GOOSE

Anseranas semipalmata (Latham 1798)
Conservation status: Least Concern

REASONS FOR LISTING

A range contraction to about a half of the species' historical extent could justify a listing of Near Threatened (criterion a). However, movement of birds between Australia and New Guinea is substantial, with the Australian population probably the larger, so national status and global status are linked (as per Gärdenfors *et al*. 1999). Furthermore, despite significant threats, there is no evidence of a current decline, and so the species is Least Concern.

INFRASPECIFIC TAXA

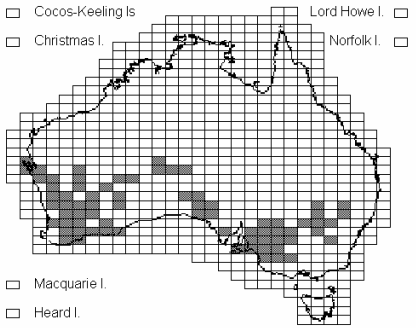
None described.

PAST RANGE AND ABUNDANCE

Across northern Australia and throughout eastern Australia, including parts of western New South Wales (Smith *et al*. 1995), southern and western Victoria (Emison *et al*. 1987) and south-east South Australia. Vagrant to south-west Australia and Tasmania (Marchant & Higgins 1990). Also present in southern New Guinea and regularly crosses Torres Strait (Draffan *et al*. 1983).

Australian Population	Estimate	Reliability
Extent of occurrence	2,500,000km^2	Medium
Trend	Stable	High
Area of occupancy	100,000km^2	Low
Trend	Stable	Medium
No. of breeding birds	4,000,000	Low
Trend	Fluctuating	Medium
No. of sub-populations	1	Medium
Generation time	5 years	Low
Global pop. share	>80 %	Medium
Level of genetic exchange	Medium	High

PRESENT RANGE AND ABUNDANCE



Natural populations extirpated from southern Australia by about 1920. Now confined to northern Australia, principally the Fitzroy R. and east Kimberley, W.A., northern Northern Territory, coastal Cape York Peninsula and patchily through eastern Queensland. Small numbers have returned to north-east New South Wales, and reintroduced successfully to Victoria, where populations are expanding in south-west and on the Gippsland Plain, and South Australia (Marchant & Higgins 1990, P. Menkhorst). Abundance in central eastern Queensland increased in the last decade (Wilson 1992, 1997). The largest population, in the Northern Territory, fluctuates greatly, probably in response to rainfall patterns (Whitehead *et al*. 1992, Whitehead and Saalfeld *In press*), but there is no evidence of an underlying decline (P. Whitehead). At Kakadu, it reaches 500,000 in dry season (Morton *et al*. 1990), and total population may sometimes exceed 4,000,000 (Bayliss & Yeomans 1990). Up to 3,000 near Rockhampton in late 1980s (Wilson 1992), but no other published counts from Queensland. The Gulf of Carpentaria may separate the Queensland and Northern Territory populations, but there are anecdotal reports of birds banded in the Northern Territory being recovered on western Cape York Peninsula (P. Whitehead).

ECOLOGY

Magpie Geese live in shallow swamps and associated grassland, feeding on seeds or tubers and green grass (Frith & Davies 1961, Whitehead & Tschirner 1992, Wilson 1997). During the wet season, the geese usually nest in extensive colonies. They move hundreds of kilometres to perennial swamps in the dry season (Frith & Davies 1961, Bayliss 1989, Bayliss & Yeomans 1990).

THREATS

The initial decline in Magpie Goose numbers was probably the result of swamp drainage and hunting (Marchant & Higgins 1990). The main threat now is invasion of breeding habitat by environmental weeds, principally Para Grass *Brachiaria mutica* and Giant Sensitive Weed *Mimosa pigra* and introduced ponded pasture plants, such as the now-declared weed *Hymenachne amplexicaulis* (Marchant & Higgins 1990, Wilson 1997), which replace the principal food plants. Hunting continues in the Northern Territory, on Cape York Peninsula and, probably, the Kimberley. However, in the Northern Territory, where monitoring has been undertaken, there is no evidence of a decline (Bayliss & Yeomans 1990). Some Magpie Geese have died after the ingestion of lead shot (Harper & Hindmarsh 1990, Whitehead & Tschirner 1991). Breeding success on pastoral properties can be affected by fencing, but the scale of this effect is unknown (Whitehead & Turner 1998).

RECOMMENDED ACTIONS

1. Monitor hunted populations to ensure exploitation is sustainable.
2. Encourage adoption of ANZECC policy on use of non-toxic shot for lead shot.
3. Support weed control programs in Magpie Goose habitat.
4. Examine the effect of pastoralism on Magpie Goose habitat, particularly in relation to weed abundance.

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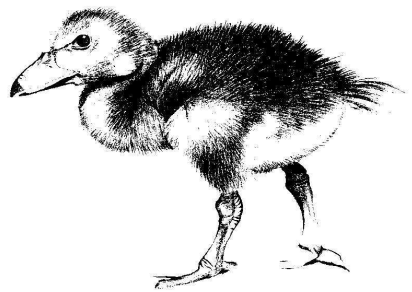

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COMMENTS RECEIVED FROM

Barry Baker, John Blyth, Peter Menkhorst, Peter Whitehead, Robyn Wilson.

FRECKLED DUCK

Stictonetta naevosa (Gould 1841)

Conservation status: Least Concern

REASONS FOR LISTING

Although scarce, the species is subject to wide natural fluctuations, rather than a distinct decline. However, status should be reassessed should further water be extracted from inland rivers. This could result in a significant decline in habitat quality (c), and a population decrease of 20% over the next three generations (15 years: Vulnerable: A2).

INFRASPECIFIC TAXA

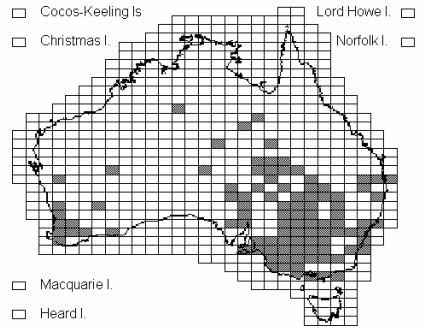
None described.

PAST RANGE AND ABUNDANCE

Recorded across southern and central Australia with largest concentrations recorded in Paroo-Warrego catchment (Currawinya Lakes, Qld), Eyre-Georgina-Mulligan catchment (Lake Torquinie, Qld) and possibly at Lake Galilee, Qld. Other inland sites where substantial numbers recorded include Cooper Creek and Bulloo R. catchments, Barkly Tablelands, Qld, and Lake Gregory, W.A. Outside this area, breeding also recorded throughout Murray-Darling catchment, notably along Lachlan R., and within Millicent Basin of South Australia and Victoria. During extensive inland droughts, apparently seeking refuge in Murray R. Basin, south-eastern Queensland, eastern New South Wales and southern South Australia, but usually some inland refuges remain (Jaensch & Vervest 1990, Marchant & Higgins 1990, Jaensch & Bellchambers 1997). Separate, small sub-population breeds in south-west Western Australia (Jaensch & Vervest 1988).

	Estimate	Reliability
Extent of occurrence	5,000,000km^2	High
Trend	Stable	High
Area of occupancy	1,500,000km^2	Low
Trend	Fluctuating	High
No. of breeding birds	20,000	Low
Trend	Fluctuating	High
No. of sub-populations	2	Medium
Largest sub-population	19,000	Low
Generation time	5 years	Low

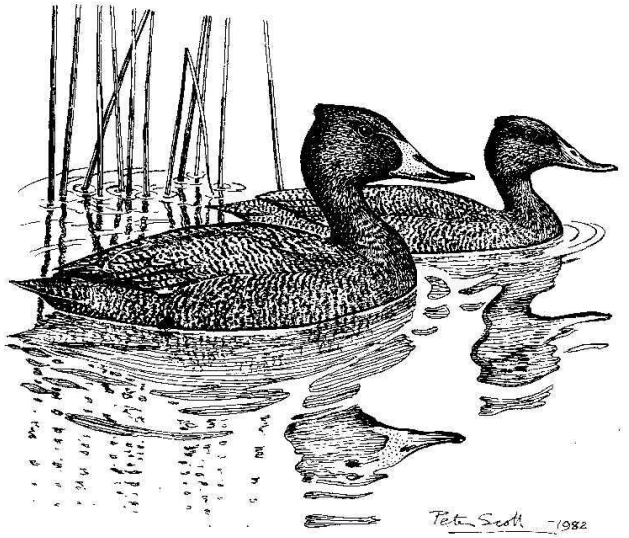
PRESENT RANGE AND ABUNDANCE



Distribution as above, with occupancy determined by river flows and extent of monsoonal rainfall on river catchments (Marchant & Higgins 1990, R. Jaensch). Abundance correlated with Southern Oscillation Index (Kingsford *et al*. 1999a), with maximum estimate at 19,000 after national ground survey for the eastern sub-population (Martindale 1986).

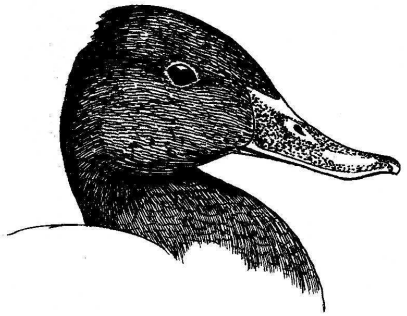
ECOLOGY

In inland eastern Australia, the largest numbers of Freckled Ducks occur in brackish to hyposaline wetlands that are densely vegetated with Lignum *Muehlenbeckia cunninghamii*, within which the birds build their nests (Braithwaite 1976, R. Jaensch). In south-western Australia, they breed primarily in seasonally flooded paperbark Melaleuca swamps (Jaensch & Vervest 1988), as well as in lignum and casuarina-dominated swamps of the wheatbelt (R. Jaensch). They may breed prolifically after exceptionally wet years, then disperse widely, largely towards the coast, but, in most years, they appear to be nomadic between ephemeral inland wetlands (R. Jaensch). In the driest years, they congregate on permanent wetlands.



THREATS

In the past, much of the wetland habitat in the south-east and south-west was drained. The biggest potential threat is the currently-shelved proposal to use water from the Paroo R. and Cooper Ck for irrigation, which would affect flooding of critical inland swamps (Kingsford 1999, 2000; Kingsford *et al*. 1998, 1999b). Also, during times of inland drought, when Freckled Duck are found near the coast, they are at risk of being misidentified as game species and shot during duck-hunting seasons (Martindale 1986, Loyn 1991), though no correlation between Freckled Duck abundance and hunting effort has been identified (Kingsford *et al*. 1999a), and several effective measures have been taken to improve hunter's identification skills and reduce accidental kill (Loyn 1991).



RECOMMENDED ACTIONS

1. Determine water flows necessary to maintain health of breeding habitat, based on comparative analysis of exploited and unexploited rivers.
2. Develop techniques to monitor long-term trends in abundance, particularly at sites where large numbers recorded.
3. Maintain adequate water flows in Cooper Creek, Bulloo River and Paroo River.
4. Protect and manage principal wetlands.
5. Monitor population on refuge wetlands during times of widespread inland drought.

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TEXT ADAPTED FROM

Fullagar (1992).

COMMENTS RECEIVED FROM

Barry Baker, Allan Burbidge, Andrew Burbidge, Gary Backhouse, Roger Jaensch, Richard Kingsford, John Martindale, Peter Menkhorst.

CAPE BARREN GOOSE (SOUTH-WESTERN)

Cereopsis novaehollandiae grisea (Storr 1980)

Conservation status: Vulnerable: D1

REASONS FOR LISTING

The total population of this subspecies probably never contained more than 1,000 mature individuals (Vulnerable: D1).

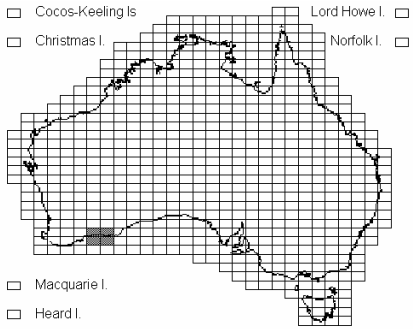
INFRASPECIFIC TAXA

C.n.novaehollandiae (south-eastern Australia, Tasmania, Kangaroo I. and Bass Strait Is) is Least Concern.

PAST RANGE AND ABUNDANCE

Southern Western Australia, centred on the Archipelago of the Recherche, but found in small numbers on the mainland from Busselton to the Nullarbor Plain. Early measures of abundance all based on incomplete surveys including 60 seen May 1991 (J. Dell) and 232 in February 1992 (Shaughnessy & Haberley 1994).

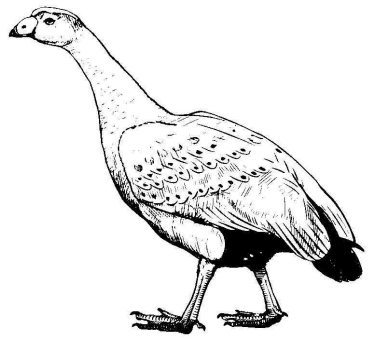
PRESENT RANGE AND ABUNDANCE



Single comprehensive survey in 1993: 631 birds, 612 being found on 79 of the 232 islands and rocks surveyed in the Archipelago of the Recherche, 15 birds in two flocks on the mainland opposite and four on Red I. 200km to the west (Halse *et al*. 1995).

ECOLOGY

In Western Australia, Cape Barren Geese live primarily in grassland on rocky islands. They are apparently mostly sedentary, but occasionally visit pastures and beaches on the mainland (Halse *et al*. 1995). They lay 4-5 eggs in nests among grass tussocks (Marchant & Higgins 1990).



	Estimate	Reliability
Extent of occurrence	6,500km^2	High
Trend	Stable	High
Area of occupancy	100km^2	High
Trend	Stable	High
No. of breeding birds	650	Medium
Trend	Fluctuating	High
No. of sub-populations	1	High
Generation time	15 years	Low

THREATS
The small population is vulnerable to extremes of weather, particularly hot summers (Garnett 1992, Halse *et al*. 1995). Large numbers of birds were hunted for food before 1937, when this was prohibited (Garnett 1992). In 1991, many geese died of starvation or heat-stress during a drought and exceptionally high temperatures (Shaughnessy & Haberley 1994, Halse *et al*. 1995). Should the climate in south-western Australia become hotter and drier, the Archipelago may become less suitable for Cape Barren Geese.

INFORMATION REQUIRED
None.

RECOVERY OBJECTIVES
1. Maintain population.

ACTIONS COMPLETED OR UNDER WAY
1. Population surveyed in 1993.

MANAGEMENT ACTIONS REQUIRED
1. Survey to monitor population once every ten years unless downward trend apparent.

ORGANISATIONS RESPONSIBLE FOR CONSERVATION
Western Australian Department of Conservation.

OTHER ORGANISATIONS INVOLVED
None.

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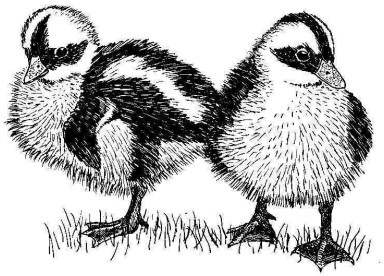
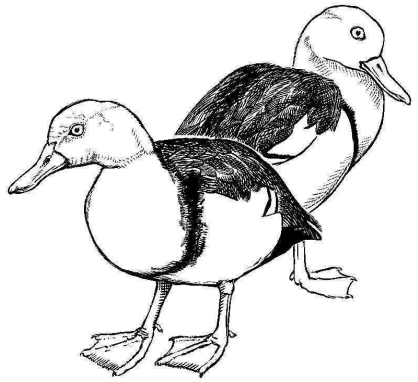
COMMENTS RECEIVED FROM
Barry Baker, Andrew Burbidge.



RADJAH SHELDUCK (AUSTRALIAN)
Tadorna radjah rufitergum (Hartert 1905)
Conservation status: Least Concern

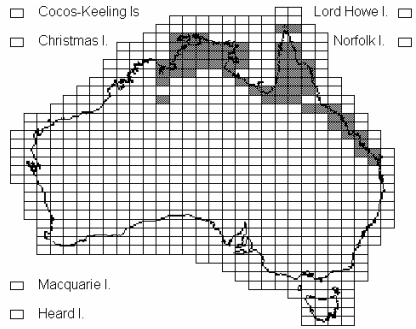


REASONS FOR LISTING
Although it has disappeared from parts of Queensland, the subspecies remains common over more than half its historical range. There is limited genetic exchange across Torres Strait and a high proportion of the population is in Australia. Thus, the Australian status is assessed independently of the global status (Gärdenfors *et al*. 1999), though both are Least Concern.

INFRASPECIFIC TAXA
T. radjah radjah of New Guinea, Moluccas and Lesser Sunda Islands is also Least Concern. Presumably intergrades with *T.r.rufitergum* in Torres Strait. The species is Least Concern.

PAST RANGE AND ABUNDANCE
Fitzroy River, Kimberley, W.A., across near coastal northern Australia and along east coast as far south as north-east New South Wales (Frith 1982, Blakers *et al*. 1984, Marchant & Higgins 1990).

PRESENT RANGE AND ABUNDANCE



In Kimberley, now confined to the east (Johnstone & Storr 1998), where abundant on Lake Argyle. In Queensland, scarce south of Cape York Peninsula and no longer present south of Maryborough. Elsewhere, remains common with no evidence of decline (Frith 1982, Blakers *et al*. 1984, Marchant & Higgins 1990).

Australian Population	Estimate	Reliability
Extent of occurrence	8,000,000km^2	Medium
Trend	Stable	High
Area of occupancy	4,000,000km^2	Low
Trend	Stable	Medium
No. of breeding birds	100,000	Low
Trend	Stable	Medium
No. of sub-populations	1	High
Generation time	5 years	Low
Global population share	80%	Low
Level of genetic exchange	Low	High

ECOLOGY
Radjah Shelduck occupies terrestrial wetlands, estuaries and the littoral zone of monsoonal regions. It nests in tree hollows in the wet season, forming flocks near the coast during the dry season. It feeds on small invertebrates and a few seeds, taken from shallow wetland edges (Marchant & Higgins 1990, Morton *et al*. 1990).

THREATS
Although sub-populations have declined near settlements (Marchant & Higgins 1990), this has not been to the extent that the subspecies is threatened.

RECOMMENDED ACTIONS
1. Monitor numbers on major wetlands such as Lake Argyle, Kakadu and Lakefield National Park.

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COMMENTS RECEIVED FROM
Barry Baker, John Woinarski.

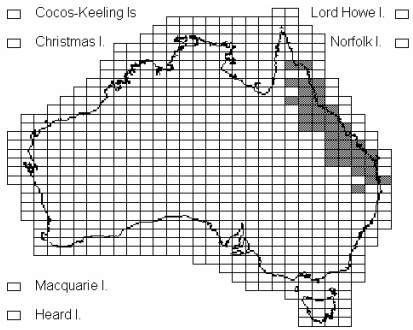
COTTON PYGMY-GOOSE (AUSTRALIAN)
Nettapus coromandelianus albipennis (Gould 1842)
Conservation status: Near Threatened: C

REASONS FOR LISTING
The population of this subspecies seems small, and appears to have declined in density over at least the southern half of its historical range (Near Threatened: C).

INFRASPECIFIC TAXA
N.c. coromandelianus (south-east Asia) does not occur in Australia and has a status of Least Concern.

PAST RANGE AND ABUNDANCE
Princess Charlotte Bay, Qld, to Hunter R., N.S.W., inland in the headwaters of the Dawson, Fitzroy and Burdekin Rivers (Frith 1982, Marchant & Higgins 1990). From limited data, the population was estimated at 1,500 individuals in the early 1960s (Lavery 1966).

PRESENT RANGE AND ABUNDANCE



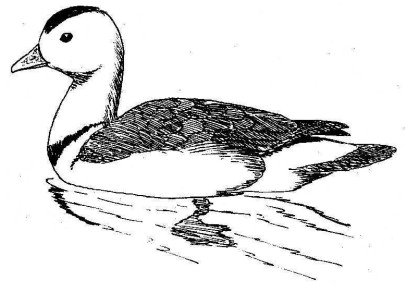
Major centres of population: Dawson, Fitzroy, Burdekin and Barron R. catchments (Blakers *et al*. 1984). Locally common in suitable habitat near Brisbane (G. Beruldsen). Now vagrant outside Queensland (Marchant & Higgins 1990).

Largest recent counts: 300 on Ross R. Dam near Townsville (Garnett & Cox 1987) and 350 at Lake Powlathanga near Charters Towers in 1990 (P. Britton). No recent estimates of total population size. Frequency of sightings near Rockhampton has apparently declined (Longmore 1978, M. Crawford).

ECOLOGY
Cotton Pygmy-Geese are found on freshwater lakes, swamps and large water impoundments. They congregate in flocks on permanent water-bodies during the dry season. They lay 6-9 eggs in the hollows of trees that stand in or beside water (Beruldsen 1977, G. Beruldsen). Principal foods are Pondweed *Potamogeton* seeds and other aquatic vegetation (Frith 1982).

THREATS
The species has been adversely affected by drainage of wetlands or their invasion by introduced weeds, particularly Water Hyacinth *Eichhornia crassipes* (Beruldsen 1977) and the exotic ponded-pastures *Echinochloa polystachya* and *Hymenachne amplexicaulis* (A. Taplin). However, it has benefitted from the creation of new wetlands, such as Ross R. Dam and Tinaroo Dam.

RECOMMENDED ACTIONS
1. Survey to determine the size and status of the population and the favoured breeding habitat.
2. Monitor spread of introduced ponded-pasture species and, if detrimental, control ponded-pasture in prime Cotton Pygmy-Goose habitat.



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	Estimate	Reliability
Extent of occurrence	400,000km^2	High
Trend	Stable	High
Area of occupancy	1,500km^2	Low
Trend	Stable	Medium
No. of breeding birds	5,000	Low
Trend	Stable	Medium
No. of sub-populations	1	High
Generation time	5 years	Low

STATUS OF THREATENED WATERFOWL IN THE SOUTH-EAST CASPIAN REGION OF TURKMENISTAN

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MARBLED TEAL

Marbled Teal are listed in the first (1985) and second (1999) Turkmenistan Red Data Books as uncommon species, although they were previously common. Over 17,000 birds were counted on the Etrek river in 1932 (Laptev *et al*. 1934). Until the 1940s, Marbled Teal occurred during winter and on migration on coastal pools in the south-east Caspian (Isacov & Vorobjov 1940). Breeding occurred on coastal pools, filtration pools and lakes along the Tedjen and Murgab Rivers (Tashliev 1973).

Disturbance, chemical pollution, and reduction in breeding habitat, have reduced the numbers of Marbled Teal migrating and wintering in coastal and inland areas of the south-east Caspian. Annual counts since 1971 show they now only occur sporadically during winter, spring and autumn migration. During winter surveys of 32 pools in November 1998, January 1999 and January 2000, we did not record any Marbled Teal. On spring migration in the Western Uzboy (see Figure 1), we recorded only 21 birds in 1999 and 13 birds in 2000. During autumn migration on the south Caspian coast, in 1999 we saw 37 birds in three flocks, and in 2000 a total of 96 birds. During especially warm weather in January 2001, we counted 64 Marbled Teal. Some 80% of these were in Area "C" of the southern Caspian coast (Figure 1) and on the lower reaches of the Etrek River, and 20% were in Area "B". The absence of Marbled Teal from Area "A" suggests that they migrate from Uzbekistan to the Caspian coast via the Saricamish Reservoir and the Western Uzboy river valley. No Marbled Teal bred along the Etrek River in 2000 and 2001, due to its extremely low water levels.

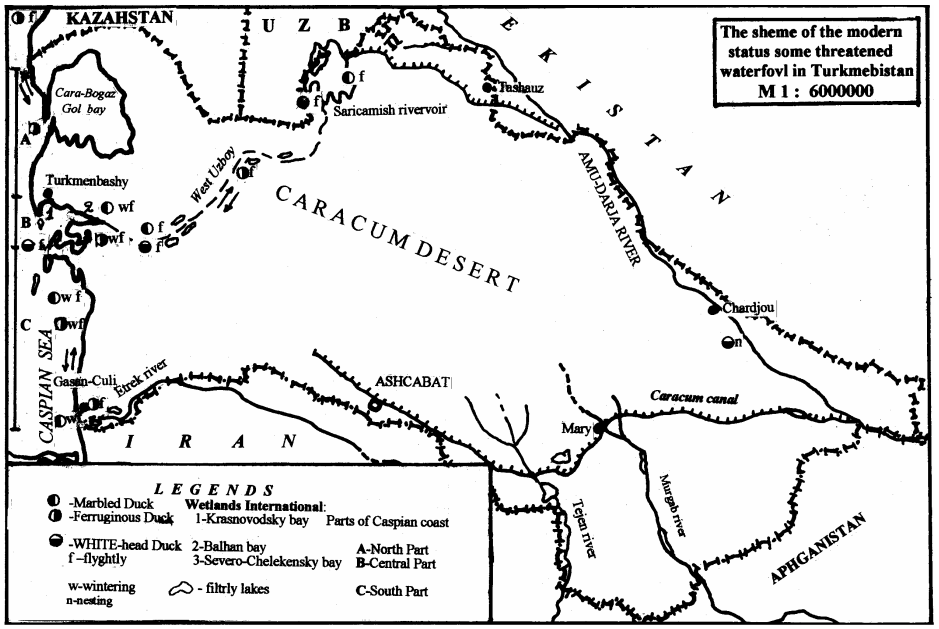
FERRUGINOUS DUCK

On inland water-bodies of south-east Turkmenistan, Ferruginous Duck breed and migrate along the Tedjen and Murgab Rivers and the Caracum Canal (Tashliev 1973). During the 1930s, the species occurred along the south-east Caspian coast (Isakov & Vorobjov 1940), especially in Krasnovodsky and Severo-Chelekensky Bays.

During 30 years of waterfowl surveys (1971-2001) of the South-eastern Caspian (Mangishlacsky Bay to the lower Etrek River), groups of 6-15 Ferruginous Ducks have been observed amongst migratory and wintering flocks of Tufted Duck, Pochard and Coot *Fulica atra*.

During late October/early November 1998-2000, we counted a total of 551 Ferruginous Ducks in 43 flocks (8-24 flocks per year). In spring 1999 and 2000, we counted 22 flocks (15 in 1999 and 7 in 2000) containing a total of 317 ducks. About 30% were recorded at the coast and 65% along the Western Uzboy river valley. Simultaneous counts of 32 pools along the south-east Caspian coast in January 1998 and 1999 found 384 Ferruginous Ducks in 27 flocks (83% in Area "B", 5% in Area "A" and 12% in Area "C"). During the warm winters of 2000 and 2001, no Ferruginous Ducks were recorded in these areas. Ferruginous Ducks are reported to be common migrants along the north-east Caspian coast (Molodovsky 1977).

Figure 1. Sites holding Marbled Teal, White-headed Ducks, and Ferruginous Ducks in Turkmenstan.



WHITE-HEADED DUCK

The White-headed Duck is listed in the first (1985) and second editions (1999) of the Turkmenistan Red Data Book as an uncommon species.

Prior to the 1980s, White-headed Ducks bred on small pools in the deltas of the larger rivers in Turkmenistan (Tashliev 1973, Ataev *et al*. 1978). More recently, Shirekov & Poslavsky (1990) found 13 pairs of White-headed Duck breeding on Sultandag Lake along the Caracum Canal. The main factors which have reduced the numbers of White-headed Ducks breeding in Turkmenistan are increased disturbance and poaching.

White-headed Ducks are commoner in Turkmenistan in winter and during migration, both on inland lakes, and on the south-east Caspian shore. In the first half of 20th century, White-headed Ducks were one of the most numerous wintering waterfowl in coastal waters with Laptev *et al*. (1934) reporting a count of 47,000 birds. Subsequently their numbers have fallen sharply. In autumn-winter 1972-1978, peak annual counts were 170-600 birds (Ataev *et al*. 1978). From 1988 onwards, peak counts have been similar at 19-820 birds. Most birds have been found in Area "B" in the Krasnovodsky and Severo-Chelekensky Bays (86-100% of birds).

Autumn migration along the coast of Turkmenistan and the Western Uzboy river valley starts in October as birds move south from more northerly breeding areas. Key staging sites include Krasnovodsky and Severo-Chelekensky Bays and Lake Becovich, where up to 74% of birds are found.

Spring migration takes place mainly between 11 February and 18 March. Peak counts in spring 1997-2001 have been about half those in autumn.

In winter White-headed Ducks have been found in single species flocks of up to 704 birds or in smaller groups of 6-17 birds amongst feeding flocks of Coot, Pochard and Tufted Duck.

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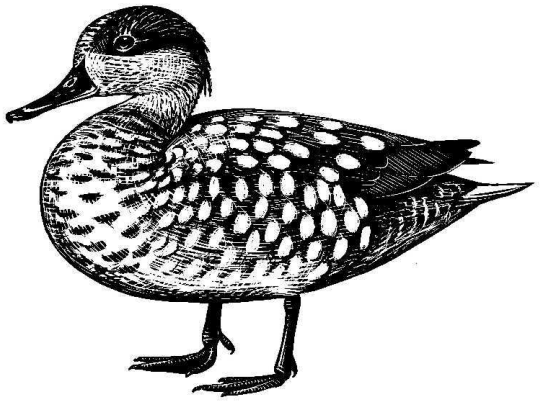

STATUS OF WATERBIRDS IN THE CASPIAN REGION OF TURKMENISTAN, 1970-2000.

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During the last 30 years, there have been various natural and anthropogenic factors affecting the availability of wetlands in the south-east Caspian (Vasiliev & Gauzer 1998, 1999). By 1979, the water level of the Caspian Sea had receded by at least 29.06m a.s.l. Many coastal wetlands were destroyed, including the Turkmenish, Balhan and Mihailovscy Bays, and many shallow marine waters from Cape a Tarta to the Carabogazgol Bay. Between 1979 and 1996, the water level in the Caspian then rose by 2.4m, increasing the coastal wetland area of the south-east coast of Turkmenistan by 70% (Vasiliev & Gauzer 1997).

Unfavourable climatic conditions have contributed to reduced waterbird numbers in the south-east Caspian. Between 1971 and 1990, about one third of winters were unsuitable for wintering waterbirds, and between 1991 and 2000, favourable conditions were only present in one year (Vasiliev & Gauzer 1999). The negative effects of many anthropogenic factors have also increased, such as pollution and disturbance, whilst the activities of nature protection agencies and their staff have declined.

Over 30 years, monitoring has shown that 36 species of waterbirds (representing 14% of Turkmenistan's bird species) are either extinct or threatened (Table 1): seven are completely extinct, 14 in danger of extinction, eight no longer breed, and nine have seriously endangered breeding populations. A national action plan has already been produced for the Lesser White-fronted Goose (Vasiliev & Gauzer 2001). Similar action plans need to be developed for other threatened waterbirds and the wetland habitats on which they depend.

Table 1. Waterbirds in Turkmenistan threatened with extinction in the year 2000.

Extinct	Nearly extinct	Extinct breeder	Nearly extinct breeder
Bewick's Swan	Buff-backed Heron	Bittern	Purple Heron
Red-breasted Goose	L. White-fronted Goose	Greater Flamingo	Great White Egret
Red Kite	White-fronted Goose	Ruddy Shelduck	Night Heron
Demoiselle Crane	Marbled Teal	Saker Falcon	Squacco Heron
Great Bustard	Ferruginous Duck	Avocet	White-tailed Eagle
Little Bustard	White-headed Duck	Common Gull	Black-winged Stilt
Whimbrel	Velvet Scoter	Gt B-headed Gull	Whiskered Tern
	Red-breasted Merg.	Eagle Owl	White-w Black Tern
	Pallas's Sea Eagle		Sandwich Tern
	Grey Francolin		
	Common Crane		
	Purple Gallinule		
	Gt Black-headed Gull		
	Sandwich Tern		

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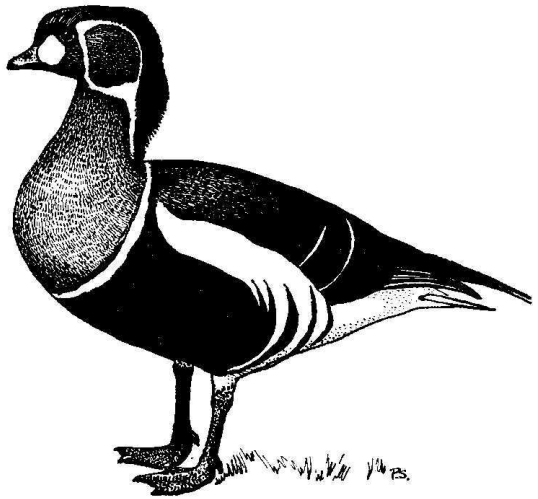

RUSSIAN-JAPANESE SWAN GOOSE CONSERVATION PROGRAMME

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Kabukurinuma Homepage: *http://www2.odn.ne.jp/kgwa/kabukuri/*. Anatidae Site Network in the East Asian Flyway Homepage: *http://www.jawgp.org/anet*.

INTRODUCTION

By the end of the 20th century, the numbers of Swan Geese in Russia dropped to less than 1,000 birds in only two breeding areas: 50 pairs on the Toreyskie Lakes in Transbaikalia, and 200 pairs in the Lower Amur region. Published data and preliminary research suggest that the Swan Goose declined due to its habits of nesting in the densely populated and easily accessible flood plains, and of wintering in China, where it suffers from intensive and uncontrolled hunting. These problems were exacerbated by the Swan Goose's approachable nature.

CONSERVATION PROGRAMME

In 2000, the Russian Goose and Swan Study Group (RGSSG) and the Japanese Association for Wild Geese Protection (JAWGP) launched a Swan Goose conservation programme that aims to prevent the species extinction by identifying "critical points" in the biology of the species and developing measures for its restoration and conservation. The programme, which is being led by Nikolay D. Poyarkov (Russia) and Masayuki Kurechi (Japan), will involve: coordinating national research and conservation programs; founding an international working group; determining the Swan Goose's status and distribution; identifying differences in biology between different geographical populations; creating protected areas; developing measures to prevent occasional shooting; and developing and implementing a reintroduction programme.

The following action plan for 2001-2003 has been developed:

- To conduct census and studies of the biology of Swan Geese;
- To discover new breeding areas through a GIS analysis of known breeding areas followed by surveys of potential sites;
- To mark geese from different geographical populations with coloured collars and satellite transmitters;
- To create an international database containing information about marked birds;
- To establish new protected sites in areas inhabited by the geese;
- To coordinate special hunting regulations in key breeding and staging areas;
- To inform local people about the need to protect the Swan Goose;
- To develop measures to protect the Transbaikalia and Lower Amur populations using experience gained from Russian-American cooperation on the conservation of Snow Geese. The measures should include: prohibition or control of hunting, particularly on the wintering grounds and along flyways; establishment of no-hunting zones, nature reserves;
- To develop procedures and investigate the prospects of reintroduction programmes;
- To create pedigree books of the Swan Goose stock in captivity;

SURVEY RESULTS

During an expedition to the Lower Amur region in 2000, Swan Geese were found in three places: the Kholan Canal, Lake Udyl' and Lake Chertovo (Table 1). According to interview data, more pairs (maybe even a few dozen) nested in the Udyl'-Kizi Depression along the east bank of the Amur River. In addition, a number of birds were reported from the coast of the Sea of Okhotsk. No Swan Geese nested at Lake Chertovo in 2001, and numbers in the Amur River valley were slightly lower than in 2000 (Table 2). In July and August 2001 we surveyed the coast of Nikolaya Bay, and found a small number of new Swan Goose nest sites near the mouths of some small rivers. Local hunters reported that Swan Geese also nested along other small rivers, streams and canals running into Nikolaya Bay and the more northerly Ulbanskiy Bay.

Aerial surveys of the vast Lower Amur region were carried out from 27-29 July 2001 with Prof. Higuchi (Tokyo University) and ornithologists from Khabarovsk and Vladivostok. Ten young birds were ringed and satellite transmitters put on two adult geese. We also printed and distributed a poster depicting a Swan Goose and delivered a number of lectures. In 2001, a new protected territory "Kholan" was established in Swan Goose breeding areas.

Table 1. Observations of Swan Geese in the Lower Amur region in 2000.

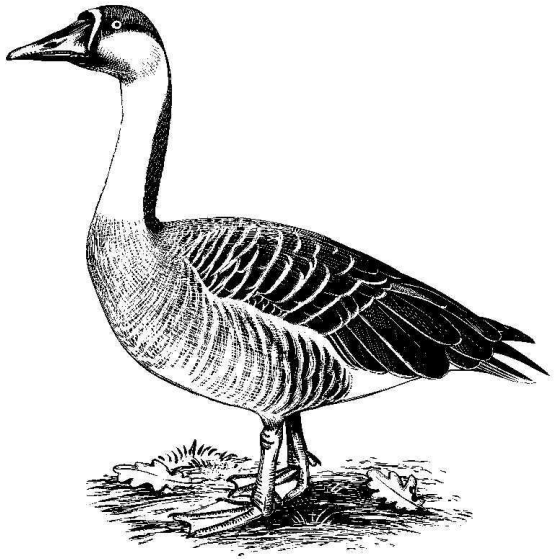
Place	Date	Number of Birds	Comments
Lake Udyl Pil'da River mouth	12.07	2 ad + 3 juv (1/3 of adult size)	Swimming in SW direction
Lake Udyl Pil'da River mouth	3.08	5 ad flying	Probably non-breeding
Lake Udyl Bichi River delta	14.07	48 ad + 72 juv (1/3 of adult size)	Group observed to 6 August
Kholan Canal	20.07	Up to 30 birds	Footprints, droppings and feathers
Lake Chertovo	11.08	15 ad + 15 juv (2/3 of adult size)	Maybe not all geese in the group were counted

Table 2. Observations of Swan Geese in Nikolaya Bay in July and August 2001.

Date	Lat + Long	Number of Birds	Comments
09.07, 13.07	53°28'N, 138°14'E	10 ad + ~15 juv	In Usalgin River mouth
14.07	53°37'N, 138°19'E	6 ad + 8 juv	One flock with 10 ad + ~15 Bean Geese in a small river mouth
15.07	53°30'N, 138°19'E	10 ad + 15 juv	Small river mouth. May be same birds observed on 9-13.07 on Usalgin River
15.07	53°37'N, 138°21'E	2 ad + 1(?) juv	On small river, 2km from mouth. Probably more than one gosling.

Detailed surveys of the Toreyskie Lakes in Transbaikalia (50°05'N, 115°38'E) were carried out simultaneously with fieldwork in the Lower Amur region. The numbers of the Swan Geese appeared to be unusually high there, with an estimated 1,200 individuals (both adults and young) in late July.

Such high numbers could be explained by improvement of conditions for breeding at the Toreyskie Lakes, or to poorer conditions on the adjacent Mongolian territories. Reintroduction programmes for Swan Geese have began in the Irkutsk Oblast, in Kamchatka and in the Muraviovskiy National Park (Amur Oblast).



SATELLITE TELEMETRY OF STELLER'S EIDER IN ALASKA

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Large numbers of Steller's Eiders moult and winter in southwest Alaska. Most of these birds presumably belong to the population breeding in the Russian Far East, but Alaska-breeding Steller's Eiders are also present. Steller's Eiders banded at Izembek Lagoon, Alaska, between 1957 and 1962 were recovered mostly in Russia, but one bird was also recovered at Barrow; three other birds, captured at Izembek or Nelson lagoons, were observed at Barrow between 1991 and 1999. Prior to 2000, these records provided the only clues to the movements of the Alaska-breeding population in fall and winter. It was not known whether the Alaska-breeding population intermixed extensively with the more numerous Russian population, or if individuals exhibited strong fidelity to specific, limited locations.

The Alaska-breeding population historically occupied the western and central portions of the Arctic Coastal Plain (ACP) and the coastal fringe of the Yukon-Kuskokwim Delta. Several nests were found on the Yukon-Kuskokwim Delta in the late 1990's, but the region near Barrow is the only place in Alaska regularly used by substantial numbers of nesting Steller's Eiders in recent decades. The Alaska-breeding population of Steller's Eiders was listed in 1997 as a threatened species under the Endangered Species Act. In 2000, the U.S. Fish & Wildlife Service initiated a satellite telemetry study to document movements and habitat use outside the breeding season. This information is needed to evaluate potential threats and to develop recovery strategies pertinent to the non-breeding season.

A pilot study was initiated in 2000, with transmitters implanted in three males and one female at Barrow. Three of the four birds survived approximately one year, after which all of the transmitters depleted their batteries. Based on this initial success, a total of 10 PTT's were implanted from 9-15 June 2001 at Barrow. Pairs were captured as a unit in all cases (in one case, two pairs were captured simultaneously), thus the sex-ratio of captured birds was even (five of each gender). Although Steller's Eiders arrived at Barrow in 2001, we have no evidence that they attempted to breed. Pairs did not disperse into known nesting areas, and pair counts were dramatically lower than in 1999 and 2000. The capture event appeared to disrupt pair bonds, as we observed birds separated from their mates after release, and the telemetry locations indicated disparate movement patterns for formerly paired birds.

Although we cannot be certain that birds recovering from surgery behave similarly to undisturbed birds, the results provide some intriguing insight into the movements of "Barrow birds" in a non-breeding year. Most birds remained on the ACP or adjacent nearshore marine waters for several weeks (range 11-63 days). Females tended to remain longer on the ACP than males, although the first bird to leave (on 23 June) was a female. During this period, there was considerable movement of birds within an area extending from the village of Wainwright to Dease Inlet. Several birds moved south or east, away from Barrow and then back toward Barrow, before departing the ACP altogether.

There was extensive summer use of Russian coastal waters. At least eight individuals used Russian waters (Figure 1). There were six coastal locations in Chukotka that were used by at least one bird for at least one week. Residency at these sites ranged from ten days to over 50 days, depending on the individual. The sites used by the most birds included the mouth of Kolyuchin Bay (particularly in the vicinity of the Islands of Serykh Guzy; used by three birds this year and one bird last year), and the area north of Cape Nanyagmo in the Bering Strait, west of the Diomede Islands (used by four birds this year).

Based on their locations during early to mid-September, we believe that five birds moulted in the Kuskokwim Shoals area, one at Cape Mendenhall on the south side of Nunivak Island, three in the Port Moller/Nelson Lagoon complex, and one at Izembek Lagoon. As of 5 November, five of the six birds that moulted at Nunivak Island or Kuskokwim Shoals have moved a substantial distance south (to Hagemeister Strait, Chignik Lagoon, Nelson Lagoon, and Izembek Lagoon). Birds that moulted at Nelson Lagoon and Izembek Lagoon remain in those same regions.

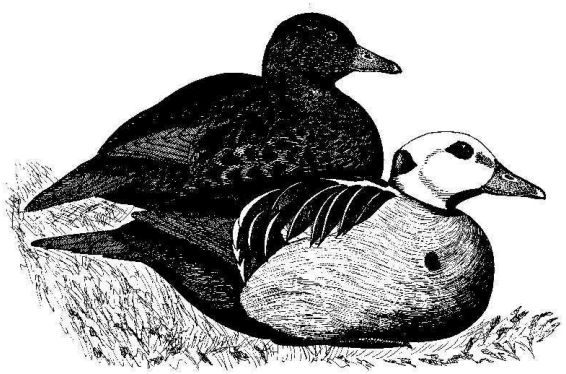
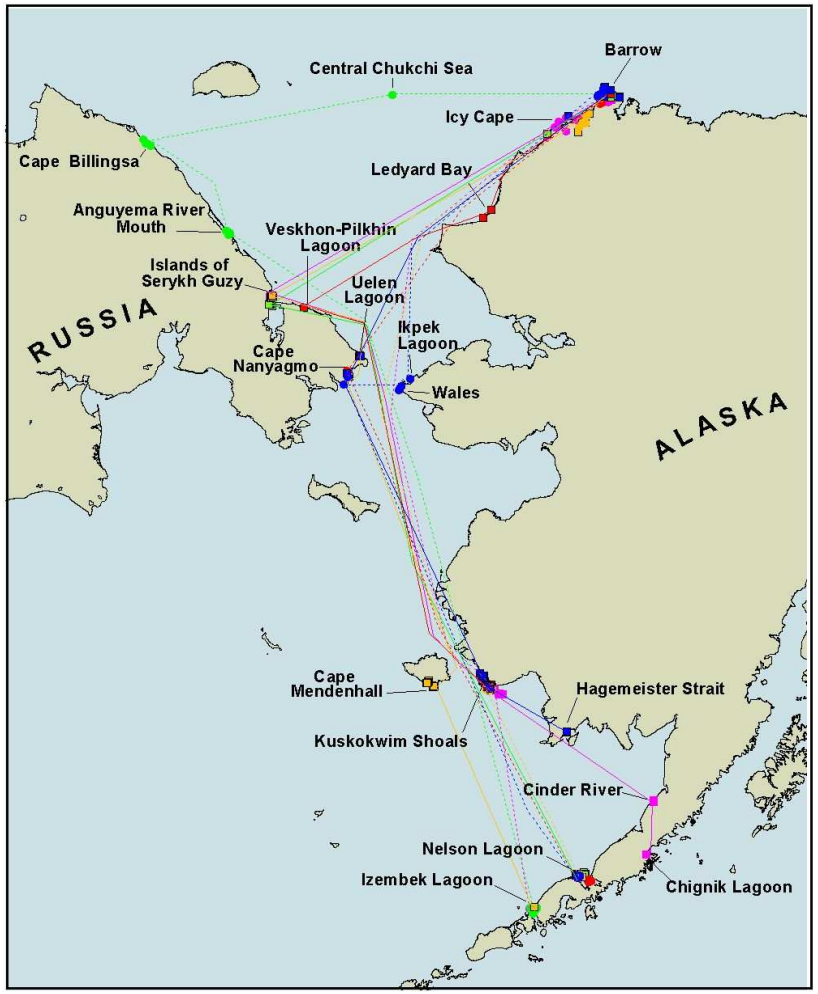


Figure 1. Locations of Steller's Eider satellite-tracked from Barrow, Alaska, from June, 2001. The lines on the map are conceptual only, and are not meant to represent actual routes of movement. The marked locations represent the "best" location per duty cycle, with transmitters programmed to transmit six hours out of every three days. Circles and dashed lines indicate females, squares and solid lines indicate males. These results are preliminary, and should not be cited without permission of the author.



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