Colonial Waterbird Populations and Management on Florida’s Gulf of Mexico Coast

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Colonial Waterbird Populations and Management on Florida’s Gulf of Mexico Coast

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Study Area - Florida’s Gulf of Mexico Coast – ~200 miles
Levy County to Charlotte County & N. Lee County
Waterbirds - definitions

Waterbirds include long-legged wading birds, seabirds (gulls and terns), and shorebirds.

Colonial nesters – nest in colonies for behavioral synchrony and mutual defense
  - tree nesting – wading birds
  - beach nesting – gulls, terns, black skimmers

Solitary beach nesters – nest singly, generally on shorelines
  (American oystercatchers, willet, plovers)
Audubon’s Florida Coastal Islands Sanctuaries
Colonial Waterbird Management Program

- 75 year old conservation program
- Annual management of 30 species of colonial waterbirds & seabirds nesting on Florida’s Gulf of Mexico coast
- Approximately >200,000 birds / 100,000 pairs annually, the highest richness of these species in Florida
- Nesting colony protection is critical for successful reproduction
- Post, monitor, survey, manage, & patrol 125 local colonies & coordinate with colony management agencies & volunteers
Audubon’s Florida Coastal Islands Sanctuaries
Colonial Waterbird Management Program

• Annual Program Activities
  • Nesting protection: spring & summer nesting season - Posting, planning, coordination
  • Comprehensive colony protection & project management, habitat restoration projects – throughout year
  • Conservation and policy initiatives – throughout year
  • Survey data allow tracking population trends
Brief history of the colony survey program

- Management program since 1930s, focused on a few colonies
- Sporadic surveys before 1980s
- No coherent regional survey
- First comprehensive survey in Tampa Bay 1984-1985
- Found 22 active bird colonies – at least 11 of which have winked out because they were disrupted or abandoned

- ~59,000 pairs on 5 colonies that no longer support large populations:
  - Fantasy Island 15,000
  - Port Manatee Key 4,000
  - Bayway Spoil 30,000
  - Tarpon Key 2,000
  - Passage Key 7,500
- Birds moved to other colony locations
- Survey area increased in 1990s, found more colonies and added them to the survey schedule
- Widened survey area to more counties, higher level of effort, more partners
Program emphasis on colonial waterbirds – messengers for conservation, indicators of ecological integrity, charismatic wildlife of Florida
Listing Status

USFWS and FWC Listed Species
- Brown Pelican -- SSC
- Snowy Egret -- SSC
- Little Blue Heron -- SSC
- Tricolored Heron -- SSC
- Reddish Egret -- SSC
- White Ibis -- SSC
- Roseate Spoonbill -- SSC
- Wood Stork -- E
- Florida Sandhill Crane -- T
- Whooping Crane – E (Experimental)
- Limpkin – SSC
- Least Tern - T
- Bald Eagle – T
- Snail Kite – E
- Marian’s Marsh Wren – SSC
- Worthington’s Marsh Wren - SSC

Top 20 Common Birds In Decline (Florida)
- American Bittern ↓59%
- Little Blue Heron ↓54%

Watch List Species – RED LIST and YELLOW LIST
- Reddish Egret
Watch List Species
(Partners In Flight & National Audubon Society)

YELLOW LIST

- Snowy Plover
- Wilson’s Plover
- Long-billed Curlew
- Marbled Godwit
- Red Knot
- Sanderling
- Semipalmated Sandpiper
- Gull-billed Tern
- Roseate Tern
- Black Skimmer
- Mangrove Cuckoo
- Red-headed Woodpecker
- Prairie Warbler
- Warbler Migrants
- Prothonotary Warbler
- Painted Bunting
- **Clapper Rail**
- Western Sandpiper
- Nelson’s Sharp-tailed Sparrow
- Northern Bobwhite
- Horned Grebe
- **Little Blue Heron**
- Northern Harrier
- Peregrine Falcon
- **Limpkin**
- American Oystercatcher
- American Avocet
- Lesser Yellowlegs
- Whimbrel
- Dunlin
- Short-billed Dowitcher
- Wilson’s Snipe
- Common Tern
- Burrowing Owl
- Chuck-will’s Widow
- Whip-poor-will
- Loggerhead Shrike
- Brown-headed Nuthatch
- Grasshopper Sparrow
Watch List Species
(Partners In Flight & National Audubon Society)

RED LIST

- Mottled Duck
- Magnificent Frigatebird
- Reddish Egret
- Black Rail
- Whooping Crane
- Piping Plover
- Least Tern
- Ivory-billed Woodpecker*
- Florida Scrub-Jay
2011 - Colonial wadingbird and seabird colonies – 10 county area – 125+ active colonies annually
Waterbird seasonal activity cycle

Nesting

Courtship

Fledging

Aggregation

Dispersal
Nomadism vs. migration

- Regional waterbird populations are not migratory; instead, they are nomadic – centered on nesting colonies during the nesting season, and searching for forage the rest of the year.

- Least terns, most shorebirds – migrate annually.

- White pelicans – breeding adults migrate, non-breeding young birds may over-winter.
What do waterbirds need to complete the cycle?

- **Food** – the right forage – aquatic and terrestrial macro-invertebrates (larvae & adults) & **SMALL** fish

- **Water** – quantity and quality; young may need or benefit from freshwater, even though adults are estuarine nesters

- **Cover** – for nesting, hiding, & foraging

- **Space** –
  - Home range – generally not defended by waders
  - Territory – defended nest site
And, for successful nesting – birds need no disturbance, no predators
Food

- Each species requires the right forage –

Need foraging opportunities optimal for foraging strategy (visual or tactile feeders) and for leg length

Forage is generally aquatic and terrestrial macro-invertebrates (larvae & adults) & SMALL fish
Foraging Strategies

Several species may forage at the same time, & partition prey

Age groups may partition prey based on foraging adeptness
Foraging strategies vary among species

By target prey and by behavior

By day and by night
Young birds take time to develop foraging abilities

Limpkin adult can forage in much deeper water than chicks

Limpkin adult forages for snails and large invertebrates, the chick is fed tiny invertebrate prey

Young need very shallow littoral zones
Forage availability varies seasonally and with water elevation

Extended littoral zone with mixed graminoids, forbs, shrubs – diverse structure for species with different foraging strategies

Stormwater ponds with dense seed and terrestrial and aquatic invertebrate production
Water

- Species nest in the estuary and the adults tolerate estuarine or marine salinities
- Nestlings of white ibis must be fed freshwater prey
- Young of other species eat both estuarine and freshwater prey
Cover

Provides

Nesting sites
Hiding cover
Foraging opportunity
Variable by species

Reduces energy needs – birds are not flushed continuously
Space

**Home range**
- Wading birds in west-central Florida are generally not migratory
- Nomadic during the non-nesting period, focused on the nesting colony during the nesting period

**Territory**
- The nest and area defended around the nest – size varies for each species
Airports

Summary of airports by type in the 10 county area of west-central peninsular Florida.
7 categories, 29 airports
## 29 Airports in 10 counties - west-central Florida

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Primary Commercial Service

Hillsborough County
Tampa International Airport

Pinellas County
St. Petersburg – Clearwater International Airport

Sarasota County
Sarasota-Bradenton International Airport

Charlotte County
Charlotte County Airport – Punta Gorda

Lee County
Southwest Florida International Airport – Ft. Myers
Non-Primary Commercial Service

Lee County
Naples Municipal Airport
Reliever Airports

Hillsborough County
Peter O. Knight Airport
Tampa Executive Airport (Vandenberg Airport)

Polk County
Lakeland  Linder Regional Field – Lakeland

Pinellas County
Clearwater Air Park – Clearwater
Albert Whitted – St. Petersburg

Charlotte County
Page Field – Ft. Myers
Venice Municipal Airport - Venice
General Aviation Airports

Citrus
Inverness Airport – Inverness

Hernando County
Hernando County Airport – Brooksville
Winter Haven’s Gilbert Airport – Winter Haven

Polk County
Bartow Municipal Airport – Bartow

Hillsborough County
Zephyrhills Municipal Airport – Zephyrhills
Plant City Airport – Plant City
Other Public Use Airports (not NPIAS listed)

Hernando County
Pilot Country Airport – Brooksville/Spring Hill
Jack Brown’s Seaplane Base – Winter Haven

Polk County
South Lakeland Airport - Lakeland

Pasco County
North Tampa Aero Park – Wesley Chapel

Manatee County
Airport Manatee – Palmetto

Charlotte County
Shell Creek Airpark – Punta Gorda
Military Airports

Hillsborough County
MacDill Air Force Base
Notable Private-use Airports

Pasco County
Hidden Lake Airport (Hidden Lake Estates) – New Port Richey

Polk County
*Fantasy Of Flight - Lakeland

Charlotte County
Buckingham Field (Lehigh Acres) – Ft. Myers
All airports – 10 county area
At the landscape level, what is the positional relationship of airports and waterbird colonies, what is the seasonal distribution of the bird population, and what are potential bird movements based on seasonal habitat needs?

Bird distribution and activity varies by species and seasonally - movements are related to species-specific habitat needs and behaviors.
All bird colonies and airports – 10 county area
Example - Polk County

5 Airports
Lake Linder
Bartow
South Lakeland
Fantasy of Flight (private museum)

3 Colonies
• Circle B Bar Preserve – small herons and egrets
• Lake Somerset
  400 wood storks, plus white ibis, small herons and egrets, anhingas, roseate spoonbills, brown pelicans
• Lone Palm Country Club – wood storks, small herons and egrets
Landscape level relationship of airports and bird colonies in Polk Co.
Tampa Bay area (Hillsborough and Pinellas Counties) has a much denser landscape level bird population.
Hillsborough Bay – Alafia Bank Bird Sanctuary is the most important colonial wadingbird colony on the west-central coast – 10,000-15,000 pairs (mixed spp.) annually
Predicting habitat use

Waterbird movements are partially predictable in the landscape context in non-migratory populations, based on the season. Movement is related generally to locating a nest site (colony position), nesting and raising young, and foraging. When the young are in the nest the adults forage and return to their nest and incubating partner. After the young fledge, adults and young disperse until the next nesting season. Then, movements are nomadic, focused on foraging and building body condition for the next nesting cycle.

The type of prey selected may change with the age of the young, prey availability, and the hydrological cycle. Prey bloom occurs with seasonal rains.

The most efficient foraging is in shallow water / shallow ponds where prey is trapped and rapidly acquired. The target is prey, not water.
Natural vs. man-made wetland types – functional equivalents

Natural wetland types

- Rivers – flowing water in freshwater zone; examples: Hillsborough River, Alafia River
- Streams - tributaries to rivers, narrow and shallow
- Lakes – large ponded water bodies
- Ponds – persistent, small ponded water bodies
- Prairie ponds – ephemeral, short hydroperiod wetlands
- Cypress domes – unique, forested wetlands with short hydroperiod to extended flood period

Man-made wetland types

- Old phosphate mines – fingers or islands of unexcavated material left where bird colonies can develop
- Borrow pits – often seen near roadway construction
- Stormwater ponds – industrial, commercial, and residential water retention for stormwater control, some with islands
- Water hazards – ponds on golf courses
- Ditches – linear drainages moving stormwater, replace natural creeks and streams
Commuter Notes

- Colony size varies – a few pairs to 100s to 1,000s
- Species in the colony varies – 1-many
- Flying elevations vary depending on activity – some examples:
  - White pelicans – migrants and over-winter, 4,500-5,000 <10,000 ft AGL when migrating, 800-3,000 ft soaring and moving, looking for forage – schools of fish
  - Wood storks – soar at 800-1,200 ft, single birds at 5,000-6,000 ft
  - Waterbirds – most waders fly low to foraging sites – about 500 ft
  - Passerines – often 5,000-6,000 ft in migration – the Tampa Bay area is a migration funnel
  - Moorhens / coots – poor flyers, commonly flushed from a pond and slowly climbing to 100-200 ft
Study: Roseate spoonbill foraging in the Tampa Bay watershed

- Alafia Bank Bird Sanctuary ~50% of Florida’s Roseate Spoonbills;
- Terra Ceia Bay: Washburn & Washburn Jr.;
- Riviera Bay: Coffeepot Bayou Bird Island
- Indian Key NWR
- Clearwater Harbor: I-25
- Foraging: both estuarine and freshwater locations
Ditches provide foraging – replacing natural streams

Cattle Egrets looking for insects

White Ibis digging for invertebrates
Stormwater ponds

Stormwater ponds without cover provide little habitat value – no cover, less forage

Shallow vegetated ponds have good cover at water drawdown, more forage
Emergent and floating aquatic plants have high wildlife value

When ponds have a littoral shelf or very gentle shoreline slope they develop emergent plants around the perimeter – here, a stand of cattails (*Typha latifolia*) is thick enough to provide cover for nesting ducks, moorhens, etc.

Floating aquatic plants provide invertebrate prey, and *Lemna* has 18% protein content plus aufwuchs
Colony substrate is highly variable

- Cypress Creek ELAPP – island in an old borrow pit – elderberry, red maple, dying cypress, and Carolina willow
- Myakka River wood stork colony on island
- Lake Somerset – unmined fingers in an old phosphate pit
Night Roosts

• About 125 birds roosting 05:45 in trees at Lake Platt
• Birds roost safe from predators high in trees over water
• Wintering roosts when not nesting
• Night roosts may develop into nesting colonies if suitable habitat, no predators, and no disturbance
Summary

- Monitoring of nesting colonies guides timely & appropriate management responses.
- Audubon worked with partners, agency staff, & volunteers to protect nesting habitat for 95+% of the regional waterbird population.
- Long-term data now can be used to respond to regional planning needs, including landscape-level airport safety evaluations.
- Data coupled with remote sensing is a powerful tool.
Program Results

75 Years in Tampa Bay
• Long-term conservation of viable bird populations, institutions that effectively manage and protect local populations, and a public that understands and supports measures needed to secure habitats.

Looking Forward
• Ecosystem conservation initiatives and colony protection directly involves volunteers, agencies, and the public to protect regional bird colonies and habitat for >200,000 colonial waterbirds of 30 species, including 14 listed species.
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Audubon of Florida
Thank you to our many partners

- Audubon Chapters
- Southwest Florida Water Management District
- Manatee County Port Authority
- Florida Parks Department
Questions?