

Memorandum

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1 July 2002

Dear Reviewer:

The following manuscript is the product of 33 months of work by dozens of individuals who have assisted with Audubon of Florida's IBA Program. This is an external review copy of the manuscript, and represents the final opportunity for widespread review. Due to a recent change in the production schedule, publication of *The Important Bird Areas of Florida: 2000–2002* now is planned for spring 2003. **Note that information in this draft manuscript is subject to change before publication. Please do not cite any information in this manuscript.**

Printed copies of the entire manuscript will be sent to the Florida IBA Executive Committee and a few other individuals. IBA site accounts will be sent to all site nominators. This PDF (Adobe Acrobat) copy of the manuscript has been posted to encourage maximum participation in the review process. (Despite the significant contributions that the IBA Program has received, several important potential contributors undoubtedly have been overlooked. I will be grateful to readers who inform their colleagues about this manuscript).

Please read the introductory material before reviewing the IBA site accounts. Many “blanks” remain in the site accounts (and elsewhere in the text), and questions or comments are included in brackets and underlined. It is anticipated that missing data will be supplied by the site nominators and other reviewers. Several additional tasks remain to be completed by the Executive Committee or me; some of these are listed on the following page. There may be other, later changes made to the manuscript (e.g., the boundaries of some IBAs may be adjusted).

GIS maps included in this manuscript show the boundaries of most of Florida's IBAs (a few wading bird rookery islands are too small to appear). These maps will be improved and updated before publication.

For the most part, IBA site selection has ended and we are not seeking additional nominations. However, *truly significant* sites that are not included here *will* be considered as additional IBAs provided that the nominations are complete, that they conform to the format used in this manuscript, and that they are received in a timely manner (i.e., by 1 August 2002). **Please contact me before formally nominating any new site as a potential IBA.**

The Executive Committee chose to designate as an Important Bird Area any nominated site that supports at least 1% of the state population of any species of conservation priority or concern. *We are aware that several additional sites could be nominated on the basis of using this “1% criterion” for a single species (e.g., IBAs based on 11 Bald Eagle nests or 2 pairs of Wilson's Plovers).* However, at this stage in the Florida IBA Program, we are most concerned with sites that support larger populations of listed species, significant populations of several species, or very large numbers of waterfowl, shorebirds, or Neotropical migrants. (Subsequent site-selection efforts in Florida may need to use a “2%” or “3%” criterion to select the state's IBAs).

The deadline for submission of comments is 15 August 2002 (or 31 August for reviewers of the entire manuscript). Minor comments or corrections may be e-mailed to <bpranty@audubon.org>; please put “IBA review” in the subject line, or FAXed to 813-623-4086. All other comments or corrections must be made on printed copies mailed to me at the above address. **Please do not submit an edited electronic copy of this manuscript.**

All comments, additions, and especially corrections of errors of omission or commission are sought. Significant contributors will be acknowledged as reviewers of the Florida IBA book.

On behalf of Audubon of Florida and the Florida IBA Executive Committee, I thank you for your assistance.

Tasks remaining before production of the final manuscript

1. Design a system to numerically rank Florida's IBAs
2. Determine Global [DONE], Continental, and National IBAs, and mention all these in the accounts
3. Define the number of species in certain groups (e.g., waterfowl, shorebirds, wood-warblers) for which a "significant diversity" of species will be accepted. This probably can most easily be determined by choosing a particular percentage (probably 80–90%) of the species that occur regularly in Florida. For example 80% of the regularly-occurring wood-warblers would be 30 species, while 90% would be 34.
4. Review +(Cox et al. 1994) to ensure that all Strategic Habitat Conservation Areas within IBAs are designated in "Other Resources."
5. For at least some species, review and reference the U.S. Fish and Wildlife Service's South Florida Multi-Species Recovery Plan for distribution, conservation, and other information.
6. Review the FCREPA series to make consistent the English names of all non-avian animals
7. Reference the Florida Forever 5-year plan for information on IBAs that contain CARL–FF projects
8. Table 4 (page 32) begs for some type of analysis/discussion

**PUBLIC AGENCIES OR PRIVATE CONSERVATION ORGANIZATIONS
THAT OWN OR MONITOR LANDS WITHIN FLORIDA’S IBAs**

FEDERAL PROPERTIES

Department of Defense installations: Avon Park Air Force Range, Cape Canaveral Air Station, Eglin Air Force Base, Eglin Air Force Base Test Site, and (part of) Tyndall Air Force Base

National Estuarine Research Reserve: Rookery Bay

National Forests: Apalachicola, Ocala, and Osceola

National Monument: Fort Matanzas

National Seashores: Canaveral, and Gulf Islands

National Parks: Biscayne, Dry Tortugas, and Everglades

National Preserve: Big Cypress

National Wildlife Refuges: Arthur R. Marshall Loxahatchee, Cedar Keys, Chassahowitzka, Crocodile Lake, Florida Panther, Great White Heron, J.N. “Ding” Darling, Key West, Lake Wales Ridge, Lake Woodruff, Lower Suwannee, Merritt Island, National Key Deer, Okefenokee, Passage Key, Pelican Island, Pine Island, Pinellas, St. Johns, St. Marks, St. Vincent, and Ten Thousand Islands

Other: Kingsley Plantation, and Timucuan Ecological and Historic Preserve

STATE PROPERTIES

Fish Management Area: Tenoroc

Military Reservation: Cape Blanding

Northwest Florida Water Management District properties: [none yet]

St. Johns Water Management District Conservation Areas: Blue Cypress, Buck Lake, Canaveral Marshes, Emerald Marsh, Fort Drum Marsh, Lake George, Lochloosa Wildlife, Moses Creek, Seminole Ranch, and Three Forks Marsh

St. Johns Water Management District other properties: Brevard Coastal Scrub Ecosystem, Gum Root Swamp, Lake Apopka Restoration Area, and Ranch Reserve

South Florida Water Management District properties: Corkscrew Regional Ecosystem Watershed, Corkscrew Regional Mitigation Bank, Dupuis Reserve, East Coast Buffer, Frog Pond/L-31 N Transitional Lands, Kissimmee Chain of Lakes, Kissimmee River, Loxahatchee Slough, Model Lands Basin, Pal–Mar, Southern Glades, Stormwater Treatment Areas, Strazzulla Tract, and Upper Lakes Basin Watershed

Southwest Florida Water Management District properties: Annutteliga Hammock, Bright Hour Watershed, Chassahowitzka River and Coastal Swamps, Cypress Creek Flood Detention Area, Flying Eagle Ranch, Green Swamp Wilderness, Gum Slough, Halpata Tastanaki Preserve, Jack Creek, Lake Panasoffkee, Myakka River, Panasoffkee/Outlet Tract, Potts Preserve, Starkey Wilderness Park, and Weekiwachee Preserve

State Forests: Blackwater River, Goethe, Jennings, Lake George, Lake Wales Ridge, Myakka, Picayune Strand, Ross Prairie, Seminole, Tate’s Hell, and Withlacoochee

State Parks: Allen David Broussard Catfish Creek Preserve, Anastasia, Anclote Key Preserve, Bahia Honda, Big Talbot Island, Bill Baggs Cape Florida, Caladesi Island, Collier–Seminole, Curry Hammock, Dr. Julian G. Bruce St. George Island, Edward Ball Wakulla Springs, Fakahatchee Strand Preserve, Faver–Dykes, Fort Clinch, Fort George Island Cultural, Guana River, Highlands Hammock, Honeymoon Island, Hugh Taylor Birch, Ichetucknee Springs, John Pennekamp Coral Reef, John U. Lloyd Beach, Jonathan Dickinson, Key Largo Hammock Botanical, Kissimmee Prairie Preserve, Lake June-In-Winter Scrub, Lake Kissimmee, Lake Louisa, Lignumvitae Key Botanical, Little Talbot Island, Long Key, Lower Wekiva River Preserve, Myakka River, Oscar Scherer, Paynes Prairie Preserve, San Felasco Hammock Preserve, (part of) St. Andrews, T.H. Stone Memorial St. Joseph

Peninsula, Tomoka, Topsail Hill Preserve, Waccasassa Bay Preserve, Wekiwa Springs, and Werner–Boyce Salt Springs

State Recreation and Conservation Area: (parts of) Cross Florida Greenway

State Reserves: Cape St. George, Cedar Key Scrub, Rock Springs Run, and William Beardall Tosohatchee

Suwannee Water Management District properties: [none yet]

Wildlife and Environmental Areas: Florida Keys, Lake Placid, Little Gator Creek, Platt Branch Mitigation Park, and Split Oak Mitigation Park

Wildlife Management Areas: Big Bend, Bull Creek, Chassahowitzka, Everglades and Francis S. Taylor, Fisheating Creek, Fred C. Babcock–Cecil M. Webb, Guana River, Half Moon, Hilochee, Holey Land, J.W. Corbett, Rotenberger, Three Lakes, and Triple N Ranch

COUNTY AND MUNICIPAL

Alachua County: Gum Root Park/Gum Root Conservation Area

Brevard County: Batchelor, Dicerandra Scrub Sanctuary, Enchanted Forest Sanctuary, Jordan Boulevard, Malabar Scrub Sanctuary, Micco Scrub Sanctuary, North Rockledge Sanctuary, South Babcock/Ten Mile Ridge, Tico Scrub Sanctuary, Turkey Creek Sanctuary, and Valkaria Scrub Sanctuary

Duval County: Huguenot Memorial Park

Hillsborough County: E.G. Simmons Park, The Kitchen, and Wolf Branch

Lee County: Stairstep Mitigation Bank

Miami-Dade County: Charles Deering Estate, and Matheson Hammock Park

Orange County: Moss Park

Osceola County: Lake Lizzie Nature Preserve

Palm Beach County: City of West Palm Beach Water Catchment Area, Loxahatchee River Natural Area, Loxahatchee Slough Natural Area, and Pal–Mar Natural Area

Pasco County: Withlacoochee River Park

Pinellas County: Al-Bar Ranch, Cross Bar Ranch Wellfield, and Fort De Soto County Park

Polk County: Babson/Hesperides Tract, Saddle Creek County Park, and Sumica/Lake Walk-in-the-Water Tract

Sarasota County: North Lido Public Beach, Palmer Point County Park, Pinelands Reserve, and T. Mabry Carleton, Jr. Memorial Reserve

Volusia County: Smyrna Dunes Park

PRIVATE CONSERVATION ORGANIZATIONS

Archbold Expeditions, Inc.: Archbold Biological Station

Audubon of Florida: Corkscrew Swamp Sanctuary, Florida Coastal Islands Sanctuaries, Lake Okeechobee Sanctuaries, Sabal Point Sanctuary, and Saddle Creek Sanctuary

Tall Timbers Research Station: Tall Timbers Research Station, and the following Conservation Easements: Allee Property, Chemonie Plantation, Conlin Island, Foshalee Plantation, Horseshoe Plantation, Pickney Hill Plantation, Straw Pond, Sunny Hill Plantation, Swamp Creek Preserve, and Woodfield Springs Plantation

The Nature Conservancy: Avalon Plantation Conservation Easement, Carter Creek, Catfish Creek, Disney Wilderness Preserve, Fillman Bayou Preserve, Holmes Avenue, Jeff Lewis Wilderness Preserve, Mays Pond Plantation Conservation Easement, Saddle Blanket Lakes Preserve, Saddle Bunch Keys, Sun Ray Scrub, Tiger Creek Preserve, Torchwood Hammock Preserve, and Withlacoochee Swamp Conservation Easement

THE IMPORTANT BIRD AREAS OF FLORIDA: 2000–2002

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“Since the 1950s, Florida's population has risen at an annual rate of approximately four percent. In the [past] 50 years, more than eight million acres of forest and wetland habitats (about 24 percent of the state) have been cleared to accommodate the expanding human population. In 1990, about 19 acres per hour of forest, wetland, and agricultural land [were] being converted for urban uses.”

—History of Florida's Conservation Lands +(<<http://p2000.dep.state.fl.us/background.htm>>)

“Take ... 1500 acres of farm or forest, divide it into 300 lots, dig 300 wells, plant one septic tank on each plot, and add a home for three people. You will have accommodated just one days' worth of immigrants to Florida.”

—*Problems, Prospects, and Strategies for Conservation* by Ronald L. Myers and John J. Ewel in *Ecosystems of Florida* +(Myers and Ewel 1990)

“Florida is a unique former-paradise, engulfed in monumental change. The Seminoles knew it as an unbroken mosaic of wetlands, scrubs, seashores, prairies, and steamy forests. Mammoth oaks, palms, cypress, and mahoganys were laced together from the panhandle to the keys by a nearly continuous forest of stately pines. A subtropical peninsula attached to an arctic continent, Florida served for eons as a prolific reservoir of biological diversity. ... Today ... the huge trees are gone. Wetlands are levied or drained, prairie grasses are replaced by domestic forage crops, and almost every inch of seashore can be viewed from an upper-story window. The visual and biological impacts of explosive human immigration dominate the landscape. As of 1990, Florida harbors eight of the ten fastest growing cities in the United States. Growth of Florida's human population seems destined to proceed in permanent fast-forward. Birds will either adjust to the new human landscape or they will continue to perish in our wake.”

—*Foreword* by John W. Fitzpatrick in *Florida Bird Records in American Birds and Audubon Field Notes 1947–1989* +(Loftin et al. 1991)

“It all began with one man and one boat, protecting pelicans on a tiny five-acre island in Florida. From that humble beginning arose the world's largest and most diverse network of lands dedicated to the protection and management of a vast array of wildlife. America's National Wildlife Refuges now [encompass] over 93 million acres on over 500 refuges. In 1903, Pelican Island became the center of an epic battle between conservationists and feather hunters. After years of relentless slaughter, many of our most majestic birds were at the brink of [extirpation]. Pelican Island was the last breeding ground for Brown Pelicans along the entire east coast of Florida and it was here that a stand was made. Urged on by a German immigrant named Paul Kroegel, many prominent people rallied around this small island to spearhead the protection of the last remaining areas vital to the survival of wildlife. Under the leadership of President Theodore Roosevelt, wildlife protection became a national interest, and for the first time, was based on wildlife's intrinsic worth rather than its utilitarian value. With the stroke of a pen, on March 14, 1903, Teddy Roosevelt set in motion a commitment to the preservation of our wildlife heritage, and, in so doing, prevented many species from certain extinction.”

—Introduction to *Pelican Island: Honoring a Legacy* +(USFWS 1999)

“Just as we now blame past generations for the extinction of the Passenger Pigeon, Carolina Parakeet, and Ivory-billed Woodpecker, future Floridians will ultimately hold our generation responsible for the manner in which we conserve the species and natural resources we inherited. Perhaps the greatest insult we could ever bear would be to document the problems that threaten some of Florida's rarest plants and animals, propose solutions to these problems, and then fail to act with proper speed and resolve.”

—*Foreword of Closing the Gaps in Florida's Wildlife Habitat Conservation System* by James Cox, Randy Kautz, Maureen McLaughlin, and Terry Gilbert +(1994)

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ALPHABETICAL LISTING OF ALL IBAs

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Alachua Lakes
Apalachicola and Tates Hell Forests
Avon Park Air Force Range–Bombing Range Ridge
Babcock–Webb Ecosystem
Bay County Beaches
Big Bend Ecosystem
Big Cypress Swamp Watershed
Big Marco Pass Shoal
Biscayne Bay
Blackwater River State Forest
Brevard Scrub Ecosystem
Bright Hour Watershed
Buck Island Ranch
Camp Blanding–Jennings State Forest
Cape Canaveral–Merritt Island
Central Pasco
Chassahowitzka–Weekiwachee
Citrus County Spoil Islands
Clearwater Harbor–St. Joseph Sound
Coastal Pasco
Cockroach Bay–Terra Ceia
Corkscrew Swamp Watershed
Crystal River Tidal Marshes
Disney Wilderness Preserve
Dog Island–Lanark Reef
Dry Tortugas National Park
Duval and Nassau Tidal Marshes
Eglin Air Force Base
Emeralda Marsh
Everglades National Park
Fisheating Creek Watershed
Florida Keys Hammocks
Fort George and Talbot Islands
Goethe State Forest
Great White Heron National Wildlife Refuge
Greater Apalachicola Bay
Green Swamp Ecosystem
Guana River
Gulf Islands GEOpark
Gulf Islands National Seashore & adjacent areas
Highlands Hammock–Charlie Creek
Hillsborough Bay
Huguenot Park–Nassau Sound
Ichetucknee Springs State Park
J.N. “Ding” Darling National Wildlife Refuge
Johns Pass
Kanapaha Prairie
Key West National Wildlife Refuge
Kissimmee Lake and River
Kissimmee Prairie Preserve State Park
Lake Apopka Restoration Area
Lake Disston
Lake Hancock–Upper Peace River
Lake Istokpoga
Lake Lafayette
Lake Mary Jane–Upper Econ Mosaic
Lake Okeechobee
Lake Tohopekaliga and Adjacent Uplands
Lake Wales Ridge
Lake Woodruff National Wildlife Refuge
Little Estero Lagoon
Lower Tampa Bay
Loxahatchee River and Slough
Matanzas Inlet and River
Myakka River Watershed
North Lido Beach–Palmer Point
Northern Atlantic Migrant Stopover
Northern Everglades
Ocala National Forest–Lake George
Orlando Wetlands Park
Oscar Scherer State Park
Osceola Flatwoods and Prairies
Osceola National Forest–Pinhook and Okefenokee Swamps
Paynes Prairie Preserve State Park
Pelican Island National Wildlife Refuge
Pelican Shoal
Pine Island National Wildlife Refuge
Red Hills Ecosystem
Rookery Bay National Estuarine Research Reserve
St. Johns National Wildlife Refuge
St. Joseph Bay
St. Marks National Wildlife Refuge
St. Sebastian River State Buffer Preserve
San Felasco Hammock Preserve State Park
Sanibel Lighthouse Park
Sarasota and Roberts Bays
Southern Atlantic Migrant Stopover
Starkey Wilderness
Ten Thousand Islands National Wildlife Refuge
Turkey Creek Sanctuary
Upper St. Johns River Basin
Volusia County Colony Islands
Wakulla Springs
Walton County Beaches
Wekiva–Ocala Greenway
Wekiwa Basin GEOpark
William Beardall Tosohatchee State Reserve
Withlacoochee–Panasoffkee–Big Scrub
Withlacoochee State Forest

FOREWORD

(to be written by Stuart Strahl)

ACKNOWLEDGMENTS

This book is the product of the efforts of dozens of individuals representing Federal, State, and local government agencies, non-governmental conservation and scientific organizations, and private citizens. *The Important Bird Areas of Florida: 2000–2002* represents a cooperative effort to identify, preserve, and properly manage those sites deemed most critical for maintaining the diversity, abundance, and distribution of the state's native avifauna.

To give the Florida IBA Program strong scientific credibility, an advisory committee composed of some of the state's leading ornithologists and conservation biologists was formed. Five Committee members were from Audubon while the remaining seven were affiliated with other conservation agencies or organizations, and one university. This “Executive Committee” assisted with development of the site selection criteria and was responsible for designation of the Important Bird Areas of Florida. Members of the Committee and their professional affiliations are: Gianfranco Basili (St. Johns River Water Management District, formerly the ornithologist of Florida Audubon Society), Reed Bowman (Archbold Biological Station), Jim Cox (Tall Timbers Research Station), Frances James (Florida State University), Mark Kraus (Audubon of Florida), Katy NeSmith (Florida Natural Areas Inventory), Ann Paul (Audubon of Florida), Rich Paul (Audubon of Florida), Bill Pranty (Coordinator; Audubon of Florida), Stuart Strahl (Audubon of Florida), George Wallace (formerly with the Florida Fish and Wildlife Conservation Commission, now at Rocky Mountain Bird Observatory), and Glen Woolfenden (Archbold Biological Station). The late William B. Robertson, Jr. had also agreed to serve on the Committee, but passed away before its first meeting. I am greatly honored that many of Florida's leading ornithologists considered the IBA Program sufficiently important to have volunteered their time and offered their comments and advice so readily.

An equally vital group of individuals nominated sites for consideration as IBAs. These individuals have my sincere gratitude for the assistance they provided; those marked with an asterisk (*) nominated multiple sites: Beverly Anderson, Allison Baker, *Gian Basili, *Sonny Bass, *Ted Below, Shane Belson, Lianne Bishop, Seth Blicht, Brian Braudis, *Roger Clark, *Sam Cole, Scott Crosby, Mike DelGrosso, Teresa Downey, Terry Doyle, Charles DuToit, Nancy Dwyer, Erik Egensteiner, Susan Epps, *Charlie Ewell, Judy Fisher, Cathy Flegel, Monica Folk, Liz Golden, Paul Gray, Bruce Hagedorn, Jim Higgins, Harry Kelton, Jerry Krummrich, Ed Kwater, Pat Leary, Mike Legare, Manny Lopez, Andrew Mackie, Joy Marburger, *Mike McMillian, Doug McNair, J.B. Miller, Cynthia Meketa, Jane Monaghan, Ann Moore, Vince Morris, Katy NeSmith, *Steve Nesbitt, Terry O'Toole, Richard Owen, Tom Palmer, *Ann Paul, *Rich Paul, Pat Pazara, Charlie Pedersen, Kwami Pennick, Belinda Perry, Gary Popotnik, Peggy Powell, *Bill Pranty, Arnold Rawson, Joe Reinman, Sharon Robbins, Jayde Roof, *Rex Rowan, Sean Rowe, Petra Royston, Charles Sample, Rick Sawicki, Mark Sees, *Celeste Shitama, David Simpson, Ileana and Glenn Sisson, Ed Slaney, *Parks Small, *Gary Sprandel, J.B. Starkey, Jr., *Eric Stolen, Dan Sullivan, Tammy Summers, Dave Sumpter, *Ken Tracey, George Wallace, *Jeff Weber, *Tom Wilmers, and Mike Wilson.

Thanks are given to others who reviewed nominations, provided additional data, or otherwise assisted with site nominations: Jocie Baker, Mary Barnwell, Gary Beecham, Paul Blair, Dick Blewett, Gary Comp, Tylan Dean, Mike Delany, Robin Diaz, Lucy Duncan, Dot Freeman, Wally George, Mark Glisson, Doria Gordon, Ross Hinkle, Ron Houser, Julie Hovis, Dotty and Hank Hull, Teri Jabour, Fred Lohrer, Ken Meyer, John Mitchell, Norman Moss, Mike Renda, Arlyne Salcedo, Hank Smith, Ken Spilios, Hilary Swain, Cindy Thompson, and Rick West. I thank staff at Archbold Biological Station for hosting the initial “pre-meeting” of the Executive Committee, and Todd Engstrom for setting up its formal meeting at Tall Timbers Research Station.

Several biologists provided avian data that were of great use to the Florida IBA Program. For their assistance with providing databases and GIS coverages, I thank Mike Delany (“Florida” Grasshopper Sparrow data), Julia Dodge (wading bird and Bald Eagle nests), Patty Kelly (Snowy and Piping plovers), Paul Kubilis (wading bird nests), Ken Meyer (Swallow-tailed Kites and Short-tailed Hawks), Jim Rodgers (Snail Kites), Gary Sprandel (shorebirds), and George Wallace (Snowy Plovers).

Robert “Chip” Chipley of the American Bird Conservancy provided criteria for ranking Globally significant IBAs. Sally Jue and other staff of the Florida Natural Areas Inventory were extremely helpful in providing current GIS coverages of the state’s conservation lands.

Deep appreciation is given to the foundations and organizations that funded the Florida IBA Program: The Elizabeth Ordway Dunn Foundation; the Batchelor Foundation; Pinellas County Utilities; and the Jim and Jonnie Swann Foundation, as well as several individuals. Furthermore, I greatly appreciate the assistance of Pick Talley, Wayman Bailey, and others at Pinellas County Utilities for funding a Florida Scrub-Jay conservation project that indirectly supported the IBA Program.

The efforts of Gian Basili and Clay Henderson of the former Florida Audubon Society, and Paul Gray, Wayne Hoffman, and Rich Paul of state offices of the National Audubon Society, are appreciated for their initial efforts to begin an IBA program in Florida. To Gian Basili, a big thank you for continued guidance on IBA and other matters. Under the leadership of Stuart Strahl, Audubon of Florida has grown considerably since its formation in 1999. I thank Stuart and several other AOF employees for the assistance they provided: Sandra Bogan, former editor of the *Florida Naturalist*; Mark Kraus, Deputy Director; Irela Bague, Public Affairs Coordinator; Susan Cummins, Editorial Assistant; Don Ebbert, Director of Finance and Administration; Kristy Loria, Senior Accounting and Budgeting Director; Shannon Mayorga, Conservation Associate; Connie Perez, Foundation and Government Relations Manager; Erin Petra, former Executive Assistant; and Lisa Yalkut, Associate Director of Development. At the National Audubon Society, I appreciate the advice and support of Frank Gill, Senior Vice-President; Fred Baumgarten, former National IBA Coordinator; Dan Niven, current National IBA Coordinator; and Jeff Wells, former Coordinator for the New York IBA, who freely offered advice and encouragement whenever called upon. Jim Wilson, IBA Coordinator for Georgia, attended the first Executive Committee meeting, and contributed ideas about IBAs that share our states’ boundaries.

I am extremely grateful to Kurt Rademaker, who performed an invaluable service to Audubon by designing the Florida IBA website, which broadcast the program widely, efficiently, and without cost.

In addition to many of the site nominators, the following individuals improved the “final” draft of the manuscript: Sally Treat, [and probably dozens more over the next two months].

Lastly, I thank my parents, Dom and Peggy Pranty, for a lifetime of support, and Holly Lovell for continued friendship and support. To any individual whose name inadvertently was omitted from this list, please accept my apologies and thanks. Finally, to all who assisted with this program in any of a myriad of ways, I hope that this book meets your expectations for helping to conserve Florida's spectacular avifauna.

Bill Pranty
Tampa, Florida
29 June 2002

INTRODUCTION¹

Florida is blessed with an abundance of natural riches. It boasts the greatest native avian diversity (474 species) of any state east of the Mississippi River, 81 natural communities, 8500 miles (13,600 km) of shoreline, 7800 lakes and ponds, 1700 rivers and creeks, some of the most diverse forests and grasslands in North America, hardwood hammocks of West Indian affinity, tropical coral reef systems unique on the continent, and one of the world's great wetlands. Overall, Florida supports about 3800 native or naturalized plants and 700 native vertebrates, with 8% and 17% of these, respectively, endemic to the state (i.e., they occur nowhere else in the world).

Florida also boasts a succession of the largest and most aggressive public land acquisition programs in the world, which began in 1964. By the end of 2000, State and municipal governments and private conservation organizations had spent over \$3.7 *billion* to protect 4.7 million acres (1.9 million ha) of land. When combined with Federal conservation areas, these lands protect 8.7 million acres (3.4 million ha), or just over one-quarter of the state's non-submerged land area. There currently are over 1200 individual public and private conservation lands in Florida. The State's newest land acquisition program, Florida Forever, was designed to raise \$300 million annually between 2000 and 2009 for the acquisition and management of conservation lands.

Concurrently, and in stark contrast, Florida is the most endangered state in the Union. According to a report issued in 1995 by Defenders of Wildlife, Florida was the only state to earn “extreme” ratings for every category measured (overall risk, ecosystem risk, species risk, development risk, development status, and development trend), and it contained more endangered ecosystems (nine) than any other state. So great is the threat that *every* natural community in southern Florida was combined into the “South Florida Landscape”—considered to be the most endangered ecosystem in the United States.

Florida gains 700–900 residents *every day*, or one million residents every three to four years, making it one of the fastest-growing states in the nation. Florida's population increased from 2.7 million residents in 1950 to 15.9 million in 2000. An appalling amount of habitat—about 165,000 acres (66,000 ha) *annually*—has been destroyed to accommodate the expanding human population. This growth has reduced cutthroatgrass seeps by 99%, Miami pine rocklands by 98%, longleaf pine flatwoods by 97%, unimpounded Brevard County salt marshes by 95%, Lake Wales Ridge scrub by 85%, and Everglades marshland by 65%. If the current rate of growth continues, *virtually every remaining buildable acre of Florida will be developed by 2065*. In less time than an average human lifespan, all of Florida's remaining private forests, scrubs, prairies, wetlands, farms, groves, and pastures will either be developed or preserved.

During the twentieth century, five birds native to Florida (the Passenger Pigeon, Carolina Parakeet, Ivory-billed Woodpecker, Bachman's Warbler, and “Dusky” Seaside Sparrow) were driven to extinction by human activities, and populations of numerous others have been reduced severely. Twenty species or subspecies of birds are listed by the Florida Fish and Wildlife Conservation Commission as Endangered, Threatened, or of Special Concern. In a more thorough inventory, the Florida Committee on Rare and Endangered Plants and Animals listed 72 birds as recently extinct, recently extirpated, endangered, threatened, rare, of special concern, or of status undetermined.

¹ References cited in the Introduction are: +Bowman (2000, 2001), +Chafin (2000), +FGFWFC (1997), +Jue et al. (2001), +FNAI (1990), +McCaffrey (2002), +Myers and Ewel (1990), +Noss and Peters (1995), +Rodgers (1996), and the website of the Atlas of Vascular Plants of Florida (<<http://www.plantatlas.usf.edu>>).

BACKGROUND OF THE IBA PROGRAM

The Important Bird Areas Program is part of a global effort to conserve bird populations by identifying, preserving, and properly managing their habitats. The first IBA program was implemented in Europe in 1985 by ornithologists from an organization known now as Birdlife International. Focusing on wetlands, this initial effort designated 2444 sites in 32 European countries +(Grimmett and Jones 1989). Next to be published was *Important Bird Areas in the Middle East* +(Evans 1994), which identified 391 sites in 14 Middle Eastern countries. Following these inventories, the IBA Program was brought to the New World by the American Bird Conservancy and the National Audubon Society. Audubon-based programs in New York and Pennsylvania completed their initial inventories in 1998, identifying 127 and 73 IBAs, respectively +(Wells 1998, Crossley [1998]). Subsequent statewide efforts identified 52 IBAs in Idaho +(Ritter 2000), 46 in Colorado +(Cafaro 2000), 53 in Washington +(Cullinan 2001), and 208 in California +(Cooper 2001). Currently, over 100 countries and 39 states have IBA programs underway.

In 1997 and 1998, Audubon ornithologists attempted an IBA program in Florida, but sufficient funding was not available at the time. Florida's IBA Program began formally in March 1999, when members of the fledgling Advisory Committee (later renamed the Executive Committee) met for the first time at Archbold Biological Station. The following month, an IBA workshop was presented to members of the Florida Ornithological Society. In October 1999, the Program Coordinator was hired, based out of Audubon's sanctuary office in Tampa. The following month, the Florida Audubon Society and the state offices of the National Audubon Society merged to form Audubon of Florida. A twelve-member Executive Committee finalized the site-selection criteria in January 2000.

As modified for the Florida program, **an Important Bird Area is a site that is documented to support significant populations of one or more species of native birds, or a significant diversity of species.** It is important to point out that **the IBA Program carries no regulatory powers; therefore, IBA designation places no restrictions on a site.** On the other hand, IBA designation often implies good site management, and frequently results in publicity beneficial to land owners. The Florida Program excluded as IBAs those sites that have been heavily disturbed (e.g., phosphate mines or agricultural lands), even though these sites may support large numbers of birds during one or more seasons. On the other hand, a few artificial dredged-material (i.e., “spoil”) islands that support significant wading bird or larid colonies were accepted as IBAs. Also designated as IBAs were former agricultural lands now in public ownership and being restored to wetlands (e.g., at Emerald Marsh, Lake Apopka, and the Northern Everglades).

The primary goal of Florida's IBA Program is to help ensure the persistence of the state's native avifauna, which is under extreme pressure from habitat destruction, human disturbance, fire exclusion, and other factors. About 25% of the state's land area has been developed, mostly since 1950 (Florida Department of Environmental Protection website; +<http://p2000.dep.state.fl.us/backgrnd.htm>>), while another quarter is composed of conservation lands held in public ownership or under perpetual conservation easements +(Jue et al. 2001). The remaining half of the state is—or eventually will be—up for sale to the highest bidder, with conservationists competing with developers to determine the final fate of Florida's privately owned lands and waters. Consider the following fact: in Brevard County, it took *ten years* for the County's Environmentally Endangered Lands Program to purchase and protect 13,000 acres (5200 ha) of land. During a *five-month* period from late 1999 to early 2000, an equal amount of land elsewhere in the county was permitted for development (R. Hinkle pers. comm., April 2000). Continuing habitat destruction on such a massive scale will continue to exert intense pressure on Florida's bird communities, and it is essential that the IBA Program plays an integral role in conserving bird populations and habitats throughout the state. This role includes protecting the habitats of rare species, as well as “keeping common birds common.”

It also seems important to point out that **this book is not meant to encourage widespread visitation to IBAs**—specific directions to the sites are not included. As the data contained within this book clearly demonstrate, increased human use of most of Florida's coastal IBAs will further endanger some of the state's most critically imperiled species. Rather, **the primary intent of this book is to**

present to a wide audience an “avian resource inventory” of Florida's IBAs, identifying *which* sites were selected, *why* they are important, *how* the public can assist to preserve bird populations, and—in many cases—*where* human and resource management can be improved to benefit native birds and their habitats. Perhaps this resource-based concept will be adopted to map areas critical to other groups of Florida's flora and fauna (e.g., “Important Sea Turtle Areas,” “Important Butterfly Areas,” or perhaps “Important Orchid Areas”).

This edition of *The Important Bird Areas of Florida: 2000–2002* presents the initial 99 sites selected as IBAs in the state. Site nomination began in February 2000 and initially was planned to end in December 2000, but nominations were accepted through June 2002 to allow many more of the state's potential IBAs to be nominated formally. Nonetheless, **potential IBAs unrecognized in this book undoubtedly exist in Florida**, and ornithologists, birders, land managers, foresters, Audubon members, and others should keep these sites in mind when the revision of this book is planned (probably around 2005). With the massive amount of habitat destruction occurring in Florida, as well as the various land acquisition programs that constantly are bringing significant natural areas into public ownership or under perpetual conservation easement, IBA site selection and review in Florida should occur frequently.

IBAs and private property

The IBA Coordinator could not be expected to identify thousands of private properties that deserve to be preserved; to contact the land owners to determine their interest in preservation; and finally to receive their consent to include the properties within designated Important Bird Areas. Rather, the Florida IBA Program has relied on government agencies and conservation organizations to identify these properties, primarily through the State's “Conservation and Recreation Lands,” “Florida Forever,” and “Save Our Rivers” land acquisition programs. However, the inclusion of non-public lands in the IBA Program is vital, since nearly half of the state remains in private ownership, and IBA designation of some private properties may result in public acquisition or improved management. Florida's IBA Program required land owner approval for all properties specifically mentioned by name in this book, but obviously not for all properties mapped—some state acquisition projects included within IBAs contain literally thousands of landowners. Private lands targeted for preservation have been added to Florida's IBAs when they were adjacent or close to existing conservation lands—many IBAs consist of a core public ownership surrounded by private properties sought for public acquisition or perpetual conservation easement (e.g., the Myakka River Watershed or Florida Keys Ecosystem IBAs). However, in a few instances when significant supporting avian data have been provided, the IBA program has recommended the preservation of private lands that have not been identified by others (e.g., the Alachua Lakes, and Osceola Flatwoods and Prairies IBAs). On the other hand, we suppressed the inclusion of a highly significant ranch from the Lake Wales Ridge IBA on the recommendation of a member of the State's Acquisition and Restoration Council, who feared that the IBA Program might somehow interfere with on-going attempts by others to publicly acquire the property.

It is hoped that the recommendations made herein will be embraced by the agencies responsible for acquiring private lands, for managing public lands, and for enforcing laws designed to protect the state's floral and faunal resources. Contact information for the primary conservation agencies and organizations in Florida is found on pages 27–28.

The “Important Birding Areas” Program

There was some confusion about the purposes and goals of the IBA Program. Some individuals referred to the IBA Program as the “Important Birding Areas” Program, and thought that its purpose was to denote worthwhile birding sites. These individuals nominated as IBAs sites that typically were small city or county parks that provided opportunities for birding or environmental education, but did not support significant populations of any species. The majority of these sites were not accepted as IBAs, although a few sites were designated if they were deemed important to *populations* of birds, rather than to a few

individuals, or that contained a diversity of Neotropical migrants that seemed significant. For information on birding sites in Florida, see *A Birder's Guide to Florida* (Pranty 1996a), or visit the website for the Great Florida Birding Trail: <<http://www.floridabirdingtrail.com>>.

METHODS

Site Selection

The Florida IBA Coordinator, assisted by the Executive Committee and other biologists, prepared the criteria for site selection. These criteria followed those used by IBA programs around the world, but were modified specifically for circumstances in Florida. Because many bird populations in the state are surveyed periodically (e.g., Bald Eagle nests and many larid colonies annually, Piping Plovers every five years, and wading bird rookeries every 10 years), the Florida IBA Program developed stringent site-selection criteria emphasizing specific, recent avian data significant at the statewide level. Four primary categories were used to select Florida's IBAs, and all designated areas met the criteria of at least one of these. A fifth—and secondary—category, for long-term avian research, could be used only in conjunction with one or more of the primary categories. Florida's site selection criteria are listed below; bird names in quotation marks denote subspecies.

CATEGORY 1: Sites that support significant populations of Endangered or Threatened birds.

This category contains all birds on the “official” list of Endangered or Threatened species or subspecies, maintained by the Florida Fish and Wildlife Conservation Commission (FFWCC; +FGFWFC 1997). We make one exception to this list: the Red-cockaded Woodpecker is listed as Federally Endangered but only State Threatened (and is currently proposed for down-listing to Special Concern); for IBA purposes, the Red-cockaded Woodpecker was considered Endangered. A “significant” population was defined as meeting or exceeding 1% of the total statewide population (Table 1) of any listed species. Nominated sites that met this criterion for any Category 1 birds were designated as IBAs.

1a: FFWCC Endangered species or subspecies

Wood Stork, Snail Kite, Peregrine Falcon, Red-cockaded Woodpecker, “Florida” Grasshopper Sparrow, and “Cape Sable” Seaside Sparrow.

1b: FFWCC Threatened species or subspecies

Bald Eagle, Crested Caracara, “Southeastern” American Kestrel, “Florida” Sandhill Crane, Snowy Plover, Piping Plover, Roseate Tern, Least Tern, White-crowned Pigeon, and Florida Scrub-Jay.

CATEGORY 2: Sites that support significant populations of other birds of conservation priority.

This category contains all birds considered by the FFWCC to be of “Special Concern,” as well as birds on the lists of the Florida Committee on Rare and Endangered Plants and Animals (FCREPA; +Rodgers et al. 1996), the Partners In Flight Watch List and/or Audubon WatchList, as well as three other birds of concern chosen by the Florida IBA Executive Committee because they do not appear on any other list. FCREPA species listed in Category 2 are only those not listed by the FFWCC in Category 1. For Watch List species, the Executive Committee chose to concentrate on those with significant breeding or wintering populations in Florida; those species occurring largely as migrants can occur in a wide variety of habitats, and are much more difficult to prioritize on a site-by-site basis. The definition of a significant population is the same as for Category 1 species or subspecies, but statewide counts or estimates (Table 1) are not available for many of the birds in Category 2.

2a: FFWCC Species of Special Concern

Brown Pelican, Little Blue Heron, Snowy Egret, Tricolored Heron, Reddish Egret, White Ibis, Roseate Spoonbill, Limpkin, American Oystercatcher, Black Skimmer, Burrowing Owl, Marsh Wren (breeding populations only), and Seaside Sparrow (excluding the “Cape Sable” Seaside Sparrow, which is Endangered).

2b: FCREPA birds (Endangered, Threatened, Rare, Species of Special Concern, and Status Undetermined). Two species (Antillean Nighthawk and Cave Swallow) were not included in the IBA Program because they breed solely in disturbed areas or on artificial structures.

Magnificent Frigatebird, Least Bittern, “Great White” Heron, Great Egret, Black-crowned Night-Heron, Yellow-crowned Night-Heron, Glossy Ibis, Osprey, Swallow-tailed Kite, White-tailed Kite, Cooper’s Hawk, Short-tailed Hawk, Merlin, Black Rail, Wilson’s Plover, American Avocet, Gull-billed Tern, Caspian Tern, Royal Tern, Sandwich Tern, Sooty Tern, Brown Noddy, Mangrove Cuckoo, Hairy Woodpecker, Black-whiskered Vireo, White-breasted Nuthatch, “Cuban” Yellow Warbler, “Florida” Prairie Warbler, and Painted Bunting.

2c: Species on the Partners In Flight Watch List and/or the Audubon WatchList (only those for which data were submitted are included here).

Mottled Duck, Yellow Rail, Willet, Red Knot, Stilt Sandpiper, Gray Kingbird, Brown-headed Nuthatch, Loggerhead Shrike, Bachman's Sparrow, and Henslow's Sparrow.

2d: IBA species of concern

Magnificent Frigatebird, “Greater” Sandhill Crane, and Laughing Gull (breeding populations only)

CATEGORY 3: Sites that support significant numbers of birds, or a significant diversity of species.

This broad category is broken down into seven sub-categories, five for supporting specific groups of birds, another for other species or groups, and one for diversity. The Florida IBA Program requested that all avian data submitted were gathered recently (i.e., preferably in the past 10 years), and that population counts or estimates be based on daily totals. In cases where several consecutive years of data were available for a site, oftentimes only those for the past 3–5 years were used and only the means and ranges are given.

3a: Aquatic birds. Sites that support 10,000 aquatic birds, primarily in winter. This group includes loons, grebes, cormorants, waterfowl, rails, Purple Gallinules, Common Moorhens, and American Coots. *This criterion was seldom used (Table 6, pages 38–41) suggesting that the Florida threshold was set too high.*

3b: Wading birds. Sites that support 1000 breeding pairs, or 500 birds at foraging or roosting sites. We arrived at the former figure after the results of the 1999 FFWCC statewide wading bird survey were made available to us; the 29 largest rookeries in the state each contained 1000 or more breeding pairs of wading birds. *Data for Cattle Egrets were not used by the IBA Program because Cattle Egrets are not dependent on wetlands as are all other wading birds. The exclusion of Cattle Egrets follows the methodology used by most wading bird biologists.*

3c: Raptors. Sites that support 300 raptors, primarily during fall migration. This group excludes vultures due to recent taxonomic reclassification +(AOU 1998). *This criterion was used primarily for stopover sites (i.e., roosting or foraging areas) and other natural areas, rather than any site from which large numbers of migrating raptors could be observed.*

3d: Shorebirds. Sites that support 1000 shorebirds during migration or in winter. (*For breeding species, Categories 1b, 2a, 2b, or 3f were used*).

3e: Larids. Sites that support 250 nesting pairs of larids, or 1000 terns or skimmers during migration or in winter. *Concentrations of non-breeding gulls were not included in the Florida IBA Program.*

3f: Others. Sites that support any species or subspecies not listed in Categories 1 or 2, or any group not listed above (e.g., wintering flocks of sparrows, or migrating flocks of Bobolinks). Because no thresholds could be established for these species, nominated sites had to be clearly more important than surrounding areas, and had to support large numbers of individuals for any species or group claimed.

3g: Diversity. Sites that support an exceptional diversity of birds, whether in overall species or within a particular group (e.g., wading birds, shorebirds, or wood-warblers). Again, because no thresholds could be established for diversity [we may yet determine diversity thresholds], nominated sites had to be clearly more important than surrounding areas.

CATEGORY 4: Sites that support species characteristic of natural habitats.

Originally, this category was to be used only for IBAs that were exceptional in size and/or quality, or represented the best regional example of a natural community. But because nearly all natural habitats in Florida are severely threatened by human use, it was later decided that this category should apply to any IBA that contained large (and presumably significant) amounts of natural habitats. We required that the site be documented to contain significant populations of native birds—sites nominated solely on the basis of habitat, or the “presumed” presence of significant bird populations, were not accepted as IBAs. A few of these non-accepted sites seem worthy of future IBA designation if sufficient avian data can be gathered; see Appendix 1 (pages 262–263).

CATEGORY 5: Sites that support, or have supported, long-term avian research.

“Long-term” research was defined as being 10 or more years in duration, and ideally has resulted in the publication of one or more peer-reviewed papers. *This was a secondary category, and no site could be nominated solely on the basis of long-term avian research.*

Table 1. Significant population counts or estimates of Category 1 or Category 2 species or subspecies.

The following table includes all birds that are listed by the Florida Fish and Wildlife Conservation Commission (FFWCC) as Endangered (E), Threatened (T), or Species of Special Concern (SSC). It also includes all birds ranked by the Florida Committee on Rare and Endangered Plants and Animals (FCREPA), species on the Partners In Flight Watch List or Audubon WatchList (WL; only those for which data were provided are included), and three other birds (Magnificent Frigatebird, “Greater” Sandhill Crane, and Laughing Gull) included by the Florida IBA Executive Committee for conservation reasons (IBA). **State-listed (i.e., FFWCC) species are bold-faced.**

The numbers in Table 1 are taken mostly from the FCREPA bird volume +(Rodgers et al. 1996), but more recent population figures have been used when available, such as for Brown Pelicans (2000–2001; +Nesbitt 2001a), Bald Eagles (1998–2000), American Oystercatchers (2001), Snowy and Piping plovers (2001), Red-cockaded Woodpeckers (mostly 1999; +USFWS 2000), and “Florida” Grasshopper Sparrows +(1999; Delany et al. 1999). For larids, we used the highest single count during 1998–2001 from IBA data and +(Gore and Sprandel 2000). Note that some of the counts or estimates below refer to the number of *individuals*, while others refer to *pairs*. *Pairs* are understood to denote breeding birds. For many species that breed in Florida, only breeding season data were used—numbers of shorebirds and larids in Florida greatly increase during migration and winter. “Significant” populations could not be determined for birds that lack statewide population counts or estimates (marked with a “?”). In these cases, nominators were asked to supply as much information about a site as was available, and only those counts that seemed to be significant were used.

N.B. As an aside, these data are intriguing in terms of the status of species or subspecies listed by the FFWCC with regard to statewide population size. For example, Wood Storks are considered Endangered, even though their population numbers 5500 breeding pairs. On the other hand, Snowy Plovers, which probably number fewer than 150 pairs, are listed as (only) Threatened, and Short-tailed Hawks, which number perhaps only 500 individuals and virtually are restricted in the U.S. to Florida, are not listed at all. It seems clear that revision of the listed status of several species needs to be re-examined based upon current statewide counts or estimates. Petitioning the FFWCC to change the status of several birds in Florida seems to be a worthwhile project for conservation committees of Audubon of Florida, the Florida Ornithological Society, and perhaps other organizations.

RANKING	SPECIES	STATEWIDE POPULATION (SURVEY PERIOD)	SIGNIFICANT (i.e., ≥1%) TOTALS
SSC	Brown Pelican	8650 pairs (1999)	87 pairs
IBA	Magnificent Frigatebird	70 pairs (1993) or 5000 individuals	1 pair or 50 individuals
FCREPA	Least Bittern.....?	?	?
FCREPA	“Great White” Heron	850 pairs	9 pairs
FCREPA	Great Egret.....	39,000 individuals (1980s)	150 pairs
SSC	Snowy Egret?	?	?
SSC	Little Blue Heron	17,000 individuals (1980s)	60 pairs
SSC	Tricolored Heron	?	?
SSC	Reddish Egret	375 pairs (1990)	4 pairs
FCREPA	Black-crowned Night-Heron.....?	?	?
FCREPA	Yellow-crowned Night-Heron	?	?
SSC	White Ibis	17,100 pairs (1988)	171 pairs
FCREPA	Glossy Ibis	3500 individuals (1970s)	15 pairs
SSC	Roseate Spoonbill	1000 pairs (1992)	10 pairs
E	Wood Stork	5523 pairs (1995)	55 pairs
WL	Mottled Duck	?	?
FCREPA	Osprey.....	1600 pairs (1983)	16 pairs
FCREPA	Swallow-tailed Kite	610 pairs (1990)	7 pairs

RANKING	SPECIES	STATEWIDE POPULATION (SURVEY PERIOD)	SIGNIFICANT (i.e., ≥1%) TOTALS
FCREPA	White-tailed Kite.....	? (perhaps 25–50 pairs)	1 pair
E	Snail Kite	996 individuals (1994)	4 pairs or 10 individuals
T	Bald Eagle	1043 pairs (1999)	11 pairs
FCREPA	Cooper’s Hawk	?	?
FCREPA	Short-tailed Hawk	500 individuals (1980s)	2 pairs or 5 individuals
T	Crested Caracara	450 individuals (1991)	2 pairs
T	“Southeastern” American Kestrel	?	?
FCREPA	Merlin.....	?	?
E	Peregrine Falcon	2000 individuals (1990s)	20 individuals
WL	Yellow Rail.....	?	?
FCREPA	Black Rail	?	?
SSC	Limpkin	?	?
T	“Florida” Sandhill Crane	4000 individuals (1970s)	15 pairs
IBA	“Greater” Sandhill Crane	25,000 individuals (1989)	250 individuals
T	Snowy Plover	311 individuals (2001)	2 pairs
FCREPA	Wilson’s Plover.....	>300 individuals (1980s)	2 pairs
T	Piping Plover	~450 individuals (2001)	5 individuals
SSC	American Oystercatcher	391 pairs (2001)	4 pairs
FCREPA	American Avocet	?	?
WL	Willet	?	?
WL	Red Knot.....	?	?
WL	Stilt Sandpiper.....	?	?
IBA	Laughing Gull	23,336 pairs (1999)	234 pairs
FCREPA	Gull-billed Tern	55 pairs (1998–2000)	1 pair
FCREPA	Caspian Tern	323 pairs (1998–2000)	4 pairs
FCREPA	Royal Tern	5352 pairs (2000)	54 pairs
FCREPA	Sandwich Tern	531 pairs (2000)	6 pairs
T	Roseate Tern	324 pairs (1998–2000)	4 pairs
T	Least Tern	10,000 individuals (1990s)	40 pairs
FCREPA	Sooty Tern.....	80,000 individuals (1970s)	300 pairs
SSC	Brown Noddy	2750 pairs (1990s)	28 pairs
SSC	Black Skimmer	1404 pairs (2000)	14 pairs
T	White-crowned Pigeon	8500 pairs (1990s)	85 pairs
FCREPA	Mangrove Cuckoo.....	?	?
SSC	Burrowing Owl	3000–10,000 pairs (1987)	65 pairs
FCREPA	Hairy Woodpecker	?	?
E	Red-cockaded Woodpecker	>1226 clusters (1999)	13 clusters
WL	Gray Kingbird	?	?
WL	Loggerhead Shrike	?	?
FCREPA	Black-whiskered Vireo	?	?
T	Florida Scrub-Jay	3640 groups (1993)	37 groups
FCREPA	White-breasted Nuthatch.....	?	?
WL	Brown-headed Nuthatch	?	?
SSC	Marsh Wren	4000 pairs (1990s)	40 pairs
FCREPA	“Cuban” Yellow Warbler.....	3000 individuals (1990s)	12 pairs
FCREPA	“Florida” Prairie Warbler.....	?	?
WL	Bachman’s Sparrow	?	?
E	“Florida” Grasshopper Sparrow	<1000 individuals (1998)	4 pairs or 10 individuals
WL	Henslow's Sparrow.....	?	?
E	“Cape Sable” Seaside Sparrow	2800 individuals (1995)	28 individuals
SSC	(other) Seaside Sparrows	5750–11,000 pairs (1987)	85 pairs
FCREPA	Painted Bunting.....	?	?

Avian Data

A vast amount of information about Florida's avifauna is available—Stevenson and Anderson (1994) compiled a bibliography of about 10,000 publications through the late 1980s. The Florida IBA Program required that recent avian data significant at the statewide level be provided for every site formally nominated as an IBA, and requested that a current bird list—even if rudimentary—be included. Most data provided to the IBA Program came from one of three sources: 1) unpublished observations provided by the site nominator; 2) observations published in either *Florida Field Naturalist* or *American Birds–Field Notes–North American Birds*; and 3) “gray literature” such as unpublished technical reports available from the Florida Fish and Wildlife Conservation Commission or U.S. Fish and Wildlife Service. The wealth of avian data available for Florida ensures that other publications relevant to the state's IBAs exist, and Audubon requests notice of these publications for possible inclusion in future editions of this book.

After the close of the site nomination period, the IBA Coordinator perused all issues of *Florida Field Naturalist*, the journal of the Florida Ornithological Society, for articles and notes pertaining to sites designated as IBAs. Pranty also searched a text file containing all “Field Observations” published in *Florida Field Naturalist* since summer 1992 to add significant observations to the avian data tables, and to increase the bird lists of several sites.

Although the bird lists for each IBA are not included in this book (for reasons of space), they are available online at [+<http://www.audubon.org/bird/iba/florida>](http://www.audubon.org/bird/iba/florida). Not every site included a bird list, especially those IBAs consisting of small islands used primarily as wading bird rookeries, or recent state acquisitions, in which little ornithological work has been accomplished. Nonetheless, the bird lists generated for most sites (61 of 99 IBAs; 61%) proved informative, and helped the Executive Committee to rank sites. Additionally, the number of species observed in each IBA is presented in the avian data tables associated with each site.

The following procedures were used in compiling bird lists for the IBA Program:

- 1) Native and exotic species are listed separately.
- 2) Only those native species on the “Official state list of the birds of Florida” (Bowman 2000, 2001) are included. One exception, concerning the Couch's/Tropical Kingbird complex, was allowed due to the extreme similarity of these two species. The Tropical Kingbird is on the official Florida list but the Couch's Kingbird is not (Bowman 2000, 2001). For IBA lists, all reports of Couch's Kingbird have been changed to Couch's/Tropical Kingbird. Native species reported to occur within IBAs, but not on the official Florida list (e.g., Prairie Falcon, Common Poorwill, Cuban Emerald, Olive-capped Warbler, Bahama Yellowthroat, and Common Redpoll) were purged from IBA bird lists.
- 3) Perusal of the bird lists compiled for Florida's IBAs reveals several doubtful reports. While extensive review of these lists is beyond the scope of the IBA Program, some changes were made to improve the accuracy of the data: all Scarlet Ibises are considered to represent exotics (i.e., escapees); all White-winged Doves were considered native; reports of Ringed Turtle-Doves were changed to Eurasian Collared-Doves due to almost certain misidentifications; and all “Northern Orioles” were presumed to represent Baltimore Orioles, even though Bullock's Orioles also occur in the state. Although breeding populations of Canada Geese and Mallards clearly represent exotic (“feral”) populations, all individuals of these two species were considered native because “wild” populations winter in the state, and checklists often did not distinguish between feral vs. wild individuals.
- 4) Considering that bird checklists are available for many public areas, especially Federal properties and state parks, there are perhaps 100 or more site-specific individual checklists published in Florida (in addition to county lists). These lists are compiled in a bewildering number of different formats, they often contain taxonomy out-dated by one or more decades, and *some lists are presented in alphabetical order by English name!* It seems time that Audubon and the Florida Ornithological Society make some attempt to ensure that all bird lists published in the state are based on current nomenclature and taxonomy (*see* Bowman 2000, 2001 for the currently accepted Florida bird list),

and include standardized definitions of abundance and occurrence. Birds not on the official Florida list should be listed in a separate “hypothetical” section.

Data Presentation

Following the introductory material, most of this book is composed of the individual accounts for each of Florida's 99 IBAs. The format of the accounts is straightforward, and generally follows that of the original three-page nomination form. The following information is provided for each site:

- The name of the IBA. For IBAs composed of a single land ownership, this name usually follows the name of the site (e.g., Eglin Air Force Base, Paynes Prairie Preserve State Park), but the names of some public ownerships have been shortened for IBA purposes. (Several state properties have exceedingly long names, e.g., Dr. Julian G. Bruce St. George Island State Park, Fred C. Babcock–Cecil M. Webb Wildlife Management Area, Split Oak Forest Mitigation Park Wildlife and Environmental Area, and T.H. Stone Memorial St. Joseph Peninsula State Park). Other IBAs are named to best describe the area included within the IBA (e.g., Lower Tampa Bay, Nassau and Duval Tidal Marshes, Northern Everglades). For IBAs composed of multiple ownerships, each public and consenting private site is listed separately on the next line (e.g., the Lower Tampa Bay IBA is composed of Egmont Key National Wildlife Refuge, Fort De Soto County Park, Passage Key National Wildlife Refuge, Pinellas National Wildlife Refuge, and Shell Key Preserve). Some of these multiple-site IBAs were nominated separately but later were combined by the Executive Committee, while others were nominated as a single unit.
- The county or counties in which the IBA occurs
- The size of the IBA, listed in acres and hectares (abbreviated ha). For IBAs that contain private lands sought for public acquisition, the total acreage (or “hectarage”) is given first, followed by the number of acres (hectares) publicly acquired or protected under perpetual conservation easements.
- A general location, usually just a few lines of text, giving county designations and often describing boundaries based on public roadways or waterways. Adjacent or nearby (i.e., within 10 miles [16 km]) IBAs also are included in this section.
- A basic description of the site, often including the number of recreationists and hunters (if applicable) that the site receives annually. Elevation is not given for Florida's IBAs, since the state has so little elevational relief. The highest point in Florida, in Walton County in the western Panhandle, is 345 feet (106 m) above sea level, while Sugarloaf Mountain in Lake County, at 316 feet (95 m) above sea level, is the highest point in the Peninsula. Also not presented in this book are Latitude/Longitude coordinates of the approximate centers of Florida's IBAs. While these coordinates are useful for small islands only a few acres (hectares) in size, they are meaningless for large sites such as Everglades National Park, which encompasses over 1.5 million acres (600,000 ha). Furthermore, the precise boundaries of Florida's IBAs are mapped in this book, unlike IBAs for other countries and states, which use a “same-sized dot” format on their maps. Lastly, Florida's IBA Program is GIS-based (Projection: UTM; Datum: NAD83; Units: Meters), and the UTM coordinates of any site in the state can instantly be determined with GIS software such as ArcView®, given the proper coverages. Digital Ortho Quarter-Quads (DOQQs) are extremely detailed (one-meter resolution) infrared aerial photographs that can be imported directly into GIS coverages with the above file specifications. About half of the state's DOQQs (1999 vintage) may be downloaded free of charge from the Florida Department of Environmental Protection's Bureau of Survey and Mapping's website: (<<http://labins.org/doqq/1999sid.htm>>), an incredible resource.
- The public agency or agencies that own and/or manage the site. Non-public lands located within IBAs are designated simply as “private” properties unless the landowners consented to having their properties mentioned specifically by name or ownership.

- Habitats within the IBA; those marked with an asterisk (*) are primary habitats. See pages 21–27 for specific information on Florida habitats. For some IBAs consisting of two or more sites, information on habitats, land use, IBA categories, other resources, threats, and conservation issues is listed separately, while these data are combined for other IBAs.
- Land usage of the IBA; those marked with an asterisk (*) are primary uses.
- IBA categories for which significant data were provided; see pages 13–15.
- A usually brief summary of the avian species or groups supported, followed by one or more tables composed of specific data. These data typically consist of specific dates and numbers of individuals seen, the percentage of the known or estimated statewide population (*see* Table 1), and the status of each species onsite, whether permanent resident (R), breeding resident (B), winter resident (W), migrant (M), or non-breeding foraging or roosting flocks (N)—note that “N” does *not* refer to “*nesting*.” The tables usually include only avian data significant at the statewide level, although lesser data occasionally were included for some sites. Below the table are listed the sources from which the data were obtained.
- Other natural, cultural, or historical resources occurring within the IBA, if any.
- Threats to the site; those marked with an asterisk (*) are severe threats: See pages 38–42 for more information. *N.B. The site nomination form also included “potential” threats, but this book lists only existing threats.*
- Conservation issues impacting the IBA, along with existing or proposed solutions. Other information of conservation concern or interest may also be provided.
- The name(s) and affiliation(s) of the site nominator(s).
- References for all publications or “gray literature” used for avian data and other information.
- Website(s), if available. For the most part, these are limited to “official” (e.g., governments or “friends” groups) websites in order to minimize the likelihood of repeating misinformation potentially found elsewhere on the Internet. Furthermore, only those websites that provide additional useful information are provided.

Other conventions used are the following:

- In the data tables, months are written out as only their first three letters.
- Metric measurements are placed in parentheses following all American measurements.
- First-time listing of all plants and non-avian animals include both the English and Latin names; subsequent listings are solely of the English names. The English and Latin names of all flora and non-avian fauna mentioned in this book appear in Appendix 2 (pages 264–265); Latin names of birds are not included in the text. The English names of birds are capitalized (e.g., Great Egret, Florida Scrub-Jay), whereas those of all other species are not (e.g., longleaf pine, gopher tortoise). Subspecies are listed in quotation marks (e.g., “Florida” Grasshopper Sparrow, “Southeastern” beach mouse). Two subspecies of mammals are listed here without quotation marks, following the treatment in +(Humphrey (1992): the ♦Florida manatee (*Trichechus manatus latirostris*) is an endemic subspecies of the West Indian manatee, while the ♦Florida panther (*Felis concolor coryi*) is an endemic subspecies of the mountain lion (or cougar). For species represented in the state by only one subspecies (e.g., black bear), no subspecific name is given. The nomenclature for all plants was taken from the Institute of Systematic Botany’s website, Atlas of Florida Vascular Plants (<<http://www.plantatlas.usf.edu>>). [What do we use for animals?]
- Abbreviations have been used sparingly in the text, and only the following are used: BBS (Breeding Bird Survey), CARL (Conservation and Recreation Lands acquisition program, 1990–1999), CBC (Christmas Bird Count), FCREPA (Florida Committee on Rare and Endangered Plants and Animals), FF (Florida Forever land acquisition program, 2000–2009), FFWCC (Florida Fish and Wildlife Conservation Commission), GIS (Geographic Information System), IBA (Important Bird Area), SOR

(Save Our Rivers land acquisition programs of Florida’s water management districts), YBP (Years Before Present).

- Two symbols are used for convenience in this manuscript: a plus (+) is used to denote and easily find all references, while a diamond (◆) is used to denote the initial listing of the English names of all plants and animals.

Map Production

The maps in this book were produced with ArcView® GIS 3.1 software +(ESRI 1999) using public domain coverages, as well as coverages created by the IBA Coordinator. Draft maps, which were available on the Florida IBA website beginning in early 2000, used a public-lands coverage a few years old and therefore somewhat outdated. In mid-2002, the Florida Natural Areas Inventory provided an up-to-date public-lands coverage, from which the maps in this book were produced. These maps illustrate every IBA, along with several other land and water features.

HABITATS

Florida is an immensely diverse state, ranging from the Red Hills of Tallahassee to the tropical hammocks of the Florida Keys. The Florida Natural Areas Inventory +(FNAI 1990) identified 81 natural communities in the state, with 13 of these endemic. Detailed information on many of Florida's habitat communities is described below, inasmuch as habitat is one of the primary factors that determine the distribution and abundance of the state's avifauna. Information on Florida's habitats was taken extensively from the chapters in +Myers and Ewel (1990), a superb resource, while bird data were taken from +Pranty (1996a).

Pine Flatwoods were the most extensive upland habitat in Florida prior to human settlement. Today, they are perhaps the most threatened. Flatwoods are characterized by flat or gently rolling, relatively poorly drained soils composed of typically open-canopy ◆longleaf pine (*Pinus palustris*), ◆slash pine (*P. elliotii*), or ◆pond pine (*P. serotina*) forests with a low understory of ◆saw palmetto (*Serenoa repens*), ◆threeawns (i.e., wiregrass; *Aristida* spp.), ◆gallberry (*Ilex glabra*), and others shrubs, forbs, and grasses. Longleaf pine predominated in the Panhandle and northern half of the Peninsula, with slash pine flatwoods most common in southern Florida. Low-intensity lightning-induced growing-season fires burned flatwoods on a frequent basis, perhaps every year or two, which kept the forest open and lacking a shrub understory. Fire-maintained pine flatwoods originally covered over half of Florida's land area, but their range has been greatly reduced by development, agriculture, and silviculture. Furthermore, fire exclusion has impacted virtually all remaining flatwoods by increasing the tree density and greatly increasing the shrub layer, allowing invasion of oaks and other hardwoods. In southeastern Florida and some of the Florida Keys, the flatwoods are composed of ◆“South Florida” slash pines (*P. elliotii* var. *densa*) and are called **Pine Rocklands** because the state's limestone base is close to, or at, the “soil” surface. The understory of pine rocklands is composed largely of plants of West Indian origin, including several species of palms. Nearly all of this habitat has been destroyed for residential development and agriculture; Everglades National Park and National Key Deer Refuge on Big Pine Key preserve the largest examples remaining. Characteristic breeding birds of Florida's varied pine flatwoods include the Swallow-tailed Kite, Red-tailed Hawk, “Southeastern” American Kestrel, Northern Bobwhite, Common Ground-Dove, Great Horned Owl, Common Nighthawk, all woodpeckers including the Red-cockaded Woodpecker, Great Crested Flycatcher, Eastern Kingbird, Blue Jay, Brown-headed Nuthatch, Eastern Bluebird, Yellow-throated Warbler, Pine Warbler, Common Yellowthroat, Summer Tanager, Eastern Towhee, and Bachman's Sparrow. **Pine Plantations** are common throughout the state, especially in the Northern Peninsula, and most are harvested every 20 or so years for the production of paper and related products. Some birds of pine flatwoods occur also in pine plantations, such as Downy Woodpecker,

Brown-headed Nuthatch, and Summer Tanager, but others such as Hairy Woodpecker, Red-cockaded Woodpecker, and Bachman's Sparrow do not. For information on **Scrubby Flatwoods**, see the section on scrub.

Sandhills are mixed forests of oaks and pines growing on well-drained sandy soils. Many sandhills were formerly longleaf pine forests that now are dominated by ♦turkey oak (*Quercus laevis*) and ♦bluejack oak (*Q. incana*) following clear-cutting of the pines and decades of subsequent fire exclusion. Some sandhills still retain the open, grassy structure of the former flatwoods, while others now are dense forests of oaks. Extensive sandhills occur in the western Panhandle and the west-central Peninsula; two sites known for their sandhills are Eglin Air Force Base and Withlacoochee State Forest. Many sandhills are being restored to flatwoods through removal of oaks and an increase in fire frequency. **Southern Ridge Sandhill** is a particular plant community endemic to the Lake Wales Ridge, which runs through the interior of central Florida. The oaks are composed of scrub species and the endemic ♦scrub hickory (*Carya floridana*) often is conspicuous. Characteristic breeding birds of sandhills depend upon the extent of oak/pine and shrub/grass coverages, and may include the Cooper's Hawk, Red-tailed Hawk, “Southeastern” American Kestrel, Northern Bobwhite, Common Ground-Dove, Great Horned Owl, Common Nighthawk, Red-cockaded Woodpecker, Great Crested Flycatcher, Yellow-throated Vireo, Blue Jay, Tufted Titmouse, Brown-headed Nuthatch, Eastern Bluebird, Yellow-throated Warbler, Pine Warbler, Common Yellowthroat, Summer Tanager, Eastern Towhee, and Bachman's Sparrow.

Hammocks are forests of hardwoods (e.g., oaks, hickories, and magnolia) that occur throughout Florida. **Temperate Hammocks** are common along the northern border with Alabama and Georgia, and extend spottily into the central Peninsula, primarily the western half. Hammocks in northern Florida contain some of the most diverse forests in the eastern United States. Those along the Apalachicola River contain plants and animals disjunct from their primary range in the Appalachian Mountains, and these hammocks contain a few endemic trees such as the ♦Florida torreya (*Torreya taxifolia*) and ♦Florida yew (*Taxus floridana*). ♦Live oaks (*Quercus virginiana*) and ♦laurel oaks (*Q. laurifolia*) are abundant in hammocks. Because many oaks in Florida are nearly evergreen, hammocks are shaded year-round; as a result, the understory often is extremely sparse and the ground is covered with leaf litter. Fires do not normally occur in hammocks. Except in extreme northern Florida, ♦cabbage palms (*Sabal palmetto*)—Florida's state “tree” (palms aren't trees; they're cycads)—also occur in hammocks, and many hammocks in the prairies north and west of Lake Okeechobee are composed entirely of cabbage palms. Some examples of temperate hammocks occur at Tall Timbers Research Station north of Tallahassee, San Felasco Hammock Preserve State Park near Gainesville, and Highlands Hammock State Park near Sebring. **Maritime Hammocks** are temperate hammocks along or close to the Atlantic coast. They often are sculpted by sea breezes, and are low in stature. Characteristic breeding birds of temperate and maritime hammocks include the Cooper's Hawk, Red-shouldered Hawk, Wild Turkey, Yellow-billed Cuckoo, Barred Owl, Red-bellied Woodpecker, Downy Woodpecker, Great Crested Flycatcher, White-eyed Vireo, Yellow-throated Vireo, Red-eyed Vireo, Carolina Chickadee, Northern Parula, and Summer Tanager. **Tropical Hammocks** are limited to southern Florida, and are composed of evergreen trees, shrubs, and palms largely of West Indian affinity, such as ♦gumbo-limbo (*Bursera simaruba*), ♦pigeon plum (*Coccoloba diversifolia*), ♦false tamarind (*Lysiloma latisiliquum*), ♦false mastic (*Mastichodendron foetidissimum*), and ♦strangler fig (*Ficus aurea*). Trees and palms are covered with orchids and bromeliads, and ferns carpet the ground. Two subspecies of mammals are endemic to tropical hammocks of the mainline Keys. Royal Palm Hammock and Mahogany Hammock, both in Everglades National Park, as well as the hammocks on Key Largo, are typical examples. The diversity of avian species breeding in tropical hammocks is quite limited, but several of these species occur nowhere else in the United States. Characteristic breeding birds include the White-crowned Pigeon, Mangrove Cuckoo, Great Crested Flycatcher, Gray Kingbird, White-eyed Vireo, and Black-whiskered Vireo. West Indian birds

that stray to Florida, such as the Zenaida Dove, Cuban Pewee, La Sagra's Flycatcher, Thick-billed Vireo, and Western Spindalis, typically are found in tropical hammocks.

Scrub is Florida's oldest plant community, and was formerly common throughout the Peninsula during periods of lower sea levels and drier climates. Today, scrub is restricted to areas of excessively well-drained soils, which now occur largely on sand ridges that represent earlier shorelines created during periods of higher sea levels. Scrub occurs on ridge systems throughout the Peninsula, and along the Gulf coast in the Panhandle, west barely into Alabama. **Xeric Oak Scrub** is an early successional form of scrub, with numerous patches of bare sand, and where vegetation is kept low from intense fires that occur perhaps every eight to 20 years. Because scrub is Florida's oldest plant community and was often isolated from other habitats by large expanses of water, scrub flora and fauna have a high degree of endemism; at least 40% of oak scrub species are endemic. Florida's only endemic bird species—the Florida Scrub-Jay—is restricted to xeric oak scrub of the Peninsula, as are several other vertebrates such as the ♦Florida scrub lizard (*Sceloporus woodi*), ♦sand skink (*Neoseps reynoldsi*), and ♦Florida mouse (*Podomys floridanus*). In the absence of fire, xeric oak scrub succeeds to oak hammocks or sand pine scrub, and scrub endemics decline in numbers, potentially to extirpation, unless fire is returned to the community.

The Lake Wales Ridge is the oldest ridge system in Florida, and contains nearly all the oak scrub endemics. The endemic ♦scrub oak (*Quercus inopina*) is common in most interior scrubs, but is not found along coastal ridges; other oak species are ♦sand live oak (*Quercus geminata*), ♦myrtle oak (*Quercus myrtifolia*) and ♦Chapman's oak (*Quercus chapmanii*). ♦Florida rosemary (*Ceratiola ericoides*) is a common evergreen shrub of many scrublands in Florida. Because scrub soils are well-drained, much habitat has been destroyed by the citrus industry, while other scrublands have been eliminated by commercial and residential development. By the early 1990s, it was estimated that about 85% of Lake Wales Ridge scrub had been destroyed, and most of the remainder would almost certainly suffer the same fate unless public acquisition activities were initiated quickly. As a result, several State and Federal agencies and non-profit groups partnered to purchase the most significant patches of xeric oak scrub that remained. Preservation of Lake Wales Ridge habitats has been the State's highest priority for several years, and as a result, many of the most significant scrublands have been preserved. The first scrub preserve—Archbold Biological Station, established in 1941—remains one of the most impressive and most diverse scrub sites in Florida (and the world). The Merritt Island–Cape Canaveral complex also contains large amounts of scrub habitats that are undergoing much-needed restoration after a long period of fire exclusion. Another State concern is the scrub ridges of mainland Brevard County, which are under severe threat from residential development. Characteristic breeding birds of xeric oak scrub are few but include the Northern Bobwhite, Mourning Dove, Common Ground-Dove, Common Nighthawk, White-eyed Vireo, Florida Scrub-Jay, Northern Mockingbird, Common Yellowthroat, and Eastern Towhee.

Scrubby Flatwoods contain a canopy of longleaf or slash pines and a sparse to extensive understory of scrub oaks. They occur widely in the central Peninsula. +Abrahamson and Hartnett (1990) note that some of scrubby flatwoods may be artifacts of previous logging and fire exclusion activities. For a startling and graphic example of how quickly and completely oaks can invade pine flatwoods in the absence of fire, see the photographs in +Myers and Ewell (1990: 192) of the same landscape at Archbold Biological Station in 1929 and 1988, after 60 years of fire exclusion. Scrubby flatwoods typically contain a mixture of flatwoods and xeric oak scrub species.

The third scrub community is **Sand Pine Scrub**, a forested habitat dominated by ♦sand pines (*Pinus clausa*). Because most scrubs formerly burned more frequently than at present, sand pine scrub probably was less common historically than it is at present. Indeed, sand pine forests are the only natural habitat that *increased* in extent during the 20th century +(Kautz 1993). As noted above, all scrub-endemic species decline as the oaks and pines increase in coverage and height, so sand pine scrub supports an entirely different avifauna than does xeric oak scrub. The largest patch of sand pine scrub in the world occurs in and around Ocala National Forest. Other patches of sand pine scrub occur along the Panhandle

coast and in the Peninsula south to Palm Beach County. Characteristic breeding birds include the Cooper's Hawk, Eastern Screech-Owl, Hairy Woodpecker (local), Great Crested Flycatcher, White-eyed Vireo, Blue Jay, Pine Warbler, and Summer Tanager.

Dry Prairie bears little resemblance to the rolling prairies of the central United States. In Florida, prairies are flat, treeless areas grown to threeawns, saw palmetto, ♦fetterbush (*Lyonia lucida*), ♦staggerbushes (*Lyonia ferruginea* and *Lyonia fructosa*), ♦blueberries (*Vaccinium* spp.), ♦wax myrtle (*Myrica cerifera*), and dozens of other grasses, forbs, and shrubs. Contrary to their name, dry prairies are poorly drained areas, and often are inundated with one inch (2.3 cm) or more of water following late spring or summer thunderstorms. Dry prairies are an exceptionally diverse community, with as many as 41 species of plants per square meter, one of the most diverse plant communities in the Western Hemisphere +(Orzell and Bridges 1998). The most extensive dry prairies in Florida occur north and west of Lake Okeechobee in the south-central Peninsula. Populations of the endemic, Endangered “Florida” Grasshopper Sparrow have declined severely as prairies have been converted to unsuitable habitats, primarily to pastures planted with non-native grasses such as ♦bahiagrass (*Paspalum notatum*). Avon Park Air Force Range, Fisheating Creek Ecosystem, Kissimmee Prairie Preserve State Park, and Myakka River Watershed IBAs all contain much dry prairie habitat. Characteristic breeding birds include the Red-shouldered Hawk, White-tailed Kite, Crested Caracara, Northern Bobwhite, “Florida” Sandhill Crane, Mourning Dove, Common Ground-Dove, Burrowing Owl, Common Nighthawk, Eastern Kingbird, Loggerhead Shrike, American Crow, Eastern Meadowlark, Bachman's Sparrow, and “Florida” Grasshopper Sparrow. During migration, flocks of Bobolinks are observed frequently, and other sparrows are common residents during the winter. “**Wet Prairies**” are quite unlike dry prairies and are synonymous with shallow freshwater marshes.

Swamps are wetland forests characteristic of the southeastern United States. They grow along the edges of rivers and streams, in poorly-drained seepage basins and ponds, or occupy large, shallowly-flooded areas, often mixed with slightly elevated areas grown to pinelands. Three types of swamps are discussed here, but several other types of swamps, bogs, domes, strands, and other wetland forests occur. **Cypress Swamps** are composed primarily of two species of trees: ♦bald-cypress (*Taxodium distichum*) and ♦pond-cypress (*Taxodium ascendens*). Bald-cypresses tend to occur along moving water, while pond-cypresses tend to grow in still water, but many individuals cannot be identified with certainty, even by skilled botanists +(Ewel 1990). **Hardwood Swamps** occur in much of the same areas as cypress swamps but are dominated by hardwoods such as ♦blackgum (*Nyssa sylvatica*), ♦hickories (*Carya* spp.), ♦red maple (*Acer rubrum*), and several other species. **Bay Swamps** are smaller depression swamps often surrounded by uplands. They are characterized by ♦loblolly bay (*Gordonia lasianthus*), ♦sweetbay (*Magnolia virginiana*), and ♦swamp bay (*Persea palustris*). Well-known swamps include those along the Apalachicola River, Pinhook Swamp in northern Florida, Green Swamp in central Florida, and Big Cypress Swamp and Corkscrew Swamp in southwestern Florida. Characteristic breeding birds of Florida's varied swamps and other wetland forests include the Anhinga, wading birds (perhaps most notably the Wood Stork), Wood Duck, Osprey, Swallow-tailed Kite, Bald Eagle, Red-shouldered Hawk, Limpkin, Yellow-billed Cuckoo, Eastern Screech-Owl, Barred Owl, many woodpeckers (notably Pileated Woodpecker but not Red-cockaded Woodpecker), Great Crested Flycatcher, White-eyed Vireo, Red-eyed Vireo, American Crow, Fish Crow, Carolina Chickadee, Carolina Wren, Blue-gray Gnatcatcher, Northern Parula, Prothonotary Warbler, Northern Cardinal, and Common Grackle.

Mangrove Forests are one of the most characteristic features of low wave-energy shorelines of the southern half of the Peninsula. They are composed of three primary species, each in their own genus: ♦red mangrove (*Rhizophora mangle*), ♦black mangrove (*Avicennia germinans*), and ♦white mangrove (*Laguncularia racemosa*). Mangroves cannot tolerate sub-freezing temperatures for extended periods, although black mangroves are somewhat cold-hardy and occur farther north than the other species. About

90% of Florida's mangrove forests are found in Collier, Lee, Miami-Dade, and Monroe counties. Dozens of tiny mangrove islands occur in the Ten Thousand Islands region southeast of Naples, and in Florida Bay between the southern mainland and the Mainline Florida Keys. Destruction of mangrove forests is now largely illegal due to wetlands protection laws. Characteristic breeding birds include the Brown Pelican, Magnificent Frigatebird (Dry Tortugas National Park only), wading birds, Clapper Rail, White-crowned Pigeon, Mangrove Cuckoo, Gray Kingbird, Black-whiskered Vireo, “Cuban” Yellow Warbler, and “Florida” Prairie Warbler.

Freshwater Marshes are abundant throughout the Peninsula and locally in the Panhandle. There are several different varieties of freshwater marsh, depending primarily on the water depth and duration of flooding. Wetlands in Florida typically contain multiple varieties of marsh; three types are described here. **Flag Marshes** are dominated by tall forbs such as ♦ pickerelweed (*Pontedaria cordata*), ♦ arrowheads (*Sagittaria* spp.), and other species. **Cattail Marshes** contain ♦ cattails (*Typha* spp.) often in extremely dense monotypic stands. **Sawgrass Marshes** are typical of the Everglades and are dominated by ♦ Jamaican swamp sawgrass (*Cladium jamaicense*), which despite its name, is a sedge, not a grass. (The Everglades therefore is a “River of Sedge” rather than a “River of Grass”). The Upper St. Johns River marshes and Everglades National Park are two examples of extensive marsh systems in Florida. Characteristic breeding birds depend upon the type of marsh and may include the following: the Pied-billed Grebe, Least Bittern, Mottled Duck, Snail Kite, King Rail, Common Moorhen, Purple Gallinule, Sandhill Crane, Common Yellowthroat, Red-winged Blackbird, and Boat-tailed Grackle. The “Cape Sable” Seaside Sparrow has occupied at least four types of freshwater and brackish marshes in the extreme southwestern Peninsula—it is unique among Seaside Sparrows in that it breeds in freshwater marshes.

Tidal Marshes also are composed of several different types, depending upon their proximity to salt water and degree of soil salinity. They are found along coastlines with little wave action, along shores of rivers often many miles (km) upstream, and in protected coves on barrier islands. They are most extensive along the Gulf coast from Wakulla County south to Pasco County, where they occur nearly unbroken for nearly 200 miles (315 km). The two primary types of salt marshes are composed of often monotypic stands of ♦ needle rush (*Juncus roemerianus*) and ♦ smooth cordgrass (*Spartina alterniflora*); several other species are present in “high marsh” far from salt water. Extensive areas of tidal marsh are found within the Big Bend Ecosystem and Crystal River Marshes IBAs. Breeding bird diversity of tidal marshes is limited to a few species, primarily the Black Rail, Clapper Rail, Willet, Marsh Wren, Common Yellowthroat, Seaside Sparrow (excluding the Cape Sable subspecies), and Red-winged Blackbird.

Lacustrine habitats (i.e., lakes and ponds) are abundant in the Peninsula but rare in the Panhandle. No other southern state contains a lake district like that of Florida, and in fact, no state closer than those adjacent to Canada contain a comparable number of lakes. There are over 7800 lakes in Florida greater than 1 acre (0.4 ha) in size. Most of these are small, but five lakes exceed 39 square miles (100 square km). Lake Okeechobee, the second-largest fresh water lake wholly within the Lower 48 States, is largest, followed by lakes George, Kissimmee, Apopka, and Istokpoga. Most lakes occur along the ridge systems that run through the center of much of the Peninsula; appropriately named Lake County contains 1345 lakes and ponds. Most lakes are (or at least historically were) rimmed by extensive forests of bays, cypresses, and other hardwoods, while many ponds are surrounded by willows and other shrubs. Characteristic breeding birds include the Pied-billed Grebe, Mottled Duck, Snail Kite, King Rail, Common Moorhen, Common Yellowthroat, Red-winged Blackbird, and Boat-tailed Grackle. The six largest lakes in Florida are IBAs.

Riverine habitats (i.e., rivers, streams, and sloughs) also are abundant in Florida, with over 1700 in the state. The longest river in Florida is the St. Johns, which winds north for 320 miles (512 km) from Indian River County before emptying into the Atlantic Ocean at Jacksonville. Several rivers, creeks, and streams are spring-fed. Florida contains over 300 springs, of which 27 are termed “first magnitude,” which means they each discharge at least 64 million gallons (242 million liters) of water daily. The total discharge of Florida's springs is an estimated 8 billion gallons (30 billion liters) of water daily, with about 80% of this amount from first-magnitude springs. Florida contains nearly one-third of all first-magnitude springs known in the United States. Extensive riverine habitats are found within the Apalachicola and Tates Hell Forests, Green Swamp, and Withlacoochee–Panassoffkee–Big Scrub IBAs. Characteristic breeding birds of rivers and creeks depend primarily upon habitats present. Forested rivers will contain species found in cypress forests and bayheads, while slow-moving sloughs will contain species of freshwater marshes.

Estuarine habitats (i.e., estuaries, bays, seagrass beds, oyster bars, etc.) represent one of the most significant habitats in Florida, if defined broadly. Livingston (1990), who used the term “inshore marine habitats,” defined estuarine habitats as “any area where sea water is diluted by land runoff.” Using this description, he estimated that 3 million acres (1.2 million ha) along the Gulf coast qualified as estuarine habitats. Extensive mudflats, oyster bars, and associated communities are prevalent along Florida's west coast because the Gulf of Mexico is quite shallow offshore. Characteristic birds of Florida's varied estuarine habitats include Brown Pelicans, wading birds, waterfowl, shorebirds, and larids; bird use is strongly dependent upon tidal conditions.

N.B. Lacustrine, riverine, and estuarine habitats are not really habitats per se, but rather different types and salinities of aquatic habitats. However, because it would have been cumbersome to designate “open water” or “moving water” with varying salinity levels as different habitats, and because lakes, rivers, and estuaries are such conspicuous features of the landscape, these “habitats” have been used here.

Coastal Strand represents the beach–dune habitats that occur (or formerly occurred) abundantly along both coasts, especially along the entire Atlantic coast, and barrier island systems along Gulf coast in the Panhandle and southern half of the Peninsula. Most of this habitat has been destroyed or severely impacted by high-rise development and heavy recreational use. As a result, breeding birds of coastal strand probably are the most threatened group of birds in Florida. Some species (American Oystercatcher, Least Tern, other terns, and Black Skimmers) now nest on rooftops (with varying success) in areas where the beaches receive heavy human use. The most familiar plant on foredunes is ♦seaoats (*Uniola paniculata*), but several other grasses and forbs are present. Away from the foredunes, vegetation varies considerably, dependent upon the location in Florida and the extent of wave and wind actions. Backdune vegetation may include grasslands, wind-sculpted oak scrub, cabbage palm hammocks, tropical hardwood hammocks, or slash pine flatwoods. Extensive areas with coastal strand habitats are protected on barrier islands in the Panhandle, at numerous sites along the Atlantic coast, most notably the Cape Canaveral area, and scattered remnants in southern Florida. Characteristic breeding birds of coastal dunes and beaches include the American Oystercatcher, Snowy Plover, Wilson's Plover, Laughing Gull, Least Tern, Royal Tern, Gull-billed Tern, Black Skimmer, and Common Ground-Dove.

Artificial Habitats refer to human-modified or human-created areas such as mined areas, dredged-material “spoil” islands, parking lots and buildings, etc. Two other artificial habitats, pastures and agricultural fields, are described separately below. Virtually all IBAs in Florida contain some artificial habitats—even if only a paved parking lot or fields mowed for recreation—but very few IBAs are composed primarily of artificial habitats. Perhaps the best example of critical artificial habitats are the “spoil” islands within the Hillsborough Bay IBA, which support extremely significant breeding populations of wading birds, shorebirds, and larids.

Non-native Pastures are planted with bahiagrass and other exotic forage grasses and forbs, usually after all or most native vegetation has been removed. Surprising as it may seem, Florida is a significant cattle-producing state, ranked 10th among all states in the number of cattle. In 1998, over 1,050,000 cow/calf units were supported on 5.5 million acres (2.2 million ha) of “native range” and pastureland, predominantly in a ten-county area in southwestern-central Florida (Archbold Biological Station website: <http://www.archbold-station.org/abs/Biennial97/R7Research/R7MAERC.htm>). The state contains four of the nation's ten largest cattle ranches, including the largest ranch, which grazes more than 35,000 cattle on 300,000 acres (120,000 ha)! Because pastures are highly disturbed and largely sterile habitats, they are included in IBAs only when native habitats also are present, and/or when pastures have been purchased by conservation agencies and will be restored to native plant communities. Depending upon the severity of grazing and other habitat present, breeding birds may include the “Florida” Sandhill Crane, Burrowing Owl, Loggerhead Shrike, Northern Mockingbird, and Eastern Meadowlark. **Agricultural Fields** support one or more fruit or vegetable crops but a very limited diversity of breeding species. The only IBAs in Florida that contain agricultural fields are those where the farmland is sought for public acquisition and will be restored to native habitats, as is occurring in IBAs at Emeralda Marsh, Lake Apopka, and in the Everglades. The continued rapid expansion of citrus groves into southwestern and south-central Florida severely threatens the continued existence of many prairie and flatwoods species, especially the Crested Caracara and Florida panther. The citrus industry has also played a major role in the severe habitat reduction and fragmentation of xeric oak scrub, especially along interior ridges of central Florida, which has severely reduced populations of Florida Scrub-Jays.

LAND ACQUISITION AND MANAGEMENT IN FLORIDA

Several dozen agencies and non-governmental organizations are engaged in acquiring and managing conservation lands in Florida. The primary agencies and organizations are listed below, with contact information supplied for most. Dozens of other local agencies (counties and municipalities) and private land trusts also are involved with the acquisition and management of conservation lands in Florida. Refer to +(Jue et al. 2001) for additional information.

Federal Agencies

U.S. Department of Defense
[apparently no state or regional office]

U.S. Forest Service
National Forests in Florida
325 John Knox Road, Suite F-100
Tallahassee, Florida 32303
850-523-8500
<<http://www.southernregion.fs.fed.us/florida>>

U.S. Fish and Wildlife Service
Southeast Regional Office
1875 Century Boulevard
Atlanta, Georgia 30345
404-679-4006
<<http://southeast.fws.gov/maps/fl.html>>

U.S. National Park Service
Southeast Region
100 Alabama Street SW
1924 Building
Atlanta, Georgia 30303
404-562-3100
<<http://www.nps.gov/legacy/regions.html>>

State Agencies

Florida Department of Environmental Protection
Division of Recreation and Parks
850-488-9872
<<http://www.dep.state.fl.us/parks/index.asp>>

Florida Department of Environmental Protection
Office of Greenways and Trails
3900 Commonwealth Boulevard
Mail Station 795
Tallahassee, Florida 32399-3000
1-877-822-5208
<<http://www.dep.state.fl.us/gwt>>

Florida Department of Environmental Protection
Office of Coastal and Aquatic Managed Areas
3900 Commonwealth Boulevard
Mail Station 235
Tallahassee, Florida 32399-3000
850-488-3456
<<http://www.dep.state.fl.us/coastal/contacts.htm>>

Florida Department of Agriculture and Consumer Services
Division of Forestry
3125 Conner Boulevard
Tallahassee, Florida 32399-1650
850-488-4274
<<http://www.fl-dof.com>>

State Agencies, continued

Florida Fish and Wildlife Conservation Commission
Division of Wildlife
620 South Meridian Street
Tallahassee, Florida 32399-1600
850-488-3831
<<http://floridaconservation.org>>

Northwest Florida Water Management District
81 Water Management Drive
Havana, Florida 32333-4712
850-539-5999
<<http://sun6.dms.state.fl.us/nwfwmd>>

St. Johns River Water Management District
P.O. Box 1429
Palatka, Florida 32178-1429
800-451-7106 or 386-329-4500
<<http://www.sjrwmd.com>>

South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33416-4680
800-432-2045 or 561-686-8800
<<http://www.sfwmd.gov>>

Southwest Florida Water Management District
2379 Broad Street
Brooksville, Florida 34604-6899
800-423-1476 or 352-796-7211
<<http://www.swfwmd.state.fl.us>>

Suwannee River Water Management District
9225 County Road 49
Live Oak, Florida 32060
800-604-2272 or 386-362-1001
<<http://www.srwmd.state.fl.us>>

Private organizations

Audubon of Florida
444 Brickell Avenue, Suite 850
Miami, Florida 33131
305-371-6399
<<http://www.audubonofflorida.org>>

The Nature Conservancy
222 South Westmonte Drive, Suite 300
Altamonte Springs, Florida 32714
407-682-3664
<<http://nature.org/wherewework/northamerica/states/florida>>

[[Archbold Biological Station?](#)
[Tall Timbers Research Station?](#)]

SITE NOMINATION PROCESS

Several methods were used to broadcast the Florida IBA Program to maximize the number of nominations. The first of these was a fund-raising letter and a simple “nomination form” that was mailed in early 1999 to all members of Florida Audubon Society. Next was an IBA workshop presented to members of the Florida Ornithological Society (FOS) in spring 1999. During this presentation, a large (5 x 6 foot; 1.5 x 1.8 m) laminated map of Florida was hung on a wall, and workshop participants placed numbered stickers over potential IBAs.

Once the Florida IBA Program was underway and the site selection criteria had been finalized, the Program was broadcast widely. In February 2000, a website (<http://www.audubon.org/bird/iba/florida>) was created and updated frequently. This website included site-nomination instructions and the nomination form, as well as draft maps that showed the locations of Florida’s IBAs by regions. Additionally, a two-page article about the program was published in the March 2000 edition of Audubon's *Florida Naturalist* magazine, and a notice was published in the May 2000 edition of FOS's *Florida Field Naturalist*. These notices were followed up with letters mailed to presidents and conservation chairs of Audubon's 45 Florida chapters, and field-oriented members of FOS. Additionally, hundreds of regular mail or e-mail letters were sent to managers of national and state forests, parks, and refuges; state recreation areas; wildlife management areas; water management district landholdings; preserves of The Nature Conservancy; and many others. These letters introduced readers to the Florida IBA Program and pointed them to the website, from which site-nomination materials could be downloaded and printed. IBA workshops were presented to participants of Audubon's Annual Assemblies in November 2000 and November 2001, and a publicity event at Corkscrew Swamp in November 2001 helped to “launch” Audubon's IBA Program nationwide. Finally, after the manuscript was “completed” in June 2002, an Adobe Acrobat (PDF) copy was posted to the Florida IBA website to encourage widespread participation in the review process, and also to encourage nomination of additional sites.

RESULTS

Site nominations

Respondents to the 1999 Florida Audubon Society fund-raising appeal suggested 108 sites possibly worthy of IBA designation, while participants of the spring 1999 FOS workshop identified 116 potential sites. Because these site-selection efforts preceded the formal IBA nomination process, individuals who identified these potential IBAs were contacted in early 2000 and asked to nominate the sites formally. Over 300 regular mail letters were sent out to promote the Florida IBA Program, and several hundred pages of e-mail correspondence were generated. Between February 2000 and July 2002, the Florida IBA website received over 3500 “hits,” and probably hundreds of nomination forms were downloaded from it. Published notices of the Florida IBA Program reached 43,000 Audubon members in Florida, over 400 members of FOS, and dozens of land managers and other biologists.

Nominations were received from several sources, but most sites were nominated by the IBA Coordinator or a biologist associated with the site (e.g., park or forest biologist). Very few sites were nominated by members of Audubon or FOS; the extensive three-page nomination form likely discouraged submissions from most non-professionals. Ultimately, 138 sites were formally nominated as potential IBAs in Florida. Several other sites were suggested by individuals as potential IBAs but the data submitted were insufficient for formal nomination; these informally nominated sites were not sent to the IBA Executive Committee for review.

Site selection

Eight months into the site nomination period, several dozen sites had been nominated formally. Members of the IBA Executive Committee met for a day-long meeting at Tall Timbers Research Station on 1 October 2000. (Jim Wilson, IBA Coordinator for Georgia, also attended). During that meeting, 62 sites were discussed; eight of these were not accepted, and the remaining 54 sites were accepted as 32 IBAs—the Executive Committee combined several sites when it made sense from biological and/or geographical perspectives. Nominations continued to be received into mid-2002, and the Committee voted several additional times. Because schedules of the Committee members precluded face-to-face meetings, the IBA Coordinator prepared electronic copies of site nomination forms, and e-mailed these to Committee members on a frequent basis. E-mail voting was “closed” when at least six Committee members had responded. Sites unanimously accepted by voting members of the Committee were immediately designated as IBAs, while sites for which all votes were negative were dropped from further consideration. Sites that received mixed votes (i.e., some for and some against IBA designation) were deferred until the Committee could discuss those nominations in detail.

The first e-mail site-selection “meeting” was closed in March 2001, when 16 nominations were reviewed. Additional e-mail “meetings” were closed in April 2001 (17 sites), May 2001 (15 sites), and July 2001 (12 sites in two meetings). At the end of August 2001, a conference call among Committee members was held to discuss 11 nominations, including some deferred previously. E-mail selection rounds were resumed in November 2001 (2 sites), January 2002 (6 sites), February 2002 (10 sites), March 2002 (6 sites), and May 2002 (4 sites). Finally, on 22 May 2002, during a second conference call, Committee members voted on 8 new sites and 11 sites deferred previously. This phone call nearly marked the close of the site-selection period for the Florida IBA Program—a period originally anticipated to end in November 2000! In early June 2002, an additional site was nominated by two Committee members, and this site was quickly accepted by the entire Committee.

Of the 138 sites nominated formally as potential Important Bird Areas in Florida, 126 (91%) were accepted as 99 IBAs, while the remaining 11 sites (8%) were not accepted [an additional site remains deferred pending additional data]. IBAs are distributed in 55 (80%) of Florida's 67 counties. Four counties (Brevard, Highlands, Osceola, and Volusia) each contain seven IBAs, while Lake, Pasco, and Polk counties each contain six. The sole nomination from St. Lucie County was not accepted as an IBA, and no nominations were submitted from 11 counties: Bradford, Calhoun, Gadsden, Gilchrist, Hamilton, Holmes, Jackson, Lafayette, Madison, Union, and Washington. As mentioned previously, all IBAs had to meet the criteria of at least one of the four primary site-selection categories (pages 13–15); surprisingly, nearly half (47; 47%) of the IBAs met all four categories (Table 6; pages 34–37). Florida's IBAs vary considerably in size, ranging from Pelican Shoal (less than 1 acre; 0.4 ha) to Everglades National Park and associated wetlands (more than 1.5 million acres; 600,000 ha). All together, Florida's IBAs encompass over 10.3 million acres (4.1 million ha) of land and water, including about 26% of the state's land area. These sites support 437 species of native birds, which represent 92% of the state's accepted native avifauna +(Bowman 2000, 2001).

Some IBAs are a single land ownership—a national park or a state forest for example, while other IBAs are composed of several ownerships that would not qualify individually (e.g., the Withlacoochee–Panasoffkee–Big Scrub IBA, pages 211–212). Most of Florida's IBAs are a mix of public and private lands, 44 are entirely publicly owned, and four IBAs (Bright Hour Watershed, Buck Island Ranch, Kanapaha Prairie, and Red Hills Ecosystem) are entirely in private ownership.

[Need to mention/describe the tables]

Table 2. Global, Continental, and National IBAs in Florida. [Need to explain what these are (including the G4 rankings) and need to add Continental and National IBAs, once these criteria have been established].

IBA Name	County(ies)	IBA Ranking
ABC Islands	Collier	G4-f
Apalachicola and Tates Hell Forests	Franklin, Leon, Liberty, and Wakulla	G1
Avon Park Air Force Range–Bombing Range Ridge	Highlands and Polk	G1
Big Bend Ecosystem	Dixie, Levy, and Taylor	<u>G4-f</u>
Brevard Scrub Ecosystem	Brevard	G1
Cape Canaveral–Merritt Island	Brevard and Volusia	G1
Central Pasco	Pasco	<u>G1</u>
Disney Wilderness Preserve	Osceola and Polk	<u>G1</u>
Eglin Air Force Base	Okaloosa, Santa Rosa, and Walton	G1
Everglades National Park	Miami-Dade and Monroe	<u>G1?</u> , G4-d
Fisheating Creek Ecosystem	Highlands and Glades	G1
Gulf Islands GEOPark	Pasco and Pinellas	G1
<u>Hillsborough Bay</u>	<u>Hillsborough</u>	<u>G4-c, G4-f</u>
<u>Kissimmee Prairie Preserve State Park</u>	<u>Okeechobee and Osceola</u>	<u>G1</u>
Lake Apopka Restoration Area	Lake and Orange	G4-b
Lake Wales Ridge	Highlands, Lake, Osceola, and Polk	G1
<u>Osceola Flatwoods and Prairies</u>	<u>Osceola</u>	<u>G1</u>
Ocala National Forest–Lake George	Lake, Marion, and Putnam	G1
Osceola National Forest–Okenfenokee and Pinhook Swamps	Baker and Columbia	G1
Oscar Scherer State Park	Sarasota	G1
St. Sebastian River State Buffer Preserve	Brevard and Indian River	G1
Ten Thousand Islands National Wildlife Refuge	Collier	G4-f
Upper St. Johns River Basin	Brevard, Indian River, Orange, Osceola, Seminole, and Volusia	G4-f
Wekiva–Ocala Greenway	Lake and Volusia	G1
Withlacoochee–Panasoffkee–Big Scrub	Citrus, Marion, and Sumter	G1

Table 3. The 13 most diverse IBAs in Florida, arranged in descending numeric order. All these IBAs support a native diversity in excess of 250 species. *Includes the entire seashore (i.e., both the Florida and Mississippi portions). A plus (+) denotes inland sites.

IBA Name	County(ies)	# of Species
Everglades National Park	Miami-Dade and Monroe	344
Eglin Air Force Base	Okaloosa, Santa Rosa, and Walton	324
St. Marks National Wildlife Refuge	Jefferson, Taylor, and Wakulla	320
Cape Canaveral–Merritt Island	Brevard and Volusia	313
*Gulf Islands National Seashore	Escambia, Okaloosa, and Santa Rosa	310
+Lake Apopka Restoration Area	Lake and Orange	304
Lower Tampa Bay	Hillsborough, Manatee, and Pinellas	302
Dry Tortugas National Park	Monroe	300
Big Bend Ecosystem	Dixie, Levy, and Taylor	277
Gulf Islands GEOPark	Pasco and Pinellas	268
+Paynes Prairie Preserve State Park	Alachua	266
Chassahowitzka–Weekiwachee	Citrus, Hernando, and Pasco	258
+Northern Everglades	Broward, Miami-Dade, and Monroe	252

Table 4. Approximate statewide percentages of populations of listed species and subspecies supported by Florida’s IBAs. For breeding species, only those IBAs that support breeding populations are included, to avoid double-counting individuals. Generally, only data gathered since 1999 were used to compute population totals and no data gathered before 1990 were used. The Burrowing Owl now occupies largely artificial habitats +(Bowen 2001), so very few birds occur within IBAs. For some species (i.e., Marsh Wrens, “Cuban” Yellow Warbler, and Seaside Sparrows), sizes of most populations within IBAs are poorly known or unknown, so most subspecies are not included in the table. For species whose breeding populations are known to be limited to IBAs (e.g., most larids), the figure of 100% is placed in parentheses next to the percentage obtained by summing all the numbers from each individual IBA. See text for explanation of percentages that exceed 100%. Recent Snail Kite data are lacking for most Everglades sites, but virtually all of the Snail Kites in Florida occur within IBAs.

Species	Estimated statewide population (Table 1) (pages 16–17)	# of IBAs that support significant populations	% of the statewide population within IBAs
Brown Pelican	8650 pairs	18	63
Magnificent Frigatebird	70 pairs	breeding: 1	100
“Great White” Heron	850 pairs	3	63
Great Egret	39,000 birds	12	54
Little Blue Heron	17,000 birds	8	35
Reddish Egret	375 pairs	8	25
White Ibis	17,100 pairs	11	“135”
Glossy Ibis	3500 birds	4	40
Roseate Spoonbill	1000 pairs	7	28
Wood Stork	5523 pairs	14	64
Osprey	1600 pairs	<u>13/14</u>	<u>51/52</u>
Swallow-tailed Kite	610 pairs	breeding: 7	breeding: 28
Snail Kite	996 birds	5	100?
Bald Eagle	1043 pairs	15	30
Short-tailed Hawk	500 birds	2	6
Crested Caracara	450 birds	9	23
“Florida” Sandhill Crane	4000 birds	6	7
“Greater” Sandhill Crane	25,000 birds	6	30
Snowy Plover	311 birds	10	57
Wilson’s Plover	>300 birds	11	41
Piping Plover	450 birds	12	71
American Oystercatcher	391 birds	7	36
Laughing Gull	23,336 pairs	7	“124” (100?)
Gull-billed Tern	55 pairs	3	91
Caspian Tern	323 pairs	4	92 (100)
Royal Tern	5352 pairs	4	97 (100)
Sandwich Tern	531 pairs	4	“164” (100)
Roseate Tern	324 pairs	1	79
Least Tern	10,000 birds	9	25
Sooty Tern	80,000 birds	1	100
Brown Noddy	2750 pairs	1	100
Black Skimmer	1600 pairs	8	“130”
White-crowned Pigeon	8500 pairs	3	97
Burrowing Owl	3000–10,000 birds	0(!)	0
Red-cockaded Woodpecker	>1226 clusters	13	99
Florida Scrub-Jay	3640 groups	10	58
“Worthington’s” Marsh Wren	?	1	100?
“Florida” Grasshopper Sparrow	<1000 birds	3	>95
“Cape Sable” Seaside Sparrow	2800 birds	1 or 2	100
“MacGillivray’s” Seaside Sparrow	?	1	100?

Table 5. Florida IBAs of which at least 20% are held in private ownership, ranked hierarchically. Lands protected under conservation easements—although still privately owned—are not included in the column denoting private acreage, as these lands are protected from further alteration, theoretically in perpetuity. *Source: +Jue et al. (2001)

IBA name	County(ies)	Total Acreage	Private Acreage	% privately owned*
Bright Hour Watershed	De Soto	47,235	47,235	100
Buck Island Ranch	Highlands	10,300	10,300	100
Kanapaha Prairie	Alachua	3520	3520	100
Red Hills Ecosystem	Gadsden, Jefferson, and Leon	105,000	105,000	100
Brevard Scrub Ecosystem	Brevard	33,982	26,502	77
Alachua Lakes	Alachua and Marion	60,948	41,484	69
Fisheating Creek Ecosystem	Glades and Highlands	176,760	116,882	66
Central Pasco	Pasco	52,885	33,475	63
Highlands Hammock–Charlie Creek	Hardee and Highlands	15,243	9703	63
Babcock–Webb	Charlotte and Lee	174,231	104,504	62
<u>Wakulla Springs</u>	<u>Wakulla</u>	<u>12,704</u>	<u>7964</u>	<u>62</u>
Matanzas Inlet and River	St. Johns	24,985	14,700	58
Corkscrew Swamp Watershed	Collier and Lee	72,463	40,075	55
Emeralda Marsh	Lake and Marion	15,706	8617	54
Wekiva–Ocala Greenway	Lake and Volusia	72,000	34,785	48
Osceola Flatwoods and Prairies	Osceola	216,692	102,146	47
St. Joseph Bay	Gulf	8401	3933	46
Green Swamp Ecosystem	Lake, Pasco, Polk, and Sumter	242,010	101,161	45
Lake Wales Ridge	Highlands, Lake, Osceola, and Polk	69,011	24,834	35
Avon Park Air Force Range–Bombing Range Ridge	Highlands and Polk	145,183	35,064	24
Florida Keys Hammocks	Monroe	23,383	5685	24
Myakka River Watershed	De Soto, Manatee, and Sarasota	105,146	24,790	23
Withlacoochee–Panasoffkee–Big Scrub	Citrus, Marion, and Sumter	93,900	<u>21,592</u>	<u>22</u>
Osceola National Forest–Okefenokee and Pinhook Swamps	Baker and Columbia	250,411	51,927	20
<u>Duval and Nassau Tidal Marshes</u>	<u>Duval and Nassau</u>	<u>TBD</u>	<u>TBD</u>	<u>TBD</u>
<u>Walton County Beaches</u>	<u>Walton</u>	<u>TBD</u>	<u>TBD</u>	<u>TBD</u>

Table 6. Site-selection criteria met by each IBA in Florida. A summary of the 15 site selection sub-categories are listed here: **1a** (significant population of Endangered species); **1b** (significant population of Threatened species); **2a** (significant population of Species of Special Concern); **2b** (significant population of FCREPA species); **2c** (significant population of Watch List species); **2d** (significant population of IBA species); **3a** (10,000 aquatic birds at one time); **3b** (wading birds: 3000 breeding pairs, or 500 roosting or foraging individuals at one time); **3c** (300 raptors per day); **3d** (1000 shorebirds at one time); **3e** (larids: 250 breeding pairs, or 1000 terns and skimmers roosting or foraging at one time); **3f** (significant population of others species or groups); **3g** (significant diversity, overall or within a group); **4** (significant natural habitats); and **5** (long-term research).

IBA Name	County(ies)	1a	1b	2a	2b	2c	2d	3a	3b	3c	3d	3e	3f	3g	4	5
ABC Islands	Collier			x	x		x		x							x
Alachua Lakes	Alachua and Marion		x		x						x		x	x	x	
Apalachicola and Tates Hell Forests	Franklin, Leon, Liberty, and Wakulla	x		x	x	x							x	x	x	
Avon Park Air Force Range– Bombing Range Ridge	Highlands and Polk	x	x	x	x	x								x	x	x
Babcock–Webb	Charlotte and Lee	x	x			x								x	x	
Bay County Beaches	Bay		x													x
Big Bend Ecosystem	Dixie, Levy, and Taylor		x	x	x		x		x		x					x
Big Cypress Swamp Watershed	Collier, Miami-Dade, and Monroe	x		x	x	x			x						x	x
Big Marco Pass Shoal	Collier		x	x	x	x					x	x			x	x
Biscayne Bay	Miami-Dade		x	x	x		x									x
Blackwater River State Forest	Okaloosa and Santa Rosa	x	x		x	x								x	x	x
Brevard Scrub Ecosystem	Brevard		x													x
Buck Island Ranch	Highlands		x	x	x										x	x
Camp Blanding–Jennings	Clay	x	x			x									x	x
Cape Canaveral–Merritt Island	Brevard and Volusia	x	x	x	x			x	x			x			x	x
Central Pasco	Pasco		x		x											x
Chassahowitzka–Weekiwachee	Citrus, Hernando, and Pasco			x											x	x
Citrus County Spoil Islands	Citrus			x	x		x									
Clearwater Harbor–St. Joseph Bay	Pinellas		x	x	x							x				<u>x</u>
Coastal Pasco	Pasco												x	x	x	
Cockroach Bay–Terra Ceia	Hillsborough and Manatee			x					x						x	<u>x</u>
Corkscrew Swamp Watershed	Collier and Lee	x							x						x	x
Crystal River Tidal Marshes	Citrus		x												x	x
Disney Wilderness Preserve	Osceola and Polk	x	x		x	x									x	
Dog Island–Lanark Reef	Franklin		x	x	x						x	x	x		x	
Dry Tortugas National Park	Monroe			x	x		x					x	x	x	x	x

IBA Name	County(ies)	1a	1b	2a	2b	2c	2d	3a	3b	3c	3d	3e	3f	3g	4	5
Lake Okeechobee	Glades, Hendry, Martin, Okeechobee, and Palm Beach	x	x		x		x	x	x		x				x	x
Lake Tohopekaliga and Adjacent Uplands	Osceola	x	x		x										x	
Lake Wales Ridge	Highlands, Lake, Osceola, and Polk		x												x	x
Lake Woodruff National Wildlife Refuge	Volusia				x					x				x	x	
Little Estero Lagoon	Lee		x		x	x					x	x				
Lower Tampa Bay	Hillsborough, Manatee, and Pinellas		x	x	x	x	x				x	x	x	x	x	
Loxahatchee River And Slough	Martin and Palm Beach	x	x	x	x				x						x	
Matanzas Inlet and River	St. Johns	x									x				x	
Myakka River Watershed	De Soto, Manatee, Sarasota				x	x			x				x		x	
Northern Atlantic Migrant Stopover	Flagler, Nassau, St. Johns, and Volusia	x	x	x	x	x				x		x	x		x	
North Lido Beach–Palmer Point	Sarasota		x		x										x	
Northern Everglades	Broward, Hendry, Miami-Dade, and Palm Beach	x		x	x				x						x	<u>x</u>
Ocala National Forest–Lake George	Lake, Marion, Putnam, and Volusia	x	x		x	x				x				x	x	<u>x</u>
Orlando Wetlands Park	Orange	x		x	x				x						x	
Osceola National Forest–Okefenokee and Pinhook Swamps	Baker and Columbia	x	x			x								x	x	<u>x</u>
Oscar Scherer State Park	Sarasota		x												x	x
Osceola Flatwoods and Prairies	Osceola	x	x		x	x								x	x	x
Paynes Prairie Preserve State Park	Alachua	x	x										x	x	x	
Pelican Island National Wildlife Refuge	Indian River	x		x					x						x	
Pelican Shoal	Monroe		x									x				
Pine Island National Wildlife Refuge	Lee			x					x						x	
Red Hills Ecosystem	Leon and Liberty		x		x									x	x	x
Rookery Bay National Estuarine Research Reserve	Collier			x	x				x						x	x
St. Johns National Wildlife Refuge	Brevard				x										x	
St. Joseph Bay	Gulf		x	x		x				x					x	

IBA Name	County(ies)	1a	1b	2a	2b	2c	2d	3a	3b	3c	3d	3e	3f	3g	4	5
St. Marks National Wildlife Refuge	Jefferson, Taylor, and Wakulla		x	x	x		x	x	x		x	x		x	x	x
St. Sebastian River State Buffer Preserve	Brevard and Indian River		x			x								x	x	
San Felasco Hammock Preserve State Park	Alachua												x	x	x	
Sanibel Lighthouse Park	Lee												x			
Sarasota and Roberts Bays	Manatee and Sarasota	x		x											x	
Southern Atlantic Migrant Stopover	Broward and Palm Beach												x	x	x	
Starkey Wilderness	Pasco					x										x
Ten Thousand Islands National Wildlife Refuge	Collier		x	x	x				x					x	x	
Turkey Creek Sanctuary	Brevard												x	x		
Upper St. Johns River Basin	Brevard, Indian River, Orange, Osceola, Seminole, and Volusia	x	x	x	x	x		x	x	x						x
Volusia County Colony Islands	Volusia			x												
<u>Wakulla Springs</u>	Wakulla				x											x
Walton County Beaches	Walton		x													x
Wekiva–Ocala Greenway	Lake and Volusia		x													x
Wekiwa Basin GEOPark	Lake, Orange, and Seminole					x							x			x
William Beardall Tosohatchee State Reserve	Brevard and Orange		x	x					x							x
Withlacoochee–Panasoffkee–Big Scrub	Citrus, Marion, and Sumter		x													x
Withlacoochee State Forest	Citrus, Hernando, and Sumter	x				x								x	x	

THREATS

Site nominators identified 18 severe or minor threats to Florida's IBAs. These are listed below arranged hierarchically [currently they're in alphabetical order], and include widespread threats such as development, human disturbance, exotic plants, and habitat succession, as well as localized threats that include erosion, raccoons, or cattle grazing. The site nomination form identified three levels of threats: severe, minor, and potential. This book includes only existing threats. Only 10 (10%) IBAs in Florida were considered by their nominator(s) to be free of severe threats: Blackwater River State Forest, Chassahowitzka–Weekiwachee, Crystal River Tidal Marshes, Dry Tortugas National Park, Lake Lafayette, Lake Woodruff National Wildlife Refuge, Pelican Shoal, St. Sebastian River State Buffer Preserve, William Beardall Tosohatchee State Reserve, and Upper St. Johns River Basin.

Altered hydrology is symptomatic of most of Florida's wetlands systems. As defined here, altered hydrology is any human-caused disruption of natural water delivery amount, timing, duration, or frequency. In most cases, levees and drainage canals have reduced the amount of surface water available and decreased the period that lands are flooded. In other cases, the opposite is true, where natural lands are over-flooded in order to protect agricultural and inhabited areas. Oftentimes, both factors are working against natural systems simultaneously, thereby compounding the problem. Everglades National Park and Lake Okeechobee are two IBAs that are severely impacted by altered hydrology.

Bombing and gunnery exercises were listed as a minor threat at Avon Park Air Force Range. While live-fire bombing and gunnery practice from air- and ground-based weapons systems likely impact populations of birds living within the active ranges, the frequent ordnance-caused fires associated with such activities may actually help *maintain* populations of fire-dependent species and habitats, most notably “Florida” Grasshopper Sparrows.

Cattle grazing was listed as a threat for only two IBAs, Avon Park Air Force Range and Kissimmee Prairie Preserve State Park, where the threats were considered minor. In both cases, cattle graze semi-native prairies occupied by “Florida” Grasshopper Sparrows. The effects of cattle grazing on sparrow populations is unknown (and deserving of study), but some sparrow nests surely must be trampled by cattle. In most other areas, cattle graze non-native pastures, which support an extremely limited native avifauna.

Cowbird brood parasitism is not (yet?) a serious threat in Florida as it is elsewhere. Populations of birds elsewhere in the United States (e.g., “Least” Bell's Vireo in California, Black-capped Vireo in Texas, and Kirtland's Warbler in Michigan) are severely threatened by cowbird brood parasitism, but effects in Florida are only local and do not seem to be impacting significant populations of any species. However, populations of breeding birds in Florida evolved *without* cowbirds, so invading populations of Brown-headed Cowbirds from the north, and (possibly) Shiny Cowbirds from the Caribbean may pose increasing threats to native breeding species in the future.

Development: As defined here, development refers to any form of habitat destruction or alteration for human use. Typically, the term refers to residential and commercial Developments of Regional Impact (DRIs) that each destroy hundreds or thousands of acres (or ha) of land. However, conversion of natural habitats to cattle pastures, citrus groves, other forms of agriculture, or silviculture (tree-farming) also was classified as development. Habitat destruction poses the greatest threat to Florida's native species and communities. Virtually all IBAs in Florida that are privately owned are under severe threat of development. Even publicly owned sites are threatened from impacts of offsite development (e.g., agricultural or commercial runoff, feral cats, increased difficulty using fire as a management tool, or increased recreational use). Undoubtedly, many private properties in Florida that contain significant

populations of plants and animals will be lost to development before preservation can be realized. In fact, such activities have been occurring for decades.

Erosion was listed as a major threat to several natural or artificial islands in Florida. In some cases, “riprap” (i.e., large rocks, tires, or other objects placed along the shoreline) can minimize erosion, as can the planting of marsh grasses and mangroves, or the creation of offshore oyster bars or shoals.

Exotic animals do not pose the threat to Florida’s native flora and fauna posed by exotic plants, but “wild” populations of three domesticated species do pose threats. ♦ **Feral cats** (*Felis domesticus*) were listed as a major threat to Hugh Taylor Birch State Park (part of the Southern Atlantic Migrant Stopover IBA), and minor threats to five other IBAs. There are over 66 million cats in the United States, and over 40 million of these are allowed to roam freely, causing massive destruction to birds and other small wildlife. It has been estimated that cats kill *hundreds of millions* of birds and *billions* of small mammals annually (American Bird Conservancy website: <<http://www.abcbirds.org/cats/wildlife.pdf>>). Readers of this book who own cats should *never* allow them to roam free, under any circumstances and for any length of time. (The notion that “belling” your cat prevents them from killing birds is false, as birds do not associate ringing bells with danger). ♦ **Feral hogs** (*Sus scrofa*) are a threat to bird populations indirectly by greatly disturbing terrestrial habitats from the hogs’ foraging behavior. Eurasian wild boars were released into Florida by the Spaniards in the 1500s, and subsequently by hunt clubs. Domestic pigs have escaped from farms and barn yards, and have interbred with wild boars, so the term “feral hogs” is used for all varieties of *Sus scrofa*. The state population of free-roaming feral hogs, which occur in all of Florida’s 67 counties, was estimated at over 500,000 in 1983 +(Layne 1997). Managers of most public lands remove feral hogs whenever they are encountered, but feral hogs are a prized game species in Florida, so their presence on some lands (e.g., Wildlife Management Areas) is encouraged to benefit hunters—a practice that should be discontinued on public lands. ♦ **Free-roaming dogs** (*Canis domesticus*) were listed as a minor threat to two IBAs: Bay County Beaches and Wekiwa GEOpark, but unleashed pet dogs are a severe threat to beach-roosting and -foraging birds; see the section on human disturbance, below.

Interestingly, **exotic birds** pose little threat to populations of native birds. Even though an amazing number of exotic species has been observed free-flying in the state (over **180** species—with 74 of these parrots; +Pranty 2001), the vast majority of these are restricted to urban areas that support few native species. Population sizes of most exotics number no more than a few dozen individuals each (e.g., +Pranty and Epps in review). Only three species of exotic birds in Florida are known to be directly impacting native species: cavity-nesting European Starlings that compete with woodpeckers, House Sparrows that apparently compete locally with Eastern Bluebirds, and breeding populations of Mallards that hybridize with Mottled Ducks +(Moorman and Gray 1994). For the Mallard, eradication efforts seem to be justified to prevent the extirpation of a native species of waterfowl. It has been estimated that at least 5% of Florida’s Mottled Ducks contain Mallard-like plumage characteristics +(Moorman and Gray 1994). Furthermore, +Moorman and Gray (1994) warn that, “if no preventative management action [against feral Mallards] is taken, the Mottled Duck as a discreet entity has a questionable future.” Exotic birds are prevalent in virtually all of Florida’s IBAs, usually the same two to three species—Rock Dove, Eurasian Collared-Dove European Starling, and/or House Sparrow. Everglades National Park (the largest IBA in Florida) contains the largest number of exotic birds—12 species—but perhaps only the European Starling is a regularly breeding species. Overall, 37 species of exotic birds have been reported within the boundaries of Florida’s IBAs, but no site nominator considered any of these species to be a threat.

Exotic plants are a catastrophic problem in the state (primarily the southern half of the Peninsula), posing the second-greatest threat to native species and ecosystems. Excepting Hawaii, Florida is plagued with the most severe exotic plant problem in the United States, with more than \$75 million spent annually on their control. It has been estimated that over 25,000 species of exotic plants have been brought into Florida, primarily as ornamentals, and 1200 of these are reproducing on their own. Sixty-five species are ranked as

Category 1 exotics, meaning they have the greatest potential to replace native communities. Over 1.5 million acres (600,000 ha) of the state currently are infested with exotic plants (Florida Department of Environmental Protection website: <<http://www.dep.state.fl.us/secretary/comm/2001/01-214.htm>>). The most serious of these are the ♦punktree (*Melaleuca quinquenervia*), ♦Brazilian pepper (*Schinus terebinthifolius*), ♦Australian-pine (*Casuarina* spp.), ♦Japanese climbing fern (*Lygodium japonicum*), and ♦common water-hyacinth (*Eichhornia crassipes*). Punktree is by far the most serious exotic, converting huge amounts of Everglades marshland into dense monotypic forests. Nearly half of Loxahatchee National Wildlife Refuge's 145,000+ acres (58,000+ ha) are infested by punktree. To date, over 2.4 million punktrees have been removed from the Refuge, but these efforts are grossly insufficient: punktree invades an estimated 10 acres (4 ha) of Refuge lands *every day* (<<http://loxahatchee.fws.gov/Biology/exotics.asp>>). Japanese climbing fern is a recent invader to southern Florida; coverage by this species increased 328% in four years, from 25,000 acres (10,000 ha) in 1993 to 107,000 acres (42,800 ha) in 1997 (Loxahatchee National Wildlife Refuge website). Funding for control of invasive exotics in Florida is inadequate, assuring that additional areas will become infested. Federal and State agencies hope for a 25% reduction of invasive exotics within National Park Service lands in Florida by 2010 (Florida Department of Environmental Protection website), with total eradication seemingly impossible. +Curnutt (1989) documented a greatly reduced avian diversity, and lower overall breeding densities, in a mature Brazilian pepper stand at Everglades National Park compared to adjacent native habitats.

Ground-water extraction from wellfields was listed as minor threats to two IBAs in Pasco County: Central Pasco and Starkey Wilderness. Florida's explosive growth has far exceeded its ability to provide sufficient water to its residents without negatively impacting the environment. Unfortunately, Florida's state and municipal governments repeatedly have chosen to damage the environment rather than to control growth. Excessive wellfield pumping is not limited to wellfields in Pasco County, but three of its wellfields were the only ones in the state that were nominated as IBAs. Until alternate sources of drinking water become available (e.g., desalination, or reuse of treated wastewater), then wellfields will continue to impact local wetlands. On the other hand, wellfields assure that tens of thousands of acres (thousands of hectares) of habitats will never be developed, and they serve as significant conservation areas in Pasco County and elsewhere.

Habitat succession is a concept that is poorly understood by the public, but is a serious problem in Florida. Put simply, habitat succession is the process where one plant community changes to another over time, from either natural or human causes. When land is cleared, for instance, it quickly "succeeds" from a plot of bare sand to a weedy field, then eventually to some type of forested habitat if not grazed, mowed, or cleared again. Habitat succession is a natural process, but one that has been altered drastically by humans. In Florida, which receives more lightning strikes than any other region in North America +(Chen and Gerber 1990), most upland habitats evolved *with* fire, and many of the state's plants and animals *require* fire periodically for their reproduction and survival. Previously, fires in Florida might burn for several days or weeks, burning tens of thousands of acres (or hectares). In some areas, the same site might have burned annually or nearly so for hundreds of years. By building roads, fire breaks, and other structures, humans have substantially reduced the frequency that any patch of habitat can burn, causing habitat succession on a massive scale. Habitats historically maintained in open conditions now have succeeded to dense forests with extensive under- and mid-story vegetation, or to areas densely grown to shrubs. It is no coincidence that some of Florida's most imperiled birds (e.g., the Red-cockaded Woodpecker, Florida Scrub-Jay, and "Florida" Grasshopper Sparrow) are those that require fire, and have declined severely in its absence.

Human disturbance: Virtually all coastal areas that contain beach habitats—including those within Florida's IBAs—suffer from severe and frequent disturbance by humans and unleashed dogs. It seems to be an irresistible impulse to many people for themselves, their children, or their dogs to intentionally and repeatedly flush roosting or foraging flocks of shorebirds or larids. At some sites, these flocks are

disturbed dozens to perhaps hundreds of times each day. At important sites where coastal species congregate, fencing, signage, and education are necessary to keep out humans and their dogs. When these deterrents fail to protect birds (e.g., when dog owners ignore signs and/or leash laws), then enforcement becomes necessary. Unfortunately, enforcement is sparse or lacking at most coastal areas where birds are disturbed frequently—even Critical Wildlife Areas designated by the Florida Fish and Wildlife Conservation Commission are not patrolled to discourage disturbance. Other coastal areas (e.g., wading bird rookeries on keys) are disturbed by adjacent boat or jet-ski traffic, or from boaters who anchor too close to nesting colonies. Inland sites also suffer from human disturbance. Perhaps most notably, airboaters damage lakes and other wetlands throughout the state, and cause great disturbance to waterfowl and flocks of wintering coots. Airboaters also were blamed for the abandonment of the largest Swallow-tailed Kite roost in North America; fortunately, the birds moved to a nearby site not impacted by airboats.

Monofilament fishing line was listed as a serious threat at several coastal IBAs that support Brown Pelican and/or wading bird rookeries. With the number of people who fish off bridges and piers, under which Brown Pelicans and other species fly, these birds often get hooked, and uneducated people often let the bird fly away while still hooked and trailing a length of fishing line. When these birds return to the rookery, they and others can become entangled in the line and die from strangulation or starvation. Monofilament fishing line removal is an annual event at many coastal wading bird rookeries. (If you are fishing and hook a bird, *do not cut the line*. Rather, reel in the bird, push the hook through the skin, cut off the barb, and back out the remainder of the hook through the wound. Once the hook is removed, release the bird if it appears uninjured, or turn it over to a wildlife rehabilitation center if the wound appears serious).

Organochlorine pesticide residues present in soils were listed as a serious threat at Lake Apopka Restoration Area, where over 18,000 acres (7200 ha) of farmland have been purchased in recent years to clean up Lake Apopka and to restore large areas of former marshland along its northern shoreline. The possibility of pesticide-contaminated fields at Belle Glade resulted in this site being rejected as an IBA, despite the huge numbers of wading birds and shorebirds that use the fields regularly in summer and early fall (e.g., Sykes and Hunter 1978). Pesticides may pose threats to other farmland restoration projects ongoing or planned in Florida. (Although the most harmful organochlorine pesticides—e.g., DDT and its breakdown products DDE and DDD, toxaphene, and dieldrin—have been banned for several years to a few decades, they may persist in lethal amounts in muck soils for many years).

Poaching was listed as a minor threat to the Wakulla Springs potential IBA. Although no other nominator mentioned poaching, it likely occurs on many public and private lands in the state.

Raccoons were considered a serious threat at a few coastal islands that support colonial water bird rookeries. Because they are capable of killing adult birds as well as eating their nestlings and eggs, even a single raccoon can cause the abandonment of large rookeries. Colonial water birds seek out islands as nesting areas because they usually are free of terrestrial predators, but during extremely low tides, some islands are connected to the mainland—or islands already occupied by raccoons—which allows for raccoons to invade new islands. Raccoons found on islands that support significant pelican and/or wading bird rookeries are removed as quickly as possible.

Runoff is water pollution from any of several sources. Residential and commercial runoff may contain chemicals such as pesticide residues or motor oil, while agricultural runoff is rich in nutrients such as phosphorus and nitrogen. When this nutrient-rich water runs into lakes, it can cause “blooms” of algae, cattails, or other undesirable plants, and can create serious water-quality problems. Runoff was listed as a minor threat to many of Florida's IBAs, and a severe threat to two: Alachua Lakes and Lake Okeechobee. Lake Apopka, northwest of Orlando, was the most polluted water body in Florida, following decades of

abuse by the agricultural industry, but the farms were bought out by 1999, and the lake slowly is recovering.

Sea-level rise was listed as severe threats to four IBAs: Duval and Nassau Tidal Marshes, Everglades National Park, Great White Heron National Wildlife Refuge, and Key West National Wildlife Refuge. In all these cases, a significant rise in sea levels due to global warming could inundate substantial portions of these areas, or allow their succession to another habitat (e.g., much of the marshland of Everglades National Park may succeed to mangrove forests, while existing mangroves in the Keys may be completely inundated). The U.S. Environmental Protection Agency's Florida webpages (<http://www.epa.gov/globalwarming/impacts/stateimp/florida/index.html>) contains much useful information. The average annual temperature at Ocala during 1892–1921 was 66°F; during 1966–1995 it was 69°F. A climactic model predicts an additional 3–4° rise in temperatures in Florida by 2100. Increased temperatures worldwide are causing rising sea levels. In southern Florida, sea levels have risen about 12 inches (30 cm) since 1846, and are currently rising 8–16 inches (20–40 cm) per century. This rate is 6–10 times faster than the rate of sea-level rise during the previous 3000 years (EPA website). A sea-level increase of 20 inches (50 cm) over the next 100 years will involve potentially catastrophic losses of land, wildlife, and human structures in Florida. Rising temperatures are also expected to alter the forest composition of the state, especially if changes in precipitation amounts and timing also occur.

Timber harvesting was considered a severe threat at Camp Blanding, and a minor threat in the Red Hills Ecosystem. In the former case, salvage logging of dead pines was believed to be impacting cavity breeders, especially “Southeastern” American Kestrels. In the Red Hills, there was a concern that shorter harvest rotations would reduce the amount of Red-cockaded Woodpecker habitat. Timber harvesting probably is impacting other IBAs as well.

LIMITATIONS OF THE IBA PROGRAM

Despite its successes around the world with habitat protection, monitoring of bird populations, and greater citizen awareness of conservation, the IBA Program by itself cannot accomplish all the goals of preserving bird populations. Furthermore, limitations related to IBA methodology are inherent within each program, including such issues as site selection criteria and boundary designation. Below are some aspects that may be considered limitations of the Florida IBA Program.

1. Of the two primary methods for designating IBAs that support listed species, one is to select the top 5–10 sites most important to a particular species or group (e.g., Red-cockaded Woodpeckers or waterfowl). The other method, which was used in Florida, was to designate any site documented to support 1% or more of the state population of any listed species. Although one might have thought that this would result in hundreds of IBAs in Florida, surprisingly it did not. Perhaps one reason for this is that only *nominated* sites were designated as IBAs. During 2001 and even into mid-2002, statewide GIS coverages, databases, and survey reports for several listed species were supplied to the IBA Coordinator by Federal or State biologists. Rather than nominate (literally) a few dozen additional IBAs based on the “1% criterion” well into the manuscript preparation phase of the Program, the Coordinator chose to add only those that seemed most important. As examples, a review of the Bald Eagle GIS coverage resulted in Orange Lake being added to the Alachua Lakes IBA, several thousand acres (and ha) of private lands on the north side of Lake Marian were added to the Osceola Flatwoods and Prairies IBA, and a 1-mile (1.6 km) buffer was drawn around the shoreline of Lake Tohopekaliga.
2. Colonially-breeding species and winter-flocking species are emphasized heavily within IBAs simply because large numbers are easy to count, whereas Neotropical migrants and other non-colonial species are far less represented. However, it is believed that our approach of choosing large areas of

natural habitat within IBAs has allowed significant numbers of virtually all of Florida's native bird species to be protected within the state's IBAs, even if these species or groups are not mentioned specifically in the IBA accounts.

3. Some population data used in Tables 1 and 4 were gathered in the 1970s or 1980s and probably are outdated. The 1983 statewide estimate of 1600 pairs of Ospreys, for example, likely is an underestimate of current numbers. The increase in Bald Eagle nests in the past 20 years may support this belief. During 1980–1984, the mean number of eagle nests in the state was 362 (range of 340–378), but the number of nests in 2001 was 1102 +(Nesbitt 2001b). The elimination of DDT and other organochlorine pesticides presumably is responsible for this increase, and it seems likely that Florida's Osprey population has rebounded similarly. The statewide estimate of Wilson's Plovers (>300 birds), a species never formally censused in the state, also seems to be an underestimate. *The data in Table 1 perhaps can be used to prioritize the list of species for which current statewide population data should be determined.*
4. Statewide populations of some colonial breeding species vary considerably from one year to the next, often due to weather-related events (e.g., during years of extreme drought, wading birds may leave Florida to nest farther north). As a result, the percentage of the statewide population occurring within IBAs (Table 4, page 32) exceeded 100% for several species. For species whose breeding populations were restricted to IBAs (e.g., most larids), we used IBA data to determine the statewide population. For other species (e.g., White Ibis), we used the most recent population data to determine the percentage of the population found within IBAs, even if this figure is greater than 100%.
5. Based upon data summarized in Table 4, it is clear that the IBA Program failed to adequately “cover” a few species. Of the 40 species or subspecies included in Table 4, IBAs account for less than half of the statewide populations for 14 species, and less than 25% for 4 species (Short-tailed Hawk, 6%; Crested Caracara, 23%; “Florida” Sandhill Crane, 7%, and Burrowing Owl, 0%). The lack of significant populations of Burrowing Owls within IBAs can be explained by the tendency for owls to use human-modified habitats (which generally were ignored by the IBA selection process) and probably insufficient surveys on some several large properties that likely support significant populations (e.g., Kissimmee Prairie Preserve State Park). The small percentage of the populations of the Short-tailed Hawks, Crested Caracaras, and “Florida” Sandhill Cranes within IBAs may also reflect insufficient data from large properties, but future IBA site-selection efforts in Florida should keep these species in mind.
6. Because site nominations were being received at a slow rate—far too slowly to finish the initial site selection period on schedule, a “top-down” approach eventually was taken. Using this method, the Florida IBA Coordinator nominated or “pre-nominated” dozens of sites, and then sought assistance and review from others. For the same reason, a similar “top-down” approach was undertaken in California +(Cooper 2001) and Georgia (J. Wilson pers. comm.). It is hoped that participation in the Florida IBA process will increase now that sites have been selected. Local individuals or groups can volunteer to lead bird walks, assist with bird surveys, or update bird checklists, remove trash or exotic plants and replant native vegetation, lobby politicians to purchase private property adjacent to IBAs, or assist agency staff with site management or improvement in other ways.
7. Some important contributors to the Florida IBA Program were not contacted until shortly before the final manuscript was prepared, which prevented these individuals from contributing significantly to the program. It seems a certainty that other equally important individuals who could have improved this document never were aware of the IBA Program before or during manuscript preparation. It is hoped that these and other individuals will offer their assistance with future IBA site selection efforts in Florida.

FLORIDA IBAS BY COUNTY

Alachua

Alachua Lakes, Goethe State Forest, Kanapaha Prairie, Paynes Prairie Preserve State Park, San Felasco Hammock Preserve State Park

Baker

Osceola National Forest–Okefenokee and Pinhook Swamps

Bay

Bay County Beaches

Bradford

No nomination submitted

Brevard

Brevard Scrub Ecosystem, Cape Canaveral–Merritt Island, St. Johns River National Wildlife Refuge, St. Sebastian River State Buffer Preserve, Turkey Creek Sanctuary, Upper St. Johns River Basin, William Beardall Tosohatchee State Reserve

Broward

Northern Everglades, Southern Atlantic Migrant Stopover

Calhoun

No nomination submitted

Charlotte

Babcock–Webb

Citrus

Chassahowitzka–Weekiwachee, Citrus County Spoil Islands, Crystal River Tidal Marshes, Withlacoochee–Panasoffkee–Big Scrub

Clay

Camp Blanding–Jennings

Collier

ABC Islands, Big Cypress Swamp Watershed, Big Marco Pass, Corkscrew Swamp Watershed, Ten Thousand Islands National Wildlife Refuge

Columbia

Osceola National Forest–Okefenokee and Pinhook Swamps

De Soto

Myakka River Watershed

Dixie

Big Bend Ecosystem

Duval

Duval and Nassau Tidal Marshes, Huguenot Park–Nassau Sound, Northern Atlantic Migrant Stopover

Escambia

Gulf Islands National Seashore and adjacent areas

Flagler

Lake Disston, Northern Atlantic Migrant Stopover

Franklin

Apalachicola and Tates Hell Forests, Dog Island–Lanark Reef, Greater Apalachicola Bay

Gadsden

No nomination submitted

Gilchrist

No nomination submitted

Glades

Fisheating Creek Watershed, Kissimmee Lake and River, Lake Okeechobee

Gulf

St. Joseph Bay

Hamilton

No nomination submitted

Hardee

Highlands Hammock–Charlie Creek

Hendry

Lake Okeechobee

Hernando

Chassahowitzka–Weekiwachee,
Withlacoochee State Forest

Highlands

Avon Park Air Force Range–Bombing
Range Ridge, Buck Island Ranch, Fisheating
Creek Watershed, Highlands Hammock–
Charlie Creek, Kissimmee Lake and River,
Lake Istokpoga, Lake Wales Ridge

Hillsborough

Cockroach Bay–Terra Ceia, Hillsborough
Bay, Lower Tampa Bay

Holmes

No nomination submitted

Indian River

St. Sebastian River State Buffer Preserve,
Upper St. Johns River Basin

Jackson

No nomination submitted

Jefferson

St. Marks National Wildlife Refuge

Lafayette

No nomination submitted

Lake

Green Swamp Ecosystem, Emeralda Marsh,
Lake Apopka Restoration Area, Lake Wales
Ridge, Ocala National Forest–Lake George,
Wekiva–Ocala Greenway, Wekiwa Basin
GEOpark

Lee

Babcock–Webb, Corkscrew Swamp
Watershed, J.N. “Ding” Darling National
Wildlife Refuge, Little Estero Lagoon, Pine
Island National Wildlife Refuge

Leon

Apalachicola and Tates Hell Forests, Lake
Lafayette

Levy

Big Bend Ecosystem, Goethe State Forest

Liberty

Apalachicola and Tates Hell Forests

Madison

No nomination submitted

Manatee

Cockroach Bay–Terra Ceia, Lower Tampa
Bay, Myakka River Watershed, Sarasota
Bay

Marion

Alachua Lakes, Emeralda Marsh, Ocala
National Forest–Lake George,
Withlacoochee–Panasoffkee–Big Scrub

Martin

Lake Okeechobee, Loxahatchee River and
Slough

Miami-Dade

Big Cypress Swamp Watershed, Biscayne
Bay, Everglades National Park, Northern
Everglades

Monroe

Big Cypress Swamp Watershed, Dry
Tortugas National Park, Everglades National
Park, Florida Keys Ecosystem, Great White
Heron National Wildlife Refuge, Key West
National Wildlife Refuge, Pelican Shoal

Nassau

Duval and Nassau Tidal Marshes, Huguenot
Park–Nassau Sound, Northern Atlantic
Migrant Stopover

Okaloosa

Blackwater River State Forest, Eglin Air
Force Base

Okeechobee

Disney Wilderness Preserve, Kissimmee
Prairie Preserve State Park, Kissimmee Lake
and River, Lake Okeechobee

Orange

Lake Apopka Restoration Area, Lake Mary
Jane–Upper Econ Mosaic, Upper St. Johns
River Basin, Wekiwa Basin GEOpark,
William Beardall Tosohatchee State Reserve

Osceola

Kissimmee Prairie Preserve State Park, Kissimmee Lake and River, Lake Mary Jane–Upper Econ Mosaic, Lake Tohopekaliga, Lake Wales Ridge, Osceola Flatwoods and Prairies, Upper St. Johns River Basin

Palm Beach

Lake Okeechobee, Loxahatchee River and Slough, Northern Everglades, Southern Atlantic Migrant Stopover

Pasco

Central Pasco, Chassahowitzka–Weekiwachee, Coastal Pasco, Green Swamp Ecosystem, Gulf Islands GEOpark, Starkey Wilderness

Pinellas

Clearwater Harbor–St. Joseph Bay, Gulf Islands GEOpark, Johns Pass, Lower Tampa Bay

Polk

Avon Park Air Force Range–Bombing Range Ridge, Disney Wilderness Preserve, Green Swamp Ecosystem, Kissimmee Lake and River, Lake Hancock–Upper Peace River, Lake Wales Ridge

Putnam

Ocala National Forest–Lake George

St. Johns

Matanzas Inlet and River, Northern Atlantic Migrant Stopover

St. Lucie

No nomination accepted

Santa Rosa

Blackwater River State Forest, Eglin Air Force Base, Gulf Islands National Seashore and adjacent areas

Sarasota

Myakka River Watershed, Oscar Scherer State Park, Sarasota and Roberts Bays

Seminole

Upper St. Johns River Basin, Wekiwa Basin GEOpark

Sumter

Green Swamp Ecosystem, Withlacoochee–Panasoffkee–Big Scrub

Suwannee

Ichetucknee Springs State Park

Taylor

Big Bend Ecosystem, St. Marks National Wildlife Refuge

Union

No nomination submitted

Volusia

Cape Canaveral–Merritt Island, Ocala National Forest–Lake George, Lake Woodruff National Wildlife Refuge, Northern Atlantic Migrant Stopover, Upper St. Johns River Basin, Volusia County Colony Islands, Wekiva–Ocala Greenway

Wakulla

Apalachicola and Tates Hell Forests, St. Marks National Wildlife Refuge, Wakulla Springs

Walton

Eglin Air Force Base, Walton County Beaches

Washington

No nomination submitted

THE IMPORTANT BIRD AREAS OF FLORIDA: 2000–2002

