

Review of the status of American Coot (*Fulica americana*) and Caribbean Coot (*Fulica caribaea*) in the United States Virgin Islands

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Abstract

This paper considers the current breeding status of American Coot (*Fulica americana*) and Caribbean Coot (*F. caribaea*) in the United States Virgin Islands in historical and regional context. Breeding and nonbreeding coots are generally rare to uncommon in the U.S. Virgin Islands, where they have a restricted distribution at several dozen brackish and freshwater sites. The status of the two coot species here, as elsewhere, has been clouded by difficulties in identification, particularly in the case of sight reports. The two species' sympatric breeding range includes St. Croix, where coots are most numerous at brackish Southgate Pond, the preferred breeding site of both coot species in the U.S. Virgin Islands. A man-modified seasonal salt pond, Southgate Pond has had the largest documented breeding colony (eight pairs) of any island in the eastern Caribbean (where both coot species are also generally rare and restricted to a few sites). The largest breeding colony at any freshwater site in the eastern Caribbean has been at Marshall's Pond in Barbados (four pairs of Caribbean Coots), although the largest number of confirmed freshwater breeding sites has been at St. Croix (up to three pairs per site at six sites), where coots have undoubtedly been overlooked until recently, since about 2002. Coots respond rapidly to changes in water levels at seasonal or permanent wetlands and have the capacity to nest year-round, but populations in the region remain low. Without management intervention at wetland sites, coots will remain local and rare to uncommon breeders in the eastern Caribbean. Future surveys should focus on selected manmade freshwater ponds and low-salinity salt ponds.

Introduction

Caribbean (*Fulica caribaea*) and American

(*F. americana*) Coots are two of the rarest wetland birds that breed in the U.S. Virgin Islands (hereafter, USVI), yet their breeding status there and in the eastern Caribbean has not been critically reviewed. This paper reviews the historical and current breeding and nonbreeding status of coots in the USVI and eastern Caribbean islands. Their sympatric distribution in this region requires clarification, especially if American Coots are expanding their breeding range (Levesque et al. 2002), before inquiries into the underlying reasons for the different geographical distributions of the species, which have also been considered morphs of a single species (Payne and Master 1983), are undertaken. The taxonomic status of Caribbean Coot merits continued investigation (Roberson and Baptista 1988; also Phillips 1967, Payne and Master 1983, Clark 1985, Taylor 1996), as does its conservation status. Although Taylor (1996) stated that Caribbean Coot is not a globally threatened species, it is listed as locally endangered in the United States Virgin Islands (Indigenous and Endangered Species Act of 1990) and is considered threatened throughout the West Indies, especially breeding populations (Rafaele et al. 1998). BirdLife International treats the species as near-threatened (Statensfelt and Capper 2000).

Because coots are associated with freshwater marshes and low-salinity wetlands (Kantrud 1985), they are most numerous on St. Croix, which contains 43 of the total of 52.2 ha of extant freshwater ponds and 228.8 of 289.3 ha of extant salt ponds in the USVI (Conservation Data Center, unpubl. data). St. John—which contains 43.8 of the 60.6 ha of salt ponds in the northern USVI—likewise has more coots than St. Thomas, even though the latter island has 7.5 of the 9.1 ha of freshwater ponds in the northern USVI.

Methods

I searched for published historical data on breeding and nonbreeding coots in the USVI (including Christmas Bird Counts; hereafter CBCs), unpublished data in Division of Fish and Wildlife files (St. Croix), including brackish wetlands listed in Knowles and Amrani (1991) and Knowles (1996), and museum collections (skin specimens, egg sets). Banded coots have not been recovered

in the USVI (K. Klimkiewicz, pers. comm., Bird Banding Laboratory). I also searched the literature and solicited unpublished data from observers for breeding information on coots in the British Virgin Islands and Lesser Antilles to compare with data from the USVI, to provide broader context for their breeding status on small islands in the eastern Caribbean. I did not accept field identification of coots at face value and present as confirmed records only those supported by specimen, photograph, or competent field notes; other reports are treated as referring to unidentified coots.

Christmas Bird Counts (CBCs) are useful for analyzing relative abundance of bird species on large geographic scales, but the CBC data from St. Croix, St. Thomas, and St. John cannot be used to examine coots' relative abundance at this small scale: coots are highly social, normally occur in flocks, and have a highly skewed, clumped distribution (Bock and Root 1981). Moreover, because species identification of many individual coots was uncertain on several counts, I have combined counts of American and Caribbean Coots on each CBC. Spearman's rank correlation tests were used to assess the association between annual changes and counts of coots on each CBC, and the Kruskal-Wallis test was used to compare differences in rank abundance on these three CBCs. All tests used an α -value of 0.05.

I obtained current information on the abundance and distribution of coots on St. Croix through monthly waterbird surveys in fresh- and brackish wetlands since 2002 (through April 2005). Visits to ca. 30 freshwater ponds were monthly but less frequent at other ponds, some of which were only recently covered (St. Croix has over 125 man-made freshwater ponds). Coots are conspicuous birds in wetlands with little emergent vegetation, unlikely to be overlooked in such surveys.

Below I present information on the maximum number of birds (all adult and subadult coots) for each site by consecutive monthly periods, along with breeding information from sites visited more frequently. Many nonbreeding coots were not identified to species because they were too distant to see well, so I lumped species counts at each site (though computed species ratios of birds I did identify). Coot identification is complicated by hy-

bridization. I followed the criteria of Roberson and Baptista (1988) to distinguish American (types A and B) from Caribbean (types C, D, and E) coots in the field, even though a small percentage ($\leq 1.4\%$) of the broad-, high-, and bulbous-shielded males may be white-shielded morphs of American Coots. Types A and B have a dark chestnut or red-brown corneous callus, whereas types C, D, and E lack a callus. Surveys were conducted during a period that included two torrential rainfall events throughout the USVI, a 50-year rainfall event (mean of 40–50 cm) from 15–20 November 2003 and in mid-September 2004 another heavy rainfall (over 25 cm) during Tropical Storm *Jeanne*. These rainfall events followed a prolonged drought for approximately the preceding year and a half. Rainfall data for St. Croix were taken from the U.S. Department of Agriculture Agricultural Research Station at Kingshill. Site names on St. Croix follow Imsand and Philibosian (1987), apart from other sites that I have named. A site is a discrete geographic entity (e.g., Southgate Pond).

Results

Breeding Status in the U.S. Virgin Islands, St. Croix, Southgate Pond

Coots have nested at Southgate Pond since at least 1919 (Table 1), when one pair of American Coots laid seven eggs in a nest built in a mangrove of unidentified species (Beatty 1930). Although Beatty (1930) stated that he had never found Caribbean Coots, he later collected Caribbean Coots on St. Croix, including two presumed chicks (Tables 1, 2). Seaman (1957) suggested that Caribbean Coots formerly nested in Red Mangroves (*Rhizophora mangle*) in the eastern third of Southgate Pond before 1957, one year after this section of the pond was drained and cleared, but he provided no documentation. Seaman (1973) also stated that Caribbean Coot nests and young were often found at Southgate Pond. One adult with enlarged testes was collected at Southgate Pond on 14 January 1962 (Table 2). Sladen observed mixed pairs at Southgate Pond during February 1985 but did not document breeding (Norton 1985). McNair and Cramer-Burke (in press) provide recent breeding information at Southgate Pond, where seven to eight pairs nested during the winter and spring of 2003–2004 and three pairs nested during the autumn and winter of 2004–2005. Almost all pairs nested in small, live White Mangroves (*Laguncularia racemosa*) away from the shore.

St. Croix (other sites)

The first confirmed breeding of a coot on St. Croix (and the USVI) was a Caribbean Coot chick collected at an unknown locality (perhaps Southgate Pond) in 1861 (Table 1).

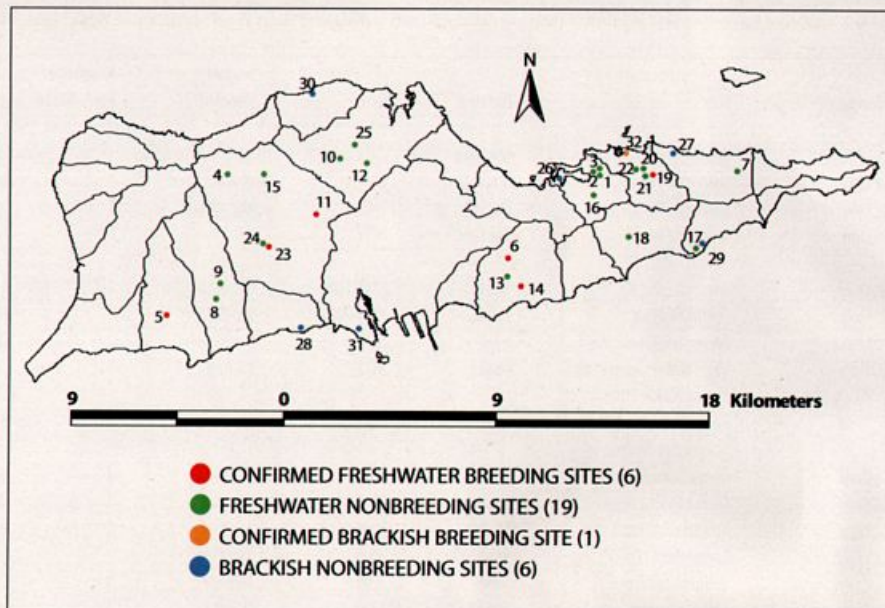


Figure 1. Thirty-two sites where coots have occurred on St. Croix. Watershed boundaries are also indicated. See Table 3 for numbered site names.

Beatty (1930) stated that American Coots were common on all the ponds and lagoons of St. Croix, where they nested from July to October (the hurricane season; see also Seaman 1973, 1993). However, Beatty only documented breeding records at Southgate Pond (above). Coots were not confirmed to breed at any other site on St. Croix until 2002–2005, when nesting occurred at six farm ponds: Carlton North Pond, Catherine's Rest South Pond, Fredensborg Pond, Granard South Pond, Schuster East Pond, and Virgin Islands Agricultural Station Middle Pond (McNair and Cramer-Burke, in press).

St. John

Coots have been confirmed to breed at two sites on St. John (Table 1), including a mixed pair with young that was present at Hart Bay in the early 1980s. I have been unable to find documentation that American Coots nested in February 1983 (see Leck and Norton 1991). Earlier, Nichols (1943) stated that coots in the northern USVI were particularly numerous on St. John but documented no specific nest records there.

St. Thomas

Coots have been confirmed to breed at only one site off St. Thomas, in a salt pond on Saba Cay where a clutch of six eggs of the Caribbean Coot was collected (Nichols 1943; Table 1). Nichols (1943) also stated that coots nested on St. Thomas and two more cays but gave no details.

Finally, Clark (1985) stated that territorial displays of American and Caribbean Coots (American pairs, Caribbean pairs, and mixed pairs) were observed in the USVI from December 1983 through early February 1984. However, further details are

lacking. Considering both recent and historical data, coots in the USVI have nested in every month of the year (Table 1). The largest number of documented pairs nesting at any single site was eight pairs at brackish Southgate Pond, St. Croix during spring 2004.

Breeding Status in the British Virgin Islands and Lesser Antilles

Breeding coots have been confirmed on at least six islands in the British Virgin Islands and Lesser Antilles, with breeding of American Coots documented south to Guadeloupe, where Caribbean Coots have not been confirmed to nest (Table 1). This total excludes probable breeding sites such as Lake Antoine, Grenada, a relatively undisturbed reed-fringed crater lake about 300 m in diameter (E. B. Massiah, pers. comm.), where two Caribbean Coots (male and female) were collected by James Bond on 21 March 1929 (Academy of Natural Sciences at Philadelphia 86381, 86382); brackish Graeme Hall Swamp, Barbados from 1860 to 1888, when Caribbean Coots were presumed to nest but documented breeding evidence is lacking (Frost and Massiah 2001); and Antigua, Martinique, and Marie-Galante (Raffaele et al. 1998; H. Raffaele, pers. comm.), where I was unable to find documentation of recent confirmed breeding evidence. Coots in the British Virgin Islands and Lesser Antilles have been documented to nest in every month of the year except November (Table 1). The largest number of documented pairs nesting at any single site was four pairs at freshwater Marshall's Pond, Barbados in the early 2000s (Frost and Massiah 2001; Frost, pers. comm.). The dominant vegetation at this site is Live Creeping Burrhead (*Echinodorus*

Table 1. Confirmed breeding records of American Coots and Caribbean Coots in the United States Virgin Islands, British Virgin Islands, and Lesser Antilles.

Island	Site	Habitat	Year	Season (month)	Number of Pairs/Nests	Species	Reference
St. Croix	Unknown	Unknown	1861	Jan	1 ^a	Caribbean Coot	ZMUC ^b 37.940
St. Croix	Southgate Pond	Brackish	1919	10 Aug	1	American Coot	Bailey 1930
St. Croix	Southgate Pond	Brackish	1943	Mar	1	Caribbean Coot	FMNH ^c 415962 and 415963 ^d
St. Croix	Southgate Pond	Brackish	1984		?	Unknown	Sladen 1992; Sladen, unpubl. data
St. Croix	Southgate Pond	Brackish	2003-2004	Dec-May	7-8	Mixed colony	McNair and Cramer-Burke, in press
St. Croix	Southgate Pond	Brackish	2004-2005	Sep-Jan	3	Mixed colony	McNair and Cramer-Burke, in press
St. Croix	Fredensborg Pond	Fresh	2002	Apr-Jun	1	Caribbean Coot	McNair and Cramer-Burke, in press
St. Croix	Virgin Islands Agricultural Station Middle Pond	Fresh	2003	Jul-Aug	1	Caribbean Coot	McNair and Cramer-Burke, in press
St. Croix	Virgin Islands Agricultural Station Middle Pond	Fresh	2004	Jun-Aug	1	Mixed pair	McNair and Cramer-Burke, in press
St. Croix	Granard South Pond	Fresh	2004	May-Aug	3	Mixed colony	McNair and Cramer-Burke, in press
St. Croix	Granard South Pond	Fresh	2004	Nov-Dec	2	Mixed colony	McNair and Cramer-Burke, in press
St. Croix	Schuster East Pond	Fresh	2004	Jun-Aug	1	Mixed pair	McNair and Cramer-Burke, in press
St. Croix	Carlton North Pond	Fresh	2004	Jun-Sep	1	Caribbean Coot	McNair and Cramer-Burke, in press
St. Croix	Carlton North Pond	Fresh	2005	Feb-Apr	1	Caribbean Coot	McNair and Cramer-Burke, in press
St. Croix	Catherine's Rest South Pond	Fresh	2004	Nov-Dec	1	Unknown	McNair and Cramer-Burke, in press
St. John	Unknown	Unknown	1936-1943	Unknown	?	Caribbean Coot	Nichols 1943
St. John	Francis Bay	Brackish	1961	Unknown	1	Unknown	Norton 1982
St. John	Francis Bay	Brackish	1982	11 May	10 ^e	Unknown	Norton 1982
St. John	Hart Bay	Brackish	1983	10 Aug-2 Nov	13 ^f	Mixed pair(s)	Norton 1984
St. Thomas	Unknown	Unknown	1936-1943	Unknown	?	Caribbean Coot	Nichols 1943
St. Thomas	Saba Cay	Brackish	1936-1943	6 Jun	?	Caribbean Coot	Nichols 1943; WFWZ ^g 155658
St. Thomas	Salt Cay	Brackish	1936-1943	Unknown	?	Caribbean Coot	Nichols 1943
St. Thomas	Water Island	Brackish	1936-1943	Unknown	?	Caribbean Coot	Nichols 1943
Tortola	Josiah's Bay Pond	Brackish	1976	26 June	16 ^h	Caribbean Coot	Mirecki et al. 1977
Anguilla	Caul's Pond	Brackish	2000	June	12 ⁱ	American Coot	S. Holliday, unpubl. data
St. Martin	Unknown	Unknown			?	Mixed pair	Norton 1982
St. Martin	Etang de Philipsburg	Brackish	early 1980s	Dec-Jul	1 ^j	American Coot	Benito-Espinal 1990
St. Martin	Little Bay Pond	Brackish	2001-2002		?		Hans van Buel, unpubl. data
St. Martin	Little Bay Pond	Brackish	2003-2004	Jan-Mar	1-2 ^k	Unknown	vide A. C. Brown
St. Martin	Fresh Pond	Brackish	22 Apr 1982	22 April	15 ^l	Caribbean Coot	Norton 1982, 1984
St. Martin	Fresh Pond	Brackish	2002	27 Mar	1 ^m	Mixed pair	A. Levesque, unpubl. data
St. Martin	Fresh Pond	Brackish	2002	6 Jun	1 ⁿ	Caribbean Coot	Hans van Buel, unpubl. data
St. Martin	Fresh Pond	Brackish	2002	Oct	1 ^o	Mixed pair	Hans van Buel, unpubl. data
St. Martin	Fresh Pond	Brackish	2002-2004	Jan-Mar	2-6 ^p	Caribbean Coot	A. C. Brown, unpubl. data
St. Kitts	Greatheeds Pond	Unknown	1929	3 Jan	1 ^q	American Coot	Danforth 1936, Steadman et al. 1997
St. Kitts	Unknown	Unknown	Unknown	Jan	?	Caribbean Coot	Bond 1976
Guadeloupe	Grande Terre (Port-Lewis)		2001	Jan-Feb	1	American Coot	Levesque et al. 2002
Guadeloupe	Gaschet Reservoir	Fresh	2004	Feb-May	2 ^s	American Coot	Levesque, unpubl. data
Barbados	St. Philip - Marshall's Pond	Fresh	1999-2004	Apr-Sep	≤ 4	Caribbean Coot	Frost and Massiah 2001

^aChick about two weeks old (J. Fjeldså, pers. comm.), presumably identified on basis of attending adult(s), which were not collected. The chick was originally identified by Riise as a Common Moorhen (*Gallinula chloropus*).

^bZoological Museum of the University of Copenhagen (ZMUC), Denmark.

^cField Museum of Natural History (FMNH), Chicago, Illinois.

^dTwo downy chicks, presumably identified on basis of attending adult(s), which were not collected.

^eThe 10 birds included three apparent American Coots, two apparent Caribbean Coots, and five immatures.

^fThe maximum number of 13 birds included as many as six young on 25 October, when five apparent American Coots and two Caribbean Coots were also present.

^gWestern Foundation of Vertebrate Zoology (WFWZ), Camarillo, California. The clutch size was six eggs.

^hThe flock of 16 included two young birds.

ⁱThe 12 birds included four adults and eight juveniles (size otherwise undescribed).

^jBenito-Espinal discovered one nest that contained six eggs (photographed; A. Levesque, pers. comm.).

^kTwo nests in 2003, one nest in 2004.

^lThe 15 birds included nine apparent adult American Coots, three apparent adult Caribbean Coots, and three immatures attended by the three Caribbean Coots.

^mThe pair with three chicks was photographed.

ⁿOne adult with one chick was photographed.

^oOne nest was discovered.

^pTwo nests and no chicks were noted in 2002, two nests and three chicks in 2003, and six chicks in 2004.

^qOne nest found by James Bond.

^rBond (1976) stated he found nests with eggs.

^sOne adult nest-building (transporting plant materials) and, later, two pairs seen with pulli.

berteroi) (Spreng.) Fasset.

Nonbreeding Status in the U.S. Virgin Islands, St. Croix

The earliest coots were reported at St. Croix in the late 1850s by Newton and Newton (1859). Birds of both species were collected thereafter through 1962 (mainly in the 1930s and early 1940s; Table 2), including at Southgate Pond and Rust-op-Twist Salt

Pond. Seaman (1955, 1973, 1993) stated that coots were present in considerable numbers in the 1920s, when he found as many as 150 birds at Southgate Pond, but they were no longer plentiful by 1955. He also stated coots generally preferred freshwater, where they occurred on farm ponds, but also stated coots were found (other than at Southgate Pond) at five saline lagoons (with tidal inlet) or salt ponds (no tidal in-

let): Altona Lagoon, Great Pond, Krause Lagoon (now a remnant), Rust-op-Twist Salt Pond, and Williams Pond (north of Fredriksted; now a semi-open wooded swamp and marsh). Sladen (1992) documented that American Coots were more numerous than Caribbean Coots at Southgate Pond from 1981 to 1985 (ratio of 2.4/1; 29% Caribbean), when he never found coots at Great Pond. Knowles (1996) reported no

more than five coots per month per site from February 1989 to June 1996 at four (out of nine) salt ponds (Southgate Pond, the large cooling pond at what is now St. Croix Renaissance Park, Coakley Bay Salt Pond, and the University of Virgin Islands Wetlands), until autumn and winter of 1995-1996 (following a wet autumn), when he counted 24 birds at the University of Virgin Islands Wetlands in February 1996 and 11-44 birds at Southgate Pond from December 1995 to April 1996 (highest number in March). Knowles (1996) reported only two out of 119 coots he identified at Southgate Pond as Caribbean Coots (1.7%).

Including the seven recent confirmed breeding sites (Southgate Pond, Carlton North Pond, Catherine's Rest South Pond, Fredensborg Pond, Granard South Pond, Schuster East Pond, Virgin Islands Agricultural Station Middle Pond), coots have occurred at 32 sites on St. Croix since 2002 (Table 3; Figure 1), but they did not nest at these twenty-five other sites except possibly Diamond Pond. Twenty-five of 32 are freshwater sites: twenty farm ponds, three golf course ponds, a wastewater treatment pond on one of these golf courses, and one pond on a former golf course. The seven brackish sites are four salt ponds, two lagoons, and a large (formerly industrial) cooling pond. Except for Southgate Pond (after the drought ended), where up to 69 adults and subadults were present in June and July 2004, coots occurred infrequently at other saline sites on St. Croix and only in low numbers and usually only after heavy rainfall (from the 50-year event of mid-November 2003 or Tropical Storm *Jeanne* in mid-September 2004) had contributed substantial amounts of freshwater to these sites. Coots also occurred at many more freshwater sites following these two rainfall events, at 15 sites from mid-November 2003 until mid-September 2004 and at 19 sites from then through April 2005 compared to just six freshwater sites before mid-November 2003. Coots occurred fairly regularly (≥ 10 months) at six freshwater sites (nesting at four), including the Buccaneer Hotel, where they are fed but where breeding habitat is probably lacking. The ratio of American to Caribbean Coots that were identified was 1.9/1 (35% Caribbean; a higher proportion of Caribbean Coots was generally associated with the six breeding sites).

St. Thomas

Other than Nichols (1943), Beatty (1938) reported two coots at a salt pond on Water

Table 2. Specimens of adult and subadult American and Caribbean Coots collected in the United States Virgin Islands.

Species	Locality	Year	Date (month)	Number of Birds	Reference
American Coot	St. Croix	1862 ^d		1	ZMUC ^b 37.909
	St. Croix	1934	Apr	1 ^c	USNM ^d 353836; Danforth 1935
	St. Croix	1940	Nov	2	FMNH ^e 157526 and 157527
Caribbean Coot	St. Croix	1933-1934	Dec-Apr	7 ^f	USNM ^d ; Danforth 1935
	St. Croix	1940-1941	Dec-Feb	5	FMNH ^e
	St. Croix	1962	Jan	1	ANSP ^g 169874; Bond 1966
	St. John	1880 ^h		2	USNM ^d 081020 and 081021; Ridgway 1884

^dDate of entry in the museum catalogue is 17 August 1862.

^bZoological Museum of the University of Copenhagen (ZMUC), Denmark.

^cBird collected at Southgate Pond.

^dUnited States National Museum (USNM), Washington, D.C.

^eField Museum of Natural History (FMNH), Chicago, Illinois.

^fBirds collected at Southgate Pond except one at Rust-op-Twist Salt Pond.

^gAcademy of Natural Sciences of Philadelphia (ANSP), Philadelphia, Pennsylvania.

^hDate of entry in the museum catalogue is 23 October 1880.

Cay off St. Thomas on 19 April 1936. Coots have occurred infrequently in small numbers (≤ 5 birds/day) at Turpentine Run on St. Thomas (Division of Fish and Wildlife files, unpubl. data). Floyd E. Hayes (unpubl. data) observed single American Coots (possibly the same individual) on St. Thomas at Turpentine Run from 9 November through 8 December 2002 and at Perseverance Bay Salt Pond from 27 January through 14 February 2003.

St. John

The type specimen of Caribbean Coot was a male collected at St. John in 1880 (Ridgway 1884), as was also a female (Table 2), although a presumed young bird was collected at St. Croix by chemist Riise as early as January 1861 (Table 1). One coot was present at Francis Bay Salt Pond during November and December 1989 (Knowles and Amrani 1989). The largest number of coots seen on St. John by L. Brannick-Trager (pers. comm.) has been four at Grootpan Salt Pond in January 1997.

CBC Data

The median number of 4.5 coots (range: 0-24; $n=22$) on the St. Croix West End CBC was significantly greater than the median number of one coot on either the St. John (range: 0-29, $n=16$) or St. Thomas (range: 0-4, $n=16$) CBCs, respectively (Kruskal-Wallis $H=10.15$, $n=64$, $df=2$, $P=0.006$). Except for three winters from 1981 to 1984, when counts on St. John CBCs were 10, 29, and 21 coots, respectively, all other counts on this CBC were six or less. Coots on the St. John and St. Thomas CBCs significantly declined

over time (St. John: 1978-2004, $r_s=-0.42$, $P=0.04$; St. Thomas: 1976-1992, $r_s=-0.64$, $P<0.01$), whereas coots on the St. Croix West End CBC increased over time, though this relationship was not significant (1972-1989, 1999-2004: $r_s=0.30$, $P=0.18$). Four of the six largest counts (≥ 12 birds) occurred on four of the last five St. Croix West End CBCs.

Discussion

American and Caribbean Coots have nested in two habitats in the USVI, British Virgin Islands, and the Lesser Antilles, primarily at natural seasonally flooded salt ponds and freshwater ponds (usually manmade) in the interior of these islands. Nests in the interior at freshwater sites dominated by perennial emergent forbs were floating platforms built among this vegetation (Frost and Massiah 2001), which is typical of American Coot nests in marshes (Fredrickson 1970, Sugden 1979, Gorenzel et al. 1982, Kantrud 1985, Alisauskas and Arnold 1994), or conspicuous bulky mounded nests of sticks built amongst remnant stands of thin dead *Sesbania* shrubs in open water (McNair and Cramer-Burke, in press). Southgate Pond, where nests are usually built in woody vegetation when conditions are suitable (McNair and Cramer-Burke, in ms.), is the preferred breeding (and nonbreeding) site for coots on St. Croix (and in the USVI), even though it is brackish. Nests found on St. Martin in two brackish salt ponds have been built in emergent, not woody vegetation (A. C. Brown, unpubl. data). Other than recently on St. Croix, few breeding sites have been confirmed on any given island where abundance and breeding densities are low and coot distribution is otherwise restricted, even on favorable islands such as St. Croix and St. Martin. Breeding phenology of Caribbean Coots documented earlier in the USVI spanned May-June and September-October (Nichols 1943, Taylor 1996), but both coots have the capacity to nest year-round in the USVI (and elsewhere in the eastern Caribbean), depending upon favorable water levels in seasonal wetlands. Shallow seasonal wetlands are also generally preferred habitat for American Coots in North America (Kantrud 1985 and references cited therein, Arnold 1993, Alisauskas and Arnold 1994). Nonetheless, despite the rapid response of coots to rainfall events and filling of some wetlands, coots without management intervention will remain local and rare to uncommon breeders in the eastern Caribbean, with breeding likely at a nadir during droughts. Regardless, coots are pre-

Table 3. The distribution and abundance of adult (and subadult) coots (both species combined) by consecutive monthly periods from January 2002 to April 2005 at 32 sites (25 freshwater; 7 brackish) on St. Croix, U.S. Virgin Islands.

Site Number	Site Name	Site N Lat ^a / W Long ^a	Monthly Period of Occurrence	Number of Months	Maximum Number of Coots
FRESHWATER					
1	Buccaneer Hotel: golf course link #8 pond	17.75208 / 64.67507	Apr 2002-Jul 2003 Nov 2003 Aug-Oct 2004 Jan-Mar 2005	16 1 3 3	5, Apr-May 2002 1 9, Aug 7, Jan
2	Buccaneer Hotel: golf course link #9 pond	17.75277 / 64.67736	Jun 2004 Aug-Oct 2004	1 3	1 7, Sep
3	Buccaneer Hotel: Wastewater Treatment Pond	17.75312 / 64.67333	May 2002-Nov 2003	19	5, Jan-Feb
4	Carambola Golf Resort Upper Pond	17.74984 / 64.82368	May-Jul 2004	3	2, Jun-Jul
5	Carlton North Pond ^{bc}	17.69872 / 64.84763	Jun 2004-Apr 2005	11	6, Sep
6	Catherine's Rest South Pond	17.72075 / 64.71189	Nov-Dec 2004	2	1
7	Cotton Valley Pond	17.75331 / 64.62037	Feb 2005	1	1
8	Cruzan Rum Distillery Pond	17.70555 / 64.82808	Dec 2002-Jun 2003	7	1
9	Diamond Pond	17.71056 / 64.82582	Oct 2004-Mar 2005	6	7, Mar
10	Frangipani East Pond	17.75614 / 64.77891	May 2004 Dec 2004-Feb 2005	1 3	1 2, Dec
11	Fredensborg Pond ^b	17.73471 / 64.78819	Feb 2002-Mar 2004 Jun 2004-Mar 2005	26 10	16, Mar 2002 6, Aug-Sep
12	Glynn South Pond	17.75475 / 64.76842	Oct-Nov 2004	2	1
13	Granard Middle Pond	17.71449 / 64.71165	Nov-Dec 2004 Mar 2005	2 1	2, Nov
14	Granard South Pond ^b	17.71056 / 64.70720	Feb 2002; Jan 2004-Apr 2005	1 16	2 11, Mar 2005
15	Hermitage Pond	17.74967 / 64.80918	Mar 2004	1	1
16	Lowry Hill Road North Pond	17.74417 / 64.67744	Sep 2004	1	
17	Mount Fancy Pond	17.72535 / 64.63641	Jan 2005	1	1
18	Mountain Mint Dairy Lower Pond #1	17.72172 / 64.66552	Apr 2004	1	1
19	Schuster East Pond ^{bc}	17.75124 / 64.65467	Jun-Oct 2004	5	2, Jul-Sep
20	Schuster Lower Pond	17.75373 / 64.65785	Apr-Oct 2004	7	5, Aug
21	Schuster Upper Pond	17.75132 / 64.65691	Aug-Oct 2004	3	7, Sep
22	Southgate Plantation Pond ^c	17.75336 / 64.66061	Jun-Jul 2004	1	2, Jul
23	Virgin Islands Agricultural Station Middle Pond ^b	17.72312 / 64.80725	Jun 2003-Apr 2005	23	10, Nov 2003
24	Virgin Islands Agricultural Station Upper Pond	17.72516 / 64.80920	Nov 2004-Mar 2005	5	2, Mar
25	Windsor North Pond	17.76125 / 64.77360	May-Jun 2004 Nov 2004-Mar 2005	2 5	1 1
BRACKISH					
26	Altona Lagoon	17.75222 / 64.69300	Jan 2002	1	2
27	Coakley Bay Salt Pond	17.75932 / 64.64575	Dec 2004	1	3
28	Manning Bay Lagoon	17.69423 / 64.79276	Dec 2003-Jan 2004 Aug 2004	2 1	3, Jan 1
	Feb 2005	1	1		
29	Mount Fancy Salt Pond	17.72548 / 64.63490	Oct 2004 Jan 2005	1 1	1 3
30	Rust-op-Twist Salt Pond	17.77948 / 64.78956	Jan 2005	1	1
31	St. Croix Renaissance Park: large cooling pond	17.69584 / 64.76728	Jan 2004	1	3
32	Southgate Pond ^b	17.75821 / 64.66265	Feb 2002; Nov 2003-Jul 2004 Sep 2004-Apr 2005	1 9 8	9 69, Jul 22, Dec

^aCoordinates given using decimal system. ^bConfirmed breeding site. ^cPond visited infrequently before 2004.

adapted to tolerate considerable disturbance to nesting habitat and can select a variety of vegetation types as nest-sites in the Caribbean, despite the degradation of some wetland habitats. The dependence of breeding coots on ephemeral marsh habitats

would strongly suggest that they would occur at unpredictable times and places in the Caribbean (as do other rallids; Remsen and Parker 1990).

Coots were most numerous within the USVI on St. Croix, where winter popula-

from the mainland. Whether nesting American Coots in the eastern Caribbean are of North American rather than Caribbean origin needs to be determined. Larger counts during winter do show a presumed influx of North American populations of American

tions have not declined (although the sample size is low), but available data do not otherwise allow assessment of long-term population trends or population fluctuations of coots on St. Croix (and elsewhere in the USVI) in relation to rainfall or land use dynamics, although rainfall patterns (drought, floods) do help explain some distributional patterns there. Recent intra-island movements of both species of coots on St. Croix have been limited to thirty-two sites, with frequent absences at most of these sites in response to drought or other factors. Beatty (1930; see also Seaman 1973, 1993) stated uncritically that coots were formerly common on all the ponds and lagoons of St. Croix, but currently coots are scarce on meso-saline lagoons and salt ponds except for Southgate Pond, and their distribution on freshwater ponds (where they are rare to uncommon) has also been local. Consequently, current coot populations have been easy to monitor, although the limited data (no marked birds) cannot elucidate whether coots also have inter-island movements, even following the two heavy rainfall events after which both species of coots nested at Southgate Pond during two successive hydrological cycles (cf. Hawaiian Coot *F. americana alai*; Engilis and Pratt 1993). Winter breeding of American Coots south to Guadeloupe (Levesque et al. 2002) suggests that these birds are not from the mainland. Breeding into May through the summer, such as at Southgate Pond and five freshwater farm ponds in 2004, also suggests these birds are not

Coots to the USVI (and eastern Caribbean), south to Grenada and Barbados, where they rarely occur (Riley 1916, Bond 1976, 1984; Raffaele et al. 1998; M. Frost, pers. comm.). Farther north in the Lesser Antilles on St. Martin, Caribbean Coots outnumber American Coots: 470 out of a cumulative total of 658 coots (71.4% Caribbean) in the years 2001-2003 (A. C. Brown, unpubl. data); and a ratio of approximately 5:1 on St. Martin from 1999-2003 (Hans van Buel, unpubl. data, *vide* F. E. Hayes). By contrast, Caribbean Coots are outnumbered by American Coots in the USVI, at least in recent times (this study; Sladen 1992, Knowles 1996; the latter source may underestimate the abundance of Caribbean Coots due to misidentification). The reasons for the sharp increase in the proportion of Caribbean Coots farther south in the Lesser Antillean chain away from the USVI are not known.

Nichols (1943) in the northern USVI and Seaman (1973) on St. Croix assumed all breeding coots must be Caribbean Coots, which is not the case; thus, the accuracy of older sight reports of both coot species, and of reports of breeding coots, is unknown. Uneven observer coverage, even at Southgate Pond, has resulted in an incomplete historical record of coots in the USVI (e.g., coots probably nested at Southgate Pond during winter 1995-1996 when water levels were high, but Knowles [1996] did not document this event). Furthermore, Nichols (1943) never reported American Coots in the northern USVI during winter (even though adults were collected on St. Croix during this season and period), casting some doubt on his species identification of breeding Caribbean Coots (including the egg set), even though he claimed the birds bred from May through October. American Coots are most likely to occur during winter, when presumed residents are augmented by visitors (cf. Buden 1991, 1993), but verified records of Caribbean Coots going back to 1861 also document its occurrence, when this species may also breed. The comparative breeding (and nonbreeding) status of each species during the twentieth century may have remained relatively unchanged (despite problems with reliable identification of many birds), but populations of both species have almost certainly declined because of habitat destruction and degradation, as well as hunting in some areas (Raffaele et al. 1973; A. Levesque, pers. comm.). Renewed searches are required in the northern USVI to document the breeding status of coots at low-salinity salt ponds on St. John and several cays where they formerly nested (Nichols 1943), as well as at some other sites in the eastern Caribbean (e.g., Lake Antoine, Grenada); some islands (e.g., Saba) appear to lack suitable habitat for nesting coots.

Wetland surveys in February 2002 and May 2004 on St. Kitts failed to find breeding coots (A. C. Brown, unpubl. data). Recent activities by several observers in the Lesser Antilles, however, have provided detailed documentation of coots and their breeding status (Frost and Massiah 2001, Levesque et al. 2002).

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