IWRB Threatened Waterfowl Research Group Newsletter

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No.5, March 1994
EDITORIAL

The IWRB Threatened Waterfowl Research Group was established in October 1990 and is coordinated from The Wildfowl & Wetlands Trust at Slimbridge, UK. It is now officially part of the IUCN Specialist Group network, along with the other IWRB research groups. Since I am currently conducting research into the ecology of Marbled Teal at the Estación Biológica de Doñana, my colleague Janet Hunter has done most of the compilation and editing of this issue of the newsletter. There is currently 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 taxa across the world that are threatened with extinction, to gather and exchange information on these taxa and to assist in their conservation. The TWRG constantly monitors the status of these taxa, and publishes regular reviews in the journal Wildfowl. This fifth issue of the newsletter is being distributed to over 400 people around the world with a special interest in threatened Anseriforms. Anyone else who wishes to receive the newsletter should contact us at the address below.

The articles in this newsletter always bring a mixture of good and bad news. Available funds for conservation projects are very restricted, and we are forced to make a constant stream of difficult choices between which species and which projects to support. Hence the bad news is disappointing, but is immensely valuable since poor results can help us to improve our future conservation planning just as much as good results. For example, the news herein that the decline in the mainland population of Brown Teal continues despite extensive releases from captivity is further evidence that such release programmes are doomed to failure if the causes of the population decline are still active. It also shows that confirmation of breeding of released birds in the wild is no proof of success. Detailed research is usually required to identify ways to eliminate the causes of population decline. Where possible, such research should be undertaken before a population has declined to very low levels as it becomes far more difficult to accurately identify habitat requirements of the significance of different mortality factors when there is only a tiny, dispersed, surviving population to study. This is the situation now facing the Brazilian Merganser. And for this reason it is so encouraging that for the first time research is now underway into the ecology of the West Indian Whistling Duck.

We welcome submissions for future issues of the newsletter on any of the taxa listed below, or on any other taxa that may be globally or at least regionally threatened. The submissions can be in the form of reports on the status of a taxon on a global or local 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 sixth issue of the newsletter, submissions should be sent to the address below by 1 June 1994.

The opinions expressed in the articles in this newsletter are those of the authors, and do not necessarily represent those of the Coordinator, IWRB or WWT. 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.

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TAXA FOR CONSIDERATION BY THE THREATENED WATERFOWL RESEARCH GROUP

Recognising that few data are available on many waterfowl taxa, the following is a preliminary list of those taxa thought to be 'threatened' on the basis of simple quantitative criteria partly related to those of Mace & Lande (1991).

R = Rare taxa, with a world population of less than 100,000, and also under decline. Taxa with stable or increasing populations of more than 10,000 do not qualify.
V = Vulnerable taxa with a world population of 2,500 to 10,000.
E = Endangered taxa with a world population of 250 to 2,500.
C = Critically threatened taxa with a world population of under 250.
Ex = Taxa that are probably extinct.
H = Taxa threatened with elimination by hybridisation with a close relative. Even an abundant taxon could be eliminated by this cause.
* = Subspecies whose validity is in question (Sibley & Monroe 1990). Research is needed to establish which of these are truly differentiated.

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

RAFR
RC
RC
RV
RC
RE
EAST ASIA
Anser cygnoides
Anser erythrophus
Anser fabalis middendorfi
Anser fabalis serrirostris
Tadorna cristata
Cairina scutulata
Anas falcata
Anas formosa
Anas gibberifrons albogularis
Anas gibberifrons gibberifrons
Anas luzonica
Aythya baeri
Polysticta stelleri
Somateria fischeria
Mergus squamatus

NORTH AMERICA
Anser albirostris gambelli
Branta canadensis leucopareia
Branta canadensis occidentalis
Anas rubripes
Anas diaci
Polysticta stelleri
Somateria fischeria
Somateria mollissima sedentaria

References

AUSTRALASIA, EAST INDIES & OCEANIA
Dendrocygna arcuata pygmaea
Branta sandvicensis
Stictonetta naevosa
Cereopsis novae-hollandiae grisea
Hymenolaimus malacorhynchos
Nettapus coromandelianus albipennis
Salvadorina waigensis
Anas aucklandica aucklandica
Anas aucklandica nesiotes
Anas aucklandica chlorotis
Anas superciliosa superciliosa
Anas superciliosa pelewensis
Anas superciliosa rogersi
Anas laysanensis
Anas wyvilliana
Anas platyrhynchos oustedai
Anas georgica georgica
Anas eatoni eatoni
Anas eatoni drygalskii
Aythya australis extima

SOUTH AMERICA & CARIBBEAN
Chauna chavaria
Dendrocygna arboea
Neochen jubatus
Tachyeres leucocephalus
Sarkidiornis melanotos sylvicola
Merganetta armata armata
Merganetta armata columbiana
Merganetta armata leucogenis
Anas cyanoptera tropica
Anas cyanoptera borreroi
Anas bahamensis galapagensis
Anas georgica niceforoi
Anas flavirostris altipetens
Anas flavirostris andium
Netta erythropthalmia erythropthalmia
Mergus octoetaceus
Oxyura jamaicensis andina

PROGRESS IN THE CONSERVATION OF NEW ZEALAND'S THREATENED WATERTOUL

Murray Williams, Department of Conservation, PO Box 10-420, Wellington, New Zealand.

New Zealand has the distinction (if that is what it is) of having five species on the TWRG's list of 'threatened' waterfowl - that's 5 of its 9 extent native species and 5 of the 13 species of waterfowl now breeding in the country. High though this proportion may be, it is not dissimilar to that applying to other avian groups in New Zealand, to its herpetofauna, some insect groups and to various plant families. Like that of other isolated island groups, New Zealand's endemic biota has been savaged by alien species introductions and wholesale landscape changes and, for many species, the prognosis is not especially encouraging.

New Zealand's principal wildlife management agency, the Department of Conservation (established in 1987 by combining the former Wildlife Service and parts of Forest Service and Department of Lands) moved rapidly to establish a series of species recovery plans for threatened biota; presently 15 have been completed and 35 are in draft form. The recovery plan for Blue Duck Hymenolaimus malacorhynchos was the very first to be compiled (Williams 1988), that for the 2 subantarctic species Anas nesiotes and A.aucklandica was published in mid-1993 (McClelland 1993) and the Brown Teal A.chlorotis plan is in final draft stage. Only the 'plight' of Grey Duck A.s.superciliosa has remained unaddressed by this process.

All of the recovery plans have, as their over-riding goal, an improvement in the conservation status of the species. However, each plan has more limited and immediate objectives to be achieved in the 5-year period for which the current version of the plan applies.
Blue Duck

Its recovery plan is now being re-written following the very successful achievement of all objectives of the initial 5-year plan.

The distribution of the species has now been recorded at a level of detail that probably exceeds that known for any other vulnerable avian taxa in the country (Cunningham 1991) and the computerised database is now maintained as a constantly updated biological record. Although the bird is more widely distributed than previously thought, the catchment by catchment records show this riverine species as having an increasingly discontinuous range with whole catchments devoid of birds, while those next door retain them. In New Zealand such discontinuity, and the development of population isolates, are characteristic symptoms of species in decline.

The second main objective of the plan was the protection of rivers containing significant Blue Duck populations. Water conservation orders, to protect the wild, scenic or wildlife values of waterways, are a relatively new statutory conservation mechanism in New Zealand and the presence of Blue Ducks has been used as one of the main arguments in the advocacy process. There have been some very notable courtroom battles between Blue Ducks and the state Electricity Corporation which have seen the Motu and Manganuataeo Rivers, which contain the North Island's largest Blue Duck populations, being given total protection, and increased water flows returned to the headwaters of another important habitat, the Whanganui River. Blue Ducks are now being viewed as an indicator of riverine ecosystem quality and advocacy for the species has extended to a wider stage.

The resolving of a range of biological issues prior to attempting population enhancement or re-establishment was the third major objective of the initial recovery plan. Dispersal characteristics of the species, whether investigated using banding (Williams 1991), radio-telemetry, or DNA fingerprinting (Triggs et al. 1991, 1992) all showed that dispersal predominantly takes place over only very short distances and that both sexes are highly philopatric. Demographic processes continue to be monitored so as to provide an understanding of the species, ability to respond to natural or human-induced perturbations and to indicate the likely growth of any newly-established population. One demographic study at the Manganuataeo River (Williams 1991) is now in its 14th year while four others in alpine and headwater sites have been going for 3-6 years; collectively they are providing data for realistic population viability analyses now underway. Studies of instream characteristics of existing Blue Duck habitat at the macro level (Collier et al. 1993), within and between territories (Veltman & Williams 1990; Veltman et al. 1991) and relationships between Blue Duck and their prey (Collier 1991; Mason et al. in subm.; Veltman et al. in subm.) have been used to identify key habitat requirements and to aid selection of sites for future population re-establishment.

The biological studies are forcing a radical rethink about where future Blue Duck conservation should be targeted. Alpine and headwater populations appear to be demographically very unstable unless topped up by recruits from elsewhere in the catchment; it is the birds residing in the middle sections of rivers that are the productive ones. At present, most Blue Ducks reside in headwater areas within the protective confines of national or forest parks, areas that, now, may have to be interpreted as relict and sub-optimal habitat. The discontinuity in range can be seen as the result of an inevitable demise of headwater populations which have lost their downriver source of recruits.

The next version of the Blue Duck recovery plan is likely to give greater emphasis to river conservation beyond headwaters and to promote population re-establishment. Providing a source of birds for re-population will be a challenge; translocated adults have returned over 150 km to the very territory from which they were removed, juveniles show a propensity to scatter before homing back to the natal range, and to date, results of captive breeding have been very disappointing.

Auckland Island Teal

Recent electrophoretic studies (C. Daugherty unpubl.; Williams et al. 1991) indicate this bird, Campbell Island Teal and Brown Teal each to have arisen as a result of separate colonisation events sourced from Australia. Thus, each is now considered to be separate taxa at the species level.

This small flightless teal is restricted to the Auckland Islands group in the New Zealand subantarctic, where it is present only on all islands except main Auckland Island. The objectives of the recovery plan are simple and straightforward: protect and maintain all existing small island populations and promote re-establishment of teal on Auckland Island.

Previous estimates of teal abundance (Williams 1986; Moore & Walker 1991) at about 500-600 are now viewed as being very conservative; fieldwork in the 1991 austral summer, when taped calls and a dog were used to locate teal, found 200 birds on Ewing Island alone (previous best estimate 140) and recorded teal in abundance all through the grassland of Rose Island, where previously they had been found only around the coastline. Follow-up work in 1992 found teal very widespread in the tussock grasslands of both Disappointment (400 ha) and Adams (10,000 ha) Islands; 1,500 would have to be the new, and undoubtedly still conservative, working estimate!

Auckland Islands are the focus of concerted conservation work by the Department of Conservation. In 1993, the hoardes of rabbits on Rose and Enderby Islands were poisoned and their complete elimination is imminent. This will have a particularly dramatic effect on Enderby Island (600 ha) as an extensive tussock grassland develops around the coastal fringes; the main beneficiary of this change will be the teal and within 50 years the present population of 50-70 could increase tenfold.

Main Auckland Island contains three nasties that affect teal: cats, goats and pigs, all legacies of the sailing ship era and failed human settlement. The goats have just been eradicated. Trailling of pig poison baits are now underway and there is a commitment to pig eradication in the next few years. Cats, however, will pose the greatest conservation challenge for they are present at low density over most of the 51,000 ha island with concentrations near coastal seabird colonies.
Of all the New Zealand taxa on the TWRG list, *Anas aucklandica* has by far the most certain future and requires the least management effort.

**Campbell Island Teal**

It is a little hard to believe that, in 1993, there is still a species of New Zealand waterfowl whose nest, egg and chick have never been viewed. Nevertheless, *Anas nesiotis*, by virtue of its isolation on a small 23 ha islet, Dent Island, off the western coast of Campbell Island about 300 km south of New Zealand, has yet to reveal such very basic characteristics of its biology.

Tiny Dent Island has been the sole refuge of this species for at least 150 years; Norway rats *Rattus norvegicus* established on 11,400 ha Campbell Island early in the 1800s and no biological expedition there since 1840 has recorded the teal's presence. Dent Island has approx 10-15 ha of tussock grassland through which the teal are dispersed and which they share with enormous numbers of petrels and shearwaters. There are several small seapages running down the slopes of the island and teal appear to be concentrated nearby. The terrain and cover make population estimation particularly difficult; current best estimate is 60 (Goudswaard 1991) and 'no more than 100' (McClelland 1993).

The long-term goal for this species is to re-establish them on Campbell Island but this requires the prior elimination of all rats. Rat eradication on this scale simply hasn't been attempted anywhere in the world; given the size and remoteness of Campbell Island this is unlikely to be attempted in the next decade or two!

The more pragmatic short-term objective in the recovery plan is to establish, within the next decade, another island population, but even this is not without some major hurdles. Question 1 is how, and question 2 is where?

Prior to the formal writing of the recovery plan, 7 males and 4 females had been taken into captivity. This is seen as the source for any new population. However, after 17 pair-years in captivity, no eggs have been laid - there is an enormous avicultural challenge ahead, one in which captive *aucklandica* females have become involved as surrogates. Direct translocation from Dent Island is ruled out as an option at this time because of the small size and the presumed (based on recent fieldwork on *aucklandica*) low reproductive and recruitment rates of the wild population.

Where the second population is established will prove contentious; should it be within or beyond the subantarctic environment? To place them elsewhere within the New Zealand subantarctic and thus subject them to many of the selective forces that have shaped their evolution would inevitably mean deliberately placing an alien species into a pristine island environment. Putting them on a predator-free island close to the New Zealand mainland takes them well away from their 'point of origin' and exposes them to disease risks previously not experienced - is that wise? It's a classic dilemma which arises time and again in the conservation of rare island endemics.

**Brown Teal**

This, the third of the 'Austral Teals' in the New Zealand region, is close to becoming extinct on the mainland; the main stronghold of the species is New Zealand's fourth-largest island, Great Barrier, where the population is estimated, perhaps a little generously, at 1,300-1,500 (Hayes & Dumbell 1989).

Within Northland, the remaining mainland location at the very top of North Island, a decline of about 60% over the past 5 years has been monitored by the Department of Conservation. An increase in the suite of predators and persistent habitat alienation have taken their toll and the imminent recovery plan for the species recognises that, at best, the rate of decline may be slowed but extinction there not prevented. This is despite a valiant attempt by Ducks Unlimited who have released almost 800 captive-reared teal into Northland over the past decade.

The main focus of the recovery plan is the protection of the Great Barrier Island population and the search for fallback positions to support it. Over the next 5 years, an attempt will be made to establish at least five small island populations using captive-bred birds. Most likely these will be on islands off the east coast of Northland and in the Hauraki Gulf, adjacent to the existing wild range of the species. However, the more strategically important step will be the appraisal of both Stewart and Chatham Islands as potential sites for re-introduction and, if suitable, the commencement of that programme.

Both Stewart and Chatham Islands have supported natural populations of Brown Teal. On Stewart Island, teal declined rapidly from about 1950 and the last birds were seen there in 1972; cats in particular were implicated. Chatham Island teal, which, interestingly, had shorter wings than their mainland cousins and thus may have been heading towards flightlessness, disappeared finally about 1916. On both islands there will be a fair amount of remedial work required before re-introduction can be contemplated, but Chatham and its satellite islands look promising for some initial trials using captive stock.

The cost of failing to provide a fallback position beyond Great Barrier could be high. Presently, Great Barrier Island lacks mustelids, possums and Norway rat, part of the debilitating predatory cocktail on the mainland. However, the island is becoming increasingly popular as a residential and recreational retreat and an inadvertent introduction or two could expose Brown Teal to these rapacious selective forces.

Ducks Unlimited's captive breeding of Brown Teal is, far and away, New Zealand's most successful captive programme for an endangered species; it is both sad and cause for concern that 20 years of effort and 1,000 releases have failed to turn the tide!

**Grey Duck**

Although hybridisation between *Anas s. superciliosa* and the introduced Mallard *A. platyrhynchos* has long been known and identified as a potential conservation issue, its extent has been particularly difficult to appraise using phenotypic criteria alone. Gillespie's (1985) effort ran foul of the considerable plumage
variation shown by hen Mallards, the result of the introductions being sourced originally from gamefarm stock, and highlighted the need for the issue to be resolved at the molecular level. Unfortunately, Grey Duck and Mallard cannot be distinguished using allozyme electrophoresis (Hitchmough et al. 1990) and the use of more sensitive DNA technologies appears necessary.

In 1990 heart and wing muscle tissue was collected from almost 400 birds taken by hunters throughout New Zealand to serve as the basis for a new appraisal. The sample was sorted using a phenotype-based scoring system into 4 categories: ‘Greys’, ‘Grey-like’, ‘Mallard-like’ and ‘Mallards’; ‘Greys’ comprised 17% of the sample, ‘Mallards’ 40% and the ‘hybrid’ categories a combined 43%. This preliminary sorting also suggested that ‘Mallards’ were more common in the intensive lowland agricultural areas, ‘hybrids’ more common in the interior hill country and upland lakes and rivers, while ‘Greys’ dominated samples from predominantly wooded landscapes and from Chatham Island (where Mallards are only now establishing).

As a first step, tissue from about 10 birds of each category was made available to Judith Rhymer at the Smithsonian Institution for restriction enzyme analysis of mtDNA. The results (Rhymer et al. in press) indicate that not only is there introgression of Grey Duck mtDNA into Mallard populations but there is significant introgression the other way; in short we may be witnessing the reversal of the speciation process! Perhaps another Anas oustaleti is in the making?!

At Auckland University, David Lambert has used PCR amplification to obtain DNA fragments from 5 to 0.3kb in size but has found individual profiles to be highly variable. He has suggested the only sure way to locate reliable nuclear markers that will positively discriminate hybrids from ‘pures’ and, possibly, provide an indication of the genetic make-up of hybrids, will be by way of species-specific single locus probes, a technology New Zealand doesn’t yet possess.

The existing tissue collection is substantial and I am very happy to make samples available to anyone who can contribute to further analysis of this hybridisation event or who can assist me eventually to relate phenotype to genotype.

The demise of Anas s. superciliosa in New Zealand as a result of hybridisation is not viewed by local officials as an issue of conservation concern. This perception may have arisen because (a) Grey Ducks are gamebirds and are still ‘common’; (b) the species is native, not endemic to New Zealand and remains widespread in Australia; (c) there has been no study conclusively demonstrating the need for concern; and (d) nothing can realistically be done about the problem anyway! A definitive appraisal of the hybridisation event at the genetic level would certainly help the process of evaluation!

References
Veltman, C.J. & Williams, M. 1990. Diurnal use of time and space by breeding Blue Ducks. Wildfowl 41:62-74
Williams, M. 1986. The numbers of Auckland Island Teal. Wildfowl 37:63-70
A SURVEY OF THE WHITE-WINGED (WOOD) DUCK, CAIRINA SCUTULATA, IN INDIA

H.S.A. YAHYA, Centre of Wildlife & Ornithology, A.M.U. Aligarh, India.

Until the beginning of this century, the White-winged (Wood) Duck (WWD) was commonly found in parts of North-east India. Since then, there has been a steady decline in numbers, so much so that in Dibrugarh and Lakhimpur districts of Assam, numbers have dropped from 'common' in 1900 to an estimated 44 (Green 1992). Green (1992, 1993) has documented, in detail, the past and present distribution of this critically endangered bird and has also discussed the various factors affecting the population. In 1993, a pilot survey to collect first hand information on the status and habitat of WWD in parts of Assam and Arunachal Pradesh, was begun. Two successive surveys were carried out between February (dry season) and May (wet season). All five key sites suggested by Green (1992) were surveyed (Fig.1). The various types of human pressure on habitats of the WWD were determined and conservation measures suggested.

Figure 1. Locations of survey sites in Assam. 1 = Doom Dooma, 2 = Tinsukia, 3 = Namdapha Tiger Reserve, 4 = Mehao Wildlife Sanctuary, 5 = D’Ering Memorial Wildlife Sanctuary, 6 = Pakhui Wildlife Sanctuary.

Numbers of WWD were estimated by two methods: a) calls recorded in captivity at Slimbridge were played-back, using a tape recorder, at dawn and dusk during the dry season, and again during the wet season where birds had been observed or heard. Nests were located during the wet season surveys. b) a questionnaire, asking for sightings and/or evidence of poaching which was distributed to local people. Existing WWD habitats were classified according to suitability for nesting and disturbance. Further details on methodology and findings are described in Yahya (1994).

It is heartening that out of an estimated total of 65 birds (Green 1992), we had 26 sightings and heard birds eight times in about 40 days of intensive search. The largest number of observations were made in Doom Dooma Forest Division and Dibru-Saikhowa Wildlife Sanctuary (Table 1).

Table 1: Number of White-winged Wood Duck seen (s) and heard (h) at sites in Assam, India, February and May 1993. Letters in parentheses denote habitat type: sw = swamp; r = riverine; md = moist deciduous forest; c = cultivated; seg = semi-evergreen; sf = secondary forest; np = new plantation.

<table>
<thead>
<tr>
<th>Site</th>
<th>No. seen</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIBRU-SAIKHOWA WLS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gujjan range</td>
<td></td>
<td>Fishing, grazing, wood</td>
</tr>
<tr>
<td>&amp; Salvin rivers</td>
<td></td>
<td>cutting, (r,sw,af)</td>
</tr>
<tr>
<td>Sal Bheel, river bed</td>
<td>0</td>
<td>(md)</td>
</tr>
<tr>
<td>Salbheel Pathar</td>
<td>0</td>
<td>(md)</td>
</tr>
<tr>
<td>Gramjan Bheel</td>
<td>0</td>
<td>Depopulated in 1952 earth-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>quake; WWD may feed here.</td>
</tr>
<tr>
<td>Kunda Ghat, River nala</td>
<td>0</td>
<td>Adjoining Gramjan Bheel</td>
</tr>
<tr>
<td>Colomy Nala (27.34N 95.20E)</td>
<td>1s</td>
<td></td>
</tr>
<tr>
<td>Colomy Pathar</td>
<td>0</td>
<td>(md)</td>
</tr>
<tr>
<td>Kolipsani Bheel (27.38N 95.26E)</td>
<td>1s 2h</td>
<td>(r, sw)</td>
</tr>
<tr>
<td>Nagori Bheel</td>
<td>0</td>
<td>Fishing in winter, over</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flooded in monsoon,(r,sw)</td>
</tr>
<tr>
<td>Kusni Bheel</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Champa Bheel</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Khajuli Bheel</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Baghjan Bheel</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>School Garba (27.38N 95.26E)</td>
<td>2s</td>
<td>(seg)</td>
</tr>
<tr>
<td>Digholirang</td>
<td>0</td>
<td>Nesting site. (md)</td>
</tr>
<tr>
<td>Bori Bheel WLS</td>
<td>0</td>
<td>Least disturbed in Dibru.(sw)</td>
</tr>
<tr>
<td>Dimbholia Nala</td>
<td>0</td>
<td>Ideal foraging/resting.(md)</td>
</tr>
<tr>
<td>Dangri River (27.38N 95.38E)</td>
<td>0</td>
<td>WWD fly across at times.</td>
</tr>
<tr>
<td>Tchka Bheel</td>
<td>0</td>
<td>Relatively undisturbed.(r,sw)</td>
</tr>
<tr>
<td>Salhowa Range</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Dhola Ghat, Riverine bank</td>
<td>0</td>
<td>Scanning Brahmaputra banks.</td>
</tr>
</tbody>
</table>

DOOM DOOMA DIVISION

Sadia Range

Sadia ghat side

Kakapathar range

Dhangoria

Ubbata (27.35N 95.41E)

Litong, Block 4 & 5 (27.36N 95.42E)

Litong Camp site

Nambholong (27.56N 95.42E)

Morgikona line Bheel

Gohapar range

Gohapar forest side

Saurala Bheel

Margritya range

Dirok river side

Dirok Muth

Arunachali Bheel

| Total = 31 | (incl. possible repeated obs.) |
| Total = 17 | (excl. possible repeated obs.) |

Although three key sites were surveyed in Arunachal Pradesh, no first hand reports of WWD were obtained. Only the calls of one WWD near M-Pen Nala in Namdapha Tiger Reserve were heard (Table 2). Some suitable habitat was recorded in D’Ering and Pakhui Wildlife Sanctuary. However, Mehao
Wildlife Sanctuary did not contain any suitable habitat and should no longer be regarded a key site. The total 65 WWD estimated by Green (1992) may be an underestimate, while the 200 pairs in Assam, reported by the Forest Department, is an overestimate. Total numbers of WWD in both Assam and Arunachal Pradesh are estimated at around 100.

Nowhere is WWD habitat free from human pressure. Depletion and fragmentation of habitat and, poaching of eggs and ducklings appear to be the main reasons for the reduced population of WWD. Adults also are continually poached for selling (Choudhury 1993, pers. obs.). Fishing and logging for firewood are permanent features in most WWD habitat. The annual flooding devastates some areas of forest. An earthquake in 1952 severely damaged some of the prime WWD habitat. Arunchali Bheel has habitat very suitable for WWD but, as in many other areas, quarrying of stones, selective logging and shikar occur.

None of the sites we visited had many apparently suitable trees for nesting. Probably this could be regarded as a limiting factor explaining the low population of WWD in those areas where other human disturbances are minimal.

I suspect that captive WWD escaped from nearby aviaries and may be mingling with wild populations and spreading disease. Recently, several escaped from Namdang Tea Estate (Assam) and Miao Zoo (Arunachal Pradesh).

Feeding areas adjoining tea estates may be becoming polluted with chemicals, thereby adversely affecting the ducks.

Table 2. Number of White-winged (Wood) Duck seen (s) or heard (h) at sites in Arunachal Pradesh, India, February and May 1993. Letters in parentheses denote habitat type: sw = swamp; r = riverine; md = moist deciduous forest; eg = evergreen; gl = grassland.

<table>
<thead>
<tr>
<th>Site</th>
<th>No. seen /heard</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Namdapha Tiger Reserve</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-Pen Nala (27.30N 96.20E)</td>
<td>1h</td>
<td>Good for feeding/heating, (eg)</td>
</tr>
<tr>
<td>Moti Jheel A&amp;B</td>
<td>0</td>
<td>Winter foraging/nesting, (eg, sw)</td>
</tr>
<tr>
<td>Haldi Bari</td>
<td>0</td>
<td>Unsuitable for WWD, (eg)</td>
</tr>
<tr>
<td>Hornbill</td>
<td>0</td>
<td>Unsuitable, (eg)</td>
</tr>
<tr>
<td>Bulbuli</td>
<td>0</td>
<td>Unsuitable; sulphur stream, (eg)</td>
</tr>
<tr>
<td>Rani Jheel</td>
<td>0</td>
<td>1 pair seen by staff, (eg, sw)</td>
</tr>
<tr>
<td>Raja Jheel</td>
<td>0</td>
<td>Worth checking for nests, (eg, sw)</td>
</tr>
<tr>
<td><strong>Mehao Wildlife Sanctuary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Devpani River side</td>
<td>0</td>
<td>Unsuitable</td>
</tr>
<tr>
<td>Mehao lake side</td>
<td>0</td>
<td>Lake recently created, high site, no records for last 5 years, (eg)</td>
</tr>
<tr>
<td><strong>D’Ering Memorial Wildlife Sanctuary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sibia Mukh</td>
<td>0</td>
<td>Unsuitable, (r, gl)</td>
</tr>
<tr>
<td>Mail Bheel</td>
<td>0</td>
<td>Unsuitable, (sw, md)</td>
</tr>
<tr>
<td>NamSingh Bheel</td>
<td>0</td>
<td>No recent records of WWD, (sw)</td>
</tr>
<tr>
<td>Mail Bheel</td>
<td>0</td>
<td>WWD may visit to feed.</td>
</tr>
<tr>
<td>Banderdeva range</td>
<td>0</td>
<td>Earlier report; now unsuitable, chosen cultivation in progress.</td>
</tr>
<tr>
<td>Chessa forest area</td>
<td>0</td>
<td></td>
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<tr>
<td><strong>Pakhui Wildlife Sanctuary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seijusa</td>
<td>0</td>
<td>Unsuitable, (eg)</td>
</tr>
<tr>
<td>Khari</td>
<td>0</td>
<td>No recent report, &quot;natural pond&quot; is possible site for WWD, (eg)</td>
</tr>
</tbody>
</table>

Total = 1

Conservation priorities

Conservation priorities have been discussed in detail in Yahya (1994). The main points are highlighted below:

- Colomy Nala, Colomy Pathar, Koliapami Bheel and Bori Bheel WLS in the Gujjan Range, and Ubhata and Littong (blocks 4 & 5) in the Kakopathar Range should be protected at all cost.
- The Littong and Kakopathar forest ranges under Dooma Dooma Division should be declared a WWD sanctuary.
- Some nesting pairs should be located, protected and monitored for the entire breeding season. Radiotracking of these birds would provide essential data. Artificial nest boxes should be provided in suitable places.
- Illegal activities should be stopped in WWD habitats. More forest guards are required for this purpose.
- The existing captive breeding centres should be modernised and only healthy WWD stocks maintained. To prevent escapes of diseased birds, these aviaries should be more carefully guarded and bird pinioned.
- Field surveys should continue and a long term study on ecology and biology of WWD should be launched.
- No release/reintroduction programme is recommended at present.
- An intensive and effective awareness campaign should be launched without further delay.
- The relevant forest departments should co-ordinate all efforts of study, conservation and management of WWWD.

References:
DECLINE OF SPECTACLED EIDERS
NESTING IN WESTERN ALASKA

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The United States Fish and Wildlife Service (USFWS) listed the Spectacled Eider Somateria fischeri as a threatened species in May 1993. About 50,000 pairs of Spectacled Eider nested on the Yukon-Kuskokwim Delta (YKD) in western Alaska in 1971 (Dau and Kistchinski 1977). In 1992, an estimated 1,721 nests (Stehn et al. 1993) remained, less than 4% of former numbers. This rapid and continuing decline in nests of 14% per year was not recognized until 1990, and its cause is undocumented. The data documenting the decline comes from both aerial transect survey and ground plot sampling. The standard North American Waterfowl Breeding Pair aerial survey indicates a 7% annual rate of decline (1957-1992) in population size of combined eider species. Spectacled, Common (Somateria mollissima v-nigra) and Steller's (Polysticta stelleri) Eiders are found restricted to coastal areas on only 22 of the 107 16-mi segments flown in western Alaska. Spectacled Eider were abundant only on the YKD. Common Eider are less abundant although more widespread along the west coast of Alaska. Steller's Eider previously nested on the YKD in low numbers but disappeared by 1975 (Kertell 1991).

Data from intensified aerial surveys on the coast of the YKD document the recent (1988-1992) population trend for breeding eiders. The survey is made during the first half of the incubation period before male eiders depart. Fledged and non-breeding Spectacled Eider are not seen. The 1988 to 1992 observations of eiders, which includes Spectacled, Common, and unidentified eiders, show a 9% annual rate of decline. The remaining high density nesting areas for Spectacled Eiders coincide with the higher density nesting areas of either Cackling Canada Geese, Emperor Geese, or Brant Geese (W.I. Butler, Jr., USFWS, unpubl. data) in tide-influenced sedge meadows near the river mouths of the central YKD.

From 1986 to 1992, searches for Spectacled Eider nests were completed on 618 randomly-located plots with 55-90 plots sampled each year. The trend in population size indicates a 14% annual rate of decline. In 1992, Spectacled Eider densities averaged 0.66 nests/km² on 1975 km² of the central coast and 0.06 nests/km² on 10634 km² in the remainder of the delta. Field crews found 27 Spectacled Eider nests on 17 of 71 plots covering 23.0 km² in 1992. The estimated population for the 5 coastal strata sampled was 1,308 ± 270 nests. With 76% of the aerially-observed population occurring in those strata sampled by plots, we extrapolated the ground-based plot sampling to arrive at a total population estimate of 1,721 nests. In comparison, historic data indicated nest densities ranging from 2.1 to 19.0 nests/km² with an average of 4.4 nests/km² in coastal regions (Dau and Kistchinski 1977).

The average Spectacled Eider clutch size was 5.10 eggs from 1986-1992 which is greater than the 4.68 mean clutch size from 1965-1976 (Dau 1976; C.J. Lensink pers. comm. 1992). The largest difference in frequency distribution in clutch sizes between these years was a greater number of 1-3 egg clutches in the 1965-1976 data, 17% of 412 clutches compared to 9% of 263 clutches in recent years. Also, the recent data indicated 9% versus 3% frequency for clutches with 7-10 eggs. The frequency of 4, 5 and 6 egg clutches did not differ. Because older experienced females tend to initiate nesting earlier and have larger clutches (Dau 1974), the age structure of nesting females may now contain relatively few young birds. This could be caused by decreased production or a reduced survival rate of young to the age of first breeding in the 1980s compared to the 1960s.

The proportion of nests remaining active at the time of search has been high in 5 of the last 7 years. The average 1986-1992 index to nesting success was 83% and higher than the 1969-1973 estimate of 71% (Dau 1974). Recent data are not exactly comparable because of single versus multiple nest visitation, however, the production of young at hatching does not appear to be low.

The continuing decline of Spectacled Eider populations on the west coast of Alaska indicates that undocumented causes of excessive mortality are still operating. Our data show the rate of decline is not slowing. If the decline continues at the annual rate of 14%, by the year 2012 there will be fewer than 90 Spectacled Eider nests on the YKD. Observations of Spectacled Eiders from 1981 to 1991 near Prudhoe Bay on the northern coast of Alaska also indicate a downward trend similar to that on the YKD (Warmock and Troy 1992). No survey or trend data were available on the Siberian nesting populations.

Many aspects of Spectacled Eider biology remain unknown, including their marine foraging habitats, food items, migratory movements and population ecology. Except while nesting on arctic coastal tundra during late May and June, Spectacled Eiders are rarely seen. Locations of their moulting and wintering areas are unclear, although sightings along the northwest coast of Alaska, at St. Lawrence Island and along the east and south coasts of the Chukotski Peninsula, suggest that fall and winter marine foraging habitat occurs among polynyas and edges of pack ice in the northwestern or central Bering Sea (Dau and Kistchinski 1977; Kessel 1989).

Factors causing the population decline of Spectacled Eider must be determined and appropriate actions taken to reverse the trend. Population growth will require increased survival of adults, subadults, first-year birds, or broods. Nesting success appears to be adequate. A review of possible threats to the species (Stehn et al. 1993) suggests the importance of quantifying potential impacts from: parasites, disease and contaminants; subsistence harvest; predation during brood rearing; and alteration of Bering Sea food resources at staging or wintering areas.

Determination of which of these factors is most important is not yet possible. We found no indication that Spectacled Eider have been reduced by the destruction of wetland habitats; the physical and vegetative components of nesting habitat on central YKD coast are unchanged. Cackling Canada (Branta canadensis minima) and White-fronted (Anser albifrons frontalis) Goose populations in the same nesting area have
been increasing rapidly since 1987 (Butler 1991), although goose populations are still much smaller than 30 years ago. Losses of eiders to predation by Glaucous Gulls (Larus hyperboreus) and Arctic Fox (Alopex lagopus), while known to occur, have not been rigorously quantified.

Natives of a few coastal villages on the YKD traditionally harvest eiders for subsistence in early spring while they are hunting seals near the edge of shorefast ice. Taking eggs or hunting eiders during nesting is now uncommon. Such harvests are a cultural tradition and an important resource valued by native people of western and northern Alaska. There is no evidence that these harvests were ever large enough to have caused the decline of Spectacled Eider, nevertheless, the combined impact of subsistence hunting in various locations may now be excessive for the recovery of current populations. Without better definition of population size, survival and harvest parameters throughout the range of the species, the importance of spring and fall subsistence harvest on Spectacled Eider populations remains unclear. The complexity of issues involving subsistence harvest of eiders and the cultural traditions of arctic peoples suggest that Yup’ik and Inupiat peoples must be directly involved in the management and conservation of eiders.

References


THE SPECTACLED EIDER ON THE INDIGIRKA RIVER DELTA, SAKHA, RUSSIA

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In 1993 the Spectacled Eider Somateria fischeri was listed as a threatened species under The Endangered Species Act of North America. The Yukon-Kuskokwim Delta (YKD) in Western Alaska is the primary North American breeding ground of Spectacled Eider (Dau and Kistchinskii 1977). Historically 50,000 pairs of Spectacled Eiders nested on the YKD, but in 1992 only 1,721 pairs were estimated to be present based on aerial surveys (see above). Reasons for the decline are unknown.

The breeding range of the Spectacled Eider in Russia extends from the Amgheat River on the Chukotka Peninsula west to the Lena River Delta (Fig. 1), and is the most common species of eider on the Chaun, Kolyma and Indigirka River Deltas (Kistchinskii 1988).

Figure 1. Locations of Spectacled Eider breeding areas mentioned in the text.

Because of the decline of the Western Alaskan breeding population and limited available information on the status of Spectacled Eider populations in Russia, The Alaska Fish and Wildlife Research Center and The Yakutsk Institute of Biology conducted preliminary field studies of Spectacled Eiders on the Indigirka River Delta in June 1993. Initial study objectives were to: identify potential study sites and provide a preliminary assessment of the relative abundance of spectacled eiders by aerial survey; conduct preliminary investigations of eider nesting ecology if concentrations of nesting eiders were discovered; and communicate with local people and biologists of Yakutsk and the Indigirka Delta about the status of eiders and other bird species occurring in Alaska and Russia.

Recommendations by Russian biologists led to the selection of a preliminary study site based at Tabor (71°16’N, 150°18’W), located 30 km inland on the central channel of the Indigirka
River. Ground investigations were conducted from 9-25 June 1993 within a 550 km² area encompassing both interior and coastal sites. Migration of Spectacled Eiders was underway upon our arrival at Tabor. Flocks of both Spectacled and Steller’s Eiders Polysticta stelleri were observed flying through the area, primarily to the west, from 9-16 June, and flocks ranged in size from 4-60 and 4-16 birds, respectively. Birds were in adult plumage and in mixed flocks of males and females. A large movement of >2000 eiders of both species passed through the study area on 14 June between 0500 and 0830. We observed small flocks and pairs of eiders resting and feeding on small wetlands dominated by Arctophila fulva.

We located 28 Spectacled Eider and 3 Steller’s Eider nests at sampled sites within the study area. A more detailed search of the Indigirka Delta may reveal areas used by greater numbers of Steller’s Eiders. Nesting densities of Spectacled Eiders increased near the coast, especially on a small archipelago at the mouth of the Indigirka River. Assuming average clutch size of 5 eggs, peak of nest initiation was between 13 and 17 June. Habitat characteristics of each nest site were measured and will be used for initial comparisons with Alaska breeding areas and for future classification of eider nesting habitats on the Indigirka River.

About 12 hours of aerial surveys were flown using a Russian AN-2 biplane. Eighteen transect lines totaling 1,078 km were flown at 5 km intervals parallel to the coast as a sample of the 7,789 km² Indigirka River Delta. During both ground and aerial surveys we observed Spectacled Eiders to be the most abundant waterfowl species on the Indigirka River Delta, with most eiders within 20 km of the coast.

We collected blood, muscle and organ tissue samples, from 8 Spectacled and 6 Steller’s Eiders for analysis of DNA and contaminants. Sixteen feather and 10 egg shell membrane samples were also collected for analysis of DNA. Gizzard contents were collected and preserved for analyses of food habits and lead shot ingestion. We found a single female Steller’s Eider that apparently died due to ingestion of lead shot.

We hope to proceed with a long-term research program on the ecology of Spectacled Eiders, beginning in 1994 and continuing though 1998. Research on the Indigirka Delta would provide comparative data between Russian and North American populations. Spectacled Eider research on the Indigirka River Delta would include: the continuation of aerial surveys to monitor population status, initiation of a nesting ecology study, collection of tissue for DNA analysis, determination of molting and wintering areas with satellite telemetry and examination of birds for contaminants and disease.

References

THE FRECKLED DUCK STICTONETTA NAEVOSA AS A 'THREATENED' TAXON
F.J. Norman, Flora and Fauna Branch, Department of Conservation and Natural Resources, PO Box 37, Heidelberg, Victoria, Australia 3084
R.T. Kingsford, National Parks and Wildlife Service (NSW), PO Box 1967, Hurstville, New South Wales, Australia 2220
S.V. Briggs, National Parks and Wildlife Service (NSW), c/o CSIRO Division of Wildlife and Ecology, PO Box 84, Lyneham, Australian Capital Territory, Australia 2602

The status of the Freckled Duck Stictonetta naevosa, an Australian endemic species, was considered insufficiently known to assign it to any IUCN category by Cowling (1978); ten years later it was still listed as K* (insufficiently known, under review) by IUCN (1988). Nevertheless, debate about its status has continued in local literature, usually without definition of terminology or reference to the associated IUCN phrase 'threatened with extinction'. Emotive discussion has inevitably included the term rare, vulnerable and endangered, without context or qualification. Here we present recent data and discuss aspects of the debate regarding the species' threatened status.

The Freckled Duck is found in southeastern and southwestern Australia; a vagrant elsewhere in Australia, it disperses towards more permanent (and more coastal) wetlands in dry periods (Marchant & Higgins 1990). Considered by Fullagar (1988) to be Australia's rarest duck, its population was estimated at 19,000 (Martindale 1983). The species was recorded <100 times and in <10 1° blocks (of latitude and longitude) during the Australian Atlas project (Brouwer & Garnett 1990), and had a low reporting rate generally (Blakers et al. 1984. Frith (1965) described the species as 'rare', a definition given more substance (small population, at risk but not endangered) by Brouwer & Garnett (1990). An array of terminology has described the species’ status. State faunal authorities also reflect the equivocal perception of the species' status in their legislation. Thus, in May 1993, the Freckled Duck was listed as 'protected' (Queensland), 'threatened' (Victoria), 'vulnerable and rare' (New South Wales, South Australia), or 'likely to become extinct, or is rare' (Western Australia; cf. Slater 1978). However, federally, the species is not included amongst those birds considered endangered or vulnerable on a continental basis (Anon. 1991).

Surveys of hunters and wetlands in southeastern Australia since 1972 have indicated that large numbers of Freckled Duck may occur in hunting areas in some years (e.g. 1980, 1981), when many birds may be shot (Corrick 1980, 1982; Norman & Norris 1982; Norman & Horton 1993), (Table 1). Prior to the 1980s, the Murray - Darling system (particularly the Lachlan - Murrumbidgee) was considered the major source of Freckled Ducks moving to more permanent, southern wetlands (Frith 1965). However, many seen in South Australia may come from the eastern Lake Eyre basin (Parker et al. 1985, Marchant & Higgins 1990) or from northwestern New South Wales or southwestern Queensland, where extensive lignum Muehlenbeckia sp. swamps (a major breeding habitat) occur on floodplains (Maher 1991). Movement of non-breeding,
adult-plumaged Freckled Ducks to permanent wetlands (inland or coastal) in dry periods (when habitat disappears) apparently follows floods (extensive breeding, and hence increased numbers) followed by drought (Marchant & Higgins 1990). Indices of abundance during aerial surveys of 10% of eastern Australia in the 1983 - 1992 period have varied by a factor of over 180 (Table 1). Freckled Ducks are rarely observed, except when in more southern concentrations. Few observers survey inland wetlands, nest sites are inaccessible after floods and there have been no detailed studies of breeding populations or their distribution. Numbers of the species, and their distribution, vary in eastern Australia. The effect of floods may last for years; dispersal towards the coast and increased numbers there may operate in a 5-9 year cycle (Parker et al. 1985).

Table 1. Data on abundance and hunting mortality in Freckled Ducks. Indices of abundance from aerial surveys of eastern Australia in October are presented. Numbers of birds shot during opening weekends (February to March) at Bool Lagoon in southeastern Australia are also given, with % of ducks examined that were Freckled Duck given in parentheses.

<table>
<thead>
<tr>
<th>Year</th>
<th>Aerial survey indices</th>
<th>Bool Lagoon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>1 (0.3)</td>
<td></td>
</tr>
<tr>
<td>1980a</td>
<td>436 (4.6)</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>14 (0.9)</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>2 (0.1)</td>
<td></td>
</tr>
<tr>
<td>1983a</td>
<td>2925</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>1086</td>
<td>0</td>
</tr>
<tr>
<td>1985</td>
<td>4119</td>
<td>6 (0.1)</td>
</tr>
<tr>
<td>1986</td>
<td>201</td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>1954</td>
<td>0</td>
</tr>
<tr>
<td>1988</td>
<td>64</td>
<td>1 (&lt;0.1)</td>
</tr>
<tr>
<td>1989</td>
<td>112</td>
<td>0</td>
</tr>
</tbody>
</table>

a No hunting season in 1983.

b Freckled Duck no longer legal game species in Victoria (and elsewhere) from 1980.

Large concentrations (of up to 10,000+ birds) can occur at swamps in western and southwestern Queensland (Kingsford & Porter 1993), and in inland Western Australia; these may represent a large proportion of the total population. In more southern wetlands, in Victoria or South Australia, occasional breeding (presumably by remnants from previous eruptions) can occur but generally habitat is now restricted or inappropriate, having been eliminated or reduced. Wetlands used in drier, non-breeding periods may reflect availability rather than preference. In Victoria, where reporting rates of Freckled Ducks are highest from January to March, records exist for all wetland types with higher rates on permanent open freshwater and saline wetlands (A.H. Corrick, pers. comm.).

All species face possible extinction. However, it is the probability of extinction and whether it is increased by human activities which is important. Various factors need to be considered objectively when assigning risk categories and estimating rates of decline of species within a specific time span (see Mace & Lande 1991). Care must also be taken to clearly and unambiguously define categories so that discussion may be based on sound biological data. To date, the only population estimate of the Freckled Duck is 18,700 individuals which was extrapolated from a count of 7,900 (Martindale 1984) during drought conditions. Such numbers were presumably minimal since complete wetland coverage (inland and coastal) was impossible, and it is unlikely that the whole population moved to more coastal wetlands (e.g. thousands were present in northwestern New South Wales in late 1983, Braithwaite et al. 1985). Data are currently unavailable to determine whether declines in this base population have occurred. Indeed the Freckled Duck, like other vertebrate species from inland, arid habitats are likely to undergo large changes in numbers and distribution as a response to varying climatic conditions (and food supply; Parker et al. 1985). Although hunting may reduce numbers at drought refuges, it is not a threat to the general population. Improved hunter awareness and management should reduce such problems. Modification or elimination of inland breeding habitat (particularly through water regime modification) presents a major, ongoing threat to the security of the species. The Freckled Duck may well be rare numerically but fluctuations shown by its population do not readily allow assessment of any decline and current information makes it impossible to categorise its status as being vulnerable or endangered (cf. Green 1992). Risk categories should allow for species which show natural but dramatic shifts in abundance, despite a legislative need for simple classifications.

References
Brouwer, J. & Garnett, S. 1990 (Eds.). Threatened birds of Australia (§) an annotated list. ?RAOU & ANPWS.
Consequently, 200-300 West Indian Whistling-ducks (Dendrocygna arborea), visit the cay each day to feed, roost and nest. This is the largest known population of these ducks in the entire Bahamas archipelago (Collar et al. 1992). Almost nothing is known of the ecology and behaviour of this species. This report describes observations on the whistling-ducks made during a pilot study on Hog Cay and Long Island, Bahamas in June/July, 1993.

Hog Cay

Approximately 200-300 whistling-ducks arrive on Hog Cay to feed each evening. They begin to arrive at about 1430 hrs and the numbers peak around 2000 hrs at twilight. Some birds stay and feed throughout the night and most of them have left the feeding platform by dawn. The birds appear to be flying in from Galliot Cay (northern Long Island) and the northeast end of Hog Cay, although some may be coming from other places on Long Island. Many whistling-ducks appear to be spending all their time on Hog Cay, a hundred or more of them roosting during the day in the mangroves on the northeast end of the island. There also seems to be adequate nesting habitat on the cay. In my two weeks there I found two active nests, the remains of three other nests (fate unknown) and observed at least seven different broods with downy young which must have hatched on the cay. Since there is no hunting, an ample food supply and very few people on Hog Cay, it offers a refuge for the ducks.

Eleven birds were captured in mistnets, measured, fitted with coloured plastic nasal markers and released. Males and females of this species appear to be identical in plumage and are very difficult to sex ventrally. We caught 4 adult males, 2 adult females and 5 adults of unknown sex and the following measurements were taken for each: culmen length, bill length, tarsus length, wing length to longest primary, and weight (see Table 1). Although males appear to be larger than females on average, the sample sizes were quite small and a Wilcoxon rank sum test was unable to detect any significant difference between males and females. There appeared to be some plumage differences on the flanks and breast of the juveniles which may prove important in ageing the birds. All eleven of the marked birds were subsequently observed back on Hog Cay and did not seem to be adversely affected by the nasal markers.

Table 1. Average body measurements of D. arborea on Hog Cay, Bahamas

<table>
<thead>
<tr>
<th>Average measure</th>
<th>Males (n=4)</th>
<th>Females (n=2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culmen (mm)</td>
<td>53.3</td>
<td>50.9</td>
</tr>
<tr>
<td>Bill length (mm)</td>
<td>57.2</td>
<td>53.8</td>
</tr>
<tr>
<td>Tarsus (mm)</td>
<td>71.4</td>
<td>67.6</td>
</tr>
<tr>
<td>Wing length (mm)</td>
<td>268.8</td>
<td>258.5</td>
</tr>
<tr>
<td>Weight (g)</td>
<td>1050</td>
<td>940</td>
</tr>
</tbody>
</table>
Nesting observations

Several sources report that West Indian Whistling-ducks roost and even nest in trees (Allen 1961, Bond 1936, Paterson 1972), as do Black-bellied Whistling-ducks (*D. autumnalis*). However, in the Bahamas there are few trees large enough to provide suitable nesting cavities and the nests found in 1993 all consisted of leaf-lined depressions on the ground, well concealed beneath thatch palms (*Thrinax microcarpa*) and dense bushes. Clutch size is unknown for this species although David (1941) reported that it is about 9 eggs. The two active nests found on Hog Cay, contained 7 eggs (1 infertile) and 6 eggs (1 infertile) each. Eggs are cream-coloured and averaged 58.4 mm in length and 42.1 mm in width for the nests found this year.

Behavioral observations

Very little is known of the brood ecology of any of the whistling-ducks. Johnsgard (1965) reported that family bonds in *arborea* are strong and the male presumably assists in incubation and care of the young. On Hog Cay, many family groups composed of two adults and several juveniles of unknown age were seen in 1993. These groups behaved like goose families, engaging in numerous and intense conflicts at the feeding platform with corresponding threat behaviours like the "forward posture" exhibited by Canada geese (Raveling 1970). The families often approached the platform in a unified group, threatening both individuals and other family groups. A high degree of gregariousness was observed in *arborea* in the Bahamas as they roost and feed in large flocks. This fact, coupled with the strong cohesion of the family groups, suggests that individuals probably become sexually mature rather slowly, as geese do (Hanson 1953).

Long Island

I spent one week in July on Long Island visiting a dozen ponds between Stella Maris and Deadman's Cay. While whistling-ducks have been reported on many of these ponds in the past, due to the unusually dry weather this year many of them were dried up and I observed ducks on only one pond. At dusk on July 8, I saw two broods swimming on the pond with 4 and 5 ducklings each. I also saw and heard two adults fly over the pond (I assume they eventually landed there).

Future plans

I intend to return to the Bahamas next year to undertake a two-year radio-tracking study designed to obtain information on the local movements, habitat use and breeding biology of the West Indian Whistling-duck as a basis for my masters thesis in Conservation Biology at the University of Minnesota.

Acknowledgements

I would like to thank Ducks Unlimited, Bahamas and the Dayton and Wilkie Funds for Natural History and Behaviour for their financial support. Many thanks to Mr. and Mrs. Peter Graham for their generous hospitality and permission to visit Hog Cay and a special thanks to Perciles Maillis, president of the Bahamas National Trust, for all his kind assistance.

References


Hanson, H.C. 1953. Inter-family dominance in Canada geese. *Auk* 70: 11-16.


THE CURRENT STATUS OF THE BRAZILIAN MERGANSER *Mergus octogetaceus* IN ARGENTINA

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The Brazilian Merganser *Mergus octogetaceus* is one of the least known and most threatened species of waterfowl in the world. Less than 10 pairs are currently known to exist (data from Collar et al. 1992). At present, there are at least three, highly fragmented populations, one in Misiones Province (Argentina) and the remainder in south-central Brazil. Its global status has recently been determined as situation critical: action urgent, which is the highest priority classification for birds with extant populations (Collar et al. 1992).

Between July and September 1993, the status of the Brazilian Merganser in Misiones Province, north-eastern Argentina, was assessed by a team of British and Argentinian ornithologists. Surveys were conducted in an inflatable boat along sections of five of the major rivers in the region that are known to have supported the species in the past (the Uruguay-, Úruzu, Piray Mini, Piray Guazú & Yacyuí). The surveys were timed to coincide with the emergence of broods, when the species is probably most conspicuous.

Despite covering some 376 kilometres of seemingly suitable rivers, only a single Brazilian Merganser was located during the survey period. The bird was seen on 9th August along the Arroyo Piray Mini (26° 19'S 54° 20'W) in central-northern Misiones and was clearly flightless. It was more likely to have been a male as it had a very long crest that reached its back, although crest length may be an inconsistent sexual characteristic (Bartmann 1988).

The habitat along the river where the bird was first observed was selectively logged secondary forest with dense understory growth, predominantly bamboo (*Guadua* spp.). The river was
approximately 15m wide and 2-3m deep at this point, with sections of rapids around 25m long, at 1-2km intervals. The habitat downstream soon became increasingly degraded with extensive areas of cleared forest, cattle grazing and small settlements. The water quality seemed to be poorer than that of other rivers surveyed, probably due to domestic waste from the settlements. Fish populations, however, appeared healthy, with large shoals regularly observed.

The major threat to the Brazilian Merganser population in Misiones would appear to be the various forms of habitat degradation that are currently occurring, particularly when these are practised in the upper catchment areas of rivers. These include forest clearance for agriculture, selective logging and road and dam constructions. A significant proportion of the habitat degradation is caused by forest clearance for agriculture, particularly that practised by illegal immigrants from Brazil who are entering the east of the province on a large scale, and where many of the rivers important for the Brazilian Merganser have their source. Subsistence hunting by the local people may also pose a threat to the species.

In Misiones, there are still a number of river sections that remain unsurveyed and could potentially support small populations of the Brazilian Merganser (eg. the Soberbio and its tributaries, the Yabotí Miní and its tributaries, the Piray Guazú above 26° 27'S 54° 08'W and its two main tributaries and the Piray Miní above 26° 17'S 54° 02'W).

If the rivers surveyed during the expedition had supported a healthy population of Brazilian Mergansers, at least 20 pairs should have been located. Considering there was only a single record of an individual, and the available habitat within Misiones Province is being continually degraded, the long-term survival of the species in Argentina seems unlikely.

References
ANATIDAE 2000 CONFERENCE

An international conference on the conservation, habitat management and wise use of swans, ducks and geese, organised by IWRB will be held on the 5 - 9 December 1994 in Strasbourg, France. The conference themes include work on globally threatened waterfowl. Two relevant workshops will be held: a) Population Ecology of Threatened Species and b) Recovery Programmes. One of the goals of the conference will be to convey the priorities for further research and management, enabling new collaborative ventures between workers concerned with threatened anatidæ.

Registration is £70.00. For further information contact Simon Nash, IWRB, Slimbridge, Gloucester, GL2 7BX, UK.
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