

Despite its large range through the Bahamas, Turks and Caicos, Cuba, Caymans, Jamaica, Haiti, Dominican Republic, Puerto Rico, U.K. Virgin Islands, St Croix, St Kitts-Nevis and Antigua and Barbuda, this fresh- and saltwater marsh-dwelling duck has suffered everywhere from relentless hunting pressure and wetland drainage, so that today its status is precarious. Much more attention needs to be given to wetland conservation within its range, and authorities have to find ways of reducing levels of (now almost universally) illegal hunting on their territories. Cuba and the Bahamas in particular deserve fuller survey.

DISTRIBUTION The West Indian Whistling-duck is widely scattered throughout most of the Caribbean from the Bahamas, Greater Antilles and adjacent islands and in a great number of the smaller archipelagos east to the Lesser Antilles (Leeward Islands only; see Remarks 1). Unless otherwise stated coordinates in the following account are taken from OG (1955b, 1958, 1963a), DMATC (1972, 1973) and Scott and Carbonell (1986), with records roughly from west to east; significant numbers of birds observed or collected (when data were available in the original source) are generally discussed under Population. The species was recorded accidentally in Bermuda in November 1907 (see Bond 1956b) and in Texas, U.S.A. (see Remarks 2). A small feral population may exist in Florida (see Owre 1973).

Bahamas Records (north to south) on individual islands are: (*Abaco*) May 1973 (J. Patterson *in litt.* 1973 to W. B. King); (*Andros*) January 1879 (specimen in FMNH), May 1884 (specimen in ROM), January 1902 (Bonhote 1903), March 1922 (five specimens in AMNH); western Andros, April 1890 (Northrop 1891) and currently, where it probably breeds (Scott and Carbonell 1986); on the ponds situated a few miles from the mouth of Fresh Creek (c.24°43'N 77°47'W, read from ACB 1976), undated (Cory 1880); (*New Providence*) unspecified (Bond 1971); artificial pond at Nassau, December 1984 (C. A. Faanes *in litt.* 1986); (*Cat*) c.3 km east of Smith Bay (24°21'N 75°28'W), near New Bight (c.24°18'N 75°26'W) and 1.5 km east of McQueens (c.24°11'N 75°28'W), June 1986 (Buden 1987c; coordinates read from the map in Buden 1987c); (*San Salvador*) unspecified (Brudenell-Bruce 1975, King 1978-1979); (*Rum Cay*) c.2.5 km north of Cotton Field Point (23°39'N 74°52'W) and Yard Pond (23°39'N 74°57'W), June 1987 (Buden 1990; coordinates from ACB 1976); (*Long*) unspecified (King 1978-1979); (*Hog Cay*) (23°24'N 75°28'W), currently (P. D. Graham *in litt.* 1991); (*Ragged*) Little Ragged (22°10'N 75°43'W), April 1907 (see Buden 1987b); (*Crooked*) where a downy young was taken in March 1934 (Buden 1987a); (*Acklins*) in the early 1970s (see Buden 1987a); (*Inagua*) "Inagua", February and April 1888 (four specimens in FMNH and MCZ) and still present in 1973 (see Population); Great Inagua, Horse Pond, near Mathewtown, where a nest was found in February 1909 (Todd and Worthington 1911), September 1966 (H. F. Mayfield *per* J. T. Emlen *in litt.* to W. B. King) and undated (Campbell 1978); Inagua National Park and Lake Rosa (21°05'N 73°30'W), currently (Scott and Carbonell 1986).

Turks and Caicos Records are: (*Caicos*) Ft George Cay (c.21°54'N 72°05'W, read from the map in Buden 1987a), where a flock in flight tentatively identified as this species was observed in July 1930 (see Buden 1987a); Stubbs Cay (a small cay next to Ft George Cay), July 1930 (see Buden 1987a); North Caicos, Sawgrass and Bellfield Landing ponds (untraced), July and September 1987 (Norton and Clarke 1987); (*Turks*) Grand Turk, where a few birds were under domestication by local salt merchants in July 1930 (see Buden 1987a).

Cuba Records include:

Mainland (Pinar del Río) Laguna La Deseada (untraced), San Cristóbal (22°43'N 83°03'W), July 1932 (five specimens in FMNH); 1 km from the coast south of San Cristóbal, October 1955 (three specimens in YPM; also Ripley and Watson 1956); (*La Habana*) Laguna de Ariguanabo (22°56'N 82°33'W), February 1920 (six specimens in AMNH); "Guariguanabo" (presumably Ariguanabo), where the species was still present in 1943 (Barbour 1943); (*Matanzas*) "Ciénaga de Zapata", March 1913 (two specimens in MCZ); "Zanja La Cocodrila" (22°34'N 81°39'W), where a female with three ducklings were observed in May 1968 (Garrido 1980); Península de Zapata, near Bahía Cochinos, December 1991 (J. M. Jiménez López *in litt.* 1992); Guamá (on the south-eastern corner of Laguna del Tesoro, 22°21'N 81°07'W), undated (Garrido 1980) and June 1978 (Clements 1979; also J. F. Clements *in litt.* 1991); (*Sancti Spiritus*) sanctuary at Soledad (apparently botanical gardens, now evidently Pepito Tey, 28°08'N

80°20'W: see Figure 1 in Rutten 1934), where the species bred regularly (Barbour 1923, 1943); Soledad (presumably same as previous locality), March 1941 (specimen in CM); Jibaro wetlands (21°00'N 79°10'-80°00'W), currently (Scott and Carbonell 1986); (*Ciego de Avila*) Cayo Coco, October 1973 (Garrido 1976); (*Camagüey*) Cayo Romano, before 1981 (Acosta and Berovides 1984); (*Granma*) Laguna el Leonero (Leonero, 20°41'N 77°04'W), Ciénaga de Birama (at the mouth of the río Cauto), April 1971 (Bond 1972); “Fca de la Punta”, c.6.5 km west of Guamo (on the río Cauto), January 1949 (six specimens in USNM); (*Guantánamo*) San Carlos de Río Seco (possibly San Carlos, 20°09'N 75°09'W), July 1909 (specimen in AMNH); “La Lagüña” (untraced), Los Caños (20°03'N 75°09'W), January 1919 (specimen in USNM); mangroves along the bay between Manatí (20°05'N 75°06'W) and Los Caños, January 1913 (three specimens in USNM); Manatí, March 1912 (specimen in AMNH);

Adjacent islands and archipelagos (Isle of Pines or Isla de la Juventud) (records north to south) “Rincon Lagoon” (north-east coast: see the map in Todd 1916), 1904 (Todd 1916); McKinley (21°53'N 82°55'W), Santa Bárbara and río de las Nuevas (21°56'N 82°56'W), sometime before 1911 (see Todd 1916); “Santa Fé”, 1904 (Bangs and Zappey 1905); Los Indios (21°42'N 83°00'W), 1904 (Todd 1916); western end of the Ciénaga de Lanier, near Siguanea (21°38'N 82°58'W), September 1912 (specimen in FMNH), November 1912 and April 1913 (Todd 1916); Ciénaga de Lanier (21°35'N 82°48'W), May 1904 (Bangs and Zappey 1905; five specimens in MCZ) down to the present (Scott and Carbonell 1986); La Vega (possibly San Francisco de la Vega: see the map in Todd 1916), October 1925 (specimen in YPM); Pasadita (Ciénaga de Lanier: see the map in Todd 1916), 1904 (Todd 1916); (*Archipiélago de los Canarreos*) Cayo Matías (21°34'N 82°26'W), resident around 1985 (Acosta *et al.* 1988); Cayo Cantiles (21°36'N 82°02'W), where large numbers have been recorded (see Garrido and Schwartz 1968).

Cayman Islands The species is a breeding resident on Grand Cayman (Westerly Freshwater Wetlands, 19°16'N 81°18'W; Central Mangrove Swamp and Booby Cay, 19°20'N 81°16'W; Meagre Bay Pond and Pease Bay Pond, 19°17'N 81°13'W; Conocarpus Swamps and Frank Sound Wetland, 19°19'N 81°10'W; Malportas Pond, Rock Pond and Point Pond, 19°21'N 81°12'W) and Little Cayman (Tarpon Lake and Wearis Bay Wetlands, 19°41'N 80°02'W; Charles Bight Wetland and Sesuvium Swamp, 19°42'N 79°59'W), feeding areas in the latter also including Booby Pond and nearby Heronry, 19°40'N 80°04'W, and North Mangrove Swamp, 19°42'N 80°03'W (Scott and Carbonell 1986). The species is not considered to be resident on Cayman Brac but it is occasionally observed there (Bond 1972, Bradley 1985, van Liefde 1992).

Jamaica Records are from: Negril Aerodrome, May 1989 (Levy 1989); Negril Morass (18°19'N 78°20'W), currently (Scott and Carbonell 1986); morasses of Westmoreland (Westmoreland parish, at 18°14'N 78°09'W), where the species was a numerous breeder (Gosse 1847); Mount Edgecumbe (*sic*) Swamp (Mount Edgecombe at 18°08'N 78°01'W), currently (A. Sutton *in litt.* 1990 to IWRB-TWRG); Font Hill (St Elizabeth) (18°04'N 77°56'W), currently (A. Sutton *in litt.* 1990 to IWRB-TWRG); Parottee (presumably Parottee Salt Pond, 17°58'N 77°50'W), December 1976 (see Kear 1979); Parottee Salt Pond, and Black River Lower Morass (18°03'N 77°48'W), currently (Scott and Carbonell 1986, Downer and Sutton 1990); Falmouth Swamps (18°30'N 77°40'W), currently (Downer and Sutton 1990); Long Bay (17°51'N 77°01'W), near Spanish Town, December 1861 (specimen in USNM); Salt Island Lagoon (17°53'N 76°59'W), currently (Downer and Sutton 1990); Caymanas Dam (Caymanas at 18°01'N 76°54'W), currently (Downer and Sutton 1990); Great Salt Pond (17°58'N 76°52'W), October 1862 (specimen in USNM); Passage Fort (17°59'N 76°52'W), October 1863, October 1864 and November 1865 (three specimens in AMNH, MCZ); Grant's Pen (18°02'N 76°47'W), currently (Downer and Sutton 1990).

Haiti Records are from: Ile-à-Vache, May 1930 (Wetmore 1932c); Les Basses (18°35'N 73°42'W), January 1918 (Wetmore and Swales 1931); Étang Miragoane (18°24'N 73°03'W), 1927 and February 1928 (Bond 1928a, Danforth 1929); near Gonaïves (19°27'N 72°41'W), 1927 (Danforth 1929); Artibonite Sloughs beyond St Marc, where a few birds were observed in 1927 (Danforth 1929); Rivière Estère (Rivière L'Estère, at 19°54'N 72°38'W; see Remarks 3) reportedly common sometime before 1809 (see Wetmore and Swales 1931); Source Matelas (18°43'N 72°22'W), undated (see Wetmore and Swales 1931); “Lac Assuei” (= Étang Saumâtre), June 1938 (specimen in FMNH); Étang Saumâtre, April 1917

(Wetmore and Swales 1931) and March 1918 (Wetmore and Swales 1931) down to the present (see Scott and Carbonell 1986); Trou Caïman (18°40'N 72°09'W), April 1917 (Wetmore and Swales 1931); Fort Liberté, reported to Bond (1928a); Les Salines (untraced), 1927 (Danforth 1929).

Dominican Republic Records are from: “Santo Domingo”, April 1895 (specimen in FMNH); Lago Enriquillo, October 1919 (see Wetmore and Swales 1931) and at least until 1981 (Stockton de Dod 1981); Laguna del Salodillo (= Laguna de Saladilla, 19°39'N 71°43'W), near Copey (19°41'N 71°41'W), June 1927 (Danforth 1929), March 1985 (C. A. Faanes *in litt.* 1986) down to the present (see Scott and Carbonell 1986); Montecristi (= Monte Cristi or Fernando de Montecristi, 19°52'N 71°39'W), currently (A. Stockton de Dod *in litt.* 1986); Laguna Salada (17°41'N 71°28'W), February 1977 and May 1978 (see Vargas Mora and González Castillo 1983); Bucán de Base (17°38'N 71°26'W), July 1977 (Wiley and Ottenwalder 1990); Laguna de Oviedo (17°46'N 71°21'W), Laguna de Cabral (Cabral at 18°15'N 71°13'W), mangroves near Gaspar Hernández (19°37'N 70°17'W), Rincón de San Francisco de Macorís (San Francisco de Macorís at 19°18'N 70°15'W), Bayaguana (18°45'N 69°38'W) and Pilancón (18°54'N 69°36'W), where the species was present at least until 1981 (all six preceding localities from Stockton de Dod 1981); several localities in the Bahía de Samaná (“Samaná Bay”, “Samaná Bay, San Lorenzo”, “San Lorenzo Bay”, “Sanchez” (*sic*), “La Cañita” [“swamp at mouth of Yuna River”]), April 1883 (four specimens in FMNH), July 1883 (two specimens in ANSP), July and September 1916 and February 1919 (12 specimens in AMNH and in USNM), May 1927 (Wetmore and Swales 1931); (*Isla Beata*), “regularly” reported by 1977 (see Wiley and Ottenwalder 1990). Untraced localities are: Almezein, late eighteenth century (Fisher 1981), Jicomé and Esperanza (which are common names of settlements), where the species was present up to 1981 (Stockton de Dod 1981).

Puerto Rico Records are from: (*Mona Island*), where the species was observed before 1974 (Bond 1974) and before 1977 (King 1978-1979); (*Mainland*) Aguada (18°23'N 67°11'W), where it was regularly observed in 1982-1983 (J. A. Colón *in litt.* 1986); Boquerón (18°01'N 67°10'W), regularly (J. A. Colón *in litt.* 1986); near Mayagüez (18°12'N 67°09'W), 1875 (Gundlach 1878b); Cartagena Lagoon (18°01'N 67°06'W), currently (Scott and Carbonell 1986); Laguna de Guánica (18°00'N 66°56'W), 1876 (Gundlach 1878b) and regularly observed in 1982-1983 (J. A. Colón *in litt.* 1986); Tiburones Swamp (18°28'N 66°41'W), currently (Scott and Carbonell 1986); Tortuguero Lagoon and Cabo Caribe Swamp (18°27'N 66°27'W), probably breeding (see Scott and Carbonell 1986); Torrecillas (18°20'N 66°26'W), shortly before 1973 (H. A. Raffaele *in litt.* 1973 to W. B. King); Cibuco Swamp (18°28'N 66°23'W), where the species is considered to be resident (see Scott and Carbonell 1986); Anegado Lagoon (possibly Anegado Shoal, at 18°27'N 66°07'W), December 1921 and a nest found in December 1922 (see Wetmore 1927b); Torrecilla Alta (18°25'N 65°54'W), currently (see Scott and Carbonell 1986); Canóvanas (Barrio Canóvanas, at 18°23'N 65°53'W) and Río Grande (18°23'N 65°50'W), regularly (J. A. Colón *in litt.* 1986); Humacao Swamp (18°11'N 65°46'W), where a flock of c.80 birds was observed shortly before 1973 (H. A. Raffaele *in litt.* 1973 to W. B. King) down to the present (Scott and Carbonell 1986, J. A. Colón *in litt.* 1986, Raffaele 1989); mangrove swamps near Mameyes (18°22'N 65°46'W), reported to Wetmore (1927b); Roosevelt Roads Naval Reservation, 18°14'N 65°37'W, currently (Scott and Carbonell 1986); (*Vieques Island*) on the “larger lagoons”, where it was reported to occur at times (Wetmore 1916); wetlands on the southern shore of the island, notably at Laguna Kiani (18°07'N 65°34'W), currently (Scott and Carbonell 1986).

Virgin Islands (U.K.) The species has been recorded from Virgin Gorda, where two adults and three downy young were collected in December 1889 (specimens in BMNH and FMNH), and recently before 1976 (Bond 1976).

St Croix (U.S.A.) The species was collected in July and September 1858 (Newton 1859), December 1939, November and December 1940 and January and February 1941 (seven specimens in FMNH).

Antigua and Barbuda The species has been listed as breeding in Antigua (see Bond 1980), and in Barbuda it was recorded in November 1903 (specimen in USNM) and January 1976 (Bond 1977), and it is currently present (Faaborg and Arendt 1985) in the coastal mangroves in the north-west (see Lewis and

Renton 1989) and in the Bull Hole and inland mangroves (17°35'N 61°46'W) (Scott and Carbonell 1986).

St Kitts-Nevis There is an undated specimen in MCZ from St Kitts.

POPULATION The West Indian Whistling-duck has clearly suffered an alarming decline throughout its range, but the scant information available does not allow a precise evaluation of its current status.

Bahamas Cory (1880) referred to the species as “not uncommon” on some of the larger islands; this assessment is supported by other authors visiting some of the larger islands during the nineteenth and early twentieth centuries (see below), but the species now seems to be rare or very rare almost everywhere.

(*Abaco*) According to J. Patterson (*in litt.* 1973 to W. B. King), the species was formerly found in “much greater numbers”, but “rare” with only few records in recent years.

(*Andros*) It was considered “quite abundant” on the ponds situated a few miles from the mouth of Fresh Creek (Cory 1880), and Bonhote (1903) referred to it as “often seen” along the west coast, although “generally in small parties”. There appears to be no more recent assessment.

(*New Providence*) The status of the species in the past is unknown. There was a sighting of seven or eight birds at Nassau in December 1984 (C. A. Faanes *in litt.* 1986).

(*Cat*) Buden (1987c) reported it an “uncommon to fairly common” resident, although breeding is undocumented. During May-July 1986, birds were seen and heard in the southern half of the island; villagers throughout the island considered it a permanent resident and an agricultural pest (Buden 1987c).

(*San Salvador*) The status of the species remains unclear (see Scott and Carbonell 1986).

(*Rum Cay*) It was reported for the first time in June 1989, and is probably resident although breeding is undocumented; a flock of 10-15 birds was observed at Yara Pond and 43 were counted at a small freshwater pond c.2.5 km north of Cotton Field Point (Buden 1990).

(*Hog Cay*) This small 100 ha cay supports a resident population which during the “past 15 years” reached a maximum of approximately 380 birds (P. D. Graham *in litt.* 1991).

(*Ragged*) The only known observation, on Little Ragged, 1907, concerned six birds (Buden 1987b).

(*Crooked*) The species is known to have bred in March 1934 (Buden 1987a).

(*Acklins*) The species's status is uncertain. There is a record of c.20 in two flocks in the early 1970s (see Buden 1987a).

(*Inagua*) Todd and Worthington (1911) found the species “not uncommon” but “exceedingly shy” on Great Inagua; reproduction was confirmed as a nest was found in February 1909. A small but “apparently secure population” was reported in 1973 (see King 1978-1979), but Campbell (1978) considered it a rarity. The species is currently present in “tens of birds” in Inagua National Park (see Scott and Carbonell 1986), but C. A. Faanes (*in litt.* 1986) failed to detect it there after several searches in suitable habitat during April 1985.

Turks and Caicos A few domesticated birds in 1930 in Turks (see Buden 1987a) suggest a breeding population, but there are no recent records, and C. A. Faanes (*in litt.* 1986) failed to find the species in the mid-1980s. On Caicos there are records from 1930 (see Distribution) and two flocks of 11 and 15 (probably family groups) were observed in July and September 1987 (Norton and Clarke 1987).

Cuba (Mainland) Gundlach (1876) referred to the species as “very common” in appropriate habitat (see Ecology) but Barbour (1923, 1943) noted that the species had been “greatly reduced” in numbers as a consequence of lowland deforestation, having disappeared “from many localities where but a few years ago they were very abundant”; he referred to “one small band” being left at Ariguanabo, and it was still to be found “about the Ciénaga” (presumably Ciénaga de Zapata) and was “still abundant” in remote (less densely populated) coastal regions. He also reported it breeding “regularly” in the sanctuary at Soledad, where sightings of “twenty or more” resting during the day were not uncommon. Ripley and Watson (1956) also noted its increasing rarity, calling it “formerly common”. In 1974 numbers declined drastically at the Jibaro wetlands, after a pest control programme in the rice paddies (see Scott and Carbonell 1986). On Cayo Cantiles, Archipiélago de los Canarreos, the species was known to occur in large flocks (see Garrido and Schwartz 1969). Garrido and García Montaña (1975) still considered it

common, and although Garrido (1984) referred to a “notably decrease of its populations”, and then expressing the belief that it still was “locally common in swamps, along coasts, and even on keys, in good numbers” and reporting that it was actually recovering as a result of its protection against hunting (Garrido 1985; but see Threats). In the Ciénaga de Zapata Gundlach (1893) had found it “very common” but nowadays the species is considered rare there: in six years it was only observed twice, 12 being the largest number recorded (L. Fazio *in litt.* 1992). There are still occasional sightings in this area (e.g. a group of five in December 1991 near Bahía Cochinos: J. M. Jiménez López *in litt.* 1992). In Camagüey, Pinar del Río and some of the cays (e.g. Cayo Coco), the species is considered “not uncommon” (A. Kirkconnell and O. H. Garrido *per* L. Fazio *in litt.* 1992).

(*Isle of Pines*) Bangs and Zappey (1905) found the species in “considerable” numbers in 1904 (with birds collected in the Ciénaga de Lanier), while Todd (1916) recorded it several times in the northern part of the island along the río de las Nuevas, and considered it “quite common” in the western extreme of the Ciénaga de Lanier. Later, Ripley and Watson (1956) noted a decline in the Ciénaga de Lanier, where it had become “rare”.

Cayman Islands Johnston *et al.* (1971) considered it an “uncommon breeding resident” on Grand Cayman and Little Cayman, although D. W. Johnston in 1973 judged it “reasonably common”, “less so” on Cayman Brac (see King 1978-1979) and Bradley (1985) considered it a “rare breeding resident”. The overall population was estimated at over 400 birds (for numbers observed in each of the wetlands mentioned under Distribution see Scott and Carbonell 1986), but very few individuals have been seen or heard during organized evening watches on the edges of mangrove forests in the centre of Grand Cayman (van Liefde 1992). The species appears to be fairly secure in Little Cayman, where the human population is very small and the wetlands still intact; rough counts there yielded numbers up to 125 birds (van Liefde 1992). According to local hunters, the species was formerly numerous on Grand Cayman, where it was “easy to find” and “easy to hunt”, but now is “almost impossible to find” (van Liefde 1992).

Jamaica Gosse (1847) found the West Indian Whistling-duck “numerous”, breeding in the morasses of Westmoreland, and Sclater and Salvin (1876) described it as a breeding resident in “numerous and compact flocks”. By the 1920s Bangs and Kennard (1920) reported it a “rather common resident” although they had already noted a decline as a result of the introduction of the mongoose *Herpestes*; however, they speculated that it might have changed its breeding habits, “probably” keeping its young in places too wet for the mongoose and apparently “regaining its former abundance”. Bond (1956b) called it “common” on the island. At present, the species “regularly” occurs in Negril Morass and the Black River Lower Morass, this being considered the last stronghold of the species on the island (Scott and Carbonell 1986). Downer and Sutton (1990) still thought it “locally common” but extremely shy and difficult to see.

Haiti The evidence assembled by Wetmore and Swales (1931) shows that the species must have been very common late in the eighteenth, nineteenth and early twentieth centuries. By 1918 it was reported to be the “most common duck” in the country (see Wetmore and Swales 1931), and Danforth (1929) found it “very abundant” at Les Salines and near Gonaïves in 1927 with birds seen near Grand Goave, Lake Miragoane and the Artibonite Sloughs. The species occurs regularly at Etang Saumâtre (see Scott and Carbonell 1986) and although currently considered “extraordinarily rare” (C. A. Woods verbally 1992), P. Y. Roumain (*in litt.* 1991) indicated that it can still be found in small numbers at night in isolated swamps and in rice-growing areas.

Dominican Republic Cory (1885) called the West Indian Whistling-duck “probably resident, but not abundant”. It seems to have been locally common in the early decades of the twentieth century, judging from the comments in Wetmore and Swales (1931), who considered it “fairly common” in the lowlands, notably in the Bahía de Samaná (18 specimens in AMNH and USNM were collected in 1916), Laguna de Saladilla and Lago Enriquillo, a site where Danforth (1929) reported it “very abundant” in June 1927 (12 birds shot). Later observations include a group of seven birds in Laguna Salada in February 1977 (see Vargas Mora and González Castillo 1983), and in this same year marines on Beata Island reported it “regularly” in mangroves, and “many” were observed at Bucán de Base (Wiley and Ottenwalder 1990). Stockton de Dod (1981) considered the species to be on the way to extinction. By 1986, “some colonies”

were reported from Montecristi, although it was “very rare” elsewhere on the northern coast (A. Stockton de Dod *in litt.* 1986). DVS (1990) counted it amongst the country's threatened species.

Puerto Rico The species has suffered a great decline, having once been recorded at “many localities” and locally in numbers (Gundlach 1878b). Wetmore (1927b) described it as “formerly common” but “now locally fairly common”, at a time when this was its status at Laguna Cartagena, where according to local informants it was observed at times in flocks of up to one hundred (Wetmore 1927b). Danforth (1936) also referred to its former abundance, but reported “now they are scarce” because of hunting. Further assessments in the second half of this century are from Bond (1956b), who judged it “rare”, and King (1978-1979), who, quoting other sources, indicated that the species was “very rare” despite a record of c.80 birds near Humacao in the early 1970s. This large flock and the “limited comeback” of the species in the area resulted presumably from the re-flooding of some former marshlands (H. A. Raffaele *in litt.* 1986, J. W. Wiley *in litt.* 1986). Despite this, H. A. Raffaele (*in litt.* 1986) achieved only a single sighting of a group of five birds despite active fieldwork during the early 1970s. By 1984, the species's population was estimated only at about 150-250 individuals (J. A. Colón *in litt.* 1986), and although regularly reported from several localities in 1986 (see Distribution), at present it is only known to occur regularly in the Humacao area, being very rare elsewhere (Raffaele 1989). The species was known to occur on the “larger lagoons” of Vieques Island (Wetmore 1916); at present it is known from Laguna Kiani (Scott and Carbonell 1986). On Mona Island it is occasional (see Distribution).

Virgin Islands The species was presumably resident in Virgin Gorda, where there is a record of a pair with downy young in 1889; other records on this island are from the early 1970s (see Distribution), the species today being considered very rare (Raffaele 1990). Scott and Carbonell (1986) did not mention the species for any of the British or U.S. islands and according to S. Oldfield (*in litt.* 1988) it no longer occurs on Anegada.

St Croix Newton (1859) reported the species “pretty common on the mangrove lagoons” in 1857 and 1858, although its breeding status could not be proved. Beatty (1930) considered it a “very rare” resident, adding that 15 years ago it used to breed and was “very common”. There are seven specimens (in FMNH) collected in December 1939, November and December 1940 and January and February 1941.

Antigua and Barbuda The species appears to be resident with certainty only on Barbuda, where a “large population” was reported in a suitable area during 1983-1984 (Faaborg and Arendt 1985), but no estimation of its population exists (Lewis and Renton 1989).

ECOLOGY The West Indian Whistling-duck inhabits both fresh and saline waterbodies such as lagoons, swamps, mangroves, ricefields and palm savannas (Gundlach 1876, Cory 1880, Todd 1916, Wetmore and Swales 1931, Garrido and García Montaña 1975, Raffaele 1989, DVS 1990). It is known to spend the daylight hours hidden in the vegetation, e.g. mangroves (Bradley 1985, Garrido 1984), “maciales” *Typha* (Cuba) (Barbour 1943), woodlands (Stockton de Dod 1978, Garrido 1984, N. Varty verbally 1992) or even in the hills (Puerto Rico) (Raffaele 1989).

The species feeds mostly at night, birds generally being seen at dusk when flying in flocks to the feeding haunts in search of the highly appreciated fruit of the royal palm trees *Roystonea* sp. (e.g. Cuba, Jamaica, Dominican Republic, Puerto Rico), fruits, seeds and grasses or crops, notably rice and corn (Gundlach 1893, Bangs and Zappey 1905, Wetmore 1927b, Wetmore and Swales 1931, Barbour 1943, Stockton de Dod 1978, Garrido 1984, Bradley 1985, Buden 1987c, Downer and Sutton 1990). Stomach contents of birds taken on the Isle of Pines were “grass” (Todd 1916) and in the Dominican Republic “small seeds” but mostly grasses (Danforth 1929).

The breeding season is ill-defined and variable from one island to another and even within one particular island: in Cuba the commonest breeding months are from June to October (Gundlach 1876, Davis 1941, Ripley and Watson 1956, Balát and González 1982), but there are records from December and January (Gundlach 1893, Bond 1977, Balát and González 1982); in Jamaica breeding was believed to occur from October to December (Biaggi 1970) but Downer and Sutton (1990) judged it to occur from May to October; in Grand Cayman nesting runs from May to June, but it has also been reported in

November/December for two consecutive years (van Liefde 1992), and in Little Cayman from February to May (Bradley 1985); in Haiti laying has been reported in January (Wetmore and Swales 1931) and birds collected in November in the Dominican Republic had fully enlarged gonads (specimens in AMNH); in Puerto Rico the breeding season is considered variable (Raffaele 1989). Nests have been reported in tree holes, on horizontal branches, in clumps of bromeliads, in reeds near the ground or on the ground among roots of fallen trees in bushy cover, but normally not far from water; clutches generally contain 10-16 eggs (Gundlach 1876, Barbour 1943, Biaggi 1970, Stockton de Dod 1978, Bradley 1985, Downer and Sutton 1990). Very little is known about the species's movements from island – or groups of islands – to island, but displacements appear to occur: Stockton de Dod (1978) indicated that (in the Dominican Republic) the species “disappears” from time to time but “usually only for short periods in January, February or March.

THREATS The West Indian Whistling-duck is suffering from destruction of wetlands in most of its wide range, primarily as a result of human activities and development projects (see Scott and Carbonell 1986 for threats affecting the most important wetlands within the species's range). The good quality of its flesh has resulted in indiscriminate hunting (see Remarks 4), which, combined with the loss of suitable habitat, has resulted in the alarming decline that the species has suffered throughout its range (see, e.g., Gundlach 1878a, 1893, Cory 1892, Danforth 1936, Barbour 1943, Campbell 1978, Scott and Carbonell 1986). The use of pesticides in agriculture (the rapid adaptation of the species to feeding on crops, notably rice and corn, has been well documented: see Ecology) is another factor that has provoked massive mortality (e.g. in Cuba: Garrido 1985). Egg-collecting and keeping captive birds as pets have been widespread influences (see, e.g., Gundlach 1893, Todd 1916, Wetmore and Swales 1931, Barbour 1943, Bond 1961, Stockton de Dod 1981 amongst others).

Bahamas Although the species is protected it is still prized by hunters (Campbell 1978).

Cuba Hunting, egg-collecting and pesticide usage have been the major causes of decline (see above).

Cayman The Development Plan of 1977 for Grand Cayman adopted in 1981 called for the incorporation of 97% of Grand Cayman's wetlands into urban (e.g. tourist complexes) and agricultural schemes: the implementation of this plan is in progress, and the ultimate removal of 97% of the island's wetland habitat would result in a dramatic decline in wildfowl populations and represent an important loss of one of the best refuges within the species's range (see Scott and Carbonell 1986). Furthermore, some of the ponds used for feeding at night on Grand Cayman are currently being encroached upon by housing, with much resulting disturbance; some have been ploughed, levelled for more pasture or filled in by developers; and man-associated animals (e.g. dogs, cats) are said to be proliferating (van Liefde 1992). In addition the species is being negatively affected by hunting (Scott and Carbonell 1986, van Liefde 1992).

Jamaica The species's strong decline in the island has been in part attributed to the introduction of the Indian mongoose *Herpestes* (Bangs and Kennard 1920, Kear and Williams 1978). Despite recognition of wetlands as areas of special conservation value (see Measures Taken), they remain under threat, particularly from drainage for agriculture, housing and industrial development (details in Scott and Carbonell 1986).

Haiti Despite the extreme degradation of terrestrial environments owing in part to the density and poverty of the human population (see Threats under White-winged Warbler *Xenoligea montana*), the wetlands in the country have suffered comparatively less, but continuing conversion of freshwater marshes to rice-growing areas, drainage for other forms of cultivation, cutting of mangroves for charcoal, and local pollution from domestic sewage have been identified as the major threats; pesticides are not widely used and there is relatively little disturbance from hunting and fishing activities (Scott and Carbonell 1986; see Remarks 5).

Dominican Republic Habitat loss, hunting and the use of pesticides are the major problems (Stockton de Dod 1978, J. W. Wiley *in litt.* 1986, DVS 1990).

Puerto Rico The species is suffering from illegal hunting (J. A. Colón *in litt.* 1986, J. W. Wiley *in litt.* 1986), intensive industrial development and the expansion of agriculture and “sanitary” land-fills, causing a deterioration of the wetlands (excessive drainage, diversion of watercourses, infilling for construction, excessive use of fertilizers, insecticides and herbicides: see Scott and Carbonell 1986).

Virgin Islands Wetlands in both the British and U.S. Virgin Islands have suffered much deterioration as a result of development projects and tourism (Scott and Carbonell 1986, Norton *et al.* 1986).

Antigua and Barbuda In Antigua vast areas of mangroves and wetlands have been destroyed by coastal developments (see CCA 1991a), and in Barbuda, although the original habitats on the island are still in reasonable condition, new development projects threaten the salt-pond and mangrove swamp (see CCA 1991a).

MEASURES TAKEN

Bahamas The species is (only nominally) protected (Campbell 1978; see Threats). It is known to occur in the Inagua National Park (Scott and Carbonell 1986), and on Hog Cay (a privately owned approximate 100 ha cay) it has increased in numbers considerably in recent years as a consequence of regular feeding by the owner (see Population).

Turks and Caicos On Caicos, the Sawgrass Pond (where a family group was observed in July 1977) has been protected as a Ramsar site (Norton and Clarke 1987).

Cuba Hunting of the species is forbidden (Garrido 1985); but see Threats. The protected areas where the species is known to occur or have occurred are: Península de Zapata and Ciénaga de Lanier National Parks, within Archipiélago de Camagüey (Cayo Coco and Cayo Romano Natural Reserves) and Cayo Cantiles Faunal Refuge (see Wright 1988).

Cayman The species is protected against hunting (Scott and Carbonell 1986); but see Threats. The following wetlands where the species is known to be present are protected (as listed in Scott and Carbonell 1986): Central Mangrove Swamp and Booby Cay (only the 150 m wide fringe of mangroves around North Sound and Booby Cay); Meagre Bay Pond, Malportas Pond, Rock Pond and Point Pond, Westerly Ponds, Salt Water Pond and Booby Pond (only the mangrove fringe). The Cayman Island Bird Club is trying to assess the species by determining the sites where it occurs regularly (van Liefde 1992).

Jamaica Hunting of the species is prohibited (King 1978-1979); but see Threats. Wetlands are considered by the National Physical Plan and Parish Development Orders as areas of special conservation value (see Scott and Carbonell 1986); but again see Threats. Some of the important wetlands for the species (Negril Morass, Black River Lower Morass, Canoe Valley and Portland Bight Swamp) have been proposed for different degrees of protection under the National Physical Plan (see Scott and Carbonell 1986; also JCEP 1987).

Haiti None is known.

Dominican Republic The species is protected (DVS 1990). Los Haitises, Isla Cabreros, Jaragua and Monte Cristi National Parks are of great importance for the species (see Distribution).

Puerto Rico Shooting is prohibited (King 1978-1979); but see Threats. The wetlands of Torrecilla Alta and Roosevelt Roads Naval Reservation (see Remarks 6) have received some degree of protection (see Scott and Carbonell 1986).

Virgin Islands Hunting of the species has been outlawed since 1976 (J. A. Colón *in litt.* 1986).

MEASURES PROPOSED This endangered and poorly known species deserves more attention and close monitoring throughout its huge range in order to clarify its current status. Protection of any of the important wetlands (as listed in Scott and Carbonell 1986) within this range is obviously a priority. Educational campaigns to show the importance of wetlands for the conservation of wildlife and particularly the critical situation of the West Indian Whistling-duck should also be conducted.

Bahamas Very little ornithological exploration has been conducted in most of the larger islands with potential habitat for the species (see Scott and Carbonell 1986); moreover, there is almost no information on the hundreds of small islands and cays where the species may possibly nest or roost. Clearly, therefore, some survey work is needed to furnish a solid database on which conservation initiatives can be built. The remarkable population increase on Hog Cay (see Measures Taken) shows that relatively small management efforts on small islands can help support the species; this particular achievement deserves fuller study, for example through a long-term programme of monitoring the population and marking individual birds.

Cuba Further field investigation is needed to clarify the current status of the species in some of the most important wetlands listed in Scott and Carbonell (1986).

Cayman Islands The implementation of the Development Plan for Grand Cayman should be urgently reviewed and important wetland areas (see Scott and Carbonell 1986) excluded from any development project. The importance of these wetlands for wildlife in general has already been stressed by Bradley (1985) and Scott and Carbonell (1986), and their particular value for the West Indian Whistling-duck (one of the most important areas within its overall range) should be emphasized as an indication of the islands' international obligations to conservation.

Jamaica The following areas should be afforded protection: Negril Morass, Black River Lower Morass, Parrottee Salt Pond and Great Salt Pond. The species would also benefit from the conservation of other wetlands in the country where suitable habitat is present.

Haiti Protection of the wetlands is urgently required: none of the 11 important sites has yet been gazetted (Scott and Carbonell 1986). As priorities, the Caracol area and Baie de Fort Liberté, the floodplain and delta of the Artibonite river, Étang Saumâtre, Étang Miragoane and eastern Ile-à-Vache deserve attention. There are, however, other important wetlands listed in Scott and Carbonell (1986) (e.g. Cayemite Islands and Baie des Bararderes, Baie d'Aquin, the wetlands on Gonave Island) where, from their habitat descriptions, the West Indian Whistling-duck may well be present.

Dominican Republic The proposed extensions to the Los Haitises and Isla Cabritos National Parks (see DVS 1990) are of great importance for the conservation of the species; this would also benefit the threatened Ridgway's Hawk *Buteo ridgwayi* (see Measures Proposed under this species).

Puerto Rico A minimum step should be to gazette the currently unprotected wetlands in which the species has been reported (see Distribution).

Antigua The remaining mangrove areas (in the north-eastern part of the island) should be protected, with restriction of access (see figure 3.1.3 in CCA 1991a).

Barbuda Codrington Lagoon's extensive mangrove forest and seven-mile barrier beach should be considered for nomination as a Ramsar site as suggested in CCA (1991a). The creation of the following proposed protected areas would also be valuable: Codrington Lagoon Bird Sanctuary, Codrington Lagoon and Goat Island and the Flashes (CCA 1991a). Furthermore, the Bull Hole and inland mangroves (see Distribution) are important for the species and thus some action to ensure and protect the population found

there is needed.

REMARKS (1) Hellmayr and Conover (1948) included Guadeloupe, Martinique and Barbados within the species's range, but there is no evidence to support its occurrence there other than as a casual vagrant (see Bond 1956b). (2) A ROM printout credits J. H. Fleming for the remark "original label lost, came with other *Dendrocygna* from Brownsville, Texas, that were taken from 1891-1894; this is an Armstrong skin and is no doubt a Texas record". The occurrence of stragglers in the Gulf of Mexico is certainly likely during severe Caribbean storms and hurricanes. (3) OG (1955) also lists "Rivière de l'Estère" at 19°24'N 72°42'W. (4) Hunting is a reason for concern despite having been protected in most of its range (see Measures Taken). Sympatric occurrence in some areas with the commoner Fulvous Whistling-duck *Dendrocygna bicolor* makes it easy to confuse and thus it is difficult to protect it effectively against hunting, especially in rice plantations (Garrido 1984, O. H. Garrido *in litt.* 1992). (5) The difficult economic situation in the country is also responsible for the general lack of guns, which presumably has prevented much shooting of this and other species (C. A. Woods verbally 1992). (6) The Roosevelt Roads Naval Reservation (the extent to which this is different from the Naval Station of the same name listed under Yellow-shouldered Blackbird *Agelaius xanthomus* is not clear) has no legal habitat protection, but intrusion is prevented by the naval authorities (Scott and Carbonell 1986).