Threatened Birds of Asia:

The BirdLife International Red Data Book

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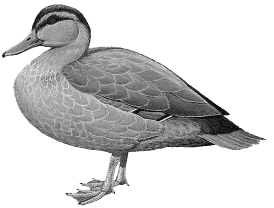
PHILIPPINE DUCK

Anas luzonica



Critical □ —
Endangered □ —
Vulnerable ■ A1a,c,d; A2c,d

This duck has undergone a rapid population decline over the past three decades owing to extensive overhunting and widespread conversion of its wetland habitats. It has been upgraded to Vulnerable because it is estimated that this reduction has exceeded 20% over the last 10 years.

DISTRIBUTION Apart from apparently vagrant records in Taiwan, undated (Wang Chia-hsiong *et al*. 1991), and Okinawa, Japan, 1981 and 1983 (McWhirter *et al*. 1996), the Philippine Duck (see Remarks 1) is confined to the Philippine archipelago, where it has been recorded from all the major islands, not just four as listed in Madge and Burn (1988) and Carboneras (1992). A record from Siquijor based on Steere (1890), although repeated by McGregor (1909–1910) and Rand and Rabor (1960), remains to be substantiated (Dickinson *et al.* 1991). Gonzales and Rees (1988) described the species as scarce in the Sulu archipelago; in fact, this appears to be the only reference to its occurrence there. Specific localities (untraced ones are treated within the text) include:

■ ***PHILIPPINES*** *Luzon* (*eastern*) **Buguey**, Cagayan, where apparently present every winter and possibly throughout the year, with observations logged in April 1986 (Alonzo-Pasicolan 1987, 1990, Scott 1989); **Abulug river**, March 1906, when "extraordinarily abundant" (McGregor 1909–1910); **Rio Grande**, April 1894 (Whitehead 1899d); **Solana** at Andarayan and Nabbutuan, 1969, February 1971, March, May and June 1972 (15 specimens in PNM), February 1994 (Hornbuckle 1994); **Sisim**, Pena Blanca, Cagayan, May 1960 (female in FMNH); **Maria Aurora Memorial National Park** in the Amro watershed near Casiguran, June 1996 (D. W. Billing *in litt.* 1997); **Canili lake**, April 1996 (D. W. Billing *in litt.* 1997); (western) **Agaga**, Burgos (label simply says "Agraga" [*sic*]), Ilocos Norte, March 1907 (male in FMNH); **Paoay lake**, Ilocos Norte, January 1907 (male in USNM); **Liwan** at Kenama, Kalinga-Apayao, 450 m, January 1971 (two specimens in DMNH); Trinidad Lake (untraced, but presumably near Trinidad), Benguet, May 1907 (female in USNM); Nueva Vizcaya, March 1973 (Temme 1976); **Papaya**, Nueva Ecija, November 1958 (male in CM); **Arayat**, Pampanga, June 1953 (male in UMMZ); **Apalit**, Pampanga, June 1985 (female in NCSM); montane lakes in Lepanto and Benguet, 1895 (Whitehead 1899d); **Hermosa**, Bataan, February 1902 (male in AMNH); **Pagbilao**, where the species probably breeds (Scharringa 1988), 1977 to present, including 239 in April 1987 (Fisher mss, Howes 1987b, many observers *in litt*. 1997; see Population); **Jala Jala**, January 1902 (female in FMNH); **Candaba Marsh**, first seemingly recorded in 1974 (Temme 1976) and present in diminishing numbers ever since (Fisher mss, Scott 1989, P. A. J. Morris *in litt*. 1997; see Population); **Subic Bay**, over 600 birds on the sea, March 1997 (P. A. J. Morris *in litt*. 1997); (*central*) **Novaliches Reservoir**, Rizal, December 1947 and November 1948 (four males in PNM); **Tanay**, Laguna, April 1906 (Baud 1978); **Pangil**, undated (Meyer de Schauensee and duPont 1962), specifically at Balian, March 1976 (male in DMNH); **Pagsanjan Marsh**, Laguna, March 1979 (Fisher mss); **Calatagan** at Palo Bandera, Batangas, April 1966 (Gonzales 1983); **Looc**, Nasugbu, Batangas, April or May 1996 (J. C. T. Gonzalez *in litt.* 1997); **Tayabas Bay** at Agdangan, April 1987 (Howes 1987b) and at the Mangrove Forest Research Center, regularly at least in 1980s (Scott 1989); (*southern*) presumably near **Daet** (in whose market young birds were found for sale), Camarines Norte, September 1969 (Gonzales 1969); **Lalaguna Marsh**, Lopez, Quezon, regularly in 1980s (Scott 1989), including a flock of 200 prior to 1983 (in

Davies *et al.* 1990); **Lake Baao**, April 1983 (Clarke 1983); **Irosin**, Sorsogon, May 1961 (male in FMNH), specifically at Juban, January 1972 (three specimens in DMNH); **Bulusan lake**, Sorsogon, October 1995 (Diesmos and Altamirano 1995);

Polillo noted to have a native name there in 1909 (McGregor 1910a), so presumably then recorded, but first record otherwise apparently of 240 seen (and an estimated 3,000 considered likely to be present) in marshes and mangroves on **Jomalig** Island, May 1996, with reports from Patnanongan Island (Gonzalez 1997, J. C. T. Gonzalez verbally 1997);

Catanduanes Maysoram (untraced) on the Lusong river, June 1969 (Gonzales 1983); **Caramoran**, 1969 (Gonzales 1983); **Viga** (qualified as "Albay" on label but here assumed to be on Catanduanes), May 1909 (male in USNM) and 1971 (Gonzales 1983); **Viga river** estuary, May 1969 (Gonzales 1983); **Bagamanoc** at Macutay, December 1970 (two males in PNM), and in the marsh north of Bugao, June 1971 (Gonzales 1983; see Remarks 2);

Marinduque **Santa Cruz**, no date (duPont 1972b), this evidently based on a male in DMNH catalogued as from Matabang Bundok, Kilo-Kilo, 300–450 m, May 1971;

Lubang October–November (most probably 1902) (McGregor 1904a);

Mindoro **Calapan**, September and November 1890 (specimens in MCML, ZMB), October 1909 (two specimens in AMNH); along the **Baco river** from Chicago inland to Balete, March–May 1905 (McGregor 1905c); **Mamara**, Occidental, May 1972 (four specimens in PNM); **Lake Babae** near Mamburao, March 1972 (Temme 1976); **Bajo Rio Catuiran**, June 1888 (male in AMNH); **Makatok**, Victoria, March 1954 (Ripley and Rabor 1958); **Lake Naujan**, 1954 (Ripley and Rabor 1958), August 1963 (two specimens in AMNH, PNM), August 1973 (Temme 1976), and in the past decade (Davies *et al.* 1990, J. C. T. Gonzalez verbally 1997); **Lake Lubao**, January 1994 (Hornbuckle 1994) and February 1997 (B. Gee *in litt.* 1997); **Siburan**, 1990s (Brooks *et al.* 1995b); **Bok-bok** (Bocboc), Bongabong, Oriental, 200 m, July 1963 (two specimens in AMNH, PNM); **Mt Iglit-Baco National Park**, December 1991, 600 m, 74 birds (R. J. Timmins *in litt.* 1997); **Lumintao river**, March 1972 (Temme 1976); **Bugsanga river**, March 1972 (Temme 1976); **San Jose**, June 1953 (eight specimens in FMNH, PNM, UMMZ), and at the 555 ha Philippine Salt Industry (PSI) evaporation pans, 1970–1974, and to the north of the town at the NIDC farm in the same period (Temme 1976); coralline island of **Alibatan** off the south coast, October 1971 (Temme 1976, 1994); Kamali-malihan (untraced), Occidental, May 1971 (specimen in DMNH); South Tandag (untraced), January 1992 (R. J. Timmins *in litt.* 1994);

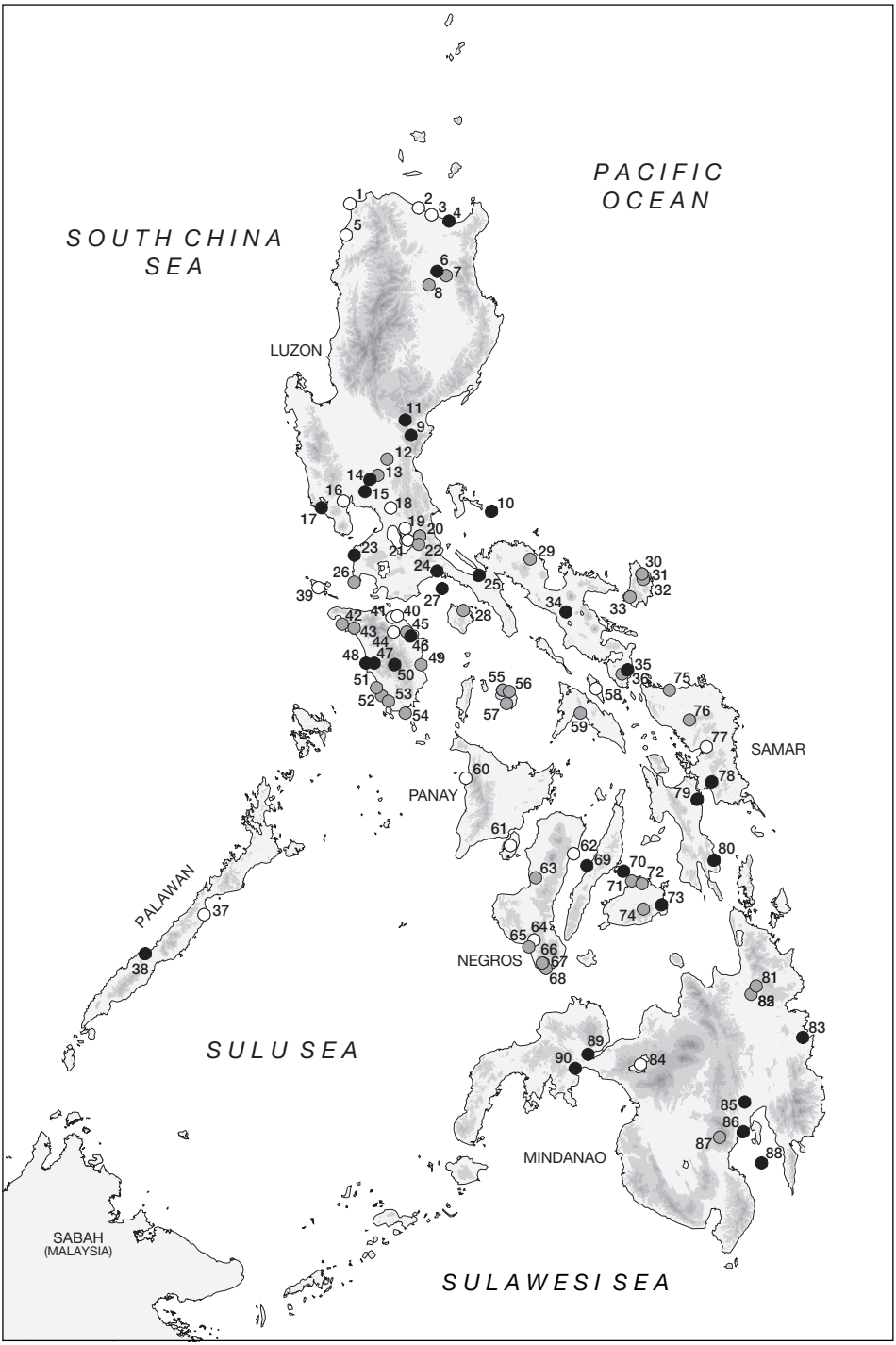
Ticao unspecified locality (McGregor 1903, 1909–1910);

Masbate **Milagros**, where "very abundant" (McGregor 1909–1910), and specifically Potot, sea-level, March 1972 (four specimens in DMNH);

Panay **Culasi**, May 1918 (McGregor 1921a); unspecified locality, October 1890 (male in CM);

The distribution of Philippine Duck *Anas luzonica* (map opposite; sequence not as in text): (1) Agaga; (2) Abulug river; (3) Rio Grande; (4) Buguey; (5) Paoay lake; (6) Solana; (7) Sisim; (8) Liwan; (9) Maria Aurora Memorial National Park; (10) Jomalig Island; (11) Canili lake; (12) Papaya; (13) Arayat; (14) Candaba Marsh; (15) Apalit; (16) Hermosa; (17) Subic Bay; (18) Novaliches Reservoir; (19) Tanay; (20) Pangil; (21) Jala Jala; (22) Pagsanjan Marsh; (23) Looc; (24) Pagbilao; (25) Lalaguna Marsh; (26) Calatagan; (27) Tayabas Bay; (28) Santa Cruz; (29) Daet; (30) Bagamanoc; (31) Viga river estuary; (32) Viga; (33) Caramoran; (34) Lake Baao; (35) Bulusan lake; (36) Irosin; (37) Puerto Princesa; (38) Quezon; (39) Lubang; (40) Calapan; (41) Baco river; (42) Mamara; (43) Lake Babae; (44) Bajo Rio Catuiran; (45) Makatok; (46) Lake Naujan; (47) Lake Lubao; (48) Siburan; (49) Bok-bok; (50) Mt Iglit-Baco National Park; (51) Lumintao river; (52) Bugsanga river; (53) San Jose; (54) Alibatan; (55) Casing; (56) Silum; (57) Taclobo; (58) Ticao; (59) Milagros; (60) Culasi; (61) Guimaras; (62) San Carlos; (63) Payao; (64) Amio river; (65) Sicopon river; (66) Balanan; (67) Candugay; (68) Canaway; (69) Tajao; (70) Olango; (71) Getafe; (72) Burgos; (73) Cogtong Bay; (74) Cantaub; (75) Catarman; (76) Matuguinao; (77) Loquilocon; (78) Sohoton National Park; (79) Palo; (80) Hinunangan; (81) Sumile; (82) Maguinda; (83) Bislig; (84) Lake Lanao; (85) Tadeco; (86) Caroland Resort; (87) Mt Apo; (88) Davao Gulf; (89) Tambulig; (90) Pagadian.

○ Historical (pre-1950) ◍ Fairly recent (1950–1979) ● Recent (1980–present)


PACIFIC OCEAN
SOUTH CHINA SEA
LUZON
PANAY
SAMAR
NEGROS
PALAWAN
SULU SEA
MINDANAO
SABAH (MALAYSIA)
SULAWESI SEA

Guimaras unspecified locality, January of unspecified year (male in AMNH);

Negros **San Carlos**, Occidental, September 1948 (female in PNM); **Payao**, Binalbagan, Occidental, 75 m, October 1979 (two females in DMNH); **Amio river**, April and May 1948, including Talastos (12 specimens in FMNH, UPD), and evidently adjacent **Sicopon river**, April 1948 (two specimens in FMNH), a total of 15 birds being collected in this period (Rand 1951); **Canaway**, Siaton, Negros Oriental, June 1955 (female in UPLB); **Candugay**, c.9 km north of Siaton, August 1965 (four juveniles in UPLB), and specifically on the Tayko ranch and at Lamtok and Nabanog on the Garcia ranch, 1972–1973, and probably spreading to the adjacent Bondo area when breeding (Alcala and Carumbana 1975; also Pa-alan 1993); **Balanan**, Siaton, February 1957 (two males in YPM; also Ripley and Rabor 1958);

Cebu **Tajao**, Pinamungahan on the west coast, November 1986 (Magsalay 1988); **Olango Island**, regularly in the 1980s (Scott 1989);

Sibuyan **Silum**, near Magdiwang, March 1972, when a flock of at least 200 was present (Goodman *et al.* 1995); **Taclobo**, March 1972 (Goodman *et al.* 1995); **Casing**, near Magdiwang, March 1972 (Goodman *et al.* 1995; four specimens in DMNH, PNM);

Samar **Catarman** at Samar Institute of Technology, Makiwalo, May 1959 (male in PNM); **Matuguinao** at San Isidro, 300–400 m, where 14 birds out of about 100 were collected in five days in late April and early May 1957 (Rand and Rabor 1960; 16 specimens in AMNH, DMNH, UPLB, YPM); **Loquilocon**, Wright, July 1948 (female in PNM); **Sohoton National Park**, north of Basey, May 1992 (Scotwin 1992);

Leyte **Palo** at MacArthur's Beach Resort, May 1992 (Scotwin 1992); rice paddies at **Hinunangan**, undated (Davies *et al.* 1990);

Bohol **Getafe**, May 1961 (female in DMNH); **Burgos**, Talibon, March 1976 (male in PNM); **Cogtong Bay**, regularly in 1980s (Scott 1989); **Cantaub**, Sierra Bullones, 700–750 m, May 1955 (Rand and Rabor 1960);

Mindanao (*eastern*) **Bislig** airport and PICOP road 11, recently in small numbers (Hornbuckle 1994, G. C. L. Dutson and P. A. J. Morris *in litt.* 1996, 1997, D. Allen verbally 1997, I. Mauro *per* F. Verbelen *in litt.* 1997); (*central*) Lake Bounboun (untraced), Butuan, August 1997 (J.-P. Turpin *in litt.* 1997); **Pagadian**, July 1997 (J.-P. Turpin *in litt.* 1997); **Maguinda**, November/December 1976 (Sanguila and Tabaranza 1979); **Sumile**, November/December 1976 (Sanguila and Tabaranza 1979); **Caroland**, near Davao, March 1990, when over 50 were present (Greensmith 1990, N. J. Redman *in litt*. 1996) and similar numbers subsequently, but with a recent drop (P. A. J. Morris *in litt.* 1996); **Lake Lanao**, August 1903 (female in USNM), March 1906 (Meyer de Schauensee 1957; two specimens in ANSP); **Tadeco**, Davao, in a small wetland area amidst a large banana plantation, March 1983 (Clarke 1983); west-side coastlands of **Davao Gulf**, 1980s (Scott 1989), with 26 west of Davao City in May 1987 (Howes 1987b), and near Carmen (untraced), north of Davao City, January 1982 (Fisher mss); foot of **Mt Apo**, August 1975 (E. C. Dickinson *per* D. Callaghan *in litt*. 1997); (*western*) **Tambulig**, Molave, Zamboanga del Sur, August 1975 (E. C. Dickinson *per* D. Callaghan *in litt*. 1997);

Palawan (see Remarks 3) **Puerto Princesa**, undated (de Elera 1895); **Quezon**, June 1984 (male in WFVZ).

POPULATION Despite the assertion that the species "does not often occur in large numbers" (F. S. Bourns and D. C. Worcester in McGregor 1909–1910), there is plenty of evidence to the contrary; what is not clear is how season affects gregariousness.

The species was common at certain localities in the 1890s ("large flocks" on the Rio Grande and "common" in Benguet and Lepanto, Luzon, with two assistants shooting over 20 at one lake in a few hours; and "abundant" on Samar) (Whitehead 1899d). On Mindoro in 1905 the species was "not uncommon" on the lower Baco river (McGregor 1905c). On Panay in 1918 a few birds were in Culasi marsh and pairs were found in adjacent areas (McGregor 1921a), which suggests low to moderate numbers.

Experience in the 1920s led Hachisuka (1931–1935) to consider it "extremely rare", reporting securing one on Luzon, "but during our several months' stay in swampy districts, especially at Buluan, Mindanao, we were never able to obtain any information from the natives". Hachisuka (1936) expressed this slightly differently, speculating that he did not know if a decline had occurred or if the species was just very patchy in distribution, but reporting that "we did not find a single bird in the Leguasan marsh or the Cotabato valley, although they appeared very favourable to ducks." Hoogstraal (1951:64) had the same experience (although not specifically commenting on the absence of the Philippine Duck), encountering three species himself and discovering that these were the only ones known to local people.

In the early 1950s Manuel (1953) reported that, while "small flocks of a few pairs may be seen feeding in small ponds", the size of the bird and its year-round availability made it a target of hunters and poachers, causing "a great scarcity" of the species. Small groups of 3–5 birds were frequently observed at Lake Naujan, Mindoro, in 1954, but this and other species were "no longer in their former numbers" (Ripley and Rabor 1958; see Threats). In the late 1950s, when it was characterised as "a somewhat rare duck" (Meyer de Schauensee 1957), the species was found in large feeding flocks (up to 100) in freshwater bodies in southern Negros, but very few birds were present in the early 1970s (Alcala and Carumbana 1975).

On Catanduanes in 1971 the Philippine Duck gathered "in large numbers" to feed (Gonzales 1983). In the period 1970–1972 counts up to a maximum of 2,000 (in November 1970) were made at salt pans used by resting birds (Temme 1976). Lake Naujan in eastern Mindoro was reported once to be an important site for the species (note also preceding paragraph), but appeared in the 1970s to hold only isolated pairs (Temme 1976), although it was still listed as the site for a resident population in the 1980s (Scott 1989). In fact by the mid-1970s it was judged that the species had undergone an enormous decline in many places (Temme 1976), although from the evidence assembled under Distribution there were only a few localities at which it was ever found to be common. The species was still in "fair numbers" (absolute maximum 40) on the ranches at Candugay, Negros, October 1972–February 1973 (Alcala and Carumbana 1975). A flock of over 1,000 was seen on Luzon in 1978 (Green 1992c). In the late 1970s the possibility that it might be in difficulties was first raised but then discounted ("said to be local and uncommon, but not endangered" (Kear and Williams 1978).

In the 1980s it was judged "probably still locally numerous" and "probably not severely endangered" (Madge and Burn 1988). There was an implication that possibly several thousand birds congregated each November at Buguey, northern Luzon (Scott 1989), and certainly there were over 2,000 counted there between January and April 1987 (Alonzo-Pasicolan 1987); around 250 birds were present at Tayabas Bay, "significant numbers" were recorded on Olango Island between Cebu and Bohol, and small numbers were present along the west Davao Gulf coast (Scott 1989). In the early 1990s it was speculated that the total population of the species "could be only a few thousand" (Green 1992c), but this was in ignorance of fieldwork which showed that in the late 1980s in August–October and January–March "thousands of Philippine Ducks" were taken "every week", so that the total population was considered "likely to be in the range of 10,000–100,000 individuals, and declining" (Callaghan and Green 1993). At Candaba Marsh on Luzon, the most important site in the Philippines for numbers of wintering waterfowl (as many as 100,000 ducks were once counted in one day), the Philippine Duck and Garganey *Anas querquedula* were identified as the site's "two most abundant species" in the 1980s (Scott 1989), which strongly suggests a complement of many thousands of birds; this site was effectively destroyed in the 1990s, and the Philippine Duck has virtually disappeared from the area as a wintering bird (T. H. Fisher *per* D. Allen verbally 1997), the highest recent count being of 20+ on 18 February 1997 (P. A. J. Morris *in litt.* 1997). Similarly at Pagbilao marshes there were large numbers (200–300) in February 1979, 140 in July 1987 (Jensen and Hornskov 1992), up to 55 in November 1991 (R. J. Timmins

in litt. 1997), and 20 in March 1997 (P. A. J. Morris *in litt*. 1997), all suggesting a decline at this site.

The 1994 Asian Wildfowl Census reported just 31 birds at 51 sites, with none recorded (number of sites not known) in either 1995 or 1996 (J. R. Howes *in litt.* 1997). These figures can easily misrepresent the situation, however, as the encouraging extrapolation of about 3,000 on Polillo in May 1996 and the sighting of 600 at Subic Bay in March 1997 (see Distribution) indicate. Nevertheless, the evidence points to a steep decline in numbers of birds of the type which would lead to their absence from many previous areas.

ECOLOGY ***Habitat*** The Philippine Duck is found in lakes, reservoirs, marshes, swamps, small freshwater ponds, streams, rivers, estuaries, brackish fishponds, tidal creeks, mangroves, mudflats, salt pans (for rest and refuge) and the open sea, sometimes venturing into fields (Temme 1976, Gonzales 1983, Howes 1987b, Gonzales and Rees 1988; also McGregor 1909–1910 and Distribution). According to D. S. Rabor's composite experience of the species, it frequents "ponds and even carabao (water buffalo) wallows; sometimes in small streams in original forest"; on Samar it was not encountered in any of the numerous rivers in the region surveyed, but around 100 (moulting) birds gathered in a small marsh inside primary forest in a small valley surrounded by densely forested hills, the open water scarcely covering a hectare but the marshy edges extending well into the forest (Rand and Rabor 1960). In southern Negros it has been found in ponds and creeks characterised by good cover of trees, shrubs and grasses into which the birds could retreat when disturbed; at night in the lowlands the birds occupied the forested parts of creeks (Alcala and Carumbana 1975). Breeding habitat is weedy, unworked ricefields on Mindoro (Temme 1976), small ponds in southern Negros (Alcala and Carumbana 1975).

Food Food and feeding methods are probably similar to those of the Mallard *Anas platyrhynchos*, with dabbling and upending behaviour noted (Johnsgard 1978, Carboneras 1992). Foraging occurs on the muddy bottoms of ponds and ricefields, mostly in the mornings and late afternoons, but probably also at night (Alcala and Carumbana 1975). Food consists of "fish, shells, seeds, and the shoots of young plants", and at Caramoran on Catanduanes in 1971 farmers complained that birds caused considerable damage to newly sown fields and sprouting crops (Gonzales 1983); also insects and rice (Gonzales and Rees 1988). The stomach of the female from Apalit, Luzon, 1985, held shrimp (NCSM label data). Birds are most active early in the morning and late in the afternoon, and on moonlit nights (Gonzales 1983, Gonzales and Rees 1988).

Breeding This duck possibly breeds throughout the year, with evidence for February–December (Temme 1976, Gonzales 1983, Gonzales and Rees 1988), the chief period at least on Mindoro apparently being high summer, July–August (Temme 1976), although a male with enlarged gonads was collected there in March (Ripley and Rabor 1958). In southern Luzon, month-old ducklings have been found in April and somewhat older ones in September (Gonzales 1983), with two ducklings from the north (Cagayan) in May (two specimens in PNM). The first two birds recorded on Bohol, in May, were a male with testes enlarged and a female in tail moult, and all 14 birds collected on Samar in April were in tail moult, with one female completely flightless (Rand and Rabor 1960; also Ripley and Rabor 1958). Egg-laying has been recorded in the period July to October, southern Negros, coinciding with the rainy months (Alcala and Carumbana 1975), although again a male with enlarged gonads was collected at Lake Balanan in late February (Ripley and Rabor 1958). Two nests, southern Negros, were in the middle of cogonal patches overlooking ponds, although reports were also from ricefields; they were made of dried grass on the ground, concealed by leaf-blades being bent down over the cavity (Alcala and Carumbana 1975). Clutch-size varies from seven (observed, but perhaps not complete) to 12 (reported) (Alcala and Carumbana 1975; also Gonzales and Rees 1988) or 8–10 (observed) to 16 (reported) (Temme 1976), contradicting

the personal information of D. S. Rabor (in Ripley 1951) that the species only lays four eggs in the wild. Incubation lasts 25–27 days (Alcala and Carumbana 1975).

Migration Little information is available. Birds appear mostly sedentary (Carboneras 1992). November gatherings of various duck species at Buguey, northern Luzon, consist chiefly of this and one other species (Scott 1989), implying some seasonal aggregation and displacement. The two records from Palawan suggest non-breeding wanderers (see Remarks 3).

THREATS Loss of habitat and hunting pressure are the major influences on this species.

Habitat loss There are few data to correlate directly with the general decline and local disappearance of the Philippine Duck, but it seems incontrovertible that the conversion of natural wetlands, through either drainage or adoption of wet agriculture, has significantly affected the species (Temme 1976, Scott 1989, P. A. J. Morris *in litt*. 1996), possibly by limiting the amount of habitat available in the dry season (Kear and Williams 1978, Green 1992c). The most obvious and immediate of examples is the drainage in the 1990s of Candaba Marsh, which—since it has been considered the most important site for waterfowl in the Philippines, with the Philippine Duck as its most abundant species (Scott 1989)—can be assumed to have been the most important wintering site in the world for this species. Its decline at Lake Naujan on Mindoro was attributed, by implication, to drainage of marshy areas (Ripley and Rabor 1958). The encouragingly strong population found in May 1996 on Jomalig Island, Polillo group, faces serious threat from conversion of habitat there (marshes and mangroves) to fishponds and ricefields (J. C. T. Gonzalez *in litt*. 1996). The loss of mangroves in the Philippines—67% destroyed in 60 years—must have had a serious impact on this duck, which is commonly found in this habitat, as must recent extensive use of pesticides on ricefields occupied by the species (D. Callaghan *in litt*. 1997).

Hunting and trapping The main cause of the decline of the species was attributed to exceptionally high levels of hunting and persecution evident in the 1960s, and even with the political control of weapons in 1972 (martial law) this persecution continued in the form of trapping at nests and taking of clutches (Temme 1976). Already in 1954 the species was "wary in Lake Naujan because of overhunting" and had declined there principally because of this factor (Ripley and Rabor 1958). Hunting of the species on Negros—presumably outside the designated season of December/January—was "rampant" prior to the firearm ban in 1972, and was "probably the main single cause" of its decline (Alcala and Carumbana 1975); however, robbing of nests was (is) also widespread in southern Negros and probably also contributed to the decline (Alcala and Carumbana 1975), as perhaps elsewhere. Young birds in markets in Camarines Norte in September 1969 (Gonzales 1969) further testify to the widespread nature of hunting in the past. In 1987 an estimated five birds per week were taken by each hunter from two sites near College, Luzon, with the equivalent figure at Candaba being 50 per week (Alonzo-Pasicolan 1990). Extreme wariness not only of people but also of other animals, causing them to fly at the slightest disturbance (Alcala and Carumbana 1975), is surely a sign of enormous hunting pressure; so too is the species's rarity around populated areas (G. C. L. Dutson *in litt.* 1996). Illegal hunting occurs at Tayabas Bay (Scott 1989).

Natural predators Crows *Corvus* probably take eggs and young; and in one instance a Grass Owl *Tyto capensis* was reported to have made its nest close to a duck's nest with seven eggs, and even to have built a passage between the two nests, causing the duck to desert, while eggshells were later found in the connecting passage (Alcala and Carumbana 1975).

MEASURES TAKEN The Philippine Duck is known from one NIPAP site (Mt Iglit-Baco National Park on Mindoro) and one CPPAP site (Bataan Natural Park/Subic Bay on Luzon; see Appendix). Furthermore, Olango Island has been designated as a Ramsar site and as a 920 ha Wildlife Sanctuary (see Appendix). The species receives legal protection in these areas and at another "key site": Maria Aurora Memorial National Park, Luzon. The presence of

the species in Sohoton National Park, Samar (see Distribution), may be significant (this needs investigation). At Candugay in southern Negros the ranches where the duck occurred were private bird sanctuaries in 1973 (Alcala and Carumbana 1975). The Caroland Resort on Mindanao is a private wetland reserve (Greensmith 1990), although the efficiency of this in habitat protection is not known. Candaba Marsh has been proposed as a Ramsar site by DENR and WBSJ (see equivalent section under Streaked Reed-warbler *Acrocephalus sorghophilus*). A government ban on firearms was imposed in September 1972 (Alcala and Carumbana 1975). The species breeds freely in captivity (Kear and Williams 1978) but the purity of captive stock is questionable owing to the frequency of uncontrolled crossings with Mallards *Anas platyrhynchos* (D. Callaghan *in litt*. 1997).

MEASURES PROPOSED Apart from the areas targeted for conservation above, the species is known from six "key sites" (Mt Cetaceo and Candaba Marsh on Luzon; Central Catanduanes; Lake Naujan and Siburan on Mindoro; Mts Madja-as/Hantod-tubig on Panay; see Introduction) and these deserve formal designation, at least in part, under the NIPAS process. In 1975 it was recommended that an animal sanctuary of at least 2,000 ha should be established in southern Negros not just for the duck but for a variety of other gamebirds (and involving the control of certain bird predators), and this measure—which was intended to serve as a mechanism to ensure a population for sport-hunting—appeared to be in train (Alcala and Carumbana 1975); the outcome is unknown. Long-term ecological investigation of the duck, to elucidate its management requirements, was also called for at this time (Alcala and Carumbana 1975).

It is clear that some detailed ecological and life-history studies of the Philippine Duck are urgently needed. Equally important, and perhaps necessary as a precursor to such work, in order to locate appropriate study sites, are intensive surveys to identify areas in moderately intact condition where the species survives, including those most likely to serve as the sources of the concentrations found recently on Polillo and at Subic Bay.

REMARKS (1) Hachisuka (1932b) considered this bird—often called the Luzon Duck, Luzon Mallard or Philippine Mallard—closely related to the Spot-billed Duck *Anas poecilorhyncha* of E Asia and Pacific Black Duck *A. superciliosa* of Australia, and reported that it had been hybridised with the latter. Delacour and Mayr (1945a) thought *superciliosa*, *poecilorhyncha* and *luzonica* formed a single species. Ripley (1951), however, argued that the downy plumage of *luzonica* points to its being "an old relict form... well worthy of full specific rank". Indeed, the structural characters of this duck were analysed by von Boetticher (1937), who considered it sufficiently distinct to propose for it the subgenus *Philippinetta*, and although this has not been adopted the behavioural repertoire of the species suggests that it is a somewhat divergent form of mallard (Johnsgard 1978). Livezey (1991) treated *luzonica*, *superciliosa* and *poecilorhyncha* as a distinct South Pacific mallard group of the infragenus *Polionetta*. (2) Gonzales (1983) gave 1979 for this record, but that this was mistaken is backed up by specimens in PNM. (3) The two records from Palawan do not carry complete authority. The first was either overlooked or discarded by later writers, while the second is a specimen obtained from (but not necessarily by) P. Cua (for whom see Measures Taken *Implementation of CITES* under Philippine Eagle *Pithecophaga jefferyi*).