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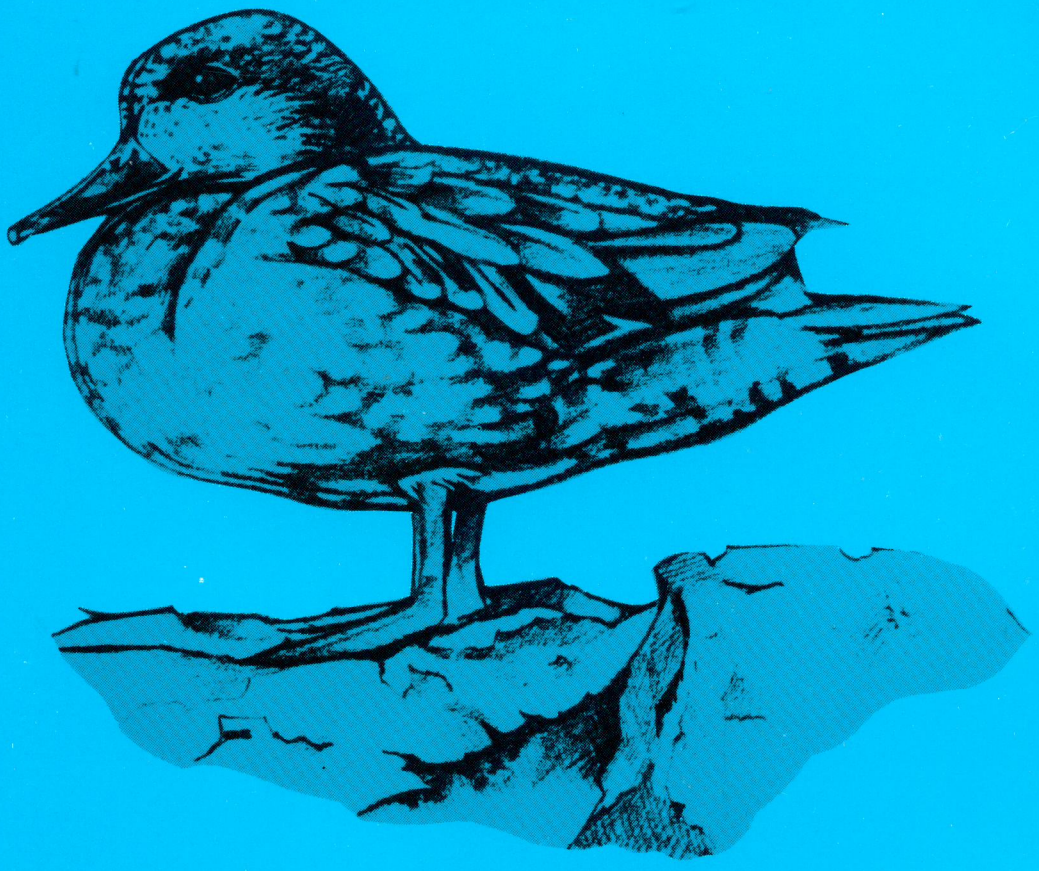
THE STATUS AND CONSERVATION OF THE MARBLED TEAL *MARMARONETTA ANGUSTIROSTRIS*

A report undertaken by The Wildfowl & Wetlands Trust and the International Waterfowl and Wetlands Research Bureau

Andy J. Green



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(FIRST PAGE)

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A report undertaken by The Wildfowl & Wetlands Trust and the International Waterfowl and Wetlands Research Bureau

compiled by

Andy J. Green

With contributions from: G. Hilton, D.A. Scott, V. van den Berk, J.D. Navarro Medina, M. Patrekeev, C. Pouteau and M. Smart

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SUMMARY

This report contains a thorough investigation into the status and conservation of the Marbled Teal *Marmaronetta angustirostris*, a globally threatened species with an increasingly fragmented distribution and a small world population. Former and current status are reviewed on a national basis, along with habitat use and biology, the causes of population decline and the conservation measures taken to date. A directory of sites of importance for Marbled Teal is compiled, along with a comprehensive list of records of the species. Provisional recommendations for conservation action are offered for each range state.

The current world wintering population is at least 33,000, with at least 2,000 in the western Mediterranean and tropical Africa (the majority in Morocco), about 1,000 in the eastern Mediterranean and at least 30,000 in western and southern Asia (25,000 in Iran and 5,000 in Pakistan). The world population has declined by more than 50% this century, and possibly by more than 90%. There has been a major shrinkage in range, particularly in Asia. Loss of breeding habitat and hunting pressure during the breeding season are probably the major causes of these declines, which are likely to be continuing. The species qualifies for the IUCN category of **Vulnerable**.

Some 140 wetlands of current importance for Marbled Teal are identified, 63% of which are completely unprotected and many of which are severely threatened. Recommendations for action required to prevent further population declines concentrate on the protection of habitat, particularly in breeding sites, and the removal of hunting pressure. Field surveys to clarify distribution are required in some parts of the range, while research is needed to clarify the species' ecological requirements. Conservation measures are required at an international, flyway level owing to the migratory nature of all major populations of Marbled Teal.

1. INTRODUCTION

1.1 BACKGROUND

The Marbled Teal *Marmaronetta angustirostris* was once regarded as a typical surface-feeding duck of the genus *Anas* but is now known to be a rather unique species in a monotypic genus. It can be considered as an evolutionary link between the surface-feeding ducks (*Anatini*) and the pochards (*Aythyini*) and has recently been reclassified as a member of the latter (Johnsgard 1961; Livezey 1986). Marbled Teal is considered a globally threatened species and is currently listed as IUCN Vulnerable (Collar & Andrew 1988; WCMC 1990). It is one of only two globally threatened duck species occurring in Europe, along with the White-headed Duck *Oxyura leucocephala*. Following preparation of a detailed review of the status and conservation needs of the White-headed Duck (Anstey 1989), it was decided that a similar document for Marbled Teal would be a valuable aid to the conservation of that species. This report was prepared between June 1991 and January 1993, by the IWRB Threatened Waterfowl Research Group and The Wildfowl & Wetlands Trust.

1.2 METHODOLOGY

Information was gathered largely through an extensive literature search of published and unpublished sources, and through the help of a network of contacts with an interest in Marbled Teal and the wetlands it occupies. These contacts were mainly acquired through the development of the IWRB International Waterfowl Census (IWC), the IWRB Threatened Waterfowl Research Group (TWRG) and the production of the report on the White-headed Duck, which shares many range countries with Marbled Teal. These people provided data in response to general requests for information published in the IWRB and TWRG newsletters, and particularly in response to the circulation of draft chapters for comments, corrections and inclusion of additional information. The most important source of information for wintering data since 1966 was analysis of the IWRB IWC databases (see van der Ven 1987, 1988; Scott & Rose 1989; Perennou *et al.* 1990; Perennou & Mundkur 1991, 1992; Rose 1992). These databases also hold important site information that is not available in published sources.

1.3 INFORMATION CONTAINED

The following information on Marbled Teal is reviewed in detail in national chapters, and summarised in Chapter 2.

1.3.1 Former and current status

All available information on former and current status of the species is reviewed. This identifies the extent of the species' decline, the distribution and size of surviving populations and areas where status remains unclear and further work (e.g. surveys) is required. This information is also used to identify the sites of most importance for the conservation of the species, listed in the site directory.

It is important to stress that Marbled Teal is not a particularly easy species to identify in the field (compared with e.g. White-headed Duck), and there is a possibility that some of the records presented in this report are misidentifications (e.g. of Garganey, *Anas querquedula*). This particularly applies to IWC data, since relatively inexperienced counters take part in some censuses. Some IWC data have been excluded from this report (e.g. for India) on the advice of ornithologists with great experience in that region, on the grounds that the location and numbers of birds reported make an accurate identification extremely unlikely.

1.3.2 Habitat

Information on the types of wetlands (water chemistry, vegetation etc.) used by Marbled Teal throughout its annual cycle is reviewed for each range state, in order to clarify the habitat requirements of the species.

1.3.3 Biology

Information on the biology of Marbled Teal is reviewed for each range state, paying particular attention to information on breeding biology, diet and movements. This helps to shed light on the conservation needs of the species, e.g. by clarifying ecological requirements and the extent to which conservation measures are required at the flyway level in more than one range state.

1.3.4 Threats

The probable causes of former, ongoing and potential future declines of Marbled Teal are identified. Itemisation of these threats plays a major role in elucidating the conservation measures required to prevent populations from undergoing further declines and to allow them to recover.

1.3.5 Conservation measures taken

The measures already taken to conserve the species are identified and their effectiveness is assessed. These measures are considered at the habitat protection level (i.e. wetland conservation) as well as at the species protection level (especially legal protection from hunting).

1.3.6 Evaluation and conclusions

The above information and its implications for conservation of the species are considered, and the general priorities for conservation measures in each major range state are identified.

1.3.7 Action needed

Provisional recommendations are offered for the conservation actions necessary to maintain the current range and abundance of Marbled Teal and to allow for possible expansion. Efforts were made to ensure that, wherever possible, these recommendations were made at a national or local level by contributors with a great deal of experience working in waterbird and wetland issues in the relevant region, who were best able to judge what recommendations were appropriate. However, owing to limited time and resources, it was not possible to travel widely enough to ensure close consultation with all relevant authorities in range states during the preparation of these recommendations. Hence they should be regarded as a starting point for the development of Marbled Teal conservation policies in range states rather than as a final statement of what these policies should be.

1.3.8 Site directory

Sites of current importance for Marbled Teal are identified and described. Two categories for these sites are used. Those of most importance are KEY SITES: those with a cumulative total count of 100 or more birds since 1970 (not considering more than one count for any given year or winter) or with confirmed or probable breeding records for more than one year since 1970. Other sites are classified as SITES OF SOME IMPORTANCE: those with a cumulative total count of 10 or more since 1970 (not considering more than one count for any given year or

winter) or with confirmed or probable breeding records for one year since 1970. Sites which qualify on these criteria but have since been destroyed are not included in the directory.

For every site in the directory, information is given on location, protected status, threats, its value for Marbled Teal and references which contain more information. For sites described in readily available wetland inventories (e.g. Carp 1980; Scott 1989; Grimmett & Jones 1989; Ramsar 1990; Hughes & Hughes 1992) or in publications in widely circulated journals, no further information is given. For sites not treated in such publications, available information is presented such as that found in typical wetland inventories (general description, area etc.). Likewise, a number of sites in Pakistan and China are listed in the Asian Wetland Directory (Scott 1989) and a cross reference is given for these sites (e.g. PK27, CN180). A number of sites in Spain and Turkey are listed in the directory of Important Bird Areas of Europe (Grimmett & Jones 1989), and a cross reference is given for these sites (e.g. IBA 247).

1.3.9 Comprehensive list of records

A list of all Marbled Teal records acquired during the production of this report is given for all major range states, with a breakdown by regions where appropriate. IWC data are presented in tables, while all other records are presented as lists in the texts. These records are stored on a database which will be regularly updated. In the IWC tables, blank spaces indicate years when sites were not counted. Zeros indicate years when sites were counted but no Marbled Teal were recorded. It must be emphasised that a zero count is no guarantee that Marbled Teal were not present at a site, as many sites are very large and often only a fraction of them are counted. Furthermore, large numbers of unidentified ducks are frequently recorded at larger sites, and there is always a possibility that these include some Marbled Teal.

1.4 REPORT FOLLOW UP

1.4.1 Conservation action

This report provides a basis for future measures for the conservation of Marbled Teal. The conservation recommendations made in the report are directed to the reader and to the conservation world at large. All organisations and individuals able to assist in Marbled Teal conservation are encouraged to do so. Owing to the migratory nature of the species, there is a need for concerted national actions which are coordinated at an international level. Where possible, national action plans should be prepared and implemented. An international workshop should be held to stimulate and coordinate the preparation and implementation of measures at a national level.

It is recommended that this report be reviewed and updated in 1998, in order to assess changes in the status and conservation needs of Marbled Teal.

1.4.2 Monitoring

The production of this report has established centralised monitoring of the current status and distribution of Marbled Teal by the IWRB Threatened Waterfowl Research Group. It is important that this continues as an aid to the planning of international conservation action. All readers are therefore encouraged to send details of future records to: The Coordinator, IWRB Threatened Waterfowl Research Group, The Wildfowl & Wetlands Trust, Slimbridge, Gloucester, GL2 7BT, U.K. Details of past records not found in this report are also requested.

1.5 GLOSSARY OF ABBREVIATIONS USED

IWC =International Waterfowl Census, organised by IWRB in the Western Palaearctic and Africa and jointly organised by IWRB and Asian Wetland Bureau in Asia.
IBA = Important Bird Area, described in Grimmett & Jones (1989).

2. THE STATUS AND CONSERVATION OF THE MARBLED TEAL *MARMARONETTA ANGUSTIROSTRIS*

2.1 STATUS AND DISTRIBUTION

The past and present distribution of the Marbled Teal are shown in Figure 1. Counts of the species have been received from about 300 wetlands since 1960. Figure 2 shows 26 wetlands on which concentrations of 100 or more birds have been recorded since 1980. The current distribution of the Marbled Teal is fragmented, with three major centres of distribution: the western Mediterranean and tropical Africa (Spain, Morocco, Algeria, Tunisia, Senegal, Mali, Nigeria and Chad); the eastern Mediterranean (Turkey, Israel and Egypt); western and southern Asia (Commonwealth of Independent States, Iraq, Iran, Afghanistan, Pakistan, India, China). IWC counts have been received from 13 different countries (Table 1).

Apart from the western Mediterranean, there are no ringing data for Marbled Teal and, although it is clear that movements occur regularly within and possibly between regional populations, these movements are very poorly understood and open to speculation. The population wintering in tropical Africa is thought to be made up of birds breeding in the western Mediterranean and migrating along the east Atlantic flyway. The Asian population may be subdivided into at least two subpopulations, with the population wintering in Pakistan being discrete from that wintering in south-western Iran (D.A. Scott *in litt.* 1992).

Marbled Teal is migratory across its range in the sense that it undergoes frequent movements across national frontiers, and there are major differences between wintering and breeding distributions in each region, although there is also considerable overlap. Although there may formerly have been some small resident populations (e.g. in the Cape Verde and Canary Islands), there are probably no surviving Marbled Teal populations that are truly resident. Unlike many palaearctic ducks, Marbled Teal generally does not undergo predictable migrations across national frontiers according to a fixed annual cycle but is more nomadic, making unpredictable, non-cyclical and opportunistic movements in relation to rainfall and flooding patterns that themselves are highly unpredictable in most of the range. Marbled Teal is one of many waterbirds of semi-arid and arid regions that are nomadic in this way, others including Greater Flamingo *Phoenicopterus ruber roseus*, Gull-billed Tern *Gelochelidon nilotica*, Slender-billed Gull *Larus genei*, Black-winged Stilt *Himantopus himantopus*, Avocet *Recurvirostra avosetta* and Kentish Plover *Charadrius alexandrinus*. In parts of its range, Marbled Teal makes extensive use of temporary wetlands that are dry for years at a time, both for breeding and wintering (e.g. Sebkhet Sidi Mansour in Tunisia and Zangi Nawar in Pakistan).

The former and current status and distribution of Marbled Teal is summarised below.

2.1.1 Spain

The major population centres of Marbled Teal are in Andalucia and Valencia. In Andalucia, several thousand breeding pairs were present at the Marismas del Guadalquivir at the turn of the century (Valverde 1964). The numbers have since declined markedly, with 50 to 200 breeding pairs between 1988 and 1992 (Grimmett & Jones 1989; L. García pers. comm. 1992). From July to December, important concentrations are found in the lagoons of Cadiz and Seville (Agencia de Medio Ambiente *in litt.* 1992) with 341 in the Espera lagoons in October 1987 (Ceballos Benito 1989). In some winters, up to 500 birds occur in the Marismas (L. García pers. comm. 1992), while in others they are almost absent. Five ringing recoveries show that some Marismas birds winter in Morocco and Algeria (Fernandez Cruz 1972, 1982). Numbers breeding in Valencia have also declined, with an estimated

200 breeding pairs in the mid 1960s at El Hondo reservoirs (J.D. Navarro Medina *in litt.* 1992). Since 1985 there have been 3-30 breeding pairs divided between El Hondo and three other sites (Dolz García *et al.* 1991; Navarro Medina & Robledano Aymerich 1992). In July 1992, 148 birds were seen at El Hondo (J.D. Navarro Medina *in litt.* 1992). Breeding has occasionally been reported in Castilla-La Mancha and the Balearic Islands (Lemke & Bernis 1973; *La Garcilla* 82: 31) and may also occur in Murcia. Breeding was formerly recorded from the Canary Islands (Cramp & Simmons 1977).

2.1.2 Morocco

Marbled Teal were formerly very abundant in winter when they were exceeded in number around Tangier only by the Common Teal *Anas crecca*. They were also a "common breeder" (Phillips 1923). Numbers have clearly declined significantly as Marbled Teal are now heavily outnumbered in winter by many duck species (Rose 1992), but there remains a regular wintering population of 1,000-2,000 (Table 2) with regular concentrations of up to 1,680 at Merja de Sidi Bou Rhaba in the north-west (*British Birds* 78: 638) and up to 920 at Lagunes de Sidi Moussa-Oualidia in the Centre Atlantic (IWC). The highest count in recent times is of 3,000 at Dayet Merzouga in May 1973 (*Alauda* 45: 286). Breeding currently occurs at seven sites in the North-West, North-East and South regions, but in small numbers with Sidi-Bou Rhaba the most important site with 5-15 pairs (Thévenot 1976; C. Pouteau *in litt.* 1992). There were at least 20 pairs in 1968 at Lak Iriki (Robin 1968), which is now drained.

2.1.3 Algeria

Marbled Teal were formerly "very common...in summer" (Hume & Marshall 1880) and breeding in "countless numbers" in Lac Fetzara (Phillips 1923) which is now drained. There are few recent data, but breeding is currently thought to occur at four sites in the El Kala, Centre and West-Oranie Regions (Ledant *et al.* 1981) with probably more sites as yet undiscovered and at least 50 breeding pairs in wet years. Wintering is concentrated in West-Oranie with up to 360 birds recorded in the 1970s, divided between Grande Sebkhet d'Oran, Lac des Gharabas and Marais de la Macta (IWC). Occasional records from South Algeria suggest that the little known wetlands of this region may support a significant wintering population (B. Chalabi pers. comm. 1992). A record of 12 spring migrants on the Moroccan border (Smith 1968) suggests that some Algerian breeders may winter in Morocco. A record from the southern Algerian Sahara suggests that some wintering occurs south of the Sahara in the Chad basin (Ledant *et al.* 1981).

2.1.4 Tunisia

Hume & Marshall (1880) described Marbled Teal as "very common...in winter", but wintering has been very occasional in recent decades, with an exceptional concentration at Sebkhet Sidi Mansour in 1971 (Table 1). Breeding is thought to occur at 10 sites, and is divided between large, natural lakes (particularly Sidi Mansour and Sebka Kelbia) and artificial reservoirs such as Barrage el Haouareb (M. Smart *in litt.* 1992). In July 1991, 318 were seen at Sidi Mansour (A. Djaziri *in litt.* 1992). Sidi Mansour and Kelbia are dry for years at a stretch, and the size of the breeding population fluctuates accordingly but probably peaks at over 100 pairs. Wintering of Tunisian breeders is thought to occur south of the Sahara (M. Smart *in litt.* 1992).

2.1.5 Tropical Africa

Small numbers are recorded in mid-winter in the Senegal Basin in Senegal, the Niger Delta in Mali and the Chad Basin in Chad and Nigeria, with no more than 61 in any one year (Perennou 1991). In January 1962, several hundreds were recorded in north-eastern Chad (Edmond-Blanc 1968). These birds are thought to be migrants

breeding in Morocco, Algeria or Tunisia. However, one pair bred in Senegal in 1979 (Dupuy & Sylla 1981), and it is possible that breeding occurs elsewhere, such as in Chad (Smith 1968). There have been no records in the region since 1979.

2.1.6 Egypt

Marbled Teal formerly bred in the Western Desert and in the Nile Valley. They were "quite common" at Lake Qarun in the Nile Valley but elsewhere the numbers were small (Goodman & Meininger 1989). In winter they were "often obtained" in the Nile Delta and Suez Canal area (Meinertzhagen 1930). Marbled Teal is now only a winter visitor to the Nile Valley and Nile Delta in very small numbers (Goodman & Meininger 1989). A record of one migrant in North Sinai in September 1990 (G. Atta *in litt.* 1992) suggests that these birds breed in Israel or Turkey.

2.1.7 Israel

In the last century, Marbled Teal bred "in great numbers" in the Hula Valley, where 100-200 pairs were breeding in the 1950s (Phillips 1923; Paz 1987). Numbers have been greatly reduced and there are now 10-50 pairs in the valley breeding in Hula Nature Reserve and nearby fish ponds (Blitzblau 1992; Eyal Shy *in litt.* 1992). The Hula Valley is also the main wintering site, with up to 80 birds (Table 1).

2.1.8 Turkey

While there is no information on the status in the first half of this century, in the early years of the IWC, between 1967 and 1971, large numbers of Marbled Teal were recorded in winter at the Çukurova Delta, with 2,660 in 1968. Over 2,000 were seen in the delta in August 1967 (OST Bird Report). Marbled Teal is now almost entirely a summer visitor and breeding bird in about 12 sites split between the Southern Coastlands, Central Plateau, East Turkey and South-East Turkey. There are an estimated 150-250 breeding pairs in total, with the majority found in the Çukurova and Göksu Deltas in the Southern Coastlands, where breeding occurs annually. In April 1990 106 were seen in the Çukurova Delta (L.J. Dijksen *in litt.* 1991) and in 1991 31 broods were seen at the Göksu Delta (V. van den Berk *in litt.* 1992). Much breeding habitat in both these deltas and elsewhere has been lost, and there has been an apparent decline of more than 65% in the population size in the last 25 years. Wintering records are now exceptional, and the birds are likely to winter at unknown sites in the Middle East (e.g. Egypt or Syria).

2.1.9 Commonwealth of Independent States

Marbled Teal was formerly a common breeder in Kazakhstan, Turkmenistan and Azerbaijan, with breeding populations also in Russia, Uzbekistan and Tadjikistan (Dementiev & Gladkov 1952; Poslavski 1992). The major breeding centres were the Caspian coast, Syrdarya and Amudarya valleys and the Turkmen plains. The major wintering area was Turkmenistan, where 17,200 birds were seen in February 1932 in the Atrek Delta area (Poslavski 1992). Drastic declines have since occurred, and known breeding sites are now confined to five sites in Azerbaijan (70-200 breeding pairs, M.V. Patrekeev *in litt.* 1992), one site in Armenia (2-15 pairs, Adamyan 1989), four sites in Turkmenistan (c.100 pairs, Poslavski 1992) and two sites in Uzbekistan (c.10 pairs, Poslavski 1992). There are not likely to be more than 400 pairs for the whole CIS (V. Vinogradov pers. comm. 1991), although the possibility remains that other surviving populations have been overlooked. Wintering now appears to be exceptional, and probably occurs in Iran.

2.1.10 Iran

There is little information on the historical status of Marbled Teal in Iran. In winter, Iran holds most of the current world population, with counts of up to 21,513 (Table 1) and an estimated peak of 25,-30,000 birds (D.A. Scott *in litt.* 1992). The major sites are found in south-west Iran in Khuzestan and Fars Provinces. There have been IWC counts of over 10,000 birds in Shadegan marshes, Khuzestan in five of 17 winters in which the site was counted. The Khuzestan lowlands probably support one to several thousand breeding pairs, Fars probably supports about 1,000 pairs and Azerbaijan Province about 50-100 pairs (D.A. Scott *in litt.* 1992). Phillips (1923) reported breeding on the south coast of the Caspian and Seistan. Breeding probably continues in Seistan but no longer occurs along the Caspian. It is possible that the majority of the birds wintering in Iran breed in Iraq and the CIS. In the 1970s small numbers of migrants were seen on passage close to Turkmenistan on the south-east Caspian, and this passage is likely to be of up to a few hundred birds. Movements of small numbers are also likely between Seistan and Pakistan (D.A. Scott *in litt.* 1992).

2.1.11 Iraq

Marbled Teal are thought to breed widely in central and southern Iraq in wetlands of the lower Tigris and Euphrates valleys, where they were reported to be a common breeder by Ticehurst *et al.* (1922) and Moore & Boswell (1956). There may still be up to several thousand breeding pairs, with most birds wintering in Iran. Some wintering certainly occurs in Iraq, as 180 birds were seen in the Mahrut Valley in January 1968 (Georg & Vielliard 1970), but none were observed during three other winter surveys in the 1970s (Scott & Carp 1982).

2.1.12 Afghanistan

Marbled Teal was formerly considered to be an "irregular summer visitor and breeder" with only a few remaining in winter (Phillips 1923). The most important area is the Seistan Basin on the Iranian border where the most permanent wetland is Hamoun-e Puzak on the Afghani side. In February 1971, 63 birds were recorded from this site (Scott 1975) and breeding is likely to continue here.

2.1.13 Pakistan

Marbled Teal is mainly a wintering species in Pakistan but also breeds there. It was formerly "extremely common" in winter in Sind Province, where it was recorded in large parties in every district, and was regular in winter in southern Punjab (Hume & Marshall 1880). In recent decades only small numbers were recorded in Sind, but since 1989 there have been regular high counts with a peak of 5,463 in 1992 (Table 2). Occasional breeding occurs in Sind, with at least 15 pairs at Mehboub Shah in Nawabshah district in 1992 (T.J. Roberts *in litt.* 1992). Many Sind wetlands remain little known and may hold more birds. Zangi Nawar in Baluchistan is an important breeding and wintering site in wet years with c.150 breeding pairs in May 1984 and 300 in January 1984 (Roberts 1985). The Baluchistan population may be linked to that in Afghanistan. The birds wintering in Sind are most likely to breed to the north in the CIS or China, and autumn passage is regularly noted at Taunsa Barrage, Punjab (Scott 1989).

2.1.14 India

In the last century, Marbled Teal was a "regular" visitor to northern Gujarat (Hume & Marshall 1880) and specimens were collected as far south as Maharashtra and as far east as Assam (Baker 1921; Ali & Ripley 1968). The Ganges valley appears formerly to have been a regular flyway for small numbers of winter visitors that bred to the north in the CIS or China. There have only been recent records from Gujarat and Rajasthan from areas close

to the wintering grounds in Sind, Pakistan. In February 1990, 200 birds were seen at Chhari-Dhand in Kutch, Gujarat (S.A. Akthar and J.K. Tiwari *in litt.* 1992).

2.1.15 China

Marbled Teal are thought to breed in Xinjiang Autonomous Region following the species' discovery there in June 1985 when eight birds, including displaying pairs, were seen at Karamay oilfield (Harvey 1986). Xinjiang has many poorly known wetlands with the potential to support a large breeding population of Marbled Teal (Scott 1989). This region may perhaps be the major source of the birds wintering in Pakistan and India.

2.1.16 Other countries

There are historical breeding records from the Cape Verde Islands, the Camargue in France, Macedonia (former Yugoslavia), Greece (Crete) and Cyprus. Breeding probably also formerly occurred in Italy and Hungary (Phillips 1923; Mikuska 1975; Cramp & Simmons 1977). With the exception of Cape Verde Islands, where Marbled Teal bred "plentifully" (Baker 1921), all these records involved small numbers of birds. There have been no breeding records from any of these countries since 1950. One pair bred in Jordan in 1990 (*British Birds* 84: 3). Vagrants have been recorded from Portugal, Belgium, Germany, Switzerland, Malta, Albania, Bosnia (former Yugoslavia), Poland, the Czech Republic, Bulgaria, Romania, Libya, Jordan, Syria, Lebanon, Oman and Bahrain.

2.2 CURRENT POPULATION SIZE AND TRENDS

On the basis of recent mid-winter counts (Tables 1 & 2), the current world wintering population of Marbled Teal can be conservatively estimated at 33,000 birds. The western Mediterranean/tropical African population can be estimated at 2,000, with a 1989 IWC count of 1,711 in Spain and Morocco and several hundred birds probably wintering in tropical Africa. The eastern Mediterranean wintering population must be at least 600, given the fact that 200 pairs or more currently breed in Turkey and Israel. The south-western and southern Asian wintering population can be conservatively estimated at 30,000, with a 1992 IWC count of 26,275. Many potential wintering sites in Asia still have an unknown fauna, particularly in Iraq, Afghanistan and the CIS, and this population is likely to be underestimated.

The *actual* total world population is most likely to lie in the range of 33-40,000, with a total breeding population of 8-13,000 pairs (Table 4). This estimate of breeding population is partly based on the fact that, in a successful breeding year in similar waterfowl species, the wintering population produced is three to four times the number of breeding pairs (D.A. Scott pers. comm. 1992). Like those of other duck species, Marbled Teal populations must fluctuate considerably from one year to the next, and the above figures refer to estimates of peak population size within the range of current fluctuations. There are insufficient data to estimate the lower limit of this range, but it is likely to be less than 50% of the peak population.

Historic data are mainly non-quantitative and it is impossible to know the former size of the Marbled Teal population. However, available data suggest major declines across the Marbled Teal range, with a former wintering population of over 72,000 (Table 4). Hence the world population of Marbled Teal has almost certainly declined by over 50% this century. This may be a considerable underestimate as, in those two countries where quantitative historical data are available, the population declines have been much greater. The Spanish and CIS breeding populations have apparently both declined by over 90% this century, while the Turkish breeding population appears to have declined by at least two thirds since the late 1960s. Hence it is quite likely that the world population has itself declined by over 90% this century.

The IWC has collected winter counts of Marbled Teal for 25 years (Table 1), but it has only revealed strong evidence of a population decline over that period for Turkey. Significant counts during the 1970s for Algeria, Tunisia and tropical Africa have not been repeated during the 1980s, but there is no firm evidence that this is due to real population declines. In Tunisia, wintering is highly exceptional, while in Algeria and tropical Africa, Marbled Teal are likely to have been missed in the 1980s due to incomplete coverage of huge wetlands. Analysis of trends at Marbled Teal sites counted every winter between 1986 and 1992 reveals no evidence of ongoing declines in any of the wintering areas (Table 3). However, there is evidence of an increase over this period in the population wintering in Pakistan. The reasons for this are completely unknown, but are more likely to involve a change in wintering distribution than a genuine population increase. There is also weak evidence of a recent population increase in Spain (Table 3), and indeed the Spanish breeding population has recovered to some extent since its lowest point in the late 1970s.

2.3 THREATS AND CAUSES OF DECLINE

Marbled Teal is one of few Palaearctic ducks that both winters *and* breeds at relatively low northern latitudes, with the major centres of distribution lying in near-coastal areas at 30-45^{o} N (Figure 1) in regions with a mediterranean or steppe climate (Anon. 1990a). As a result, it spends its whole annual cycle in regions with a relatively high human density. The great majority of the bird's range has human densities of over 10 per km^2, with large areas having over 40 per km^2. In contrast, most palaearctic ducks breed at 55-80^{o} N in areas with a subarctic or tundra climate and human densities below two per km^2 (Anon. 1990a). As a result, Marbled Teal has suffered higher degrees of development activity (and hence habitat destruction) and hunting pressure in its breeding range than most other duck species. The White-headed Duck *Oxyura leucocephala* has a similar distribution to Marbled Teal and it is no coincidence that these two species are the only duck species in the Western Palaearctic that are considered globally threatened. Different classes of threats are reviewed in detail below.

2.3.1 Habitat loss and degradation

This century, very large areas of wetlands of great importance for breeding and wintering Marbled Teal have been completely destroyed, or degraded to such an extent that they have lost their value. This habitat loss has occurred across the species' range and is probably the single major cause of the decline in world population and in distribution.

Drainage by agricultural schemes has resulted in a catastrophic decrease in the area of Marbled Teal habitat across the CIS, particularly in Turkmenistan, Kazakhstan and Azerbaijan. The wetlands of the Amudarya and Syrdarya catchments have been devastated after these rivers were diverted for enormous irrigation projects (Borodin 1978). Many lakes in Tashauz Oblast in northern Turkmenistan, where Marbled Teal was common, have been destroyed (Poslavski 1992). Numerous shallow lakes and river floodlands have been drained in Kazakhstan (IZASK 1978). Drainage of Marbled Teal sites is still continuing in Azerbaijan (M. Patrekeev *in litt.* 1992).

In Spain, the area of marshes in breeding sites in Andalucia and Valencia has been drastically reduced (Ramsar 1990; Navarro Medina & Robledano Aymerich 1992). In Iran, three important sites in Fars have been drained since the 1970s, including the Soltanabad marshes breeding site (D.A. Scott *in litt.* 1992). In Turkey, there has been extensive drainage in the Çukurova Delta, Göksu Delta and elsewhere, including the loss of the Aynaz swamp area which was an important breeding site and held over 1,200 birds in winter 1967 (Aukes *et al.* 1988). In Israel, the area of the Hula marshes where Marbled Teal was once very abundant has been reduced from about

6,000 ha to 200 ha (Carp 1980). In Tunisia, upstream barrages have severely affected several breeding sites, increasing the frequency of desiccation of Sebkha Kelbia by 2.5 times and increasing the salinity at Lac Ichkeul (Hughes & Hughes 1992). In Pakistan, diversion of catchment streams for irrigation have harmed a number of sites, including the most important breeding site, Zangi Nawar (Scott 1989). Other important breeding sites destroyed include Lake Fetzara, Algeria and Lac Iriki, Morocco.

These are just a few examples of habitat loss, and many more are given in the national chapters. No figures for the overall rates of habitat loss are available, but the destruction of Marbled Teal breeding habitat may well have exceeded 50% this century. Furthermore, additional areas of habitat have been degraded through various means. Intensive reed-cutting, reed-burning and overgrazing are commonplace and reduce the amount of habitat available for nesting. Pollution from agricultural, industrial and domestic sources is a threat at many Marbled Teal sites. For example, in Spain, Marbled Teal have been poisoned by pesticide abuse in the Marismas del Guadalquivir (Hidalgo 1975) while El Hondo reservoir has a polluted water supply and is suffering from extreme eutrophication (J.D. Navarro Medina *in litt.* 1992). In Tunisia, major urbanisation at Lake Tunis during the 1980s stopped Marbled Teal from breeding along the north shore (M. Smart *in litt.* 1992). Fish introductions have occurred (e.g. at Lake Parishan in Iran) and have had an unknown effect.

Many sites are currently facing new threats from development proposals, including the following examples. Further upstream dams are planned for the Lac Ichkeul catchment in Tunisia (Hughes & Hughes 1992), and for the Chhari-Dhand catchment in India (S.A. Akthar and J.K. Tiwari *in litt.* 1992). Drainage schemes are planned that will destroy the seasonal wetlands of the Göksu Delta (V. van den Berk *in litt.* 1992), a major road scheme threatens the Lower Loukos area of Morocco (C. Pouteau *in litt.* 1992) and there is a proposal to dump untreated domestic sewage into El Hondo, Valencia (G. Gonzalez Barbera pers. comm. 1992). In some cases, huge areas of wetlands are threatened by new projects. For example, the wetlands of the lower Tigris and Euphrates in Iraq are seriously threatened by a large new irrigation canal completed in 1992 and constructed to drain the southern marshes (*The Guardian* 27.8.92; *The Observer* 28.2.93). This could potentially destroy habitat used by thousands of breeding pairs of Marbled Teal. These wetlands are also threatened by the construction of new dams upstream in Turkey and Syria (D.A. Scott *in litt.* 1992).

2.3.2 Hunting

The Marbled Teal is considered to be a relatively tame duck species that is easy to shoot, particularly in the breeding season (Phillips 1923). Although in winter Marbled Teal are typically found on wetlands that support many more ducks of other species, in summer it is one of only a handful of wildfowl species occurring in its range. As a result, it is particularly vulnerable to shooting and egg collection through the summer. Hunting is said to have caused a significant decline in the numbers of Marbled Teal in Algeria as early as 1867, following an increase in hunting pressure after the French occupation (Phillips 1923). Intense hunting pressure is likely to have eliminated the breeding population in Egypt (P.L. Meininger *in litt.* 1992). In Spain, 357 birds were shot in Marismas del Guadalquivir in the winter of 1926-27 (Valverde 1964). Egg collection at Sebkha Kelbia, Tunisia was so severe in the 1960s that very few young reached maturity (Smart 1970). The numbers of Marbled Teal in parts of Turkmenistan are thought to have been decimated by intensive poaching (Poslavski 1992). In Turkey, extreme hunting pressure has been held responsible for the decline of the species in the Southern Coastlands by 1970 (Gürpinar & Wilkinson 1970).

Hunting, illegally or legally, is thought to be a continuing problem in every major range state, although there is very little quantitative information. In Iran, over 100 Marbled Teal were seen for sale together in a market in about 1984 (H. Farhadpour pers. comm. 1991), although hunting is now thought to be under much tighter control.

Official records show 74 birds were shot at two sites in Valencia, Spain, in the winter of 1981-1982 (J.D. Navarro Medina *in litt.* 1992). At Akyatan Gölü in the Çukurova Delta, Turkey, there were an estimated 80,000 hunter man-days in 1986 (Aukes *et al.* 1988).

2.3.3 Additional threats

Warfare is a significant threat to the Marbled Teal population in Iraq and Iran. The chemical weapons used in the Iran-Iraq war may have caused significant damage to important wetlands on the Iranian side of the border, including the Shadegan marshes (Ramsar 1990). There are numerous other threats of relatively minor importance, including disturbance from commercial fishing operations (e.g. at Lake Aggel in Azerbaijan, M. Patrekeev *in litt.* 1991), disturbance from tourism (e.g. at Merja de Sidi Bou Rhaba in Morocco, C. Pouteau *in litt.* 1992), predation of young by stray dogs (e.g. in the Marismas del Guadalquivir, L. García pers. comm. 1992) and the drowning of young in fishing nets (e.g. in the Göksu Delta, V. van den Berk *in litt.* 1992).

2.3.4 Limiting factors

Whilst it has been argued that it is likely to be the area of habitat and the food supply available in winter that naturally limits the population size of typical palaearctic ducks (Owen & Black 1990), it seems more likely that Marbled Teal populations are limited by factors operating during the breeding season. The area of breeding habitat and hunting pressure in summer are likely to be the major factors.

The fact that Marbled Teal shares its breeding sites with few other Anatidae species makes it likely to suffer relatively intense pressure from hunting, egg collection or predation at this time of the year. Since this species breeds in semi-arid and arid regions, often in wetlands that are dry in many summers, the area of breeding habitat available may often be limiting. Since the habitat requirements of Marbled Teal in winter may be less specific than in summer (e.g. dense areas of emergent vegetation are only required for nesting) and rainfall is concentrated in winter periods in the Marbled Teal's range, the availability of wintering habitat is unlikely to be limiting. However, our understanding of Marbled Teal ecology is very limited and the possibility remains that competition for food with other duck species or unknown habitat requirements in winter do indeed make habitat availability at that time of year a limiting factor.

2.4 CONSERVATION MEASURES TAKEN

2.4.1 Habitat protection

Of a total of 140 KEY SITES and SITES OF SOME IMPORTANCE identified across the Marbled Teal range, 55 (39%) have been granted some kind of protection status, such as a hunting reserve, National Park, Wildlife Sanctuary or Ramsar site. A much higher proportion of the more important KEY SITES have been protected (34 of 64, 53%) than of SITES OF SOME IMPORTANCE (21 of 76, 28%). The proportion of sites protected varies considerably between different range states with the highest proportion in Spain and Iran and the lowest in Turkey and the CIS (Figure 3). In many cases, their importance for Marbled Teal has undoubtedly played an important role in the decisions to protect these wetlands, although it is not possible to assess the importance of this factor compared with their value for other waterbird species. There have been no habitat conservation programmes to date that have made explicit use of the Marbled Teal as a "flagship", in the way that the White-headed Duck has been used as a flagship for the conservation of Andalucian lagoons and Burdur Gölü in Turkey (Green & Anstey 1992).

In numerous cases, the protection status granted to wetlands of importance for Marbled Teal has not been

effectively enforced, or has not had enough legal basis to prevent their degradation (e.g. due to construction of dams or irrigation works outside the boundary of a protected area but inside the water catchment). Many of the above examples of ongoing habitat degradation refer to sites with protected status.

2.4.2 Species protection

Marbled Teal has been granted legal protection in Spain, Turkey, Tunisia, Iran, Pakistan and the former Soviet Union (although the legal status in the independent republics is unclear). It is unclear how effective this legislation is, and hunting is thought to continue illegally in all these countries.

2.5 CONCLUSIONS

2.5.1 Conservation status

The Marbled Teal has undergone a marked reduction in range this century, particularly in Asia (Figure 1), and a significant reduction in population size across its range. The world population has declined by over 50% this century and possibly by over 90%. None of the regional populations appears to be very secure, as all face a range of threats and have many sites of major importance that still lack effective protection. Although there is little quantitative evidence of ongoing declines in recent years, real declines are likely to be continuing in many areas owing to the relentless pressure for "development" of wetlands and their environs that is currently affecting many sites important for Marbled Teal across its range. Mortality from hunting is also likely to be causing continuing declines in some areas and preventing recolonisation of suitable habitats in others.

Although Marbled Teal retains a larger world population than many other threatened bird species, it is still at risk owing to its rate of decline and the fact that the great majority of the population is concentrated in south-western and southern Asia. This is particularly true in winter when the majority of birds are highly concentrated in a handful of sites and most of the world population can sometimes be found together in the Shadegan Marshes in Iran. In addition, the majority of the Asian population may breed in Iraq, where it faces considerable threats. The populations in the eastern and western Mediterranean region are relatively small and at considerable risk. Marbled Teal is clearly worthy of its Red Data Book status.

2.5.2 IUCN category

Marbled Teal is currently listed as IUCN Vulnerable (WCMC 1990). This category remains appropriate under the revised criteria proposed by Mace & Lande (1991), owing to the high degree of population fragmentation and high rate of decline this century (Ellis-Joseph *et al.* 1992).

2.5.3 Conservation actions needed

Conservation action is clearly needed to maintain the current range and abundance of Marbled Teal and to allow for possible expansion. Full details of conservation action recommendations are given in the national chapters, but an overview is given here.

The greatest need is for an improvement in habitat protection, which needs to be extended to more sites, concentrating on KEY SITES that remain unprotected. Protection needs to be tightened at sites already granted protected status, and where possible management plans for these sites should be developed and implemented. Habitat restoration should also be considered in protected sites that have been degraded. In some areas, Marbled

Teal may be an appropriate "flagship" for wetland conservation schemes.

Since the most serious threats to Marbled Teal are probably the destruction of breeding habitat and hunting throughout the breeding season, a top priority must be to give complete protection to as many breeding sites as possible. The nine most important breeding sites, each regularly holding 50 pairs or more are: Marismas del Guadalquivir in Spain; Sebkhet Sidi Mansour in Tunisia; Göksu Delta and Çukurova Delta in Turkey; Lake Aggel in Azerbaijan; Lake Sultandag in Turkmenistan; Lake Parishan and Dez River Marshes in Iran; Zangi Nawar in Pakistan.

Another top priority is the complete protection of those sites regularly holding very major concentrations in winter (particularly Shadegan Marshes in Iran; Merja de Sidi Bou Rhaba in Morocco; Soonahri Lakes in Pakistan).

Legal protection of Marbled Teal from hunting is required in Algeria, Morocco, India and the republics of the CIS. Effective hunter education programmes to prevent the shooting of Marbled Teal are required across the range.

Owing to the frequent movements across national frontiers within all regional Marbled Teal populations, a flyway management plan would be a very important conservation tool for each region. Such a plan is called for in the draft Western Palaearctic Waterfowl Agreement (Boere & van Roomen 1991), and would currently be most appropriate for the western Mediterranean population.

Survey work is required in many parts of the range to clarify the status and distribution of Marbled Teal and the location of major sites, particularly in the breeding season and especially in Asia. Better understanding of winter distribution should be achieved by improved coverage of wetlands during the International Waterfowl Census.

Very little specific biological research has been conducted on Marbled Teal. Ecological and behavioural research is required, focussing on identifying the detailed habitat requirements of the species throughout its annual cycle. Such information is essential for effective habitat management. Spain, Morocco and Turkey would be the best places to conduct such research. Ringing studies are also required to clarify the nature of population movements (e.g. to identify the breeding grounds of the Pakistan wintering population and the wintering grounds of the Tunisian and Turkish breeding populations).

3. SPAIN

3.1 LOCAL NAME

"Cerceta Pardilla". In Valencia, "Rosseta" (Miguel i Gil & Font i Ten 1989).

3.2 DISTRIBUTION AND STATUS

In Spain, Marbled Teal occur mainly in the south in Andalucia and the east in Valencia.

3.2.1 Andalucia

In Andalucia, the most important site is the Marismas del Guadalquivir, a large area of marshes, shallow seasonal lagoons (*lucios*) and river channels most of which now lies within the Doñana National Park and Parque Natural del Entorno de Doñana (situated around the National Park). Marbled Teal was formerly a very abundant breeder here and several thousand breeding pairs were thought to be present in the Isla Mayor and Las Nuevas areas at the turn of the century (Valverde 1964). Locals reported collecting 3,000 Marbled Teal eggs in one day. In the 1890s, Marbled Teal was more abundant here in August than any other duck except Mallard *Anas platyrhynchos*, and flocks of over 1,000 were still a common site in the 1920s. Around 500 were shot in one day in August about 1926 (Valverde 1964).

Numbers in the Marismas have always been subject to major fluctuations between years but a major decline had apparently already taken place by the 1930s, and this was accentuated in the 1950s by several years of drought. In 1958 there were only an estimated 100-200 pairs present in the breeding season (Valverde 1964). Peak numbers during the 1950s and 1960s have been estimated at 300-500 breeding pairs although, as up to 100 were shot each year in late summer on the eastern side of the Guadalquivir, these numbers may be underestimates (Hidalgo 1991). Numbers fell much lower following the prolonged drought of the late 1970s and early 1980s (Hidalgo 1991) with an estimate of only "up to 20 pairs" given by Amat (1982).

Since the mid 1980s there has been a degree of recovery following higher rainfall and in 1988 a peak was reached of an estimated 150-200 pairs (Grimmett & Jones 1989; ICONA pers. comm. 1992). In other recent years, the numbers have been lower with some 50-100 pairs in total (L. García pers. comm. 1992). Variation in rainfall alone does not explain all the fluctuations, as for example Marbled Teal were very scarce in 1990, a very wet year (ICONA pers. comm. 1992). In 1992, the following distribution of breeding pairs was estimated by L. García (pers. comm. 1992). Water levels were very low owing to dry weather and there was thought to be little or no breeding success.

Salinas de Sanlúcar and Bonanza, Entorno de Doñana:	15-20 pairs
Veta de la Palma, Entorno de Doñana:	30-40 pairs
Lucio del Cangrejo, Entorno de Doñana:	1-2 pairs
Fao-Guadimar, Doñana National Park:	4-5 pairs
Cantaritas, unprotected area:	3-4 pairs
Total for Marismas del Guadalquivir:	53-71 pairs

Breeding of isolated pairs is occasionally recorded in the inland lagoons of Seville and Cadiz that lie outside the Marismas. Such breeding has been recorded at Laguna de Taraje, Cadiz, in 1910 (Valverde 1964), Laguna de la

Cigarrera, Seville (once between 1976 and 1982, J. Amat *in litt.* 1992) and Laguna de los Tollos in 1991 (Agencia de Medio Ambiente *in litt.* 1992). Breeding also occurred in an unidentified lagoon in 1967 (*Ardeola* 14: 169).

Marbled Teal can be found in the Marismas throughout the year, but there are wide fluctuations in numbers between different months and different years (Valverde 1964) that are partly related to water levels. In a typical year, most of the Marbled Teal desert the breeding areas in the Marismas from July onwards as they dry out. From July to September, some flocks are found in those *lucios* that still hold water, but in recent decades only the artificial *lucios* of Isla Mayor retain water in summer (J. Fernandez-Palacios *in litt.* 1992). From July to December, many of the birds move away from the Marismas into the neighbouring lagoons of Seville and Cadiz, many of which often retain water throughout the year. In very dry years, even these lagoons dry out between the end of July and September (J. Fernandez-Palacios *in litt.* 1992). The most important lagoons are the Espera complex, Puerto Santa Maria complex, Chiclana complex and Laguna de los Tollos in Cadiz and the Lebrija-Las Cabezas complex in Seville (Agencia de Medio Ambiente *in litt.* 1992). Numbers peak in these lagoons in October and November, with the largest count being of 341 in the Espera complex in October 1987 (Ceballos Benito 1989). From late January onwards, the Marbled Teal begin to return to the Marismas in numbers (Valverde 1964), although some remain in the lagoons throughout the winter. This pattern of movements varies between years, and concentrations have been found in the *lucios* of the Marismas in October and November (e.g. 600 on 24.10.85 [*British Birds* 80: 10] and 530 in November 1985 [García *et al.* 1989]). Although 300-500 currently regularly occur in the Marismas in mid-winter (L. García pers. comm. 1992), in some years it seems that they are almost absent in midwinter and do not arrive until April (ICONA pers. comm. 1992; J. Hidalgo *in litt.* 1992). Early this century it was also noted that breeding Marbled Teal are very abundant some years and almost absent in others (Valverde 1964). These fluctuations show that the Marbled Teal is nomadic here as elsewhere in its range, and are probably related to population movements between Spain and North Africa. Ringing recoveries show that birds breeding in the Marismas have wintered in Morocco and Algeria in the winters 1969-70, 1970-71, 1975-76 and 1976-77 (see 3.4.2). Regular movements between Andalucia and Valencia are also likely to occur.

3.2.2 Valencia and Murcia

Marbled Teal breed regularly at three sites in Valencia: Marjal del Moro, the Salinas de Santa Pola and El Hondo. Isolated pairs may also breed in some years at Clot de Galvany in Valencia and Mar Menor in Murcia. Breeding probably occurred at Mar Menor in the past century (J.D. Navarro Medina *in litt.* 1992). Most of the birds only seem to be present in the area between early April and early November, and may winter elsewhere (Navarro Medina & Robledano Aymerich 1992). In winter and on passage, small numbers often occur away from the breeding sites at Albufera de Valencia (Bernis 1964; Dolz Garcia *et al.* 1991).

Marbled Teal were probably formerly very abundant in Southern Alicante, Valencia where there were originally very large areas of marshland habitat at Albufera de Elche and the mouths of the Segura and Vinalopo rivers. Marbled Teal were common at Bassa Llarguera and remained so when it was converted to the El Hondo Reservoirs in 1935-1945 (Navarro Medina & Robledano Aymerich 1992). Between 1940 and 1960, local reports suggest over 100 pairs were present in the breeding season, with an estimated 200 pairs in the mid 1960s (J.D. Navarro Medina *in litt.* 1992). A major decline began from 1960-1965 until the species apparently disappeared as a breeding species in 1978 (Navarro Medina 1988; Navarro Medina & Robledano Aymerich 1992). The El Hondo population reappeared in 1985 and has since recovered slightly, with 10-20 pairs breeding in 1988, 1989 and 1991 (Dolz García *et al.* 1991). The numbers breeding at the other sites in the region are much smaller, with up to nine pairs at Salinas de Santa Pola and up to two pairs at Marjal del Moro. In 1992, the numbers of breeding pairs estimated for southern Alicante were as follows (J.D. Navarro Medina *in litt.* 1992).

El Hondo:	13-21 pairs
Salinas de Santa Pola:	2-4 pairs
Total for Southern Alicante:	15-25 pairs

A record of 148 Marbled Teal at El Hondo on 30.7.92 demonstrates the current importance of the site and may have been an influx from Andalucia (J.D. Navarro Medina *in litt.* 1992).

3.2.3 Elsewhere

Small numbers of Marbled Teal occasionally disperse over a much larger area of Spain in autumn and winter, with records from Castilla-La Mancha, Cataluña, Caceres in Extremadura, Avila in Castilla-León and as far north as Asturias and Navarra (Table 5). There were regular records in the 1950s and '60s from the Ebro Delta in Cataluña, when up to 100 were seen in September (Maluquer 1971). To the north, breeding is also occasionally recorded in Castilla-La Mancha. Heavy floods in the winter of 1969-1970 led to breeding at Laguna de El Taray in Toledo in 1970 and at least 50 birds were shot in the region from September to December 1970 (Club Alcyon 1971; R. Martí *in litt.* 1992). Breeding was recorded "for the first time" at Tablas de Daimiel in Ciudad Real in 1991 (*La Garcilla* 82: 31). Marbled Teal had been reported as breeding at Tablas de Daimiel much earlier (Carp 1980). Ones and twos are regularly recorded from the Balearic Islands, where breeding is reported to have occurred in 1969 (Lemke & Bernis 1973; J. Mayol *in litt.* 1992). Breeding was occasionally recorded from the Canary Islands before 1915 (Phillips 1923; Cramp & Simmons 1977).

3.3 HABITAT

In the Marismas del Guadalquivir in winter, very large areas of water are under flood. When the floods dry up in spring they leave smaller areas of shallow water with luxuriant growths of *Scirpus maritimus*, *Scirpus lacustris* and *Juncus subulatus* that provide Marbled Teal with a good food supply and a safe area for breeding. Marbled Teal breed mainly on *quebradas* (seasonally flooded old watercourses, Amat 1982) and *vetas* (islands of glasswort *Salicornia fruticosa* [*Sarcocornia fruticosa*] that remain dry in the winter floods, Hawkes 1970). Valverde (1964) described nests placed between two clumps of *Juncus glomeratus*, in clumps of glasswort *Salicornia fruticosa* and in clumps of other *Salicornia* spp. On areas of high level ground, nests are also found in clumps of *Arthrocnemun macrostachyum* (salty Almajo) and *Suaeda vera* (fresh Almajo), especially in the former (Valverde 1964; J. Fernandez Palacios *in litt.* 1992).

Marbled Teal also breed along the banks of arms of the Guadalquivir river and along drainage canals and ditches. Pairs breeding along the arms of the Guadalquivir formerly relied on banks of *Phragmites* to provide cover for their young (Valverde 1964), but breeding often now occurs amongst glasswort growing on the banks of drainage or irrigation channels in areas where there are no tall emergents (L. García pers. comm. 1992). On the left bank of the Guadalquivir, nesting also occurs in dense groves of *Spartina* (J. Hidalgo *in litt.* 1992). In the 1960s, nesting occurred in the roofs of old reed and grass huts and even inside deserted houses (Hawkes 1970; J. Hidalgo *in litt.* 1992). Nests can also be found in thick vegetation such as under cactus *Opuntia* bushes and hedges and under vegetation along fences (Hidalgo 1991, *in litt.* 1992).

Marbled Teal usually feed in shallow, brackish to saline water (Hidalgo 1991). Valverde (1964) considered Marbled Teal to be better adapted to breeding in shallow waters and saline water than other species. Nevertheless, he considered that high salinity caused by drought led to the complete failure of breeding in 1957 in Las Nuevas. Females with broods show a preference for feeding in the fresher waters of *lucios* than those of salinas (J. Hidalgo

in litt. 1992).

Marbled Teal usually begin to return to the Marismas in numbers in late January, a few months after the rains arrive and flood the Marismas. This suggests that, when the land is newly flooded and water levels are at their highest, available food supply may not be so high until the levels have started to drop (Agencia de Medio Ambiente *in litt.* 1992). In winter, Marbled Teal are found on the large, freshwater *lucios*. From late summer to early winter and particularly in autumn, they are also found in numbers on the small, shallow, mainly brackish, endorreic, inland lagoons such as the Espera complex.

In Valencia, Marbled Teal are now mainly seen on small or medium size, fresh to brackish, shallow artificial pools made for hunting or fishing, and it is here that they breed. These pools are usually bordered with beds of *Phragmites* or other reeds or with patches of *Juncus* or *Scirpus*. Marbled Teal also frequent pools formed amongst glasswort *Salicornia* beds with adjacent patches of *Tamarix*. In Murcia, the birds are seen in similar small brackish lagoons on the west coast of Mar Menor, with reedbeds and glasswort (J.D. Navarro Medina *in litt.* 1992; F. Robledano *in litt.* 1992).

3.4 ECOLOGY AND BEHAVIOUR

3.4.1 Breeding biology

Breeding success and rainfall are very strongly correlated, with few pairs attempting to breed during years of low rainfall. In the Marismas del Guadalquivir, more than one female is often found to lay eggs in the same nest and Valverde (1964) found that complete clutches vary from 11 to 20 eggs with a mean of 14.1. Hawkes (1970) found three nests in the roof of one old hut, each attended by a pair of incubating teal and containing 20, 16 and 16 eggs. Females are also reported to lay inside nests of other wildfowl such as Mallad *Anas platyrhynchos* (J. Hidalgo *in litt.* 1992). Nesting occurs later than in most other ducks and laying usually begins in early May. Young have been seen as early as 23 May (Valverde 1964). Females and broods move to the *lucios* where there is plenty of cover provided by *Scirpus*. Females nesting in the Salinas de Sanlúcar swim with their young broods across the Guadalquivir to the fresher *lucios* of Las Nuevas where they fledge (J. Hidalgo *in litt.* 1992).

Early this century, locals reported the formation of huge communal nests in the Marismas during years of great abundance of Marbled Teal (Valverde 1964). These nests were formed on a veta under mixed thickets of *Opuntia*, thistles and *Anacyclus clavatus* (fam. Compositae) and contained tunnels 50-100 cm long leading to the exterior. In one case up to 100 eggs were said to have been laid in two nests connected together by a tunnel 2 m long. Up to 14 females were said to leave this tunnel together and many of the eggs were laid inside the tunnel. Large communal nests were also reported to occur in *Salicornia* thickets in the river banks.

3.4.2 Migration

Ringing recoveries are as follows (Bernis & Fernandez Cruz 1965, 1968; Fernandez Cruz 1972, 1982):

Juvenile ringed on 3.8.62 at Lucio del Cochinato, Marismas del Guadalquivir.
Recovered on 2.3.64 at Marisma de Henares, Sanlucar de Barrameda.

Juvenile ringed on 3.8.62 at Lucio del Cochinato, Marismas del Guadalquivir.
Recovered in April 1965 at Las Marismillas, Huelva.

Juvenile ringed on 11.7.69 at Doñana National Park.
Recovered on 23.1.70 at Oualidia (Safi), Morocco.

Female ringed on 16.7.69 at Doñana National Park.
Recovered in Nov 69 at Douyiet (Fez), Morocco.

Female ringed on 16.7.69 at Lucio Grande, Doñana National Park.
Recovered on 30.11.70 at Douyiet (Fez), Morocco.

Male ringed on 6.8.75 at Guadiamar Reserve, Marismas del Guadalquivir.
Recovered on 11.2.77 at La Macta, Arzew, Algeria.

Female ringed on 17.8.75 at Guadiamar Reserve, Marismas del Guadalquivir.
Recovered on 22.11.75 at Zerja Bouka, Sidi Yahia de Gharb, Morocco.

3.5 THREATS

3.5.1 Habitat loss and degradation

There are various major threats to the Marismas del Guadalquivir through water extraction in surrounding areas, pollution etc. These are well known and documented and do not require detailed repetition here (see e.g. Ramsar 1990). Large areas of the marshes have been reclaimed this century, and the area of breeding habitat available to Marbled Teal has decreased drastically. The species was a common breeder in many arms and channels of the Guadalquivir that have been removed as a result of drainage activities in the Isla Mayor (Valverde 1964). Changes in hydrological regime and water quality have occurred that may have made the habitat less suitable for Marbled Teal and more suitable for other species such as Gadwall *Anas strepera* and Red-crested Pochard *Netta rufina* whose numbers have increased in recent decades (Amat 1982). Lowering of the water levels has led to a noticeable reduction in recent years in the area of wetlands that persist through the summer and so allow successful breeding (L. García pers. comm. 1992). Beds of *Spartina* on the left bank of the Guadalquivir formerly used by Marbled Teal for nesting were buried with material dredged from the river bottom (J. Hidalgo *in litt.* 1992). This century, 60% of inland Andalucian lagoons, an important habitat for Marbled Teal at some times of the year, have been drained (J. Fernandez Palacios pers. comm. 1991).

In Valencia, drainage of marshland habitat used by Marbled Teal began in the 18th century, and by the middle of this century the area of habitat was drastically reduced (Navarro Medina & Robledano Aymerich 1992). Drainage of pools and marshes adjacent to El Hondo continued until the 1970s, but in recent years new artificial ponds created for hunting and fishing have probably increased the number of Marbled Teal breeding (J.D. Navarro Medina *in litt.* 1992). The water supply entering El Hondo is charged with agricultural and industrial pollutants, and now the Confederación Hidrográfica del Segura is planning to dump untreated sewage from Catral, San Isidro and other small towns around El Hondo straight into the reservoirs, effectively using the site as a treatment facility (G. Gonzalez Barbera pers. comm. 1992).

Drainage has also occurred in other areas of Spain frequented by Marbled Teal; e.g. the former breeding site in the Canary Islands was largely drained by 1948 (Cramp & Simmons 1977).

3.5.2 Hunting

Marbled Teal are considered to be relatively tame and so more easily shot than other species (J. Hidalgo *in litt.* 1992). Between 1923 and 1958, 1,224 Marbled Teal were shot in the southern *lucios* of the Marismas del Gualquivir alone (Mörzer Bruijns 1959). There were great fluctuations in the number shot in any one year, probably reflecting genuine fluctuations in the size of the population, and the peak number was 357 in the winter of 1926-27, with the last high peak in 1947-49 when 102 were shot in 1947-48 and 97 in 1948-49. Hunting occurred from July to April inclusive, and is likely to have contributed to the decline of the species in the Marismas (Valverde 1964). Before 1960, big shoots took place in late summer when Marbled Teal were concentrated on the reduced area of wetlands, taking a large toll of the species (J. Hidalgo *in litt.* 1992). In 1969, birds were on sale at a market in Coria del Rio near the Marismas (Hawkes 1970).

Hunting was formerly very widespread, such that most of the pre 1980 records from Cataluña and parts of Valencia and Castilla-La Mancha are of shot birds, and at least 50 were shot in September to December 1970 in La Mancha at the edge of the range (Club Alcyon 1971). A taxidermist in Elche, Alicante, mounted about 150 Marbled Teal between 1955 and 1965 (Navarro Medina & Robledano Aymerich 1992). Inspections at hunting posts in El Hondo, Alicante, in the early 1970s found that more Marbled Teal had been shot than any other duck except Shoveler *Anas clypeata* (Navarro Medina 1972). Official hunting records from El Hondo and Salinas de Santa Pola report that 74 Marbled Teal were shot in the 1981-1982 season, 68 in 1982-1983, 50 in 1983-84, 11 in 1984-85 and four in October 1985 (Consellería d'Agricultura i Pesca, Generalitat Valenciana). These records are not very accurate and may underestimate the actual numbers killed, but suggest a level of hunting pressure much higher than could be sustained by the Valencian Marbled Teal population. There have been no official hunting records in Valencia since 1985. El Hondo and Salinas de Santa Pola are divided into 15 private hunting estates used by 371 hunters, without any hunting refuges. They hunt legally for 12 days a year between late October and late January and in the 1988-89 season the official bag was 15,000 ducks and coot (J.D. Navarro Medina *in litt.* 1992). There is currently no education or monitoring programme to prevent shooting of Marbled Teal, and it seems very likely that many are still shot each year. Some were shot at Salinas de Santa Pola on 17.10.92 and at least two were shot at El Hondo on 8.11.92. Uncontrolled hunting is also a serious threat at other sites in Valencia such as Marjal del Moro (J.D. Navarro Medina *in litt.* 1992).

Illegal hunting remains intense in winter in parts of the Parque Natural del Entorno de Doñana used by Marbled Teal, especially at the Salinas de Sanlúcar (Agencia de Medio Ambiente *in litt.* 1992). Illegal hunting may also still occur in the breeding season (J. Hidalgo *in litt.* 1992). Hunting is permitted in areas outside Doñana likely to be frequented by Marbled Teal at times. It is likely that some are shot occasionally, especially as hunters are permitted to start shooting only one hour after first light, when it is still too dark to discriminate quarry species from non-quarry species (L. García pers. comm. 1992).

3.5.3 Predation

Stray dogs are widespread in the breeding sites in the Marismas del Guadalquivir and kill a number of Marbled Teal ducklings, which are relatively easy to catch as they occur in shallow waters and often in enclosed spaces within narrow canals (L. García pers. comm. 1992). Likewise, the young bred at Laguna de Los Tollos in Cadiz in 1991 were probably killed by dogs (Agencia de Medio Ambiente *in litt.* 1992). Rat *Rattus norvegicus* predation is also a major problem on the *vetas* in the Marismas, as the *vetas* form a refuge for the rats during the winter floods (L. García pers. comm. 1992).

3.5.4 Others

In the Marismas del Guadalquivir, Marbled Teal are one of many waterfowl species that die when caught in

fish-traps placed by crayfish poachers. Some 2,000 traps are placed each day from January to July within Doñana National Park and 50,000-60,000 birds are reported to have died in 1983 alone. The constant pass of poachers setting traps also causes disturbance and damages vegetation needed by Marbled Teal for nest sites (Martin-Novella 1989). Massive bird poisoning has occurred in the Marismas due to uncontrolled use of pesticides in the catchment, and Marbled Teal has been amongst the species affected (Hidalgo 1975). Pesticide use is also presumed to be the cause of botulism epidemics that have a regular impact on Marbled Teal (Ramsar 1990).

In Valencia, plans have been made for a new motorway from Alicante to Cartagena that may run very close to the major breeding sites of Salinas de Santa Pola and El Hondo as well as to two sites of lesser importance (Salinas de la Mata in Alicante and Mar Menor in Murcia). According to one current plan (Ministerio de Obras Publicas y Transporte), the road will travel 30 m from the eastern edge of El Hondo and 0-1,000 m from the north and west boundaries of Santa Pola. It seems likely that this project would reduce the breeding activity of Marbled Teal through disturbance and increase mortality of birds moving between the two sites, which will be separated by the road. An alternative route is being considered that would bypass the two sites (*La verdad*, 7.7.92). The project has currently been suspended due to lack of private funds, but may go ahead within a few years.

3.6 CONSERVATION MEASURES TAKEN

3.6.1 Habitat protection

Seven of the nine most important sites for Marbled Teal are protected as Reserves, National Parks and/or Ramsar sites. Two regular breeding sites, Las Cantaritas and Marjal del Moro, remain unprotected. Of seven sites of less importance, five have some degree of protected status, the exceptions being Laguna de los Tollos and Clot de Galvany. While protected status has had a clear benefit to wetlands in Andalucia, this is not the case in Valencia. El Hondo and Salinas de Santa Pola have both been protected since 1988 as Parajes Naturales, Ramsar Sites and EEC SPAs, but there has been no implementation of protection measures to date.

There are currently proposals to restore an area of marshland in the Marismas del Guadalquivir that was reclaimed for agriculture many years ago. Veta de la Palma is a large estate of 10,000 ha in the southern Isla Mayor of the Marismas, lying within the Parque Natural del Entorno de Doñana. The area is currently in use for agriculture and aquaculture, with the wetland area of over 600 ha modified for aquaculture with no islands and little nesting habitat for waterfowl. There are ambitious plans to develop a major wetland reserve and visitor centre on the site, and to establish reedbeds of *Scirpus* and *Phragmites* in the wetlands that will provide breeding habitat for Marbled Teal and other species (T.A. Jones *in litt.* 1991).

3.6.2 Species protection

The Marbled Teal has been protected from hunting across Spain under national law since 1980. It is listed as endangered in the Spanish Red Data Book (Blanco & Gonzalez 1992). The Marbled Teal is also listed as endangered in the National Catalogue of Threatened Species (Royal Decree 439/90) and hence it is compulsory to prepare regional Recovery Plans under Law 4/89 (B. Heredia *in litt*. 1993). The Generalitat Valenciana have prepared a regional Action Plan for the conservation of Marbled Teal in the Community of Valencia, completed in late 1992. A captive breeding programme is taking place in Doñana National Park.

3.7 EVALUATION

Spain holds one of the most important populations of Marbled Teal in the Mediterranean region, but one that has declined markedly this century and is still significantly threatened by lack of suitable habitat and hunting. Most of the important sites have protected status, but there is currently a general lack of appropriate habitat management within these protected areas that caters for the species. In Valencia there are new threats to the habitats, and hunting there remains intense and uncontrolled. There is a clear need for conservation action in Spain if the future of the species here is to be assured. The existing protected areas holding the species must be given more effective protection, particularly in Valencia. Breeding habitat should be improved within the protected areas by appropriate management. Those breeding sites that are still unprotected should be protected. The most important measure that could be taken is the preparation of a National Recovery Plan for Marbled Teal. Such plans have a legal basis to their implementation enshrined in the Ley de Conservación of April 1989.

It is clear that interchange between the Spanish and North African populations of Marbled Teal often occurs, but it is not known whether this happens annually or what proportion of the 1,500 birds often recorded in Morocco in mid-winter are Spanish breeders. There is a need both for flyway studies and cooperation over conservation measures between the countries sharing this migratory flyway.

3.8 ACTION NEEDED

The following recommendations were drawn up during a meeting of Spanish experts in Doñana in June 1992, by the authors of the regional Action Plan for Valencia, and with the help of other Spanish contributors:

Preparation of a National Spanish Recovery Plan for Marbled Teal: such plans are enforced by the Ley de Conservación of April 1989.

Protection of additional sites: Las Cantaritas, Laguna de los Tollos, Marjal del Moro and Clot de Galvany. In the Mar Menor complex, the habitat in San Pedro del Pinatar, Playa de la Hita and Lo Pollo should be restored and managed, and protected within a Ramsar site and EC-SPA.

Intensive habitat management in some parts of the Marismas del Guadalquivir: creation of more suitable breeding habitat by the management of water levels and provision of islands and appropriate vegetation for nesting through the Veta de la Palma project (Parque Natural del Entorno de Doñana), in the Salinas de Sanlúcar (Parque Natural del Entorno de Doñana) and the Salinas de San Rafael (Doñana National Park).

Extensive habitat management in the Marismas del Guadalquivir: creation of more suitable breeding habitat within the large area of ricefields by stimulating the creation and conservation of a network of well vegetated canals and walls.

Control of predation in the Marismas del Guadalquivir: control of stray dogs in the reserves and ricefields, and control of rats in the *vetas* suitable for breeding by Marbled Teal.

Control of hunting at El Hondo and Salinas de Santa Pola: Hunting refuges should be provided, and hunting bags closely monitored to ensure that no Marbled Teal are shot. There should be continuous hunter education to raise awareness of the importance of conserving Marbled Teal and how to identify them. Use of lead shot over these wetlands should be phased out.

Protection of habitat at El Hondo and Salinas de Santa Pola: habitat management should be initiated to provide improved breeding and feeding sites for Marbled Teal. The motorway project should be cancelled or re-routed to

minimise the impact on these wetlands. Other developments should be prevented around the border of the sites. The quality of inflow water to El Hondo should be monitored and improved. No untreated sewage should be allowed to enter the site.

Development of ecotourism at El Hondo and Salinas de Santa Pola: Alicante receives large numbers of tourist visitors and these sites should be developed as strict nature reserves with a visitor centre and facilities for viewing the wildlife. Such a scheme has the potential to generate a high income.

Conducting research into the ecology and biology of Marbled Teal, especially into breeding ecology and the nature of movements and migrations within and beyond Spain.

Preparation of a joint flyway management plan between Spain, Morocco and Algeria.

3.9 SITE DIRECTORY

KEY SITES

Marismas del Guadalquivir (Doñana National Park, Parque Natural del Entorno de Doñana, Las Cantaritas)
Laguna de Medina
Espera lagoon complex
Puerto Santa María lagoon complex
Salinas de Santa Pola
El Hondo
Marjal del Moro

SITES OF SOME IMPORTANCE

Tablas de Daimiel
Chiclana lagoon complex
Laguna de los Tollos
Lebrija-Las Cabezas lagoon complex
Albufera de Valencia
Mar Menor
Clot de Galvany

Name Marismas del Guadalquivir.
Location Huelva, Seville and Cadiz provinces. 37.00 N, 06.25 W.
Area 180,000 ha.
Protected Status 49,225 ha of the 180,000 ha are protected as a national park, Ramsar site and EC-SPA; 56,930 ha as Parque Natural Entorno de Doñana.
Threats Hydrological changes, pollution from pesticides, predation from rats and dogs, illegal hunting, illegal fish-trapping.
References Ramsar 1990, Carp 1980, IBA 247, Incafo 1991.
Status of Marbled Teal The major breeding site in Spain, with 50-100 pairs.

Name Laguna de Medina.
Location Cadiz Province. 36.37 N, 06.03 W.
Protected Status Reserva Natural, Ramsar site and EC-SPA.
Threats Quarry development.
References Ramsar 1990, IBA 252, Fernandez-Palacios 1990, Incafo 1991.
Status of Marbled Teal Up to 110 from August to October. Small numbers regular at other times of the year. Probably mainly a passage site.

Name Espera Complex (Lagunas Hondilla, Salada de la Zorrilla and Dulce de Zorrilla).
Location Cadiz Province. 36.53 N, 5.53 W.
Protected Status Reserva Natural and EC-SPA.
References IBA 249, Incafo 1991, Amat 1984.
Status of Marbled Teal Recorded from July to January with peak count of 341 (October 1987).

Name Puerto Santa María complex (Lagunas de Chica, Salada and Juncosa).
Location 36.39 N, 6.13 W. Cadiz Province.
General Description Endorreic lagoon complex of 63 ha (6.2 Chica, 33.4 Salada and 7.6 Juncosa).
Protected Status Reserva Natural and EC-SPA. Salada is a Ramsar site.
References Incafo 1991, Amat 1984, Ramsar 1990, Fernandez-Palacios 1990.
Status of Marbled Teal Up to 75 from October to January. Small numbers regularly seen at other times.

Name Salinas de Santa Pola complex.
Location 38.13 N, 00.35 W. Alicante Province, Valencia.
Protected Status Paraje Natural, EC-SPA and Ramsar site.
Threats Excessive and uncontrolled hunting pressure. A road bisects the site and there are plans for a motorway that will run beside the edge of the Paraje Natural. Refuse and construction rubble are dumped on site. Development of pisciculture projects. Urban and touristic development.
References Carp 1980, IBA 216, Ramsar 1990, Navarro Medina *in litt.* 1992.
Status of Marbled Teal Regular breeding site, with up to 7 pairs breeding. Rarely seen in winter.

Name El Hondo.

Location 38.20 N, 00.42 W. Alicante Province, Valencia.
Protected Status Paraje Natural, Ramsar site, EC-SPA.
Threats Domestic, agricultural and industrial pollution of inflow water, affecting mainly the reservoirs. Excessive and uncontrolled hunting pressure. There are plans for a motorway that will run beside the edge of the site.
References Carp 1980; IBA 215; Navarro Medina 1988; Ramsar 1990.
Status of Marbled Teal Regular breeding of up to 20 pairs, mostly in the pools. 148 seen on 30.7.92. Rarely seen in winter.

Name Marjal del Moro.
Location 39.38 N, 00.15 W. Valencia Province, Valencia.
General Description Complex of endorreic, seasonal coastal marsh and lagoons of 250 ha. There are plenty of macrophytes, reedbeds and patches of *Juncus* and *Scirpus*.
Depth 50-70 cm.
Altitude sea level.
Salinity fresh to fairly brackish.
Protected Status None.
Owner private.
Threats Habitat transformation and water level management, hunting, agricultural pollution, urban and industrial development.
References Dolz Garcia *et al.* 1991, Ambiental crew *in litt.* 1992.
Status of Marbled Teal One to two pairs breed regularly.

Name Chiclana Complex (Lagunas de Jeli & Montellano).
Location 36.27 N, 6.05 W. Cadiz Province.
General Description Endorreic lagoon complex of 49 ha (10.3 Montellano, 22.9 Jeli).
Protected Status Reserva Natural.
References Incafo 1991, Amat 1984.
Status of Marbled Teal Up to 19 from June to December.

Name Laguna de los Tollos.
Location 36.52 N, 06.00 W. Lebrija/Jerez; Seville and Cadiz Provinces.
Protected Status None.
Threats Industrial quarry; predation by dogs.
References Amat 1984, J. Fernandez-Palacios *in litt.* 1992.
Status of Marbled Teal Up to 39 in winter (1991). One pair bred in 1991.

Name Lebrija-Las Cabezas complex (Lagunas del Charroao, Taraje, Peña, Pilón, la Galiana, la Cigarrera).
Location 36.53 N, 5.53 W. Seville Province.
General Description Endorreic lagoon complex of 23.1 ha (3.5 Charroao, 8.4 Taraje, 4.7 Peña, 2.6 Pilón, 2.5 Galiana, 6.5 Cigarrera).
Protected Status Reserva Natural.
References Incafo 1991, Amat 1984.
Status of Marbled Teal Up to 14 from September to November.

Name Albufera de Valencia.
Location 39.20 N, 00.15 W. Valencia.
Protected Status Parque Natural, EC-SPA and Ramsar site.
Threats intense pollution, hunting, urbanisation, drainage.
References Ramsar 1990, Carp 1980, IBA 214.
Status of Marbled Teal Ones and twos seen in autumn and winter. Possible breeding in 1991.

Name Mar Menor Complex.
Location 37.45 N, 00.45 W. Murcia.
Protected Status Playa de la Hita is a Paisaje Protegido. Salinas de San Pedro del Pinatar is a Parque Regional.
Threats Pollution, development, disturbance and a new motorway is planned that will pass close to the west shore.
References IBA 218, Ambiental crew *in litt.* 1992, F. Robledano *in litt.* 1992.
Status of Marbled Teal 15 in Jan 1978, 1-5 in May 1988, 1989 and 1992. Possible breeder along the west shore in some years.

Name Clot de Galvany and Balsares Pools.
Location 38.15 N, 00.33 W. Alicante Province, Valencia.
General Description Complex of brackish, endorreic, seasonal coastal pools of 120 ha. Dense growths of macrophytes (*Ruppia maritima*) and *Phragmites australis* occur in the ponds with patches of *Tamarix* in the adjacent area.
Depth Max. 1.8 m, Ave 0.7-1 m.
Altitude 1-5 m a.s.l.
Protected Status None.
Owner Private.
Threats Intense illegal hunting and disturbance from recreational use. Rubbish and construction rubble are dumped on site. A road bisects the site.
References J.C. Aranda Lopez *in litt.* 1992.
Status of Marbled Teal A pair seen in the breeding season in 1991 and 1992. Breeding may have occurred in 1991.

Name Tablas de Daimiel.
Location 39.00 N, 03.45 W. Ciudad Real Province, Castilla-La Mancha.
Protected Status National Park, EC-SPA and Ramsar site.
Threats Drainage of areas outside the park has reduced water levels.
References Ramsar 1990, Carp 1980, IBA 087.
Status of Marbled Teal Breeding recorded in 1991 and probably earlier. 1 in winter 1972.

3.10 RECORDS FOR SPAIN

Location	Date	Source	Number	Notes
Andulucía				
MdG, Doñana & Guadiamar Biological Reserves	Jul 76	XVII	5	
MdG, Doñana & Guadiamar Biological Reserves	Aug 76	XVII	7	
MdG, Doñana & Guadiamar Biological Reserves	Apr 77	XVII	7	
MdG, Doñana & Guadiamar Biological Reserves	May 77	XVII	2	
MdG, Doñana & Guadiamar Biological Reserves	Jun 77	XVII	2	
MdG, Doñana & Guadiamar Biological Reserves	Aug 77	XVII	5	
MdG, Doñana & Guadiamar Biological Reserves	Sep 77	XVII	9	
MdG, Doñana Biological Reserve	13.10.77	I	8	
MdG, Doñana & Guadiamar Biological Reserves	Feb 78	XVII	2	
MdG, Doñana & Guadiamar Biological Reserves	Mar 78	XVII	2	
MdG, Doñana & Guadiamar Biological Reserves	Apr 78	XVII	4	
MdG, Doñana & Guadiamar Biological Reserves	May 78	XVII	4	
MdG, Doñana & Guadiamar Biological Reserves	Jun 78	XVII	5	
MdG	22.2.78	I	2	
MdG	Dec 78	IV	1	
MdG	Sep 85	XXX	195	
MdG	Oct 85	XXX	70	
MdG	Nov 85	XXX	530	
MdG	Dec 85	XXX	310	
MdG	Jan 86	XXX	0	
MdG	Feb 86	XXX	0	
MdG	Mar 86	XXX	94	
MdG	Apr 86	XXX	13	
MdG	1988	XX	-	estimated maximum of 175 breeding pairs
MdG, Lucio del Cagaero	8.1.69	IX	1,000	
MdG, Lucio del Cagaero	13.1.69	IX	150	
MdG, Lucio de los Ansares, National Park	Dec 67	IX	30	
MdG, Lucio de los Ansares, National Park	14.1.75	XIV	20	
MdG, Lucio del Cangrejo, National Park	24.10.85	III	600	
Lucio del Caño Nuevo, Isla Mayor, Entorno	18.11.73	V	4+	
Lucio de El Cuquero, Isla Mayor	19.5.89	XXXVIII	2	
Lucios de La Esparragosilla, Isla Mayor	19.5.89	XXXVIII	22	
Lucios de Las Gavetas IV, Isla Mayor	11.3.89	XXXVIII	9	
Lucios de Las Gavetas I, Isla Mayor	18.5.89	XXXVIII	21	
Lucios de Las Gavetas IV, Isla Mayor	19.5.89	XXXVIII	3	
Isla Mayor, Entorno de Doñana	Nov 90	XXV	4+	
Isla Mayor, Entorno de Doñana	May 91	XXV	10+	
Isla Mayor, Entorno de Doñana	Spring 1991	XXV	-	a pair with 13 pulli and a nest with 8 eggs
Isla Mayor, Entorno de Doñana	Jun 91	XXV	14+	
Isla Mayor, Entorno de Doñana	17.6.92	XXIX	80+	
Salinas de Bonanza-Sanlucar, Entorno de Doñana	13.4.60	XXXI	2	
Salinas de Sanlucar, Entorno de Doñana	16.4.87	XXXVII	2	
Salinas de Sanlucar, Entorno de Doñana	17.4.90	XXXVII	1	
Salinas de Sanlucar, Entorno de Doñana	20.11.90	XXV	27	
Salinas de Sanlucar, Entorno de Doñana	Dec 90	XXV	1	
Salinas de Sanlucar, Entorno de Doñana	Apr 91	XXV	2	
Salinas de Sanlucar, Entorno de Doñana	May 91	XXV	14	seven pairs
Salinas de Sanlucar, Entorno de Doñana	7.5.92	XXXVII	2	

Salinas de S. Marcos y S. Rafael	7.4.61	IX	1	
Costa de Huelva	Oct 85	XXX	10	
Costa de Huelva	Dec 85	XXX	0	
Costa de Huelva	Jan 86	XXX	0	
Unidentified lagoon in Andalucia	25.4-Jun 67	XXXII	-	small numbers seen almost daily
Unidentified lagoon in Andalucia	31.5.67	XXXII	-	possible nest with five eggs on island
Unidentified lagoon in Andalucia	9.6.67	XXXII	-	nest with five eggs on island
Lagoons of Seville, Cadiz, Cordoba, Malaga	Oct 79	VI	36	on one lagoon
Lagoons of Seville, Cadiz, Cordoba, Malaga	Aug 80	VI	1	
Lagoons of Seville and Cadiz	12.10.77	I	59	
Lagoons of Seville and Cadiz	Dec 1978	IV	1	
Lagoons of Seville and Cadiz	Aug 90	XXV	11	peak count for this month
Lagoons of Seville and Cadiz	Sep 90	XXV	39	peak count for this month
Lagoons of Seville and Cadiz	Oct 90	XXV	233	peak count for this month
Lagoons of Seville and Cadiz	Nov 90	XXV	239	peak count for this month
Lagoons of Seville and Cadiz	Dec 90	XXV	186	peak count for this month
Lagoons of Seville and Cadiz	Jan 91	XXV	98	peak count for this month
Lagoons of Seville and Cadiz	Feb 91	XXV	65	peak count for this month
Lagoons of Seville and Cadiz	Mar 91	XXV	12	peak count for this month
Lagoons of Seville and Cadiz	Apr 91	XXV	2	peak count for this month
Lagoons of Seville and Cadiz	May 91	XXV	30	peak count for this month
Lagoons of Seville and Cadiz	Jun 91	XXV	54	peak count for this month
Lagoons of Seville and Cadiz	Jul 91	XXV	16	peak count for this month
Lagoons of Seville and Cadiz	Aug 91	XXV	15	peak count for this month
Lagoons of Seville and Cadiz	Sep 91	XXV	9	peak count for this month
Laguna de Medina, Cadiz	19-21.11.73	V	44	
Laguna de Medina	17.8.85	XXXVI	3	
Laguna de Medina	16.9.85	XXXVI	30	
Laguna de Medina	27.9.85	XXXVI	45	
Laguna de Medina	2.10.85	XXXVI	110	
Laguna de Medina	26.10.85	XXXVI	55	
Laguna de Medina	Dec 1985	XXXVII	30	
Laguna de Medina	3.1.86	XXXVI	2	
Laguna de Medina	31.3.86	XXVI	5	
Laguna de Medina	3.8.86	XXXVI	6	
Laguna de Medina	Aug 86	XXXVII	110	
Laguna de Medina	13.9.86	XXXIII	5	
Laguna de Medina	5.12.87	XXXVI	19	
Laguna de Medina	13.12.87	XXXVI	70	
Laguna de Medina	19.12.87	XXXVI	8	
Laguna de Medina	28.12.87	XXVI	6	
Laguna de Medina	2.1.88	XXXVI	8	
Laguna de Medina	24.1.88	XXXVII	4	
Laguna de Medina	18.6.88	XXXVI	3	
Laguna de Medina	23,30.7.88	XXXVI	5	
Laguna de Medina	6.8.88	XXXVI	2	
Laguna de Medina	13-27.8.88	XXXVI	5	
Laguna de Medina	3.9.88	XXXVI	8	
Laguna de Medina	11.9.88	XXXVI	13	
Laguna de Medina	17.9.88	XXXVI	3	
Laguna de Medina	23.9.88	XXXVI	13	
Laguna de Medina	1.10.88	XXXVI	28	
Laguna de Medina	8.10.88	XXXVI	26	
Laguna de Medina	11.10.88	XXXVII	11	
Laguna de Medina	16.10.88	XXXVI	3	

Laguna de Medina	22.10.88	XXXVI	4
Laguna de Medina	28.4-2.5.89	XXXVII	1
Laguna de Medina	16.7.89	XXXVII	16
Laguna de Medina	22.8.89	XXXVII	26
Laguna de Medina	7.5.90	XXXVII	2
Laguna de Medina	2.8.90	XXV	5
Laguna de Medina	Jun 91	XXV	8
Laguna de Medina	24.8.91	XXXVII	30
Laguna de Medina	Sep 91	XXV	7
L. Salada, Puerto Santa María complex, Cadiz	25.4.86	XXXVI	2
L. Salada, Puerto Santa María complex	24.5.86	XXXVI	9
L. Salada, Puerto Santa María complex	18.10.86	XXXVI	4
L. Salada, Puerto Santa María complex	26.6.87	XXVI	2
L. Salada, Puerto Santa María complex	27.7.87	XXXVII	1
L. Salada, Puerto Santa María complex	25.8.87	XXVI	8
L. Salada, Puerto Santa María complex	17.10.87	XXVI	16
L. Salada, Puerto Santa María complex	17.10.87	XXXVI	39
L. Salada, Puerto Santa María complex	6.12.87	XXXVI	12
L. Salada, Puerto Santa María complex	21.12.87	XXXVII	4
L. Salada, Puerto Santa María complex	29.8.88	XXXVI	5
L. Salada, Puerto Santa María complex	15.9.88	XXV	12
L. Salada, Puerto Santa María complex	17.9.88	XXXVI	32
L. Salada, Puerto Santa María complex	15.10.88	XXXVI	31
L. Salada, Puerto Santa María complex	11.4.89	XXXVII	2
L. Salada, Puerto Santa María complex	3.6.90	XXXVII	2
L. Salada, Puerto Santa María complex	28.7.90	XXV	1
L. Salada, Puerto Santa María complex	Aug 90	XXV	1
L. Salada, Puerto Santa María complex	10.8.90	XXV	2
L. Salada, Puerto Santa María complex	Sep 90	XXV	6
L. Salada, Puerto Santa María complex	Oct 90	XXV	42
L. Salada, Puerto Santa María complex	Nov 90	XXV	14
L. Salada, Puerto Santa María complex	Dec 90	XXV	8
L. Salada, Puerto Santa María complex	Jan 91	XXV	35
L. Salada, Puerto Santa María complex	19.1.91	XXXVII	6
L. Chica, Puerto Santa María complex	31.1.91	XXV	40
L. Salada, Puerto Santa María complex	Feb 91	XXV	11
L. Chica, Puerto Santa María complex	Feb 91	XXV	15
L. Salada, Puerto Santa María complex	Mar 91	XXV	8
L. Salada, Puerto Santa María complex	26.3.91	XXXVII	6
L. Salada, Puerto Santa María complex	Jun 91	XXV	16
L. Salada, Puerto Santa María complex	Jul 91	XXV	2
L. Dulce de Zorrilla, Espera complex, Cadiz	22.10.87	XXVI	341
L. Salada de Zorrilla, Espera complex	27.12.85	XXXVI	5
L. Salada de Zorrilla, Espera complex	10.8.86	XXXVI	58
L. Salada de Zorrilla, Espera complex	13.9.86	XXXVI	69
L. Dulce de Zorrilla, Espera complex	13.9.86	XXXVI	11
L. Dulce de Zorrilla, Espera complex	1.11.86	XXXVI	1
L. Dulce de Zorrilla, Espera complex	11.1.87	XXXVI	6
L. Salada de Zorrilla, Espera complex	25.7.87	XXXVI	46
L. Dulce de Zorrilla, Espera complex	25.7.87	XXXVI	7
L. Dulce de Zorrilla, Espera complex	12.9.87	XXXVI	2
L. Salada de Zorrilla, Espera complex	17.10.87	XXXVI	10
L. Dulce de Zorrilla, Espera complex	6-15.11.87	XXXVI	1
L. Salada de Zorrilla, Espera complex	19.4.-24.7.88	XXXVI	1
L. Salada de Zorrilla, Espera complex	18.9.88	XXXVI	1

L. Salada de Zorrilla, Espera complex	23.10.88	XXXVI	55	
L. Salada de Zorrilla, Espera complex	4.11.88	XXXVI	30	
L. Salada de Zorrilla, Espera complex	27.11.88	XXXVI	200	
L. Salada de Zorrilla, Espera complex	Aug 90	XXV	5	
L. Salada de Zorrilla, Espera complex	Sep 90	XXV	21	
L. de Hondilla, Espera complex	6.9.90	XXV	6	
L. Salada de Zorrilla, Espera complex	Oct 90	XXV	172	
L. de Hondilla, Espera complex	Oct 90	XXV	4	
L. Salada de Zorrilla, Espera complex	Nov 90	XXV	193	
L. de Hondilla, Espera complex	Nov 90	XXV	1	
L. Salada de Zorrilla, Espera complex	Dec 90	XXV	157	
L. de Hondilla, Espera complex	Dec 90	XXV	1	
L. Salada de Zorrilla, Espera complex	Jun 91	XXV	15	
L. Salada de Zorrilla, Espera complex	Jul 91	XXV	14	
L. Salada de Zorrilla, Espera complex	Aug 91	XXV	15	
L. de Comisario, Puerto Real complex, Cadiz	25.8.87	XXVI	1	
L. de Taraje, Puerto Real complex	30.7.89	XXV	1	
L. de Taraje, Puerto Real complex	18.9.89	XXV	1	
L. de Comisario, Puerto Real complex	8.8.89	XXV	11	
L. de Comisario, Puerto Real complex	15.8.89	XXV	2	
L. de Comisario, Puerto Real complex	28.8.89	XXV	22	
L. de Comisario, Puerto Real complex	5.9.89	XXV	21	
L. de Comisario, Puerto Real complex	10.9.89	XXV	28	
L. de Comisario, Puerto Real complex	17.9.89	XXV	11	
L. de Taraje, Puerto Real complex	2.10.89	XXV	4	
L. de Jeli, Chiclana complex, Cadiz	12.7.89	XXV	4	
L. de Jeli, Chiclana complex	24.6.90	XXV	1	
L. de Montellano, Chiclana complex	20.7.90	XXV	1	
L. de Jeli, Chiclana complex	26.7.90	XXV	2	
L. de Montellano, Chiclana complex	2.8.90	XXV	2	
L. de Montellano, Chiclana complex	8.8.90	XXV	3	
L. de Jeli, Chiclana complex	15.8.90	XXV	1	
L. de Montellano, Chiclana complex	20.8.90	XXV	1	
L. de Jeli, Chiclana complex	20,24.8.90	XXV	2	
L. de Montellano, Chiclana complex	24.8.90	XXV	7	
L. de Jeli, Chiclana complex	26,28.8.90	XXV	3	
L. de Jeli, Chiclana complex	12.9.90	XXV	2	
L. de Montellano, Chiclana complex	12.9.90	XXV	4	
L. de Jeli, Chiclana complex	16.12.90	XXV	19	
San Antonio, Cadiz	25.8.89	XXV	6	
Tarelo, Cadiz	Dec 90	XXV	1	
L. de los Tollos, Cadiz	13-18.1.69	IX	46	
L. de los Tollos, Cadiz	9.3.89	XXXVIII	19	
L. de los Tollos, Cadiz	15.8.90	XXV	7	
L. de los Tollos, Cadiz	Jan 91	XXV	23	
L. de los Tollos, Cadiz	Feb 91	XXV	39	
L. de los Tollos, Cadiz	Mar 91	XXV	4	
L. de los Tollos, Cadiz	Apr 91	XXV	6	
L. de los Tollos, Cadiz	May 91	XXV	6	
L. de los Tollos, Cadiz	Jun 91	XXV	1+3	female and 3 pulli, none fledged
Henares marsh, Jerez de la Frontera, Cadiz	21.8.81	XII	1	in flight with a flock of mallard
Tarifa beach, Cadiz	6.4.84	VI	7	flying over the sea
Palmones estuary, Cadiz	15.12.89	XXXVII	1	
L. de la Cigarrera, Lebrija-Las Cabezas complex	1976-1982	XIX	-	one pair bred one year
L. de Taraje, Lebrija-Las Cabezas complex	22.10.87	XXVI	1	

La Peña, Lebrija-Las Cabezas complex, Sevilla	6.9.90	XXV	6	
La Peña, Lebrija-Las Cabezas complex	31.10.90	XXV	2	
L. de Taraje, Lebrija-Las Cabezas complex	31.10.90	XXV	12	
El Pilon, Lebrija-Las Cabezas complex	31.10.90	XXV	1	
L. de Taraje, Lebrija-Las Cabezas complex	26.9.90	XXV	2	
Guadalhorce estuary, Malaga	19.11.85	VII	1	
Guadalhorce estuary, Malaga	14.12.86	VII	5	
Guadalhorce estuary, Malaga	18.1.87	VII	3	
Guadalhorce estuary, Malaga	10.11.87	VII	3	
L. de Fuente de Piedra, Malaga	23.4.88	VII	1	male
Charcas de Los Prados, Malaga	2.10.90	XCI	1	
Albufera de Adra, Almería	4.8.87	XCI	3	
Albufera de Adra, Almería	7.6.89	XCI	2	
Salinas de Cerrillos y Viejas, Almería	11.5.91	XCI	1	
Salinas de Cerrillos y Viejas, Almería	24.5.91	XCI	2	
Cañada del Puerco, Norias de Daza, Almería	20.6.91	XCI	4	
Cañada del Puerco, Norias de Daza, Almería	13.8.91	XCI	1	
Valencia				
Salinas de Santa Pola, S. del Pinet, Alicante	29.3.70	II	5	
Salinas de Santa Pola, Alicante	7.5.70	II	3	
Salinas de Santa Pola, Alicante	17.8.70	II	1	
Salinas de Santa Pola	2.4.72	XXI	2	a pair
Salinas de Santa Pola	5.8.73	XXI	1	
Salinas de Santa Pola	12.8.73	XXI	1	
Salinas de Santa Pola, santa fe	18.1.75	XXI	3	
Salinas de Santa Pola, santa fe	25.11.75	XXI	2	a pair
Salinas de Santa Pola, santa fe	4.4.77	XXI	1	
Salinas de Santa Pola, azb.dalt	1.8.77	XXI	8	adult and 7 pulli
Salinas de Santa Pola	1981-82	XXI	21	official number shot that season
Salinas de Santa Pola	1982-83	XXI	53	official number shot that season
Salinas de Santa Pola	1983-84	XXI	36	official number shot that season
Salinas de Santa Pola	5.4.85	XXI	5	one pair
Salinas de Santa Pola	19.5.85	XXI	2	a pair
Salinas de Santa Pola	22.5.85	XXI	3	one pair
Salinas de Santa Pola	6.6.85	XXI	1	
Salinas de Santa Pola, santa fe	1.7.85	XXI	9	
Salinas de Santa Pola	1.5.86	XXI	2	a pair
Salinas de Santa Pola, canalets	1.5.86	XXI	18	
Salinas de Santa Pola	4.5.86	XXI	2	a pair
Salinas de Santa Pola	11.5.86	XXI	6	three pairs
Salinas de Santa Pola, canalets	18.5.86	XXI	22	
Salinas de Santa Pola, canalets	26.5.86	XXI	9	three pairs
Salinas de Santa Pola	29.5.86	XXI	6	adult and 5 pulli
Salinas de Santa Pola	26.8.86	XXI	25	
Salinas de Santa Pola	13.4.87	XXI	2	
Salinas de Santa Pola	16.4.87	XXI	2	
Salinas de Santa Pola, charcolis	14.6.87	XXI	1	
Salinas de Santa Pola	22.7.88	XXI	8	adult and 7 pulli
Salinas de Santa Pola	6.8.88	XXI	5	
Salinas de Santa Pola	1988	XXII	-	at least two breeding pairs
Salinas de Santa Pola, canalets	23.4.89	XXI	3	
Salinas de Santa Pola, cuadretas	16.7.89	XXI	1	
Salinas de Santa Pola, canalets	30.7.89	XXI	2	a pair
Salinas de Santa Pola, canalets	6.8.89	XXI	3	

Salinas de Santa Pola	1989	XXII	-	at least seven breeding pairs
Salinas de Santa Pola, ch torre	7.6.90	XXI	4	two pairs
Salinas de Santa Pola	19.6.90	XXI	1	
Salinas de Santa Pola	29.6.90	XXI	2	adult and 1 pulli
Salinas de Santa Pola	29.7.90	XXI	8	
Salinas de Santa Pola	1990	XXII	-	at least one breeding pair
Salinas de Santa Pola	1991	XXII	-	five to seven breeding pairs
Salinas de Santa Pola, santa fe	19.6.91	XXVIII	11	
Salinas de Santa Pola, irles	19.6.91	XXVIII	1	
Salinas de Santa Pola, santa fe	10.6.92	XXVIII	16	
Salinas de Santa Pola, santa fe	17.6.92	XXVIII	20	flocks of up to 17
Salinas de Santa Pola, santa fe	24.6.92	XXVIII	15	flying to El Hondo, Irles
Salinas de Santa Pola	1992	XXVIII	-	two to four breeding pairs
El Hondo, Alicante	11.11.56	XXXIX	3	three shot
El Hondo, Alicante	31.5.70	XI	7	flying into a reedbed
El Hondo, Alicante	16.5.71	XI	20	10 pairs, some in flight
El Hondo, Alicante	17.10.71	XI	11	flying over a reedbed
El Hondo	31.10.71	XI	10	shot
El Hondo	5.3.72	XXI	2	a pair
El Hondo, chn	29.3.72	XXI	2	a pair
El Hondo	14.5.72	XXI	2	a pair
El Hondo	21.5.72	XXI	2	a pair
El Hondo	13.8.72	XXI	2	
El Hondo	26.11.72	XXI	1	
El Hondo	11.3.73	XXI	3	
El Hondo, chn	4.4.73	XXI	5	
El Hondo	7.4.73	XXI	2	a pair
El Hondo	22.4.73	XXI	2	a pair
El Hondo	13.5.73	XXI	2	a pair
El Hondo	3.6.73	XXI	2	a pair
El Hondo	20.6.73	XXI	3	
El Hondo, chn	5.10.73	XXI	300	
El Hondo, el	25.11.73	XXI	1	
El Hondo, chn	19.5.74	XXI	6	
El Hondo, chse	2.6.74	XXI	70	
El Hondo	1981-82	XXI	53	official number shot that season
El Hondo	1982-83	XXI	15	official number shot that season
El Hondo	1983-84	XXI	14	official number shot that season
El Hondo	1984-85	XXI	11	official number shot that season
El Hondo	14.4.85	XXI	1	
El Hondo, chn	21.4.85	XXI	2	a pair
El Hondo	25.4.85	XXI	1	
El Hondo	5.5.85	XXI	1	
El Hondo, la raza	7.5.85	XXI	4	two pairs
El Hondo, chn	11.5.85	XXI	5	
El Hondo	22.5.85	XXI	3	one pair
El Hondo	25.5.85	XXI	2	a pair
El Hondo	28.5.85	XXI	3	
El Hondo, la raja	28.5.85	XXI	21	a pair plus female with 18 pulli
El Hondo	30.5.85	XXI	3	one pair
El Hondo, ep	16.6.85	XXI	20	three pairs
El Hondo, el	23.6.85	XXI	1	
El Hondo, chn	21.7.85	XXI	3	
El Hondo	Oct 1985	XXI	4	official number shot that month
El Hondo	6.4.86	XXI	7	

El Hondo, north east	20.5.86	XXI	11	
El Hondo	23.5.86	XXI	2	
El Hondo, chn	28.5.86	XXI	2	a pair
El Hondo, chn	4.6.86	XXI	2	a pair
El Hondo, ep	14.6.86	XXI	9	three pairs
El Hondo, la raja	14.9.86	XXI	1	
El Hondo, balserones east	26.4.87	XXI	3	
El Hondo, balserones east	1.5.87	XXI	2	a pair
El Hondo, balserones east	12.5.87	XXI	5	one pair
El Hondo, balserones east	24.4.88	XXI	5	
El Hondo, la raja	24.4.88	XXI	1	
El Hondo, la raja	30.7.88	XXI	1	
El Hondo	1988	XXII	-	10 breeding pairs
El Hondo	18.1.89	XXI	4	
El Hondo, balserones west	28.6.89	XXI	2	a pair
El Hondo	1.12.89	XXI	5	
El Hondo	1989	XXII	-	c.20 breeding pairs
El Hondo, la raja	18.4.90	XXI	1	
El Hondo	11.5.90	XXI	3	
El Hondo	1990	XXII	-	at least two breeding pairs
El Hondo	1991	XXII	-	10-15 breeding pairs
El Hondo, la prada	19.6.91	XXVIII	13	includes 11 pulli
El Hondo, norte	18.8.91	XXVIII	24	
El Hondo, la prada	25.8.91	XXVIII	12	
El Hondo, emb. poniente	12.10.91	XXVIII	52	
El Hondo, emb. poniente	1.11.91	XXVIII	14	
El Hondo, emb. poniente	21.1.92	XXVIII	6	
El Hondo, balserones	7.5.92	XXVIII	12	
El Hondo, charca del canal	7.5.92	XXVIII	1	
El Hondo, codo convenio	7.5.92	XXVIII	2	
El Hondo, charca del canal	20.5.92	XXVIII	10	
El Hondo, charca del canal	24.5.92	XXVIII	12	
El Hondo, charca galiana	24.5.92	XXVIII	2	
El Hondo, charca del canal	31.5.92	XXVIII	10	
El Hondo, la prada	31.5.92	XXVIII	2	
El Hondo, charca galiana	31.5.92	XXVIII	4	
El Hondo, charca norte	31.5.92	XXVIII	1	
El Hondo, charca del canal	7.6.92	XXVIII	12	flocks up to 6
El Hondo, la prada	9.6.92	XXVIII	11	includes 10 pulli
El Hondo, charca del canal	12.6.92	XXVIII	8	
El Hondo, vaquero/balserones	12.6.92	XXVIII	22	
El Hondo, charca del canal	14.6.92	XXVIII	7	
El Hondo, balserones	12.6.92	XXVIII	20	
El Hondo, charca del canal	23.6.92	XXVIII	6	
El Hondo, lo vaquero	23.6.92	XXVIII	14	
El Hondo, charca galiana	23.6.92	XXVIII	3	
El Hondo, lo vaquero	15.7.92	XCII	5	female and 4 pulli
El Hondo, charca este	16.7.92	XCII	7	female and 6 pulli
El Hondo, emb. poniente	23.7.92	XXVIII	10	including 2 well grown pulli
El Hondo, emb. poniente	26.7.92	XXVIII	13	including two broods of 2+4 pulli
El Hondo, lo vaquero	29.7.92	XXVIII	45	
El Hondo, lo vaquero	30.7.92	XXVIII	148	
El Hondo, emb. poniente	2.8.92	XXVIII	25	including 1 well grown pulli
El Hondo, lo vaquero	6.8.92	XXVIII	122	
El Hondo	1992	XXVIII	-	13 to 21 breeding pairs

Albufera de Valencia	14.9.49	XXIV	4	shot
Albufera de Valencia	Sep 53	XXIV	6	shot
Albufera de Valencia	1.3.56	XXIV	1	shot
Albufera de Valencia	14.10.62	XXIV	-	some shot
Albufera de Valencia	17.2.72	IX	2	
Albufera de Valencia, Mata del Fang	10-11.11.85	VIII	1	
Albufera de Valencia, Mata del Fang	29.11.85	VIII	2	
Albufera de Valencia, Mata del Fang	22-27.11.85	VIII	1	
Albufera de Valencia, Mata del Fang	4.1.86	VIII	1	
Albufera de Valencia	1991	XXII	-	possible breeding pair
Vedado de Sueca (Albufera de Valencia?)	Jan 72	IX	-	present
Dolores, Albufera de Elche	Nov 1958	XXXI	-	shot in abundance
Pantano de Elche	Dec 1959	XXXI	-	shot
Albufera de Elche	26.11.61	XXXV	-	very abundant, shot in large numbers
Marjal del Moro	1988	XXII	2	one breeding pair
Marjal del Moro	29.4.89	XXIII	5	
Marjal del Moro	14.5.89	XXIII	5	
Marjal del Moro	22.7.89	XXIII	6	
Marjal del Moro	1989	XXII	4	two breeding pairs
Marjal del Moro	1990	XXII	2	one breeding pair
Marjal del Moro	1991	XXII	2-4	one or two breeding pairs
Clot de Galvany	16.5.91	XXVIII	1	
Clot de Galvany	31.5.91	XXVIII	2	possible breeding pair
Clot de Galvany	14.6.91	XXVIII	1	
Clot de Galvany	13.5.92	XXVIII	1	
Murcia				
Murcia	pre 1859	XCIII	-	rare in summer in small creeks and marshes
Mar Menor	22.1.78	XXI	15	
Mar Menor, Salinas de San Pedro del Pinatar	24.8.87	VII	1	
Mar Menor	25.5.88	VII	1	
Mar Menor, Encañizadas	14.5.89	XXI	6	
Mar Menor, Salinas de San Pedro del Pinatar	17.5.92	XXVIII	1	
Mar Menor, Playa de la Hita	10.5.92	XXVIII	3	
Mar Menor, Playa de la Hita	21.5.92	XXVIII	1	
Mar Menor, Playa de la Hita	3.8.92	XXVIII	3	
Castilla-La Mancha				
Manchega Region	4.3.70	II	6	3 pairs
Manchega Region	26.4.70	II	2	pair nesting
Manchega Region	10.5.70	II	1	flying
Manchega Region	3.9-13.12.70	II	50	minimum number shot over this period
Alto Guadiana	24.5.70	II	1	flew into marshes
Clay quarry near Tablas de Daimiel, Ciudad Real	29.6.91	XVI	7	adult and 6 pulli in pond
L. de El Taray, Toledo	24.10.64	IX	1	shot, male
L. de El Taray	4.9.67	IX	3	shot
L. de El Taray	13.4.68	XXXII	1	shot
L. de El Taray	14.4.68	XXXII	2	pair
L. de El Taray	12.5.68	XXXII	2	pair
L. de El Taray	26.5.68	XXXII	1	
L. de El Taray	6.6.68	XXXII	1	
L. de El Taray	22.7.70	II	6	female and 5 half-size pulli
L. de El Taray	15.8.70	II	7	female and 6 pulli
Taray, near	Sep 83	XVIII	1	
Laguna de Alcázar de San Juan, Ciudad Real	26.5.68	XXXII	1	

Lagunas de Alcázar	15.12.68	IX	1	male, with hundreds of other ducks
Graveras de Albarreal de Tajo, Toledo	27.1.90	XXVII	1	
Laguna de Pétrola, Albacete	14.10.90	XXVII	2	
Cataluña				
L. de La Encañizada, Ebro Delta	24.9.57	XC	-	small flocks, 7-8 shot
L. de La Encañizada, Ebro Delta	Sep 1957	XXXI	20-25	some shot
Isla de Buda, Ebro Delta	29.9.57	XXXI	5+	5 shot, some others seen
L. de La Encañizada, Ebro Delta	Oct 1957	XC	-	seen and shot throughout the month
L. de La Encañizada, Ebro Delta	8.10.65	IX	2	shot
L. de La Encañizada, Ebro Delta	12.9.68	XV	80-100	17 of this group were shot
L. de La Encañizada, Ebro Delta	15.11.68	IX	2	shot
L. de La Encañizada, Ebro Delta	1.9.69	II	2	shot
L. de La Encañizada, Ebro Delta	27.9.69	II	1	shot
L. de La Encañizada, Ebro Delta	23.9.73	V	2	shot
Balaeric Islands				
Salinas de Campos, Es Trenc	c.1969	XXXIV	-	breeding confirmed
Estanq Pudent, Formentera Island	12.5.72	X	1	found dead
S'Albufera de Mallorca, Mallorca	Aug 1988	XXXIV	2	
S'Albufera de Mallorca, Mallorca	Jun 1989	XXXIV	1	
S'Albufera de Mallorca, Mallorca	Aug 1989	XXXIV	2	
S'Albufera de Mallorca, Mallorca	Aug 1991	XXXIV	2	
S'Albufera de Mallorca, Mallorca	Oct91-Feb92	XXXIV	1	
Asturias				
Isabel la Católica Park, Gijon	24.12.88	XVI	2	
Navarra				
Embalse de las Cañas, Viana	31.10.81	XIII	2	
Embalse de las Cañas, Viana	15-23.8.83	XXVII	1	

L. = Laguna (Lagoon)
MdG = Marismas del Guadalquivir
Lucio = shallow, seasonal lake

I 1979. *Doñana Act. Vert*. 6: 83-84
II 1971. *Ardeola* 15: 92, 115, 121, 126
III 1987. *Brit. Birds* 80: 10
IV 1980. *Doñana Act. Vert.* 7: 22-23
V 1974. *Ardeola* 20: 160-168, 331
VI 1984. *Ardeola* 31: 68, 142
VII 1988. *Ardeola* 35: 300
VIII 1987. *Ardeola* 34: 279
IX 1972. *Ardeola* 17-18: 37-77, 125, 156
X 1973. *Ardeola* 19: 16
XI 1972. *Ardeola* 16: 231
XII 1983. *Ardeola* 30: 117
XIII 1982. *Ardeola* 29: 178
XIV IWRB mid-winter count reports
XV 1971. *Ardeola* vol. especial: 223
XVI 1992. *La Garcilla* 82: 31
XVII Amat 1981
XVIII Mörzer Bruyns & van der Ven 1986
XIX J. Amat *in litt.* 1992
XX Grimmett & Jones 1989
XXI J.D. Navarro Medina pers. comm. 1992
XXII Dolz Garcia, Giménez Ripoll and Huertas Pedrero 1991
XXIII *Medi Natural, Generalitat Valenciana* 2: 162
XXIV Bernis 1964
XXV Agencia de Medio Ambiente *in litt.* 1992
XXVI 1989. *Oxyura* 5: 161-169
XXVII 1990. *Ardeola* 37: 325-352
XXVIII Ambiental Crew *in litt.* 1992
XXIX L. García pers. comm. 1992
XXX García *et al.* 1989
XXXI 1960. *Ardeola* 6: 170, 212, 222, 368
XXXII 1968. *Ardeola* 14: 169, 213
XXXIII H.G. Young *in litt.* 1992
XXXIV J. Mayol *in litt.* 1992
XXXV 1963. *Ardeola* 8: 241
XXXVI Sanchez Garcia *et al.* undated
XXXVII C.E. Perez *in litt.* 1992. Includes data from *Alectoris* 6,7 and Strait of Gibraltar Bird Observatory Reports
XXXVIII M. Fernández Cruz, C. Martín Novella and R. Martí pers. comm. 1992
XXXIX 1957. *Ardeola* 3: 297-298
XC 1958 *Ardeola* 4: 189-190

XCI 1991. *Ardeola* 38: 331
XCII J. Huertas/Ambiental Crew *in litt.* 1992
XCIII F. Robledano *in litt.* 1992

4. MOROCCO

4.1 LOCAL NAME

Sarcelle marbrée.

4.2 DISTRIBUTION AND STATUS

Marbled Teal were formerly very abundant in Morocco, and in winter in the last century they were reported to be exceeded in number around Tangers only by the Common Teal *Anas crecca* (Phillips 1923). Nowadays in winter the numbers of Marbled Teal are exceeded in number by eight other duck species (Rose 1992). Nevertheless, Morocco currently holds the largest known wintering population of Marbled Teal anywhere outside Iran. There have been regular winter counts of around 1,000 in recent years, divided between the North-West, North-East, Middle Atlas, Centre Atlantic and South Morocco regions, with the peak being 1,680 birds at Merja de Sidi Bou-Rhaba in 1982 (Table 6). In recent years the wintering population has predominantly been divided between three sites - Sidi Bou-Rhaba, the Sidi Moussa-Oualidia complex and the Oued Massa Delta (C. Pouteau *in litt.* 1992). There have been winter or autumn/spring counts of over 100 Marbled Teal from six other wetlands since 1970. There is no evidence of a decline in the size of the wintering population since the 1960s (Table 6).

It is unclear how many of this regular wintering population of 1,000-2,000 birds breed in Morocco. Marbled Teal were formerly known as a "common breeder" (Phillips 1923) and "very common...in summer" (Hume & Marshall 1880) in Morocco. However, since 1970 only small numbers of breeders have been reported. Breeding is currently thought to occur in the sites listed below, at least in some years.

North-West Morocco

Merja de Sidi Bou-Rhaba: 10-15 nesting pairs per year from 1969 to 1976 (Thévenot 1976). 6-8 pairs minimum, possibly more than 10 pairs, in 1990 & 1991; 5-6 pairs in 1992 (C. Pouteau *in litt.* 1992). There are no data to support the view of Aguesse *et al.* (1983) that there is a breeding population of around 50 pairs.

Merja de Douyiet: Breeding proved in 1972. Three pairs in 1977. Groups of 150-200 birds seen on 20.5.87, 14.6.87, 12.4.91 and 21.06.92 (Franchimont *et al.* 1990; Pouteau *et al.* 1992, 1993).

Marshes and estuary of the Lower Loukos: Possible breeding 1971-1976 (Pineau & Girand-Audine 1977), and breeding confirmed in 1984 (M. Thévenot *in litt*. 1992).

North-East Morocco

Moulouya Delta: Breeding considered very probable in 1981 (Thévenot *et al.* 1982). Eight to 10 pairs displaying in 1989, although breeding not proven (Brosset 1990).

South Morocco

Guelta El Aouina: Probably one pair in 1985 (Dakki & DeLigny 1988).

Guelta La'youne: One pair in 1985 (Dakki & DeLigny 1988).

Oued Massa Delta: First proof of breeding in 1982; at least five broods in 1984 (British Birds 78; 638-645).

Lac Iriki: Several pairs in 1966. At least 20 pairs in 1968 (Robin 1968). The site has now been destroyed (C. Pouteau *in litt.* 1992).

Overall, there is no evidence that the breeding population is more than 50 pairs in the whole of Morocco. Robin (1968) estimated that 500 pairs were breeding at Iriki in 1965, 1966 and 1968 but presents no data supporting this other than a count of over 1,000 in January 1968. Hence this may be a severe over-estimate. Breeding distribution of this nomadic species is affected by variation in rainfall between years. For example, the breeding site at Lac Iriki was flooded in only seven out of twenty years between 1948 and 1968 (Robin 1968). Merja de Douyiet dries out completely in dry years (Scott 1980).

There is evidence of recent increases in the breeding populations in some locations. Breeding was not observed at Sidi Bou-Rhaba until 1963 (Thévenot 1976) and confirmed breeding was first recorded along the coast of South Morocco in 1982 (*British Birds* 78: 638), and since then there have been records at the above three locations. Breeding activity was first noted in the North-East in 1981 in the Moulouya Delta (Thévenot *et al.* 1982).

It seems likely that a large part of the wintering population in Morocco are breeders from Spain. There is considerable evidence that much of the Spanish breeding population regularly winters in Morocco. Five of seven recoveries of birds ringed in summer in Spain have been recovered from North Africa, four of them from Morocco (see 3.4.2). Influxes of Marbled Teal to Sidi Bou-Rhaba frequently coincide with spells of inclement weather in Southern Spain (C. Pouteau *in litt.* 1992). In at least some years, only small numbers of birds remain in Spain throughout the winter. However, the Spanish breeding population is not thought to have exceeded 200 pairs in recent years and is often much smaller, suggesting that it is likely to produce a winter population of fewer than 800 individuals. Hence it seems unlikely that the Spanish breeding population alone can account for the regular midwinter counts of over 1,000 in recent years. It is possible that significant numbers of breeding Marbled Teal are being overlooked in Morocco at Dayet Merzouga or elsewhere. Alternatively, it is possible they are being overlooked in north-west Algeria. There is some evidence that large numbers of Marbled Teal remain in North Africa during the summer. An exceptionally high count of 3,000 was made at Dayet Merzouga in May 1973 (*Alauda* 45: 286) while summer counts of 150-200 have regularly been made at Merja de Douyiet in recent years (see above). A count of 1,103 was made at the Sidi Moussa-Oualidia complex on 25 March 1989, although this may represent wintering birds that had deserted the other major sites of Sidi Bou-Rhaba and the Oued Massa Delta that spring (C. Pouteau *in litt.* 1992).

4.3 HABITAT

Marbled Teal breed in the brackish coastal and inland lagoons of Merja Sidi Bou-Rhaba and Merja de Douyiet, and in the Massa, Loukos and Moulouya estuaries, all of which have extensive fresh water marshes (Morgan 1982b; Hughes & Hughes 1992). Breeding also occurs on coastal *gueltas* (impounded areas of brackish water in desert or semi-arid areas, Thévenot *et al.* 1988), and has also taken place on the vast, temporarily flooded depression of Lac Iriki (Robin 1968).

Wintering and passage has been recorded from additional sites of the same type, such as the brackish lagoons of Merja Zerga, Sidi Moussa-Oualidia and Sebkha Zima, as well as at other wetland types: permanent freshwater lakes in the mid-altitude Middle Atlas (the Dayets Ifrah, Annoceur, Afourgah, Aoua), coastal salines (eg Sebkha Bou Areg), temporary desert lakes such as Dayet Merzouga, and reservoirs (eg Barrage Rwidate). Extensive emergent vegetation is a characteristic of the breeding sites, but does not appear to be critical for wintering

(Morgan 1982b; Carp 1980; Ramsar 1990; Hughes & Hughes 1992). Some sites are dependent on fluctuations in rainfall and disappear completely during dry years. Dayet Merzouga, Guelta el Aouina and Dayet Annoceur have been dry in recent years (J. Franchimont *in litt.* 1992). Other sites are dry during most summers, notably much of the Sidi Moussa-Oualidia complex and Sebkha Zima (Morgan 1982b; Pienkowski 1975).

4.4 ECOLOGY AND BEHAVIOUR

4.4.1 Breeding biology

At Sidi Bou-Rhaba pairs are seen in display from early April until early May (Frete 1970). Clutches have been found on 14 April (5 and 12 eggs) and 21 June (15, 18, 20, 22 and 24 eggs) at Lac Iriki (Robin 1968) and on 2 June at Sidi Bou-Rhaba (Frete 1970). The large clutch sizes suggest a high rate of egg dumping by other females. The nests at Iriki were situated close to the water, hidden in thick vegetation at the foot of clumps of rushes, grasses, *Salicornia* or tamarisk with two or three entry tunnels under the vegetation (Robin 1968). Compared with other duck species, nesting occurs late in the season, more so in northern Morocco than in southern areas (C. Pouteau *in litt.* 1992). A one-week old chick was seen on 23 April at Guelta La'Youne (Thévenot *et al.* 1988) but at Sidi Bou-Rhaba the earliest observation of chicks is from 8 May 1990, and in most years the first pulli appear early in June (Frete 1970; Thévenot 1976; Thévenot *et al.* 1981; C. Pouteau *in litt.* 1992), indicating that laying usually takes place early in May. The latest sightings of non-flying juveniles is on the 27 July at Lac Iriki (Robin 1968).

4.4.2 Migration

Ringing recoveries show that Spanish breeders arrive in Morocco by late November and are still present in mid-February (see 3.4.2). The timing of passage is very variable and is probably related to weather conditions (C. Pouteau *in litt.* 1992). Spring passage has been noted in northern Morocco from the end of February to mid-May, with autumn passage from September to October (Heim de Balsac & Mayaud 1962; C. Pouteau *in litt.* 1992). Arrival of winter visitors to augment the breeding population at Sidi Bou-Rhaba begins in late August (Thévenot 1976). Spells of cold weather in Southern Spain prompt large influxes from October to early December (C. Pouteau *in litt.* 1992; Thévenot 1976) and in hard winters the Moroccan sites probably hold the majority of Spanish birds. For example, 1,700 Marbled Teal were counted at Sidi Bou-Rhaba in 1982 (Aguesse *et al.* 1983) during a hard winter in Spain (Aguesse *et al.* 1983).

4.4.3 Diet

In the last century near Tangers, Marbled Teal were reported to feed on winged insects *Myrmelion* (Hume & Marshall 1880; Phillips 1923).

4.4.4 Predation

At Sidi Bou-Rhaba, young Marbled Teal are regularly taken by Black Kites *Milvus migrans* and Marsh Harriers *Circus aeruginosus* which cause a high level of mortality because Marbled Teal breed later in the year than other waterbirds, making them a particular target (C. Pouteau *in litt.* 1992).

4.5 THREATS

4.5.1 Habitat loss and degradation

Considerable areas of wetlands likely to have been of importance to Marbled Teal have been drained. For example, the area of marshland along the Lower Loukos river where Marbled Teal may formerly have bred has been reduced from 25,000 ha to less than 1,000 ha by an agricultural reclamation scheme (Morgan 1982b). Drainage has converted the Merjas de Sidi Mansour and Daoura from permanent to seasonal wetlands, and reduced them to 20% of their former area (Scott 1980; Morgan 1982b). Drainage is a threat at Merja Zerga (Dugan 1991). Lac Iriki, formerly an important breeding site, was drained after a dam on the Oued Draa was completed in 1972 (Scott 1980; C. Pouteau *in litt.* 1992). Parts of the Sidi Moussa-Oualidia complex have been drained for the development of market gardening and greenhouses (Carp 1980; C. Pouteau *in litt.* 1992). Extensive areas of salt marsh at Sidi Moussa-Oualidia and elsewhere have been converted to salines, although it is unclear whether this is harmful to Marbled Teal as salines are used as wintering habitat. A dam constructed upstream of the Oued Massa Delta is converting the site from a river estuary to a fresh water lagoon (C. Pouteau *in litt.* 1992). The dam has reduced the river's capacity for flooding the marshes and the implications of this transformation for the Marbled Teal are not clear (Hughes & Hughes 1992). In the Moulouya Delta, development activity has brought about a rare improvement of the habitat for Marbled Teal. The construction of dams upriver and raising of the water table due to irrigation activity has led to the formation of extensive marshes and oxbows since 1960. The area of marshland has increased from 50 ha in 1953 to 400 ha in 1989 (Brosset 1990).

Pollution from domestic refuse in the Guelta La'youne where Marbled Teal have bred is so severe that it may no longer support animal life (Dakki & De Ligny 1988). Dayet Afourgah is similarly degraded (J. Franchimont *in litt.* 1992), and urbanisation with sewage pollution is also threatening Merjas Zerga (Dugan 1991) and Sidi Bou-Rhaba (C. Pouteau *in litt.* 1992). The margins of Sidi Bou-Rhaba are undergoing siltation and eutrophication and the area of breeding habitat for Marbled Teal is likely to decrease (C. Pouteau *in litt.* 1992). Heavy grazing, burning and cutting of emergent vegetation is a problem in the Lagoons of Sidi Moussa-Oualidia (Scott 1980; Hughes & Hughes 1992), Merja Zerga (Hughes & Hughes 1992), Sidi Bou-Rhaba (C. Pouteau *in litt.* 1992), the Lower Loukos marshes (Beaubrun *et al.* 1986), Dayet Afourgah and Merjas Sidi Mansour and Daoura (Morgan 1982b).

4.5.2 Hunting

Few Moroccans have guns and habitat change is a more significant threat to Marbled Teal than hunting (J. Hulme *in litt.* 1992). However, there is high hunting pressure at some Marbled Teal sites, particularly in winter. Hunting is intense in parts of Merja Zerga north of the Oued Drater, the Sidi Moussa-Oualidia complex (Scott 1980; Hughes & Hughes 1992), the Lower Loukos (Beaubrun *et al.* 1986), Sidi Bou-Rhaba, the Oued Massa Delta (C. Pouteau *in litt.* 1992) and Dayet Ifrah (J. Franchimont *in litt.* 1992). In some sites, official hunts are organised for groups of foreign tourist hunters by SOCHATOURS (C. Pouteau *in litt.* 1992).

4.5.3 Others

Disturbance from tourists and watersports etc. is a problem in the central lake of Merja de Sidi Bou-Rhaba (C. Pouteau *in litt.* 1992), Merja Zerga (Ramsar 1990), Dayet Afourgah (Morgan 1982b), Dayet Ifrah and Dayet Aaoua (J. Franchimont *in litt.* 1992). Deforestation, stray dogs and children are causing disturbance to the north side of Sidi Bou-Rhaba (C. Pouteau *in litt.* 1992). Guelta El Aouina is threatened by oil exploration and by disturbance due to road building and military activity (Carp 1980; Ramsar 1990). The Tanger-Rabat motorway proposal threatens the Lower Loukos area (C. Pouteau *in litt.* 1992). Causeways have split the Dayet Annoceur into three and caused disturbance (Morgan 1982b). Fish farming may cause problems at Dayet Aoua (Morgan 1982b) and the Moulouya Delta (A. Brosset *in litt.* 1992).

4.6 CONSERVATION MEASURES TAKEN

4.6.1 Habitat protection

Merja de Sidi Bou-Rhaba and Merja Zerga are Reserves Biologiques and Ramsar sites, while Oued Massa is a Reserve Biologique and a National Park (C. Pouteau *in litt.* 1992; J. Franchimont *in litt.* 1992). Merja de Douyiet is protected as a Royal Property and hunting is banned (Franchimont *et al.* 1990). Sebkha Zima is a hunting reserve (Johnson & Biber 1974; Aguesse *et al.* 1983), and the Lower Loukos is a tourist hunting reserve (Aguesse *et al.* 1983). The Society For The Protection Of Animals Abroad (SPANA), Direction des Eaux et Forets and ICBP are supporting training of Moroccan conservationists, wetland education programmes in schools and a National Conservation Education Centre at Sidi Bou-Rhaba (Salathé *in litt.* 1992; J. Franchimont *in litt.* 1992; J. Hulme *in litt.* 1992).

4.6.2 Species protection

The species is not legally protected from hunting in Morocco (C. Pouteau *in litt.* 1992). The wetland education programme in schools includes material on the Marbled Teal (J. Hulme *in litt.* 1992).

4.7 EVALUATION

Despite evidence of a marked population decline this century, Morocco still holds more Marbled Teal in winter than any other range state except Iran and is a very high priority for conservation action to ensure the survival of the species in the Mediterranean region. Several of the wetlands of most importance to the species are unprotected and subject to a variety of threats. These sites need to be protected as a matter of urgency. The protection status of some existing protected areas needs to be improved. Habitat management to increase the area of breeding habitat available to Marbled Teal should also be considered.
Although it is clear that interchange occurs between the Moroccan, Spanish and other North African populations of Marbled Teal, it is not known how regularly this happens or what proportion of the 1,500 birds often recorded in Morocco in mid-winter breeds in which country. There is a need for research to clarify the breeding distribution of the birds wintering in Morocco and for flyway cooperation over Marbled Teal conservation with Spain, Algeria and Tunisia.

4.8 ACTION NEEDED

Protection of additional sites: Moulouya Delta, Lower Loukos marshes and estuary, northern part of Sidi Moussa-Oualidia complex, Dayet Merzouga, Dayet Ifrah and Dayet al Hafa.

Improved protection of existing protected sites: Sidi Bou-Rhaba should be declared a National Park.

Sidi Bou-Rhaba: declaration as a National Park, management to prevent the loss of habitat through siltation and eutrophication, inclusion of Marbled Teal as a "flagship" in the National Conservation Education Centre.

Oued Massa Delta: habitat management to create more breeding habitat.

Species Protection: Marbled Teal should be listed as a protected species. This would prevent shooting by official hunts such as those organised by SOCHATOURS but should be done without excessive publicity in order to

avoid making the species and its eggs attractive to hunters.

Surveys of known and possible breeding sites: to clarify the size and distribution of the breeding population.

Preparation of a joint flyway management plan between Morocco, Spain and Algeria.

Conducting research into the biology of Marbled Teal, especially into winter ecology and the nature of movements and migrations within and beyond Morocco.

4.9 SITE DIRECTORY

KEY SITES
Oued Massa Delta
Lagunes de Sidi Moussa-Oualidia
Merja de Sidi Bou-Rhaba
Merja Zerga
Sebkha Zima
Merja de Douyiet
Moulouya Delta
Dayet Ifrah
Dayet Merzouga
Lower Loukos marshes and estuary
Dayet al Hafa

SITES OF SOME IMPORTANCE
Guelta El Aouina
Guelta La'youne
Lagune de Khnifiss
Dayet Annoceur
Dayet Afourgah
Dayet Aoua
Barrage Rwidate
Barrage de Tamlakout
Barrage d'Ouarzazate
Marais de Moul Bergui
Sedd El Mejnoun
Merja Barga
Sebkha Bou Areg

Name Oued Massa Delta.
Location 30.02 N, 9.40 W. Agadir Province, South Morocco.
Protected Status Reserve Biologique, National Park.
Threats Moderate disturbance from tourists, poaching, drainage, ecological changes caused by upstream dam (conversion of estuary to freshwater lagoon, cessation of irregular flooding).
References Johnson & Biber 1974, Hughes & Hughes 1992, C. Pouteau *in litt.* 1992.
Status of Marbled Teal Breeding confirmed in 1982 and 1984. Up to 350 in mid-winter (1988 and 1991).

Name Lagunes de Sidi Moussa-Oualidia.
Location 32.50-33.00 N, 8.40-9.00 W. El Jadida Province, Centre Atlantic.
Protected Status None.
Threats Drainage, heavy grazing, cutting of vegetation, hunting, disturbance.
References Pienkowski 1975, Scott 1980, Carp 1980, Kersten *et al.* 1983, Morgan 1982b, Dies Jambrino *et al.* 1989, Hughes & Hughes 1992.
Status of Marbled Teal Up to 736 in mid-winter (1986) and 1,100 on 25.3.89.

Name Merja de Sidi Bou-Rhaba/Lac de Mehdia.
Location 34.10 N, 6.39 W. Kénitra Province, North-West Morocco.
Protected Status Ramsar site, Reserve Biologique.
Threats Disturbance from tourism, poaching, grazing, urbanisation (the spread of Mehdia town), deforestation, heavy raptor predation.
References Scott 1980, Carp 1980, Morgan 1982b, Aguesse *et al.* 1983, Ramsar 1990, Dugan 1991, Hughes & Hughes 1992.
Status of Marbled Teal The most important site in Morocco. Breeds regularly (at least 6-8 pairs in 1990 & 1991, 5-6 pairs in 1992). Up to 1,680 in mid-winter (1982).

Name Merja Zerga.
Location 34.50 N, 6.20 W. Kénitra Province, North-West Morocco.
Protected Status Biological Reserve and Ramsar site.
Threats Hunting in the part north of Oued Drater, disturbance from tourists and watersports, cutting of vegetation, drainage, grazing, urbanisation with sewage discharge.
References Zwarts 1970, Scott 1980, Carp 1980, Morgan 1982b, Aguesse *et al.* 1983, Ramsar 1990, Dugan 1991, Hughes & Hughes 1992.
Status of Marbled Teal Up to 500 on autumn passage (5.10.80). Regularly in small numbers in mid-winter, over 800 in January 1964.

Name Sebkha Zima and salines.
Location 32.05 N, 8.40 W. Safi Province, Centre Atlantic.
Protected Status Hunting Reserve.
References Johnson & Biber 1974, Carp 1980, Morgan 1982b.
Status of Marbled Teal Up to 336 in mid-winter (1988).

Name Merja de Douyiet.

Location 34.05 N, 5.00 W. Fes Province, North-West Morocco.
Protected Status Hunting banned and access forbidden as Royal Reserve.
References Scott 1980, Carp 1980, Franchimont *et al.* 1990.
Status of Marbled Teal Breeding regularly (at least 3 pairs), and frequently over 100 birds in June. Up to 350 in mid-winter (1987) and up to 600 (14.10.87) in autumn.

Name Moulouya Delta.
Location 35.07 N, 2.34 W. Nador Province, North-East Morocco.
General Description Fresh water marshes in river bed, brackish oxbow lagoons, river floodplain inundated in winter. Area c. 3000 ha, includes 400 ha of marshes.
Protected Status None.
Threats Fish farming.
References Scott 1980, Carp 1980, Morgan 1982b, Brosset 1990.
Status of Marbled Teal 8-10 breeding pairs in 1989. Up to 250 on migration (30.9.79).

Name Dayet Ifrah.
Location 33.38 N, 4.55 W. Fes Province, Middle Atlas.
Protected Status None.
Threats Tourism, fishing, hunting.
References Morgan 1982b, J. Franchimont *in litt.* 1992.
Status of Marbled Teal c.300 on 17.12.73.

Name Dayet Merzouga (Dayet Srij/Sebkha Mesguida/Sebkha Ammar).
Location 31.05 N, 4.03 W. Errachidia Province, South Morocco.
Protected Status None.
Threats This temporary wetland has been dry in recent years, and it is unclear whether this is a purely natural occurrence.
References Scott 1980, J. Franchimont *in litt.* 1992.
Status of Marbled Teal Very high spring counts when flooded: 3000 in May 1973; 1500 May 1970. No records since 1980.

Name Marshes and estuary of the Lower Loukos.
Location 35.08 N, 6.04 W estuary, 35.08 N, 6.04 W marshes. Tétouan Province, North-West Morocco.
Protected Status None.
Threats Most of the freshwater marshes have been drained for agriculture, and an area of 25,000 ha has been reduced to about 200 ha. The remaining marsh vegetation is cut, burned and heavily grazed and there is intense hunting. Tanger-Rabat motorway proposal.
References Scott 1980, Morgan 1982b, Beaubrun *et al.* 1986.
Status of Marbled Teal Breeding confirmed in 1984. Up to 50 in winter (November 1972, February 1989).

Name Dayet Al Hafa.
Location 33.07 N, 08.32 W. Centre Atlantic.
Protected Status None.
Status of Marbled Teal 149 in January 1992 (only record).

Name Guelta El Aouina.
Location La'youne Province, South Morocco.
Area 35 ha.
General Description Endorreic, temporary coastal saline lagoon of 35 ha with a max. depth of 3 m and salinity of 22-40 g/l.
Protected Status Adjacent to Khnifiss Bay Hunting Reserve & Ramsar Site.
Threats Road building and military activity increasing disturbance and accessibility.
References Carp 1980, Scott 1980, Thévenot *et al.* 1988, J. Franchimont *in litt.* 1992.
Status of Marbled Teal Probable breeding pair in 1985.

Name Guelta La'youne.
Location 27.09 N, 13.15 W. La'youne Province, South Morocco.
General Description Endorreic lagoon of 320 ha with salinity of 18-44 g/l.
Protected Status None.
Threats Pollution from domestic refuse from La'youne.
References Dakki & De Ligny 1988.
Status of Marbled Teal One breeding pair in 1985.

Name Lagune de Khnifiss/Lagunes near Akhfennir.
Location 28.00 N, 12.25 W. La'youne Province.
Protected Status Ramsar Site and Reserve Biologique.
Threats Road building & military activity causing disturbance & increased accessibility. Considerable hunting pressure.
References Carp 1980, Ramsar 1990, Hughes & Hughes 1992.
Status of Marbled Teal Small numbers in winter; 4 in January 1986, 10 in January 1990.

Name Dayet Annoceur/Agoulmane/Dayet en berbèrc.
Location 33.34 N, 5.07 W. Fes Province, Middle Atlas.
Protected Status None.
Threats Causeways have been constructed dividing the site into three.
References Morgan 1982b, J. Franchimont *in litt.* 1992.
Status of Marbled Teal 15 in January 1972 (only record).

Name Dayet Hafourgah/Afourgah.
Location 33.38 N, 4.52 W. Fes Province, Middle Atlas.
Protected Status None.
Threats Extremely degraded, water area much reduced, vegetation eliminated, cattle grazing, disturbance from tourism.
References Morgan 1982b, J. Franchimont *in litt.* 1992.
Status of Marbled Teal 10 on 30.9.79, 7 in January 1981.

Name Dayet Aaoua.
Location 33.39 N, 5.03 W. Fes Province, Middle Atlas.
Protected Status None.
Threats Disturbance from tourists - a hotel on the north shore, & watersports. Fish farming.
References Morgan 1982b.
Status of Marbled Teal c.10 on 12.9.79.

Name Barrage Rwidate.
Location 33.44 N, 6.59 W. Centre Atlantique.
Status of Marbled Teal 14 in January 1991. Not suitable habitat, probably a temporary stopover site.

Name Barrages de Tamlakout & Taghdouzt near Tazenakht.
Location 30.35 N, 7.20 W. Ouarzazate Province, South Morocco.
Status of Marbled Teal 20 on 3.5.80. 4 in January 1991.

Name Barrage d'Ouarzazate.
Location Ouarzazate Province, South Morocco.
Status of Marbled Teal 25 on 24.3.90.

Name Marais de Moul Bergui.
Location 32.31 N, 8.57 W. Centre Atlantic.
Status of Marbled Teal 19 in January 1972.

Name Sedd El Mejnoun/El Kelaa des Sgharnas.
Location 32.09 N, 8.18 W. Centre Atlantic.
Status of Marbled Teal 15 in January 1988.

Name Merjas du Rharb (Merja Barga & Daya El Kahla).
Location 35.01 N,6.13 W. North-West Morocco.
Status of Marbled Teal 45 on 26.1.64 & 13 on 30.10.91.

Name Sebkha Bou Areg.
Location 35.10 N, 2.57 W. Nador, Noth-East Morocco.
Protected Status None.
References Morgan 1982b.
Status of Marbled Teal Up to 6 (25.11.80) in autumn & winter.

4.10 RECORDS FOR MOROCCO

Location	Date	Source	Number	Notes
Morocco (maritime)	Jan 1964	XXVI	1295	estimated total of 1500-2000
North-West Morocco				
Sidi Bou-Rhaba	1957-59	XXXV	-	no nesting; birds present Oct-Dec & April
Lac de Mehdia	pre 1962	XXXIII	20	observed from 20.11 to 20.12
Sidi Bou-Rhaba	09.06.63	XXXV	1+9	1 adult + 9 juveniles; 1st breeding record for site
Lac de Mehdia (Sidi Bou-Rhaba)	07.06.64	XXVIII	6	3 pairs
Lac de Mehdia (Sidi Bou-Rhaba)	08-09.08.64	XXVIII	12	
Lac de Mehdia (Sidi Bou-Rhaba)	Spring 1965-70	V	-	1 or 2 breeding pairs regularly
Lac de Mehdia (Sidi Bou-Rhaba)	01.05.65	XXVIII	6	3 pairs
Lac de Mehdia	June 1965	XXXIV	2+27	2 females & 27 juveniles
Lac de Mehdia (Sidi Bou-Rhaba)	23.06.66	XXVIII	2+8	2 females with broods of 5 and 5 pulli
Sidi Bou-Rhaba	15.12.69	XXXV	50	
Lac de Mehdia	02.06.70	XXXIV	3+35	3 females; 35 juveniles; 4 nests
Sidi Bou-Rhaba	07.11.70	XXXV	30	
Sidi Bou-Rhaba	30.01.71	XXXV	10	
Sidi Bou-Rhaba	28.03.71	XXXV	10	
Sidi Bou-Rhaba	27.07.71	XXXV	-	several females with non-flying juveniles
Sidi Bou-Rhaba	28.10.71	XXXV	50	

Sidi Bou-Rhaba	11.01.72	XXXV	10	
Sidi Bou-Rhaba	18.06.72	XXXV	1+12	1 female & 12 pulli
Sidi Bou-Rhaba	21.09.72	XIV	c.50	
Sidi Bou-Rhaba	31.12.72	XXXV	5	
Sidi Bou-Rhaba	18.11.73	XXXV	15	
Mehdia	08.12.73	XVII	c.50	
Sidi Bou-Rhaba	07.07.74	XXXV	2+20	1 female + 8 juveniles; 1 female with 12 juveniles
Sidi Bou-Rhaba	16.10.74	XXXV	100+	
Sidi Bou-Rhaba	03.11.74	XXXV	250	
Sidi Bou-Rhaba	22.12.74	XXXV	10	
Sidi Bou-Rhaba	Jan 1975	XXXV	c.150	
Sidi Bou-Rhaba	Sept & Oct 1975	XXXV	c.100	
Sidi Bou-Rhaba	Nov 1975	XXXV	c.150	
Sidi Bou-Rhaba	30.11.75	XXXV	50	
Sidi Bou-Rhaba	22.01.76	XXXV	220+	
Sidi Bou-Rhaba	17.03.76	XXXV	145	
Sidi Bou-Rhaba	Spring 1976	XXXV	70-90	
Sidi Bou-Rhaba	19.06.76	XXXV	3+30	3 females + broods of 8, 10, 12.
Sidi Bou-Rhaba	21.05.79	VIII	c.30	breeding; migrants increase numbers from October
Sidi Bou-Rhaba	02.06.80	XII	20+	2 families with 8 and 10 pulli
Sidi Bou-Rhaba	10.06.80	XII	15+	2 families with 6 and 7 pulli
Sidi Bou-Rhaba	26.09.80	XII	100	
Sidi Bou-Rhaba	23.11.80	XII	100	
Sidi Bou-Rhaba	Nov/Dec 1980	XII	280	
Sidi Boughaba	Winter 1980-82	XXXVI	750	average of 3 counts
Sidi Bou-Rhaba	Mar 1981	XXXVIII	10	
Sidi Bou-Rhaba	Apr 1981	XXXVIII	46	
Sidi Bou-Rhaba	Sept 1981	XXXVIII	130	
Sidi Bou-Rhaba	Oct 1981	XXXVIII	200	
Sidi Bou-Rhaba	Nov 1981	XXXVIII	790	
Sidi Bou-Rhaba	Dec 1981	XXXVIII	482	
Sidi Bou-Rhaba	Jan 1982	XCIV	1680	
Sidi Boughaba	pre 1983	XXXVI	c.100	c.50 pairs breed
Sidi Bou-Rhaba	Jan 1984	XVI	5	
Sidi Bou-Rhaba	25.03.87	XXI	60+	
Sidi Bou-Rhaba	07-10.04.87	XXI	40+	
Sidi Bou-Rhaba	22.12.87	XXXI	>800	
Sidi Bou-Rhaba	10.01.88	XXXI	171	
Sidi Bou-Rhaba	18.01.88	XXXI	125	
Sidi Bou-Rhaba	18.09.88	XXXIX	8	
Sidi Bou-Rhaba	18.01.89	XXXIX	c.50	
Sidi Bou-Rhaba	03.05.89	XXXIX	45	
Sidi Bou-Rhaba	31.08.89	XXXIX	c.10	
Sidi Bou-Rhaba	03.09.89	XXXIX	4	
Sidi Bou-Rhaba	12.09.89	XXXIX	c.10	
Sidi Bou-Rhaba	26.09.89	XXXIX	15	
Sidi Bou-Rhaba	10.10.89	XXXIX	c.5	
Sidi Bou-Rhaba	17.10.89	XXXIX	c.60	
Sidi Bou-Rhaba	24.10.89	XXXIX	c.80	
Sidi Bou-Rhaba	14.11.89	XXXIX	c.100	
Sidi Bou-Rhaba	21.11.89	XXXIX	120	
Sidi Bou-Rhaba	26.11.89	IX	120	
Sidi Bou-Rhaba	08.12.89	XXI	55	prob. only on permanent lake, not whole site.
Sidi Bou-Rhaba	1990	XXXIX	-	6-8 breeding pairs min.; possibly >10 pairs
Sidi Bou-Rhaba	09.01.90	III	179	

Sidi Bou-Rhaba	19.01.90	XXX	245	
Sidi Bou-Rhaba	23.01.90	XXXIX	173	
Sidi Bou-Rhaba	30.01.90	XXXIX	100	
Sidi Bou-Rhaba	Feb 1990	XX	c.100	
Sidi Bou-Rhaba	06.02.90	XXXIX	78	
Sidi Bou-Rhaba	13.02.90	XXXIX	15	
Sidi Bou-Rhaba	20.02.90	XXXIX	41	
Sidi Bou-Rhaba	27.02.90	XXXIX	39	
Sidi Bou-Rhaba	Mar 1990	XX	c.60	
Sidi Bou-Rhaba	06.03.90	XXXIX	49	
Sidi Bou-Rhaba	13.03.90	XXXIX	52	
Sidi Bou-Rhaba	20.03.90	XXXIX	46	
Sidi Bou-Rhaba	Apr 1990	XX	c.50	
Sidi Bou-Rhaba	03.04.90	XXXIX	44	including displaying (territorial) pairs
Sidi Bou-Rhaba	07.04.90	I	20+	
Sidi Bou-Rhaba	10.04.90	XXXIX	25	including displaying (territorial) pairs
Sidi Bou-Rhaba	17.04.90	XXXIX	16	including displaying (territorial) pairs
Sidi Bou-Rhaba	24.04.90	XXXIX	14	including displaying (territorial) pairs
Sidi Bou-Rhaba	May 1990	XX	c.20	c.20 adults and at least 3 broods (11, 12, 14 pulli)
Sidi Bou-Rhaba	08.05.90	XXXIX	5+12	5 adults; 1 brood of 12 pulli
Sidi Bou-Rhaba	15.05.90	XXXIX	21+25	21 adults; 2 broods of 11 & 14
Sidi Bou-Rhaba	22.05.90	XXXIX	22	22 adults; 3 broods of 7, 9 & 11
Sidi Bou-Rhaba	Sept 1990	XX	c.50	
Sidi Bou-Rhaba	08.09.90	XXXIX	49	
Sidi Bou-Rhaba	13.09.90	XXXIX	0	
Sidi Bou-Rhaba	18.09.90	XXXIX	0	
Sidi Bou-Rhaba	25.09.90	XXXIX	7	
Sidi Bou-Rhaba	Oct 1990	XX	c.30	
Sidi Bou-Rhaba	02.10.90	XXXIX	10	
Sidi Bou-Rhaba	09.10.90	XXXIX	25	
Sidi Bou-Rhaba	16.10.90	XXXIX	20	
Sidi Bou-Rhaba	23.10.90	XXXIX	1	
Sidi Bou-Rhaba	Nov 1990	XX	c.140	
Sidi Bou-Rhaba	06.11.90	XXXIX	53	
Sidi Bou-Rhaba	13.11.90	XXXIX	128	
Sidi Bou-Rhaba	20.11.90	XXXIX	74	
Sidi Bou-Rhaba	29.11.90	XXXIX	138	strong depression (snow) in Morroco & S.Spain
Sidi Bou-Rhaba	04.12.90	XXXIX	556	strong depression (snow) in Morroco & S.Spain
Sidi Bou-Rhaba	09.12.90	XXX	500	
Sidi Bou-Rhaba	Dec 1990	XX	c.550	
Sidi Bou-Rhaba	18.12.90	XXXIX	535	
Sidi Bou-Rhaba	1991	XXXIX	-	6-8 breeding pairs minimum; possibly >10 pairs
Sidi Bou-Rhaba	02.01.91	XXXIX	c.500	
Sidi Bou-Rhaba	08.01.91	XXXIX	413	
Sidi Bou-Rhaba	21.02.91	XXXIX	c.500	
Sidi Bou-Rhaba	26.02.91	XXXIX	373	
Sidi Bou-Rhaba	07.03.91	XXXIX	355	
Sidi Bou-Rhaba	17.03.91	XXXIX	4	
Sidi Bou-Rhaba	04.04.91	XXXIX	41	
Sidi Bou-Rhaba	23.04.91	XXXIX	85	
Sidi Bou-Rhaba	07.05.91	XXXIX	13	including displaying pairs (territorial)
Sidi Bou-Rhaba	02.06.91	XXXIX	4+20	4 adults; broods of 5,6, & 9
Sidi Bou-Rhaba	18.06.91	XXXIX	40	40 adults; broods present
Sidi Bou-Rhaba	04.07.91	XXXIX	42+19	42 adults; broods of 3,5 & 11
Sidi Bou-Rhaba	17.09.91	XXXIX	0	

Sidi Bou-Rhaba	24.09.91	XXXIX	16	
Sidi Bou-Rhaba	01.10.91	XXXIX	21	
Sidi Bou-Rhaba	08.10.91	XXXIX	98	
Sidi Bou-Rhaba	15.10.91	XXXIX	376	
Sidi Bou-Rhaba	22.10.91	XXXIX	392	
Sidi Bou-Rhaba	28.10.91	XXXIX	388	
Sidi Bou-Rhaba	05.11.91	XXXIX	440	
Sidi Bou-Rhaba	12.11.91	XXXIX	401	
Sidi Bou-Rhaba	19.11.91	XXXIX	465	
Sidi Bou-Rhaba	26.11.91	XXXIX	691	
Sidi Bou-Rhaba	03.12.91	XXXIX	835	
Sidi Bou-Rhaba	10.12.91	XXXIX	811	
Sidi Bou-Rhaba	17.12.91	XXXIX	827	
Sidi Bou-Rhaba	1992	XXXIX	-	5-6 breeding pairs
Sidi Bou-Rhaba	14.01.92	XXXIX	191	
Sidi Bou-Rhaba	21.01.92	XXXIX	c.150	
Sidi Bou-Rhaba	28.01.92	XXXIX	54	
Sidi Bou-Rhaba	04.02.92	XXXIX	142	
Sidi Bou-Rhaba	11.02.92	XXXIX	0	
Sidi Bou-Rhaba	18.02.92	XXXIX	51	
Sidi Bou-Rhaba	25.02.92	XXXIX	91	
Sidi Bou-Rhaba	05.03.92	XXXIX	124	
Sidi Bou-Rhaba	10.03.92	XXXIX	134	
Sidi Bou-Rhaba	17.03.92	XXXIX	117	
Sidi Bou-Rhaba	24.03.92	XXXIX	113	
Sidi Bou-Rhaba	31.03.92	XXXIX	64	
Sidi Bou-Rhaba	07.04.92	XXXIX	48	
Sidi Bou-Rhaba	16.04.92	XXXIX	47	
Sidi Bou-Rhaba	21.04.92	XXXIX	135	
Sidi Bou-Rhaba	27.04.92	XXIX	70+	prob >3 breeding pairs
Sidi Bou-Rhaba	02.05.92	XXXIX	132	
Sidi Bou-Rhaba	05.05.92	XXXIX	135	
Sidi Bou-Rhaba	12.05.92	XXXIX	81	
Sidi Bou-Rhaba	19.05.92	XXXIX	69	
Sidi Bou-Rhaba	26.05.92	XXXIX	66	
Sidi Bou-Rhaba	02.06.92	XXXIX	34	
Sidi Bou-Rhaba	09.06.92	XXXIX	6+6	6 adults; 1 brood of 6
Sidi Bou-Rhaba	20.06.92	XXXIX	2+15	2 adults; 2 broods of 4 & 11
Sidi Bou-Rhaba	23.06.92	XXXIX	10	no pulli
Sidi Bou-Rhaba	03.07.92	XXXIX	13	no pulli
Lagoon at Kenitra	23.07-04.08.71	VI	-	present
Merja de Douyiet	02.11.63	III	c.200	
Merja de Douyiet	18.01.64	XXVI	350	
Douyiet	Spring 1969	V	c.10	
Merja de Douyiet	Jan 1971	III	-	several
Merja de Douyiet	07.07.72	III	4	1 adult; 3 pulli
Merja de Douyiet	18.12.73	XVII	9	
Merja de Douyiet	25.05.77	III	21+	3 pairs; 15+ pulli
Merja de Douyiet	12.12.77	III	c.300	
Merja de Douyiet	05-25.11.79	VIII	c.20	
Merja de Douyiet	Oct/Nov 1980	XII	-	present
Merja de Douyiet	Nov/Dec 1980	XII	5	
Douyiet	Sept 1981	XXXVIII	125	
Douyiet	Oct 1981	XXXVIII	50	
Douyiet	Nov 1981	XXXVIII	350	

Merja de Douyiet	08.11.81	III	>350	
Merja de Douyiet	18.07.82	III	50+	c.50 adults with pulli
Merja de Douyiet	Jan 1983	III	15	
Merja de Douyiet	14.09.84	III	c.200	
Merja de Douyiet	14.09.85	III	>100	
Merja de Douyiet	15.10.85	III	>100	
Merja de Douyiet	13.11.85	III	>100	
Merja de Douyiet	13.09.86	III	c.400	
Merja de Douyiet	20.05.87	III	150-200	
Merja de Douyiet	14.06.87	III	150-200	
Merja de Douyiet	13.09.87	III	100s	several hundreds
Merja de Douyiet	07.10.87	III	c.500	
Merja de Douyiet	14.10.87	III	c.600	
Plan d'eau Douyiet	19.12.87	XXXI	1	
Plan d'eau Douyiet	27.01.88	XXXI	3	
Merja de Douyiet	17.06.88	III	c.120	
Merja de Douyiet	16.04.89	IX	50	
Merja de Douyiet	23.05.89	IX	120	
Merja de Douyiet	08.11.89	IX	60	
Merja de Douyiet	22.10.90	XX	3-4	
Douyiet	12.04.91	XC	c.200	
Douyiet (Lac Oriental)	16.06.92	XCI	c.40	
Douyiet	21.06.92	XCI	c.150	
Merja Zerga	27-28.01.64	XXVI	800+	
Merja Zerga	Winter 1972-75	XXXVI	0	average for 3 counts
Merja Zerga	07.12.73	XVII	-	present
Merja Zerga	21.06.80	XII	-	present
Merja Zerga	05.10.80	XII	500	
Merja Zerga	Oct 1981	XXXVIII	c.100	
Merja Zerga	Nov 1981	XXXVIII	c.50	
Merja Zerga	Winter 1981-83	XXXVI	9	average for 3
Merja Zerga	31.10-01.11.91	XC	2	
Merja Zerga	04.11.91	XC	1	
Larache (marshes upstream of Loukos delta?)	April 1971-76	X	-	seen in pairs, possibly breeding
Larache	17-18.11.71	X	-	seen on migration
Larache (marshes upstream of Loukos delta?)	23.11.72	X	c.50	
Larache (marshes upstream of Loukos delta?)	03.12.73	X	1	
Bas Loukkos	Jul 1981	XXXVIII	5	
Marais du Bas-Loukkos	28.08.89	XXXIX	2	
Larache (marshes upstream of Loukos delta?)	05.11.90	XX	-	a few
Marais du Bas-Loukkos	03.01.91	XXXIX	c.10	
Marais du Bas-Loukkos	27-28.10.91	XC	15	
Marais du Bas-Loukkos	05.11.91	XC	10	
Oued Loukos, Larache	18.12.91	XXI	6	
Bas-Loukkos	19.04.92	XCI	10	
Salines de Lixus	05.11.91	XC	15	
Salines de Lixus	01.03.92	XCI	c.40	
Oued Smir	17-18.11.71	X	-	seen on migration
Oued Smir	10.11.80	XII	2	
Tangerois	pre 1962	XXXIII	-	seen on migration, March, Apr and Oct
Tanger	04.10.80	XII	1	
Merja Bouka, Sidi Yahia de Gharb	22.11.75	XXV	-	Recovery of female ringed in Spain on 17.8.75
Merjas Sidi Mansour et Daoura	26-29.01.64	XXVI	30	
Ras-el-Daoura	April pre 1962	XXXIII	-	common on migration
Merjas du Rharb / Daya El Kahla	26.01.64	XXVI	45	

Merja Barga (Merjas du Rharb)	30.10.91	XC	13	
North-East Morocco				
Sebkha Bou Areg	28.09.80	XII	3	
Sebkha Bou Areg	25.11.80	XII	6	
Basse & Embouchure Moulouya	pre 1962	XXXIII	-	seen on migration 6 May & mid-May; Sept & Oct
Delta de la Moulouya, Mediterranean coast	30.09.79	VIII	c.250	
Delta de la Moulouya	03.05.80	XII	-	present
Delta de la Moulouya	20.09.80	XII	1	
Delta de la Moulouya	28.09.80	XII	3	
Embouchure de la Moulouya	1981	XXXVIII	-	breeding very probable
Delta de la Moulouya, El Kseuba	29.04-09.05.89	VII	c.18	8-10 breeding pairs in active display
Embouchure Moulouya	25.03.92	XCI	c.10	
Middle Atlas Region				
Dayet Hafourgah	30.09.79	VIII	c.10	
Dayet Aoua	12.09.79	VIII	c.10	
Dayet Ifrah	17.12.73	XVII	c.300	
Dayet Ifrah	21.10.80	XII	-	present
Centre Atlantic Region				
Lagunes de Sidi Moussa-Oualidia	14.01.64	XXVI	70+	
Sidi Moussa-Oualidia	08.09.80	XII	53	
Lagune de Sidi Moussa, dunes	28.02.81	IV	2	
Lagune de Sidi Moussa, inter-tidal part	09.03.81	IV	17	
Complexe Sidi Moussa-Oualidia (marais)	23.12.87	XXXI	8	
Sidi Moussa-Oualidia	27.12.88	XXXIX	-	present, not counted
Salines North of Jemaa-Sidi-Brahim	25.03.89	II	1,100	part of Sidi Moussa-Oualidia complex
Oualidia Salines and Estuary	25.03.89	II	3	part of Sidi Moussa-Oualidia complex
Sidi Moussa-Oualidia	31.12.90	XX	c.200	
Sidi Moussa-Oualidia	04-05.11.91	XC	252	
Sidi Moussa-Oualidia	19-20.12.91	XC	500	
Sebkha Zima	23.01-15.02.87	XXXI	3	
Sebkha Zima	13.01.88	XXXI	95	
Cassablanca, near	25.09.79	VIII	-	present
Lac d'Imfout (Oum-er-Rbia)	13 Apr pre 1962	XXXIII	-	numerous on migration
South Morocco				
Defilia oasis, near Figuig	4.4.65	XCIII	12	flock of spring migrants flying east
Guelta El Aouina, La'youne province	23.04.85	XV	1	
Guelta El Aouina	14-16.05.85	XV	2	probable breeding
Guelta El Aouina	18.11.85	XV	3	
Guelta El Aouina	17.12.85	XV	4	
Guelta La'youne	06.05.55	XV	-	probable sighting of pair
Layoun Area	1980-86	XXXII	-	confirmed breeding
Guelta La'youne	23.04.85	XV	5	4 adults + 1 chick
Iriki/Dra inférieur	end May, pre 1962	XXXIII	c.15	pairs and isolated individuals
Iriki	01.01.66	XXVII	0	
Iriki	March 1966	XXVII	-	several pairs in flight
Iriki	21.06.66	XXVII	20+	5 nests and several other pairs
Iriki, west part	15.01.68	XXVII	1000+	wintering in a wet year
Iriki, west part	14.04.68	XXVII	c.40	c.20 pairs and two nests
Oued Massa Delta, Agadir	06.12.79	VIII	21	c.10 regular in Summer, possibly breeding
Oued Massa Delta, Agadir	31.05.80	XII	5	
Oued Massa Delta, Agadir	13.11.80	XII	71	

Oued Massa Delta, Agadir	05.12.80	XII	53	
Oued Massa Delta	Mar 1981	XXXVIII	6	
Oued Massa Delta	Apr 1981	XXXVIII	26	
Oued Massa Delta	May 1981	XXXVIII	39	
Oued Massa Delta	Sept 1981	XXXVIII	35	
Oued Massa Delta	Nov 1981	XXXVIII	196	
Oued Massa Delta	Dec 1981	XXXVIII	49	
Oued Massa	1982	XIX	-	first proof of breeding
Oued Massa	spring 1984	XIX	-	at least 5 broods
Oued Massa	04.09.86	XXI	8	
Oued Massa	20-21.03.87	XXI	40+	
Oued Massa	01.01.88	XXXI	15	
Oued Massa	15.01.88	XXXI	330	
Oued Massa Delta	03.02.89	XVI	168	
Oued Massa	12.12.89	XXI	70	
Oued Massa	29.12.89	XXI	30	
Oued Massa	31.12.89	IX	45+	
Oued Massa Delta, Agadir	04/05.4.90	I	50+	
Oued Massa Delta	14.10.90	XCII	4	
Oued Massa	29.10.90	XX	c.50	
Oued Massa	08.11.90	XXI	21	
Oued Massa	18.11.90	XXI	43	
Oued Massa	20.11.90	XXI	111	
Oued Massa	28-29.12.90	XX	c.200	
Oued Massa	02.01.91	XC	202	2 groups of 72+ and c.130
Oued Massa	14.12.91	XXI	20	
Oued Massa	15.12.91	XXI	6	
Dayet Merzouga (Dayet Srij), Errachidia	24.04.70	V	1,000	
Dayet Merzouga	01-02.05.70	XXII	1,500	
Dayet Merzouga	16.04.73	XXIV	800	
Dayet Merzouga	May 1973	XXXVII	3000	
Dayet Merzouga	20.08.75	XXXVII	400	
Merzouga	25.11.79	VIII	25	
Merzouga	06.04.80	XII	5	
Errachidia	22.11-17.12.80	XII	-	present
Barrage de Tamlakout (Tazenakht/Taghdouzt)	03.05.80	XII	20	
Khnifiss Lagoon area, Tarfaya	1985-86	XXXII	-	probable breeding
Barrage Oued Nfiss	Oct 1981	XXXVIII	1	
Barrage Oued Nfiss	Nov 1981	XXXVIII	2	
Barrage d'Ouarzazate	24.03.90	XX	25	

I N. Moorhouse *in litt.* 1991
II Dies Jambrino *et al.* 1989
III Franchimont *et al.* 1990
IV Kersten *et al.* 1983
V Vernon 1973
VI Louette 1973
VII Brosset 1990
VIII Thevenot *et al.* 1980
IX Mdarhri Alaoui *et al.* 1990
X Pineau & Girand-Audine 1977
XII Thevenot *et al.* 1981
XIII Johnson & Biber 1974
XIV Penkowski 1975
XV Dakki & De Ligny 1988
XVI Pain & Pineau 1989
XVII de Juana Aranzana 1974
XVIII Zwarts 1970
XIX *British Birds* 78: 638-645
XX Pouteau 1991
XXI H.G. Young *in litt.* 1992. Includes data by HGY, D. Wilson, S.M. Andrews, A. Forsten and T. Numminen
XXII Vielliard 1970
XXIII Cramp & Simmons 1977
XXIV Scott 1980
XXV Fernandez Cruz 1982
XXVI Blondel & Blondel 1964
XXVII Robin 1968
XXVIII Deetjen 1967

XXIX J.F. Hulme pers. comm. 1992
XXX C. Perennou pers. comm. 1992
XXXI Beaubrun & Thévenot 1988
XXXII Thevenot *et al.* 1988
XXXIII Heim de Balsac, & Mayaud 1962
XXXIV Frete, P. 1970
XXXV Thevenot 1976
XXXVI Aguesse *et al.* 1983.
XXXVII *Alauda* 45: 286
XXXVIII Thevenot *et al.* 1982
XXXIX C. Pouteau *in litt.* 1992
XC Pouteau *et al.* 1992
XCI Pouteau et al 1993
XCII de Bouard & Pineau 1990
XCIII Smith 1968
XCIV *Brit. Birds* 78: 638.

5. ALGERIA

5.1 DISTRIBUTION AND STATUS

Marbled Teal were reported to be "very common...in summer" by Hume & Marshall (1880). At the beginning of this century, Marbled Teal were "one of the most plentiful species" of wildfowl and a common breeder in Algeria, with Lac Fetzara in the north-eastern El Kala region being the most important site with "countless numbers" breeding before 1915 (Phillips 1923). Lac Fetzara was drained in the 1930s, although it still holds water in some years, and no longer supports Marbled Teal in numbers.

Marbled Teal are currently recorded throughout the year in Algeria. There is enormous variation between seasons and years in the size of natural Algerian wetlands, and the species' distribution fluctuates accordingly. The distribution of current breeding sites is unclear, but breeding is thought to occur in the sites below, at least in some years. The regions are those adopted by Ledant & van Dijk (1977) and Jacobs & Ochando (1979).

El Kala Region

Lac Tonga: said to be a current breeding site (Ledant & van Dijk 1977; Ramsar 1990), but no confirmed breeding records have been received and the species was not recorded by Chalabi (1990). The breeding population must be very small.

Centre Region

Lac de Boughzoul: up to 240 in summer 1978 including at least three breeding pairs and probably many more. Up to 170 in summer 1977 (Jacob & Jacob 1980).

Marais de Réghaïa: three breeding pairs in 1978, with regular records in earlier years (Jacob *et al.* 1979).

West-Oranie Region

Marais de la Macta: reported to probably have bred in 1956 and to have bred in 1977 (Carp 1980; Ledant *et al.* 1981; Morgan 1982a), but no details have been received.

There could be additional breeding sites elsewhere since Algeria receives relatively little ornithological coverage, and it has been suggested that Marbled Teal may breed in the Hauts Plateaux region (Cramp & Simmons 1977, see Jacobs & Ochando 1981 for Hauts Plateaux wetlands). Given this and the large size of Lac de Boughzoul and Marais de la Macta, it seems likely that there is a total of at least 50 breeding pairs of Marbled Teal in wet years. The breeding population could be more than 50 pairs, as there are several summer and passage records of over 100 from Boughzoul (François 1975; Jacob & Jacob 1980) and a record of 500 in Lac Bou Lhilet, Constantinois region, in November 1973 (Ledant *et al.* 1981). It is possible that the Bou Lhilet record was a passage of Tunisian breeders, but there may be little interchange between the Tunisian and Algerian populations (M. Smart *in litt.* 1992). Lac Tonga, Marais de Réghaïa and Marais de la Macta are largely seasonal and are not likely to be suitable for breeding in dry years. Lac Boughzoul is permanent.

In winter, up to 360 birds were regularly recorded in the West-Oranie region in the 1970s at Grande Sebkhet d'Oran, Lac des Gharabas and Marais de la Macta, with records of 150 or more from all three sites (Table 7). There have been very few records in the 1980s, probably because these sites were counted more thoroughly in the

1970s. In recent years Marbled Teal have probably been overlooked (B. Chalabi pers. comm. 1992). In wet years, Marais de la Macta and Sebket d'Oran are both huge sites holding many thousands of birds, but they are dry in some winters (Carp 1980; Scott 1980).

This Oranie winter population may be made up largely of Algerian breeders. However, one of five recoveries of birds ringed in summer in Spain was from Marais de la Macta (see 3.4.2), showing that some Spanish birds winter in the area. There are occasional winter records from the remnants of Lac Fetzara and Garaet El Mekhada in El Kala region (Table 7; A. del Novo *in litt.* 1992), Lac de Boughzoul in the Centre (Jacob & Jacob 1980) and Bou Lhilet in Constantinois (Agence nationale pour la conservation de la nature [ANCN] *in litt.* 1992). There are numerous poorly-known *sebkhas* and *chotts* in South Algeria that could hold wintering Marbled Teal (Ledant & van Dijk 1977; Jacobs & Ochando 1979; B. Chalabi pers. comm. 1992). Occasional winter records from Djemaa and Touggourt in the South support this notion (Anon. 1978; Ledant *et al.* 1981). Some birds are likely to winter south of the Sahara in Chad or neighbouring countries, and a record of one Marbled Teal on 20.11.79 from Hoggar in the southern Algerian Sahara supports this (Ledant *et al.* 1981). Twelve spring migrants flying east at Figuig on the Morocco-Algeria border (Smith 1968) may have been Algerian breeders wintering south of the Sahara (Ledant *et al.* 1981) but alternatively may have been wintering in southern Morocco. It is possible that a considerable proportion of the large population wintering in Morocco breed in Algeria.

5.2 HABITAT

Marbled Teal formerly bred in the freshwater lake and marsh, Lac Fetzara. They now breed mainly in fresh and brackish marshes such as Lac Tonga, Marais de Réghaïa and Marais de la Macta dominated by *Scirpus*, *Juncus* and *Phragmites* (Carp 1980; Morgan 1982a; Ramsar 1990). Lac de Boughzoul is a permanent reservoir with dense stands of *Phragmites*, *Typha* and *Potamogeton* (Jacob & Jacob 1980; Morgan & Boy 1982)

5.3 ECOLOGY AND BEHAVIOUR

5.3.1 Breeding biology

Numerous nests were found by Zedlitz at Lake Fetzara between 27 May and 8 June (Heim de Balsac & Mayaud 1962).

5.3.2 Diet

In the last century Marbled Teal were found by Loche to feed on crustaceans, insects and worms (Phillips 1923).

5.3.3 Movements

Breeders arrive at Boughzoul and Réghaïa in April and May with occasional records at the end of March. The birds at Boughzoul leave by late October and small numbers are seen irregularly on passage at Réghaïa between September and November (François 1975; Jacob *et al.* 1979; Ledant *et al.* 1981). A male ringed in August in Spain was recovered at La Macta on 11 February.

5.4 THREATS

5.4.1 Habitat loss and degradation

The Algerian population of Marbled Teal has undergone a major decline this century following the drainage of the former major breeding site Lake Fetzara. In the 1980s Lac Fetzara was partially restored due to a change in sluice management towards water retention for irrigation (Skinner & Smart 1984). Several other sites are threatened by drainage schemes. Attempts were made to drain the Marais de Réghaïa and convert it to *Eucalyptus* plantations in the 1930s, but this scheme was subsequently abandoned (Jacob *et al.* 1979). Garaet El Mekhada is threatened by a proposal for a dam within the El Kala National Park, upstream of the marsh (Stephenson *et al.* 1988; A. del Nevo *in litt.* 1992). Efforts to drain Lac Tonga were made in the 1960s but the site has been partially restored (Ramsar 1990; A. del Nevo *in litt.* 1992). Marais de la Macta was drained in the late 1960s, but has since apparently been restored to its former size. Heavy grazing in the marsh has changed the vegetation structure (Morgan 1982a).

There is also grazing pressure on the marshes at Marais de Réghaïa, and human pressure is very high at this small site near the capital. Reeds are harvested, and dead wood is cut for fuel. Disturbance from fishermen, walkers and hunters is high and there is a very noisy dredging machine in operation. Fires started deliberately at Réghaïa have caused a rapid transition of *Phragmites* dominated areas to *Typha* marsh and there is a pollution problem from the industrial complex close to Rouiba (Jacob *et al.* 1979). Marais de la Macta is suffering from increasing agricultural pollution with the threat of industrial pollution from the development of a steel mill and port on the northern side. A main road has been built across the northern side of the site (Morgan 1982a). Reed burning occurs at Lac de Boughzoul in dry periods (Jacob & Jacob 1980).

5.4.2 Hunting

Marbled Teal numbers were said to have declined in Algeria as early as 1867, when a "great decrease" followed the French occupation of 1839-1840 and the resulting increase in hunting pressure (Phillips 1923). Hunting pressure is currently reported to be high during weekends at several Marbled Teal sites, including Lac Tonga, despite its protected status (Ramsar 1990). Hunting is particularly intense at Garaet El Mekhada, where "thousands" of shots were fired on 16.1.92 (A. del Nevo *in litt.* 1992). Indiscriminate hunting, often from cars and boats, and nest destruction has been reported from Lac de Boughzoul and Marais de Réghaïa (Jacob *et al.* 1979; Jacob & Jacob 1980). Hunting also occurs at Grande Sebkha d'Oran (Carp 1980), but is not thought to be as great a threat to Marbled Teal here as at other, smaller wetlands (B. Chalabi *in litt.* 1992).

5.5 CONSERVATION MEASURES TAKEN

Lac Tonga is included within El Kala National Park and is a Ramsar site (Ramsar 1990). Marais de la Macta is a Réserve Naturelle, but is not given effective protection (Morgan 1982a). Lac de Réghaïa is a hunting reserve (ANCN *in litt.* 1992).

5.6 EVALUATION

Algeria formerly held a large breeding population of Marbled Teal that has declined markedly following the drainage of Lac Fetzara, but there remain a number of important breeding and wintering sites that are unprotected and threatened. Many important and potentially important wetlands have received little or no recent coverage and the current breeding and wintering distributions of Marbled Teal in Algeria remain unclear. There is an urgent need for both conservation action to protect known important sites, and survey work to clarify the status of Marbled Teal at these and other sites.

5.7 ACTION NEEDED

Species Protection: Marbled Teal should be legally protected from hunting.

Habitat Protection: Lac de Boughzoul, Lac de Réghaïa and Lac Bou Lhilet should be protected. Protection should also be considered for Grande Sebkhet d'Oran and Lac des Gharabas. Grande Sebkhet d'Oran would be suitable as a Réserve Nationale because of its relative intactness and proximity to a large university city (Morgan 1982a). Protection should be enforced at Marais de la Macta.

Monitoring in summer: breeding surveys of wetlands in the El Kala, Centre, Oranie and Hauts Plateaux regions, especially Boughzoul, Réghaïa and Marais de la Macta.

Monitoring in winter: improved coverage of Ouest-Oranie wetlands; surveys of *Chotts* and *Sebkhas* of the south (e.g. Chotts Helrhir, bou Djeloud, de Merouane, de Kerdache, de Ouargla; see Jacobs & Ochando 1979).

5.8 SITE DIRECTORY

KEY SITES
Grande Sebkhet d'Oran
Lac des Gharabas
Marais de la Macta
Barrage de Boughzoul
Lac de Réghaïa
Lac Bou Lhilet

SITES OF SOME IMPORTANCE
Garaet El Mekhada
Lac Tonga

Name Grande Sebkhet d'Oran.
Location 35.27-37 N, 00.34-01.01 W. Région Ouest-Oranie.
Protected Status None.
Threats Hunting, though not a major threat.
References Carp 1980, Scott 1980, Morgan 1982a, Hughes & Hughes 1992, B. Chalabi pers. comm. 1992.
Status of Marbled Teal Up to 200 in winter (1972), last record 31 (1978).

Name Lac des Gharabas.
Location 35.35 N, 00.25 W. Région Ouest-Oranie.
General Description Permanent mixohaline lake of 228 ha with very little vegetation, but some *Tamarix*.
Protected Status None.
References Morgan & Boy 1982.
Status of Marbled Teal Up to 150 in winter (1975), last record 1981 (38).

Name Marais de la Macta.
Location 35.41 N, 00.10 W. Region Ouest-Oranie.
Protected Status Réserve Naturelle.
Threats Partly drained in the 1960s but since restored; Agricultural pollution; Heavy grazing has reduced the area of *Phragmites*; Heavy industry developing on the northern end.
References Carp 1980, Scott 1980, Morgan 1982a, Hughes & Hughes 1992.
Status of Marbled Teal Up to 220 in winter (1977) and a breeding site (last confirmed 1977).

Name Lac de Boughzoul/Barrage de Boughzoul.
Location 35.45 N, 2.47 E. Région Centre.
Protected Status None.
Threats Indiscriminate hunting, often illegally from cars or outboard boats. Nest destruction. Reed burning in dry periods.
References François 1975, Jacob & Jacob 1980, Scott 1980, Morgan 1982a, Morgan & Boy 1982, Hughes & Hughes 1992.
Status of Marbled Teal Major summer site with up to 240 (1978). Breeding last confirmed 1978. Occasional in winter (up to 26, 3.11.77).

Name Marais de Réghaïa/Lac de Réghaïa.
Location 36.44 N, 03.20 E. Région Centre.
General Description Estuary of the Oued Réghaïa impounded by a sea wall, with a lagoon and seasonal marshes with *Scirpus*, *Phragmites* and *Tamarix*. Brackish with total area of 230 ha.
Threats Grazing; reed cutting; cutting of dead wood for fuel; fires started deliberately have caused a change from *Phragmites* to *Typha*; indiscriminate hunting; disturbance from visitors; pollution from industrial complex.
Protected Status Hunting Reserve.
References Jacob *et al.* 1979, ANCN *in litt.* 1992, Boukhalfa 1991.
Status of Marbled Teal Breeding site with at least three pairs in 1978.

Name Lac Bou Lhilet.
Location 35.26 N, 6.67 E. Région Constantinois, 50 km NE of Batna.
General Description Artificial brackish lake.
Protected Status None.
References ANCN *in litt.* 1992.

Status of Marbled Teal 500 in Nov 1973; 2 in Jan 1992.

Name Lac Tonga.
Location 36.51 N, 8.30 E. Région d'El Kala.
Protected Status Ramsar Site and part of El Kala National Park, hunting prohibited.
Threats High hunting pressure; some fishing; drainage schemes up to the 1960s, now partially restored.
References Scott 1980, Carp 1980, Morgan 1982a, Skinner & Smart 1984, Ramsar 1990, Hughes & Hughes 1992, A. del Nevo *in litt.* 1992.
Status of Marbled Teal Said to be a breeding site, recorded in small numbers in May & July.

Name Garaet El Mekhada.
Location 36.48 N, 8.00 E. Région d'El Kala.
Protected Status Probably falls outside the El Kala National Park.
Threats Grazing, upstream dam proposal, intensive hunting.
References Carp 1980, Scott 1980, Morgan 1982a, Skinner & Smart 1984, Hughes & Hughes 1992, A. del Nevo *in litt.* 1992.
Status of Marbled Teal Up to 20 in summer (20.7.84). One winter record, 1 on 16.1.92.

5.9 RECORDS FOR ALGERIA

Location	Date	Source	Number	Notes
Région d'El Kala				
Lac Fetzara	pre 1915	XII	-	countless numbers breeding
Lac Fetzara	13.2.85	II	7	
Lac des Oiseaux	9.5.84	III	4	
Lac Tonga	19.5.76	III	2	
Lac Tonga	19.7.84	I,III	2	in flight, probably nesting
Garaet El Mekhada, southern part	9.5.84	III	5	
Garaet El Mekhada, centre	20.7.84	III	c.20	in flight
Garaet El Mekhada	16.1.92	X	1	could have been more
Région Ouest-Oranie				
Marais de la Macta	7-12.5.56	XIII	-	not rare, in pairs (Makatsch). Probably bred
Marais de la Macta	14.3.76	V	10	possible record, identification uncertain
Marais de la Macta	11.2.77	VII	-	recovery of male ringed in Spain on 6.8.75
Marais de la Macta	summer 1977	VIII	-	breeding site
Région Centre				
Lac de Boughzoul	6.5.72	XVI	11-100	
Lac de Boughzoul	28.5.72	XVI	101-1000	
Lac de Boughzoul	12.6.72	XVI	0	
Lac de Boughzoul	3.7.72	XVI	11-100	
Lac de Boughzoul	1.10.72	XVI	101-1000	
Lac de Boughzoul	end Apr-Jun 1977	XVII	170	peak count over this period, probably breeding
Lac de Boughzoul	3.4.77	VI	26	possibly same record as below, correct date unclear
Lac de Boughzoul	3.12.77	XVII	26	
Lac de Boughzoul	20.2.78	XVII	4	
Lac de Boughzoul	end Apr-Jun 1978	XVII	240	peak count over this period.

Lac de Boughzoul	16.6.78	XVII	3+20	3 _s + 6,6,8 small pulli. Probably many nesting pairs
Marais de Réghaïa	14.5.75	XV	1	
Marais de Réghaïa	30.4.76	XV	10	
Marais de Réghaïa	21.5.76	XV	3	
Marais de Réghaïa	10.9-4.11.76	XV	1-2	seen several times
Marais de Réghaïa	25.5.77	XV	3	including one pair that was seen until June
Marais de Réghaïa	5.5.78	XV	6	three pairs, arrived 4.4, 13.4 and 5.5.78
Marais de Réghaïa	26.6.78	XV	1+4	female + 4 pulli of 3-4 weeks old
Marais de Réghaïa	6.7.78	XV	2+14	two females with broods of 6 and 8 pulli
Marais de Réghaïa	1979	XI	-	seen in breeding season
Région Constantinois				
Lac Bou Lhilet	Nov 1973	XVIII	500	probably autumn passage
Lac Boulhilet	Jan 1992	XI	2	
Région Sud				
Biskra	pre 1962	XIII	-	seen outside breeding season by Hartert
Djemaa	22.11.77	VI	1	
Touggourt	pre 1981	XVIII	-	occasional in winter
Temekerest, Hoggar	20.11.79	XVIII	1	

I Association "les amis des oiseaux" 1984
II M. Reyfisch *in litt.* 1985
III Chalabi *et al.* 1984
IV Johnson *et al.* 1975
V Ledant 1976
VI Anon. 1978
VII Fernandez-Cruz 1982
VIII Morgan 1982a
IX Carp 1980
X A. del Novo *in litt.* 1992
XI Agence nationale pour la conservation de la nature *in litt.* 1992
XII Phillips 1923
XIII Heim de Balsac & Mayaud 1962
XIV Dupuy 1969
XV Jacob *et al.* 1979
XVI François 1975
XVII Jacob & Jacob 1980
XVIII Ledant *et al.* 1981

6. TUNISIA

6.1 DISTRIBUTION AND STATUS

Phillips (1923) considered Marbled Teal to be a breeding species in Tunisia but one rarer there than in Algeria while Hume & Marshall (1880) described it as "very common...in winter". In recent decades, Marbled Teal has been a regular breeder in Tunisia, but wintering is rarely observed. Breeding was formerly reported to occur in Tunisia only in the wetter years, for example occurring in 1957, 1962, 1964, 1965, 1966 and 1968 but probably not in the years in between (Cramp & Simmons 1977).

There is enormous variation between seasons and years in the size of natural Tunisian wetlands, particularly freshwater wetlands, and several important Marbled Teal breeding sites such as Sebkhet Sidi Mansour and Sebkha Kelbia regularly dry out for several years at a stretch. Kelbia was flushed with water by major floods in autumn 1969 and December 1973, then rarely held any water until 1989 and 1990 when water was released artificially from the flood control dam upstream at Sidi Saad. Similarly, Sidi Mansour held water following the 1969 and 1973 rains, then hardly again until autumn/winter 1981/1982, then not again until 1989 and 1990 (M. Smart *in litt.* 1992). Breeding occurs regularly and in considerable numbers at both sites in years when they are flooded. While breeding was formerly concentrated in the natural, large freshwater lakes such as Kelbia, Sidi Mansour and Lake Ichkeul, it now also takes place on some of the many reservoirs constructed over the last 20 years, such as Barrage el Haouareb. Breeding is currently thought to occur in the sites listed below, at least in some years.

Sebkha Kelbia: c. 50 breeding pairs in 1966 and 1968 (Smart 1970). c.120 on 10.7.75. Breeding took place in 1990 and probably still occurs in numbers in wet years (M. Smart *in litt.* 1992).

Sebkhet Sidi Mansour: heavy breeding in 1990 (150+ on 16.8.90, M. Smart *in litt.* 1992) and 1991 (318 on 11.7.91, F. Maamouri *in litt.* 1992).

Lake Ichkeul: breeding is probably regular. c.70 on 10.8.84 (M. Smart *in litt.* 1992).

Lake Tunis: breeding regular but probably never in large numbers. Creche of c.40 on 2.8.78, one adult with brood on 13.7.88 (M. Smart *in litt.* 1992).

Barrage el Haouareb: 150 on 22.8.92 including several possible family parties (M. Smart *in litt.* 1992).

Barrage Bir M'Cherga: 12 on 16.8.92 with two possible family groups (M. Smart *in litt.* 1992).

Barrage Lebna: one on 16.8.92. Possibly a major breeding site (M. Smart *in litt.* 1992).

Barrages Gdir el Ghouel & Mornarguia: eight on 5.11.85. Possibly a major breeding site (M. Smart *in litt.* 1992).

Sebkhet Ariana sedimentation ponds: c.50 (mostly ducklings) on 16.7.88, 16 (probably a family group) on 3.8.90 (M. Smart *in litt.* 1992).

Oued Sed: breeding recorded in 1978, 1985, 1987, 1990 and 1991 with 60+ on 7.8.85 and at least four breeding pairs in 1990 (E. Wymenga *in litt.* 1991; M. Smart *in litt.* 1992; F. Maamouri *in litt.* 1992).

Marais de Soliman: breeding reported to have occurred (Morgan 1982a).

In wet years, there are probably up to 100-150 breeding pairs of Marbled Teal in Tunisia producing a late summer population of 300-500. Although there may have been a signicant decline in the size of the breeding population in recent decades owing to a number of significant threats, it is not possible to quantify this or to assess to what extent new populations in reservoirs have compensated for the declines elsewhere.

Marbled Teal are only recorded wintering in Tunisia very occasionally, but there was an exceptional record of 200 birds at Sebkhet Sidi Mansour in 1971 (Table 8) during an unusually wet winter which probably attracted some birds to remain. The Tunisia breeding population probably regularly winters south of the Sahara in Chad or other parts of central and west Africa and may not undergo regular exchange with the populations in western Algeria and Morocco (M. Smart *in litt.* 1992). However, some exchange seems likely to occur with the small breeding population in north-eastern Algeria since this area is adjacent to the Tunisian breeding range (Figure 1).

6.2 HABITAT

On breeding sites, Marbled Teal show a clear preference for freshwater areas. Both temporary (e.g. Kelbia, Sidi Mansour) and permanent (e.g. Lac Ichkeul, Barrage el Haouareb) freshwater sites are very important. Marbled Teal avoid the larger, steep-sided reservoirs and breed and summer in smaller ones with shelving shores and shore vegetation. The use of Barrage el Haouareb by considerable numbers of birds is surprising, as it holds minimal vegetation (M. Smart *in litt.* 1992). At Oued Sed and Metbasta in 1990, Marbled Teal were using inland brackish marshes and shallow waters with a well-developed emergent vegetation of *Phragmites*, *Typha* etc. as breeding habitat (E. Wymenga *in litt.* 1992). More brackish sites such as Lake Tunis provide little emergent vegetation and are less important as breeding habitat. Breeding at Lake Tunis now occurs in an area of extensive saltpans with neighbouring freshwater marshes fed mainly by sewage (M. Smart *in litt.* 1992).

6.3 ECOLOGY AND BEHAVIOUR

At Garaet Zougrata in 1957, clutches of five, nine, 13 and 24 eggs were found on 1 June and clutches of two, five, 13 and 15 eggs on 26 June. Some of the largest clutches were laid by more than one female (Heim de Balsac & Mayaud 1962). In Oued Sed in 1990, chicks of an estimated age of four days were seen on 28 May, suggesting that the clutch was completed during the last three days of April (E. Wymenga *in litt.* 1992). This is the earliest date on which ducklings have been recorded, the latest being 16 August (1990), when an adult with 11 "smallish" ducklings was recorded at Sidi Mansour (M. Smart *in litt.* 1992). Laying is probably concentrated in May and June (Brown *et al.* 1982). Brood sizes observed have ranged from two to 11, with a mean of 6.7 and standard deviation of 3.3. By August breeding is usually complete and birds typically tend to form small groups of 10-30 individuals, which may be mixed family parties of different broods (M. Smart *in litt.* 1992).

6.4 THREATS

6.4.1 Habitat loss and degradation

There have been vast man-made changes to the wetlands of Tunisia in the past 20 years, with several major sites of former importance to Marbled Teal being drained or degraded and a number of new, small reservoirs being created that have become important for the species. The construction of three upstream barrages has increased the frequency of dessication at Sebkha Kelbia by 2.5 times so that it is now rarely suitable for breeding (Carp 1980; Morgan 1982a; Hughes *et al.* 1992). Similarly, several small dams for flood control and irrigation on the Oueds

feeding Sidi Mansour have caused increased the frequency of desiccation (Morgan 1982a). At Sebkha Kelbia there is a proposal to drain the area by cutting a canal to the sea (Morgan 1982a). The construction of dams on the Oueds upstream of Lake Ichkeul is lowering the water level, drying out the marshes, and increasing salinity. This has resulted in vegetation changes, including a decrease in the area of *Potamogeton*. A sluice has been constructed on the Oued Tindja to reduce sea inflow and contain freshwater, but will itself increase evaporation and hence salinity. Further dams are planned for this catchment (Carp 1980; Morgan 1982a; Ramsar 1990; Hughes & Hughes 1992).

Siltation is a threat to Sebkha Kelbia where the silt load of the unimpounded rivers is increasing, and at Lake Ichkeul where it is caused by over-clearance of vegetation on the surrounding hillsides (Carp 1980; Ramsar 1990). Pollution is a problem at several sites. At Oued Sed and Barrage el Haouareb the olive oil industry has caused pollution incidents in the past (Hughes *et al.* 1992). Sewage discharge is a threat to Barrage el Haouareb, and Lake Tunis (Carp 1980; Hughes *et al.* 1992). There is a marble quarry on the Oued Djebel upstream of Lake Ichkeul. Rubbish and car dumping is threatening Sidi Mansour, and the Salins de Monastir, where urbanisation has also caused pollution from waste water (Hughes *et al.* 1992).

Major urbanisation at Lake Tunis during the 1980s has stopped Marbled Teal from breeding along the north shore, and it is now restricted to Rades Salines along the southern shore (M. Smart *in litt.* 1992). Development and urbanisation are a problem at Salins de Monastir and Marais de Soliman (Hughes *et al.* 1992). There is considerable pressure to irrigate and cultivate the land around Lake Ichkeul, Sebkha Kelbia and Salins de Monastir (Morgan 1982a; Ramsar 1990). At Lake Ichkeul overgrazing of cattle around the lake margins is a problem (Morgan 1982a; Ramsar 1990).

6.4.2 Hunting

Hunting is a problem at Oued Sed, Sebkhet Sidi Mansour, Lake Tunis, Sebkha Kelbia and possibly Sebkhet Ariana (Carp 1980; Hughes & Hughes 1992; Hughes *et al.* 1992) but is currently thought to have little impact on Marbled Teal because it is mainly a problem in winter when Marbled Teal are absent (F. Maamouri pers. comm. 1993). Egg collection is also a threat. At Sebkha Kelbia it was so severe in the 1960s that very few young reached maturity (Smart 1970), and the problem has also been noted at Sidi Mansour (Carp 1980).

6.4.3 Disturbance

Disturbance from visitors is high at Lake Tunis and Lake Ichkeul (Hughes & Hughes 1992). At Sebkhet Ariana tourist developments on the dunes between the wetland and the sea threaten to increase disturbance (Hughes & Hughes 1992).

6.5 CONSERVATION MEASURES TAKEN

6.5.1 Habitat protection

Lake Ichkeul is a national park, biosphere reserve, World Heritage site and Ramsar site (Ramsar 1990). Lake Tunis is a national reserve. Hunting is banned on all reservoirs (F. Maamouri pers. comm. 1993). Four KEY SITES are totally unprotected, as are three of seven SITES OF SOME IMPORTANCE.

6.5.2 Species protection

The Marbled Teal is legally protected from hunting (F. Maamouri pers. comm. 1993).

6.6 EVALUATION

Tunisia holds an important breeding population of Marbled Teal that fluctuates widely in size in response to great variation in the area of breeding habitat available. It may be an isolated population wintering in unknown parts of sub-Saharan Africa. Several major breeding sites are highly threatened, and those that have no imminent threats have little legal protection. Conservation action is urgently needed to secure the important breeding sites for this population and to identify its wintering grounds.

6.7 ACTION NEEDED

Habitat Protection: Oued Sed, Sebkhet Sidi Mansour, Sebkha Kelbia, Barrage El Haouareb and Sebkhet Ariana sedimentation ponds should be protected.

Monitoring: regular summer surveys of the breeding sites listed below should be conducted to clarify status, along with surveys of Barrage Chiba and Hadj Kacem marshes near Sfax, which may also be important.

Ringing programme: to attempt to identify wintering grounds.

6.8 SITE DIRECTORY

KEY SITES
Sebkhet Sidi Mansour
Sebkha Kelbia
Lake Ichkeul
Oued Sed
Barrage el Haouareb
Sebkhet Ariana
Lake Tunis

SITES OF SOME IMPORTANCE
Barrage Bir M'Cherga
Oasis de Zaafrane
Salins de Monastir
Marais de Soliman
Barrage Lebna
Barrages Gdir el Ghoul & Mornaguia
Chott Blidette

Name Sebkhet Sidi Mansour.
Location 34.15-25 N, 09.39-58 E. Gabes Gouvernorat.
Protected Status None.
Threats Pollution, hydrological schemes, hunting, egg collecting.
References Scott 1980, Carp 1980, Morgan 1982a, M. Smart *in litt.* 1992.
Status of Marbled Teal Breeding and late summer moulting site in wet years with summer counts of up to 318 (11.7.91). 200 in January 1971.

Name Sebkha Kelbia (and nearby Metbasta).
Location 35.52 N, 10.23 E. Sousse Gouvernorat.
Protected Status None.
Threats Three upstream barrages make flooding of this temporary wetland much more infrequent. Hunting, egg collecting, siltation.
References Carp 1980, Scott 1980, Morgan 1982a, Hughes & Hughes 1992, Hughes *et al.* 1992, M. Smart *in litt.* 1992.
Status of Marbled Teal Important breeding site in wet years. 50 breeding pairs in late 1960s, breeding confirmed in 1990. Up to 5 in winter (1975).

Name Lake Ichkeul.
Location 37.10-37 N, 9.34-45 E. Bizerte Gouvernorat.
Protected Status National Park, World Heritage Site, Biosphere Reserve, Ramsar Site.
Threats High visitor disturbance. Upstream dams are increasing salinity and lowering the water level, destroying the marshes. Siltation, heavy disturbance, overgrazing, marble quarry. Pressure to irrigate and cultivate the land around the lake.
References Carp 1980, Ramsar 1990, Hughes & Hughes 1992.
Status of Marbled Teal Probably a regular breeding site with summer counts of up to 70 (10.8.84).

Name Oued Sed/Sidi Bou Ali.
Location 34.14 N, 09.30 E. Sousse Gouvernorat.
General Description Temporary fresh-brackish watercourse of 20 km in length, channelling water from Kelbia to Halk el Menzel. Dense fringe of emergent vegetation. Lower reaches often retain large pools in dry periods.
Protected Status None.

Threats Pollution from olive oil residue (incidents in January 1981 & 1983), hunting.
References Hughes *et al.* 1992.
Status of Marbled Teal Regular breeding site with up to 60 birds (7.8.85). At least three breeding pairs in 1991.

Name Barrage el Haouareb.
Location 35.34 N, 9.44 E. Kairouan Gouvernorat.
General Description Reservoir of 1,000 ha on Oued Marguelil with shelving banks, and minimal vegetation.
Protected Status Hunting reserve.
Threats Pollution from an olive oil factory on Oued Marguel, illegal hunting.
References Hughes *et al.* 1992; M. Smart *in litt.* 1992.
Status of Marbled Teal Probably major breeding site with summer counts of up to 150 (22.8.92).

Name Sebkhet Ariana.
Location 36.52-58 N, 10.10-17 E. Nabeul Gouvernorat.
Protected Status None.
Threats Some hunting. Tourist developments on dunes between the wetland and the sea.
References Carp 1980, Hughes & Hughes 1992.
Status of Marbled Teal The sedimentation ponds are a regular breeding site with up to 50 birds in summer (16.7.88).

Name Lake Tunis.
Location 36.42-53 N, 10.07-18 E. Tunis Gouvernorat.
Protected Status National Reserve.
Threats Disturbance from extensive urban areas on the north bank, commercial fishing, high hunting pressure, sewage discharge.
References Carp 1980, Hughes & Hughes 1992, M. Smart *in litt.* 1992.
Status of Marbled Teal Formerly an important breeding site. Now breeds only on the south part of the lake at Rades Salines in very small numbers. Breeding of one pair confirmed in 1988.

Name Barrage Bir M'Cherga.
Location 30.30 N, 9.59 E. Zaghouan Gouvernorat.
General Description Reservoir of 705 ha on the Oued Miliane at 125 ha altitude.
Protected Status Hunting reserve.
Owner State.
References M. Smart *in litt.* 1992, IWRB-AWC.
Status of Marbled Teal Up to 12 in summer (12.8.92), and probably a breeding site.

Name Oasis de Zaafrane.
Location South of Chott el Jerid, South Tunisia.
General Description Desert oasis of <5 ha fed by drainage water from the oasis.
References F. Maamouri *in litt.* 1992.
Status of Marbled Teal 20 on 8.4.90 (only record) possibly migrants.

Name Salins de Monastir.
Location 35.45 N, 10.47 E. Monastir Gouvernorat.
Protected Status None.
Threats Agriculture & urbanisaton.
References Hughes & Hughes 1992, Hughes *et al.* 1992.
Status of Marbled Teal Up to 29 in summer (12.7.91).

Name Marais de Soliman.
Location 36.44 N, 10.30 E.
General Description Shallow, temporary, brackish coastal marsh of 200 ha dominated by *Scirpus*.
Protected Status None.
Threats Development, pollution.
References Morgan 1982a.
Status of Marbled Teal Small numbers nested before 1982.

Name Barrage Lebna.
Location 36.44 N, 10.55 E. Nabeul Gouvernorat.
Type of wetland Reservoir of 100 ha at 25 m altitude.
Protected Status Hunting reserve.
Threats Hunting (low intensity).
References IWRB-IWC.
Status of Marbled Teal 1 on 16.8.92. Possibly an important breeding site.

Name Barrages Gdir el Ghoul & Mornaguia.
Location 36.47 N, 10.02-04 E. Ariana Gouvernorat.
Type of wetland Reservoirs with fresh water marshes. Gdir el Ghoul = 16 ha; Mornaguia = 100 ha.
Protected Status Hunting reserve.
Owner State.
References IWRB-IWC.
Status of Marbled Teal 8 on 5.11.85. Possibly a breeding site.

Name Chott Blidette/Oasis Blidette.
Location 33.35 N, 8.50 E. Kebili Gouvernorat.
General description Permanent, man-made, saline desert oasis of 4 ha and 0.8 m depth.
Protected Status Partially protected.
Threats Hunting (low intensity).
References F. Maamouri *in litt.* 1992, IWRB-IWC.
Status of Marbled Teal 5 on 8.4.90; 25 on 14.2.92.

6.9 RECORDS FOR TUNISIA

Location	Date	Source	Number	Notes
Sousse, near	pre 1962	XIII	-	female on eggs collected by Blanchet
Garaet Zougrata, Gabès region	1,26.6.57	XIII	-	eight nests, clutches of 2,5,5,9,13,13,15,24

Gabès, near	30.5 pre 1962	XIII	15	recorded by Blanchet
Lake Ichkeul	pre 1906	XIII	-	breeding
Lake Ichkeul	07.07.63	I	2	may have nested
Lake Ichkeul	24.03.67	I	3	
Ichkeul (South)	18.08.78	VIII	c.45	perhaps a creche of this year's young
Ichkeul (North)	03.09.79	VIII	1+	in flight
Ichkeul (North)	10.08.80	VIII	4+	small group, possibly an adult + young
Ichkeul (North)	27.08.80	VIII	11	flights of 8 & 3; possibly family parties
Ichkeul (North)	23.08.83	VIII	c.50	apparently family parties
Ichkeul (South)	09.08.84	VIII	c.45	small groups, possibly family parties
Ichkeul (North)	10.08.84	VIII	c.70	
Ichkeul (North)	13.08.85	VIII	c.60	
Lake Ichkeul	20.08.92	VIII	6	
Sebkha Kelbia	1966	I	c.100	c. 50 breeding pairs
Sebkha Kelbia	25.05.66	IX	16	8 pairs on the north bank
Sebkha Kelbia	1968	I	c.100	c. 50 breeding pairs
Sebkha Kelbia	03-20.05.68	IX	2	1 displaying pair seen regularly
Kelbia	22.01.75	VIII	5	
Sebkha Kelbia	24.07.75	VIII	c.120	in family parties of 15-20; 2 groups of downies
Sebkha Kelbia	01.08.83	VIII	15	parties of 2,8 & 15; probably 2 families
Sebkha Kelbia	pre 1989	X	-	breeding site in wet years
Sebkha Kelbia	1990	III	-	bred
Kelbia	18.08.90	VIII	10+	possibly many more
Sebkha Kelbia	pre 1992	VIII	-	breeds regularly & in numbers
Metbasta (near Sebkha Kelbia)	27.05.90	IV	>7	
Oued Sed	04.08.78	VIII	10	inc. full grown ducklings
Oued Sed	05.08.78	VIII	2+14	2 females with broods of 8 & 6
Oued Sed	27.08.79	VIII	2+	
Oued Sed	25.08.80	VIII	2	in flight
Oued Sed	07.08.85	VIII	60+	in small groups, possibly family parties
Oued Sed	24.07.87	VIII	c.30	probably in family groups, may have been up to 50
Oued Sed	28.05.90	IV	25	4 adult pairs, 1 with 5 pulli, 1 with 12 pulli
Oued Sed	30.07.90	X	2+5	2 adults with broods of 3 & 2
Oued Sed	04.07.91	X	6+20	3 pairs & 20 pulli of 3-15 days old
Oued Sed	12.07.91	X	6+12	6 adults & 12 juvs
Oued Sed	May 1992	X	2	1 pair
Oued Sed/Sidi Bou Ali	12.05.92	XI	2	
Sebkha Sidi Mansour	28.05.64	I	3	may have nested
Sebkha Sidi Mansour	26.01.74	VIII	6+	may have been many more
Sebkha Sidi Mansour	05.01.83	VIII	1-2	probable sighting
Sebkha Sidi Mansour	16.08.90	VIII	150+	including brood of 11, possibly many more
Sebkha Sidi Mansour	07.07.91	X	271	moulting
Sebkha Sidi Mansour	11.07.91	X	318	moulting
Sebkha Sidi Mansour	16.05.92	XI	4	
Sebkha Sidi Mansour	pre1992	VIII	-	breeds regularly & in numbers
Lake Tunis	1962	I	2	pair, bred
Lake Tunis	1963	I	2	probably bred
Lake Tunis (North shore)	06.05.63	VIII	2	
Lake Tunis (North shore)	13.05.63	VIII	2	
Lake Tunis	1964	I	2	pair, bred
Lake Tunis (North shore)	06.06.64	VIII	2+	
Lake Tunis (North shore)	11.06.64	VIII	3	
Lake Tunis (North shore)	10.07.64	VIII	1+5-6	adult with 5-6 ducklings
Lake Tunis (North shore)	14.07.64	VIII	1+4	adult with 4 ducklings
Lake Tunis (North shore)	28.07.64	VIII	1	

Lake Tunis (North shore)	04.08.64	VIII	1	
Lake Tunis	1965	II	-	bred
Lake Tunis (Rades Salines)	25.10.73	VIII	c.25	
Lake Tunis (Rades Salines)	30.10.73	VIII	c.20	
Lake Tunis (North)	10.07.75	II	2	possibly failed breeders; no sign of nesting
Lake Tunis (Rades Salines)	26.07.78	VIII	c.29	including adult with 10 juv.s; at least 3 pairs
Lake Tunis (Rades Salines)	30.07.78	VIII	7	
Lake Tunis (Rades Salines)	01.08.78	VIII	c.30	
Lake Tunis (Rades Salines)	02.08.78	VIII	c.40	creche
Lake Tunis (Rades Salines)	06.08.78	VIII	30	
Lake Tunis (Rades Salines)	10.08.78	VIII	4	
Lake Tunis (Rades Salines)	11.08.78	VIII	8	
Lake Tunis (Rades Salines)	20.08.78	VIII	7	
Lake Tunis (Rades Salines)	08.08.79	VIII	3	in flight
Lake Tunis (Northern section)	1960s & 70s	VIII	-	bred in very small numbers
Lake Tunis (Rades salines)	13.07.88	VIII	1+7	adult with brood of 7
Lake Tunis (Southern part)	pre 1992	VIII	-	breeds occasionally in small numbers
Marais de Soliman	pre 1982	VI	-	small numbers nesting
Jedidi Barrage, near Hammamet	21.10.90	V	2	
Oued El Oudiane (Barrage Sidi Abdelmonein?)	19.7.92	VII	4	
Barrage Bir M'Cherga	21.08.85	VIII	4	
Bir M'Cherga	12.08.92	VIII	12	groups of 3 & 9 (possibly family groups)
Barrage Lebna	16.08.92	VIII	1	
Barrage el Haouareb	30.07.90	X	2	1 pair displaying
Barrage el Houarb	17.08.90	VIII	5+	"could have nested"
Barrage el Haouareb	17.07.92	X	140	moulting
Barrage el Haouareb	22.08.92	VIII	150	several small groups, possibly family parties
Sebkhet Ariana (sedimentation ponds)	06.08.86	VIII	1	
Sebkhet Ariana (sedimentation ponds)	16,07.88	VIII	c.50	mostly middle sized ducklings
Sebkhet Ariana (sedimentation ponds)	25.07.88	VIII	40	some clearly juveniles
Sebkhet Ariana (sedimentation ponds)	03.08.90	VIII	16	probably one adult with juveniles
Barrage Oued Chiba	29.08.85	VIII	2	
Barrage Mornaghia	05.11.85	VIII	8	
Besbessia Barrage	28.08.83	VIII	1	
Besbessia Barrage	10.08.84	VIII	1	
Sebkhat el Bahira	03.04.90	X	3	possibly migrants
Chott el Guettar	04.04.90	X	1	possibly migrants
Oasis de Hazoua, south of Chott el jerid	06.04.90	X	6	possibly migrants
Oasis Blidette, south of Chott el jerid	08.04.90	X	5	possibly migrants
Oasis Blidette, south of Chott el jerid	14.02.92	XII	25	
Oasis de Zaafrane, south of Chott el jerid	08.04.90	X	20	possibly migrants
Eau de drainage el Faouar, south of Chott el jerid	08.04.90	X	2	possibly migrants
Saline de Monastir	12.07.91	X	29	
Salins de Monastir	20.05.92	XI	3	including 1 pair

I Smart 1970
II Smart 1975
III Maamouri & Hughes 1992
IV E. Wymenga *in litt.* 1991
V D.M. Hanford *in litt.* 1991
VI Morgan 1982a
VII G. Ballesteros pers. comm. 1992
VIII M. Smart *in litt.* 1992
IX Jarry 1969
X F. Maamouri *in litt.* 1992. Data from F. Maamouri, T. Gaulthier, Groupe Tunisien d'Ornithologique
XI Kayser & Pilard 1991, 1992
XII A. del Novo *in litt.* 1992
XIII Heim de Balsac & Mayaud 1962

7. TROPICAL AFRICA

7.1 DISTRIBUTION AND STATUS

Between 1969 and 1978, small numbers of Marbled Teal were regularly recorded in mid-winter in wetlands of the Senegal Basin in Senegal, Niger Delta in Mali and the Chad Basin in Chad and Nigeria (Table 9 and Perennou 1991). In January 1962, several hundreds were recorded on a pond (Mare de Bagada) in the Mourdi depression in north-eastern Chad, well to the north of the Chad Basin (Edmond-Blanc 1968). There are also records from Tibesti in northern Chad (Delacour 1954-1964). Most or all of these birds were almost certainly migrants breeding in Morocco, Algeria or Tunisia. The fact that there have been no winter records in tropical Africa since 1978 may be a reflection of the declines in breeding populations in these North-African countries. However, there is a good chance that significant numbers of Marbled Teal have been overlooked given the limited coverage and huge size of these wetlands.

One pair was seen breeding in the Djoudj National Park in Senegal in 1979 (Dupuy & Sylla 1981), but this is the only breeding record for tropical Africa. The fact that Marbled Teal appear to have bred regularly as far south as the Cape Verde islands in the last century suggests that regular breeding may also have occurred in tropical Africa. It has been suggested that breeding may occur in the Lake Chad area or in northern Chad (Smith 1968).

7.2 ECOLOGY AND BEHAVIOUR

In the Chad Basin, Marbled Teal are reported to arrive no earlier than the beginning of November and to leave by mid-February (Vielliard 1972). They were seen forming mixed groups with Cape Teal *Anas capensis*, but not with other wildfowl. The gut of two specimens collected during the day in the Chad Basin were empty, suggesting that they feed mainly at night (Vielliard 1972). In Senegal, young were seen on 15 April 1979, extremely early compared with other countries.

7.3 THREATS

Largely unknown. The Senegal basin, including the occasional breeding site in Djoudj National Park, is threatened by hydrological changes resulting from dam schemes and from pollution resulting from the intensification of agriculture upstream and from weed infestation (Ramsar 1990).

7.4 CONSERVATION MEASURES TAKEN

The two sites where the species has been recorded in Senegal, Niokolo Koba and Djoudj, are both protected as National Parks, and Djoudj is also a Ramsar site.

7.5 EVALUATION

The status of Marbled Teal in tropical Africa is unclear. It is probably only a very occasional breeder but it is unclear whether it is an occasional or regular winter visitor, and whether the number of wintering birds has declined. In the 1960s and early 1970s, Marbled Teal may have been a regular visitor in some hundreds to Mare de Bagada and Polders du Kanem in Chad, but there have been no recent surveys of these sites.

7.6 ACTION NEEDED

Winter surveys of Mare de Bagada and Polders du Kanem in Chad.

7.7 SITE DIRECTORY

SITES OF SOME IMPORTANCE
Mare de Gossi
Polders du Kanem
Hadejia-Nguru Wetland
Le Marigot du Djoudj

Name Mare de Gossi.
Location 100 km south-east of Niger Delta, Mali. c.15.50 N, 1.30 W.
General Description Permanent endorreic lake.
References Hughes & Hughes 1992.
Status of Marbled Teal 61 in December 1971.

Name Polders du Kanem.
Location Lake Chad, Chad, Chad Basin.
Status of Marbled Teal 35 in December 1969 and 45 in January 1970 at Djiboulboul; 30 in December 1970 at Baga Sola.

Name Hadejia-Nguru Wetland.
Location Chad Basin, Nigeria. 12.51 N, 10.30 E.
General Description Seasonally flooded, endorreic inland delta.
Protected Status 30,000 ha are protected in Baturiya Reserve.
References Perennou 1991; Hughes & Hughes 1992.
Status of Marbled Teal 50 in Quad 20 in 1978.

Name Le Marigot du Djoudj.
Location Senegal. 16.30 N, 16.10 W.
General Description Backwater within a vast river delta.
Protected Status National Park and Ramsar Site.
Threats Water supply threatened by dam schemes upriver; agricultural pollution.
References Scott 1980, Ramsar 1990.
Status of Marbled Teal Breeding observed in April 1979.

7.8 RECORDS FOR TROPICAL AFRICA

Location	Date	Source	Number	Notes
Chad				
Lac Youan d'Ounianga Kebir, Ennedi	24.4.58	IV, VII	-	one collected
Tibesti	pre 1956	V	-	present
Mare de Bagada, Mourdi Depression	Feb 1962	V, VI	-	several hundreds on a pond with Cape Teal
Djiboulboul, Polders du Kanem	Dec 1969	I	35	part of Lake Chad
Senegal (Senegal Basin)				
Richard Toll, near	early Dec 1968	II	-	1 shot
Djoudj Nat. Park, marigot du Djoudj	April 1979	III	1+3	1 adult + 3 juveniles

I Vielliard (1972)
II F. Roux *in litt.* 1969
III Dupuy & Sylla (1981)
IV Salvan (1967)

V Delacour (1954-1964)
VI Edmond-Blanc (1968)
VII Heim de Balsac & Mayaud (1962)

8. EGYPT

8.1 LOCAL NAME

Sharshiir mukhattat (Goodman & Meininger 1989).

8.2 DISTRIBUTION AND STATUS

Marbled Teal were formerly "not uncommon" in Egypt (Phillips 1923). According to Meinertzhagen (1930), they formerly bred in the Western Desert at Wadi el Natrun and Dakhla Oasis and in the Nile Valley at the Faiyum (including Lake Qarun). It is not clear that Meinertzhagen had a firm basis for considering it a breeding bird at Dakhla (Goodman & Meininger 1989). Marbled Teal were described as "quite common" at Lake Qarun in June before 1877 but elsewhere the numbers recorded were small (Goodman & Meininger 1989). In winter they were "often obtained" in the Nile Delta and Suez Canal area (Meinertzhagen 1930). A large flock was seen by Meinertzhagen at Qantara on the Suez Canal in April 1920 (Phillips 1923) and a specimen was apparently collected from this flock (Goodman & Meininger 1989).

There have been no confirmed breeding records since 1930, and it is unlikely that the species still breeds in Egypt (P.L. Meininger and G. Atta *in litt.* 1992). However, occasional breeding of isolated pairs cannot be ruled out. In July and August 1979, there were two possible sightings of family groups on Lake Manzala (Meininger *et al.* 1986). The only recent confirmed records from spring and summer are of a pair at Wadi el Natrun on 27.4.86, three at Farafra on 19.3.84 and three near Cairo on 24.8.84 (Goodman & Meininger 1989). The most likely place where occasional breeding could occur in the future would be at Dakhla Oasis where some new wetlands have been created (P.L. Meininger *in litt.* 1992).

The species now appears to be only a winter visitor in small numbers, mainly to the Nile Valley and Nile Delta. One or several were seen in the lower and middle Nile Valley on each of five winter trips made between 12.2.76 and 8.3.79 in months spanning from November to March (Short & Horne 1981). In the upper Nile Valley there are records from Isna on 31.10.82 and Aswan on 24.12.83 (Goodman & Meininger 1989). In the Nile Delta, one was seen at Port Said market on 16.1.79 and three near Cairo on 24.8.84 (Meininger *et al.* 1979; Goodman & Meininger 1989)).

A recent record of one bird migrating with a group of Garganey *Anas querquedula* and flying over lake Bardawîl in North Sinai in September 1990 (Sherif Baha El Din pers. comm. to G. Atta *in litt.* 1992) suggests that the few birds wintering in Egypt may breed in Israel or Turkey.

8.3 ECOLOGY AND BEHAVIOUR

A clutch of four eggs was collected in May from Wadi Natrun, and nests there and at the Faiyum were situated under a tamarisk bush near water or in reeds (Meinertzhagen 1930).

8.4 THREATS

The disappearance of the small breeding population of Marbled Teal and the apparent decline in the number of wintering birds is probably due to the great increase in levels of human disturbance and hunting at Egyptian wetlands this century. Levels of disturbance and hunting are so high in the Nile Delta, Wadi el Natrun and Lake Qarun (e.g. Mullié & Meininger 1983) that the species could probably not survive in these areas (P.L. Meininger

in litt. 1992). One of the few recent records of Marbled Teal is of a bird on sale at Port Said market in 1979 and probably shot on Lake Manzala (Meininger *et al.* 1979).

The decline in the number of wintering birds may also be due to declines this century in the number of birds breeding in Israel and elsewhere.

8.5 CONSERVATION MEASURES TAKEN

None.

8.6 EVALUATION

The status of the species has apparently changed this century from that of a resident breeder with numbers supplemented in winter by migrants breeding elsewhere to that of a very rare winter visitor. There have been no records of more than three birds since 1930, and Egypt is no longer of importance for the conservation of Marbled Teal.

8.7 RECORDS FOR EGYPT

Location	Date	Source	Number	Notes
Western Desert				
Wadi el Natrun	16.5-5.6.10	VII	-	3 males and 1 female collected; young observed
Wadi el Natrun	pre 1923	VI	-	breeding, 4 eggs taken in May
Wadi el Natrun	27.4.86	V	2	pair
Dakhla Oasis	pre 1930	VI	-	"known to breed" (no evidence)
Dakhla Oasis, Umar Seraya	10-13.4.25	VII	2	
Dakhla Oasis, near Mut	7.9.84	VII	-	"few seen"
Farafra	19.3.84	VII	3	
Nile Delta/Suez Canal				
Alexandria	pre 1880	IX	-	specimen collected
El Marg, near Abu Zabal	24.8.17	V	-	specimen collected
El Marg, near Abu Zabal	24.9.17	V	-	specimen collected
El Qantara, Suez Canal	18-19.4.20	IV, V	-	"large flight visited", female in BMNH
El Tell el Kebir	11.2.41	V	1	
El Kabrit	29.10.52	V	1	
Lake Manzala	16.1.79	II	1	shot, on sale at Port Said market
Lake Manzala	Jul/Aug79	I	-	2 small flocks, possibly Marbled Teal families
Cairo, near	24.8.84	V	3	
Nile Valley				
Beni Hasan	pre 1880	IX	-	specimen collected
Faiyum, Lake Qarun	pre 1876	V	-	quite common in June, probably bred
Faiyum	22.2.65	V	2	
Lower Nile, near Dahshur	23.12.23	V	-	specimen collected
Lower Nile, Beni Suef	1976-1979	III	1	seen in winter
Middle Nile (El Minya to Nag Hammadi)	1976-1979	III	-	one or several seen in five winter trips
Upper Nile, Isna	31.10.82	V	-	several
Upper Nile, near Aswan	24.12.83	V	2	
Sinai				

Lake Bardawîl	Sep 1990	VIII	1	migrating with a group of Garganey, flying over lake

I Meininger *et al.* 1986
II Meininger *et al.* 1979
III Short & Horne 1981
IV Phillips 1923
V Goodman & Meininger 1989
VI Meinertzhagen 1930
VII Goodman *et al.* 1986
VIII Sherif Baha El Din pers. comm. to G. Atta *in litt.* 1992
IX Hume & Marshall 1880

9. ISRAEL

9.1 DISTRIBUTION AND STATUS

Marbled Teal are resident in small numbers in Israel. Breeding has only been recorded in the Hula valley of northern Israel (Blitzblau 1992). In the last century, Tristram "found them in great numbers throughout the year in the swamps of the Huleh" (Tristram 1884; Phillips 1923). An estimated 100-200 pairs were breeding in the valley in the 1950s (Paz 1987), mainly in extensive marshes that were drained from 1950 to 1960. Since then, breeding has been confined to the small Hula nature reserve and fish ponds nearby. According to Blitzblau (1992), breeding numbers in the valley after 1970 peaked at c.35 pairs in 1973-1974, but have since declined to only 8-11 pairs in 1990. Paz (1987) reported higher numbers after 1979 than Blitzblau (1992), with some 15 pairs in the reserve and 20 elsewhere in the valley. Eyal Shy (*in litt.* 1992) gives higher figures for the current number of breeding birds with 45-50 pairs for the whole Hula valley. Of these, 30 are found in the southern valley (25 in Hula reserve, five in fish ponds), 10-15 in the central valley and five in the northern valley. The southern valley is the main wintering site with 50-80 birds (Eyal Shy *in litt.* 1992).

Small numbers are regularly recorded in winter in northern Israel in the International Waterfowl Census (Table 10), with the majority remaining in the Hula valley and no records of more than 13 from elsewhere during mid-winter counts. The highest count in Hula valley is 84 in 1968. Since 1988 Tishlovet Hakishon, a newly constructed reservoir in the Yezreel valley of northern Israel, has been found to be an important site for Marbled Teal in August to October, with a peak count of 60 in September 1990. Small numbers are seen in July and in winter (D. Allon *in litt.* 1991).

There is no information on the movements of Marbled Teal in this region and it is possible that some of the birds breeding in eastern Turkey may winter in Israel. In March, a concentration of 150-200 birds is sometimes seen in the southern Hula valley, and it is not known where the surplus birds go during the breeding season (Eyal Shy *in litt.* 1992).

9.2 HABITAT

Breeding and wintering mainly in freshwater marshes within the Nature Reserve and in freshwater fish ponds in the Hula valley.

9.3 ECOLOGY AND BEHAVIOUR

The first young leave the nest in late May, the majority in June and July and the last in late July and early August (Eyal Shy *in litt.* 1992).

9.4 THREATS

This century, there has been widespread drainage of marshlands, swamps and wet grasslands in Israel which may have affected Marbled Teal. At the turn of the century, there were six groups of swamps covering about 18,000 ha (Carp 1980). By 1948 five of these groups had been drained, with the Hula marshes the only group remaining (Paz 1976). The Hula marshes were once very extensive covering about 6,000 ha (Carp 1980), and the drainage of most of this area in the 1950s has doubtless caused the decline in the size of the Marbled Teal breeding population in the Hula Valley. The area of wetlands today has been reduced to about 200 ha in the Hula reserve combined with 500 ha of fish ponds (Eyal Shay *in litt.* 1992). Since this drainage was completed and work to

restore the Hula Nature Reserve began, breeding Marbled Teal are still thought to have been affected in the Hula valley by cutting of bankside vegetation (Blitzblau 1992). A number of fish ponds created in the Hula Valley are being used by Marbled Teal for breeding, to some extent compensating for the destruction of the marshlands (Blitzblau 1992). However, the area of fishponds is now decreasing and the number of Marbled Teal breeding in them is likely to decrease in the future (Eyal Shy *in litt.* 1992). The water levels in the fish ponds are unpredictable and undergo major fluctuations, and they are subject to considerable disturbance, making them less suitable than Hula reserve for breeding.

9.5 CONSERVATION MEASURES TAKEN

Since 1972 efforts have been made to restore the Hula Nature Reserve (310 ha) to the former status of the extensive Hula marshes drained between 1950 and 1960 (Carp 1980). Marbled Teal began to breed in the reserve shortly after restoration began (Paz 1987).

9.6 EVALUATION

Israel has a much reduced breeding population of Marbled Teal which is present every year and now numbers up to 50 pairs. Most of these birds are resident. The Hula Valley is one of the three most important areas for the species in the east Mediterranean region, along with the Goksu and Cukurova deltas in Turkey. It is thus of high priority for the conservation of Marbled Teal. Measures are needed to secure the population at its current size and to allow it to increase.

9.7 ACTION NEEDED

The cutting of bankside vegetation, human disturbance and water levels in the Hula fish ponds should be carefully managed to improve the area of habitat available to Marbled Teal and to improve their breeding success.

9.8 SITE DIRECTORY

KEY SITES
Hula reserve
Hula valley fish ponds
Tishlovet Hakishon

Name Hula marshland nature reserve.
Location 33.05 N, 35.35 E. Southern Hula valley, northern Israel.
Area 400 ha with 200 ha flooded.
References Carp 1980; Eyal Shy *in litt.* 1992.
Status of Marbled Teal Resident, with c.25 breeding pairs.

Name Hula Valley Fish Ponds.
Location 33.02-13 N, 35.34-38 E. Hula valley, northern Israel.
Area 500 ha.
Protected Status None.
Threats Cutting vegetation, disturbance, drainage.
References Carp 1980; Eyal Shy *in litt.* 1992.
Status of Marbled Teal Resident, with c.20-25 breeding pairs.

Name Tishlovet Hakishon.
Location c.32.36 N, 35.14 E. 5 km west of Afula, Yezreel Valley.
General Description Reservoir of 50 ha made in 1984 receiving treated sewage from Haifa.
Protected Status None.
References D. Allon *in litt.* 1991.
Status of Marbled Teal Up to 60 (1990) in late summer/winter.

9.9 RECORDS FOR ISRAEL

Location	Date	Source	Number	Notes
Hula valley marshes and fishponds	1950s	VI	-	100-200 breeding pairs
Hula valley	1972	III	c.40	c.20 breeding pairs
Hula valley	1973	III	c.70	c.35 breeding pairs
Hula valley	1974	III	c.70	c.35 breeding pairs

Hula valley	1975	III	c.40	c.20 breeding pairs
Hula valley	1976	III	c.30	c.15 breeding pairs
Hula valley	1979	III	c.38	c.19 breeding pairs
Hula valley	1979-1987	VI	c.70	c.35 breeding pairs, 15 in nature reserve
Hula valley	1980	III	c.36	c.18 breeding pairs
Hula valley	1990	III	17	8 breeding pairs and 1 individual, estimated 8-11 pairs in total
southern Hula valley, fish ponds	c.1992	VII	c.10	c.5 breeding pairs
central Hula valley, fish ponds	c.1992	VII	c.20-30	c.10-15 breeding pairs
northern Hula valley, fish ponds	c.1992	VII	c.10	c.5 breeding pairs
Hula nature reserve	1972	V	2	pair present all summer without breeding
Hula nature reserve	24.5.73	V	16	pair and 14 pulli
Hula nature reserve	4.6.73	V	24	pair + 13 pulli; female + 8 pulli
Hula nature reserve	10.6.73	V	10	pair + 8 pulli
Hula nature reserve	25.6.73	V	15	pair + 13 pulli
Hula nature reserve	early Jul 73	V	-	4 pairs with young
Hula nature reserve	13.6.74	V	36	pairs with 7,10 and 13 pulli
Hula nature reserve	mid Jan 75	V	45	
Hula nature reserve	27.2.92	IV	20	including courting pairs
Hula nature reserve	c.1992	VII	c.50	c.25 breeding pairs
Tishlovet Hakishon	27.10.88	I	20	max count that winter
Tishlovet Hakishon	winter 88/89	I	3	stayed all winter
Tishlovet Hakishon	12.8.89	I	30	max count that winter
Tishlovet Hakishon	Sep 90	I	60	
Tishlovet Hakishon	winter 90/91	I	2	stayed all winter
Tishlovet Hakishon	1.10.91	IV	8	

I D. Allon *in litt.* 1991
III Blitzblau 1992
IV H.G. Young *in litt.* 1992
V Paz 1976
VI Paz 1987
VII Eyal Shy *in litt.* 1992

10. TURKEY

10.1 LOCAL NAME

Yaz Örde_i (Summer Duck).

10.2 DISTRIBUTION AND STATUS

Marbled Teal is now almost entirely a summer visitor and breeding bird in a few areas of the Southern Coastlands, Central Plateau, East Turkey and South-East Turkey. Between April and November, there are also occasional records of small groups (up to four) from the Black Sea Coastlands and Western Anatolia. By far the most important sites for the species are the Çukurova and Göksu Deltas in the Southern Coastlands.

Between 1967 and 1971, large numbers of Marbled Teal were regular recorded in mid-winter (Table 11). The majority of them were recorded in the western Çukurova Delta at Akyatan Gölü, Tuzla Gölü, Aynaz swamp and two sites in the vicinity of Aynaz. One of these was Acigöl, a small permanent lake in the Karabucak plantation area (T. Gürpinar *in litt.* 1968). The other was an unnamed lake and adjacent marsh to the east of the Berdan river (Hoekstra & Johnson 1968). This lake is almost certainly now drained (V. van den Berk *in litt.* 1992). The highest count for the delta was 2,660 in January 1968 and, although neighbouring sites were counted on different days, this figure is likely to be an underestimate of the number of birds present since considerable areas of wetlands were not counted and large numbers of unidentified ducks were seen on Akyatan Gölü, Tuzla Gölü and elsewhere (T. Gürpinar *in litt.* 1968; Hoekstra & Johnson 1968). Significant concentrations were also recorded in the delta in January 1970 and 1971 (Table 11). The only other significant winter count before 1972 was at the Göksu Delta (66 in 1971). The most significant autumn passage count over this period was of 450 at the Göksu Delta on 13.10.70 (OST Bird Report 1970-1973). From 1972 onwards there have been almost no Marbled Teal recorded in mid-winter anywhere in Turkey (maximum count three in 1989).

It is likely that the decline in the wintering numbers largely reflects a decline in the size of the Turkish breeding population. On 25.8.67 over 2,000 birds were recorded at Yemisli Gölü near Karatas in the Çukurova Delta (*OST Bird Report* 1966-1967). This post-breeding congregation is much larger than any recorded in Turkey since then and strongly suggests that the similar numbers recorded the following January were Turkish breeders. These large winter concentrations may also have been partly favoured by the weather conditions, and the disappearance of birds in the winters of 1972 and 1973 may have been related to the fact that these winters were severely cold (OST Bird Report 1970-1973). Alternatively the birds may have been overlooked. It is likely that the wintering population persisted in considerable numbers beyond 1973, since there were no mid-winter counts between 1974 and 1985.

A reduction in the breeding distribution has occurred in recent decades, following the destruction of former breeding sites such as Amik Gölü (Kumerloeve 1988) and Aynaz Swamp (Koning & Dijksen 1970). Local reports suggest that the bird was a common breeder at Aynaz (Zahavi 1967). The size of the Turkish breeding population has no doubt also been considerably reduced and a population decline was noted by 1970 by Gürpinar & Wilkinson (1970). According to recent information, the following breeding sites are currently in use, at least in some years. A number of these sites have recently been degraded (see 10.5.1), and some of them may no longer be suitable for Marbled Teal.

Southern Coastlands

Çukurova Delta: annual breeder in some numbers. 50-100 pairs in 1987 (van der Have *et al.* 1988; van den Berk & Letschert 1988). 106 birds (mainly breeders) in April 1990 (L.J. Dijksen *in litt.* 1991).

Göksu Delta: annual breeder in some numbers. 33-50 pairs in 1989 including 27-40 at Akgöl (Schepers *et al.* 1989). At least 50 pairs in 1991, including 31 broods, 27 of them at Akgöl. Similar numbers in 1992 (V. van den Berk *in litt.* 1992).

Central Plateau

Hotamis Marshes: 3-4 pairs in 1975 (*OST Bird Report* 1974-1975). 100 seen in June 1985 (Martins 1989). Up to 20 pairs may have bred in 1991 (Kirwan 1991).

Ere_li Marshes: at least one pair in 1984 and 1986 and 2-3 pairs in 1987 (Kiliç & Kasparek 1990). Often recorded from 1987-1991 and probably as common as at Hotamis (G. Kirwan *in litt.* 1992).

Sultan Marshes: two pairs in 1972 (*OST Bird Report* 1970-1973).

Salt pans near Incesu: possible breeding in 1975 (*OST Bird Report* 1974-1975).

Karapinar Ovasi: regarded as a possible breeding site by Grimmett & Jones (1989) but all the reedbeds have since been destroyed (G. Kirwan *in litt.* 1992).

Gogenc/Guvenc Gölü: five pairs in 1971 (*OST Bird Report* 1970-1973).

East Turkey

Bendimahi Delta: presumed breeding site (Grimmett & Jones 1989).

Celebibag Marshes: presumed breeding site (Grimmett & Jones 1989).

Van Marshes: four pairs bred successfully in 1986 (Schilperoord & Schilperoord-Huisman 1986). Breeding confirmed in 1987 (G. Kirwan *in litt.* 1992).

Van Gölü: one adult with a brood was seen on 23.7.87 (*OSME Bird Report* 1987-1991).

South-east Turkey

Devegeçidi Baraji: possible breeding site, with 2 pairs seen in 1990 (OSME Bird Report 1987-1991).

These data suggest a population of 150-250 breeding pairs, with the great majority of these in the Çukurova and Göksu Deltas. A good breeding year is likely to give Turkey a late summer population in the order of 700 birds. Considering that there was probably a late summer population of at least 3,000 in 1967, the Turkish population has probably declined by more than 65% in the last 25 years.

It is most likely that the majority of the remaining birds no longer winter in Turkey but migrate to somewhere in the Middle East such as Syria or Israel. There may have been a shift in wintering distribution following destruction and degradation of important wintering sites in the Çukurova Delta. There may still be small numbers wintering regularly in sites such as the Çukurova Delta that are being overlooked by counters amongst the very large numbers of wintering waterfowl (G. Magnin pers. comm. 1991).

10.3 HABITAT

In the Çukurova Delta, Marbled Teal were formerly resident and common in Aynaz Swamp, which was a

permanent freshwater swamp of about 1,000 ha with a rich submerged vegetation (Zahavi 1967; Aukes *et al.* 1988). Birds are now regularly recorded from the brackish to saline Akyatan and Tuzla Gölüs and from nearby salt marshes. Breeding seems to be concentrated at Tuzla Gölü and a series of oxbows around Tuzla, but may also occur in freshwater ponds in dunes near Akyatan (L.J. Dijksen *in litt.* 1991, 1992). Although there are now few fresh wetlands in the Çukurova delta, birds show a preference for the fresher areas that contain submerged vegetation and also for larger wetlands. This size preference is probably due to the reduced disturbance on larger sites (T.M. van der Have *in litt.* 1992).

In the Göksu Delta, birds favour the fresher areas and breed mainly in shallow parts of Akgöl (a permanent, eutrophic and slightly brackish lake) with reed-beds, reed islands, reedmace and dense submerged vegetation (V. van den Berk *in litt.* 1992). However, birds also feed in Paradeniz Gölü (a brackish lagoon), in ricefields and in the Göksu river (fresh to brackish, Anon. in prep.). Some females and their broods move into seasonally flooded saltmarsh and ricefields to feed (V. van den Berk *in litt.* 1992).

In the Central Plateau, Marbled Teal typically nest in habitat similar to that used by the White-headed Duck *Oxyura leucocephala*: dense reedbeds in shallow water of 2-3 m depth (G. Kirwan *in litt.* 1992).

10.4 ECOLOGY AND BEHAVIOUR

10.4.1 Breeding biology

Detailed observations in the Göksü Delta in 1991 (V. van den Berk *in litt.* 1992) found that laying began in late April, with a peak from the second half of May to early June. After the males deserted their mates, flocks of males were seen from early May onwards. The first brood was seen on 7 June and they continued to emerge until late July. Fully fledged broods were seen from early July onwards. Brood size varied from two to 12, with a mean of 6.5 and standard deviation of 3.0. Brood amalgamation was observed when two females with broods met. On 15 and 18 July 1992, a female was seen at Kugu Lake with 32 ducklings.

Two nests in the Hotamis Marshes were found on 4-5.6.71 with six and 13 eggs (OST Bird Report 1970-1973). The latter may have been laid by more than one female, and also contained one Mallard *Anas platyrhynchos* egg.

10.4.2 Movements and migration

At the Göksü Delta, almost all birds are now summer migrants arriving from early March with the majority arriving in late March - early April. They leave in the second half of October (V. van den Berk *in litt.* 1992).

10.4.3 Predation

Marbled Teal in the Göksü Delta are a regular prey of Peregrine *Falco peregrinus*, Lanner *F. biarmicus* and Saker *F. cherrug* Falcons (V. van den Berk *in litt.* 1992).

10.5 THREATS

10.5.1 Habitat loss and degradation

Many important Marbled Teal sites have been destroyed and all others have been degraded to some extent. The former breeding site Amik Gölü was drained in the 1950s and 1960s (Kumerloeve 1988). The Çukurova Delta has undergone drastic change and loss of habitat due to economic development since 1934, when drainage of Regma Swamp (1,000 ha) began. This was followed by the drainage of the nearby Aynaz swamp from 1969 to 1973 and probably drainage of many other small wetlands (Koning & Dijksen 1970; Aukes *et al.* 1988). The delta

is now densely populated by humans and has the most intensive agriculture in Turkey. Almost all available land is under agriculture right up to the edge of the wetlands, and large quantitities of agricultural chemicals drain into the wetlands with unknown impacts. Karatas and Tuzla are now rapidly developing as tourist resorts with likely negative impacts on the nearby Akyatan and Tuzla Gölüs. Intense grazing in the remaining natural vegetation is a further problem (Aukes *et al.* 1988).

In the Göksü Delta, the Tekfur marshes (1,200 ha) and many oxbow lakes and river relicts have been lost by reclamation and drainage improvement activities from 1920 onward (V. van den Berk *in litt.* 1992). The hydrology of the delta was later changed drastically following construction of an irrigation system in the 1960s which drains water rich in agricultural chemicals into both the main water bodies (Akgöl and Paradeniz Gölü) and converted Akgöl from a seasonally flooded, saline, unvegetated lake to a permanent slightly-brackish lake rich in vegetation (Anon. in prep.; V. van den Berk *in litt.* 1992). This has improved the habitat for Marbled Teal but the ongoing eutrophication of Akgöl is a serious threat to the future of the lake (DHKD *in litt.* 1992). There are approved proposals for agricultural development that will drain the seasonal wetlands of importance to Marbled Teal. There are additional proposals to build a small airfield to the east of the river mouth and to construct fish farms in the main Marbled Teal habitat (V. van den Berk *in litt.* 1992; DHKD *in litt.* 1992). The continous development of second homes along the coastal belt are also causing habitat loss, particularly east of the Göksü river. Housing complexes are being built inside the marshes just behind the dunes (V. van den Berk *in litt.* 1992).

Irrigation work has more than halved the area of Hotamis marshes and completely drained Bataklik Gölü, which is part of this complex, and there are problems from reed-burning throughout the year (Kirwan 1991). There are now long-term proposals to convert the site into a reservoir which may flood the Marbled Teal habitat (DHKD *in litt.* 1992). In 1990-1991 the Sultan Marshes were largely drained by irrigation work in the surrounding areas, despite their being granted full protection status (U. Ozesmi pers. comm. 1991). By 1992 the site was full again, but there are further threats from new irrigation schemes in the surrounding areas and a hydrological study is currently being conducted (DHKD *in litt.* 1992). The Ere_li Marshes suffered a major drop in water level in 1992 due to the completion of two dams on the two streams feeding the wetland. There is also heavy reed-burning in these marshes (DHKD *in litt.* 1992).

10.5.2 Hunting

The number and activity of hunters in Turkey has greatly increased in recent decades and has probably contributed to the decline in Marbled Teal. Intense hunting pressure is found at most of the Marbled Teal sites, e.g. 300 hunters were seen at the Ere_li marshes in early October 1982 (van Berk *et al.* 1983). Extreme hunting pressure and egg collection by villagers were implicated in the decline of the species in the Southern Coastlands by 1970 by Gürpinar & Wilkinson (1970). During the January census in 1968, when peak numbers of Marbled Teal were counted, heavy hunting pressure was noted at Tuzla Gölü and was forcing birds off marshland onto the open lake (Hoekstra & Johnson 1968), while four shots a minute were heard at Amik Gölü (T. Gürpinar *in litt.* 1968). Just before hunting was banned at Akyatan Gölü in 1986, there were an estimated 80,000 hunter man-days per year at this site alone (Aukes *et al.* 1988). Despite its status as a hunting reserve, there was still very high hunting pressure in winter 1991-1992 (V. van den Berk *in litt.* 1992). In the Göksü Delta, there is some hunting in late autumn and winter and the last known shooting of Marbled Teal was in 1989 (V. van den Berk *in litt.* 1992).

10.5.3 Fishing

Some immature Marbled Teal have been found drowned in fishing nets at Akgöl in the Göksü Delta (V. van den Berk *in litt.* 1992).

10.6 CONSERVATION MEASURES TAKEN

In the Çukurova Delta hunting has been banned on Akyatan Gölü since 1986, although excessive hunting is continuing (Aukes *et al.* 1988). In April 1989, the two lagoons in the Göksü Delta were declared a hunting reserve and in March 1990 the entire delta was declared a Protected Special Area with a quie effective hunting ban and a weakly implemented ban on developments in all the areas used by Marbled Teal. In May 1990, the core of the delta was designated as a Controlled Sensitive Zone (V. van den Berk *in litt.* 1992). The Sultan Marshes were declared as a strict nature reserve in 1988, although the fact that they were recently largely drained shows this is not very effective protection. The Marbled Teal is a protected species throughout Turkey.

10.7 EVALUATION

The size of the Turkish breeding and wintering population of Marbled Teal has declined markedly this century. Turkey still has an important breeding population of Marbled Teal but one that is much smaller than that present at the end of the 1960s. The majority of the remaining birds may no longer winter in Turkey. The habitat loss and degradation and increased hunting pressure thought to have caused the decline in this species should be stopped and reversed. Particular attention needs to be paid to improving the conservation status of the Göksu and Çukurova Deltas, which are by far the most important sites for the species.

10.8 ACTION NEEDED

Ere_li Marshes: declaration as a strict nature reserve; restoration of former water level; controlled reed-cutting, no reed-burning.

Sultan Marshes: hydrological management plan for the reserve and surrounding areas to ensure water levels inside the reserve are maintained.

Çukurova Delta: control illegal and excessive hunting; assessment of the impact of the drainage of pesticides from surrounding land, especially into Akyatan Gölü.

Göksu Delta: habitat protection; stop marsh reclamation; supply clean water from the river to Akgöl.

Hotamis Marshes: habitat protection; stop reed-burning and control reed-cutting.

Summer surveys of Gogenc/Guvenc Gölü, Bendimahi Delta, saltpans near Incesu, Celebibag Marshes and Devegeçidi Baraji to assess their importance for breeding Marbled Teal.

Ringing programme: to attempt to identify the wintering grounds.

10.9 SITE DIRECTORY

KEY SITES
Çukurova Delta
Göksu Delta
Hotamis Marshes
Ere_li Marshes
Sultan Marshes
Van Marshes

SITES OF SOME IMPORTANCE
Bendimahi Delta
Celebibag Marshes
Devegeçidi Baraji
Gogenc/Guvenc Gölü
Kulu Gölü
Saltpans near Incesu
Van Gölü

Name Göksu Delta.
Location 36.20 N, 33.59 E. Mersin, Southern Coastlands.
Protected Status Protected Special Area.
Threats Eutrophication from agricultural run-off, marsh reclamation, tourist and airfield developments.
References IBA 052, Schepers *et al.* 1989, V. van den Berk *in litt.* 1992.
Status of Marbled Teal At least 50 breeding pairs in 1991-1992. Occasional in winter.

Name Çukurova Delta.
Location 36.45 N, 35.25 E. Adana and Mersin, Southern Coastlands.
Protected Status Akyatan Gölü is a hunting reserve.
Threats Drainage, agricultural pollution, hunting, tourism.
References IBA 050, Aukes *et al.* 1988.
Status of Marbled Teal 50-100 pairs in 1987. Formerly resident in much larger numbers.

Name Hotamis Marshes (including Bataklik Gölü).
Location 37.35 N, 33.03 E. Konya, Central Plateau.
Protected Status None.
Threats Partial drainage, future plans for reservoir construction, reed-burning.
References G. Kirwan *in litt.* 1992, IBA 024.
Status of Marbled Teal Breeding. Up to 20 pairs in 1991.

Name Ere_li Marshes.
Location 37.30 N, 33.44 E. Konya, Central Plateau.
Protected Status None.
Threats Low water levels due to dams upstream, reed-burning.
References Kiliç & Kasparek (1990), IBA 023.
Status of Marbled Teal 1-3 breeding pairs in 1984, 1986 and 1987.

Name Sultan Marshes.
Location 38.20 N, 35.15 E. Kayseri, Central Plateau.
Protected Status Strict Nature Reserve.
Threats Irrigation projects outside the reserve leading to reduced water levels.
References IBA 030.
Status of Marbled Teal 2 breeding pairs in 1972. Up to 150 post breeding season.

Name Van Marshes.
Location 38.29 N, 43.19 E. Van, East Turkey.
Protected Status None.
Threats Grazing, tourism, reed cutting, shooting.
References IBA 077.
Status of Marbled Teal At least 4 breeding pairs in 1987.

Name Bendimahi Delta.
Location 38.56 N, 43.39 E. Van, East Turkey.
Protected Status None.
Threats Cattle grazing.
References IBA 067.
Status of Marbled Teal Possible breeding site.

Name Celebibag Marshes.
Location 39.09 N, 43.56 E. Van, East Turkey.
Protected Status None.
Threats Cattle grazing, disturbance.
References IBA 069.
Status of Marbled Teal Possible breeding site.

Name Devegeçidi Baraji.
Location South-east Turkey.
Status of Marbled Teal Possible breeding site, 2 pairs in May 1990.

Name Gogenc/Guvenc Gölü.
Location 38.11 N, 32.47 E. Central Plateau.
Status of Marbled Teal Breeding recorded in 1971.

Name Kulu Gölü.
Location Central Plateau.
Geographical Coordinates 39.02 N, 33.10 E.
Protected Status None.
Threats Conversion of surrounding steppe to agricultural land, irrigation schemes, overgrazing, intensive hunting.
References IBA 026, Carp 1980, Green *et al.* 1987, van den Berk *et al.* 1985.
Status of Marbled Teal Up to 4 in April, May and June.

Name Saltpans near Incesu.
Location Near Sultan Marshes, Central Plateau.
Status of Marbled Teal Possible breeding site.

Name Van Gölü.
Location Eastern Turkey.
Geographical Coordinates 38.16-58 N, 42.16-43.34 E.
Protected Status None.
Threats Hunting, cattle grazing.
References Schilperood and Schilperood-Huisman 1986, Carp 1980.
Status of Marbled Teal Breeding site; 1 adult with 5 young on 23.7.87.

10.10 RECORDS FOR TURKEY

Location	Date	Source	Number	Notes
<u>Black Sea Coastlands</u>				
Kizilirmak Delta	4.8.67	XXV	2	
<u>Southern Coastlands</u>				
Amik Gölü	1930s	VI	-	breeding
Amik Gölü	23.1.67	XXX	-	a few
Amik Gölü	14-16.7.67	XXXI	16	
Amik Gölü	Sept 1967	XXXI	1	probable record
Amik Gölü	2.5.70	XXIX	2	
Burdur Gölü	16.10.82	XVIII,XV	3	

ÇUKUROVA DELTA

Aynaz swamp (Lake Tarsus)	pre 67	XXX	-	winters; reported to breed commonly
Aynaz swamp	Jan 67	XXX	-	3, shot by a local hunter
Aynaz swamp	4.10.68	XXVI	2	
Tuzla Gölü, ricefields near	10-13.7.67	XXXI	1	adult
Akyatan Gölü	10/21.1.69	XXVI	-	small numbers
Akyatan Gölü	15.3.70	XXXII	7	
Tuzla Gölü	27.11.69	XXIII	52	
Çukurova Delta	1970-1971	XXIX	-	present all year
Çukurova Delta	22.5.71	XXIX	7	1 adult, 6 juveniles
Tuzla Gölü	25.11.71	XXI	36	
Tuzla Gölü	3.6.81	VII	2	
Yemisli Gölü (Karatas)	25.8.67	XXV	>2000	also known as Kidney Lake
Yemisli Gölü (Karatas, near)	10.5.79	VII	2	
Yemisli Gölü (Karatas)	4.4.82	XXIV	4	
Yemisli Gölü (Karatas)	25.5.84	XXIV	5	
Yemisli Gölü (Karatas, 10 km to north)	2.5.85	XXIV	10	
Çukurova Delta	5.4.82	XXIV	5	
Çukurova Delta	25.5.84	XXIV	4	
Tuzla Gölü	3.4.85	XXIV	50	
Tuzla Gölü	19.6.85	XXIV	2	
Tuzla	14.4.87	IV	9	
Tuzla lagoons and oxbows	15.4.87	IV	2	
Tuzla Gölü, salt marsh east of	10.5.87	IV	2	
Otter Lake, near Seyhan mouth	14.5.87	IV	7	
Dipsiz Gölü, near Seyhan mouth	14.5.87	IV	8	
Akyayan Gölü, salt marshes west of	16.5.87	IV	12	
Akyatan Gölü	17.5.87	IV	2	
Tuzla Gölü, salt marshes east of	18.5.87	IV	9	
Tuzla, beach east of	18.5.87	IV	15	
Tuzla Gölü	2-20.5.87	IV	1	
Seyhan riversides	19.5.87	IV	9	
Dipsiz Gölü	20.5.87	IV	4	
Çukurova Delta	1987	I	64+	c.32 breeding pairs, total estimate 50-100 pairs
Akyatan Gölü	5.3.90	III	1	
Akyatan Gölü	12.3.90	III	1	
Akyatan Gölü	21.3.90	III	37	
Yemisli Gölü	22.3.90	III	1	
Akyatan Gölü	26.3.90	III	2	
Tuzla Gölü	28.3.90	III	55	
Tuzla oxbows	29.3.90	III	1	
Tuzla Gölü	4.4.90	III	22	
Tuzla oxbows	5.4.90	III	1	
Tuzla Gölü	11.4.90	III	76	most thought to breed in the area
Tuzla oxbows	12.4.90	III	30	most thought to breed in the area
Freshwater ponds in dunes near Akyatan	mid Apr 1990	III	-	small numbers, mostly pairs, may have bred
Tuzla Gölü	18.4.90	III	47	
Tuzla oxbows	19.4.90	III	8	
Tuzla Gölü	25.4.90	III	40	
Tuzla oxbows	26.4.90	III	21	
Yemisli Gölü	26.4.90	III	1	
Tuzla Gölü	2.5.90	III	22	
Tuzla oxbows	3.5.90	III	19	
Akyatan Gölü	7.5.90	III	6	
Tuzla Gölü	9.5.90	III	9	
Tuzla oxbows	10.5.90	III	10	
Akyatan Gölü	14.5.90	III	14	
Tuzla Gölü	16.5.90	III	6	

Tuzla oxbows	16/17.5.90	III	18	
Göksu Delta	23.3.67	XXV	100+	flocks of 30-100 seen
Göksu Delta	early Jun 67	XXV	-	many seen, probably breeding
Göksu Delta	29.8.67	XXV	c.450	
Göksu Delta, large west lagoon	10-13.7.68	XXXI	c.70	17 adults and 51-53 juveniles. Includes 4 families of 13, 15, 13, 10-12 juveniles
Göksu Delta, ricefields	10-13.7.68	XXXI	4-5	only duck seen
Göksu Delta	10/21.1.69	XXVI	-	small numbers
Göksu Delta, coast east of Silifke	13.5.69	XXVI	2	
Göksu Delta	25.11.69	XXIII	1	
Göksu Delta	13.10.70	XXIX	450	
Göksu Delta	29.11.70	XXIX	23	
Göksu Delta	1970-1971	XXIX	-	present all year
Göksu Delta	1971	XXXV	4	2 pairs
Göksu Delta	27/28.7.71	XXIX	c.50	including females + 4 & 9 pulli
Göksu Delta	26.11.71	XXI	3	
Göksu Delta	29.4.72	XXIX	50-70	breeding
Göksu Delta	14.9.72	XXIX	100	estimate; breeding
Göksu Delta	1.6.74	XXVIII	6	
Göksu Delta	2.7.74	XXVIII	1	
Göksu Delta	21/22.5.75	XXVIII	3	
Göksu Delta	24.5.75	XXVIII	7	
Göksu Delta	1.7.76	VII	5	
Göksu Delta	3/9.8.76	VII	20	estimate
Göksu Delta	9.5.77	VII	20	estimate
Göksu Delta	3.9.77	VII	1	
Göksu Delta	16/24.10.77	VII	200+	maximum over this period
Göksu Delta	7.6.78	VII	2	
Göksu Delta	4/5.7.78	VII	up to 20	including pair + 8 pulli
Göksu Delta	14/15.5.79	VII	20	maximum estimate
Göksu Delta	25.5.80	VII	6	
Göksu Delta	11.10.80	VII	61	
Göksu Delta	20/22.5.81	VII	up to 20	
Göksu Delta	6/7.6.81	VII	5	maximum estimate
Göksu Delta	12/15.10.82	XVIII/XV	1	
Göksu Delta	17.6.83	XXIV	15+	
Göksu Delta	13.5.84	XXIV	12	
Göksu Delta	6.5.85	XXIV	12	
Göksu Delta	19.5.86	XXIV	11	
Göksu Delta	1/3.9.86	XXIV	153	
Göksu Delta	28-29.5.87	XXXVIII	52	
Göksu Delta	20.6.87	XIV	4	
Göksu Delta	11.9.88	XXXVIII	40	
Göksu Delta	25/26-9-88	XIII	30+	
Göksu Delta	pre 89	I,IX	60+	30+ pairs; breeding
Göksu Delta	Sept pre 89	I	150	maximum estimate
Göksu Delta	1989	XXXVII	66-100	33-50 breeding pairs, 27-40 at Akgöl
Göksu Delta, north west of Akgöl	9.5.89	IX	-	one shot
Göksu Delta	28.5.89	XXXIII	8	
Göksu Delta, Akgöl	12.7.89	IX	21	
Göksu Delta, river	14.7.89	IX	14	including 11 juveniles
Göksu Delta, Akgöl	15.7.89	IX	11	including 4 juveniles
Göksu Delta	7.8.89	XXXVIII	61	
Göksu Delta	3.9.90	XXXIII	30+	
Göksu Delta	1991	XXVII	c.100	c.50 pairs bred incl. at least 31 broods, 27 at Akgöl
Göksu Delta	14-18.4.91	XXVII	24	
Göksu Delta	19-24.4.91	XXVII	5	

Göksu Delta	26.4-3.5.91	XXVII	17	
Göksu Delta	4-8.5.91	XXVII	30	
Göksu Delta	13-19.5.91	XXVII	32	
Göksu Delta	23-30.5.91	XXVII	30	incomplete count
Göksu Delta	June 1991	XXXVIII	150	75 pairs
Göksu Delta	5-18.6.91	XXVII	44	plus broods
Göksu Delta	5-13.7.91	XXVII	55	plus broods
Göksu Delta	19-24.7.91	XXVII	45	plus broods, incomplete count
Göksu Delta	26.7-4.8.91	XXVII	93	plus broods
Göksu Delta	5-10.8.91	XXVII	119	
Göksu Delta	17-26.8.91	XXVII	191	
Göksu Delta	31.8-3.9.91	XXVII	102	
Göksu Delta	10-20.9.91	XXVII	100	
Göksu Delta	20-24.9.91	XXVII	81	
Göksu Delta	2-10.10.91	XXVII	186	
Göksu Delta	12-18.10.91	XXVII	100	
Göksu Delta	6-13.11.91	XXVII	1	
Göksu Delta	20-30.11.91	XXVII	0	
Göksu Delta	5-31.12.91	XXVII	1	
Göksu Delta	7-20.1.92	XXVII	3	
Göksu Delta	31.1-9.2.92	XXVII	1	
Göksu Delta	6-13.3.92	XXVII	6	
Western Anatolia/Aegean				
Marmara Gölü	1.6.66	XXV	1	
Apolyont Gölü	17.9.75	XXVIII	1	
Ayvalik, salt pans south of	1.4.72	XXIX	3	
Bafa Gölü, near Menderes Delta	8.11.83	XV	4	
Köyce_iz Gölü	2.4.88	XXXVIII	2	
Köyce_iz Gölü	8.5.89	XXXVIII	2	
Central Plateau				
Cavuscu Gölü	13.12.70	XXII	1	
Hamam	6.5.67	XXV	2	pair
Mogan Gölü	30.7.67	XXV	1	
Eber Gölü	8.5.67	XXV	5	two pairs and single
Eber Gölü	4.5.71	XXIX	2	
Eber Gölü	25.5.75	XXVIII	4	
Gogenc/Guvenc Gölü	25.7.71	XXIX	10+	5 pairs with young. Regular late Apr-late Jul.
Hotamis Marshes (near Yarma)	28.4.70	XXIX	37	max
Hotamis Marshes (near Yarma)	13/14.5.70	XXIX	120	at least
Hotamis Marshes	23.11.70	XXIX	53	
Hotamis Marshes (near Yarma)	4/5.6.71	XXIX	-	2 nests (6 & 13 eggs)
Hotamis Marshes (near Yarma), south side	11.6.71	XXIX	10	at least 5 pairs
Hotamis Marshes (near Yarma), west side	25.7.71	XXIX	20+	10 pairs + young
Hotamis Marshes	21.11.71	XXIX	51	
Hotamis Marshes	3/4.6.75	XXVIII	6-8	3-4 breeding pairs
Hotamis Marshes	22.7.75	XXVIII	2	
Hotamis Marshes	17.7.81	XXXVI	1	
Hotamis Marshes	28.9.82	XXXVI	4	
Hotamis Marshes	5.5.83	XXXVI	2	
Hotamis Marshes	31.5.83	XXXVI	3	including one pair
Hotamis Marshes	14.6.85	XXIV	100	
Hotamis Marshes	6.7.85	XXXVI	1	
Hotamis Marshes	29.4.88	XXXVI	1	
Hotamis Marshes	23.4-15.5.91	XXXIV	-	present. Up to 20 pairs breeding
Hotamis Marshes	16.7.91	XXXVIII	7	adult with 6 young
Kulu Gölü	24.5.83	XXIV	3	

Kulu Gölü	3.4-26.5.88	XI	2	
Kulu Gölü	7.6.89	XXXVIII	4	
Kulu Gölü	11.6.91	XXXVI	4	
Ere_li Marshes	8.5.68	V	20	
Ere_li Marshes	15.4.71	XXIX	2	
Ere_li area	1971	XXXV	40	20 breeding pairs. OST cited. Error?
Ere_li Marshes	21/24.4.72	XXIX	2	
Ere_li Marshes	6.7.76	VII	1	
Ere_li Marshes	5.7.78	VII	1	
Ere_li Marshes	28.9.82	V	2	
Ere_li Marshes	20.7.84	V	1+	female + young
Ere_li Marshes	10.3.86	XXIV	17	
Ere_li Marshes	12.8.86	XXIV	9	
Ere_li Marshes	5/6.4.86	V	5	
Ere_li Marshes	22/23.6.86	V	2+	2 birds with young
Ere_li Marshes	1987	I	4-6	2-3 breeding pairs
Ere_li Marshes	12-13.7.88	XXXVIII	40	
Ere_li Marshes	29.5.89	XXXIII	3	
Ere_li Marshes	15.6.89	XXXVIII	22	
Ere_li Marshes	21.6.89	XXXVIII	10	
Karapinar Ovasi	pre 1989	I	-	possible breeding site
Tuz Gölü	10.9.72	XXIX	3	
Uyuz Gölü	26.5.91	XXXVI	1	
Incesu, salt pans near (Sultan Marshes?)	31.5.75	XXVIII	10	behaving as if nesting
Sultan Marshes, Kurbaga Gölü	24.11.70	XXIX	15	
Sultan Marshes, Kurbaga Gölü	27.5.72	XXIX	4	2 breeding pairs
Sultan Marshes, Yay Gölü	12.10.84	XVI	1	probable record
Sultan Marshes	24.10.85	XXIV	4	
Sultan Marshes	24/30.8.86	XXIV	3-4	
Sultan Marshes	pre 89	I	150	maximum post-breeding and winter count
Sultan Marshes	May 1992	XXXVI	-	several, probably breeding
Sultan Marshes	20.8.92	II	4	
South-east Turkey				
Northern Euphrates, near Karkamis, S. of Birecik	14.5.73	XXIX	4	2 females, 2 males
Devegeçidi Baraji	26.5.90	XXXVIII	4	2 pairs
East Turkey				
A_ri, near, upper Euphrates	early May 68	XXVI	4	2 pairs
Van	8.8.74	XXVIII	1	
Bendimahi Delta, Van	6.8.74	XXVIII	1	
Bendimahi Delta, Van	21.5.85	XXIV	4+	
Bendimahi Delta, Van	pre 89	I	-	presumed to be breeding
Bendimahi Delta, Van	31.5.89	XXXVIII	3	
Celebibag Marshes, Van	pre 89	I	-	presumed to be breeding
Van Marshes	7.6.77	VII	1	
Van Marshes	13/14.9.84	XXIV	10	
Van Marshes	11.5.85	XXIV	34	
Van Marshes	25.5.86	XXIV	2	
Van Marshes, near Van-Iskelesi	20.7.86	XVII	44-46	19 adults, 4 families with 25-27 juveniles
Van Marshes	1/8.8.86	XXIV	25	6 adults including 3 females + 19 juveniles
Van Marshes	9.9.86	XXIV	9	
Van Marshes	4.6.87	XXXVIII	2	
south Van Marshes	1987	XXXVI	-	breeding proved
south Van Marshes	19.5.89	XXXIII	4	
Van Marshes	12.6.90	XXXVIII	2	
south Van Marshes	25.6.90	XXXVI	2	pair
Van Marshes	28.7.91	XXXVIII	90	

Van Gölü, west side	7.5.70	XXIX	2	pair
Van Gölü, bay with reeds near Ernis	19.7.86	XVII	1	
Van Gölü	23.7.87	XXXVIII	6	adult with 5 young
Erçek Gölü	June 1987	XXXVIII	9	
Ahlat	26.6.91	XXXVIII	2	

I Grimmett & Jones 1989
II G. Magnin *in litt.* 1991, 1992
III L.J. Dijksen *in litt.* 1991, 1992
IV van der Have *et al.* 1988; van den Berk & Letschert 1988
V Kiliç & Kasparek 1990
VI Kumerloeve 1988
VII Turkey: Bird Report : 1976-1981 (1986) *Sandgrouse* 8: 11.
VIII Green *et al.* 1987
IX Anon. in prep.
X Koning & Dijksen 1973
XI Anon. 1988
XII Rose 1989
XIII Bustin *et al.* 1988.
XIV Green *et al.* 1987
XV de Roder 1985
XVI Philippona 1985
XVII Schilperoord & Schilperoord-Huisman 1986
XVIII van den Berk *et al.* 1985
XIX Dijksen & Koning 1986
XX Hoekstra & Koning 1969
XXI Dijksen *et al.* 1972
XXII Dijksen & Koning 1971
XXIII Koning & Dijksen 1970
XXIV Martins 1989
XXV *OST Bird Report* 1966-67 (1969)
XXVI *OST Bird Report* 1968-69 (1972)
XXVII V. van den Berk *in litt.* 1992
XXVIII *OST Bird Report* 1974-1975 (1978)
XXIX *OST Bird Report* 1970-1973 (1975)
XXX Zahavi 1967
XXXI Vielliard 1968
XXXII F.J. Koning *in litt.* 1971
XXXIII N. Moorhouse *in litt.* 1991
XXXIV Kirwan 1991
XXXV Cramp & Simmons 1977
XXXVI G. Kirwan *in litt.* 1992
XXXVII Schepers *et al.* 1989
XXXVIII *OSME Bird Report* 1987-1991, in prep.

11. THE COMMONWEALTH OF INDEPENDENT STATES

11.1 LOCAL NAME

_____ _____ (Marbled Teal); _____ _____.

11.2 DISTRIBUTION AND STATUS

Marbled Teal was a common and numerous bird in parts of the CIS in the breeding season and in winter before the 1950s (Dementiev & Gladkov 1952; Borodin 1978). Since then there has been a widespread decline and contraction of the breeding range. Flint & Krivenko (1990) give an estimated population size of 5,000 birds for the entire CIS, with numbers "falling sharply". This number appears to be an overestimate, as the total number of breeding pairs is unlikely to be more than 400 pairs (V. Vinogradov pers. comm. 1991). Allowing for non breeding birds, this would suggest a late summer population of more like 1,500. The wintering population is not likely to be more than a few hundred.

11.2.1 Russia

Marbled Teal formerly bred on western sub-steppe *ilmenni* (shallow, generally temporary lakes) in the Volga Delta, on wetlands of the Trans-Volga and along the western coast of the Caspian in the Terek and Samur deltas but was extremely rare in these areas (Dementiev & Gladkov 1952; Krivenko 1983; J. Shegalin *in litt.* 1992). The last record from the Volga delta was in 1953 when two moulting birds were caught (Krivenko 1983). Vagrants have been recorded from as far north as Gorki and Lake Ilmen (Bakkal *et al.* 1990). In the northern Caucasus, there have been recent records from Ardon (seven in December 1986), Elkhotovo on the Terek river (three in January 1981), Solyonoe Lake in Anzgizsky, Stavropol (two in April 1985) and Dadynskoe Lake (one in October 1981) in Stavropol (Komarova & Komarova 1988; Khoehlov 1989). These recent records suggest there may still be a small breeding population in the region.

11.2.2 Kazakhstan

Most records of Marbled Teal are from before 1940. Marbled Teal was formerly a common breeder along the middle and lower Syrdarya valley from the southern border of Kazakhstan to Kazalinsk, and also on the Telikol/Telikulsk lakes (Dementiev & Gladkov 1952; Dolgushin 1960). It was also recorded from the east end of the Volga delta (at Ganyushkino), the east end of the Transvolga (breeding was confirmed on lakes near Urda and may have occurred on the Kamysh-Samarskiye Lakes) and from the Ural delta (Dolgushin 1960; Borodin 1978). It was also presumed to have occurred along the lower Sarysu valley (Stepanyan 1990). At the turn of the century, it was thought to have occurred on the lower reaches of the Kurchum river close to the Chinese border (Dolgushin 1960) and not far from Karamay in China where Marbled Teal currently breed. The last known record is from 1963 when it was seen repeatedly in the Caspian coastal waters of Guryev Oblast, Ural delta (Pridatko 1991). There are no wintering records (Dolgushin 1960).

11.2.3 Azerbaijan

Marbled Teal was formerly reported to be "common" in Transcaucasia by Phillips (1923). According to a report prepared by M.V. Patrekeev (*in litt.* 1992), in the 19th century it was common in summer in the Kura valley from Ganja to Lenkoran. Following a decline in range and population size, it is thought to have disappeared from the left bank of the Kura valley and the Mugan and Lenkoran lowlands. It is now thought to breed in Lakes Aggel and Saraesy in the Mil Steppe and in Kizil Agach (Kirov Bay) State Reserve. Breeding probably also occurs in Lakes Bos-Koba (also known as the Vtorye "plavni" or fore-delta) and Shorbet-Koba that lie inbetween Aggel and Saraesy in the same Mil Steppe lake system (Krivenko & Vinokurov 1984; V. Vinogradov pers. comm. 1991).

Numbers are thought to have been stable in this region since the 1960s. According to Patrekeev (in press), the entire Mil Steppe lake system including Lakes Aggel, Bos-Koba, Shorbet-Koba and Saraesy is thought to contain about 200 pairs in summer. There are thought to be about 50 pairs on Aggel at the start of the breeding season along with at least 20 pairs in Saraesy and 2-3 pairs on Kizil Agach (M. Patrekeev *in litt.* 1992). In the 1960s, 50-60 were reported in summer at Lake Aggel (Krivenko & Vinokurov 1984). V. Vinogradov (pers comm. 1991) estimates 5-10 pairs breeding in Kizil-Agach. Breeding has only been confirmed at Aggel, where broods have been seen (M. Patrekeev *in litt.* 1992). Grimmett & Jones (1989) give a higher figure of 250 breeding pairs for Aggel.

In the breeding season in 1989, 90 birds were seen at Lake Aggel, 70 at Lake Saraesy and another 30 at Lakes Mahmud-Chala and Agchala in the south-eastern Mugan Steppe. In May 1990, 90 birds were seen at Lake Shorbet-Koba (E. Sultanov *in litt*. 1993). In July 1990, birds were seen at Lakes Mahmud-Chala and Third Chala (Novogolovskaya Chala). It is possible that Marbled Teal still occurs elsewhere in Azerbaijan but has been overlooked. It is seen on spring migration along the Araks river valley. In autumn the Marbled Teal are thought to fly towards Iran and winter there, and they are sometimes recorded at Divichi Liman on passage (M. Patrekeev *in litt.* 1992). There are occasional records from winter and a few hundred were seen in early February at Aggel in a very cold winter in 1972 and stayed until the thaw (Tyaev & Kurbanov 1984).

11.2.4 Armenia

Marbled Teal were formerly reported as common in spring in the Erevan Region but not found breeding (Dementiev & Gladkov 1952). Reported as rare in the Araks Valley alongside the Iranian border in the 1950s, and has been recorded in spring and summer at the Armashski Carp Farm in the valley since 1984 (Adamyan 1989). On 23.6.87, 32 birds were flushed from this site and two nests found (Adamyan 1989). Birds breeding in Armenia are likely to winter in Iran, and birds breeding in Azerbaijan are reported to use the Araks valley in Armenia as a spring migration route (M. Patrekeev *in litt.* 1992).

11.2.5 Turkmenistan

Until the 1940s Marbled Teal was a common breeding duck in the Turkmen plains along the Amudarya, Murgab and Tedzhen Valleys and on the freshwater lakes of Western Uzboi and in the lower Atrek Valley (Dementiev & Gladkov 1952; Poslavski 1992). It was reported to be the most common breeding duck in Turkmenistan, and was particularly abundant in the lower and middle Amudarya (Phillips 1923; Dementiev & Gladkov 1952). In the overflowed meadows of the Alikhanow Canal, an "immense number of nests" were found (Zarudny 1896). Kostin (1956) recorded it on the lakes of the Tashaus. Some of these populations were apparently resident and larger numbers were recorded on migration and wintering in some of these sites. In the Lower Atrek Marbled Teal was very numerous on autumn migration at the end of the 19th and beginning of the 20th centuries (Zhitnikov 1900). In February 1932 about 17,000 Marbled Teal wintered in the lower reaches of the Atrek and the adjacent sections of the Caspian (Laptyev *et al.* 1934). They were also extremely numerous here on migration and in winter in 1935 and 1939 (Isakov & Vorobyev 1941). Significant numbers formerly wintered on the freshwater lakes of Western Uzboi and along the Murgab and Tedzhen valleys (Dementiev & Gladkov 1952; Krivenko 1983; Krivenko & Vinokurov 1984; Poslavski 1992). Wintering of small numbers of birds is still reported to occur in some years in the Caspian area of southwestern Turkmenia (Krivenko & Vinokurov 1984), particularly in Krasnovodsk and North-Cheleken Bays (Ramsar 1990) although this is not supported by Poslavski (1992).

In 1940 Marbled Teal were still present in the breeding season on the Amudarya between Chardzhou and Khodzheili and present in larger numbers on migration and during winter (Poslavski 1992). Marbled Teal still occasionally breeds in the middle reaches of the Amudarya Valley. Several pairs with broods were recorded in May 1985 in Lake Katta-shor. Up to 5-10 pairs are also breeding on sedimentation ponds near the town of Chardzhou and about 70 pairs bred in 1986 in the Barsa-Kelmes Bay on Lake Sultandag. Local reports suggest

it is still a rare breeder on the Kelif Lakes on the Karakum Canal in the Chardzhou Oblast. Surveys in the Middle Amudarya from 1984 to 1991, show that breeding is sporadic, with no birds recorded in some years whilst in other years breeding pairs were regularly seen in the above sites (Poslavski 1992).

Marbled Teal are no longer regularly recorded in other parts of Turkmenistan. Since 1970 only one bird has been recorded on the Lower Atrek (in June 1975, Karavayev 1979), one on the ponds in Gyaurski region in the foothills of the Kopetdag (September 1979, Eminov 1981) and five on Lake Chaskak in Kelif Uzboi (in May 1982, Poslavski 1992).

11.2.6 Uzbekistan

Marbled Teal were reported to be formerly extremely common on the lower and middle Amudarya (Dementiev & Gladkov 1952). They formerly bred in the Amudarya Delta, in the regions bordering Turkmenistan and in the Surkhandarya Valley (Salikhbayev 1950, 1961). In the Delta they were mainly recorded on the shallow parts and in the flooded areas near Kumgrad (Poslavski 1992). There are also unconfirmed records from the lakes on the Lower Zarafshan (Poslavski 1992) and nesting may have occurred in Central Fergana at the beginning of the century (Kashkaro 1983). Stepanyan (1990) recorded it as occurring as far east as Fergana Valley, close to Kirgizistan. It has also been recorded in Summer on Maipost, on Lake Sudochye (Gladkov 1953) and in the Khorezm (Bogdanov 1882, Kostin 1956).

Breeding has also been reported in the middle Amudarya (Yashchenko 1891) where in 1984 fledged young and groups of adults were seen near Dargan-Ata (Poslavski 1992). Several birds were seen on Lake Siplan near Sherabad in May 1965 (Stepanyan 1970), and some were seen on the Yuzhnosurkhan Reservoir in the Surkhandarya Basin in June 1962. Breeding was last confirmed around 1987 when a female and three young were seen on lakes near Bukhara and Kagan (V.Ye Flint pers. comm. 1991).

Small numbers of spring migrants were formerly recorded in the Termez region, on the Syrdarya near Chinaz, on Khorezm lakes, in the Amudarya Delta and on the southern shore of the Aral Sea. Autumn migrants were recorded from the Surkhandarya Valley (Kashkaro 1983). According to Poslavski (1992) there are no records from winter. However, there are unconfirmed reports that hundreds of Marbled Teal were found wintering on the lakes of Central Uzbekistan in 1990-1991 (V.I. Pridatko *in litt.* 1992).

11.2.7 Tadjikistan

The Marbled Teal was formerly a rare breeder in northern and western Tadjikistan on the upper Amudarya at Melnikovo, Kirovabad and Parkhar (Dementiev & Gladkov 1952). It was formerly seen on migration in the south-western areas of the Pamir Mountains in the Vakhsh Valley (Borodin 1978; Stepanyan 1990). The current status is unknown.

11.2.8 Ukraine

Marbled Teal has always been considered as a vagrant in the Ukraine (Bakkal *et al.* 1990; I. Gorban *in litt.* 1992).

11.3 HABITAT

Marbled Teal generally favour freshwater or slightly saline wetlands (Pridatko 1991). In the breeding season, they mainly use small, shallow lakes with a thin layer of silt on the bottom and beds of *Phragmites* and bushes along the shore, and breeding has also been recorded in temporary wetlands and flooded saltmarshes (Dementiev & Gladkov 1952; IZASK 1978). Breeding sites in Turkmenistan were in the floodlands of the rivers, on small shallow lakes fringed by beds of *Phragmites* and shrubs. In 1985 pairs and broods were seen on shallow flooded

areas of Lake Katta-shor with numerous small islands overgrown with *Phragmites* and *Typha*. Breeding has occurred on both fresh and saline wetlands in Uzbekistan (Poslavksi 1992). On migration, Marbled Teal are seen in cultivated areas of foothills, along river valleys, on coasts and in mountain regions such as the Pamir (Borodin 1978). In the winter they have been reported to spend the day in shallows along open sea coasts or in deep lakes, flying to feed in areas flooded by overflowing rivers and in flooded rice fields (Dementiev & Gladkov 1952).

11.4 ECOLOGY AND BEHAVIOUR

11.4.1 Movements

In Kazakhstan, Marbled Teal arrived at breeding sites in the Syrdarya in April to May (earliest 13 April in 1910) and left by September (Dolgushin 1960; IZASK 1978). In Turkmenistan, mass spring passages were formerly observed along the Murgab in April 7-26. Autumn passage was seen along the Uzboi in late September and early October. On the lower Atrek the first winter migrants formerly arrived by 1 November, but in midwinter they sometimes moved further south (Dementiev & Gladkov 1952). In the early 1970s, small numbers of spring and autumn migrants were seen in the south-east Caspian in Iran heading towards and away from Turkmenistan (see 12.2). Spring migration in Uzbekistan has been recorded from the beginning to the end of April and in a northerly direction (Poslavski 1992). Breeders are thought to arrive late in April and in May (Kashkaro 1983).

In Azerbaijan, spring passage was formerly seen in the Kirov Bay area in the first week of May (Dementiev & Gladkov 1952). Marbled Teal usually arrive at Lake Aggel in April and at Kizil Agach at the beginning of May, but there are occasional records from mid March onwards. They leave the Mil Steppe lakes in early September (M. Patrekeev *in litt.* 1992). In April they are also seen on migration along the Araks river valley in Armenia and Azerbaijan. The earliest record in Armenia is on 10 April 1985 (Adamyan 1989).

11.4.2 Breeding

Spring migrant flocks were reported by Dementiev & Gladkov (1952) to arrive in pairs. Along the lower Syrdarya, pair formation was seen by May 20. Males are reported to abandon females when incubation begins, forming small, nomadic flocks (Dementiev & Gladkov 1952).

Nests are made on the ground at the edges of wetlands among low vegetation or under cover of small bushes or dry grass (Krivenko & Vinokurov 1984), on small islands (Pridatko 1991) and on tussocks (Adamyan 1989). Egg-laying lasts from mid-May to the end of June (Krivenko & Vinokurov 1984), but has been reported from the Amudarya Delta in the first half of May (Poslavski 1992). Seven to 12 eggs are laid with an incubation period of 25-27 days, and young begin to appear at the end of June/beginning of July (Borodin 1978). The breeding season is protracted and, along the Amudarya, hatchlings and fully fledged young were seen together during the first two thirds of July (Dementiev & Gladkov 1952). In Uzbekistan, 5-8 young are seen in a brood (Pridatko 1991).

11.4.3 Feeding behaviour and diet

Marbled Teal dabbles in shallows and feed on the shore, digging in silt and mud and feeding amongst aquatic vegetation. Aquatic insect larvae, molluscs, seeds, grass shoots and other plant tissue are taken (Dementiev & Gladkov 1952; IZASK 1978).

11.5 THREATS

11.5.1 Habitat loss and degradation

Drainage associated with agricultural development (irrigation of arid lands, drainage of marshes and lakes etc.)

has resulted in a catastrophic decrease in the area of Marbled Teal habitat across the CIS (Krivenko & Vinokurov 1984). Water extraction from rivers has led to the drainage of breeding sites such as marshes downstream (Krivenko 1983). The waters of the Amudarya and Syrdarya have been diverted for enormous irrigation projects, leading to catastrophic changes in the Aral sea and other wetlands in the catchment areas of these rivers (Borodin 1978). Following drainage of the shallow lakes in the river floodplains, there has been a drastic reduction in the area of breeding habitat in Turkmenistan which is thought to be the main cause of the catastrophic decline in the size of its Marbled Teal population. For example, many lakes in Tashauz Oblast in the north of Turkmenistan where Marbled Teal was common have been replaced by cotton fields (Poslavski 1992). Drainage of shallow lakes and river floodlands have destroyed many habitats in Kazakhstan (IZASK 1978). Drainage is thought to be the principle cause of the shrinkage in Marbled Teal range in Azerbaijan (M. Patrekeev *in litt.* 1992). Habitat loss and degradation continues, and Lake Bos-Koba is being degraded by development activities (V. Vinogradov pers. comm. 1991), Lake Saraesy is affected by pollution and reclamation and part of the Aggel lake system is being drained (M. Patrekeev *in litt.* 1991).

It has been suggested that the contraction in the Marbled Teal breeding range may be partly related to cyclical climatic change that has caused increased desiccation of arid areas this century (Krivenko 1990). Current increases in the levels of the Caspian Sea due to man-made changes in Russia (including river diversions) may be increasing the area of habitat available to Marbled Teal and may possibly cause a recolonisation of areas of former breeding range in the west Caspian (V. Vinogradov pers. comm. 1991).

11.5.2 Hunting

Hunting is thought to be a cause of the major decline in Marbled Teal numbers this century (Pridatko 1991). Numbers in parts of Turkmenistan are thought to have been decimated by intensive poaching (Poslavski 1992). Poaching is a serious and widespread problem in Azerbaijan, even in the Aggel and Kizil-Agach reserves where the guards themselves are poachers of wildfowl. Birds are shot regularly, but hunters at Lake Saraesy report that the flesh in tasteless and Marbled Teal is not a favoured quarry species (M. Patrekeev *in litt.* 1991). Poaching is also a problem at the Armashski Carp Farm in Armenia (Adamyan 1989).

11.5.3 Others

Disturbance from commercial fishing operations is a problem in Aggel lakes, Azerbaijan (M. Patrekeev *in litt.* 1991).

11.6 CONSERVATION MEASURES TAKEN

11.6.1 Habitat protection

In Azerbaijan, the breeding sites Aggel and Kizil Agach are protected as State Reserves (Krivenko & Vinokurov 1984; V. Vinogradov pers. comm. 1991). Kizil Agach is also a Ramsar site. Protection status at Aggel is limited by the fact that the area immediately around the lake is not protected, allowing free access to the lake for grazing and poaching (M. Patrekeev *in litt.* 1991).

11.6.2 Species protection

Hunting was banned in the former Soviet Union (Borodin 1978). Current legal status in the independent republics is unclear.

11.7 EVALUATION

Marbled Teal has undergone a major decline in population size and distribution this century. This decline has been particularly pronounced in Turkmenistan. However, the current distribution and population size of the species in the CIS is unclear. There are probably vast areas of wetlands in the former range whose current avifauna is poorly known, and these areas require surveys. For example, the large population wintering in Sind, Pakistan, might breed in eastern Kazakhstan or Tadjikistan. The nature of migration within the CIS is also unclear, but most of the remaining birds are likely to migrate south to winter in Iran, Afghanistan and Pakistan. Alternatively, they could be overlooked amongst the large flocks of other species counted at CIS sites in midwinter (Perennou & Mundkur 1991).

None of the sites known to be currently important to the species is well protected, and there is an urgent need to improve their conservation status to prevent further declines in the CIS population of Marbled Teal. There are currently major political and financial constraints within the CIS that will make such conservation action very difficult to achieve.

11.8 ACTION NEEDED

Survey of former and current assumed breeding sites in Kazakshtan, Azerbaijan, Armenia, Turkmenistan, Uzbekistan and Tadjikistan to establish current status.

Azerbaijan: Protection of lakes to the south of the Kura river from Aggel to Saraesy, Kizil Agach, Saraesy and Lake Bos-Koba from poaching and habitat degradation. Aggel, Saraesy and Lake Bos-Koba should be Ramsar Sites. At Lake Aggel the protected area should be extended well beyond the edges of the lake, protected status should be enforced to prevent poaching, facilities and training of the reserve guards should be improved.

Armenia: Protection of Armashski Carp Farm.

Turkmenistan: Protection of Lake Katta-shor, Lake Sultandag and sedimentation ponds near Chardzhou.

Joint ringing studies should be initiated between the CIS states in cooperation with Iran and Pakistan.

11.9 SITE DIRECTORY

KEY SITES
Armashski Carp Farm
Lake Aggel
Lake Saraesy
Kizil-Agach State Reserve
Lake Bos-Koba
Lake Katta-shor
Lake Sultandag
Sedimentation ponds near Chardzhou

SITES OF SOME IMPORTANCE
Lake Mahmud-chala
Lake Shorbet-Koba
Bukhara and Kagan Lakes
Kelif Lakes

Name Armashski Carp Farm.
Location Araks (Aras) Valley, Armenia.
General Description 15,000 ha. Margins contain dense beds of *Phragmites* and *Carex*. The northern edge contains marshy sections with low-growing vegetation where Marbled Teal and various other wildfowl and waders breed.
Protected Status None.
Threats Poaching.
References Adamyan 1989.
Status of Marbled Teal Breeding site, with 32 birds and two nests seen on 23.6.87.

Name Aggel (Ak-Gyol, Ag Göl, Ah-gol) State Reserve.
Location 40.05 N, 47.40 E. Agjabedy district, Azerbaijan.
General Description Permanent saline lake of 10,000 ha. Part of a vast lake system to the south of the Kura river.
Depth Maximum 4.5 m. Average 0.2-1 m.
Protected Status State Reserve. State owned.
Threats Commercial fishing, poaching, grazing and drainage.
References M. Patrekeev *in litt.* 1992, IBA 076.
Status of Marbled Teal Regular breeding site, with an estimated 50 breeding pairs. Occasional in winter.

Name Lake Saraesy (Sary-Su).
Location Imishly district, Azerbaijan.
General Description Permanent saline (8%) lake of >20,000 ha with vast reedbeeds, fed by irrigation channels.

Depth 0.1-1.4 m.
Protected Status None.
Owner Partly rented by Azerbaijan Hunters' Society.
Threats Poaching, pollution and encroachment.
References M. Patrekeev *in litt.* 1992.
Status of Marbled Teal Regular breeding site with at least 20 pairs. 70 birds in summer 1989.

Name Kizil-Agach State Reserve.
Location 39.05 N, 48.57 E. Kirov Bays, Azerbaijan.
General Description Coastal area of the Caspian, with bays and shallow floodlands and lagoons with variable inflow of freshwater.
Protected Status State reserve and Ramsar site.
Threats Poaching.
References Ramsar 1990, IBA 077.
Status of Marbled Teal Regular breeding site with up to 5-10 pairs.

Name Lake Bos-Koba/Vtorye "plavni" (fore-delta) (Lake Zahermar).
Location Agjabedy, Beilagan & Imishly districts, Azerbaijan.
General Description Permanent saline lake of c.4000 ha in ancient bed of Kura river with vast reedbeds.
Depth 0.2-3.4 m.
Protected Status None.
Owner Partly rented by Azerbaijan Hunters' Society.
Threats Being degraded by development and oil exploration.
References M. Patrekeev *in litt.* 1992.
Status of Marbled Teal Thought to be a regular breeding site.

Name Lake Katta-shor.
Location 39.00 N, 63.00 E. Chardzhou Oblast, Turkmenistan.
Area 5400 ha.
References A. Poslavski *in litt.* 1990.
Status of Marbled Teal Several pairs with broods in 1985.

Name Lake Sultandag.
Location 38.45 N, 64.18 E. Chardzhou Oblast, Turkmenistan.
Area 13,000 ha.
References A. Poslavski *in litt.* 1990.
Status of Marbled Teal 70 breeding pairs in 1986 in the Barsa-Kelmes bay.

Name Sedimentation ponds near Chardzhou.
Location c. 39.09 N, 63.34 E, Turkmenistan.
Status of Marbled Teal Up to 5-10 pairs breed.

Name Lake Mahmud-chala, Third Chala (Novogolovskaya Chala), Agchala.
Location Djalilabad and Pushkin Districts, Azerbaijan.
General Description Shallow, permanent, saline lake of c.4,000 ha with vast reedbeds, fed by irrigation channels.
Protected Status None.
Owner Azerbaijan Hunters' Society.
Threats Intensive legal and illegal hunting, pesticide pollution from surrounding cotton fields.
References M. Patrekeev *in litt.* 1992.
Status of Marbled Teal Summer visitor. 30 birds in 1989.

Name Lake Shorbet-Koba.
Location Near Lake Bos-Koba, Mil Steppe, Azerbaijan.
Area 300 ha.
References E. Sultanov *in litt*. 1993.
Status of Marbled Teal Thought to be a regular breeding site. 90 birds in May 1990.

Name Lakes at Bukhara and Kagan.
Location c. 39.47 N, 64.26 E. Uzbekistan.
Status of Marbled Teal Female with brood seen c.1987.

Name Kelif/Kelifskiye Lakes.
Location 37.50 N, 64.20 E. Karakum Canal, Chardzhou Oblast, Turkmenistan.
Area 9,300 ha.
References A. Poslavski *in litt.* 1990.
Status of Marbled Teal Possibly breeding.

11.10 RECORDS FOR FORMER USSR

Location	Date	Source	Number	Notes
<u>Azerbaidzhan</u>				
Kura Valley	1930s-40s	V	-	distribution until 30s-40s
Kura Valley lake system (including Aggel & Saraesy)	up to 1991	XVIII	c.400	c.200 pairs, including 50-60 on Lake Aggel
Lake Saraesy	up to present	XIX	40	c.20 pairs
Lake Saraesy	summer 1989	XXIV	70	
Aggel State Reserve	summer 1960s	VI	50-60	probably refers to number of pairs, not individuals
Aggel State Reserve	feb 1972	XII	-	few hundred in very cold winter
Aggel State Reserve	pre 1984	XII	-	up to 3 pairs breeding
Lake Aggel/Ag-gyol	summer 1989	XXIV	90	
Aras/Araks river valley	pre 1992	XIX	-	observed on Spring migration
Lakes of Mugan	19th century	XIX	-	common migrant
Lakes Mahmud-Chala & 3rd Chala	up to 1991	XVIII	-	present in Summer
Lakes Mahmud-Chala & 3rd Chala	July 1990	XIX	-	present
Lakes Mahmud-Chala & Agchala	summer 1989	XXIV	30	
Kizil Agach	late 1930s	XIX	-	assumed to be breeding

Kizil Agach (Khirmandalay)	25.12.43	XIX	1	shot
Kizil Agach	19.1.50	XIX	1	shot
Kizil Agach State Reserve, Kalinovski Liman	29.03.80	I	2	
Kizil Agach Nature Reserve	2.5 pre 1991	XIX	-	recorded
Kizil Agach Reserve	up to present	XIX	4-6	2-3 pairs. Breeding not proved
Samur delta (fish pond)	11.03.68	XIX	2	pair
Lake Bos-Koba/Vtoryye Plavni (fore-delta)	pre 1989	IV	-	known to breed
Lake Shorbet-Koba	May 1990	XXIV	90	
Divichi Liman	up to present	XIX	-	seen on autumn migration
Abskeron Peninsula	pre 1990	XIX	1	died in oil lake (Autumn migration)
Armenia				
Erevan region	pre 1916	XVI	-	common in spring, not registered as breeding
Araks Valley	1954	II	-	rare migratory bird
Armashki Carp Farm, Araks Valley	1984	II	-	first record
Armashki Carp Farm, Araks Valley	10.04.85	II	-	first spring record
Armashki Carp Farm, Araks Valley	22.05.85	II	1	female shot
Armashki Carp Farm, Araks Valley	23.06.87	II	32	+2 nests (12 & 5 eggs)
Turkmenistan				
Lower Atrek	end C.19th	XIV	-	very numerous on autumn migration
Lower Atrek	1932	XIV	17,200	
Lower Atrek	1935	XIV	-	extremely numerous on migration & wintering
Atrek Valley, west Uzboi	end 1930s	VI,X	-	wintered in large groups and bred
Lower Atrek	1939	XIV	-	extremely numerous on migration & wintering
Lower Atrek	12.06.75	XIV	1	only record between 1973-80
Amudarya Valley	until 1940s	XIV	-	known to breed
Chardzhou to Khodzheili, Amudarya	1940	XIV	20	in breeding season
Lake Katta-shor, middle Amudarya	15-30.05.85	XIV	-	several pairs with broods of 5-6.
Middle Amudarya Valley	1984-91	XIV	-	bred in some years, not in others
Sedimentation ponds nr. Chardzhou, Amudarya	c.1991	XIV	10-20	still breeds (5-10 pairs)
Lake Sultandag (Barsa-Kelmes bay)	1986	XIV	140	70 pairs bred
Kelif Lakes, Karakum canal	1992	XIV	-	reputed to breed in low numbers
Murgab Valley	until 1940s	XIV	-	known to breed
Tedzhen valley	until 1940s	XIV	-	known to breed
Tedzhen & Murgab	1930s-40s	V,X	-	distribution until 30s-40s
Lakes of Uzboi	1930s-40s	V	-	distribution until 30s-40s
Lakes of Western Uzboi	until 1940s	XIV	-	known to breed
Gyaurski Region (ponds)	01-15.09.79	XIV	1	
Lake Chaskak	20.05.82	XIV	5	
Uzbekistan				
Uzbekistan	20.10.pre1936	XIV	-	only autumn record
Lower Amadurya Delta	1961	XIV	-	rare by this date.
Middle Amadurya Valley (nr. Dargan-Alta)	1984	XIV	-	flying young & adults
Khorezm	pre 1882	XIV	-	reported
Khorezm Oases	pre 1956	XIV	-	more frequent than Amadurya delta
Maipost	pre 1953	XIV	-	found in Summer
Lake Sudochye	pre 1953	XIV	-	found in Summer
Lake Siplan	05.05.65	XIV	-	several
Lower Zazafshan	up to present	XX	-	present in Summer
Yuzhnosivikhanskoye reservoirs	up to present	XX	-	present in Summer
Lakes of Central Uzbekistan	Winter 90-91	XVII	-	hundreds, unconfirmed record
Yuzhnosurkhan Reservoir	June 1962	XIV	-	recorded
Bukhara and Kagan lakes	c.1987	XIII	4	female and 3 young
Turkmenia/Uzbekistan				
Amudarya Valley	pre 1987	III,XIV	-	small numbers breed

Amudarya Valley	1960s	X	0	disappeared by 60s
Kazakhstan				
Dengiz region, Guryev Oblast, Ural estuary	June 1951	VIII	1	shot
Guryev Oblast	1963	XV	-	present
Ural Oblast	1953	XV	-	present
Ural estuary	pre 1960	IX, XV	-	small number bred
North coast of Caspian Sea to Ural estuary	1875	IX	-	nesting
Syrdarya Valley, middle and lower	pre 1960	IX, XV	-	small number bred here
Lower reaches of Kurchum River	1904	IX	-	present
Lakes near Urda	pre 1960	IX, XV	-	"found more than once"
Lakes near Urda	1950s & 60s	XV	-	repeatedly shot; common
Kamysh Samarskiye lakes	July 1937	IX	-	possibly some nesting
Telikul Lakes	pre 1936	XV	-	recorded
Idem Lake nr. Novo-Kazanka	Sept 1953	XVII	6	
Turum Place, Dengiz region	15.04.53	XVII	2	
Russia				
Volga Delta near Ganyushkino	pre 1960	IX	-	nest in small numbers
Volga Delta	1953	VI	2	moulting birds caught
Gorki	pre 1989	IV	-	recorded
Lake Ilmen	pre 1989	IV, XVI	-	recorded
Terek Delta	by 1960s	X	-	ceased breeding
Terek River near Elkhotovo station	Jan 1981	XXI	3	one shot
Ardon, Northern Caucasus	6.12.86	XXI	7	
Telikol/Telikulsk lakes	pre 1960	IX	-	nest but scarce
Solyonoe Lake, Anzigzsky, Northern Caucasus	01.09.84	XXII	1	shot
Solyonoe Lake, Anzigzsky, Northern Caucasus	mid Apr 1985	XXII	2	
Dadynskoe Lake, Northern Caucasus	01-15.10.81	XXII	1	shot
Mouth of Samur River, fish pond	11.03.68	XXIII	2	pair
Tadjikistan				
Melnikova	pre 1952	XVI	-	rare breeder
Kirovabad	pre 1952	XVI	-	rare breeder
Parkhar	pre 1952	XVI	-	rare breeder
Ukraine				
Ukraine	pre 1989	IV	-	recorded

I Babayev 1984
II Amadyan 1989
III Vinokurov 1987
IV Bakkal *et al.* 1990
V Stepanyan 1990
VI Borodin 1984
VIII IZASK 1978
IX Dolgushin 1960
X Krivenko 1983
XI Vlint & Krivenko 1990
XII Tuaien & Kurbanov 1984
XIII V.Ye Flint pers. comm. 1991
XIV Poslavski 1992
XV Pridatko 1991
XVI Dementiev & Gladkov 1952
XVII V.I. Pridatko pers comm. 1992
XVIII Patrekeev 1991
XIX M.V. Patrekeev *in litt.* 1992
XX Kashkaro 1983
XXI Komarova & Komarov 1988
XXII Khoelov 1989
XXIII J. Shegalin *in litt.* 1992
XXIV E. Sultanov *in litt.* 1993

12. ISLAMIC REPUBLIC OF IRAN

12.1 LOCAL NAME

Ordak Marmary (Marbled Duck).

12.2 DISTRIBUTION AND STATUS

Phillips (1923) described Marbled Teal in Iran as "quite common ... wintering on the littoral of the Persian Gulf and Arabian Sea, and breeding on the south coast of the Caspian, in the Parapamis, the Seistan region, and farther east and south". There have since been some apparent changes in distribution, but Iran currently has a large resident population supplemented during winter by unknown numbers of birds migrating from Iraq and the Commonwealth of Independent States. While Iran may hold up to 75% of the world population in winter, it is possible that the majority of these birds breed in neighbouring countries. The major Marbled Teal sites are now found in south-west Iran in Khuzestan and Fars Provinces.

In Fars the most important breeding site is Lake Parishan, where over 1,000 birds have been recorded in summer and there are likely to be several hundred breeding pairs in some years (B. Behrouzi Rad pers. comm. 1991). In the 1970s, Marbled Teal were recorded in summer at various other sites and breeding was confirmed at Lake Tashk and Soltanabad Marshes (D.A. Scott *in litt.* 1991). Lake Parishan and Bakhtegan and Tashk Lakes are both important sites in mid-winter and have both held several thousand birds on a number of occasions (Table 12). Smaller numbers winter in Dasht-e-Arjan and several other sites.

Breeding and wintering birds move around within Fars in response to changes in conditions. For example, the Bakhtegan and Tashk wetlands dry out completely during prolonged droughts, Lake Parishan can be reduced by drought to a series of small spring-fed pools and Dasht-e-Arjan dries out completely in some summers and freezes completely in some winters. In the late 1960s and 1970s there was an estimated total breeding population of about 1,000 pairs and a wintering population of about 3,000 in years when conditions were suitable. This suggests that when conditions permit, the Fars population is resident with no major immigration from elsewhere. In very dry or cold winters, many of these birds winter elsewhere, probably in Khuzestan (D.A. Scott *in litt.* 1992).

In Khuzestan, the major known regular breeding site is the marshes along the Dez River where less than 100 pairs are thought to breed every year (B. Behrouzi Rad pers. comm. 1991). In the 1970s, breeding was also confirmed west of Ahwaz in floods and in Omidiyeh oxbow (D.A. Scott *in litt.* 1991). The vast lowlands of Khuzestan contain small wetlands scattered everywhere with abundant suitable breeding habitat for Marbled Teal, and they probably support at least a thousand, and possibly several thousand, breeding pairs (D.A. Scott *in litt.* 1992).

The most important wintering sites in Khuzestan are Shadegan Marshes and nearby Karoon Fish Pond, where thousands of birds are thought to winter every year. There are major fluctuations in the numbers recorded at Shadegan (Table 12), but this partly reflects the large size of the marshes which make accurate counting from the ground almost impossible. Only 10-20% of the marshes have been surveyed in some of the recent mid-winter censuses. In addition, flocks of Marbled Teal may have been missed in some years by inexperienced counters (B. Behrouzi Rad pers. comm. 1991). In November 1991, at least 23,000 Marbled Teal were counted here, 10,000-12,000 in Shadegan marshes and 13,000 in Karoon Fish Pond (B. Behrouzi Rad pers. comm. 1991). Other important wintering sites include Bamdej Marshes (1,100 birds in 1974), Hamideh Grassland, Hore Sosangerd and Sadi Shahvour marshes.

Important concentrations of Marbled Teal are sometimes recorded in other south-western provinces. In Bushehr Province, 1,000 teal were counted in January 1975 at the Helleh Rud Delta. In nearby Chaharmahal Province, 57

birds were counted at Chogakhor Marsh in midwinter 1992 (Table 12). In addition to these concentrations in south-west Iran, breeding and wintering also occurs on an occasional basis in the north-west in Azerbaijan and Kurdestan Provinces. This region is usually extremely cold in winter and almost all freshwater wetlands are frozen solid. In the 1970s, small numbers were recorded throughout the year from several sites in Azerbaijan and breeding was confirmed at Akh Gol Lake. Breeding probably also occurred in some of the numerous fresh to brackish lakes and marshes that lie in the Lake Oroomiyeh basin (D.A. Scott *in litt.* 1991). There was probably a breeding population of 50 to 100 pairs in Azerbaijan in the 1970s. This population was migratory with only a few birds remaining in winter in mild years (D.A. Scott *in litt.* 1992). Fewer than 100 birds are still regularly seen at Ghara Geshlaq marshes in September, suggesting that Azerbaijan Province still holds an important population. This province is also likely to be used on passage by birds that breed in the CIS (Azerbaijan, Armenia and possibly Russia) and winter in south-west Iran (B. Behrouzi Rad pers. comm. 1991).

Early this century, large numbers of Marbled Teal bred and wintered in Turkmenistan and thousands were recorded on migration and in winter on the lower Atrek and adjacent sections of the south-east Caspian on the Iranian border (see 11.2). It is very likely that, before 1940, thousands of birds moved through this area to winter in Iran. In the 1970s, very small numbers were recorded on spring and autumn passage on the south-east coast of the Caspian Sea in Mazandaran Province (D.A. Scott *in litt.* 1991). The largest count was 29 on the sea off Miankaleh Peninsula on 28th February 1972. These are likely to have been birds breeding in Turkmenistan, but the paucity of records suggests that the spring and autumn passage through the south-east Caspian was unlikely to involve more than a few hundred birds (D.A. Scott *in litt.* 1992). This is consistent with the drastic decline in the size of the breeding populations in Turkmenistan and Uzbekistan.

A further population may occur in Seistan Province on the border with Afghanistan, where breeding was reported by Phillips (1923) and small numbers have occasionally been counted in mid-winter (six at Hamoun-e Saberi in 1970, one at Hamoun-e Puzak in 1977 and two at Chahnimeh in 1991). There is also an isolated record from Baluchistan Province. Although breeding has not been recorded in Seistan in recent decades, it is likely to continue, at least in wet years. One bird was recorded in June 1973 at Hamoun-e Saberi. These wetlands have always been subject to wide fluctuations in size according to variations in rainfall and snowfall in central Afghanistan, and have regularly dried out completely during long periods of drought (e.g. in 1971), at least on the Iranian side (D.A. Scott *in litt.* 1991). It is likely that the size of the Seistan population fluctuates in response to wide variations in the size of the wetlands here, and that during drought periods the birds move south-east from Seistan to Pakistan. There are several ringing recoveries of other duck species that link the Seistan wetlands to those of the Indian subcontinent and the "Indus Flyway" (D.A. Scott *in litt.* 1992). A considerable passage was observed at Kafar Qal'eh in Khorasan Province in north-east Iran in April 1903 (Zarudny 1900; Savage 1968). This suggests that some of the birds breeding in Turkmenistan or Uzbekistan may formerly have wintered in the Seistan region.

Total numbers counted in Iran in winter appear to fluctuate widely, but it is unknown to what extent this reflects genuine variation in population size as opposed to variation in counting accuracy. There will inevitably be some real fluctuations in the size of the population in response to varying breeding success, mortality rates and immigration rates from neighbouring countries. Comparisons between actual numbers counted and numbers thought to be present include the following (Scott 1973; Argyle 1978; D.A. Scott *in litt.* 1992):

Winter	Number counted	Estimated total
1971-1972	10,150	15,000-20,000
1972-1973	21,513	25,000-30,000
1973-1974	6,477	10,000-15,000
1974-1975	7,460	9,000-12,000
1977-1978	11,052	13,000-16,000

It is noteworthy that the highest count from the 1970s (21,513 in 1973) is very similar to the highest counts since 1980 (20,812 in 1992), and the peak total population is still likely to be 25,000-30,000. It is likely that a good proportion of this number breed in Iraq, as there is no evidence that such a large number breed within Iran (D.A. Scott *in litt.* 1992). Local reports received during the Iran-Iraq war state that Marbled Teal were sometimes seen at Hoor Alazam very close to the Iraq border (B. Behrouzi Rad pers. comm. 1991)

12.3 HABITAT

Breeding occurs mainly in permanent freshwater marshes but also in temporary freshwater wetlands made in heavy floods, and in tiny wetlands such as irrigation ditches in small areas of waste ground amongst agricultural land (D.A. Scott *in litt.* 1992). Wintering occurs mainly in seasonal, fresh to brackish marshes. Marbled Teal are partially nomadic in winter, apparently concentrating in newly flooded areas in a similar way to Pintail *Anas acuta* and Common Teal *A. crecca*. This habitat preference probably explains the apparently massive influx of birds that breed in permanent wetlands in Iraq into south-west Iran in autumn when Shadegan and other sites flood (D.A. Scott *in litt.* 1992).

12.4 ECOLOGY AND BEHAVIOUR

Breeding success clearly fluctuates in relation to rainfall, with breeding at Lake Parishan and along the Dez River more successful in wetter years (B. Behrouzi Rad pers. comm. 1991). During the 1970s, pairing was seen by 11 April, nests with eggs were found from 5 May to mid June and chicks were seen from 5 June to 9 July (D.A. Scott *in litt.* 1991).

12.5 THREATS

12.5.1 Habitat loss and degradation

Significant areas of breeding and wintering habitat have been destroyed or degraded in recent decades. In Fars, Zarghan Marshes, Lapuyee Marshes and Soltanabad Marshes were important sites in the 1970s but have since been drained for agriculture. The Gumoon Marshes at Lake Tashk (the best breeding habitat in the Bakhtegan/Tashk area) have been partially reclaimed for agriculture and partially converted to fish ponds, and reclamation for agriculture has affected the Kamjan Marshes to the west of Lake Bakhtegan. A proposed new road and accompanying causeway between Lakes Tashk and Bakhtegan could cause a significant change to the hydrology of the region. Agriculture in the Kamjan marshes could pollute these lakes with fertilizers and pesticides (D.A. Scott *in litt.* 1992).

A small area of marsh (20 ha) in the north-west of Lake Parishan has been drained since the 1970s. Reclamation of marshes for agriculture since the 1970s has also affected several sites in the Lake Oroomiyeh catchment in Azerbaijan including Dorgeh Sangi, Gordeh Git and Ghara Geshlaq. There are also reports of drainage for agriculture affecting the Yadegarlu and Shurgol Ramsar site in Azerbaijan (D.A. Scott *in litt.* 1992). In Khuzestan, irrigation schemes have reduced the inflow of freshwater into the Shadegan Marshes, and have degraded some parts into sterile silt flats (Ramsar 1990).

Habitat creation in the Helleh Rud Delta may have benefited Marbled Teal, as up to 1,000 have been recorded there in midwinter. The main channel of the Helleh Rud river was blocked in about 1970 and the resulting flooding created a large system of lagoons and marshes providing excellent habitat for waterbirds (D.A. Scott *in litt.* 1992).

12.5.2 Warfare

The south-west of Iran has suffered very considerable ecological damage during the Iran-Iraq war and to a lesser extent as a result of the 1991 UN Coalition-Iraq war. Many areas of Khuzestan Province, including parts of the Shadegan Marshes, were heavily polluted by chemical bombardment (Ramsar 1990), but this is not thought to have affected the areas of importance to Marbled Teal. The part of the marshes closest to the coast suffered some damage from oil pollution in 1991, but the more inland areas of marsh frequented by Marbled Teal were not damaged. The region received considerable amounts of "black rain" resulting from the air pollution induced by the oil fires in Kuwait, and this may have caused some slight damage to important wetlands, but this is not likely to be serious (B. Behrouzi Rad pers. comm. 1991).

12.5.3 Hunting

Hunting appears to have been a significant problem immediately after the Islamic revolution, and may have caused a decline in the size of the Marbled Teal population (B. Behrouzi Rad pers. comm. 1991). Over 100 Marbled Teal were seen for sale together in Shadegan Market about 1984 (H. Farhadpour pers. comm. 1991). However, since then the species has become strictly protected and hunting is no longer considered to be a serious problem (B. Behrouzi Rad pers. comm. 1991). However, poaching was reported in 1991 at Lake Bakhtegan, at the Miankaleh Peninsula, Lake Parishan and Dasht-e-Arjan (where an estimated 500-1,000 birds are poached annually). Hunting is also thought to be intense at Shur Gol, Yadegarlu and Dorgeh Sangi Lakes in Azerbaijan (Ramsar 1990).

12.5.4 Others

Although reed cutting, grazing and agriculture is commonplace at and around the major Marbled Teal sites, in most areas it is thought to be taking place at a sustainable level of resource use and is not causing ecological damage to the wetlands (B. Behrouzi Rad pers. comm. 1991). However there is thought to be excessive grazing at Shur Gol, Yadegarlu and Dorgeh Sangi Lakes (Ramsar 1990). Carp are reported to have been introduced to Lake Parishan, and disturbance to waterfowl from fishing activities in the lake has increased significantly since the 1970s (D.A. Scott *in litt.* 1992). Mass die-offs of waterfowl are regularly reported at Ghara Gheshlaq. These may be caused by botulism, and may affect Marbled Teal (B. Behrouzi Rad pers. comm. 1991).

12.6 CONSERVATION MEASURES TAKEN

12.6.1 Habitat protection

The majority of the sites of current importance to Marbled Teal are Protected Areas or Wildlife Refuges with relatively effective protection (B. Behrouzi Rad pers. comm. 1991; D.A. Scott *in litt.* 1992). Many are also Ramsar Sites, the ones of most importance being Shadegan, Lake Parishan/Dasht-e-Arjan, Yadegarlu/Shurgol, Lake Oroomiyeh and the Miankaleh Peninsula (Ramsar 1990).

12.6.2 Species protection

Marbled Teal was given strict protection in 1985 and efforts to educate hunters about this protection have been made using official newspapers. The Department of the Environment in Iran currently has plans for a four-year study of Marbled Teal, collecting information on behaviour and ecology and conducting monthly surveys of important sites (B. Behrouzi Rad pers. comm. 1991).

12.7 EVALUATION

Iran is currently the most important range country for Marbled Teal, holding the majority of the world population

in winter and possibly in summer. There is likely to have been a considerable decline in the size of the wintering population this century owing to the reduction in the number of migrants breeding in the CIS. However, there is no evidence of a decline in the size of the Iranian population since detailed monitoring began in the late 1960s. Although there has been some habitat loss since then, most important sites are now well protected. The most important current threats are likely to be those facing birds breeding outside Iran in Iraq and the CIS. Attention in Iran should focus on continuing the effective habitat and species protection measures and conducting population studies to establish how birds move between breeding and wintering sites within and beyond Iran. There is also a need for more detailed monitoring to clarify the breeding distribution of the species.

12.8 ACTION NEEDED

Research: ringing studies of movements of birds between different parts of Iran and exchange with Iraq, Azerbaijan, Armenia, Turkmenistan, Uzbekistan and Pakistan. Detailed studies of breeding and winter ecology, particularly of habitat needs.

Summer survey of potential breeding sites in Fars (e.g. Kamjan Marshes, Haft Barm Lakes), Khuzestan, Azerbaijan and Seistan.

Lakes Bakhtegan and Tashk: the proposal for a road between the lakes should be reviewed and the Kamjan Marshes should be designated as a buffer zone for the Wildlife Refuge, with restrictions on hunting and use of agricultural chemicals.

Lake Parishan: No-fishing zones should be considered.

Protection of additional sites: Ghara Gheshlaq, Helleh Rud Delta and Chogakhor Marshes should be considered for designation as Ramsar sites. Bamdej and Sadi Shahvour Marshes and Haft Barm Lakes should be considered for protection status.

12.9 SITE DIRECTORY

KEY SITES
Lake Parishan
Bakhtegan & Tashk Lakes
Dasht-e-Arjan
Shadegan
Karoon Fish Pond
Bamdej and Sadi Shahvour Marshes
Karkheh River Marshes
Helleh Rud Delta
Haft Barm Lakes
Dez River Marshes
Ghara Geshlaq

SITES OF SOME IMPORTANCE
Lake Maharlu
Hore Sosangerd
Hamideh Grassland
Karun River Marshes south of Shushtar
Yadegarlu
Shurgol
Chogakhor Marsh
Akh Gol Lake
Gareh Marsh
Lake Oroomiyeh/Jogatu Chay Delta
Floods and Omidiyeh oxbow west of Ahwaz
Caspian Sea off Miankaleh Peninsula

Name Lake Parishan.
Location 29.30 N, 51.50 E. Fars Province.
Protected Status Protected Area, Biosphere Reserve and Ramsar Site.
Threats Disturbance from fishing motorboats, possible inflow of sewage and fertilizers, poaching, fish introductions.
References Ramsar 1990, D.A. Scott *in litt.* 1992.
Status of Marbled Teal Up to 1,182 birds recorded in summer (13.6.71) and hundreds of breeding pairs in some years. Up to 5,500 in midwinter (1992).

Name Bakhtegan & Tashk Lakes (Neiriz Lakes).
Location 29.40 N, 53.30 E. Fars Province.
Protected Status Protected area - Wildlife Reserve, Ramsar Site & National Park approved for area.
Threats Upstream dam and irrigation have reduced water supply. River Kor introduces some pollution. Road proposed to run between the lakes would affect hydrology and increase access for poachers. Much of Kamjan & Gumoon Marshes destroyed by drainage for agriculture and conversion to fish

ponds. Agricultural activities could affect water quality in the lakes.
References Carp 1980, Ramsar 1990, D.A. Scott *in litt.* 1992.
Status of Marbled Teal Up to 5,000 in mid-winter (1990) on Lake Bakhtegan. Up to 470 in summer at Gumoon on Lake Tashk (June 1971) where breeding occurred.

Name Dasht-e-Arjan.
Location 29.30 N, 52.00E. Fars Province.
Protected Status Protected Area, Ramsar Site, Biosphere Reserve.
Threats Poaching, two high tension power lines run across the site.
References Ramsar 1990, D.A. Scott *in litt.* 1992.
Status of Marbled Teal Up to 100 in summer (14.6.77). Up to 40 in midwinter (1976).

Name Shadegan Marshes.
Location 30.30 N, 48.30-45 E. Khuzestan Province.
Protected Status Protected area, Wildlife Refuge, Ramsar Site.
Threats Some areas were severely damaged by chemical weapons pollution during Iran-Iraq war. Irrigation on Karun River has reduced water input. Poorly managed irrigation has converted some areas into sterile, saline silt flats.
References Carp 1980, Ramsar 1990.
Status of Marbled Teal Major and regular wintering site, with up to 19,979 (January 1973). Small numbers in the breeding season. Uses only brackish part of marshes.

Name Karoon Fish Pond.
Location about 20 km from Shadegan Marshes. Khuzestan Province.
General Description A permanent, eutrophic, exorreic, freshwater pond of 355 ha and a maximum depth of 1 m.
Altitude < 500 m.
Protected Status Privately protected.
Owner Private.
References B. Behrouzi Rad pers. comm. 1991.
Status of Marbled Teal Major wintering site, with 13,000 in November 1991.

Name Bamdej Marshes & Sadi Shavour/Horeh Bamdej Marsh.
Location 31.43 N, 48.38 E. Khuzestan Province.
General Description 12,000 ha of freshwater and permanent wetlands.
Protected Status None.
References Carp 1980, IWC.
Status of Marbled Teal In mid-winter, up to 1,100 at Bamdej (1974) and 13 at Sadi Shahvour (1971). Up to 28 in summer at Bamdej (6.6.74).

Name Karkheh River Marshes.
Location 31.45 N, 47.55 E. Khuzestan Province.
General Description Permanent and freshwater marshes of 3500 ha.
Protected Status 1,538 ha is protected in a Wildlife Refuge.
References Carp 1980, IWC.
Status of Marbled Teal Up to 250 in midwinter (1975).

Name Helleh (Halileh) Rud Delta.
Location 29.10 N, 50.47 E. Bushehr (Gulf) Province.
Area 10,000 ha.
General Description A man-made, permanent wetland, the Helleh Rud river was blocked in c.1970, and spread over a saline plain, creating a system of fresh-brackish lagoons & marshes. Depth 3.5 m.
Protected Status Protected Area - downgraded from Wildlife Refuge.
References Carp 1980, D.A. Scott *in litt.* 1992, IWC.
Status of Marbled Teal Up to 1,000 in winter (1975), and single summer record (37 in June 1974).

Name Haft Barm Lakes.
Location 29.46 N, 52.00 E. Fars Province.
General Description 150 ha. Freshwater and permanent with depth 2 m.
References IWC.
Status of Marbled Teal 200 in June 1971 (only record).

Name Dez River Marshes/Dez Dam and River/Oxbow of Dez River in Dez Wildlife Refuge.
Location 31.50 N, 48.38 E. Khuzestan Province.
General Description 8,000 ha of wetlands. Main site is Dez River with 2,000-3,000 ha of freshwater, permanent and eutrophic marshes dotted along banks. Maximum depth < 5 m.
Altitude 1,500 m.
Protected Status 3,837 ha lies within a 15,873 ha Wildlife Refuge.
Threats Grazing by cattle, but not heavy.
References Carp 1980, B. Behrouzi Rad pers. comm. 1991.
Status of Marbled Teal Regular breeding site with <100 pairs. 70 in midwinter on dam and river in 1992.

Name Ghara Geshlaq.
Location 37.10 N, 45.45 E. On plains south of Lake Oroomiyeh, Azerbaijan Province.
General Description 400 ha. Fresh to saline, with extensive freshwater marshes and Marbled Teal found in fresh and brackish parts. Usually frozen in winter. Permanent, eutrophic and maximum depth 1 m.
Altitude 1,200 m.
Protected Status Non-Hunting Area, probably soon to be a Protected Area. Proposed Ramsar Site.
Owner State.
Threats Regular mass-die offs of waterbirds, possibly caused by botulism. 100,000 birds are thought to have died in one year.
References B. Behrouzi Rad pers. comm. 1991, D.A. Scott pers com. 1992, IWC.
Status of Marbled Teal Up to 40 seen in summer (1.7.71). <100 regularly in September in recent years.

Name Lake Maharlu.
Location 29.27 N, 52.42 E. Fars Province.
General Description Brackish lake of 21,600 ha and depth 2 m. Dries out almost completely in dry years.
Protected Status None.

References Carp 1980, IWC.
Status of Marbled Teal Up to 21 birds in summer (12.6.71).

Name Susangerd/marsh west of Susangerd=Hoor Alazim.
Location 31.31 N, 48.13 E. Khuzestan Province.
References IWC.
Status of Marbled Teal Up to 60 in winter (November 1973).
Name Hamidieh/Omidiyeh.
Location 31.28 N, 48.26 E. Khuzestan Province.
General Description Temporary fresh wetland of depth 0.3 m.
References IWC.
Status of Marbled Teal 20 in January 1988 (only record).

Name Karun River Marshes/marshes south of Shushtar.
Location 31.45 N, 48.54 E. Khuzestan Province.
Area 2,500 ha.
General Description Permanent, fresh.
Protected Status None.
References Carp 1980, IWC.
Status of Marbled Teal 12 in January 1977, 34 in May 1973. Probably bred in 1922.

Name Yadegarlu.
Location 37.00 N, 45.30 E. Azerbaijan Province.
Protected Status Ramsar Site.
Threats Over-grazing, excessive hunting, possible urbanisation, possible drainage activities, political unrest in the region.
References Carp 1980, Ramsar 1990, D.A. Scott *in litt.* 1992.
Status of Marbled Teal Recorded in summer (40 birds) and mid-winter (10 in 1971).

Name Shur Gol.
Location 37.00 N, 45.26 E. Azerbaijan Province.
Protected Status Ramsar Site.
Threats Over-grazing, excessive hunting, possible drainage activities, political unrest in the region.
References Carp 1980, Ramsar 1990, D.A. Scott *in litt.* 1992.
Status of Marbled Teal Up to 30 in summer (July 1971), and up to 7 in winter (November 1972).

Name Chogakhor Marsh.
Location 31.50 N, 51.06 E. Chaharmahal and Bakhtiari Province.
General Description Permanent freshwater marsh of 1,600 ha of depth 2 m.
Protected Status None. (Proposed Protected Area and Ramsar Site).
References Carp 1980, D.A. Scott *in litt.* 1992, AWC.
Status of Marbled Teal 57 in January 1992 (only record).

Name Akh Gol Lake.
Location 39.35 N, 44.47 E. Azerbaijan Province.
General Description Brackish semi-permanent lake of 600 ha.
References IWC.
Status of Marbled Teal Two adults and nine pulli in July 1974 (only record, but a very remote site).

Name Gareh Marsh.
Location Azerbaijan Province. Possibly Ghara Geshlaq?
Status of Marbled Teal 60 in July 1975 (only record).

Name Lake Oroomiyeh/Jogatu Chay Delta Marshes.
Location 37.00 N, 44.40 E. Azerbaijan Province.
Protected Status Ramsar Site, National Park, Biosphere Reserve.
Threats Recreational use currently slight but could be a problem if expansion not controlled. Pollution threat from towns of Oroomiyeh & Tabriz.
References Carp 1980, Ramsar 1990.
Status of Marbled Teal Up to 25 in summer (June 1972) in the Jogatu Chay Delta. Also occur at times in other marshes where freshwater enters the hypersaline lake.

Name Floods and Omidiyeh oxbow west of Ahwaz.
Location Khuzestan Province.
Area Oxbow is 3 ha.
References D.A. Scott *in litt.* 1993.
Status of Marbled Teal 5 adults and 25 pulli on 5.6.74.

Name Miankaleh Peninsula, Caspian Sea.
Location 36.50-57 N, 53.17-54.00 E. Mazandaran Province.
Protected Status Protected Region - Wildlife Refuge, Biosphere Reserve, Ramsar Site.
Threats Poaching; nuclear power station planned nearby; irrigation schemes may reduce freshwater input; fish processing factory at Ashuradeh; proposed road up centre of peninsula would increase disturbance and poaching.
References Carp 1980, Ramsar 1990, D.A. Scott *in litt.* 1992.
Status of Marbled Teal Up to 29 (28 February 1972) on spring and autumn passage.

12.10 RECORDS FOR IRAN

Location	Date	Source	Number	Notes
<u>Azarbaijan Province</u>				
Azarbaijan	1977/78	XII	17	midwinter
Akh Gol Lake	9.7.74	I	11	2+9 chicks
Dorgeh Sangi Lake	12.8.71	I	6	
Gordeh Git Marshes	5-12.7.75	I	3	
Ghara Geshlaq marshes	1.7.71	I	40	
Ghara Geshlaq marshes	16.8.72	I	5	
Ghara Geshlaq marshes	Sept pre 1992	XIV	-	<100 regularly seen, perhaps on passage
Gareh Marsh	05-12.07.75	I	60	probably Ghara Geshlaq

Lake Kobi	12.8.71	I	1	
Jogatu Chay delta marshes, L. Oroomiyeh,	22.6.72	I	25	
Jogatu Chay delta marshes, L. Oroomiyeh,	30.8.73	I	12	
Jogatu Chay delta marshes L. Oroomiyeh,	29.6.74	I	1	
Lake Oroomiyeh, marsh near NW shore	28.6.74	I	1	
Shur Gol Lake	1.7.71	I	30	
Shur Gol Lake	22.11.72	I	7+	
Shur Gol Lake	29.6.74	I	10	
Yadegarlu Lake	1.7.71	I	40	
Bushehr Province				
Halileh Rud Delta	2.6.74	I	5	
Halileh Rud Delta	3.6.74	I	37	
Fars Province				
Fars	77/78	XII	2	midwinter
Lake Bakhtigan, Doshok at west end	16.10.73	I	1,000	
Lake Bakhtigan, west end	19.11.73	I	35	
Lake Tashk, Gumoon	12.5.65	I, XIII	5	
Lake Tashk, Gumoon	14.4.67	I, XIII	1	
Lake Tashk, Gumoon	9.8.67	I, XIII	14	
Lake Tashk, Gumoon	11.8.67	I, XIII	5	
Lake Tashk, Gumoon	15.8.67	I, XIII	10	
Lake Tashk, Gumoon	17.8.67	I, XIII	9	
Lake Tashk, Gumoon	23.8.67	I, XIII	10	
Lake Tashk, Gumoon	26.8.67	I	5	
Lake Tashk, Gumoon	30.8.67	I	1	
Lake Tashk, Gumoon	1.9.67	I	11	
Lake Tashk, Gumoon	3.5.68	I	11	
Lake Tashk, Gumoon	7.2.69	I, XIII	12	
Lake Tashk, Gumoon	early.6.70	I	250	1 nest + eggs
Lake Tashk, Gumoon	mid.6.70	I	250	1 nest + 8 eggs
Lake Tashk, Gumoon	14.6.71	I	470	
Lake Tashk, Gumoon	20.6.71	I	sev. 100	
Lake Tashk, Gumoon	8.5.72	I	24	
Band Amir Marshes	1.4.58	I	-	common but no sign of breeding
Dasht-e-Arjan	67/68	V	4	
Dasht-e-Arjan	11.5.67	I, XIII	3	
Dasht-e-Arjan	06.12.67	I, XIII	2	
Dasht-e-Arjan	11.5.68	XIII	3	
Dasht-e-Arjan	9.5.72	I	2	
Dasht-e-Arjan	14.6.77	I	100	
Haft Barm Lakes	22.6.71	I	200	
Lapuyee Marsh	21.1.68	I, XIII	12	
Lake Maharlu, Barmishur marshes	12.6.71	I	21	
Lake Maharlu (NW = Ab-e Parvan)	5.5.72	I	14	
Lake Maharlu (Barmishur and Ab-e-Paravan)	28.5.74	I	1	
Lake Parishan	28.7.68	I	95	
Lake Parishan	13.2.69	I	86	
Lake Parishan	14.2.69	I	73	
Lake Parishan	26.2.71	II	3	
Lake Parishan	13.6.71	I	1,182	
Lake Parishan	10.5.72	I	48+	
Lake Parishan	6.1.73	I	200+	
Lake Parishan	3.2.73	I	10+	
Lake Parishan	4.2.73	I	20	
Lake Parishan	14.10.73	I	20+	
Lake Parishan	17.11.73	I	1,150	

Lake Parishan	28.10.74	I	1,000+	
Lake Parishan	12-14.6.75	I	20	2 families of 6 or 7 chicks
Lake Parishan	7.7.75	I	160	
Lake Parishan	20.11-30.12.75	I	2,000	
Lake Parishan	2-6.5.76	I	400-500	obvious breeding
Lake Parishan	11.4.76	I	6	3 pairs
Lake Parishan	18.5.76	I	100	many pairs
Lake Parishan	10-20.6.76	I	4	brood of 4; nest + 7 eggs
Lake Parishan	10.6.77	I	560+	560 + some chicks
Lake Parishan	30-31.1.92	I	0	
Soltanabad Marshes	12.6.71	I	94	
Soltanabad Marshes	5.5.72	I	55	nest + 9 eggs
Zarghan Marshes/marsh near Takht-e-Jamshid	18.5.57	I, IV	200+	in pairs and flocks
Zarghan Marshes	28.1.65	I	1	
Zarghan Marshes	28.6.65	XIII	1	
Gilan Province				
Amirkelayeh Lake	23.11.69	I	1	probably an autumn migrant
Khuzestan Province				
Khuzestan Province	77/78	XII	11,033	midwinter
Ahwaz to Andimeshk road	26.8.72	I	2	
Ahwaz to Andimeshk road	27.4.73	I	3	
Ahwaz, floods west of	5.6.74	I	5	2+3 chicks
Ahwaz, oxbow of Karkheh river north of	15.5.72	I	8	
Ahwaz, Omidiyeh oxbow west of	14.5.72	I	4	
Ahwaz, Omidiyeh oxbow west of	5.6.74	I	25	3+22 chicks
Bamdej Marshes (east side)	5.6.74	I	5	
Bamdej Marshes (south end)	5.6.74	I	4	
Bamdej Marshes	6.6.74	I	28	
Dez Wildlife Refuge, oxbow of Dez River	15.5.72	I	4	
Dez Wildlife Refuge	29.4.73	I	36	
Dez Wildlife Refuge, oxbow of Dez River	7.6.74	I	11	1+10 chicks
Dez Wildlife Refuge, oxbow of Dez River	6.6.74	I	5	
Dez Wildlife Refuge, Dez River Marshes	pre 1992	XIV	-	regular breeder with <100 pairs
Shadegan Marshes	28.4.69	I	-	common
Shadegan Marshes (south)	13.5.72	I	3	
Shadegan Marshes (north)	14.5.72	I	2	
Shadegan Marshes	9.3.72	I	400	
Shadegan Marshes	8.1.73	I	14,480	
Shadegan Marshes	4.6.74	I	10	
Shadegan Marshes	1.11.91	XIV	10,-12,000	
Karoon Fish Pond	1.11.91	XIV	13,000	
Shushtar	1922	I	-	"must breed" here (Ticehurst 1922)
Shushtar, marshes south of	19.5.73	I	34	
Hoor Alazim/marsh west of Susangerd	13.11.73	I	60	
Hoor Alazim	pre 1992	XIV	-	present according to local reports
Mazandaran Province				
Caspian Sea, east end of Miankaleh peninsula	28.10.70	I	3	probably autumn migrants
Caspian Sea near Babolsar	18.12.71	I	1	probably autumn migrant
Caspian Sea off Miankaleh peninsula	28.2.72	I	29	sitting on sea probably spring migrants
Khorasan Province				
Kafir Kala/Kafar Qal'eh	7-10.4.1903	III	-	considerable passage movement
Seistan Province				
Hamoun-e Saberi	4.6.73	I	1	

Seistan Wetlands	17-22.1.77	XV	1	ground survey when water levels were "very high"
<u>Baluchistan Province</u>				
Bampur	6.4.1872	I	1	female shot (Blanford 1876)

I D.A. Scott pers. comm. of counts by D.A.S, M. Smart, L. Cornwallis and many others
II Scott 1971
III Savage 1968
IV Passburg 1959
V Harrington 1971
VII Scott 1975
VIII Cornwallis 1971
XI Scott 1973
XII Argyle 1978
XIII Cornwallis 1969
XIV B. Behrouzi-Rad pers. comm. 1991
XV Scott 1978

13. IRAQ

13.1 DISTRIBUTION AND STATUS

Marbled Teal is reported to be one of only two species of Anatidae that are known to breed regularly in Iraq, the other being Ruddy Shelduck *Tadorna ferruginea* (Georg & Savage 1970). Marbled Teal is thought to breed widely in Central and South Iraq in wetlands of the Tigris and Euphrates valleys (Georg & Savage 1970), where it was reported to be a common breeder by Ticehurst *et al.* (1922) and Moore & Boswell (1956). On the basis of information on breeding distribution in Iran, more than 10,000 of the 25,000-30,000 birds wintering in Iran may summer in Iraq. This suggests that there may currently be thousands of breeding pairs in Iraq. It has been speculated that one Marbled Teal breeding site may be the marshes around Habbaniya Lake, a flood relief and storage reservoir of 43,000 ha on the west bank of the Euphrates (Georg & Savage 1968).

It is most likely that few birds winter in Iraq, and that the majority of breeding birds winter in Iran (Georg & Savage 1970; Scott & Carp 1982). However it is also possible that thousands of birds regularly winter in Iraq. There are old records of a few seen on the lower Euphrates in February (Phillips 1923). The only winter record in recent decades is one of 180 from Hor Ahmar in the Mahrut Valley in January 1968 (Georg & Vielliard 1970). No Marbled Teal were counted during three of the four winter surveys between 1967 and 1979 that are the most recent to be conducted in Iraq (Scott & Carp 1982). However, only a small proportion of the huge area of wetlands in the Tigris and Euphrates valleys of middle and lower Iraq were counted during these surveys (probably less than 10%, D.A. Scott *in litt.* 1992) suggesting that thousands of Marbled Teal could have been overlooked. Observations in Iran suggest that the preferred wintering habitat may be *recently* inundated floodplain wetlands like Shadegan Marshes. If so, birds in Iraq may move out of breeding sites in permanent marshes in central Mesopotamia into peripheral areas which flood in later autumn and winter. The winter surveys in Iraq have tended to concentrate on the main permanent marshes which may be less important for Marbled Teal (D.A. Scott *in litt.* 1992).

13.2 ECOLOGY AND BEHAVIOUR

The Marbled Teal breeding season is from May to July (Georg & Savage 1970).

13.3 THREATS

13.3.1 Habitat loss and degradation

During the Iraq-UN coalition war in 1991, many dams and much of the Iraqi irrigation system in the Tigris and Euphrates valleys were disrupted by bombing. Thus the hydrology of wetlands used by Marbled Teal may have been disrupted leading to drainage or degradation of important sites. These wetlands may also have suffered from the effects of pollution resulting from the numerous oil-fires, although the prevailing winds are north-westerlies that would blow smoke south-east down the coast of the Persian Gulf. Wetlands close to the Iranian border will also have suffered damage during the Iran-Iraq war.

Since the Iraq-UN coalition war there has also been intensive shelling of the southern marshes due to internal conflicts. A large new irrigation canal between the Euphrates and Tigris, the so called "third river", has been constructed partly to drain the southern marshes occupied by marsh Arabs. This canal is likely to destroy huge areas of these marshes (*The Guardian* 27.8.92; *The Observer* 28.2.93) that may be very important for breeding Marbled Teal. These wetlands are also likely to be affected by the reduced flow in the Tigris and Euphrates due to construction of new dams higher up the rivers in Turkey and Syria. Such dam construction and diversion of water for irrigation purposes is the most serious long term threat to the wetlands of lower Iraq (D.A. Scott *in litt.* 1992).

It is possible that the effects of warfare have not all been deleterious for Marbled Teal, as bomb craters in waterlogged areas may create ideal breeding habitat (D.A. Scott *in litt.* 1992).

13.4 CONSERVATION MEASURES TAKEN

None known.

13.5 EVALUATION

Iraq is probably extremely important for Marbled Teal with a major breeding population of perhaps thousands of breeding pairs. It may hold a larger proportion of the world's breeding population than any other range state and may also be important in winter. This population may currently be highly threatened by habitat degradation and is totally unprotected. Breeding and winter surveys are urgently required to identify important sites and their conservation status, but political constraints currently prevent conservation action.

13.6 RECORDS FOR IRAQ

Location	Date	Source	Number	Notes
Basra area	1948	I	9	collected and sent to Wildfowl Trust, UK
Hor Ahmar, Mahrut Valley	1/3.1.68	II	180	

I Georg & Vielliard 1970
II Hawkes 1970

14. AFGHANISTAN

14.1 DISTRIBUTION AND STATUS

Numerous specimens of Marbled Teal were collected from Afghanistan in the last century in both winter and summer and it was considered to be an "irregular summer visitor and breeder" with only a few remaining in winter (Phillips 1923). The most important area is the Seistan Basin that lies on the Iran-Afghanistan border. Zarudny is said to have found Marbled Teal breeding in the Seistan wetlands at the turn of the century (Savage 1968) and breeding is likely to continue in the area. These wetlands have always been subject to wide fluctuations in size according to variations in rainfall and snowfall in central Afghanistan. The wetlands on the Iranian side have regularly dried out completely during long periods of drought (e.g. in 1971, D.A. Scott *in litt.* 1991). The Afghani wetlands of Hamoun-e Puzak are by far the most permanent wetlands in the Seistan Basin and probably never dry out completely. In the mid-late 1980s when the Iranian wetlands dried out completely, satellite imagery showed that the Afghani ones remained flooded with vast reedbeds.

There have been two counts of the Afghani area of Hamoun-e Puzak in recent times. Koning and Dijksen recorded 63 Marbled Teal from the ground in February 1971 when water levels were "fairly low", and Scott and Petocz recorded 55 Marbled Teal from the air in January 1976 when water levels were "fairly high" (Scott 1975, 1978). Given the counting conditions, it is very likely that more Marbled Teal were overlooked, and that these numbers bear no reliable indication of the actual number present. However, it is probably significant that Marbled Teal have been recorded on both Afghani surveys, whereas they were only recorded on two of nine surveys of the Iranian Seistan wetlands in the 1970s, with only six and one bird being recorded (Scott 1978). The Afghani wetlands could well support a resident breeding population of Marbled Teal of some hundreds that extends over onto the Iranian side during wet years (D.A. Scott *in litt.* 1992). During dry years, some or all of the Seistan birds may move to Pakistan (D.A. Scott *in litt.* 1992).

As Marbled Teal was formerly a common breeder in Turkmenistan, it may also formerly have bred in the adjacent northern lowlands of Afghanistan. Possible breeding elsewhere in Afghanistan is suggested by records of one in Kabul Bazaar in March 1966 and one at Chaman on the border with Baluchistan, Pakistan in May 1965 (Savage 1968).

14.2 HABITAT

Hamoun-e Puzak consists of a fresh to brackish, eutrophic lake and adjoining marshes with dense, extensive reedbeds (Carp 1980).

14.3 THREATS

There is no specific information on threats to the Afghan portion of Hamoun-e Puzak, but the Iranian section to the south is currently facing a number of important threats likely to have an impact upon the Afghan wetlands and their Marbled Teal population. *Phragmites* was formerly the dominant vegetation of the reedbeds, but has recently been replaced almost completely by *Typha*, possibly due to a combination of prolonged drought in the 1980s and very intense grazing pressure. A number of carp species have been introduced into the lake system. Total disappearance of emergent vegetation from nearby Hamoun-e-Saberi and Hamoun-e-Helmand has led to a further intensification of grazing pressure at Hamoun-e-Puzak. Several irrigation canals and reservoirs have been constructed, reducing the flow of water into the wetlands, particularly in dry years. A major new dam (Kamal Khan) that will further reduce water flow into the Hamouns is proposed on the Helmand River in Afghanistan. Agricultural lands in the area are suffering from rapidly increasing soil salinity (Ramsar 1990; D.A. Scott *in litt.* 1992).

14.4 CONSERVATION MEASURES TAKEN

None known.

14.5 EVALUATION

Afghanistan probably holds an important population of Marbled Teal which is threatened by habitat degradation and is totally unprotected. Surveys are urgently required to clarify the status of this population. A joint integrated management plan between the governments of Iran and Afghanistan is required to address the threats facing the wetlands of the Seistan Basin. However, political constraints currently prevent conservation action in Afghanistan.

14.6 SITE DIRECTORY

KEY SITES
Name Hamoun-e Puzak.
Location 31.28 N, 61.45 E. Nimruz Province.
Protected Status None. The Iranian part of this wetland is a Ramsar site.
Threats Intense grazing pressure, dams and irrigation systems reducing inflow, introduction of carp.
References Ramsar 1990; D.A. Scott *in litt.* 1992.
Status of Marbled Teal Up to 63 in winter surveys (1971). Probably holds a resident population.

14.7 RECORDS FOR AFGHANISTAN

Location	Date	Source	Number	Notes
Kabul	3.3.66	III	-	male found in the Bazaar by Savage
Chaman	10.5.65	III	1	found by Nithammer
Hamoun-e Puzak, Seistan Basin	3/4.2.71	I,II	63	probably underestimate
Hamoun-e Puzak, Seistan Basin	18.1.76	II	55	probably underestimate

I Scott 1975
II Scott 1978
III Savage 1968

15. PAKISTAN

15.1 DISTRIBUTION AND STATUS

Marbled Teal is mainly a wintering species in Pakistan but also breeds there. Hume & Marshall (1880) found it to be "extremely common" in winter in Sind Province, where it was recorded in every district and "invariably associated in large parties". In Shikarpur District, Sind, the majority of Marbled Teal were reported to arrive "during the latter half of October". Further south along the Eastern Narra the birds were reported to arrive in November and leave in April. Hume & Marshall (1880) also recorded Marbled Teal as "a regular but less abundant" winter visitor to the southern halves of Dera Ghazi Khan and Bhawalpur Districts in southern Punjab Province.

There has apparently been a decline in the size of the wintering population since the last century, and the species is no longer so widespread. Ticehurst considered them "pretty common" during the First World War in parts of Sind such as Manchar Lake, Larkana Lakes and Pithoro Jheel of East Narra (Roberts 1991). There are no recent records from Manchar, although they are still recorded in winter in Larkana wetlands such as Pugri, Lungh, Hamal Katchri and Drigh. Recent IWC counts are concentrated in the lowland plains of both left and right banks of the Indus in Sind where there are winter records from over 15 wetlands since 1973 (Table 13 and 15.9). Before 1989, all records were of small groups with no counts of over 100, but since 1990 there have been counts of over 1,000 from Soonahri, Hamal Katchri and Badam with a total 1992 count of 5,463. The recent rapid increase in the numbers of Marbled Teal counted in Sind is probably explained by the recent increase in the number of wetlands surveyed (Table 15). There are also mid-winter records from Taunsa Barrage and Mangla Reservoir in Punjab Province, Dera Ishmail Bridge in North West Frontier Province (NWFP) and Zangi Nawar, Sur-Bundur Coastal Wetland, Akara Dam and Baroon Kirther Lake in Baluchistan. Zangi Nawar is the most important site with up to 300 birds recorded. According to Savage (1968), there are a few historical records in winter from the lakes of the Punjab Salt Range, where there are no recent records.

There is no evidence that Marbled Teal was ever a widespread breeding bird in Pakistan. Breeding was formerly recorded in the coastal lowlands of Baluchistan at Siranda (Sonmeani) Jheel in 1915 and 1945 and in upland Baluchistan at Bund Kushdil Khan in 1913 (Baker 1921; Roberts 1991). A clutch was also collected from the Baluchistan coast at Ormarra in 1878 (Baker 1921). Small numbers of Marbled Teal also remain to breed in Sind where breeding occurs occasionally in swamps and oxbows of Khairpur District in the plains of the Indus left bank, where a breeding pair was seen in 1980 (Roberts 1991). At least 15 breeding pairs were also seen at Mehboub Shah in Nawabshah District, Sind in May 1992 (T.J. Roberts *in litt.* 1992).

The only site where breeding is known to occur on a regular basis is Zangi Nawar in upland Baluchistan, close to the border with Afghanistan. Zangi Nawar supports a nomadic population that is resident in some years, with about 300 seen in January 1984 and an estimated 150 breeding pairs in May 1984 (Roberts 1985). The size of this population fluctuates in response to variations in water level, and 150 pairs is probably close to the maximum size. The lake dries out completely about every 10 years (Ashiq Ahmad pers. comm. 1991) and no Marbled Teal were present in the drought years of 1985 and 1986. Ninety adults and 40 chicks were present in 1987 (Scott 1989) and there is no more recent information. This Baluchistan population may well interchange with that in the Seistan wetlands on the Afghanistan/Iran border. The population wintering in Sind is mainly migratory, with the majority breeding to the north, probably in China (Sinkiang) or the Commonwealth of Independent States (perhaps eastern Kazakhstan). Birds are regularly recorded on autumn passage at Taunsa Barrage, Punjab (Scott 1989).

The current status and distribution of the species in Pakistan is still somewhat uncertain, particularly in Sind. Several wetland complexes along the Indus have never been thoroughly counted for waterfowl (e.g. Beroon-Kirthar PK22) while many smaller wetlands along the west bank have not yet been identified, let alone

counted (Ahmed *et al.* in press). Furthermore, there are hundreds of relatively unexplored wetlands along the eastern border of Sind along the Thar desert border and to the east of the Narra canal in Thatta and Badin districts (T.J. Roberts *in litt.* 1992). There may therefore be additional wintering or breeding sites that have not yet been located, and the wintering population could be significantly more than the 5,463 birds seen in 1992.

15.2 HABITAT

Hume & Marshall (1880) found Marbled Teal mainly on "broads, thickly grown with rush". They are found mainly on shallow fresh to brackish pools and lakes offering plenty of reeds or inundated *Tamarix* bushes as cover. They appear to have a preference for small pools, and they avoid open water. They are generally found on seasonal wetlands (Roberts 1991). Some of these wetlands are artificial, e.g. the Sind breeding site, Mehboub Shah, is fed by seepage from the Rohri Irrigation Canal.

15.3 ECOLOGY AND BEHAVIOUR

15.3.1 Feeding biology

Marbled Teal in Pakistan are reported to feed chiefly while swimming, taking mainly vegetable matter such as leaves, shoots, roots, tubers and seeds of aquatic plants. They also take worms, molluscs, aquatic insects and their larvae (Hume & Marshall 1880). They dabble in small shallow pools and at Zangi Nawar have been seen upending in water of 1.5 m depth, where they were probably eating *Ruppia maritima* water weed (Roberts 1991).

15.3.2 Breeding biology

Breeding occurs in May and June, when a nest is made of rushes and weeds, unlined or sometimes scantily lined with down, concealed among weeds and rushes on swampy ground or on lake islands. The usual clutch size is nine to 12 (Ali & Ripley 1968). A clutch of eight eggs was collected from a nest "under a solitary babool bush" on 19.6.1878 from a salt marsh near Ormarra (Baker 1921). At Siranda Jheel, clutches of 12 and nine eggs were found on 14.6.15 in a *Juncus* sedge clump on small islands in the lake, with the entrance roofed over by bent rushes. At Zangi Nawar, nests were reported to be made well inside dense stands of *Phragmites* (Roberts 1991). Nests at Mehboub Shah in 1992 were made just above the water's surface amongst *Typha* stands and broods of up to six ducklings were observed (T.J. Roberts *in litt.* 1992).

Breeding display has been recorded on 11 April, with the male erecting his nuchal crest, stretching his head and neck up and then jerking his head downwards until it was pressed between the wing shoulders. Captive males utter a weak, squeaking call when head-jerking during display, but females are apparently silent (Roberts 1991). At Zangi Nawar on 5.5.84, about 75% of the estimated 300 birds had completed pair formation and courtship flight chasing was regularly seen with the pursuing male jerking back his head occasionally while in flight. Ducks with young have been seen to give a wing-injury distraction display (Roberts 1991).

15.4 THREATS

15.4.1 Habitat loss and degradation

Most of the Marbled Teal sites in Pakistan have been affected this century by changes in hydrology caused by widespread irrigation and drainage schemes associated with agricultural development. Reduced water levels due to diversion of streams in the catchment area for irrigation threaten Zangi Nawar and a number of wintering sites such as Drigh and Lungh in Sind. A similar process has degraded Siranda Jheel, and may have caused the disappearance of the species from this former breeding site (Scott 1989). The disappearance of the species from Manchar Lake in Sind since the First World War may have resulted from the construction of Guddu Barrage on

the Indus in 1962 that delayed the timing of river water flooding into the lake, markedly changing the ecology of the site and drastically reducing fish production (Ahmed *et al.* in press). A number of other sites are threatened with possible future drainage for agriculture, such as Pugri and Soonahri in Sind (Scott 1989).

In contrast, large areas of new wetlands have been created by irrigation activities, particularly in Sind. There are numerous new barrages, wetlands created by seepage from drainage canals and many others created at the mouths of outfall drains in the inner Indus delta. Some of these new wetlands may now be of great importance to Marbled Teal.

A number of sites currently or formerly occupied by Marbled Teal (Manchar, Hamal Katchri, Pugri, Drigh, Lungh and Ghauspur) lie in an area of the right (west) bank of the Indus plains of Sind that is currently the subject of the Right Bank Management Plan. This plan is an attempt to overcome problems of salinity and waterlogging of agricultural land in the area caused by irrigation, due primarily to rising watertables in an area with little natural drainage. The RBMP aims to drain this waterlogged land and dispose of the saline effluent in a way that will minimise the potentially harmful effects on the natural wetlands and wildlife of the region (Ahmed *et al.* in press). However, the RBMP proposals have yet to be fully accepted and future drainage activity in this area represents a potential threat to some of these wetlands, either through input of saline effluent or general lowering of water tables that may cause the wetlands to reduce in size or disappear.

Of the above six wetlands, the RBMP proposals envisage significant changes only to Manchar and Hamal Katchri. The major changes are expected to be development of a large fishery at Manchar with concurrent growth in local human population and wetland use, and increase of water levels but decrease of salinity in Hamal (Ahmed *et al.* in press). A Wetlands Ecosystem Study is proposed that would monitor the effects of adding more drainwater to Hamal in order to assess the impacts on waterfowl.

The disappearance of the species from the former breeding site of Bund Kushdil Khan may be associated with the degradation of this site by siltation and increased human disturbance (Scott 1989). Heavy grazing, burning of vegetation and disturbance from fishing are amongst other threats to sites of current importance for Marbled Teal (see 15.8).

15.4.2 Hunting

Hunting of Marbled Teal and collection of their eggs is probably widespread. At Zangi Nawar a female and clutch were taken in May 1983 (Ahmed 1983). Egg collection was recorded before 1943 at Zangi Nawar and Sirandah Jheel (Roberts 1991).

15.5 CONSERVATION MEASURES TAKEN

15.5.1 Species protection

Marbled Teal is protected from hunting by national and state legislation. However, many sites of importance to Marbled Teal are privately owned, making it very difficult to enforce hunting regulations (Hamid Ali Khan pers. comm. 1991).

In 1972, a reintroduction was attempted when 24 Marbled Teal brought from the Wildfowl Trust at Slimbridge were released into Lal Suhanra, Punjab, but all were subsequently eaten by mongooses (Savage 1970, Ahmed 1983). There are no known records of the species from Lal Suhanra, and the closest known historical record is of one or two birds shot at Jajjian Abbas Lake about 40 miles away (T.J. Roberts *in litt.* 1992).

15.5.2 Habitat protection

Zangi Nawar, Drigh, Taunsa Barrage and Lungh are Wildlife Sanctuaries, while Mangla Reservoir is a Game Reserve. Drigh is also a Ramsar Site. This protection has not been sufficient to prevent degradation of these sites. In particular, it has failed to prevent divertion of water within the catchments of these wetlands, leading to reduced water levels.

15.6 EVALUATION

In winter Pakistan holds a major population of Marbled Teal and available data suggest that it is the second most important range country after Iran. There are also significant numbers of breeding birds in wetter years. Insufficient measures have been taken to date to conserve the species. In particular, the three major wintering sites in Sind are all unprotected. There is an urgent need for further conservation action.

15.7 ACTION NEEDED

Soonahri, Hamal Katchri, Badam, Mehboub Shah, Rup and Mangla Reservoir should be declared Wildlife Sanctuaries.

Zangi Nawar and Taunsa Barrage should be declared Ramsar sites.

Management Plans should be developed and implemented for Zangi Nawar, Soonahri, Hamal Katchri, Badam, Drigh, Lungh and Taunsa Barrage.

The diversion of water away from Drigh and Zangi Nawar should be prevented.

Under the RBMP, a project is foreseen that will locate and regularly survey currently unknown wetlands within the Indus Irrigated Area of Sind, mainly in the Rice Canal Command (Ahmed *et al.* in press). Some of these wetlands may be of value to Marbled Teal, and if so it is imperative that measures are taken to retain their value during the development of drainage schemes.

Surveys should be undertaken of Pithoro Jheel of East Narra and other suitable but poorly known wetlands of Sind to assess their importance for Marbled Teal.

15.8 SITE DIRECTORY

KEY SITES
Soonahri
Hamal Katchri
Badam
Zangi Nawar
Mehboub Shah

SITES OF SOME IMPORTANCE
Drigh
Rup/Ghauspur Lake
Mangla Reservoir
Pagri
Taunsa Barrage
Akri Lake (Dhand)
Dera Ishmail Bridge
Kharroo Lake
Lungh
Tandomusty
Loonkhann
Bolahi
Morakho
Allahno Wari
Karud Wah
Seer 1 Lake
Khaipur

Name Soonahri (Dogriun) and Sangrio Lakes PK27.
Location 26.07-.10 N, 69.04-.12 E. Sanghar District, Sind.
Protected Status Soonahri is a private reserve.
Threats Hunting, fishing and possible future drainage.
Status of Marbled Teal Up to 2,509 (1992) in mid-winter.

Name Hamal Katchri PK 24.
Location 27.23 N, 67.55 E. Larkana District, Sind.
Protected Status None.
Threats Irrigation drainwater currently flows in, some of it

highly saline. Under the RBMP proposals, the depth of the site will increase and the salinity will be reduced.
Status of Marbled Teal Up to 1,625 (1991) in mid-winter.

Name Badam.
Location Sind.
Status of Marbled Teal 1,850 in January 1992 (only record).

Name Zangi Nawar PK44.
Location 29.27 N, 65.47 E. Chaghai District, Baluchistan.
Protected Status Wildlife Sanctuary.
Threats Diversion of water for irrigation has reduced water levels. Hunting.
Status of Marbled Teal The major breeding site in Pakistan, with up to 150 breeding pairs (1984) and 300 in mid-winter (1984).

Name Mehboub Shah.
Location 26.18 N, 68.13 E. Nawabshah District, Sind.
General Description Shallow lake fed by seepage from nearby Rohri irrigation canal fringed by extensive *Typha* beds with scattered *Tamarix aphylla*.
Protected Status An adjacent lake is a crocodile sanctuary.
References T.J. Roberts *in litt.* 1992.
Status of Marbled Teal At least 15 pairs breeding in May 1992.

Name Drigh Lake PK23.
Location 27.34 N, 68.02 E. Larkana District, Sind.
Protected Status Wildlife Sanctuary and Ramsar site.
Threats Water levels reduced by diversion of water for irrigation. Heavy grazing pressure.
Status of Marbled Teal Up to 59 (1991) in midwinter.

Name Ghauspur Jheel/Rup PK21.
Location 28.08 N, 69.06 E. Near Kandkhot, Jacobabad District, Sind.
Protected Status None.
Threats Hunting and fishing.
Status of Marbled Teal Up to 50 in mid-winter (1973).

Name Mangla Reservoir PK11.
Location 33.12 N, 73.39 E. Punjab.
Protected Status Game Reserve.
Threats Siltation, duck hunting with poisons.
Status of Marbled Teal 60 in February 1982 (only record).

Name Pagri/Pugri PK25.
Location 27.18 N, 68.03 E. Larkana District, Sind.
Protected Status None.
Threats Hunting, grazing and possible future drainage.
Status of Marbled Teal Up to 41 (1988) in mid-winter.

Name Taunsa Barrage PK17.
Location 30.42 N, 70.50 E, Muzaffargarh District, Punjab.
Protected Status Wildlife Sanctuary.
Threats Burning of vegetation, fishing and hunting. Possible new dam upstream would reduce water levels.
Status of Marbled Teal Up to 20 in mid-winter (1981) and 30 on passage (September 1985).

Name Akri Lake (Dhand).
Location Nawab Shah District, Sind.
Status of Marbled Teal 12 on 17.2.83 (only record).

Name Dera Ishmail Bridge.
Location 31.50 N, 71.00 E. NWFP.
Type of wetland Freshwater lake.
Depth Average 2.5 m.
Salinity Fresh.
Status of Marbled Teal 12 in January 1990 (only record).

Name Khar Roo Lake (Khararo/Hathungo Lakes).
Location 25.56 N, 69.19 E. Sind.
Status of Marbled Teal 20 in January 1991 (only record).

Name Lungh.
Location 27.26 N, 67.57 E. Larkana District, Sind.
General Description Small (19 ha) lake in an ancient arm of the Indus, fed by surplus water from surrounding rice paddies. Emergent vegetation of *Juncus*, with a little *Typha*.
Protected Status Wildlife Sanctuary.
Threats Recently lost its value for waterfowl after water supply was reduced and it became completely overgrown. However, after rehabilitation work assisted by ICBP, 15,000 birds were recorded in January 1991. The enclosing bund was restored, deeper sections dug out and observation posts made.
References Ahmed *et al.* in press, Khurshid 1991.
Status of Marbled Teal Up to 40 in mid-winter (1977).

Name Tandomusty, near Sukkur.
Location 27.42 N, 68.54 E. Sind.
Status of Marbled Teal 20 on 12.10.89. Three pairs, possibly breeding, in March 1965.

Name Loonkhann near Khipro.
Location 25.50 N, 69.30 E. Sind.
Status of Marbled Teal Up to 23 in midwinter (1991).

Name Bolahi.
Location Sind.
Status of Marbled Teal 32 in January 1991 (only record)

Name Morakho.
Location Sind.
Status of Marbled Teal 35 in January 1991 (only record).

Name Allahno Wari.
Location Sind.
Status of Marbled Teal 33 in January 1992 (only record).

Name Karud Wah.
Location Sind.
Status of Marbled Teal 13 in January 1992 (only record).

Name Seer 1 Lake.
Location 27.50 N, 67.49 E. Shahdadkot, Sind.

Status of Marbled Teal 20 in January 1992 (only record).

Location Khairpur District, Sind. 27.25 N, 68.37 E.
Status of Marbled Teal Thought to breed in small swamps and oxbows along the Indus bank. Breeding pair seen 11.4.80.

15.9 RECORDS FOR PAKISTAN

Location	Date	Source	Number	Notes
Baluchistan Province				
Nal	pre 1921	VI	-	collected
Ormarra, salt marsh seven miles north of	19.6.1878	VI	-	clutch of 8 eggs collected
Akara Dam, Gwadar Port	Jan 87	VIII	-	small numbers
Bund Kushdil Khan, Pishin District	Aug 1913	III	15	adult and 14 pulli
Bund Kushdil Khan, Pishin District	18.7.1960-79	III	4	Seen by C.D.W. Savage
Sonmiani/Siranda Jheel, Las Bela	14.6.1915	III, VI	-	At least 12 nests. Two clutches of 9 & 12 eggs
Sonmiani/Siranda Jheel, Las Bela	1945	III	2-4	estimate; 1 or 2 pairs
Sonmiani/Siranda Jheel, Las Bela	31.3.78	III	1	
Zangi Nawar	8.2.83	I	30	
Zangi Nawar	May 83	I	1	poacher took breeding female and eggs
Zangi Nawar	3/5.5.84	III	c.300	estimated 150 breeding pairs
Zangi Nawar	1985	VIII	0	drought year
Zangi Nawar	1986	VIII	0	drought year
Zangi Nawar	July 87	VIII	130	90 adults + 40 juveniles
Punjab Province				
Southern Dera Ghazi Khan District	pre 1880	VII	-	regular visitor
Southern Bhawalpur District	pre 1880	VII	-	regular visitor
Jajjian Abbas Lake, Bahawalpur Division	pre 1970	II	-	one or two shot
Taunsa Barrage	Sept 85	VIII	30	regular passage migrant
Sind Province				
Sind Province	pre 1880	VII	-	extremely common, found in all districts
Karachi	27.9 pre 1880	VII	-	young bird shot, just left nest
Akri Lake (Dhand), Nawab Shah District	17.2.83	I	12	
Ghauspur Jheel/Rup, Kandkhot complex	30.11.79	III	6	
Khairpur District	pre 1969	III	-	breeding in small swamps and oxbows
Khairpur District	11.4.80	III	2	breeding pair, at 27.25 N, 68.37 E
Manchar Lake, Dadu District	1914-1917	III	-	"pretty common"
Larkana wetlands	1914-1917	III	-	"pretty common"
Pithoro Jheel, East Narra	1914-1917	III	-	"pretty common"
Mirpur Sakro, Thatta District	11.10.81	III	2	
Soonahri Lake, Sanghar District	Winter 1974	III	7	
Tando Musti Khan, small lake near	March 65	III	6	three pairs, possibly breeding
Tandomusty, near Sukkur	12.10.89	V	20	
Mehboub Shah, Nawabshah District	13.5.92	II	30+	15 breeding pairs all with young
Habb Dam	16.10.92	II	2	in seepage pools
North West Frontier Province				
Nowshera	pre 1921	VI	-	collected

I Ahmed 1983
II T.J. Roberts *in litt.* 1992
III Roberts 1991
IV Ali & Ripley 1968
V Gretton 1990
VI Baker 1921
VII Hume & Marshall 1880
VIII Scott 1989

16. INDIA

16.1 DISTRIBUTION AND STATUS

Marbled Teal in India is mainly a winter visitor to parts of the western states adjacent to Sind Province in Pakistan. It was a "regular" visitor to northern Gujarat in the last century (Hume & Marshall 1880). Specimens were also collected from the other northern states as far south as Maharashtra and as far east as Assam (Baker 1921; Ali & Ripley 1968) and, although they have never been reported from outside Gujarat in any numbers, there are numerous historical records from the Ganges valley and sufficient to suggest that the Ganges was formerly a regular flyway for small numbers of winter visitors that bred to the north in China or elsewhere (see map in Phillips 1923).

Since 1986, the IWC has recorded Marbled Teal widely in India, but the majority of these records are considered to be misidentifications (Vivek Menon, S. Balachandran, Prakash Rao and Taej Mundkur pers. comm. 1991) and the only ones likely to be accurate are those from Gujarat (Table 14). These records from Gujarat are supported by a count of at least 200 Marbled Teal at Chhari-Dhand in Kutch, Gujarat, on 11.2.90 (S.A. Akthar and J.K. Tiwari *in litt.* 1992). There are very extensive and poorly known wetlands in Kutch (Scott 1989) that have the potential to support many more Marbled Teal. Two Marbled Teal were also seen at Pali-Marwar, Rajasthan, on 25.2.91 (J.K. Tiwari *in litt.* 1992).

16.2 THREATS

Chhari-Dhand is threatened by the construction of dams in the water catchment, siltation and the spread of the waterplant *Prosopis chitensis* (S.A. Akthar and J.K. Tiwari *in litt.* 1992).

16.3 CONSERVATION MEASURES TAKEN

None known.

16.4 EVALUATION

Despite an apparent decline in the number of Marbled Teal wintering in India, the Kutch area of Gujarat is clearly still of importance as a winter refuge for Marbled Teal and more attention needs to be paid to the status of the species in this region. Chhari-Dhand is extremely important for a variety of wetland wildlife and supports over 100,000 waterfowl in wet years (S.A. Akthar and J.K. Tiwari *in litt.* 1992). It is clearly worthy of protection.

16.5 ACTION NEEDED

Declaration of Chhari-Dhand as a Wildlife Sanctuary and a Ramsar Site.

Marbled Teal should be included in Schedule I of the Protection Act in India.

16.6 SITE DIRECTORY

Name Chhari-Dhand. KEY SITE.
Location 23.15 N, 69.49 E. Kutch District, Gujarat.
General Description Seasonal, oligotrophic, fresh to brackish wetland of up to 8,000 ha, dependent on strength of monsoon and holding water for 6-7 months.
Depth Average 1.5 m.
Altitude Sea level.
Protected Status None.
Owner State.
Threats Dam construction, siltation, weed infestation.
References S.A. Akthar and J.K. Tiwari *in litt.* 1992
Status of Marbled Teal 200 on 11.2.90.

16.7 RECORDS FOR INDIA

Location	Date	Source	Number	Notes
Punjab				
Firozpur	pre 1921	IV	-	collected
Rajasthan				
Bikaner & Bharatpur Dists.	pre 1968	I	-	occasional records
Lakhotia Talab, Pali-Marwar	25.2.91	VI	2	
Gujarat				
northern Gujarat	pre 1880	V	-	regular visitor
Kutch, Baroda, Kathiawar Districts	pre 1921	IV	-	collected
Ahmedabad, & Bhavnagar Districts	pre 1968	I	-	collected
Chhari-Dhand, Kuthc	11.2.90	VI	200+	
Uttar Pradesh				
Fatehgarh	pre 1880	V	-	collected
Oudh, near Hurdui	pre 1880	V	-	collected
Madhya Pradesh				
Madhya Pradesh	pre 1968	I	-	collected
Maharashtra				
Ahmednagar & Poona	pre 1968	I	-	occasional records
Orissa				
Udepur, western	pre 1880	V	-	specimens collected
West Bengal				
Calcutta, near	pre 1921	IV	-	collected several times
Assam				
Sibsagar	c. 1912	IV	-	one collected
Dibrugarh rivermouth	Nov 1957	II	-	one shot
Others				
Delhi, near	pre 1921	IV	-	collected several times
Kashmir				
Vale of Kashmir	pre 1968	III	-	accidental in winter

I Ali & Ripley 1968
II Savage & Mackenzie 1967
III Isakov 1970
IV Baker 1921
V Hume & Marshall 1880
VI S.A. Akthar and J.K. Tiwari *in litt.* 1992

17. PEOPLE'S REPUBLIC OF CHINA

17.1 DISTRIBUTION AND STATUS

Marbled Teal are thought to breed in Xinjiang Autonomous Region, but their existence here was only demonstrated as recently as 18.6.85 when about eight birds, including several displaying pairs, were seen at an artificial lake in Karamay oilfield (Harvey 1986). This represents the easternmost part of the species' breeding range, but breeding in the adjacent part of Kazakhstan on the lower reaches of the Kurchum river may have occurred at the turn of the century and perhaps continues (Dolgushin 1960).

There are various other wetlands in Xinjiang with the potential to support a much larger breeding population of Marbled Teal but which currently have an unknown fauna (e.g. Sayram Hu, Ebinur Hu, Manasi Hu, Chianassu Hu, Ulungur Hu, Jili Hu and the southern Altai lakes; Scott 1989). This region may perhaps be the major source of the birds wintering in Pakistan and India. A survey of some parts of Xinjiang in 1992 failed to find any Marbled Teal (Jianjian Lu pers. comm. 1992).

17.2 HABITAT

Karamay lake is a shallow, artificial, brackish to saline lagoon with extensive fringing reed-beds dominated by *Phragmites* with some *Salicornia* (Harvey 1986).

17.3 THREATS

This area of Xinjiang is likely to be opened up extensively for oil exploration and extraction in the near future (Scott 1989).

17.4 CONSERVATION MEASURES TAKEN

None known.

17.5 EVALUATION

The importance of Xinjiang for Marbled Teal is unclear, but it could be the breeding ground for the several thousand birds wintering in Sind Province, Pakistan. Hence there is an urgent need for fieldwork in the area to assess its importance for the species.

17.6 ACTION NEEDED

Breeding season survey of suitable wetlands in western Xinjiang.

17.7 SITE DIRECTORY

Name Kekamkyi (Karamay) Lake CN 180. SITE OF SOME IMPORTANCE.
Location 45.35 N, 85.00 E, Xinjiang Zizhiqu (Sinkiang Autonomous Region).
Protected Status None.
Threats None known.
References Harvey 1986.
Status of Marbled Teal 8 on 18.6.85, including displaying pairs.

18. OTHER COUNTRIES

18.1 CAPE VERDE ISLANDS

Formerly bred "plentifully" on Boa Vista (Baker 1921; Phillips 1923).

18.2 PORTUGAL

Formerly recorded from Guadiana, Ribatejo and Silves and may have bred in the north in the last century (Phillips 1923). In the Madeiras, one was shot on 29.7.1894 near Funchal (Phillips 1923).

18.3 FRANCE

Considered accidental in the last century by Phillips (1923), with a specimen taken from Bresse in 1872, two shot at Saône-et-Loire in 1893 and a number shot in the springs of 1886, 1897 and 1898 near St. Gilles (département Gard). In the Camargue, breeding occurred in the 1890s and perhaps up to the 1940s (Cramp & Simmons 1977), although the only confirmed breeding this century was in 1926 (P.J. Dubois *in litt.* 1992). Some birds, including a pair, were seen in April 1927, another pair was seen in May 1946 and two birds were recorded on 17.9.64 (P.J. Dubois *in litt.* 1992). Eleven birds were shot in the Camargue in 1957 in August and September, suggesting that breeding may have occurred locally (P.J. Dubois *in litt.* 1992). An immature shot in Baie de Somme on 17.9.81 was the first record for 17 years (*Brit. Birds* 75: 569). Since then there have been isolated records of one on 4.10.89 at Vesoul, Haute-Saône; a male at Leucate, Aude, from 13th to the 17th August 1991, and a female at Chevrières, Oise, from the 23rd of August to the 2nd September 1991 (P.J. Dubois *in litt.* 1992). The predominance of late summer and autumn records suggests that some of these sightings may be of locally-bred birds (P.J. Dubois *in litt.* 1992). In Corsica, a specimen was found in Ajaccio market in 1910 (Phillips 1923).

18.4 BELGIUM

One was seen from late August to late October in 1987 at Achêne-Taviet (*Aves* 26: 36).

18.5 GERMANY

A pair was shot near Wasserburg, Bavaria, in late 1892 (Phillips 1923).

18.6 SWITZERLAND

One was shot near Geneva in the 1890s (Phillips 1923).

18.7 MALTA

One specimen was recorded in the last century (Phillips 1923).

18.8 ITALY

Breeding is thought to have occurred in 1892 (Cramp & Simmons 1977). A flock of 50 was seen near Lucca on 16.6.1892 and 70 in August the same year. Birds were shot in various parts of northern and central Italy in late 1892 and 1893 (Phillips 1923). One was shot in late August 1897 near Molinella, one from near Foggia in May 1903 and three from near Naples in 1858. A flight was reported from Sicily in 1881 and three were shot in Sardinia in 1839 (Phillips 1923). A female was shot in Tuscany in December 1981 (*British Birds* 75: 268).

18.9 ALBANIA

Formerly recorded from Southern Albania and the Albanian coast (Hume & Marshall 1880; Phillips 1923; Othmar Reiser 1939). Listed as a vagrant by Nowak (1989).

18.10 BOSNIA-HERCEGOVINA (FORMER YUGOSLAVIA)

Three were shot on 28.5.1889 at Narenta between Lisi_i_i and Ostro_ac (Othmar Reiser 1939).

18.11 MACEDONIA (FORMER YUGOSLAVIA)

A summer visitor and a breeder at Skopje in northern Macedonia until 1960 (Mikuska 1975). The species was a regular breeder at Ar_ani_an-Sko Blato, near Skopje, until the site was drained and the last record was of a family party seen in 1936 or 1937 (Karaman 1950). Elsewhere in the Skopje area one was seen at Ibraimavo on 11.9.28, and one at Skopje on 8.3.40 (Matvejev 1948). There is also a record of one bird at Ohrid See, near Struga, southern Macedonia (Matvejev 1950). It has been suggested that Marbled Teal may still breed in Macedonia (J. Mikuska *in litt.* 1992).

18.12 POLAND

A male was seen at Turawa Reservoir near Opole on 15.3.89 (*British Birds* 83: 9)

18.13 CZECH REPUBLIC

Three males and one female were shot on Zlivský and Kní_ecí ponds, near Hluboká on 25th and 26th September 1892 (K. Š_astný *in litt.* 1992). A specimen was taken from Kladno in January 1893 (Phillips 1923). Four were seen on a pond near Lubotice on 9.4.1964 (K. Š_astný *in litt.* 1992).

18.14 HUNGARY

At Lake Velence, a female was taken on 1.8.1893, and others were taken on 15.9.1894, 5.9.1895 and 16.9.1896. Fifteen to 20 were seen in September 1896, and there was probably a small resident population on Lake Velence. A specimen was taken near Gardony, central western Hungary, in July 1893 (Phillips 1923). Again at Lake Velence, four birds were seen in January 1951 and two in March 1951 (Mikolas 1951). Two were seen on 22.11.1977 at Kardoskut, south-east Hungary (Sterbetz 1979), and one on 4.5.1981 at the Hortobágy fishponds, eastern Hungary (Kovács 1984).

18.15 GREECE

First recorded in the winter of 1857/58 by Powys (1860), who saw three birds at the extensive marshes of Phanari, Thesprotia (now drained), and reported another shot in the Louros Delta, Amvrakikos. Also recorded from Phanari and Butrinto by Lilford (Phillips 1923). First recorded from the Ionian Islands in the last century (Hume & Marshall 1880). On Crete, two birds were seen on 16.5.1925 at the mouth of Kladissos, a small river west of Chania (now drained) and on 23.6.25 a female with young were seen in a small marsh near the mouth of Almyropotamos river (now drained), near Heracleion (Schiebel 1926). This is the only breeding record. Marbled Teal was again recorded at Almyropotamos on 1-2 May 1937 (Pease 1940). Also on Crete, two were shot at the Platanias river mouth in November 1941 (Stresemann 1942) and a flock of 20 was seen at Plakias on 11.4.84 (G.I. Handrinos *in litt.* 1992). There is a record from Kos from March 1964 (Bauer *et al.* 1969) and one was seen on Kalandos Lagoon on Naxos on 1.5.84 (Broggi & Willi 1986). In the Evros Delta, two were seen on 6.5.68 (Bauer & Muller 1969) and one was shot on 28.4.72 (G.I. Handrinos *in litt.* 1992). Seven of 11 Greek records are from

between March and early May, suggesting they are mainly of spring migrants. In most cases, the birds were seen in very small island wetlands (small lagoons, river mouths, etc).

18.16 CYPRUS

Regarded as a not uncommon and regularly breeding summer visitor prior to 1950 (Flint & Stewart 1992), although Phillips (1923) described it as a "rare resident". Breeding was confirmed at Famagusta Lake, 1888. A few pairs nested at Kouklia in 1910 after an influx in April, and a nest was found at Fresh Water Lake in 1914 (Flint & Stewart 1992). Other historical sightings are of a small flight at Episkopi Bay in April 1875, of a female shot at Limassol in May 1875, and of one or more at Kouklia Reservoir in April 1929 (Flint & Stewart 1992). At Akrotiri, two birds were seen in April 1958, and one in May 1978. At Larnaca Salt Lake, three were seen in March 1985 (Flint & Stewart 1992).

18.17 BULGARIA

Recorded around the beginning of this century, although no details are known (Klein 1909). A pair was seen at Garvan Marsh, Silistra District, on 9.6.79 (*British Birds* 72: 590). One was seen at Atanasovo Lake near Burgas on 7.11.85 and another at Arkutino Marsh on 16.5.91 (P. Iankov *in litt.* 1992).

18.18 ROMANIA

At Lake Agigea, one was recorded on 26.9.65 (Van Impe 1968), and one on 19.11.68 (Johnson & Hafner 1970).

18.19 LIBYA

One was shot in Ben-Ghazi district in 1873 (Phillips 1923).

18.20 JORDAN

A rare spring migrant to Azraq Oasis and has bred on one occasion. First recorded at Azraq oasis in 1983 and there have been five April records here with a maximum count of 12 birds (I.J. Andrews *in litt.* 1992). On 23.7.90 a pair and seven well grown young were seen at Azraq fish pools, a very small area of reed-fringed fish-pools 1 km south of Shishan village (*British Birds* 84: 3; I.J. Andrews *in litt.* 1992). There are no other records from these fish pools.

18.21 SYRIA

Phillips (1923) regarded the Marbled Teal as a possible breeder. It has occurred in winter according to Dementiev & Gladkov (1952). One female was seen on 7 and 9 June 1975 at Shumaytiyah pond 20 km north-west of Deir Ez Zor (A.M. Macfarlane *in litt*. 1983).

18.22 LEBANON

There is one autumn record of Marbled Teal from the 1970s from Lake Qaraoun, a reservoir on the River Litani (A.M. Macfarlane *in litt*. 1983).

18.23 OMAN

One was seen at Seeb near Muscat, North Oman on 19 and 23.9.77 (Gallagher & Woodcock 1979; Anon. 1990b).

18.24 BAHRAIN

One was seen at Al Areen on 30.9.91 (Hirschfeld *et al.* 1992).

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