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DISTRIBUTION, POPULATION STATUS, AND DOCUMENTATION OF EXOTIC PARROTS IN BROWARD COUNTY, FLORIDA

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Abstract.—We have studied the exotic parrot fauna of Broward County, Florida since July 1999. During this period, 31 species of parrots were observed, with 20 of these not previously known to occur in the county. Twenty-four species (77%) were documented by still or video photographs. Three species are newly reported for Florida but only one of these was photographed. Breeding of 14 species was confirmed during our study. We summarize the population status, distribution, and verifiable evidence of occurrence for all parrots that have been reported in Broward County, including seven species observed prior to, but not during, our study. Populations of Red-crowned Parrots in Broward County may be suitable for reintroduction programs into Mexico, should such an effort be undertaken. Increased monitoring of parrots and other exotic birds in Florida is encouraged.

Broward County is situated along the Atlantic Ocean in southeast Florida, bordered by Palm Beach County to the north, Miami-Dade County to the south, and Collier and Hendry counties to the west. Historically, most of the county consisted of Everglades marshes, sloughs, and tree islands. Upland habitats, e.g., slash pine (*Pinus elliotii*) rocklands, xeric oak scrub, and tropical hammocks, grew on a narrow ridge (the Atlantic Coastal Ridge) just inland from the ocean (Owre 1973, Cox 1987, Myers and Ewel 1990). The occurrence of baldcypress (*Taxodium distichum*) swamps on the Atlantic Coastal Ridge was not mentioned by Ewel (1990), but many of these forests still occur.

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The human population of Broward County has grown enormously since the early 1900s. From just over 5000 residents in 1920, the population increased to nearly 40,000 by 1940, nearly 85,000 by 1950, 325,000 by 1960, and nearly 620,000 by 1970. The population surpassed one million residents by 1980, reached 1.25 million by 1990 (Broward County website: <<http://www.co.broward.fl.us>>), and exceeded 1.6 million by 2000 (U.S. census website: <<http://factfinder.census.gov>>). This massive human immigration has resulted in destruction of most uplands and many wetlands in Broward County. Native habitats on the Atlantic Coastal Ridge have been replaced by a continuous expanse of development for nearly its entire 180-km length (Owre 1973). Subsequent landscaping has used predominantly exotic vegetation from throughout the tropics and sub-tropics. In the past 20 years, municipal and county governments in Broward County have permitted development of most of the historic Everglades lying east of U.S. Highway 27, and these areas too have been revegetated extensively with exotics. By 1996, 34% of Broward County had been developed or was planned for development, while the remainder consists of Water Conservation Areas and Indian reservations west of U.S. Highway 27 (Broward County website).

The introduction of exotic parrots into Broward County for perhaps the past 50 years (Flor 1989b) has been haphazard and probably largely unintentional. There probably have been hundreds of separate releases of birds from pet owners, aviculturists, animal exhibitors, and others. Stories abound to explain the presence of free-flying parrots in southeast Florida, and some of these have been published (e.g., Flor 1989a, b; Nolin 1997). In contrast to such “popular mythology,” the ornithological record of parrots in Broward County was quite sparse and greatly incomplete before we initiated our study—and even this study is mostly limited to the Fort Lauderdale metropolitan area. Here, we provide information on general distribution, population sizes, breeding status, and verifiable evidence of parrots in Broward County.

METHODS

We use the term “parrot” to describe all species of psittacids. Because Florida’s only native parrot, the Carolina Parakeet (*Conuropsis carolinensis*), is long extinct, it should be understood that all the species we discuss are exotics. Epps has consistently recorded observations since 1997; one observation herein dates to 1989. Her data were obtained from nearly daily, incidental observations rather than from formal, standardized surveys. We include observations from aviculturists or parrot owners whose identification skills we trust; some of these individuals asked to remain anonymous. Unless specified, all observations are our own. We searched for parrot observations in *Florida Field Naturalist* and *Audubon Field Notes* and its successors through *North American Birds*, assisted through 1989 by Loftin et al. (1991). The Fort Lauderdale Christmas Bird Count is the only CBC conducted in Broward County, and parrots were first reported in De-

ember 1973. Because few species were found prior to December 2000, we cite these 27 CBCs as Bolte (1974-1989) and George (1990-2000). Data from the December 2000 and December 2001 CBCs, obtained from George (2001, 2002) and personal observations of Epps, are found in Table 1. We examined the data cards of the Florida Breeding Bird Atlas Project, 1986-1991 (Kale et al. 1992) and contacted some participants for additional information.

Table 1. Parrot data from the 17 December 2000 and 16 December 2001 Fort Lauderdale Christmas Bird Counts, taken from George (2001, 2002) and personal observations of Epps. Species marked with an asterisk (*) were observed on the 2000 CBC but were not published in *American Birds* due to problems with online data entry (G. LeBaron pers. comm.). The abbreviation "cw" refers to an observation during count-week but not on count day.

SPECIES	2000	2001
Chestnut-fronted Macaw	29	28
Blue-crowned Parakeet	32	78
Green Parakeet	6*	1
Mitred Parakeet	50	48
Red-masked Parakeet	53	36
White-eyed Parakeet	4*	1
Black-hooded Parakeet	6	13
Monk Parakeet	78	246
White-winged Parakeet	30*	180
Yellow-chevroned Parakeet	2	10
White-fronted Parrot	cw*	cw
Red-crowned Parrot	177	16
Lilac-crowned Parrot	1*	1
Blue-fronted Parrot	0	10
Yellow-headed Parrot	4	0
Yellow-naped Parrot	2*	4
Orange-winged Parrot	cw	22
Mealy Parrot	0	cw
Total species	16	17
Total individuals	524	694

For those parrots that are not included in the AOU *Check-list* and its supplements (AOU 1998, 2000, 2002), we use Sibley and Monroe (1990) for taxonomy, and Clements (2000) for nomenclature. To reduce confusion, we include alternate English names used by various authorities, except those that substitute conure for parakeet and amazon for parrot. Parrots were identified to subspecies when possible using Juniper and Parr (1998). We include at least one photograph for every species verified in Broward County, and we emphasize evidence that documents breeding. In a few instances, we photographed parrots after they were captured and returned to captivity. Verifiable evidence is included on CD-ROMs that have been deposited in the Florida Ornithological Society Archives at the Florida Museum of Natural History in Gainesville (FOSA 125). Previously unarchived images or videos on this CD-ROM have been given BPCD (Broward Parrot CD) catalog numbers. Copies of the CD-ROM are available from Pranty upon request.

We divided the Fort Lauderdale metropolitan area into several regions for precision. These are identified by roads or water bodies that form their north, east, south, and west boundaries, respectively.

- Coral Ridge: Oakland Park Boulevard, the Intracoastal Waterway, Sunrise Boulevard, and U.S. Highway 1.
- Downtown: Sunrise Boulevard, U.S. Highway 1, New River, and NW 7th Avenue.
- Golden Heights: NE 19th Street, Interstate 95, Sunrise Boulevard, and NW 31st Avenue.
- Harbor Beach: New River, Atlantic Ocean, Port Everglades, and the Intracoastal Waterway.
- Hugh Taylor Birch State Park: NE 19th Street, State Road A1A, Sunrise Boulevard, and the Intracoastal Waterway.
- Las Olas Isles: NE 6th Street, the Intracoastal Waterway, New River, and Victoria Park Road.
- Poinsettia Heights: Middle River, U.S. Highway 1, NE 13th Street, and NW 15th Avenue.
- Rio Vista: New River, the Intracoastal Waterway, State Road A1A, and U.S. Highway 1.
- The roost: the southwest corner of U.S. Highway 1 and NE 13th Street.
- Victoria Park: Sunrise Boulevard, Victoria Park Road, Broward Boulevard, and U.S. Highway 1.

RESULTS

We account for 38 species of parrots that have been identified in Broward County since the 1970s. Thirty-one species have been seen since 1999, and 20 (52%) of these were not previously known to occur in the county. We obtained photographic evidence for 24 species, including one parrot genus (*Cacatua*) and nine species known to occur in Florida but not previously verified: Gray Parrot, Red-breasted Parakeet, White-eyed Parakeet, Chestnut-fronted Macaw, White-fronted Parrot, Blue-fronted Parrot, Mealy Parrot, Yellow-naped Parrot, and Orange-winged Parrot (scientific names to follow). We also photographed one species (Red-throated Parakeet) not previously reported in Florida, and discuss two other newly-observed but unverified species (Red-and-green Macaw and Sun Parakeet or Jandaya Parakeet). The 15 species marked in the following accounts with an asterisk (*) are breeding currently (14 species) or reportedly bred previously (Budgerigar). Because parrots in Broward County cannot be divided as “neatly” as Garrett (1997) found for those in southern California, we include all species in a single list.

SPECIES ACCOUNTS

Tanimbar Cockatoo (*Cacatua goffini*): Endemic to Tanimbar and associated islands in Indonesia; considered near-threatened (Juniper and Parr 1998). There are few Florida reports. One individual with a tethering ring attached to one leg, seen at Heritage Park, Plantation

17-20 June 1999, reportedly had been present for some time. Pranty (2000a) mis-stated that the bird was "banded" and was first seen 16 June. Two photographs (BPCD 01a-b, 20 June 1999, S. Epps) clearly show a *Cacatua* but the images cannot be identified specifically. This is the Goffin's Cockatoo of Forshaw (1977) and Pranty (2000a), and the Tanimbar Corella of del Hoyo et al. (1997).

Cockatiel (*Nymphicus hollandicus*): This widespread Australian parrot is common in captivity. Escapees are seen often in Florida but do not survive long. There are seven observations in Broward County, all singles. Birds were seen at the Fort Lauderdale roost 15 March 1998 and afterward, Hollywood 8 February 2001 (L. and T. Cumiskey pers. comm.), Oakland Park 9 March-8 July 2002, and Wilton Manors 28 August 1999. Other Cockatiels were captured at the Dania Pier 21 July 2001 (D. Laird; BPCD 02, photographed in July 2001, S. Epps), Broward Community College, Davie 30 May 2001 (P. LeRoy pers. comm.), and John U. Lloyd State Park, Hollywood ca. July 1998 (C. and D. Zetes; BPCD 03, photographed in October 2001, S. Epps).

*Budgerigar (*Melopsittacus undulatus*): This Australian native probably is the most popular cagebird in the world. Escapees are frequent but do not seem to survive long. A population that formerly numbered in the thousands of individuals has been established along the central Gulf coast of Florida since the 1960s, but populations along the Atlantic coast were small and ephemeral (Pranty 2001b). Based on information provided by others, Shapiro (1979, 1980) and Wenner and Hirth (1984) referred to Budgerigars as common or abundant breeding residents at Fort Lauderdale, but these assessments were questioned by Pranty (2001b). Budgerigars were found on 10 Fort Lauderdale CBCs between 1973 and 1988, with the largest count of 11 individuals in December 1977. They were not noted in Broward County during the Atlas project (Kale et al. 1992), and only single individuals have been reported since 1990 (Pranty 2001b). Nearly all Budgerigars observed recently have been avicultural color morphs. Singles were at Dania 30 September 2001 (blue morph; BPCD 04, S. Epps); Oakland Park 14 March, 23 April, 31 August, and 6 November 2001 (two different blue morphs; BPCD 05, S. Epps; M. Garcia pers. comm.), 9 December 2001 (green morph), and 30 August 2002 (yellow and green morph; BPCD 06, S. Epps), and Pembroke Pines in late 1998 (blue morph; K. and K. Schnitzius in litt.) and 6 October 2001 and afterward (yellow morph; K. and K. Schnitzius in litt.; D. La Puma in litt.).

Gray Parrot (*Psittacus erithacus*): This central African parrot is well-known in captivity but rarely is observed in the wild in Florida. Three have been seen in Broward County in recent years, all at Hollywood. Escapees were recaptured ca. 1994 (D. and S. Clark pers. comm.) and in July 2000 (L. Cumiskey; BPCD 07, photographed 3 February

2001, S. Epps), while another was seen 7 January 2001 (W. Piedra pers. comm.). The individual photographed is *P. e. erithacus*, based upon its dark bill, pale gray plumage, and scarlet tail.

Peach-faced Lovebird (*Agapornis roseicollis*): This common cagebird from southwest Africa has established a breeding population at Phoenix, Arizona (AOU 2002). Birds are seen infrequently outside of captivity in Florida. Three singles have been observed in Broward County: at Hollywood in July 2000 (L. and T. Cumiskey pers. comm.), Oakland Park 7 May 2001 (M. Garcia pers. comm.), and Victoria Park in August 2001 (L. Gardella pers. comm.). This is the Rosy-faced Lovebird of Sibley and Monroe (1990), Clements (2000), and Pranty and Garrett (2002).

Rose-ringed Parakeet (*Psittacula krameri*): This most widely distributed parrot in the Old World is found from central Africa to south Asia. Free-flying populations have been known in Florida since at least the 1950s (Robertson and Woolfenden 1992). There are four Broward County reports: singles on Fort Lauderdale CBCs in December 1986 and December 1987, and Atlas reports of one at Boca Raton 2 July 1986 (W. Biggs) and a pair at Fort Lauderdale 14 April 1991 (J. Baker). This is the Ring-necked Parakeet of Juniper and Parr (1998).

Plum-headed Parakeet (*Psittacula cyanocephala*): This Asian parrot has been reported in the wild in Florida only a few times. Robertson and Woolfenden (1992) listed it without annotation as having occurred in Broward County.

Red-breasted Parakeet (*Psittacula alexandri*): Native from India to southeast Indochina, with only two reports for Florida (Pranty 2001a). Presumably the same individual was observed among *Aratinga* flocks at Rio Vista 17 June 2001 (BPCD 08a-c, S. Epps), Los Olas Isles (ca. 2 km away) 5 October 2001 and 21 January 2002, and "Sailboat Bend," Fort Lauderdale 6 June 2002 (BPCD 08d, S. Epps). This is the Moustached Parakeet of Forshaw (1977).

*Monk Parakeet (*Myiopsitta monachus*): This abundant native of southern South America is widespread and locally common in Florida. In Broward County, it seems to outnumber all other parrots combined. It occurs throughout all developed areas, with one nesting site (Everglades Holiday RV Park) located west of U.S. Highway 27. From localized surveys from 1999 to 2001, Pranty (unpublished data) estimated the population in Broward County at a minimum of 1200 individuals, and mapped 363 nests. By early 2002, Epps (2002) knew of 400 nests and estimated at least 2000 individuals in the county. Monk Parakeets were first reported in Broward County during the 1973-1974 Fort Lauderdale CBC, and were reported on all subsequent CBCs except during 1976-1977 (Bolte 1974-1989, George 1990-2000, Table 1). Between the 1973-1974 and 1987-1988 count periods, a mean of 4 individuals (range

0-9) was found, but numbers on subsequent CBCs increased greatly. Since the 1988-1989 count period, a mean of 106 individuals (range 34-246) has been reported (Bolte 1974-1989, George 1990-2000, Table 1). Verifiable evidence is abundant, e.g., 2 adults in a nest photographed at Pompano Beach 24 July 1999 (BPCD 09, B. Pranty), 2 at Pembroke Pines in 1999 (BPCD 10, Kevin Schnitzius), and 7 at a nest at Lauderhill 12 November 2001 (BPCD 11, B. Pranty). Crews from Florida Power and Light Company knocked down several nests at Cooper City 10 April 2000, destroying about 30 eggs (BPCD 12, Diaz 2000; BPCD 13, Guilarte 2000). Nestlings were present in several nests in the Fort Lauderdale area 24 July 1999. Between 1968 and 1972, a total of 64,225 Monk Parakeets was imported into the United States (Banks 1977 in Long 1981). The national population is increasing exponentially (Van Bael and Pruett-Jones 1996), with the largest numbers found in Florida and Connecticut (Pranty 2002a). Populations in Broward County have increased noticeably since 1999 at Pembroke Pines (Kim Schnitzius in litt.) and Lauderhill.

*Blue-crowned Parakeet (*Aratinga acuticaudata*): Native to three widely separate regions of South America. Populations in the south half of the Peninsula and the Keys appear to be increasing. In Broward County, it is rather widespread since first observed in February 1999. It is fairly common at Fort Lauderdale (Coral Ridge, Harbor Beach, Los Olas Isles, Oakland Park, the roost, and Victoria Park), with 12 at Pompano Beach 14 November 2000, 6 at Topeekeegee Yugnee Park, Hollywood 6 February 2001 (P. Baicich in litt.), 2 at Lauderhill 16 March 2001, and 4 or more at Wilton Manors in 2001. The largest counts are 78 on the CBC 16 December 2001, and 60 at Rio Vista 12 November 2001. Flocks were photographed at Los Olas Isles 21 January 2001 (BPCD 14a-b, B. Pranty; 6 individuals), Wilton Manors 25 February 2001 (BPCD 15, S. Siegel; 2 individuals), and Fort Lauderdale 25 March 2002 (BPCD 16, D. Humeston; two individuals). Six nests were found in 2001: one at Lauderhill, three at Oakland Park, and two at Wilton Manors. These were all used again in 2002, and others were found: a fourth nest at Oakland Park and at least 10 nests at Rio Vista. The extensive blue on the heads of the Broward County individuals indicate they are of the nominate subspecies. Blue-crowned Parakeets have been exported in large numbers for the pet trade, with 94,000 imported from Argentina from 1985 to 1990 (Juniper and Parr 1998).

Green Parakeet (*Aratinga holochlora*): Endemic to Mexico (Howell and Webb 1995, del Hoyo et al. 1997, Clements 2000); birds in south Texas are "probably" escapees or their descendants (AOU 1998). Green Parakeets are rarely reported outside of captivity in Florida, although the first observations were from Palm Beach County in the 1920s (Barbour 1925). Since 1999, they have been observed in small numbers at

Fort Lauderdale (Los Olas Isles and Victoria Park), with the largest count of 10 at Rio Vista 25 January 2002. Breeding has not yet been confirmed. Individuals were photographed at Victoria Park 21 January 2001 (BPCD 17, B. Pranty) and in February 2001 (BPCD 18, S. Epps).

Red-throated Parakeet (*Aratinga rubritorquis*): Native from Guatemala to Nicaragua. It formerly was considered a subspecies of *A. holochlora* but was elevated to species status by Howell and Webb (1995), del Hoyo et al. (1997), and Clements (2000). One was photographed at Los Olas Isles in early 2001 (BPCD 19, S. Epps).

Crimson-fronted Parakeet (*Aratinga finschi*): Native from Nicaragua to Panama. Known previously in Florida solely from Miami-Dade County. Duos were seen at Victoria Park 2-3 June 2001, and Fort Lauderdale 8 September 2002. This is the Finsch's Conure of Forshaw (1977) and Juniper and Parr (1998).

*Mitred Parakeet (*Aratinga mitrata*): Native from southern Peru to northwest Argentina. Populations seem to be increasing in Florida, and are established in southern California (AOU 2002). In Broward County, 45 birds were reported on the 1992 Fort Lauderdale CBC, but there were no further observations until 1999. Presently, it is fairly common at Fort Lauderdale (Los Olas Isles, Rio Vista, and Victoria Park) with one at Hollywood 18 June 2001 and a few seen at Wilton Manors 4 February 2001. The largest count is 65 at Rio Vista 12 November 2001. Nests were located at Las Olas Isles in 2000 (BPCD 20-21, 13 February 2000, G. Heim; Fig. A in Pranty and Garrett 2002) and in 2001, and at Rio Vista in 2001 and 2002 (four). Based on the large amount of red on the head, the Mitred Parakeets in Broward County represent the nominate subspecies. This species has been captured in huge numbers for the pet trade. Bolivia exported 35,100 from 1981 to 1984, and at least 108,033 birds were taken from Argentina from 1985 to 1990. Such a level of export is a "serious threat" to that population (del Hoyo et al. 1997).

*Red-masked Parakeet (*Aratinga erythrogenys*): Endemic to Ecuador and Peru, and considered near-threatened (Juniper and Parr 1998). Populations seem to be increasing in Florida. Observed first in Broward County in 1999, and fairly common at Fort Lauderdale (Coral Ridge, Los Olas Isles, Rio Vista, and Victoria Park), with 8 at Hollywood 3 June 2001, one at Pompano Beach 14 November 2000, and 16 at Wilton Manors 30 June 2001. The largest count is 53 at Los Olas Isles on the CBC 17 December 2000. Adults fed 2 juveniles at Coral Ridge 15 July 1999, and 6 juveniles were among 30 adults at Los Olas Isles 8 December 2001. Five nests were discovered in 2001: Hollywood 3 June 2001 (BPCD 22, S. Epps), Victoria Park, and Wilton Manors (three). At least 16 nests were found in 2002: ten at Rio Vista, three at Wilton Manors, and three at Fort Lauderdale (BPCD 23-25, D. Humeston).

Red-masked Parakeets have been captured in large numbers for the pet trade, with 26,375 individuals exported from 1985 to 1990 (del Hoyo et al. 1997).

*White-eyed Parakeet (*Aratinga leucophthalmus*): Widespread in northern and central South America, but reported rarely in the wild in Florida. Seen regularly at Fort Lauderdale (Los Olas Isles and Victoria Park) since January 2000, with one at Hollywood 18 June 2001. The largest counts are 25 at Victoria Park 7 February 2001, and 15 (including several copulating pairs) at Los Olas Isles 6 February 2001. Breeding was confirmed at Victoria Park when an adult fed a juvenile 2 June 2001. Individuals were photographed at Victoria Park 21 January 2001 (BPCD 26, B. Pranty) and in February 2001 (BPCD 27, S. Epps). Large numbers of White-eyed Parakeets have been exported in recent years; 31,169 birds were taken from Argentina from 1985 to 1990. Capture for the pet trade is considered a serious threat to some populations (del Hoyo et al. 1997).

Sun Parakeet (*Aratinga solstitialis*) or Jandaya Parakeet (*Aratinga jandaya*): Native to a small area of northeastern South America (Sun Parakeet), or endemic to northeast Brazil (Jandaya Parakeet). Two seen often in flight over Wilton Manors in 2000 (anonymous pers. comm.; identified specifically as Sun Parakeets) represented one of these two similarly-plumaged parrots. Both species are available locally in pet shops, with the Sun Parakeet being more common.

Orange-fronted Parakeet (*Aratinga canicularis*): Native to the Pacific slope of Central America from Mexico to Costa Rica. Since 1988, there has been only one Florida observation outside of captivity (Stevenson and Anderson 1994, Pranty 2002b). In Broward County, it is known from seven Fort Lauderdale CBCs between the 1974-1975 and 1985-1986 count periods, with the largest count of 4 individuals in December 1984.

*Black-hooded Parakeet (*Nandayus nenday*): Native from southwest Brazil to northern Argentina. Populations in Florida are widespread, locally common, and increasing (Pranty 2002a, Pranty and Lovell unpublished data). In Broward County, the Black-hooded Parakeet is common at Pompano Beach, and present less commonly throughout most urban and suburban areas. It was reported first as 3 individuals each on the 1985 and 1986 CBCs, and from Atlas reports of pairs at Pompano Beach 15 April 1989 (V. McKinney) and south of Deerfield Beach in 1990 (W. Biggs). Birds were not reported again until the 1998 Fort Lauderdale CBC. Largest counts are 87 at Pompano Beach 14 November 2000 (BPCD 28, S. Epps; ca. 31 individuals), 30 at Coconut Creek 6 September 2001 (P. Bodnick in litt.), 8 at Davie 6 September 2001 (anonymous pers. comm.), 9 at Fort Lauderdale (Coral Ridge, Los Olas Isles, and Victoria Park), 1 at Hollywood 7 January

2001, 2 at Oakland Park 13 July 2002, 6 at Pembroke Pines 10 January 2000, and 29 at Wilton Manors 5 February 2002. Two birds were observed copulating at Los Olas Isles 9 April 2001 (BPCD 29, S. Epps), and a pair was photographed at their nest at Davie 19 April 2002 (BPCD 30, D. Humeston). A snag contained an occupied cavity at Wilton Manors 11 February-30 May 2001 until it was cut down. Two juveniles were fed by adults at Coral Ridge 11 June 2001 (G. Cashin pers. comm.). During the 1980s, Black-hooded Parakeets were one of the most common parrots captured for the pet trade, with over 114,000 exported from 1985 to 1990 (Juniper and Parr 1998). This is the Nanday Conure of Forshaw (1977), and the Nanday Parakeet of Sibley and Monroe (1990), del Hoyo et al. (1997), and Clements (2000).

*Chestnut-fronted Macaw (*Ara severa*): Native from Panama to central South America. Rare to uncommon in the wild in Florida, and previously known to be breeding in only Miami-Dade County. The previous report from Broward County was from an undated checklist for Birch State Park (Stevenson and Anderson 1994). Presently, it is uncommon at Fort Lauderdale (Birch State Park, Los Olas Isles, and Victoria Park) and rare at Dania and Wilton Manors. The largest counts are 29 at Los Olas Isles on the CBC 17 December 2000 (Table 1), and 11 or more at Victoria Park 21 January 2001 (BPCD 31a-b, B. Pranty). Nests were found at Dania in 2001 and 2002, Victoria Park in 1999, and Wilton Manors (two) in 2001 (BPCD 32a-f, 25 February 2001, S. Siegel). Two begging juveniles accompanied 2 adults at Victoria Park 2 June 2001, and an injured fledgling was captured at Fort Lauderdale 28 August 2002 (B. Henry, BPCD 33; S. Epps).

Red-and-green Macaw (*Ara chloropterus*): Native from Panama through most of central South America. In spring 2001, one made at least three visits to a yard at Oakland Park where there was a captive individual of this species (B. Swanson pers. comm.). This is the Green-winged Macaw of Forshaw (1977) and Juniper and Parr (1998).

Scarlet Macaw (*Ara macao*): Native to three disjunct areas from southern Mexico to central South America; reported rarely outside of captivity in Florida. One was seen at Rio Vista 5 October 2001 (P. Sielicki pers. comm.). We know of two other recent reports of macaws that probably refer to this species.

Blue-and-yellow Macaw (*Ara ararauna*): Widespread in northern and central South America. There are several Florida reports. Individuals were observed often at Fort Lauderdale in the 1980s, including 3 at Birch State Park in 1989. One was seen at Oakland Park in spring 2001 (B. Swanson pers. comm.).

Golden-collared Macaw (*Propyrrhura auricollis*): Native to central South America. The sole Florida report outside of captivity is from Ripley (1982), who observed 2 near Birch State Park 18 February 1981,

and one in February 1982. This is the Yellow-collared Macaw of Forshaw (1977), Ripley (1982), Sibley and Monroe (1990), Robertson and Woolfenden (1992), Stevenson and Anderson (1994), del Hoyo et al. (1997), and Juniper and Parr (1998).

Orange-chinned Parakeet (*Brotogeris jugularis*): Native from southern Mexico to northern South America. It formerly was observed in southeast Florida, but has not been reported since the 1980s (Stevenson and Anderson 1994). Two were reported on the 1979 Fort Lauderdale CBC. This is the Tovi Parakeet of Juniper and Parr (1998).

The "Canary-winged" Parakeet was previously considered a single species, but the AOU (1997, 1998) elevated two races to species status: White-winged Parakeet (*B. versicolurus*) and Yellow-chevrons Parakeet (*B. chiriri*). "Canary-winged" Parakeets were first reported in Broward County at Fort Lauderdale on 11 September 1970 (George 1971a in Stevenson and Anderson 1994). They were found on nearly every CBC between 1973-1974 and 1993-1994, with a mean of 15 individuals (range 0-75; Bolte 1974-1989, George 1990-2000). They were not reported again until December 1999, when 13 were observed (Table 1). There is one Atlas report of "Canary-winged" Parakeets visiting a potential nest site at Fort Lauderdale 22 May 1989 (J. Baker). Both species were imported into the U.S. during the 1970s and 1980s (Brightsmith 1999). There seems to be no way to determine which "Canary-winged" Parakeet was observed in Broward County prior to 2000, but most if not all individuals presumably were *versicolurus*.

*White-winged Parakeet (*Brotogeris versicolurus*): Native to the Amazon Basin. Juvenile White-winged Parakeets were observed with adults at Los Olas Isles 18 July 2001, and a nest was found at Victoria Park 17 March 2002. The largest counts are from Los Olas Isles: 200 on 7 November 2000 and 180 on the CBC 16 December 2001. Several dozen individuals were videotaped at Los Olas Isles 11 January 2000 (BPCD 34, K. Fay). This is the Canary-winged Parakeet of Sibley and Monroe (1990) and Clements (2000).

*Yellow-chevrons Parakeet (*Brotogeris chiriri*): Widespread in central South America. It was thought to be restricted in Florida to southern Miami-Dade County prior to our study. Since January 2000, small numbers have been observed at Fort Lauderdale (Downtown, Los Olas Isles, and Victoria Park), usually among flocks of White-winged Parakeets. The largest count is 10 at Los Olas Isles on the CBC 16 December 2001. Adults were seen feeding fledglings at Los Olas Isles 18 July 2001 and 28 June 2002. K. Garrett (in litt.) identified by voice several Yellow-chevrons Parakeets among a mixed *Brotogeris* flock videotaped at Victoria Park 11 November 2001 (BPCD 35, B. Pranty).

White-crowned Parrot (*Pionus senilis*): Found along the Caribbean slope of Central America from Mexico to Panama. The sole Florida report is one from Fort Lauderdale 29 April 1984 (Kale 1984). This is the White-capped Parrot of Forshaw (1977).

*White-fronted Parrot (*Amazona albifrons*): Widespread from Mexico to Nicaragua. Reported rarely in the wild in Florida. In Broward County, one was observed at Fort Lauderdale 12 April 1980 (Kale 1980) but there were no further reports until 1999. The largest totals are 8 at the Fort Lauderdale roost 12 December 2000 and 8 (including at least 3 juveniles) at Oakland Park 1 August 2001. A nest was found at Wilton Manors in February 2001 (BPCD 36, S. Epps, adult at cavity entrance, 6 February 2001; BPCD 37a-g, S. Siegel, adults copulating, 25 February 2001), and 2 adults and 3 juveniles were observed there 21 May 2001. Two fledglings were videotaped at Oakland Park 12 November 2001 (BPCD 38, B. Pranty). On the basis of the limited blue patches on the fore-crown, the Broward individuals appear to be the nominate subspecies.

*Red-crowned Parrot (*Amazona viridigenalis*): Endemic to north-east Mexico, where numbers have declined severely in recent decades. Birds in south Texas are "most likely" escapees or their descendants (AOU 1998), while a large and increasing population is established in southern California (Garrett 1997, AOU 2002). Red-crowned Parrots in southeast Florida were first noted in the early 1970s and were "commonly seen" at Fort Lauderdale (Owre 1973). In Broward County, they are locally common and have been present for 30 or more years at Fort Lauderdale (Birch State Park, Coral Ridge, Golden Heights, Harbor Beach, Los Olas Isles, Poinsettia Heights, Rio Vista, the roost, and Victoria Park). Red-crowned Parrots are breeding also at Dania, Lauderdale, Oakland Park, and Wilton Manors. Reported first on the 1974-1975 CBC, they were seen annually except during the 1998-1999 count. Means on CBCs by decades are 43 (range 14-49; 1974-1979), 54 (range 6-77; 1980-1989), and 33 (range 0-100; 1990-1999); 177 and 16 were seen in December 2000 and December 2001, respectively (Bolte 1974-1989, George 1990-2000, Table 1). Paul Sykes (in Stevenson 1975) counted 21 Red-crowned Parrots at the Fort Lauderdale roost 22 February 1975, and we routinely observed over 100 individuals there. The largest counts are 236 on 11 August 2002 and 204 on 4 December 1999. We observed 38 Red-crowned Parrots (including begging juveniles) at a Dania roost 27 August 2001. Breeding in Broward County was confirmed first in May 1974, when J. and W. Bolte photographed adults feeding a juvenile at Fort Lauderdale (TTRS P232). W. Biggs (pers. comm.) removed 3 nestlings from a nest at Wilton Manors in May 1981 (TTRS P524, 8 May 1992; one photographed as an adult). There are Atlas reports of occupied nests at Fort Lauderdale and Port

Everglades in 1989 (J. Baker). Six nests were found in 2001: one at Dania, three at Oakland Park, and two at Wilton Manors. In 2002, one nest was found at Dania and 13 were discovered at Oakland Park. "Lots" of juveniles were among 158 Red-crowned Parrots at the Fort Lauderdale roost 23 October 1999 (Pranty 2000b). Numerous individuals have been verified, e.g., ca. 80 *Amazona*, mostly Red-crowned Parrots, near the Fort Lauderdale roost 21 January 2001 (BPCD 39, B. Pranty), several dozen there 11 November 2001 (BPCD 40, B. Pranty), and 2 adults at Lauderhill 16 March 2001 (BPCD 41, S. Epps; Fig. C in Pranty and Garrett 2002). This is the Green-cheeked Amazon of Forshaw (1977) and Juniper and Parr (1998).

Lilac-crowned Parrot (*Amazona finschi*): Native to the Pacific slope of Mexico, and considered near-threatened (Juniper and Parr 1998). Rare in Florida, with most reports from southeast counties. In Broward County, it was first observed at Fort Lauderdale 22 February 1975 (Stevenson 1975) but was not seen again until 20 January 2000. Seen often during our study at Oakland Park, the Fort Lauderdale roost, and Victoria Park, where one was photographed 16 August 2001 (BPCD 42, S. Epps). Most observations have been of singles, but duos were at the roost 4 October 2001 and 11 August 2002.

Red-lored Parrot (*Amazona autumnalis*): Native from Mexico to northern South America, with a disjunct population along the central Amazon River. There are few Florida reports outside of captivity. Based on its red forehead and yellow cheek patches, one at the Fort Lauderdale roost 23 January 2002 was the nominate subspecies, which ranges from Mexico to Honduras.

*Blue-fronted Parrot (*Amazona aestiva*): Native from southern Brazil to northern Argentina. Small numbers were seen free-flying in Florida in the 1970s and 1980s but not afterward (Stevenson and Anderson 1994). In Broward County, birds have been noted since January 2000 at Dania and Fort Lauderdale (Las Olas Isles, the roost, and Rio Vista). The largest count is 12 (4 adults, 4 sub-adults, and 4 juveniles) at the roost 8 February 2002, with 10 (2 adults, 4 sub-adults, and 4 juveniles) there on the CBC 16 December 2001. Two adults were at a Dania roost 7 January 2001. Two sub-adults were photographed at the Fort Lauderdale roost 21 March 2001 (BPCD 43-44, S. Epps), one sub-adult was videotaped there 11 November 2001 (BPCD 45, B. Pranty), and 2 adults fed 2 juveniles nearby 31 August 2002. A nest was found at Rio Vista in March-April 2002. This is the Turquoise-fronted Parrot of Robertson and Woolfenden (1992) and Stevenson and Anderson (1994).

Mealy Parrot (*Amazona farinosa*): Native from southern Mexico to southeast Brazil; rare in Florida. One was photographed at the Fort Lauderdale roost 24 July 1999 (BPCD 46, B. Pranty) and was seen

there again 2 August 1999. With its blackish bill and no discernable blue on the crown; this individual may have been either *A. f. guatemalae* or *virenticeps*. A different Mealy Parrot was found at Los Olas Isles 15 December 2001.

Yellow-headed Parrot (*Amazona oratrix*): Native to three regions of Central America between Mexico and Honduras. It was formerly common in captivity, and birds were reported frequently in the wild in Florida. In Broward County, individuals have been observed since 22 February 1975 (Stevenson 1975), but breeding has never been confirmed. Observed recently at Fort Lauderdale (Rio Vista and the roost) and Oakland Park. A few were seen annually on Fort Lauderdale CBCs from 1977 to 1987 (mean of 3, range 2-4, $n = 11$), but frequency declined in later years. Beginning in December 1988, Yellow-headed Parrots have been seen on only 6 CBCs (mean of 1, range 0-7, $n = 14$), with the high count in December 1989 (Bolte 1974-1989, George 1990-2000, Table 1). A pair was seen at Fort Lauderdale during the Atlas project in 1987 (W. George). We have never seen more than a single Yellow-headed Parrot at any time; most of the 4 individuals reported on the 2000 CBC may have been misidentified Orange-winged Parrots. Yellow-headed Parrots were photographed at Fort Lauderdale 24 July 1999 (BPCD 47, B. Pranty) and 5 January 2001 (BPCD 48, S. Epps). Forshaw (1977) and del Hoyo et al. (1997) combined this and the next two species as the Yellow-crowned Parrot, while Stevenson and Anderson (1994) combined the three as Yellow-headed Parrot.

*Yellow-naped Parrot (*Amazona auropalliata*): Native to Central America, primarily the Pacific slope from Mexico to Costa Rica, with a separate population along the Caribbean coast of Honduras and Nicaragua. It is rare outside of captivity in Florida. Small numbers have been seen recently at Fort Lauderdale (Los Olas Isles and the roost), with the high count of 4 on the CBC 16 December 2001. Observed first at the roost 24 July 1999 (BPCD 49, B. Pranty), an adult with a yellow forehead patch and an orange shoulder patch that apparently was either *A. a. parvides* or *caribaea*. An adult and fledgling were observed outside their nest cavity at Los Olas Isles 2 July 2000 (BPCD 50, S. Epps; an adult with a yellow forehead patch but no shoulder patches). The same nest was used again in 2001, but was cut down in 2002. One adult (lacking forehead and shoulder patches) and one juvenile were at Los Olas Isles on the CBC 17 December 2000.

Yellow-crowned Parrot (*Amazona ochrocephala*): Widespread from Panama to Bolivia and central Brazil. Florida reports are limited to the three southeast counties. There are only two Broward County observations, both from Fort Lauderdale: one at the roost 22 February 1975 (Stevenson 1975) and possible breeding observed in July 1988 during the Atlas project (J. Baker).

*Orange-winged Parrot (*Amazona amazonica*): Widespread in South America to southern Brazil. Previous Florida reports were nearly restricted to Miami-Dade County. Orange-winged Parrots have been found recently to be rather common at Fort Lauderdale (Coral Ridge and the roost), Oakland Park, and Wilton Manors. Two others were near Dania 4-5 May 2001 (L. Saul and D. Wassmer in litt.). Individuals were first observed at the roost 10 October 1997, and were verified there 24 July 1999 (BPCD 51, B. Pranty) and 19 July 2000 (BPCD 52, S. Epps). "Dozens" of birds, including "lots" of begging juveniles, were at the roost 23 October 1999 (Pranty 2000b). Other large counts are 63 at the roost 20 February 2000 and 61 at Oakland Park 22 December 1999. A fledgling was outside its nest at "Marina Mile," Fort Lauderdale 6 June 2001 (BPCD 53, S. Epps).

DISCUSSION

Ornithologists were not aware that parrots occurred outside of captivity in Broward County until the early 1970s, but anecdotal information (e.g., Flor 1989b) suggests that some *Amazona* and *Aratinga* species may have first appeared in the early 1950s. Owre (1973) published the first formal account of the exotic avifauna of Palm Beach, Broward, and Miami-Dade counties, but little information was provided for most species. He mentioned only the "Canary-winged" Parakeet and Red-crowned Parrot as occurring in Broward County (Owre 1973). In the early and mid-1970s, observations by Paul Sykes and others of *Amazona* parrots at the Fort Lauderdale roost were published in *American Birds*. During the Florida Breeding Bird Atlas Project (1986-1991), breeding evidence was obtained for 23 parrot species in Florida and seven in Broward County (Kale et al. 1992). Two of these (Monk Parakeet and Red-crowned Parrot) were confirmed to breed, four others (Rose-ringed Parakeet, Black-hooded Parakeet, "Canary-winged" Parakeet, and Yellow-headed Parrot) were considered probable breeders, and the Yellow-crowned Parrot was considered a possible breeder (Kale et al. 1992). Between the 1973-1974 and 1999-2000 Fort Lauderdale CBCs inclusive, a cumulative total of 10 parrot species was reported (mean of 4 species, range 2-7; Bolte 1974-1989, George 1990-2000). During the count-weeks of the December 2000 and December 2001 CBCs, 16 and 17 species, respectively, were found (Table 1).

Owre (1973) compiled a list of 10 species of parrots found outside of captivity in Florida by the early 1970s. This number had increased to 66 species by the early 1990s (Stevenson and Anderson 1994) and 74 by mid-2002 (Pranty 2001a, this paper). The increasing number of parrot species observed at liberty in Florida undoubtedly reflects a combination of increased awareness of exotics, as well as additional species es-

caping or being released. The Fort Lauderdale CBC provides the only long-term dataset for parrots in Broward County, but few species have been observed sufficiently to determine population trends. Moreover, results of the two most recent CBCs (Table 1) suggest that previous efforts may have overlooked species and may have underestimated numbers of individuals of species that were observed. Few observers have been willing to cover heavily developed areas within the count circle, and this has resulted in parrots and other urban species being underreported (W. George in litt.). Nevertheless, data gathered during the CBCs provide most or all the information available in the county for Budgerigar, Orange-fronted Parakeet, and Orange-chinned Parakeet.

The parrot fauna of Broward County contains species from much of their worldwide range, but only those native to the New World (i.e., *Amazona*, *Aratinga*, *Myiopsitta*, and *Nandayus* species) number in the dozens to hundreds of individuals and are breeding regularly. Garrett (1997) found that many of the same species (and even the same subspecies) occurred in southern California. The preponderance of New World parrots seen in the United States may be simply the result of the importation of huge numbers of Neotropical species in recent decades as other countries (e.g., Australia) have banned exportation. Thomsen and Mulliken (1992) estimated that over 1.4 million Neotropical parrots were legally imported into the United States from 1982 to 1988, with nearly half of these obtained from Argentina.

The "Canary-winged" Parakeet presents an interesting challenge for birders and ornithologists (Smith and Smith 1993; Garrett 1993, 1997; Brightsmith 1999; Pranty and Garrett 2002). The American Ornithologists' Union (1997) agreed that the taxon consists of two probably allopatric species, the White-winged Parakeet and Yellow-chevroned Parakeet. Thus, there now are two similar species occurring sympatrically in southern California and southern Florida (Smith and Smith 1993; Garrett 1993, 1997; Brightsmith 1999; Pranty and Garrett 2002). From 1968 to 1972, over 230,000 White-winged Parakeets were imported into the U.S., but subsequent numbers declined to "near zero" (Brightsmith 1999). To compensate for this loss, over 74,000 Yellow-chevroned Parakeets were imported from 1977 to 1990 (Brightsmith 1999). In California, Yellow-chevroned Parakeet clearly is the more numerous *Brotogeris* (Garrett 1993), but the situation in Florida is uncertain (Pranty and Garrett 2002). Up to 200 White-winged Parakeets presently are found at Fort Lauderdale, but it is not known whether these represent one or more recent avicultural releases, or a flock that was overlooked for several years. Furthermore, the two *Brotogeris* species may be hybridizing in the wild. H. Voren (in litt.) purchased 20 *Brotogeris* that reportedly were wild-caught at Fort Lauderdale in January 1999. These individuals, which have bred in

captivity and produced fledglings, show great variation in wing-patch pattern (BPCD 54-68, H. Voren; 15 different individuals). This potentially fascinating discovery warrants additional study and confirmation (cf. Brightsmith 1999).

Opinion on the status of the Red-crowned Parrot in Florida is contradictory. It was considered by Robertson and Woolfenden (1992) to be "Probably unestablished," whereas Stevenson and Anderson (1994) called it "Apparently established" in Broward County. The American Ornithologists' Union regarded the species as "established" in Miami-Dade County (AOU 1983) and in Miami-Dade and Monroe counties (AOU 1998). Both of these *Check-lists* overlooked the population in Broward County, which has always been the largest in the state based on CBC data (Stevenson and Anderson 1994). James (1997, Table 9.2, caption) erroneously reported that Red-crowned Parrots in Florida became extirpated in the 1980s. Because the Florida Ornithological Society Records Committee (FOSRC) uses Robertson and Woolfenden (1992) as its base list, the Red-crowned Parrot presently is considered not established (Bowman 2000, 2001). Robertson and Woolfenden (1992) questioned whether populations in Florida were self-sustaining. Based on numerous observations of dependent young at the Dania and Fort Lauderdale roosts (this paper), we are convinced that the Red-crowned Parrot population in Broward County is being maintained largely if not exclusively through their own reproductive efforts. The FOSRC bylaws (found online at <<http://www.fosbirds.org/RecordCommittee/RulesAndProcedures.htm>>) suggest that populations of exotic birds should number ". . . a few hundred breeding pairs" to be considered established. Based on current knowledge, numbers of Red-crowned Parrots in southeast Florida do not yet meet this criterion. The status of populations in Miami-Dade and Palm Beach counties are poorly known, although B. Russell (U.S. Fish and Wildlife Service, pers. comm.) observed 160 Red-crowned Parrots at a roost at the Breakers Resort at Palm Beach, Palm Beach County, on 27 December 2000.

The breeding populations of Red-crowned Parrots found in California (Garrett 1997), Florida (e.g., this paper), and Texas (Wiley et al. 1992, AOU 1998) may have *true conservation value* despite their exotic status. From habitat destruction and capture for the pet trade, numbers of Red-crowned Parrots within their limited range in northeast Mexico have plummeted in recent decades. From 1970 to 1982, about 5000 parrots, mostly nestlings, were removed annually to supply the pet trade (Enkerlin-Hoeflich and Hogan 1997). Red-crowned Parrots now are considered an endangered species, with a native population numbering no more than 6500 individuals (Juniper and Parr 1998). Considering the difficulties associated with the use of captive-reared parrots in reintroduction programs (Derrickson and Snyder 1992),

Red-crowned Parrot populations from the United States may provide sources of birds for potential reintroductions into Mexico (Wiley et al. 1992, Garrett 1997), should such an effort be undertaken, and providing that the birds are not genetically compromised.

We believe that the time is long overdue for parrots and other exotic birds in Florida to receive much greater scrutiny by birders and ornithologists, as others have recommended (Robertson and Woolfenden 1992, Smith and Smith 1993, AOU 1998, Brightsmith 1999). Nearly 30 years have elapsed since Owre's (1973) paper was published, documenting the exotic avifauna of southeast Florida in the 1960s and early 1970s. Since that time, many of the parrot species known to Owre have disappeared, and dozens more not found at that time have been observed subsequently, with some of these species now rather common. Shifts in the composition of Florida's parrot fauna presumably reflect changes in species importation into the United States, a situation that has also occurred in southern California (Garrett 1997). Parrots represent the most species-rich family of exotic birds found in the state, with 74 species reported since the 1960s (Pranty 2001a, this paper). Current data on the identity, distribution, and population sizes of parrots are needed especially in Miami-Dade County, the epicenter of Florida's exotic avifauna, with 127 (!) species reported (Pranty 2001a). Only through detailed study and careful documentation can we gain insight into populations of exotic birds found in southeast Florida, and to determine any impacts to wildlife, natural communities, and commercial agriculture.

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