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RESULTS AND HIGHLIGHTS

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Confirmed Breeders

The Florida Breeding Bird Atlas project located 196 species as confirmed breeders in Florida. [See **Introduction and Methods** for definition of breeding categories.]

Excluding nonnative species, 6 of these were new species documented for the first time as confirmed breeders in the state:

Table 2.1. Native species confirmed breeding in Florida for the first time.

Confirmed breeders
<u>Masked Booby</u>
<u>Black-bellied Whistling Duck</u>
<u>Bridled Tern</u>
<u>Eastern Phoebe</u>
<u>Cave Swallow</u>
<u>Shiny Cowbird</u>

In addition, the White-tailed Kite, whose last breeding in Florida occurred in the 1930s Stevenson and Anderson 1994, was again found breeding at several sites in south Florida and appears to be increasing.

Probable and Possible Breeders

The Florida Breeding Bird Atlas project also located 19 species as suspected breeding species in Florida: 16 species as probable breeders and 3 species as possible breeders. [See **Introduction and Methods** for definition of breeding categories.]

Table 2.2. Species suspected breeding in Florida.

Probable breeders	Possible breeders
<u>American Bittern</u>	<u>Cockatiel</u>
<u>Egyptian Goose</u>	<u>White-fronted Parrot</u>
<u>Ring-necked Duck</u>	<u>Cliff Swallow</u>
<u>Northern Harrier</u>	
<u>Sharp-shinned Hawk</u>	
<u>Ring-necked Pheasant</u>	
<u>Black Rail</u>	
<u>Blue-crowned Parakeet</u>	
<u>Orange-fronted Parakeet</u>	
<u>Yellow-naped Parrot</u>	
<u>Bahama Mockingbird</u>	
<u>American Redstart</u>	
<u>Worm-eating Warbler</u>	
<u>Chipping Sparrow</u>	
<u>American Goldfinch</u>	
<u>Yellow-fronted Canary</u>	

Confirmed breeding by 4 of the probable species --- Black Rail, American Redstart, Worm-eating Warbler, and Chipping Sparrow --- had been documented prior to the Atlas period; however, all 4 species are rare or relatively uncommon in summer and extremely difficult to confirm. Few birdwatchers roam the warbler habitats in northwest Florida or have the perseverance to search for rail nests.

Of the probable native species, the Bahama Mockingbird and American Goldfinch would have been new to Florida had breeding been confirmed. The Bahama Mockingbird record involved a lone male in Key West in 1991 that sang, defended a territory, and built a nest. Under most circumstances, these observations would provide excellent evidence for confirmation of breeding, but we could not use them because no female was present. This male may have been a pioneer because, by the spring of 1992, 4 Bahama Mockingbirds were recorded in south Florida, including a singing male on the same Key West territory D. Canterbury, pers. commun.. The American Goldfinch breeds in Georgia, hence it could just be a matter of time before breeding is confirmed in Florida.

No documented records of breeding by the Sharp-shinned Hawk in Florida exist Howell 1932, and the Atlas project was unable to improve this picture.

Howell 1932 reported that the Northern Harrier "breeds sporadically in northern Florida" and described 3 nests in the early years of this century. Layne and Douglass 1976 found no evidence of breeding for this species and no records of confirmed breeding were found during the Atlas period.

Of the 3 species considered possible breeders, only the Cliff Swallow is a native. It is a relative newcomer as a breeding species in Florida, first discovered nesting in 1975 under a now demolished bridge over the St. Lucie Canal. Because 1 adult was seen in 1990, an intensive search in the vicinity during the Atlas period might have found a colony; however, few experienced atlasers worked the area.

Species not recorded by the Atlas

No evidence in any category of breeding was found for 8 species known to have nested in Florida prior to the Atlas period. These were Greater Scaup, Lesser Scaup, Black Francolin,

Virginia Rail, Common Tern, Baltimore Oriole, and the extinct Carolina Parakeet *Conuropsis carolinensis* and probably extinct Ivory-billed Woodpecker *Campephilus principalis*. This is not surprising for the duck species because previous breeding records in Florida usually indicate crippled birds that cannot migrate north to breed as they normally would.

The Common Tern has nested only occasionally in Florida in the past, Florida being south of its normal breeding range. The same can be said for the Virginia Rail, with only 1 known historical breeding record for the state.

The Black Francolin was introduced from India into the Everglades Agricultural Area in the early 1960s Genung and Lewis 1982, and although it bred successfully for several years, it now has apparently died out. The last 2 birds were seen in 1976.

The only breeding record for the Baltimore Oriole in Florida was a pair that nested and produced young in Key West in 1972 Ogden 1972. The nearest breeding population of this species is in north Georgia, several hundred miles north of the Florida border; therefore a repeat of such an anomalous nesting was not expected.

No evidence in any category of breeding was found for 1 species suspected to have nested in Florida prior to the Atlas period. The Masked Duck, is not known to have ever nested in Florida, although breeding has been suspected Robertson and Woolfenden 1992. No Masked Ducks, breeding or nonbreeding, were reported during the Atlas period.

Range extensions

The Atlas maps reveal expansions in breeding ranges for several species. The Reddish Egret has extended its breeding range from Florida Bay northward along the Gulf coast to Tampa Bay and along the Atlantic coast to Merritt Island. The Roseate Spoonbill has returned to areas it last colonized in the early years of this century, also nesting north to Tampa Bay and Merritt Island. Some of the impetus for these movements might be the reduced productivity of Florida Bay resulting from disruption of water flows through the Everglades ecosystem.

The Glossy Ibis has expanded from 1 or 2 breeding colonies on Lake Okeechobee to numerous colonies throughout the peninsula.

In response to the loss of normal hydrological regimes necessary for food production and breeding in south Florida, Wood Storks have established breeding colonies northward into central and north Florida, Georgia, and South Carolina.

The Eurasian Collared-Dove, in less than a decade, has spread throughout the peninsula and into the Panhandle, a reenactment of its rapid invasion of western Europe in the 1940s and 1950s.

The Chimney Swift continues its southward invasion along the highly developed southeastern and southwestern coasts, possibly a result of increased numbers of chimneys. Barn Swallows have now reached the Florida Keys in their rapid southward expansion.

There seems to be no rhyme or reason to the slow and irregular movement of nesting American Robins into central Florida. The southward invasion of Gray Catbirds is occurring more rapidly and in greater numbers.

Undoubtedly, ornithologists of Howell's time would be greatly dismayed by the map of the European Starling. Its occupation of Florida is now almost complete.

One surprise of the Atlas project was the expansion of the breeding range of the Cuban Yellow Warbler along the southwest coast of Florida. As it meets the Brown-headed Cowbird's invasion from the north and is followed by the Shiny Cowbird moving in from the south, we can only hope it is not overwhelmed by these 2 nest parasites.

The first Shiny Cowbird in North America appeared in the Florida Keys in 1986, during the first year of the Atlas project. By 1990 the species had reached Oklahoma and Texas and by 1991 was found in Maine. Coming in from the other direction is the Brown-headed Cowbird. Because of the rapid expansion of the breeding ranges of these 2 species, the relevant Atlas maps will soon be obsolete.

The simultaneous southward expansions of the Blue Grosbeak, Indigo Bunting, and to a lesser extent the Painted Bunting, into central Florida may be associated with extreme killing frosts of the early 1980s, which destroyed large portions of the central Florida citrus groves. Many groves are now dead and overgrown with weeds and young, wild trees.

The Orchard Oriole is another species rapidly moving southward. By 1992, it had extended its range south into Osceola County.

Range reductions

Fewer species, fortunately, have experienced range contractions. One of these, a recent colonizer of Florida, is the Smooth-billed Ani. It reached Merritt Island and the Tampa Bay area in the early 1970s and since then has become considerably reduced in numbers and range, possibly due to the severe freezes of the 1980s.

The map of the Red-cockaded Woodpecker reveals the extreme habitat fragmentation occurring in its range. The Panhandle tracts now represent some of the largest populations remaining in the United States.

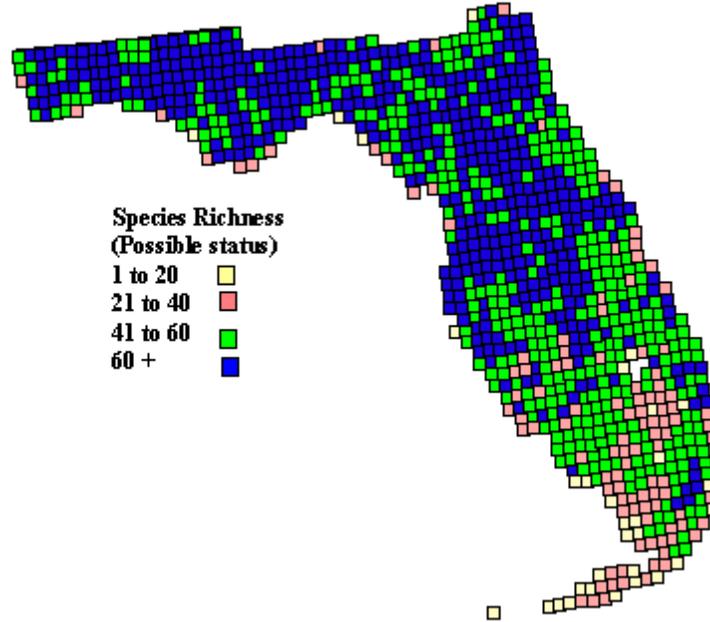
The disappearance of the once widespread White-breasted Nuthatch is a great mystery. It now breeds only in extreme north Florida in Leon and Jefferson counties, with a few scattered pairs elsewhere.

The conspicuous absence of Seaside Sparrows on the central Atlantic coast of Florida is a disheartening aspect of the Seaside Sparrow map. The last Dusky Seaside Sparrow was seen in the St. Johns marshes west of Titusville in 1980, and the subspecies was officially declared extinct in 1991. The northeast coast population once extended from Georgia to New Smyrna Beach in Volusia County. It no longer breeds south of the St. Johns River in Duval County, but other populations northward appear stable.

Species Richness

Figure 2.1 presents a summary of species richness in Florida at the quadrangle level. Quadrangles with more than 60 species occur throughout the panhandle and southward into the central peninsula. Low numbers of species in some quadrangles are the result of extensive monotypic habitat, such as sand pine forest, tree farms, Everglades marshes, and Everglades agricultural areas, all noted for low habitat diversity and fewer bird species. In some quadrangles, however, low species richness may be a reflection of sparse Atlas coverage, especially when such a quadrangle is surrounded on all sides by quadrangles with high species richness.

Figure 2.1 species richness



Most commonly recorded species

The top 20 species reported in the most Atlas blocks in Florida are shown in Table 2.3. Almost any atlaser's guess of the top 10 species in the state probably would be found on this list.

Table 2.3. The 20 species reported in the most Atlas blocks in Florida.

Species	Number of Blocks			
	Confirmed	Probable	Possible	Total
<u>Northern Cardinal</u>	2148	720	502	3370
<u>Red-bellied Woodpecker</u>	1667	635	925	3227
<u>Mourning Dove</u>	1307	1080	756	3143
<u>Carolina Wren</u>	1583	672	846	3101
<u>Northern Mockingbird</u>	2127	449	512	3088
<u>Eastern Towhee</u>	1242	874	783	2899
<u>Great Crested Flycatcher</u>	1263	859	743	2865
<u>Blue Jay</u>	1420	554	845	2819
<u>Red-winged Blackbird</u>	1513	654	619	2786
<u>White-eyed Vireo</u>	1053	709	892	2654
<u>Common Grackle</u>	1482	412	737	2631
<u>Northern Bobwhite</u>	1185	672	735	2592
<u>Brown Thrasher</u>	1075	622	693	2390
<u>Common Ground Dove</u>	436	1079	723	2238
<u>Downy Woodpecker</u>	689	611	935	2235
<u>Pileated Woodpecker</u>	440	717	1017	2174
<u>Tufted Titmouse</u>	1201	355	590	2146
<u>Red-shouldered Hawk</u>	566	548	953	2067
<u>Common Nighthawk</u>	356	855	803	2014
<u>Fish Crow</u>	405	466	1133	2004

Least commonly recorded species

Table 2.4 shows the 20 least commonly recorded breeding species excluding recently introduced nonnative species.

Table 2.4. The 20 species reported in the fewest Atlas blocks in Florida excluding recently introduced non-native species.

Species	Number of Blocks			
	Confirmed	Probable	Possible	Total
<u>Masked Booby</u>	1	0	0	1
<u>Bridled Tern</u>	1	0	0	1
<u>Brown Noddy</u>	1	0	0	1
<u>Sooty Tern</u>	1	0	0	1
<u>Eastern Phoebe</u>	1	0	1	2
<u>Caspian Tern</u>	2	0	0	2
<u>Cave Swallow</u>	2	0	0	2
<u>Magnificent Frigatebird</u>	3	0	0	3
<u>Ruddy Duck</u>	3	0	0	3
<u>Hooded Merganser</u>	4	0	0	4
<u>Roseate Tern</u>	5	0	0	5
<u>Blue-winged Teal</u>	5	0	0	5
<u>Sandwich Tern</u>	5	0	0	5
<u>House Finch</u>	4	3	3	10
<u>White-tailed Kite</u>	7	1	3	11
<u>Gull-billed Tern</u>	11	0	0	11
<u>Black-bellied Whistling-Duck</u>	1	7	4	12
<u>Grasshopper Sparrow</u>	6	0	7	13
<u>Royal Tern</u>	13	0	0	13
<u>Fulvous Whistling-Duck</u>	14	0	0	14

Recently introduced nonnative species

Florida's mild climate, especially in south Florida, has encouraged the introduction of thousands of species and varieties of tropical trees and plants. Many of these are now thriving and widespread, either as yard plantings or as wild populations. Owre 1973 stressed that the flora of southeastern Florida contained elements of the world's tropics and that virtually any exotic tropical bird would find aspects of the landscape familiar to it. Plant introductions during the first half of the century set the stage for the survival of exotic birds that appeared with the tremendous boom in the caged-bird trade Owre 1973.

Which species does one count and which species does one ignore when conducting a Breeding Bird Atlas project? Obviously domestic chicken flocks and captive breeders in aviaries cannot be included. What about semi-domesticated Mallards or Muscovy Ducks on a city pond? For the most part they are free in the wild to come and go at will. Although food subsidies may be plentiful, these birds also live off the plant and animal production of the pond, and they nest and reproduce on their own.

We decided to accept breeding reports of almost every species found nesting "in the wild" even if no evidence of an established wild population existed. Should we have excluded the swans that nested on municipal lakes or the single confirmed breeding of the Mandarin Duck in Polk County? Probably so. But at what point do we begin to include them in the avifauna of a region? As in the case of European Starlings, which for many years were kept off of Christmas Bird Count lists as "uncountable" because they are not native, Florida atlasers made similar

decisions when it came to recording semi-domesticated species, such as ducks, geese, swans, and peacocks. Thus, the maps for these species likely represent an underestimate of the incidences of breeding by these species in Florida.

Breeding in the wild by escaped or released exotics may be insignificant and amount to nothing, or it may be the pioneering effort that results in a new species becoming permanently established.

For whatever value they may have, documenting a one time historical event or the beginning of an expanding population, we have included Atlas maps of 39 recently introduced or escaped nonnative species in Florida Table 2.5. In all cases, breeding was confirmed or suspected during the Atlas period or was known to have occurred prior to 1986. With rare exceptions, little is known about the breeding biology of these species in Florida. In some cases the map itself represents all we know about the species in the state.

Table 2.5. Recently introduced or escaped nonnative species in Florida.

Common name	Scientific name
<u>Swan Goose</u>	<i>Anser cygnoides</i>
<u>Graylag or Domestic Goose</u>	<i>Anser anser</i>
<u>Egyptian Goose</u>	<i>Alopochen aegyptiacus</i>
<u>Mute Swan</u>	<i>Cygnus olor</i>
<u>Black Swan</u>	<i>Cygnus atratus</i>
<u>Muscovy Duck</u>	<i>Cairina moschata</i>
<u>Mandarin Duck</u>	<i>Aix galericulata</i>
<u>Ring-necked Pheasant</u>	<i>Phasianus colchicus</i>
<u>Common Peafowl</u>	<i>Pavo cristatus</i>
<u>Cockatiel</u>	<i>Nymphicus hollandicus</i>
<u>Budgerigar</u>	<i>Melopsittacus undulatus</i>
<u>Rose-ringed Parakeet</u>	<i>Psittacula krameri</i>
<u>Green-cheeked Parakeet</u>	<i>Pyrrhura molinae</i>
<u>Monk Parakeet</u>	<i>Myiopsitta monachus</i>
<u>Blue-crowned Parakeet</u>	<i>Aratinga acuticaudata</i>
<u>Mitred Parakeet</u>	<i>Aratinga mitrata</i>
<u>Red-masked Parakeet</u>	<i>Aratinga erythrogenys</i>
<u>Dusky-headed Parakeet</u>	<i>Aratinga weddellii</i>
<u>Orange-fronted Parakeet</u>	<i>Aratinga canicularis</i>
<u>Chestnut-fronted Macaw</u>	<i>Ara severa</i>
<u>Blue-and-yellow Macaw</u>	<i>Ara ararauna</i>
<u>Black-hooded Parakeet</u>	<i>Nandayus nenday</i>
<u>Canary-winged Parakeet</u>	<i>Brotogeris chiriri</i>
<u>White-fronted Parrot</u>	<i>Amazona albifrons</i>
<u>Hispaniolan Parrot</u>	<i>Amazona ventralis</i>
<u>Red-crowned Parrot</u>	<i>Amazona viridigenalis</i>
<u>Red-lore Parrot</u>	<i>Amazona autumnalis</i>
<u>Blue-fronted Parrot</u>	<i>Amazona aestiva</i>
<u>Yellow-headed Parrot</u>	<i>Amazona oratrix</i>
<u>Yellow-naped Parrot</u>	<i>Amazona auropalliata</i>
<u>Yellow-crowned Parrot</u>	<i>Amazona ochrocephala</i>
<u>Orange-winged Parrot</u>	<i>Amazona amazonica</i>
<u>Red-whiskered Bulbul</u>	<i>Pycnonotus jocosus</i>
<u>Common Myna</u>	<i>Acridotheres tristis</i>

<u>Crested Myna</u>	<i>Acridotheres cristatellus</i>
<u>Hill Myna</u>	<i>Gracula religiosa</i>
<u>Red-crested Cardinal</u>	<i>Paroaria coronata</i>
<u>Spot-breasted Oriole</u>	<i>Icterus pectoralis</i>
<u>Yellow-fronted Canary</u>	<i>Serinus mozambicus</i>