Threatened Waterfowl Research Group Newsletter

Coordinated by The Wildfowl & Wetlands Trust for IWRB

Edited by Janet Hunter & Andy Green

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No.6, September 1994

BRITISH AIRWAYS
ASSISTING NATURE
CONSERVATION

kindly printed and distributed this newsletter
EDITORIAL: EXTENDING OUR REMIT?

The Threatened Waterfowl Research Group was established in October 1990 and is coordinated from The Wildfowl & Wetlands Trust at Slimbridge, UK. There is no formal membership of the TWRG, and those receiving and/or contributing to this newsletter should consider themselves members. The TWRG and its newsletter aim to identify those Anseriform (Anatidae and Anhimidae) taxa across the world that are threatened with extinction, to gather and exchange information on these taxa and to promote their conservation. This sixth issue of the newsletter is being distributed to over 500 people around the world with a special interest in threatened Anseriforms. The Wildfowl & Wetlands Trust is an Associate member of the Birdlife International network, and this newsletter is distributed to Birdlife partner organisations.

It is now three years since the TWRG published its first newsletter, over which time our understanding of the status of the world’s Anatidae and Anhimidae has been greatly improved by the activities of the network and coordinators. We have published leading reviews of the status of threatened taxa in *Wildfowl* volumes 43 and 44 and co-produced a Conservation Assessment and Management Plan (CAMP) with the IUCN Captive Breeding Specialist Group. We made a major contribution to a new IWRB publication, *Waterfowl Population Estimates* (Rose & Scott 1994), which includes population estimates for all the world’s waterbird taxa and subpopulations. We are now applying the newly revised IUCN criteria for threatened categories (see Mace et al. 1992) to the Anseriforms, to produce a new list of globally threatened taxa. This is being done in harmony with the Birdlife Secretariat, who have just completed this process for all birds at the species level.

We are currently considering the possibility of extending the activities of the TWRG to cover the threatened taxa in other waterbird families, and we want to hear your views about this. There are a number of families (e.g. Rallidae, Jacanidae) that are not covered by existing IUCN/IWRB/Birdlife Specialist/Research Groups. *Waterfowl Population Estimates* shows that our understanding of the status of taxa in these families is much poorer than for the Anatidae and other families that are covered by Specialist/Research Groups. For this reason, we are thinking of extending the coverage of this newsletter and our other activities to cover families such as Rallidae, in order to improve monitoring of these taxa and to promote their conservation. Are you in favour of this idea? Which additional waterbird families should we concentrate on? Please write to us with your views.

Dr Andy Green, TWRG Coordinator


Rose, P.M. & Scott, D.A. (compilers) 1994. *Waterfowl Population Estimates*. IWRB Publ. 29. £10.00 plus postage & packing. To order copies, contact: Natural History Book Service Ltd. 2-3 Wills Road, Totnes, Devon, TQ9 5XN, UK. Fax: +44 803 865290.

INSTRUCTIONS FOR AUTHORS

Submissions for future issues of the newsletter can be in the form of reports on the status of a taxon on a local or global scale, short papers with original data, reports on the progress of conservation projects, news items etc. They should be in English, French or Spanish and no longer than 1,500 words, including references. *When submissions are prepared on a computer, we ask you to send them on disk as ASCII files or in Word Perfect, to be accompanied by a hard copy printout. All disks will be returned.* Figures should be drawn neatly in black ink and be of quality suitable for direct reproduction.

To be certain of inclusion in the next issue of the newsletter, submissions should be sent to the address below by 1 February 1995.

The opinions expressed in the articles in this newsletter are those of the authors, and do not necessarily represent those of the coordinators, WWT or IWRB. The coordinators reserve the right to make minor changes to submitted articles without consulting the authors. We welcome letters or notes from readers with any comments on articles in the newsletter as well as copies of recent publications on threatened waterfowl for citation within the newsletter.

Please send your submissions to:

Andy Green and Janet Hunter, The Wildfowl & Wetlands Trust, Slimbridge, Glos., GL2 7BT, UK.
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TAXA UNDER CONSIDERATION BY THE THREATENED WATERFOWL RESEARCH GROUP

WESTERN PALEARCTIC & CENTRAL ASIA

*Anser erythropus*

*Marmaronetta angustirostris*

*Aythya nyroca*

*Polysticta stelleri*

*Mergus merganser comatus*

*Oxyura leucocephala*

AFRICA (EXCEPT NORTH)

*Pteronetta hartlaubi*

*Anas bernieri*

*Anas melleri*

*Netta erythropthalma brunnea*

*Aythya innotata*

*Thalassornis leuconotus insularis*

EAST ASIA

*Anser cygnoides*

*Anser erythropus*

*Anser fabalis middendorfi*

*Anser fabalis serrirostris*
LAYSAN DUCK POPULATION DECLINE

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Janet Hunter, The Wildfowl & Wetlands Trust, Slimbridge, Gloucester, GL2 7BT, UK.

Introduction
The Laysan Duck, or Teal, *Anas laysanensis* is endemic to the Hawaiian Islands. Within historic times it has been restricted to Laysan Island, a small, remote island in the north-western end of the Hawaiian chain (25°46'N 171°44'W) (Fig. 1).

Figure 1. Laysan Island and its location in the Hawaiian chain. The lagoon is referred to as the central lake in the text (adapted from Marshall 1992).

The species is dependent on the island’s central lake for food (brine flies, brine fly larvae and brine shrimps), and dense vegetation for nesting and for cover during the day (Marshall 1992, 1993, Moulton & Weller 1984).

The Laysan Duck came close to extinction in the late 1800’s and early 1900’s, through persecution and habitat destruction (Marshall 1993). In the early 1920’s, efforts to protect the duck and its habitat were begun, and by the mid 1930’s the vegetation had recovered, at least superficially (Ely & Clapp 1973). By 1979 the duck population had made a remarkable recovery to an estimated 500, where it appeared to remain stable (Moulton & Weller 1984, Marshall 1992).

Current status
The United States Fish and Wildlife Service (USFWS), who conduct regular counts of Laysan Duck, first became concerned about the status of the Laysan Duck in October 1993, when
several adult birds were found dead. During the period August 1993 to January 1994 a total of 48 dead birds were discovered. Many of the dead birds which were examined were emaciated and infested with gastrointestinal nematodes. These deaths coincided with counts that were significantly lower than normal. In May 1994 the maximum count was 35 individuals, including 13 females, 10 males and 15 juveniles (4 broods). It is thought that a drought, which has resulted in the lowest water levels since 1973, a scarcity of brine flies, and an outbreak of parasites, have caused this decline in the Laysan Duck.

The situation may not be quite as severe as it appears. The above counts are likely to be short of the true total population number. Using marking and re-sighting techniques Marshall (1992) estimated that, from maximum counts of 250 individuals, the true population size could be estimated at 400-500. However, it remains unlikely that the present population exceeds 100 birds. This suggests that the Laysan Duck may now one of the top five most endangered waterfowl species in the world.

On a more positive note, the broods observed were the first signs of successful breeding in two years (USFWS unpubl. data). It is possible that the species has in fact come to the end of a "starvation event", and a recovery will now begin.

**Action taken and further recommendations**

The USFWS are currently conducting research into the cause(s) of death, brine fly/shrimp ecology, water quality and the possibility of providing supplementary feeding. Although these studies will provide solutions to the current problem, long-term management is required to prevent the Laysan Duck from being continuously threatened by events similar to those causing the present decline. Refuge staff are also conducting a programme to control *Cenchrus echinatus*, an introduced grass that threatens the nesting habitat of the duck.

The USFWS are examining the possibility of translocating ducks to alternative, suitable islands. Using sub-fossil evidence, the possibility that the species once inhabited the islands of Hawaii (R. Fleischer in prep.) and Maui (S. Olson in prep.), is currently under research. Potential islands should be carefully assessed for suitability. For example, there should be standing water, no ground predators and adequate feeding and nesting habitat. Prior to release, the risk of hybridization with Koloa and feral Mallard *Anas platyrhynchos* should be considered, the impact of the duck on the island’s ecosystem should also be assessed, and birds for translocation should be studied to determine a) what problems may be encountered and b) how adaptable the species might be to new habitats, food items, and predators.

The Laysan Duck’s existence is a precarious one which requires immediate conservation action. New, alternative populations would act as insurance against future disasters, thereby ensuring that extinction is prevented.

**Acknowledgments**

We would like to thank Elizabeth Flint, Thierry Work, Jon Giffin, Ken McDermond, Karen Rosa and Brooks Harper for their up-to-date information and comments on the text.

**References**


**TWRG SPECIAL PUBLICATION NO.1: SCALY-SIDED MERGANSER**

**Barry Hughes & Janet Hunter** (Eds.), The Wildfowl & Wetlands Trust, Slimbridge, Gloucester, GL2 7BT, UK.

The Scaly-sided Merganser *Mergus squamatus*, which has an estimated world population of around 1200 pairs, is recognised by the Threatened Waterfowl Research Group as "vulnerable" according to the latest IUCN and Birdlife International criteria for threatened taxa. The world population of this intriguing yet relatively little known species is still declining mainly owing to man’s influence through habitat destruction, persecution and disturbance. Consequently, the future of the species can only be assured through determined conservation action in the Scaly-sided Merganser’s strongholds of Russia and China.

Man began to intrude into Scaly-sided Merganser breeding habitat in Russia during the 1960s and 1970s. Despite the consequential declines in the breeding population, the rate of decline appears to have slowed in the last ten years. This is due in part to the actions of the Russian authorities; creation of reserve belts of forest along the Iman River and the cancellation of a proposed logging programme in the upper reaches of the Bikin River. While such actions are encouraging, plans for a hydro-electric dam on the Iman now seriously threaten the Scaly-sided Merganser in that area. Whilst recognising the need for economic development, Russian scientists are now calling for the creation of nature reserves on the Bikin and Iman Rivers to safeguard the unique habitat and the many endangered species which occur there, including Blakiston’s Fish Owl *Eupha blakistoni*, Rock Capercaillie *Tetrao urogallus* and of course the Scaly-sided Merganser. The TWRG wholly supports this course of action.

In China the situation appears to be bleaker. Here the breeding population, thought to be no more than 200 pairs, is still declining through habitat destruction and persecution. Breeding birds have now disappeared from much of their previous range and there are only a small number of reserves which afford the species any protection. Although some birds are known to winter on the lower reaches of rivers in the south of the Far East of Russia, most of the world population is
thought to winter in central and southern China. The exact whereabouts of the vast majority of these birds is, however, still unknown. The identification and protection of these wintering areas must be an immediate conservation priority for Chinese scientists.

Following an expedition by The Wildfowl & Wetlands Trust (WWT) to the Russian Far East in 1991 (Hughes 1991), a number of Russian and Chinese scientists agreed to submit papers on the Scaly-sided Merganser to WWT for publication. These are being published as the TWRG Special Publication No. 1, which represents the first collection of papers on Scaly-sided Mergansers ever published in western literature. The aim is to publicise the plight of the Scaly-sided Merganser in the hope that it will encourage conservationists to fight for effective conservation measures for the species. A review paper on the global conservation status and distribution of the Scaly-sided Merganser is now in preparation at WWT. To help with this review, we appeal to TWRG members of the TWRG within the species' range to bring to our attention any new threats now faced by the species.

The TWRG Special Publication No. 1 has been distributed to members of the TWRG within the range of the Scaly-sided Merganser. Anyone else requiring a copy (free of charge) should write to the editors at The Wildfowl & Wetlands Trust.

References

MARBLED TEAL IN MURCIA REGION
(SOUTH-EASTERN SPAIN)

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G.A. Ballesteros & E. Martínez. AMBIENTAL, González Adalid 11, 30001- Murcia, Spain.

The only record of the Marbled Teal Marmaronetta angustirostris in Murcia during the past century is found in Guirao 1859, who reported it as a rare species, though usually seen in small rivers and marshy areas.

Marbled Teal were not recorded in the Murcia Region until 1972. From 1986 onwards, numbers of records started to increase. This may have been due to a) greater coverage and effort by field ornithologists, b) the creation of an autochthonous regional population, probably originating in the nearby Southern Alicante breeding nucleus, or c) a combination of both factors.

Of all known records, only one refers clearly to wintering birds (January 1978, Ena & Purroy 1982). Of the remainder, 35% belong to the post-breeding period (August-October) and most (62%) to the pre-breeding and nesting period (April-June). The largest group seen was 15 birds (January 1978), and the mean number recorded was 3.7 birds.

Most records have occurred in the Mar Menor area, at the following sites: Playa de la Hita (11 records), Salinas de San Pedro del Pinatar (8), Marina del Carmolí (3) and Los Urrutias Sewage Treatment Plant (1). It should be noted, however, that besides the preferences of the species, the unequal survey effort can have some effect on distribution. Outside this area there are two further records, both in August, Cabezo Beaza Sewage Treatment Plant and Rambla de las Moreras.

In the Murcia Region, Marbled Teal seem to use mainly saline wetlands (14-22 g/l) that are usually very shallow and have dense, emergent vegetation. The presence of vegetation interspersed with water seems a critical requirement. The composition can vary (halophytic scrub, reedbed or a mixture of both), provided vegetation height and coverage give visual protection and opportunities to hide. Less frequently, it also uses other habitat types, like sewage pools (Los Urrutias, Cabezo Beaza), flooded littoral plains (Marina del Carmolí) and pools between dunes and pinewoods (Salinas de San Pedro del Pinatar). Sites markedly influenced by marine water, like the Mar Menor lagoon itself (41 g/l) and some ponds in the Salinas de San Pedro (54 g/l), seem to be used by Marbled Teal only occasionally and never for long periods. In these places they probably seek refuge and/or food during events of heavy disturbance (frequent passage of people, salt production works, etc).

Currently, there is no direct evidence of breeding (nests or ducklings) by Marbled Teal in the Murcia Region, though some pairs and individuals from the Southern Alicante population, or birds in transit between this area and the Marismas del Guadalquivir or North Africa have been seen. Whatever their origin, breeding in the Mar Menor area probably will happen regularly if habitat conditions are improved. In fact, colonisation of the pools at El Ejido (Almería), a wetland recently created by human activities, where Marbled teal bred in 1993 and 1994, supports this hypothesis. The protection of the Mar Menor shore wetlands, along with the conservation, restoration and improvement of habitat, and the cessation of human disturbance, will favour establishment of Marbled Teal there. A wetland conservation project with these aims, presently developed by the regional environmental authority with financial support from the European Union, is becoming a key instrument for the species’ recovery in the Murcia Region.

Acknowledgements
Ambiental S.L., Pedro García, Angel Guardiola, Grupo Naturalista Mar Menor and Alejandro Romero supplied us with unpublished species records in the Murcia Region.

References
PRIMER REUNIÓN SOBRE LA CERCETA
PARDILLA


Los días 19 y 20 de marzo de 1994 se ha celebrado la PRIMER REUNIÓN SOBRE LA CERCETA PARDILLA Marrrnonetta angustirostris en el Parc Natural de s‘Albufera de Mallorca, España, convocada por la Dirección General de Estructuras Agrarias y Medio Natural del Gobierno Balear. Se reunieron 15 ornitólogos, gestores de la Naturaleza y avicultores interesados en la especie.

En la reunión se concretó un pliego de conclusiones y recomendaciones, que pasamos a referir de forma resumida.

- En España urge la aprobación y aplicación de planes de recuperación de la Cerceta Pardilla actualizados en las Comunidades Autónomas incluidas en su área de distribución, debiendo preverse un mecanismo de coordinación entre ellos.

- Es necesario incrementar los conocimientos biológicos y ecológicos de la especie en el área mediterráneo-occidental, además de la determinación de la distancia genética entre esta población y la mediterráneo-oriental.

- La reproducción en cautividad de la especie en nuestra área debe de hacerse con aves de claro origen ibérico y con las máximas garantías sanitarias. Se establece un plan de sustitución de las aves de origen incierto en poder de los avicultores interesados a partir de ejemplares de origen conocido de tres centros españoles (la coordinación se lleva a cabo desde el Parc Natural de s‘Albufera de Mallorca).

- En el caso de que se efectúen liberaciones en el futuro -siempre que se consideren justificadas y favorables-, se desarrollarán en el marco de la coordinación antes referida y bajo los auspicios de los criterios UICN sobre traslocaciones de organismos.

THE NENE RECOVERY INITIATIVE - UPDATE

Janet Hunter & Jeff Black, The Wildfowl & Wetlands Trust, Slimbridge, Gloucester, GL2 7BT, UK

It is three years now since the last report on the Nene (Branta sandvicensis) Recovery Initiative was published in this newsletter (Black 1991a). A lot has happened during that time. Three field seasons (1991/92/93) in Hawaii produced data on nesting behaviour, nesting success, feeding behaviour, nocturnal behaviour, activity budgets, and diet. Analyses of dispersion and survival after release, a study of diseases and parasites in wild Nene and an analysis of genetic variability were carried out. The outcome of these studies is that managers in Hawaii are now being asked to radically rethink their strategies for Nene management if the species is ever to become self-sustaining in the wild. This report summarises the three projects completed last year, reviews the criteria for reintroduction and gives an insight into plans for the future.

Study 1: Survival and movements of released Hawaiian Geese

When the first releases of Nene were made, as few as 30 birds remained in the upland lava flows of Mauna Loa and Mauna Kea on Hawaii Island. They were, at that time, already extinct on the other islands. Since 1960, over 2000 captive-reared Nene have been released into the wild with the aim of restocking the remaining, wild population. It was assumed that the high elevation sites at which the remaining population was found was the habitat they preferred and so releases were made at these sites. Following the recent report by Black, Marshall & Gilburn (1993), there is now great concern over whether release at upland sites gives the birds the best chances of survival.

Adult Nene released at upland sites during the 1960s had an annual mortality rate of between 5% and 16%, an appropriate level for geese. However, during the drought years of 1976-1983 most birds (ca. 1000) died. The few birds that survived were the ones that migrated to areas of managed pasture land and/or areas with supplementary feeders and water. The relative tendency for Nene to migrate to these areas was apparently related to the distance to them. Once birds had migrated to pasture land they rarely moved back to the release site. Nene, like most other geese in the world, prefer and are making use of habitats that are managed by humans, to fulfil their daily/annual energetic requirements.

Over the past 30 years of restocking, it has been the ability of a small percentage of released birds to migrate from upland release sites to grasslands that has prevented the extinction of Nene in the wild.

Study 2: Foraging performance of Hawaiian Geese

In order to find out what factors are limiting the survival of released Nene, one of the questions asked was: are Nene, which are released into the wild, gaining adequate food resources for reproduction and survival? Nene were studied over two breeding seasons (1991/92 and 1992/93) and one non-breeding season (summer 1992) at two sites: Volcanoes National Park on Hawaii and Haleakala National Park on Maui (Black et al. 1994).

The Nene fed on 31 plant species; grasses predominated in most seasons, while berries were favoured during incubation. The relative amount of these foods in the diet varied between sexes, bird-class, area and date. Variation in breeding success within and between sub-populations was determined probably by local climate and subsequent plant phenology. We observed a seasonal decline in food quality and density, i.e. a decreasing protein content in grasses, a decline in density of grass seedheads and a decline in water content and density of berries. It is likely that this seasonal pattern restricts the period Nene have available for breeding, just as the spring flush of plant growth delimits the time for reproduction in arctic-breeding geese. At the Volcanoes study site, some of the
breeding pairs supplemented their berry diet by flying to grassland at some distance from the nest; at Haleakala, all incubating pairs used pastures. We argue that in order to save the goose, managers will have to employ a prolonged, intensive hands-on approach to management, by removing predators and creating and sustaining high-quality grassland habitats well into the future. Refuges should be located near to natural scrubland nesting habitat, as geese in these areas will continue to utilise the full range of foraging skills that characterise the species.

Table 1. Daily dry matter and energy intake per day by sex and breeding status. Values for non-breeders and breeding males are excluding night feeding.

<table>
<thead>
<tr>
<th>Social class</th>
<th>Time forag. (min)</th>
<th>Dry matter (g)</th>
<th>Energy intake (kJ)</th>
<th>Surplus/deficit (kJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volcanoes breeders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>48</td>
<td>37.5</td>
<td>295</td>
<td>-705</td>
</tr>
<tr>
<td>Males</td>
<td>119</td>
<td>97</td>
<td>756</td>
<td>-324</td>
</tr>
<tr>
<td>Haleakala breeders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>53</td>
<td>54</td>
<td>302</td>
<td>-698</td>
</tr>
<tr>
<td>Males</td>
<td>281</td>
<td>283</td>
<td>1585</td>
<td>+505</td>
</tr>
<tr>
<td>Volcanoes non-breeders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>240</td>
<td>72</td>
<td>418</td>
<td>-582</td>
</tr>
<tr>
<td>Males</td>
<td>157</td>
<td>47</td>
<td>273</td>
<td>-807</td>
</tr>
<tr>
<td>Haleakala non-breeders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>415</td>
<td>417</td>
<td>1835</td>
<td>+835</td>
</tr>
<tr>
<td>Males</td>
<td>226</td>
<td>227</td>
<td>999</td>
<td>-81</td>
</tr>
</tbody>
</table>

From Black et al. (1994)

Figure 1. Weight change in four female Nene during the 1993 breeding season at Slimbridge.

Study 3: Parasites and Disease
The risk of infecting a susceptible wild population with a disease that originates from captive stock is a serious concern and certainly applicable to the Nene. For years, game managers in Hawaii have been releasing many species of quail, grouse and pheasants which are known to carry parasites. Nene living in the same area may be at risk from transferred infection. A study designed to test the hypothesis: parasitic infection is limiting the productivity and survival of released Hawaiian Geese, was carried out (Bailey & Black 1994). Faecal samples, blood samples and general body condition were examined for evidence of parasites.

If the hypothesis held true we would expect to find heavy parasite infection, however, few of the 107 Nene examined were found to be infected with nematode and/or cestode eggs. Six species of endoparasite were identified and coccidian oocysts were counted in the samples. There was no significant difference in the number of nematode and/or cestode eggs detected between free-ranging and captive Nene. Although the hypothesis cannot be completely rejected by such a limited field survey, the low levels of infection suggest that parasites are not limiting Nene productivity and survival. However, managers should remain vigilant as parasite infection is known to fluctuate on both seasonal and annual cycles (Davis et al. 1977), and infection in lightly infected geese may have gone undetected.

Nene tend to congregate on pasture land to obtain sufficient nutrient reserves for breeding (Black 1992). Where many geese are utilising a small area of pasture the concentration of parasite eggs deposited may increase. Parasite eggs can be transferred to the grass that Nene and game birds are utilising, thus spreading infection. By providing larger feeding areas, so that bird density is reduced, and/or by mowing overgrown pastures to make more food available, the chances of parasitic infection could be reduced.

Avian pox has been recorded in Nene in Haleakala crater and on the Big Island. There is concern that, if goslings are released in areas where blood parasites are present in local avifauna, there may be more risk of infection. The University of Hawaii is working on a serological test for both avian pox and avian malaria and it may be possible to adapt this test for use on Nene in the future.

Conclusions
The above three studies suggest that future management/release efforts would benefit by incorporating the concept of managing grasslands for Nene. Enclosing pastures inside predator-proof fences may enable the geese to devote more time to foraging and less time to scanning the environment. Larger areas of managed pasture, mowed or grazed by livestock, would increase the availability of high quality grass and lower the risk of parasitic infection by reducing parasite egg density in the grass.

In the light of the above studies, and by considering the assessment criteria that are now available for reintroduction programmes (Black 1991b, Kleiman et al. 1994), it is possible to identify priorities for the next phase of the Nene recovery programme. See Black (in press) for more detailed information.

Black (1991b) and Kleiman et al. (1994) recommend that reintroduction or translocation of endangered species is most appropriate when all feasibility criteria are met. Apparently, with the information that was available in the 1960s most of the 13 criteria were met and reintroduction was appropriate for
the Nene at that time (Table 2). During the 1960s, managers were uncertain whether the environmental criteria (ie. habitat and predators) were problematic. The one criterion that was not met, reintroduction technology, was refined during the project. The major criticism of the original programme would perhaps be that managers failed to direct sufficient priority and funding toward detailed monitoring of the behaviour and ecology of the birds after release, and analyses of existing data (see Banko & Elder 1990).

Table 2. An assessment of the criteria for reintroduction/translocation of Nene from past and current perspectives (scale: 5 is best).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1960s</th>
<th>1990s</th>
<th>Comments/Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition of species</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Need to augment wild population</td>
<td>Yes</td>
<td>Yes</td>
<td>Still declining</td>
</tr>
<tr>
<td>2 Available stock</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3 No jeopardy to wild population</td>
<td>?</td>
<td>?</td>
<td>Improved/best available</td>
</tr>
<tr>
<td>Environmental conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Causes of decline removed</td>
<td>Yes</td>
<td>No</td>
<td>New evidence</td>
</tr>
<tr>
<td>5 Sufficient protected habitat</td>
<td>Yes</td>
<td>No</td>
<td>New evidence</td>
</tr>
<tr>
<td>6 Unsuatrated habitat</td>
<td>Yes</td>
<td>No</td>
<td>New evidence</td>
</tr>
<tr>
<td>Biopolitical conditions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 No negative impact for locals</td>
<td>No</td>
<td>No</td>
<td>Could benefit</td>
</tr>
<tr>
<td>8 Community support exists</td>
<td>1</td>
<td>4</td>
<td>Education needed</td>
</tr>
<tr>
<td>9 GOs/NGOs supportive/involved</td>
<td>Yes</td>
<td>Yes</td>
<td>Improving</td>
</tr>
<tr>
<td>10 Conformity with all laws/regulations</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Biological and other resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Reintroduction technology known or in development</td>
<td>Yes</td>
<td>Yes</td>
<td>Still refining</td>
</tr>
<tr>
<td>12 Knowledge of species' biology/ ecology</td>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>13 Sufficient resources exist for programme</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

Recommended reintroduction/translocation? | Yes | No | Habitat enhancement, predator control and optimise genetic diversity.

With current information in the 1990s, the criteria for reintroduction are clearly not met (Table 2). A major obstacle is that the cause of the species' decline has not been removed and sufficient managed habitat is not available. In fact, there is evidence that some foraging and nesting areas are already saturated, even though Nene numbers are critically low (Black et al. 1994). Based on these criteria, therefore, the reintroduction/translocation method would not be advised until suitable habitat is established and predators are removed.

Despite problems with the initial reintroductions, after 45 years of Nene recovery efforts a wild population still exists and has increased from 30 to 600 individuals. In effect extinction has been postponed, giving managers a chance to address the problems that have been highlighted by the ecology and behaviour research.

References

DISTRIBUCION ACTUAL DE LA MALVASÍA EN ESPAÑA
José Mª Ayala Moreno, Apartado 3006, 14080-Cordoba, España.

Summary
By 1976, the Spanish population of the White-headed Duck Oxyura leucocephala had declined to a minimum of 22 individuals, but has since recovered to a maximum of 786 (1992 counts). During this time the species has recolonised former wetland habitats and settled in some new ones. The distribution of the species in Spain before and since 1983 is described, based on an exhaustive literature review.

Desde que en el año 1976 se registrara el mínimo de la población ibérica de malvasía (Oxyura leucocephala), tan sólo 22 individuos (Amat y García 1979), la misma ha ido evolucionando de forma positiva, con algunas fluctuaciones, hasta alcanzar un máximo de 786 aves en el año 1992 (A.M.A. - Junta de Andalucía, 1993). Este incremento progresivo ha
propiciado la recolonización de antiguos humedales, así como la colonización de otros nuevos, algunos de los cuales se han convertido en hábitats claves para la supervivencia de la especie. Dado que el área que ocupa *Oxyura leucocephala* en España es bastante amplio (Fig 1), vamos a distinguir 4 zonas que desarrollamos con más detalle según los datos obtenidos durante el decenio 1983-1993.

**Zona A / Zone A**
Este zona ocupa la mayor parte de Andalucía, correspondiendo a las provincias de Cádiz, Córdoba, Jaén, Huelva, Málaga y Sevilla. La importancia que habían adquirido los humedales del Sur de Córdoba (Lagunas de Zóñar, Rincón y Amarga y el Embalse de Malpasillo) ha quedado relegada a un segundo plano, volviendo a adquirir importancia las Marismas del Guadalquivir, lagunas gaditanas (Medina, Complejo Endorreico de Esparta y laguna Salada del Puerto de Santa María) y humedales de Sevilla (Lagunas del Taraje y Gosque y el Embalse de la Coronela). Durante este periodo la nidificación se ha producido de nuevo en las marismas del Guadalquivir (Lucio de las Nuevas, Caño Traveso y Laguna de Santa Olalla) (Clarita 1986, Raya y Sanchez 1987) y lo ha hecho por primera vez en humedales de la provincia de Málaga (Lagunas de Fuente de Piedra, Dulce de Campillos y Capacete) (Alba et al. 1990, Ramirez et al. 1992) y en la provincia de Jaén (Laguna Honda) (Ordoñez 1989).

**Zona B / Zone B**
Corresponde íntegramente a la provincia de Almería, concretamente a la comarca del Poniente Almeriense. Desde la primera observación realizada en las Albuferas de Adra en el año 1984 (Cañada et al. 1985) la especie ha colonizado y nidificado en los siguientes humedales: Salinas de Cerrillos y Viejas (Charcón del Hornillo) (Matamala y Lopez Martos 1991) y Cañada de las Norias (Lopez y Matamala 1993). Esta zona se ha constituido de vital importancia para la especie tal y como lo demuestra el hecho de que en 1993 han nacido el 82,2% del total de los pollos nacidos en España.

**Zona C / Zone C**
Esta zona corresponde a la denominada "Mancha Húmeda" y sur de la provincia de Madrid. La malvasfa ha sido observada en distintos humedales entre los que sobresalen los Charcones de Miguel Esteban, la Laguna de Pedro Muñoz y la Dehesa de Monreal (Esparvel 1993). Este último es un humedal artificial para uso cinegético y en todos se ha reproducido (Jimenez 1991, 1993). Curiosamente en la Dehesa de Monreal nacieron en 1993 el 11,2% del total de los pollos. Sin embargo como contrapartida, al ser un humedal artificial para uso cinegético, durante el mismo año fueron abatidas al menos 11 malvasfas (Pereira, P. y Raya, C. com. pers.).

**Zona D / Zone D**
En esta zona se incluye Alicante y Baleares. En Alicante sobresale el Embalse del Hondo (Elche), donde se reprodujo por primera vez en 1991 (Navarro y Segui, 1991). En cuanto a Baleares, aunque según Joan Mayol indica que ya estaba presente en Mallorca en 1784, no había sido observada recientemente. En el año 1993 se procedió a liberar un núcleo de 31 individuos en S’Albufera, procedente del Plan de Cría en Cautividad que está desarrollando el ICONA en el Parque Nacional de Doñana y que tan buenos resultados está dando (Pereira, P. com. pers.). De este núcleo han sido observados 7 individuos durante los meses de agosto y octubre de 1993 (A.M.A. - Junta de Andalucía, 1994.)

**Figura 1 Mapa de distribución de O. leucocephala en España.** El área que ocupa está punejada y a su subdividida en 4 zonas. A (más A')-B-C-D, con las localidades de observación numeradas según las provincias a las que correspondan. [Distribution of O. leucocephala in Spain. The range is shaded and divided into 4 zones. A(plus A')-B-C-D. The provinces are indicated by 2-3 capital letters (eg. HV=Huelva), and precise locations with numbered dots.]
Tabla 1. Relación numérica y nominal de los lugares en los que se observa o se ha observado *O. leucocephala*, que se corresponde con la numeración del mapa de la Fig. 1.
[List of sites where *O. leucocephala* has been recorded, corresponding to the zones, provinces and numbers shown in Fig. 1]

** Se ha reproducido durante el decenio 1983-1993 [Bred in 1983-1993]
*** Observada con anterioridad a 1983 [Observed before 1983]

Zona A / Zone A

Huelva (HU)

1. La Redondela *
2. Marismas del Odiel *
3. Laguna de Palos ***
4. Estero de Domingo el Rubio *
5. Laguna de las Madres ***

(A'): Marismas del Guadalquivir (HU, SE y CA)

6. Complejo de El Abalarío:
   - Laguna del Alamillo ***
   - Cazales ***

7. Laguna del Huerto *
8. Laguna del Acebuche *
9. Charco del Toro ***
10. Laguna Dulce ***
11. Laguna del Taraje ***
12. Laguna del Sopetón ***
13. Laguna de Sarita Olalla **
13'. Lucio del Bolín ***
14. Lucio de Maltiempo *
15. Marismas de Hinojos ***
16. Lucio de Vetaelugua *
17. Guadianar encauzado *
18. Lucio de los Anzares **
19. Lucio de Mari López ***
20. Caño Travesio **
21. Lucio del Cangreo Grande *
22. Las Gavetas *
23. Río viejo ***
24. Dehesa de Abajo *
25. Laguna del Tarelo **
26. Marismas de Sanlúcar *

Sevilla (SE)

27. Laguna de Arjona **
28. Embalse Torre de Aguila *
29. Complejo Endorreico de Lebrjia-Las-Cabezas **
   (Lagunas de la Galiana, Cigarrera, de la Peña, del Pilón y del Taraje)
30. Embalse de la Coronela *
31. Laguna de Gosque *

Cadiz (CA)

32. Complejo Endorreico del Puerto de Santa María **
   (Lagunas Salada y Chica)
33. Laguna de las Canteras *
34. Complejo Endorreico de Chiclana *

(Lagunas de Jeli y Montellano)
35. Costa de Tarifa ***
36. Complejo Endorreico de Puerto real *
   (Lagunas del Taraje y Comisario)
37. Laguna de Medina **
38. Laguna de los Tollos *
39. Embalse de Bornos ***
40. Embalse de Arco de la Frontera ***
41. Complejo Endorreico de Espera **
   (Lagunas Hondilla y Dulce y Salada de la Zorrilla)

Malaga (MA)

42. Los Prados ***
43. Laguna de Fuente de Piedra **
44. Laguna Dulce de Campillos *
45. Laguna de Capacete **
46. Laguna de la Rata *
47. Desembocadura del Río Guadalhorce *
48. Embalse de La Viñuela *

Cordoba (CO)

49. Embalse de Cordobilla *
50. Embalse de Malpasillo *
51. Laguna de los Jarales *
52. Laguna Amarga *
53. Embalse del río Lucena *
54. Laguna de Zónar *
55. Laguna del Rincón **
56. Laguna de Tiscar *

Jaen (JA)

57. Laguna Honda **
58. Laguna Grande ***
59. Embalse Puente de la Cerrada *

Zona B / Zone B

Almeria (A)

60. Albuferas de Adra **
61. Charcones de Entinas y lagunas del campo de Golf de Almerimar **
62. Salinas de Cerrillos y Vielás *
63. Cañada de las Norias **
64. Embalse de Benimar *
65. Desembocadura del río Aguas *

Zona C / Zone C

Ciudad Real (CR)

66. Parque Nacional de las Tablas de Daimiel y Cantera de Zacatena *
67. Laguna de Pedro Muñoz **
68. Laguna de Caracuel ***

Cuenca (CU)

69. Laguna de Manjavacas *
Toledo (TO)

70. Pozo de la Puerta *
71. Laguna de Quero *
72. Lagunas del Taray y Masegar **
73. Laguna Larga de Villacafantas *
74. Laguna de la Albardosa *
75. Dehesa de Monreal **
76. Laguna de Parstrana *

Madrid (MA)

77. Graveras Soto del Parral *
78. Graveras del Jarama *

Zona D / Zone D

Alicante (AL)

79. Embalse del Hondo **
80. Embalse de Poniente *
81. Charca Sur de Levante *

Mallorca (MAL)

82. S'Albufera *

Otras localidades

83. Albufera de Valencia ***
84. San Carlos de la Rapita (Tarragona) ***
85. Delta del Ebro ***
86. Marismas de Santoña (Santander) *

Bibliografía


THE WHITE-WINGED DUCK: AT PHU JONG NAYOY NATIONAL PARK, THAILAND

Troy Hansel, 1112 Cameron Ave., Idaho Falls, Idaho 83402, USA.

The White-winged (Wood) Duck Cairina scutulata formerly had a widespread distribution in south-east Asia with records from India, Bangladesh, Union of Myanmar, Laos, Vietnam, Cambodia, Malaysia, Indonesia, and Thailand (Green 1992, 1993). Since then, this species has severely declined in population size primarily due to extensive habitat loss and increased hunting pressures. One of the largest estimated Thai populations of this species occurs in the forest complex of the Dongrek mountain range (Phu Jong Nayoy N.P., Yot Dom W.S., Kho Phanom Dongrek W.S., Khao Phra Vihan, Huai Sala W.S.). Phu Jong Nayoy National Park is believed to support 10 breeding pairs of White-winged Duck (Parr et al. 1993a & b) making it one of the largest remaining populations (Green 1993).

Phu Jong Nayoy National Park, located in Ubonratchatanı Province, Thailand, forms the emerald triangle along the Lao, Thai, and Cambodian borders (see Parr et al 1993a for map). The park extends from the Lam Dom Yai river in Nam Yun district, northward along the border of Laos to the east of Bunarik district. On June 1, 1987, the National Parks Division of the Royal Forest Department made the forest of Phu Jong Nayoy Thailand’s 53rd national park. The park tries to protect 686 km² of moist evergreen forest in the Dongrek mountain range. However, due to the continued expansion of agricultural lands in the northeast, secure protected areas are rapidly diminishing.

Park personnel often comment on the rapid reduction or disappearance of many important wildlife species such as Hornbills, White-winged Duck, Gaur, Asiatic Elephant, Kouprey. The loss or reduction is due to both hunting and habitat destruction by local people. As with other protected areas around the world, protection must come from a mutual understanding between local people around the park and the personnel within the park.

As a result of surveys organised by The Wildfowl & Wetlands Trust and the Royal Forest Department (Parr et al. 1993a,
1993b), Phu Jong Nayoy N.P. was identified as a key site for White-winged Duck conservation at national and global levels.

Until November 1993, Phu Jong Nayoy N.P. policy had been dictated by past management practices that did not include a public awareness program. However since then, an education programme, designed to help conserve the White-winged Duck population, was planned, developed and funded with help from The Wildfowl & Wetlands Trust. In an effort to conserve vital wildlife habitat within Phu Jong Nayoy National Park, members of Nature Care, a non-government organization in Ubonratchatani, park staff, and students from Ubon University are now extending conservation ideas and principles to local people around the park. This has been done in several ways: four school presentations, seven village trainings and seminars, three youth camps within the park, and the production of public relations materials. So far the most effective method has been village trainings and seminars conducted by the provincial forest office and the local military posts in conjunction with the National Park. The educational materials being presented at these different activities all have a central theme of habitat conservation and species preservation, using the White-winged Duck as a "flagship species" or focal animal (Table 1). Some of these materials have been presented to the Royal Forest Department so they can be used as a "model" for other protected areas throughout Thailand.

### Table 1. Summary of educational materials used in White-winged Duck programme in Phu Jong Nayoy National Park.

<table>
<thead>
<tr>
<th>Public relations material</th>
<th>Distribution and use</th>
<th>Intended audience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Badges</td>
<td>General</td>
<td>1,2,3</td>
</tr>
<tr>
<td>Stickers/Decals</td>
<td>Village trainings and seminars.</td>
<td>3</td>
</tr>
<tr>
<td>Banner</td>
<td>Displayed at Village trainings and seminars.</td>
<td>3</td>
</tr>
<tr>
<td>Silk Screens</td>
<td>T-shirts for park rangers and friends.</td>
<td>3</td>
</tr>
<tr>
<td>Notebooks</td>
<td>Village and school presentations.</td>
<td>1,2</td>
</tr>
<tr>
<td>Comic Books*</td>
<td>Primarily given to school children.</td>
<td>1,3</td>
</tr>
<tr>
<td>District Sign*</td>
<td>Conservation sign built near district buildings.</td>
<td>3</td>
</tr>
</tbody>
</table>

(1) children, (2) adults, (3) general public
* unfinished or in progress

### Goals and Objectives
The objectives of public relation activities are the following:

1. To enhance the cooperation between national park personnel, non-government organizations, and citizens of Ubonratchatani in conserving the forests of Phu Jong Nayoy National Park.

2. Increase the awareness of students, young adults, and parents of school children regarding the importance of habitat conservation, species preservation (White-winged Duck), and a quality environment around their home.

### Future Activities Planned:
1. Continue village presentations and seminars as the opportunity arises.

2. Increase the number of school presentations for the fall of 1994. It is very important to teach the young people of the local community as they will be the future stewards of the forests of Phu Jong Nayoy N.P.

3. During the fall of 1994, a large conservation youth camp will be conducted at Phu Jong Nayoy National Park. This will provide village students an opportunity to explore the forests and to meet students from different schools with similar interests. During the camp, student representatives from each school will be encouraged to create nature clubs in their respective schools.

These public relations activities appear to be well received by the audiences. Phu Jong Nayoy N.P. headquarters has received letters from school children who show genuine concerns for the environment around their homes and the well-being of the White-winged Duck. Many people in the local community show their interest by wearing T-shirts with the White-winged Duck logo printed across the front.

Researchers and natural resource managers need to include the local people as part of the force that will protect conservation areas and endangered species. The survival of Phu Jong Nayoy’s flora and fauna depends on the cooperation of all people.

### References
WHITE-WINGED DUCK SURVIVE IN CENTRAL LAO PDR

T. Evans & R. Timmins, c/o Berkmueller, Box 4340, Vientiane, Lao PDR.

The Nape-Nakai area of the Annamatic Mountains in central Laos is a historic locality for White-winged (Wood) Duck Cairina scutulata, with records from the 1920’s and 1930’s (Green 1992, 1993). During a survey by The Wildlife Conservation Society and staff from the National Office of Nature Conservation and Watershed Management, it was exciting to find that in 1994 White-winged Duck still occur there. They were observed at an elevation of approximately 500m on the Nakai Plateau (17°45’N 105°08’E) which is an area of pine and broad-leaved forest and where several large, sluggish rivers converge.

There were two sightings; a single bird flushed from the lower Nam (River) Xot, and two birds seen loafing together on the middle Nam On. Both rivers are about 20m wide with sandy beds and wooded banks. At two other sites away from any villages, footprints, presumably of White-winged Duck, were found on sandy river banks. Several villagers also reported frequent sightings of White-winged Duck up the Nam On.

In view of the small number of records and the large amount of time spent surveying, it is probable that the population is quite small. However, bearing in mind the rare status of the species, these records are still highly significant.

Limited suitable habitat exists within the newly designated 3500km² Nam Theun National Biodiversity Conservation Area. Most of the sluggish riverine habitat on the Nakai Plateau lies outside the reserve and it is soon to be destroyed by the Nam Theun Hydropsholic Power Project. This project was shelved in the late 1980’s due to environmental concerns, but has since been revived and is expected to be operational by 1999. No Environmental Impact Assessments have been carried out. It is feared that, in addition to the loss of habitat caused by flooding, displaced villagers will move into the reserve, causing further damage. Hence this White-winged Duck population is highly threatened with extinction.

References

REVIEW OF THE DISTRIBUTION OF WHITE-WINGED DUCK IN DOOMDOOMA FOREST DIVISION, ASSAM

Bibhab Kumar Talukdar, Animal Ecology & Wildlife Biology Laboratory, Department of Zoology, Gauhati University, Guwahati - 781 14, Assam, India

Assam, India is one of the most important areas in the whole of South-east Asia for the development of a conservation strategy for the White-winged (Wood) Duck Cairina scutulata (WWD). It includes a number of verified natural habitats. The distribution of WWD in Assam has been described by Green (1992, 1993), Talukdar (1992), Talukdar & Bhattacharjee (1993a, 1993b), Choudhury (1993a, 1993b) and Yahya (1994).

The Doomdooma Forest Division, one of the strongholds of the WWD in Assam, was created by transferring some of the Reserved Forests from Digboi and Dibrugarh Forests Divisions via Govt. of Assam’s Notification No. For. 287/66/110, dt. 09.11.1973 and the boundaries consolidated via Notification No. For. 287/66/118, dt. 18.04.1974. The main emphasis after creation of this division was on plywood timber and the development of plywood industries. The Doomdooma Forest Division was earmarked for raising mainly Dipterocarpus macrocarpa and other plywood plantation species.

At present, the Doomdooma Division comprises of 21 Reserved Forests (RF) situated within the geographical limits of latitude 27°20’N to 28°0’N and longitude 95°15’E to 96°0’E, and lying within the civil district of Tinsukia. Sixteen of the 21 Reserved Forests are situated on the southern side of the division i.e., to the south of the Lohit and Brahmaputra Rivers. The Kundil Kalia, Deopani and Sadiya Station (North Block) Reserved Forest form the inter-state boundary between Assam and Arunachal Pradesh.

The terrain is more or less flat over most of the division, especially towards the south of Brahmaputra river. The tract is intersected by streams and swamps which provide resting and feeding sites for WWD. The terrain on the north bank of the Brahmaputra river is also level but rises gradually towards the north. This is intersected by a large number of streams which result in the formation of vast sandy tracts. The altitude of the Reserved Forests in Doomdooma Division varies from 100m to 180m. The Doomdooma Forests Division is in a zone of high humidity, characterised by high precipitation and lowered temperatures which are caused by frequent showers and thunder storms. Annual rainfall is 2200-3000mm. Average temperature has a maximum of 38°C and a minimum of 5°C. Relative humidity is 65-95%.

Doomdooma RF, Dangori RF, Kumsong RF, Hakhati RF, Phillobari RF, Kakojan RF and Duamara RF are important for WWD conservation in the Doomdooma Forest Division (Table 1). The Doomdooma RF, Dangori RF and Phillobari RF can be included as Priority I areas for the WWD conservation and protection, while the Kumsong RF, Kakojan RF, Duamara RF and Hakhati RF can be included as Priority II. However, although of high priority, most of the RF boundaries in Doomdooma Division are not properly maintained. Around 8-
10% of the RF areas in the division is under human encroachment.

Table 1. The status of White-winged Duck in the forests of Doomdooma Division of Assam.

<table>
<thead>
<tr>
<th>Reserve Forest</th>
<th>Area km²</th>
<th>WWD status</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saikhowa Hakhati</td>
<td>6.71</td>
<td>1</td>
<td>May visit from adjoining Kumjong RF. Human encroachment. Robi plantation inside RF.</td>
</tr>
<tr>
<td>Kumasong</td>
<td>22.52</td>
<td></td>
<td>Human encroachment.</td>
</tr>
<tr>
<td>Mesaki</td>
<td>13.66</td>
<td>0</td>
<td>Degraded.</td>
</tr>
<tr>
<td>Kakopathar Doomdooma</td>
<td>28.80</td>
<td>3</td>
<td>Karif crops are being illegally planted.</td>
</tr>
<tr>
<td>Doomdooma Tokowani</td>
<td>5.03</td>
<td>0</td>
<td>Known population of 6-8.</td>
</tr>
<tr>
<td>Phillobari</td>
<td>3.18</td>
<td>2</td>
<td>Removal of trees continues.</td>
</tr>
<tr>
<td>Kakojan</td>
<td>23.46</td>
<td>2</td>
<td>No records of WWD.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Visited by WWD.</td>
</tr>
<tr>
<td>Naloni Hollonghabi</td>
<td>5.20</td>
<td>1</td>
<td>Felling continues. Disturbed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khatangpani Duarsama</td>
<td>6.53</td>
<td>1</td>
<td>2 seen in 1990-91. Disturbance by felling.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tarani Buridebing (Nth. Block)</td>
<td>20.39</td>
<td>0</td>
<td>No records.</td>
</tr>
<tr>
<td></td>
<td>15.17</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Buridebing (Sth. Block)</td>
<td>7.78</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Lukai-pathar</td>
<td>1.05</td>
<td>0</td>
</tr>
<tr>
<td>Sadiya Kukurmara</td>
<td>3.65</td>
<td>0</td>
<td>No records.</td>
</tr>
<tr>
<td>Hollogaon</td>
<td>3.71</td>
<td>0</td>
<td>No records.</td>
</tr>
<tr>
<td>Sadiya Sni (Wst. Block)</td>
<td>5.41</td>
<td>0</td>
<td>No records.</td>
</tr>
<tr>
<td>Sadiya Sni (Nth. Block)</td>
<td>23.31</td>
<td>0</td>
<td>No records. New plantations.</td>
</tr>
<tr>
<td>Kundil Kalia</td>
<td>72.84</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Deopani</td>
<td>15.20</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

Key to Status:
3 = good numbers (8-20 WWD), 2 = fewer numbers (3-8 WWD), 1 = very rare (1-3 WWD), 0 = no records for last 10 years, ? = no information.

Based on vegetation composition, the Division can be broadly classified into two forest types. The first type is Hollong-Nahor forests, commonly known as Upper Assam Dipterocarpus Mesua Forest, which has been classified as Assam Valley Tropical Wet Evergreen Forest (Champion & Seth, 1968). These forests extend from Doomdooma and Dangori RFs of Doomdooma Division, in the east, towards the Jaiapore RF of Dibrugarh Division in the west. These forests are well represented in Tarani RF, Kakojan RF, Buridebing RF and Duarmara RF. The forest is composed of several canopy layers. The top layer is dominated almost entirely by Hollong Dipterocarpus macrocarpa with a height of up to 50m. The middle canopy is dominated by Nahor Mesua ferra. Both Hollong and Nahor saplings are found all over the forest floor. Both species provide nesting sites for WWD.

The second type of forest is termed Miscellaneous. The Miscellaneous forests can be divided into sub-types: (a) Mixed Deciduous Forests and (b) Mixed Deciduous Forests with evergreen patches. These forest types are best represented in the reserve forests situated on the northern portion of the division, towards north to the Dangori RF, and fall into categories 3/IS2 and 4D/SSI of Champion and Seth (1968). The RFs of these types are Kumsong, Mesaki, Kundil Kalia, Deopani, Sadiya Station, Kukurmara, Hollongaon, Lokai-pathar, Tarani and Kakojan. Nahor is predominant in the top canopy.

One of the greatest set-backs in the conservation and protection of WWD in these forests, is that almost all the RFs of Doomdooma Division has been selected for felling by the Assam Forest Department. WWD are sporadically found in at least eight RFs in the Division, hence the whole forest belt of the Division is important for the long term survival of WWD in the wild.

Recommendations
1) The boundary posts of RFs should be marked properly to reduce encroachment.
2) Felling activities of the Forest Department in the RFs of Doomdooma Division must be regulated. No further felling should be allowed, in the areas where WWD are regularly sighted.
3) Before felling a tree, the Forest Department must be sure that no WWD are nesting in that tree.
4) Doomdooma RF should be declared as a Wildlife Sanctuary, to conserve and protect the WWD and its habitat.
5) The Dangori and Phillobari RF should be protected under the Wildlife Protection Act, 1972.
6) Humans encroaching on the RFs areas should be evicted immediately.
7) Awareness programmes in the adjoining forest areas under the Doomdooma Division should be launched.

References
Champion, H.G. and Seth, S.K. 1968. A revised survey of the forest types of India. New Delhi: Govt. of India.
STATUS OF FERRUGINOUS DUCK IN SAUDI ARABIA


The Ferruginous Duck Aythya nyroca is listed as a globally threatened species by the TWRG and BirdLife International. Though reported uncommon and irregular in Saudi Arabia in earlier years (Jennings 1981), it is now seen more regularly (Stagg 1987). This could be due to the large scale alteration of desert habitat caused by recent irrigation projects. Several man-made wetlands now occur and seemingly unlikely bird species can be seen. A few species have even settled to breed. Since 1984, 30 new species have been recorded breeding (Jennings 1992).

The Ferruginous Duck is now frequently seen in some numbers around Riyadh and has been reported to be breeding within Saudi Arabia (Jennings pers. comm.). Recently I have recorded this duck on two occasions in Wadi Al-Hair near Riyadh. On the 12th of February 1994, I saw three birds feeding in the marsh near Dam Site and again one pair on the 14th of April, wading though open water with Garnaney Anas querquedula.

However, the Ferruginous Duck is declining elsewhere. Though regarded as common in earlier years (Ali & Ripley 1968) the population of this bird is declining in India. While around 1980-82 (Ali et al. 1981) I used to ring them in good numbers in at Bharatpur (Rajasthan) and in Hanake (Punjab) but now they are rarely seen Bharatpur and only occasionally at other places. The causes of its decline and remedial measures should be ascertained as soon as possible.

References

CALL FOR ASSISTANCE - NETTAPUS RESEARCH AT WILDLIFE CONSERVATION PARK / BRONX ZOO, U.S.A.

Douglas M. Piekars, Dept. of Ornithology, Wildlife Conservation Society, WCP / Bronx Zoo, 185th St. & Southern Blvd., Bronx, NY 10460 U.S.A.

Currently we are undertaking a survey of captive husbandry for the genus Nettapus (Pygmy Geese). Those collections who report to ISIS will automatically be receiving a copy of the survey, however we would like to include all who would be willing to participate. The survey results and data from the research project will be combined and published in a Nettapus Husbandry Manual. Anyone who participates in the survey will automatically receive a copy of this manual free, upon its completion.
If you keep Pygmy Geese and would like to participate in the survey, please telephone the department secretary, Paula Young, on +1 718 220 5154 to request a copy of the survey, or write to The Nettapus Husbandry Service, c/o D. Piekarz at the above address.

Over the last four years an intensive, cooperative husbandry and behavioral research project has been focusing on the African Pygmy Goose *Nettapus auritus* at the Wildlife Conservation Park, Bronx Zoo. Thus far, several case studies regarding micro-habitat preference, exhibit utilization and activity pattern analysis have been completed. A preliminary ethogram for the Indian Pygmy Goose or Cotton teal *Nettapus coromandelianus coromandelianus* is nearly complete. Two other North American collections have collaborated to produce case studies. These are the Central Park Wildlife Conservation Centre and Sea World of Florida.

We would also be interested in hearing from anyone in the field who could help with gathering information on *Nettapus* species in nature. *Nettapus auritus* is of particular interest due to the focus of this project.