Conservation Planning Services and Project Reviews

February & March 2020

Christine Raininger, Land Use Planning Program

Office of Conservation Planning Services

Conservation Planning Services

Land Use Planning: 18 staff

•All land/water-use changes in state that have the potential to affect resources (property, activities, species)

•Public and private sources

•Avoidance and Minimization

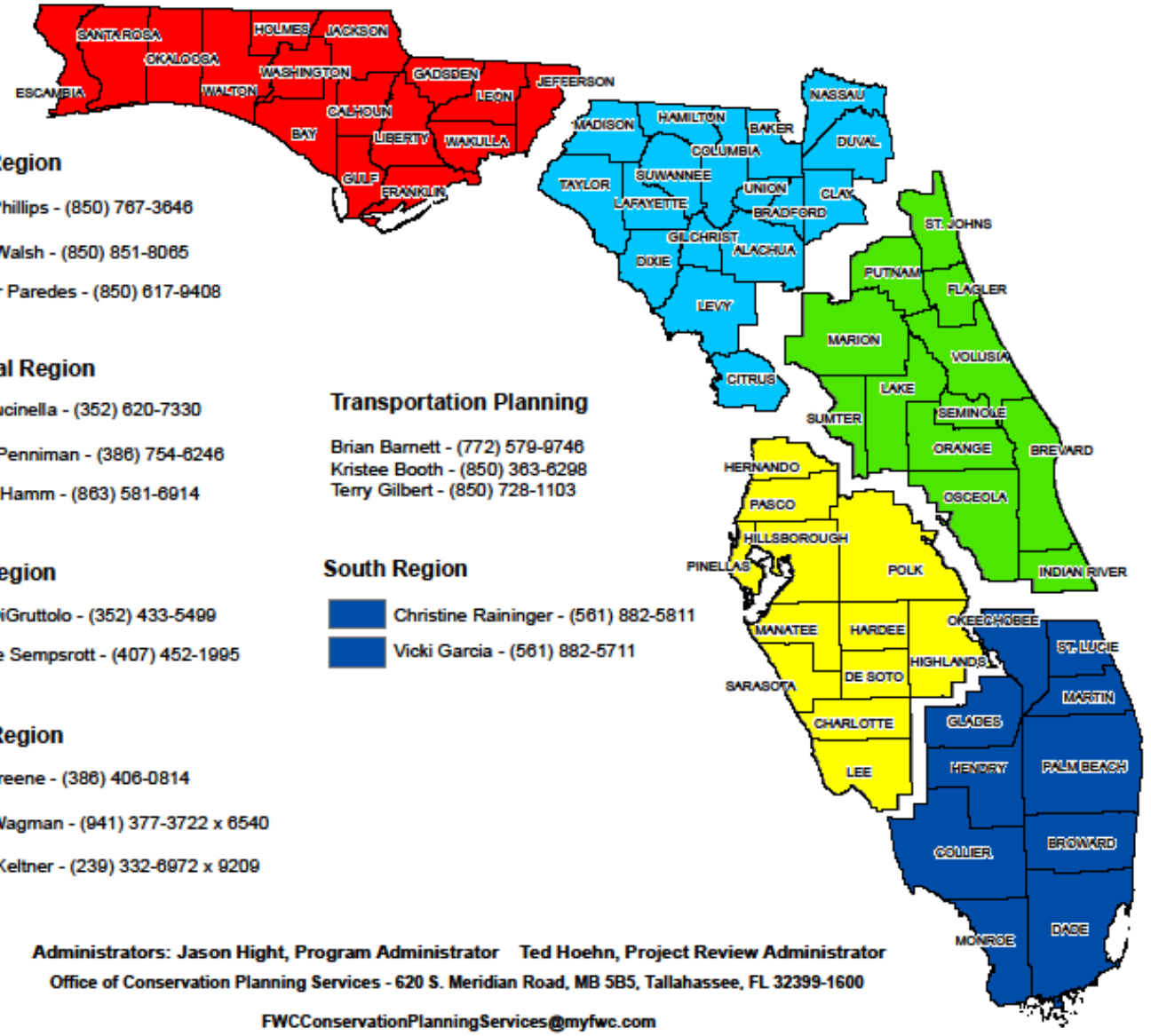
Landowner Assistance: 18 staff

- Private landowner technical assistance
- Habitat management
- Financial assistance

Conservation Planning Services

- Florida: the FWC is a state review agency and referenced in 38 different rules/statutes
- Federal: USACE, USFWS, DOI, Armed Forces, CZMA/FCMP
- Review projects with or without a federal nexus
- Proactive technical assistance
- Provide permitting guidance

Office of Conservation Planning Services - Land Use Planning - Staff Contacts



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Administrators: Jason Hight, Program Administrator Ted Hoehn, Project Review Administrator

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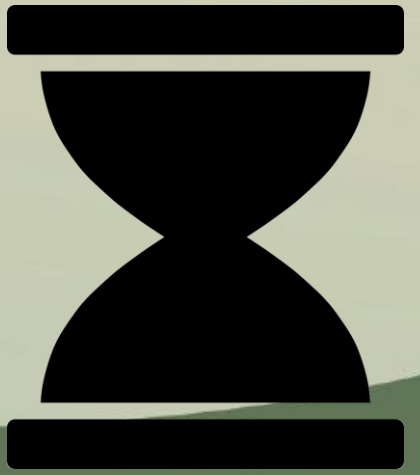
FWCConservationPlanningServices@myfwc.com

Conservation Planning Services

- OCPS facilitates this agency function for the FWC
- OCPS also manages the FWC Log that supports this process
- Division/Office lead reviewers
- Land Use Planning is lead on the majority of the reviews
- OCPS Leadership Team

FWC's Project Review Process

- All coordinated through the Conservation Planning Services Leadership Team
- Projects are received through a "general correspondence" inbox
- Projects are screened for appropriateness and logged into the database
- GIS analysis run for each project logged
- Lead reviewer assigned for each project



FWC's Project Review Process

- Technical assistance
  - External - Publicly available information and technical resources, other state and federal agencies
  - Internal – species data, SME collaboration, ISMP
- Identify potential for listed species habitat onsite
- Work on survey guidance and site/project plans WITH applicant – avoidance, minimization, and mitigation
- Requires *constant* internal collaboration to provide an agency opinion

Federal Partners

Federal Agencies - Fish and Wildlife Coordination Act

State Clearinghouse - Coastal Zone Management Act/Florida Coastal Management Program

US Army Corps of Engineers

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

FERC Federal Energy Regulatory Commission

NRCS

State Partners

- Other State regulatory or review agencies requesting or requiring FWC's review
- Relationships range from a need to know basis to long-standing partnerships

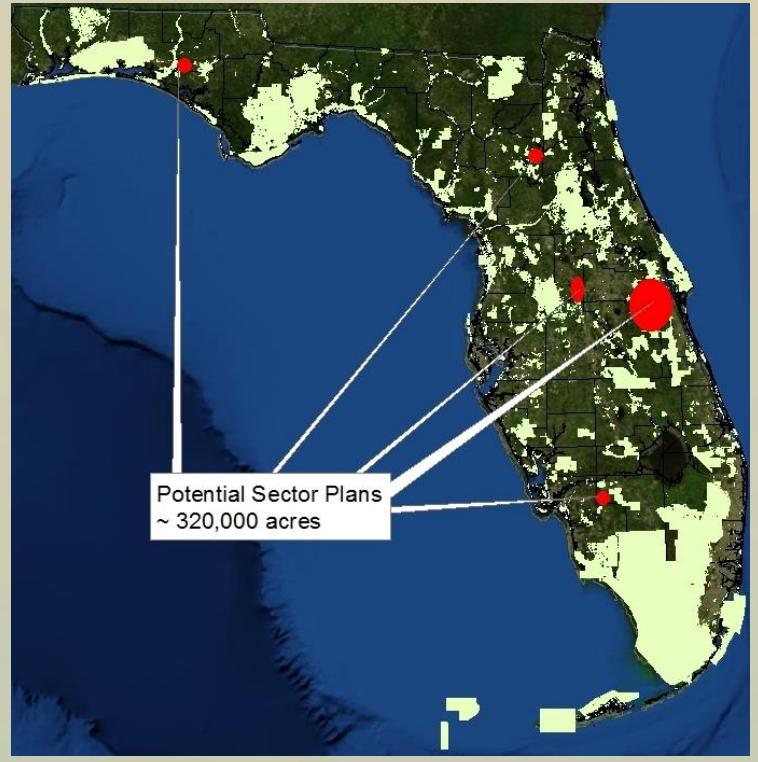

Conservation Planning Services

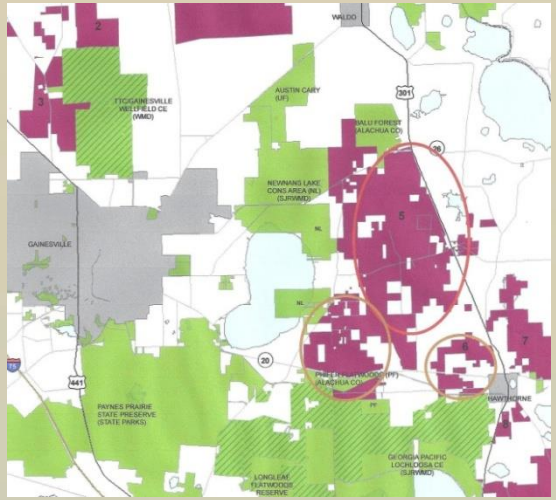
Growth Management

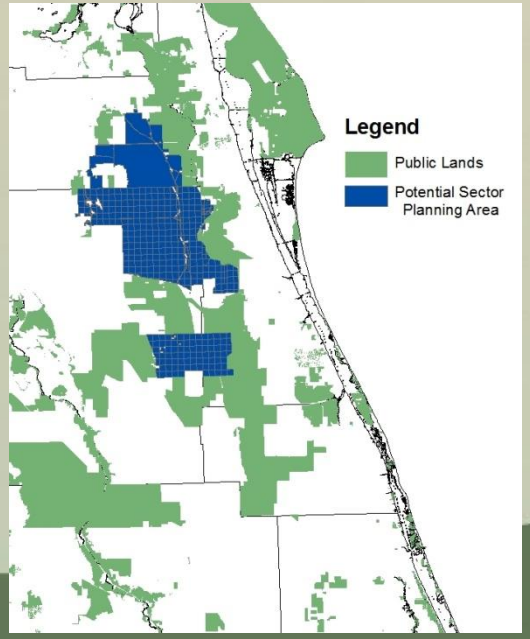
- LUP coordinates with landowners on ~750,000 acres per year

- Working closely with landowners and local governments on fish and wildlife issues

- Working to keep connections between public conservation lands







Conservation Planning Services

- Local or regional land use changes: Sector Plans
- Commercial/residential/industrial development
- Oil/Gas Exploration: terrestrial and marine geoseismic
- Roadway projects: FDOT and local
- Energy: Sites and corridors
- Mining and reclamation

Stakeholder Engagement

Private Citizens and General Public

- Do we know about it?
- What do we want to do?

Non-governmental or Non-profits

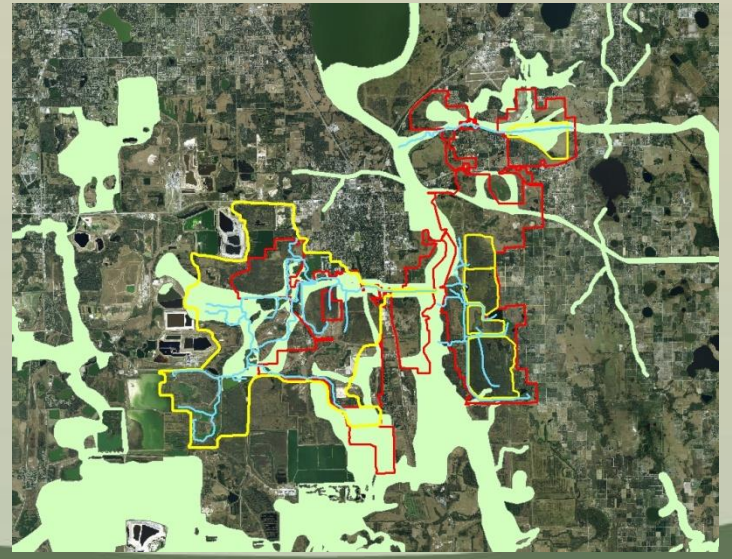
- Formal correspondence
- Discussions in public forums
- Discussions in interagency meetings

Reclamation and Restoration

- Work with large corporate landowners to minimize impacts of their operations
- Recommendations and incentives for reclaiming or restoring the native plant communities
- Mining, power, military, agriculture







FWC Roles

- The FWC is not the agency issuing the permits 95% of the time
- With 34 different rules or statutes mentioning the FWC in state processes - we can always provide information on fish and wildlife resources (almost!)
- We mostly *influence* permitting conditions and recommendations, including mitigation.
- Federal regulations like 33 CFR 332.8(b) REQUIRE the FWC to be involved in interagency review teams.
- Review teams are general practice for many other types of state and local project reviews.

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  Land Use Planning Program
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- Christine Raininger, Biological Scientist IV
  Land Use Planning Program
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Questions?

Process for FWC Review of FDOT Projects

The FWC is an active participant in several routine transportation project review processes.

- Efficient Transportation Decision Making (ETDM)
- Alternative Corridor Evaluation (ACE)
- Project Development & Environment Study (PD&E)
- Public Conservation Lands Involvement
- Permits

FWC is one of more than 30 members of FDOT's Environmental Technical Advisory Team (ETAT) which includes:

- Federal Agencies
- State Agencies
- Local Governments
- Native American Tribal Governments

Efficient Transportation Decision Making

As part of the Environmental Technical Advisory Team, FWC provides comments on each project run through the ETDM process

How do we review a project, and what elements are most important?

- Most important: the GIS data layers in the Environmental Screening Tool
- Specifically, the data layers in the “Natural “ layer category, which includes the sub-topics:
  - Coastal and Marine
  - Floodplains
  - Geology
  - Land Cover
  - Soils
  - Water Quality and Quantity
  - Wetlands and Surface Waters
  - Wildlife and Habitat

Other routine elements of FWC ETDM reviews

- Aerial and ground-level photography – Google Earth, Street View
- Consult with other FWC staff who are Subject Matter Experts in
    - Fish and wildlife species
    - FWC Management Areas
    - Specific geographic areas (river basins, the Everglades, estuaries, counties, etc.)
    - Agency proprietary interests via fee title ownership or conservation easement
    - Protected species Incidental Take Permits
- Consult with other review agencies, such as the U.S. Fish and Wildlife Service
- Field surveys of selected projects

Draft Memo

Sent to Subject Matter Experts for Review

Final Memo

Sent to FWC official ETAT members

Comments are entered in the ETDM EST

Primary FWC ETDM Project Concerns

- Fish and wildlife habitats that will be impacted, both directly and indirectly
- Fish and wildlife resources, especially listed species, that could be impacted
- Potential for increased habitat fragmentation
- Impacts on wildlife corridors
- Potential for wildlife roadkill

Primary FWC ETDM Project Concerns (cont.)

- Need and appropriate location of wildlife crossings to maintain habitat connectivity and reduce roadkill
- Impacts on public conservation lands, either directly (taken for right-of-way) or indirectly (reduced ability for controlled burning, etc.), with special attention given to impacts on FWC management areas and conservation easements
- Impacts on proposed conservation lands such as Florida Forever or CERP projects
- New public conservation lands that could be acquired as mitigation

Alternative Corridor Evaluation (ACE)

- FDOT identifies multiple feasible corridors for a road project
- An ACE report is prepared and circulated to the ETAT members for review
- Goal is to narrow the list of alternatives for further examination in the PD&E Study
- FWC reviews and compares the alternative corridors using the same criteria as the ETDM process

Project Development & Environment Study

- FDOT's procedure for complying with the National Environmental Policy Act (NEPA) of 1969
- FWC reviews the Natural Resources Evaluation, a part of the PD&E Study that includes a detailed analysis of potential impacts to threatened and endangered species
- For state-funded projects where significant environmental impacts would be expected, a State Environmental Impact Report (SEIR) is prepared, and also reviewed by FWC

Primary FWC NRE Concerns

- Completeness and accuracy of the list of potentially occurring protected species
- Project commitments regarding protected species and their habitats, including pre-construction surveys, further coordination with FWC and USFWS, mitigation for wetlands and species impacts, adherence to species conservation protocols, etc.

Public Conservation Lands Involvement

- If public conservation lands are directly impacted, they must be appropriately replaced
- For state lands, they must be replaced at least at a 1.5 to 1 ratio, with approval of the Governor and Cabinet acting as the Land and Water Adjudicatory Commission FWC is usually involved in the selection process for such mitigation lands
- If the impact is to FWC management areas or conservation easements, we are directly involved in the legal process for mitigation

Permits

FWC Issued Permits

- Most major road projects require FWC gopher tortoise incidental take permits
- For new highways going through lands occupied by several listed species, sometimes a multi-species incidental take permit is required, involving significant acquisition of new conservation lands

Wetland Permits

- All road projects must comply with U.S. Army Corps of Engineers (USACE) permit and state Environmental Resource Permit (ERP) requirements for wetlands and surface water impacts
- USACE permits can involve Section 7 Endangered Species Act Consultation with the U.S. Fish and Wildlife Service for federal listed species, frequently resulting in significant mitigation requirements
- FWC participation in wetlands permit review typically results in FDOT commitments to perform pre-construction surveys for a variety of state-listed species, with requirements for impact avoidance, minimization, and mitigation

Questions?

Florida's Imperiled Species Management Plan
&
Incidental Take Permitting

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ISMP:

comprehensive management plan for state-listed species

- 59 species included
  - 38 state Threatened
  - 21 removed from the List
- Tied to state listing process
- Multiple components
  - Species Action Plans
  - Guidelines
- Rules and Policies
- 10-year plan
- 6 objectives

State-Threatened Species

68A-27.003, F.A.C.

- No person shall *take*, possess, or sell any threatened species, nests, eggs or any part thereof
- Unless authorized by rule, permit, or in a FWC approved management plan or species guideline

State-Threatened Species

American Oystercatcher

Short-tailed Snake

Crystal Darter

Photos: FWC

Species Action Plan Summaries

Florida Burrowing Owl

Athene cunicularia floridana

Photograph by FWC.

The Florida burrowing owl is geographically distinct from burrowing owls occurring in the western U.S. Burrowing owls require well-drained upland habitats, and are typically found at treeless sites with sparse or low-growing vegetation. Because of this, they may be found at airports, golf courses, in some neighborhoods, and at sites cleared for development.

Status

Listed as state Threatened on Florida's Endangered and Threatened Species List.

Conservation Goal

Conservation status of the Florida burrowing owl is improved to a point that the species can be removed from Florida's Endangered and Threatened Species list and will not again need to be listed.

Identified Threats

- Loss of native habitat and the resulting dependence on altered habitat.
- Lack of protected habitat, even for rural burrowing owls.
- Lure of potentially hazardous habitat, such as predevelopment activities (vegetation clearing) resulting in sites that mimic native habitat of the burrowing owl.
- Urban area threats, including vehicle collision, predation or injury by domestic animals, and burrow destruction by mowers or other equipment.

Conservation Approach

- Protect and manage habitat to support current population and to accommodate population growth.
- Minimize impacts of development and land-use conversion through Species Conservation Measures and Permitting Guidelines, outreach, and technical assistance.
- Ensure adequate protection of burrows through education, enforcement, and management.
- Determine if one or more populations exist, and monitor population(s) to assess size and trend.

Current Protections

- No person shall take (including harm or harass), possess, or sell any Threatened species or parts of their nests or eggs, as outlined in Chapter 68A-27, F.A.C., Rules Relating to Endangered or Threatened Species.
- Under the federal Migratory Bird Treaty Act, it is unlawful to pursue, hunt, take, capture, kill, or sell migratory birds, including their feathers, eggs, and nests.

Resources

- Species Action Plan
- Biological Status Review Report

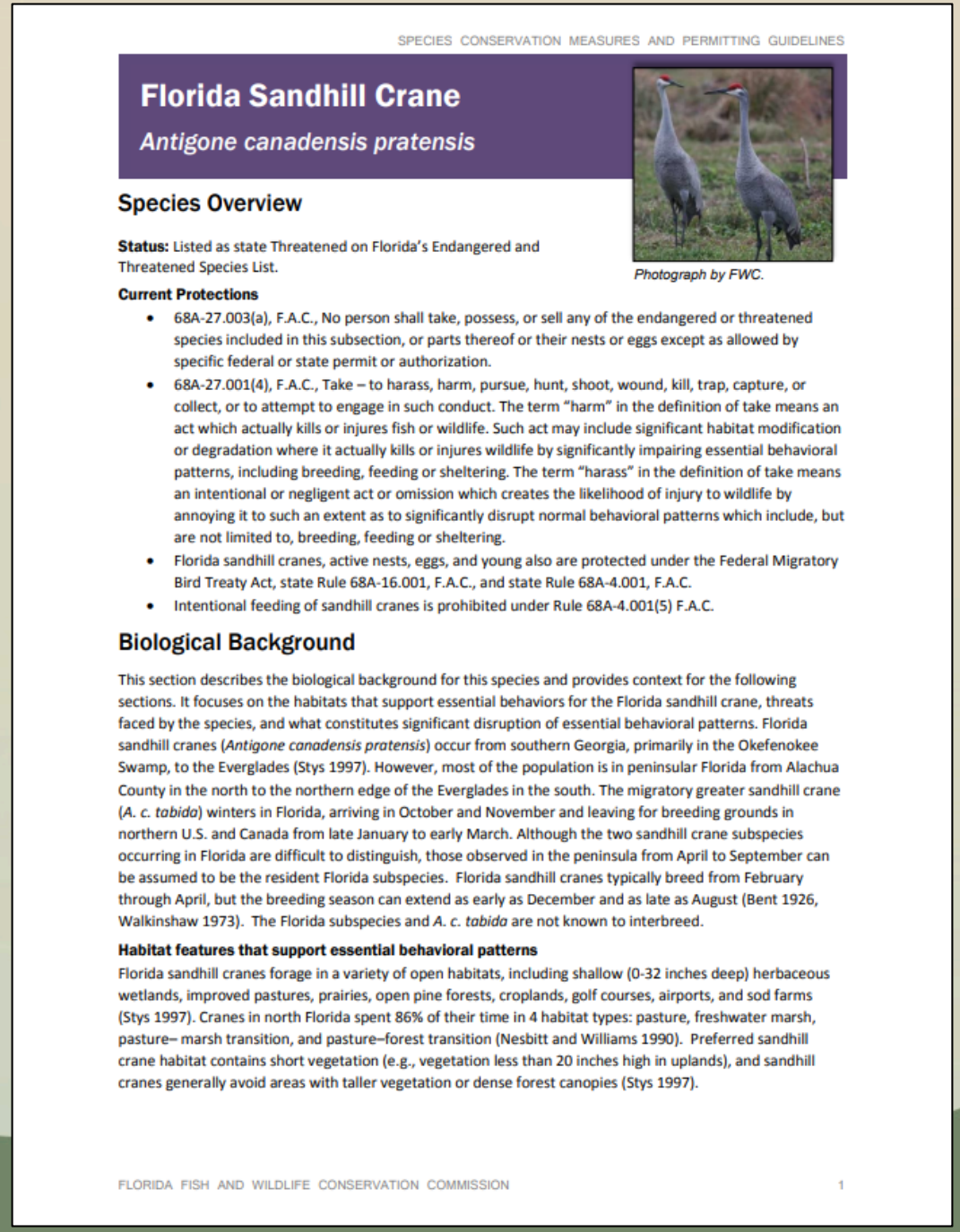
ISMP Policies

- Nest Removal for Inactive Single-Use Nests of State-Threatened Bird Species
- Cryptic Species
- Listed Species and Man-Made structures
- Aversive Conditioning of State-Listed Species

Photo: FWC

Species Conservation Measures and Permitting Guidelines

- Provides information and tools for interpreting existing protections
- Can authorize exempt activities
- Address mitigation options and establishes scientific benefit for state-Threatened species
  - Avoidance
  - Minimization
  - Mitigation



Florida Sandhill Crane

Antigone canadensis pratensis

Photograph by FWC.

Species Overview

Status: Listed as state Threatened on Florida's Endangered and Threatened Species List.

Current Protections

- 68A-27.003(a), F.A.C., No person shall take, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.
- 68A-27.001(4), F.A.C., Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.
- Florida sandhill cranes, active nests, eggs, and young also are protected under the Federal Migratory Bird Treaty Act, state Rule 68A-16.001, F.A.C., and state Rule 68A-4.001, F.A.C.
- Intentional feeding of sandhill cranes is prohibited under Rule 68A-4.001(5) F.A.C.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support essential behaviors for the Florida sandhill crane, threats faced by the species, and what constitutes significant disruption of essential behavioral patterns. Florida sandhill cranes (*Antigone canadensis pratensis*) occur from southern Georgia, primarily in the Okefenokee Swamp, to the Everglades (Stys 1997). However, most of the population is in peninsular Florida from Alachua County in the north to the northern edge of the Everglades in the south. The migratory greater sandhill crane (*A. c. tabida*) winters in Florida, arriving in October and November and leaving for breeding grounds in northern U.S. and Canada from late January to early March. Although the two sandhill crane subspecies occurring in Florida are difficult to distinguish, those observed in the peninsula from April to September can be assumed to be the resident Florida subspecies. Florida sandhill cranes typically breed from February through April, but the breeding season can extend as early as December and as late as August (Bent 1926, Walkinshaw 1973). The Florida subspecies and *A. c. tabida* are not known to interbreed.

Habitat features that support essential behavioral patterns

Florida sandhill cranes forage in a variety of open habitats, including shallow (0-32 inches deep) herbaceous wetlands, improved pastures, prairies, open pine forests, croplands, golf courses, airports, and sod farms (Stys 1997). Cranes in north Florida spent 86% of their time in 4 habitat types: pasture, freshwater marsh, pasture– marsh transition, and pasture–forest transition (Nesbitt and Williams 1990). Preferred sandhill crane habitat contains short vegetation (e.g., vegetation less than 20 inches high in uplands), and sandhill cranes generally avoid areas with taller vegetation or dense forest canopies (Stys 1997).

Species Conservation Measures and Permitting Guidelines

- Provides information and tools for interpreting existing protections
- Can authorize exempt activities
- Address mitigation options and establishes scientific benefit for state-Threatened species
  - Avoidance
  - Minimization
  - Mitigation

Osprey

Pandion haliaetus

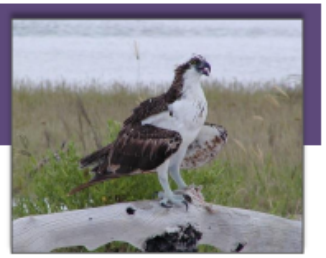


Photo by Ricardo Zambrano, FWC.

Species Overview

Status: Removed from Florida's Endangered and Threatened Species list in 2018.

Current Protections

- 68A-4.001, F.A.C., General Prohibitions — No wildlife or freshwater fish or their nests, eggs, young, homes or dens shall be taken, transported, stored, served, bought, sold, or possessed in any manner or quantity at any time except as specifically permitted by these rules nor shall anyone take, poison, store, buy, sell, possess or wantonly or willfully waste the same except as specifically permitted by these rules.
- 68A-1.004, F.A.C., Take—The term shall include taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife or freshwater fish, or their nests or eggs by any means whether or not such actions result in obtaining possession of such wildlife or freshwater fish or their nests or eggs.
- Osprey, active nests, eggs, and young are also protected under the Federal Migratory Bird Treaty Act and state Rule 68A-16.001, F.A.C.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support osprey, and the threats faced by the species.

Ospreys occurring in Monroe County are not genetically distinct from ospreys elsewhere in Florida, and this information led to the removal of the osprey of Monroe County from Florida's Endangered and Threatened Species list in 2018. *Pandion haliaetus* species was not previously listed.

Figure 1: Osprey nest on channel marker in Florida Bay. Photograph by Heather Henkel, USGS.

The osprey is found in temperate and subtropical areas that contain permanent fresh, brackish, or salt water for foraging (Henny 1988). Ospreys typically utilize canals, ponds, lakes, bays and man-made impoundments. Ospreys prefer areas with clear, shallow waters (0.5 to 2 m [1.6 to 6.6 ft] deep) for hunting that is within 10 to 20 km (6.2 to 12.4 mi) of nest sites. The osprey diet is made up almost entirely of live fish. Bierregaard et al. (2016) report that live fish make up 99% of prey items reported in all publications addressing osprey's diet; ospreys rarely take small birds, mammals, and reptiles.

Ospreys prefer to nest near shallow water but will fly long distances if a breeding site is desirable (Bierregaard et al. 2016). Nests (Figure 1, Figure 2) are large and primarily made up of sticks, historically in trees, but commonly found on artificial structures such as channel markers, utility poles, cell phone

Stakeholder Involvement & ISMP Resources

- Commenting on draft permitting guidelines
- Feedback on existing Guidelines, policies, etc.
  - Imperiled@myfwc.com or Kelly.Oconnor@myfwc.com
- Additional resources (including Guidelines, Species Action Plans, full text of the ISMP) at https://myfwc.com/wildlifehabitats/wildlife/

Photos: FWC

Incidental Take Permitting

Angela T. Williams
Protected Species Permit Coordinator
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(850) 921-5990

How does one “take” a Threatened Species?

- 68A-27.001, F. A. C. - defines **take** of state threatened species as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect wildlife
  - **Harm** –activity which directly kills or injures wildlife or indirectly kills or injures wildlife by impairing essential behaviors such as breeding, feeding or sheltering.
  - **Harass** - intentional or negligent act or omission likely to cause injury to wildlife by disrupting normal behaviors such as breeding, feeding or sheltering.

What is Incidental Take?

- 68A-27.001, F.A.C. defines incidental take as - any taking otherwise prohibited, if such taking is incidental to, and not the purpose of the carrying out of an otherwise lawful activity.

Permitting Incidental Take

- 68A-27.007, F.A.C.- FWC may issue permits authorizing incidental take of Threatened species if:
  - Species specific standards in Rule 68A-27.003 are met or
  - Clearly enhances the survival potential of the species or
  - Scientific or conservation benefit provided and will not negatively impact survival potential of the species

Permitting Incidental Take (continued)

Considerations for issuing a permit:

1. Objectives of FWC management plan
2. Long range impact
3. Impacts to other fish and wildlife species
4. Extent of injury, harm or loss of the species;
5. Applicant ability to avoid, minimize or mitigate incidental take of the species
6. Human safety and
7. Other conservation and management factors

When is a permit recommended?

Activities will cause take (direct or indirect)

- Avoidance is not feasible (cannot maintain buffer, working during the nesting season)
- Applicants typically meet criteria via combination of
  - Avoidance measures
  - Minimization measures
  - Mitigation measures

Example: Burrowing Owls

- State listed as Threatened
- Prefer grassy habitats with few trees
  - Often occupy residential areas, airports, and sports fields
  - Some dense local populations, such as Marco Island and Cape Coral
- Rely on burrows year round for breeding and sheltering
- Burrows average 5-10 feet long

Photo: Ron Bielefeld, Whistling Wings Photography

Example: Burrowing Owls

- Collapsing or blocking a burrow results in take
  - — Potential to harm eggs, young, adults
  - — Harassment of adults

Example: Beach-nesting birds

- State Threatened
- Nest in “scrape” in sand
- Nests, eggs, chicks camouflaged
- Nest Located: beaches, islands

Example: Beach-nesting Birds

- Person walks through colony, crushes eggs
- Dog runs through colony, birds flush off nest, leaving young and eggs exposed to elements and predators

Photo: CWF

Example of Take Via Significant Habitat Modification

- Least tern habitat at Summerhaven

When is no permit needed?

- When take of species can be completely avoided
- ISMP addresses 3 types of avoidance
  - Activities not expected to cause take
    - Species specific in guidelines
  - Avoidance measures undertaken to remove need for ITP
    - Buffers, work during nonbreeding season, JCP
  - Exemptions
    - Land management consistent with management plans
    - Agricultural best management practices
    - Airport Safety Rule – 68A-9.012 F.A.C.

When is no permit needed? (continued)

- When the following ISMP policies are followed:
  - Nest removal for inactive single-use nests of state-Threatened birds applies to birds that do not re-use the same nests.
  - Aversive conditioning of state-listed species applies to species with Guidelines that describe non-lethal actions to reduce or eliminate nuisance behavior
  - State-listed species and man-made structures policy applies to species that are using structures such as buildings, bridges, utility poles, signs and pipes for essential behavior, such as breeding.

Additional Resources

- Protected Wildlife Permits webpage
- Species Conservation Measures and Permitting Guidelines webpage
- Florida's Endangered and Threatened Species List

How to Contact the Permitting Office

(850) 921-5990

or

Wildlifepermits@myfwc.com

or

myfwc.com/license/wildlife/protected-wildlife-permits/

Questions?

Florida Black Bears and Roadways

Bear Management and Research Programs

Florida Fish and Wildlife

Conservation Commission

Carlton Ward, 2017

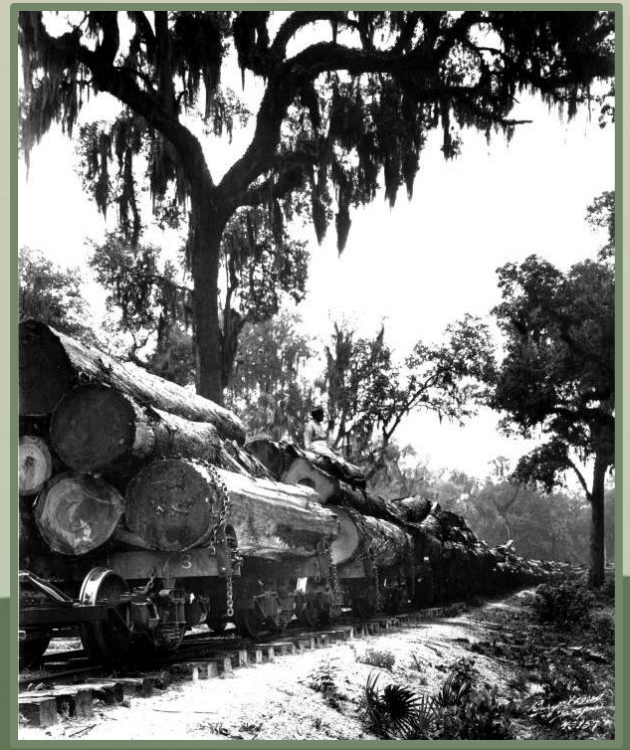
Background

Gene Smith

Abundant

Little or no management

Over-exploited



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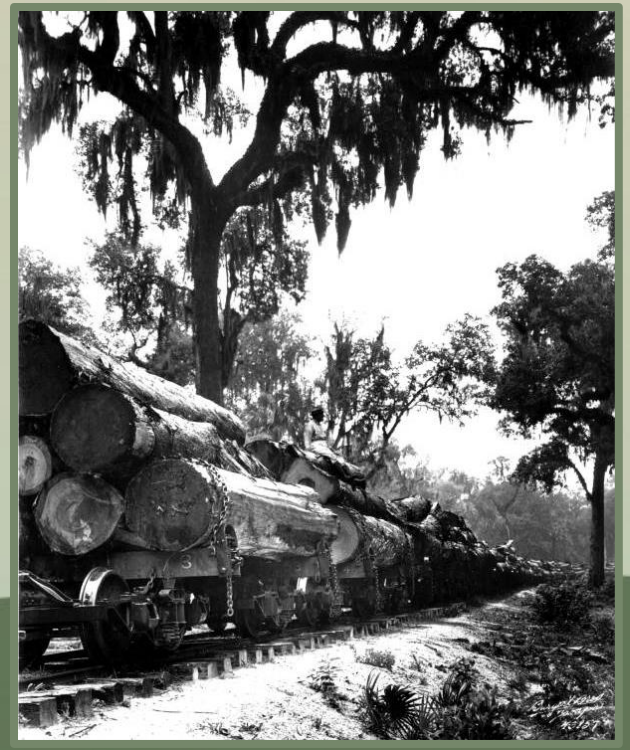
Background

Gene Smith

Over-exploited



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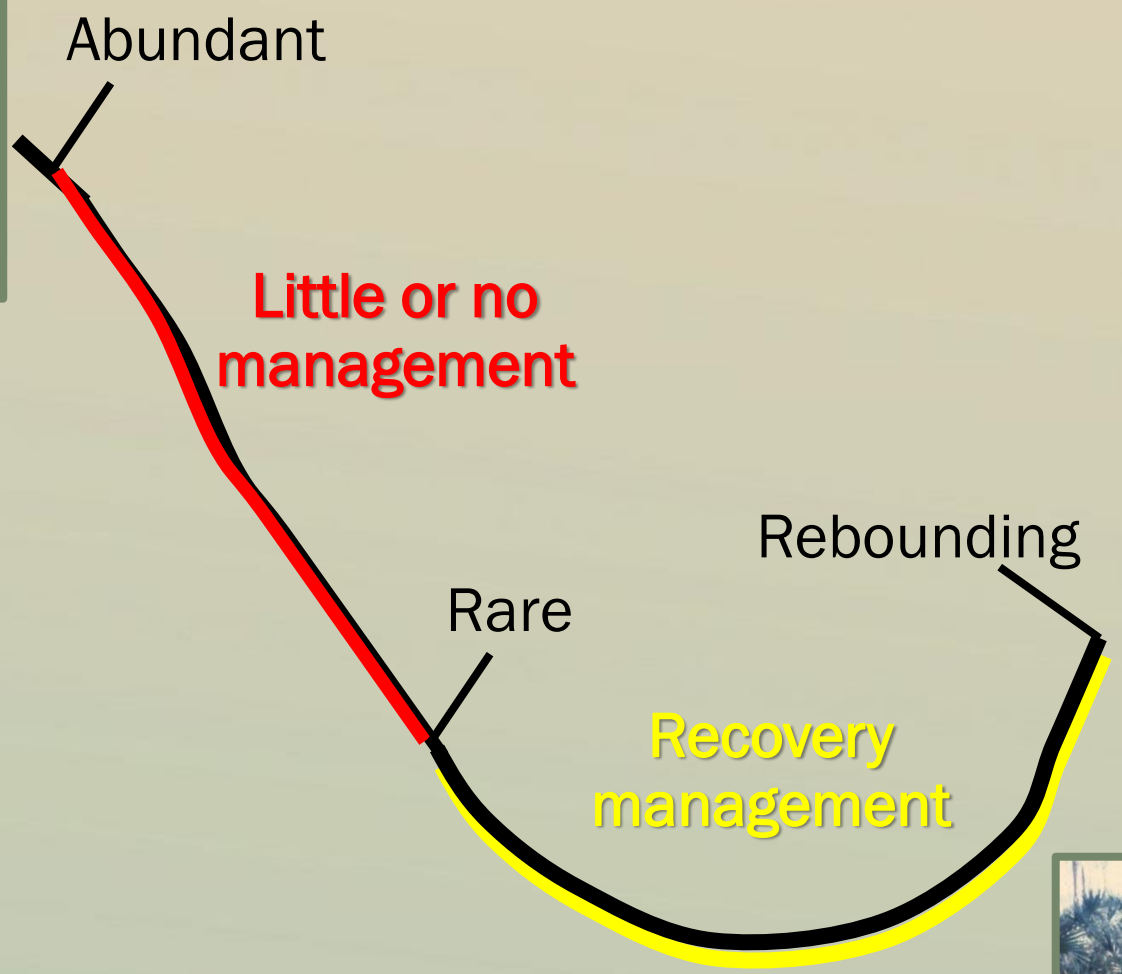

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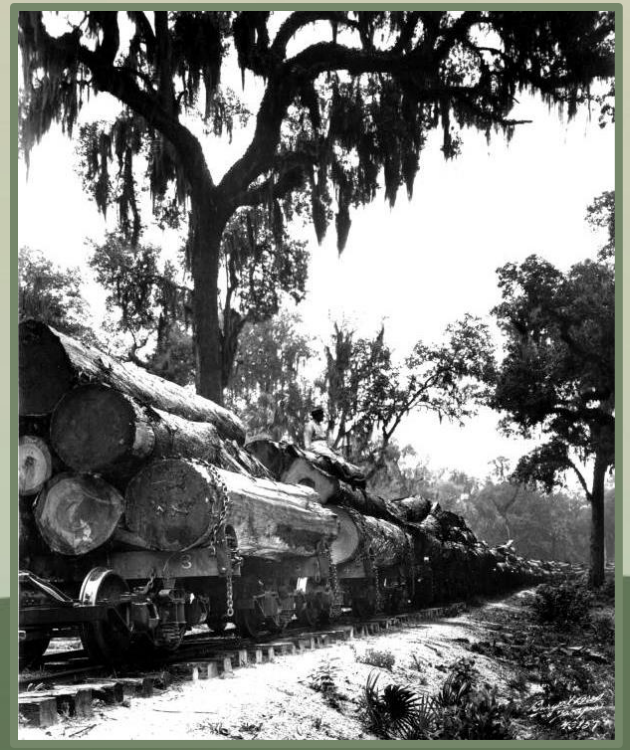

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Abundant

Little or no management

Rare

Recovery management

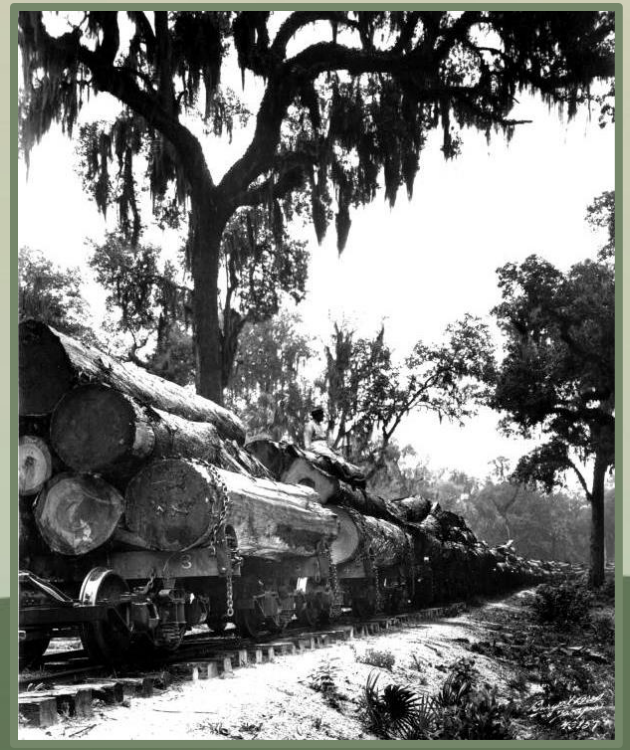
Rebounding

Conflict management

Background

Gene Smith

Over-exploited



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Abundant

Little or no management

Rare

Recovery management

Rebounding

Conflict management

Stable

Sustainable Co-Existence

ORLANDOSENTINEL

Abundance Estimates

- 2002 Estimate

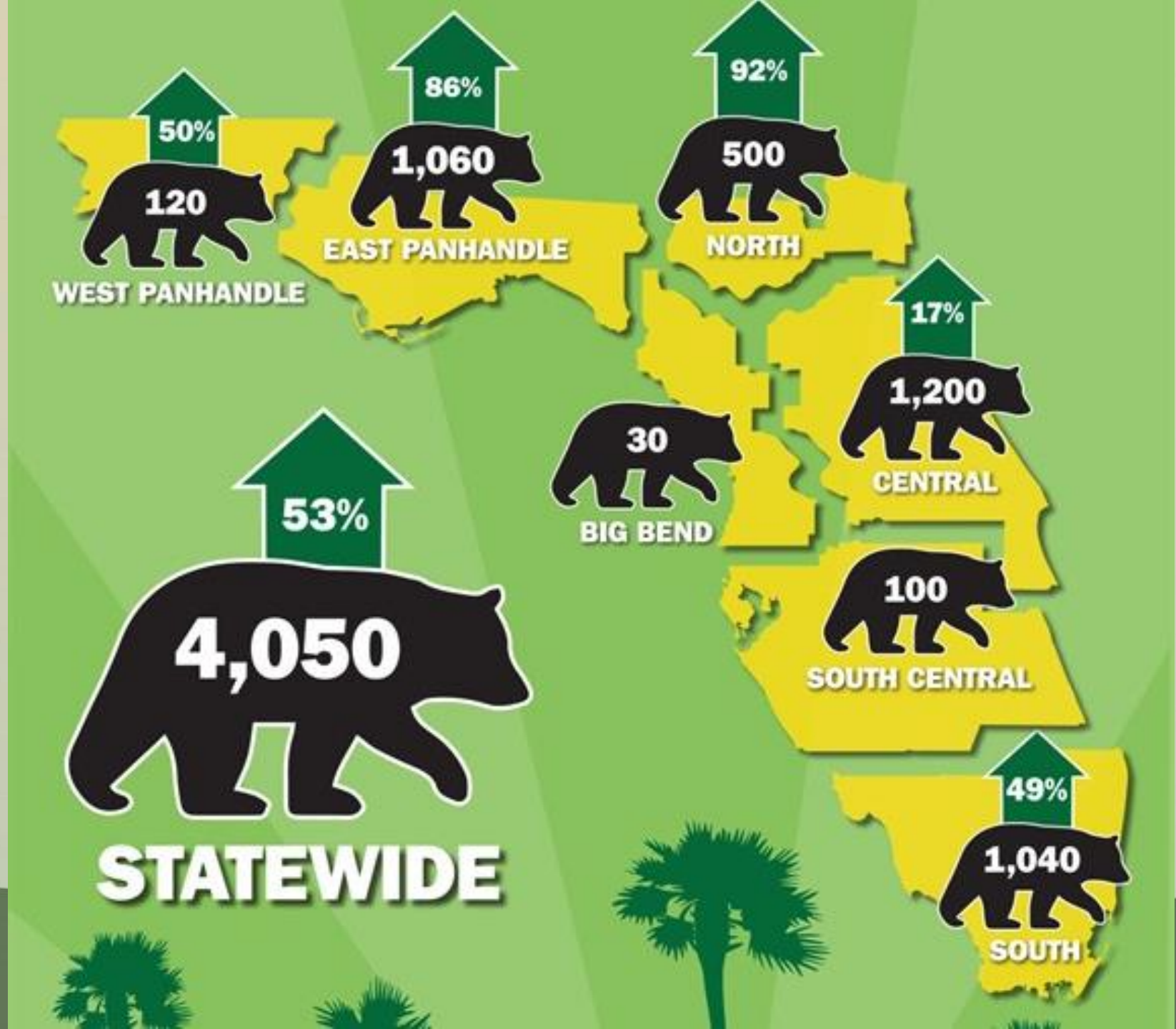
  = 2,600 bears

(Funded by FDOT)

- 2016 Estimate

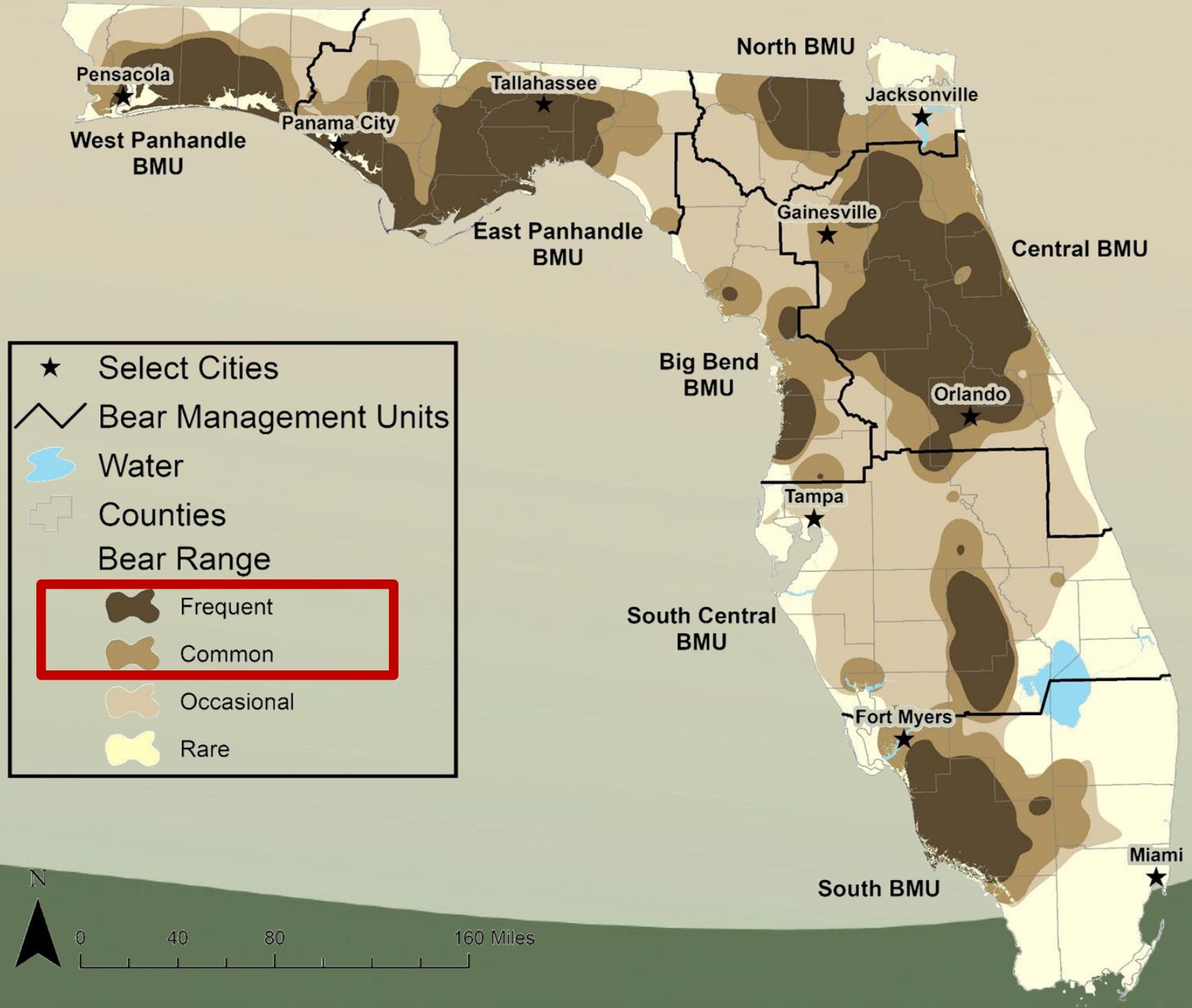
  = 4,050 bears

(> 50% increase)



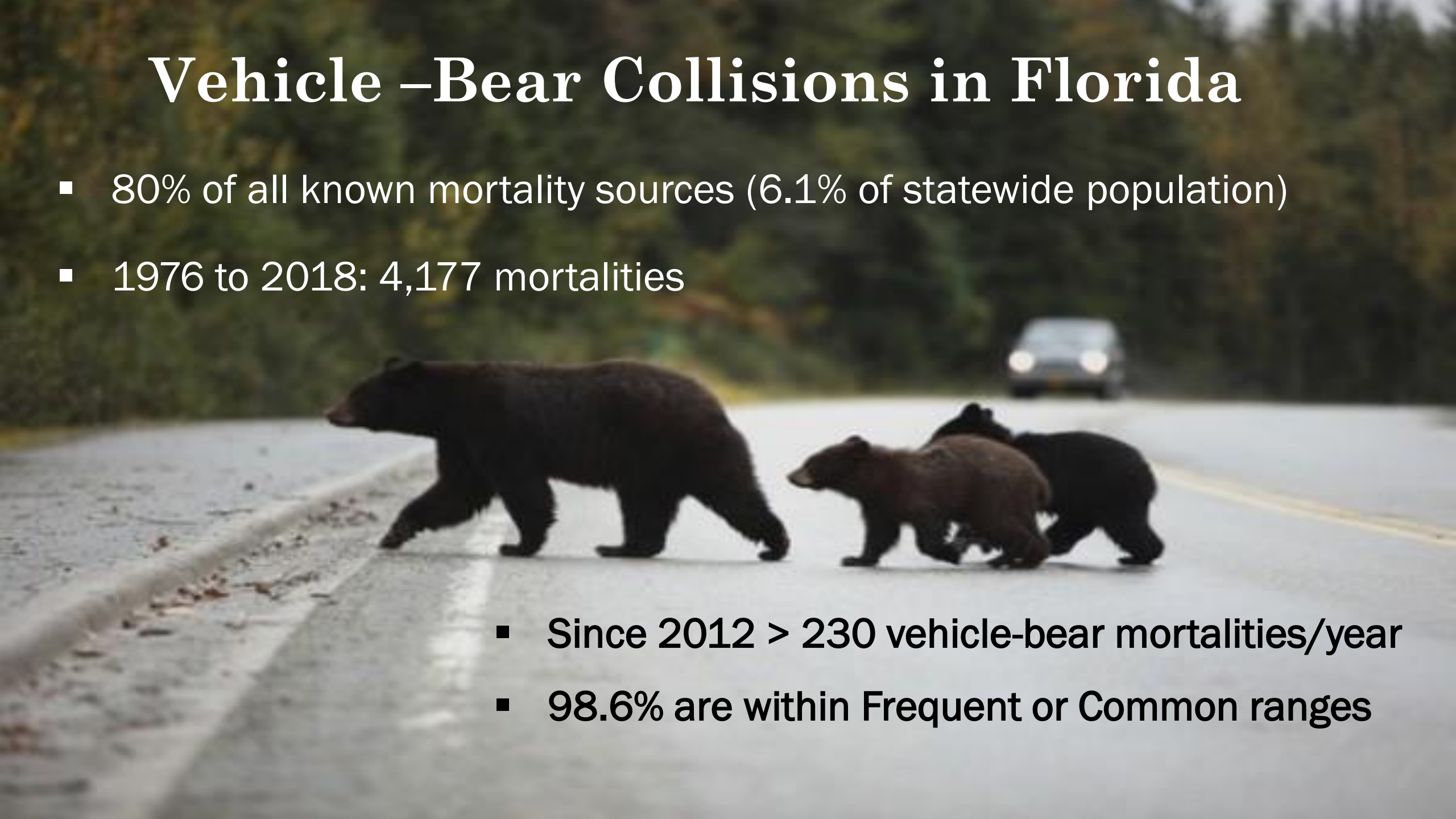
Bear Range

- Occupied Range
- 49% of historic
- Up from 17% (1993)



Vehicle –Bear Collisions in Florida

- 80% of all known mortality sources (6.1% of statewide population)
- 1976 to 2018: 4,177 mortalities



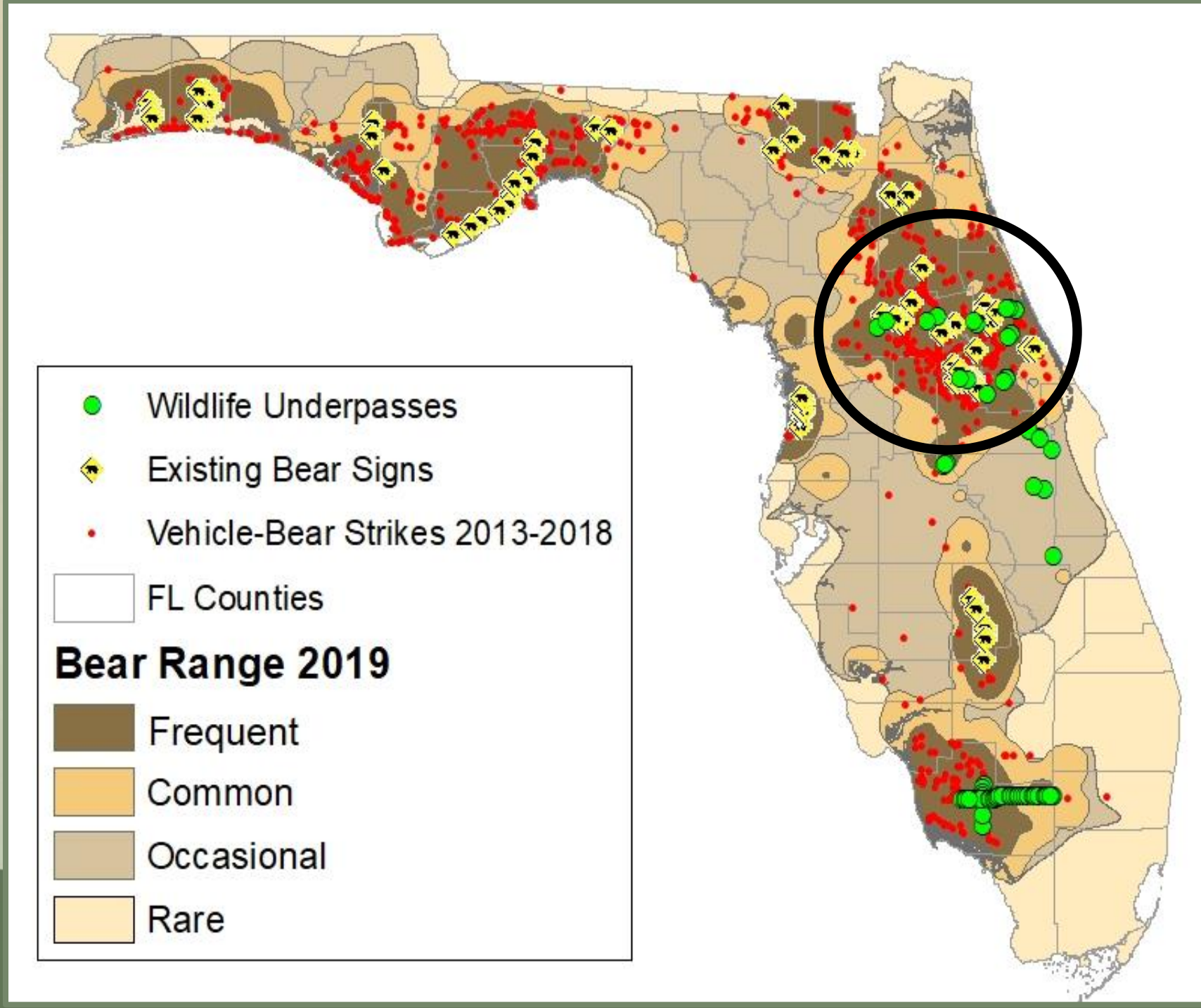
- Since 2012 > 230 vehicle-bear mortalities/year
- 98.6% are within Frequent or Common ranges

FWC and FDOT Working Together

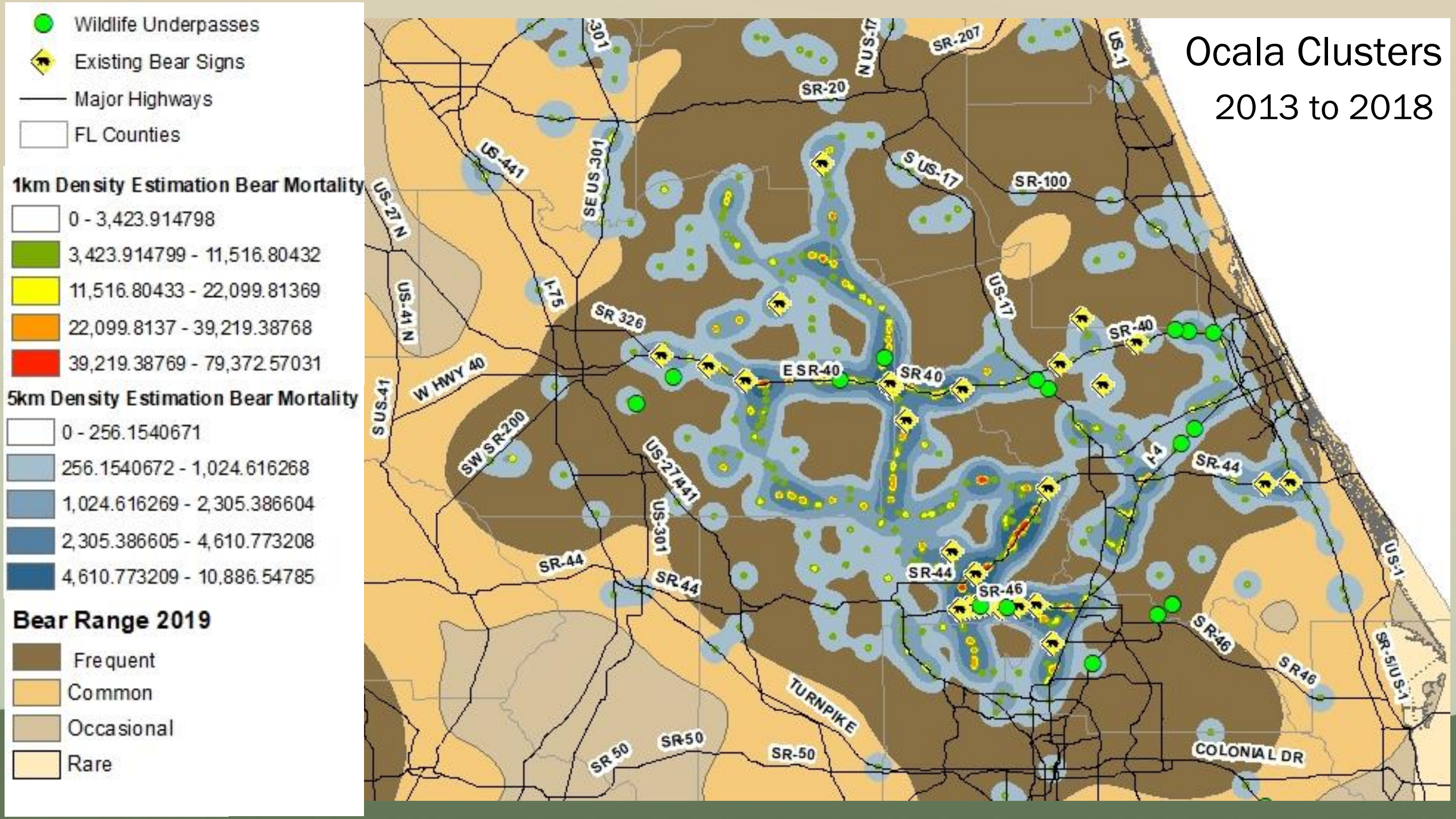
- Commenting on road development and improvement projects
- Technical assistance and stakeholder groups
- Outreach on driving in bear country
- Periodic assessments of vehicle-bear mortality hotspots
  - Bear Crossing Signs
  - Underpasses
  - Modify Existing Bridges

Vehicle-Bear Mortality Cluster Analysis

- Density Map
- 1km & 5km
  - 2003 to 2007
  - 2008 to 2012
  - 2013 to 2018

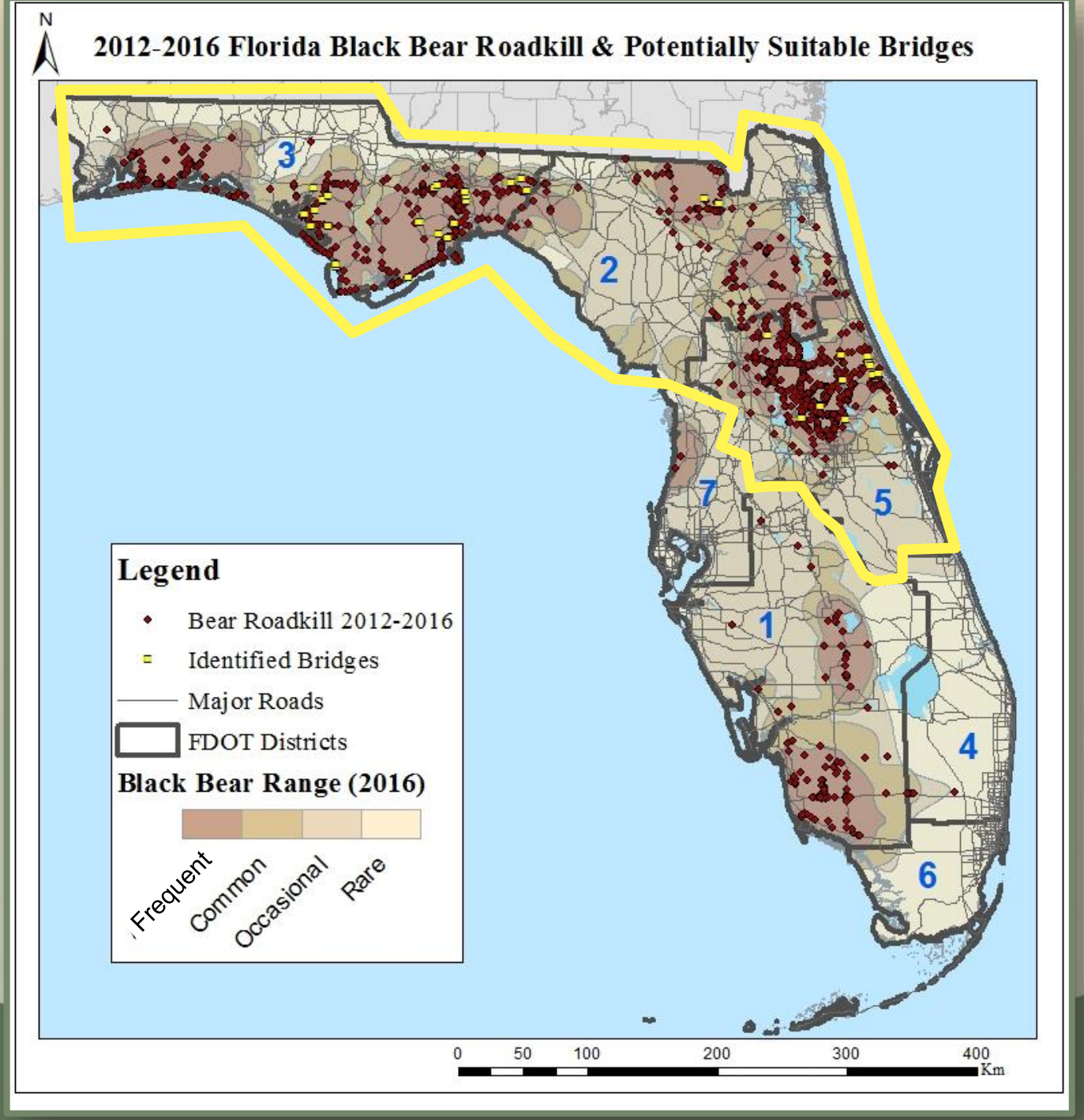


Ocala Clusters
2013 to 2018

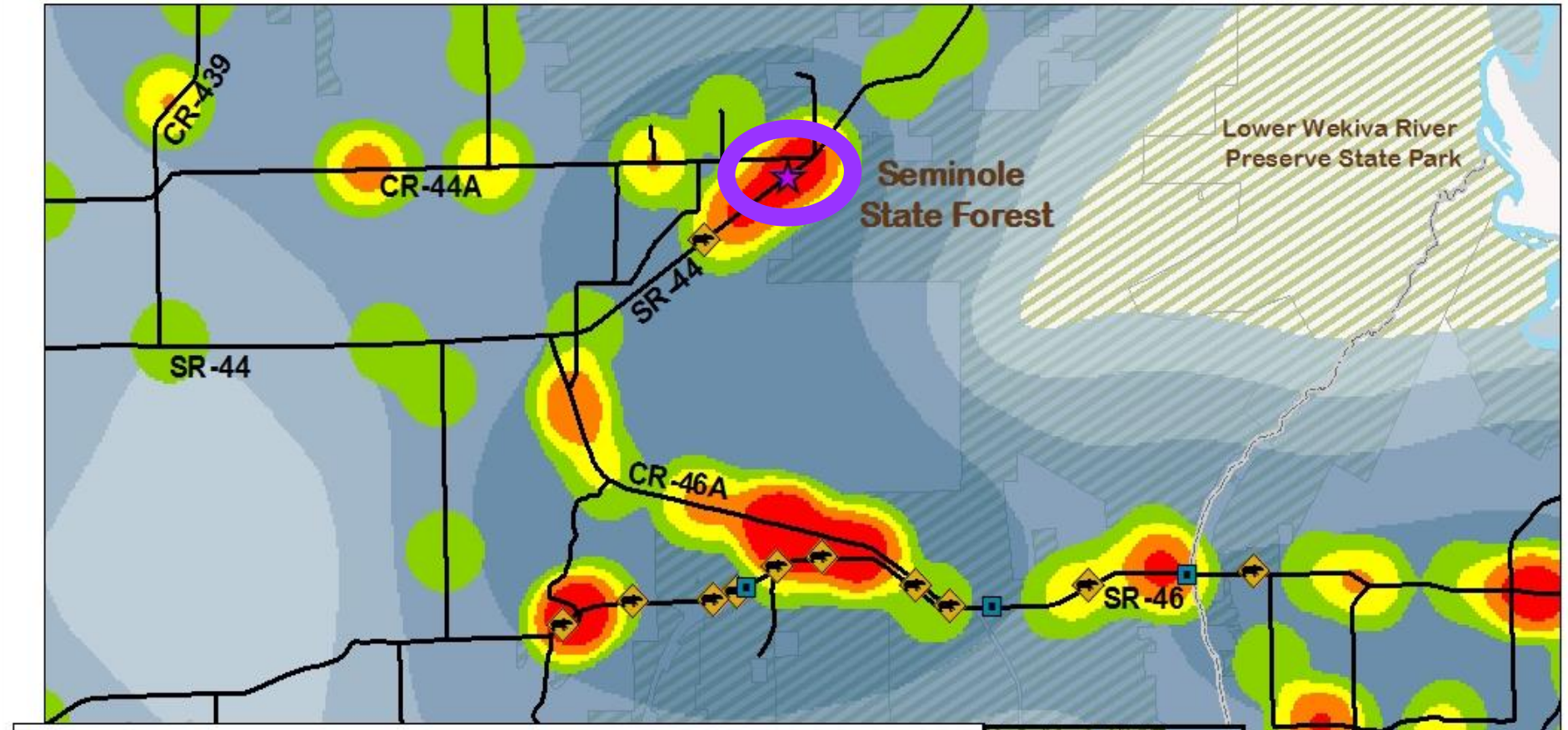


Fencing Bridges

- FDOT Districts 2,3, and 5
- 2012 to 2016 = 1,238 bears
- 34 bridges identified
  - Proximity to hotspot
  - Ownership on both sides
  - Length and height of bridge



District 5 (Lake Co.) Hotspots and Bridges



Legend

- Bear Crossing Sign
- Major Roads
- County Boundaries
- Conservation Areas

Bridges
Priority Level
- High
- Moderate
- Low

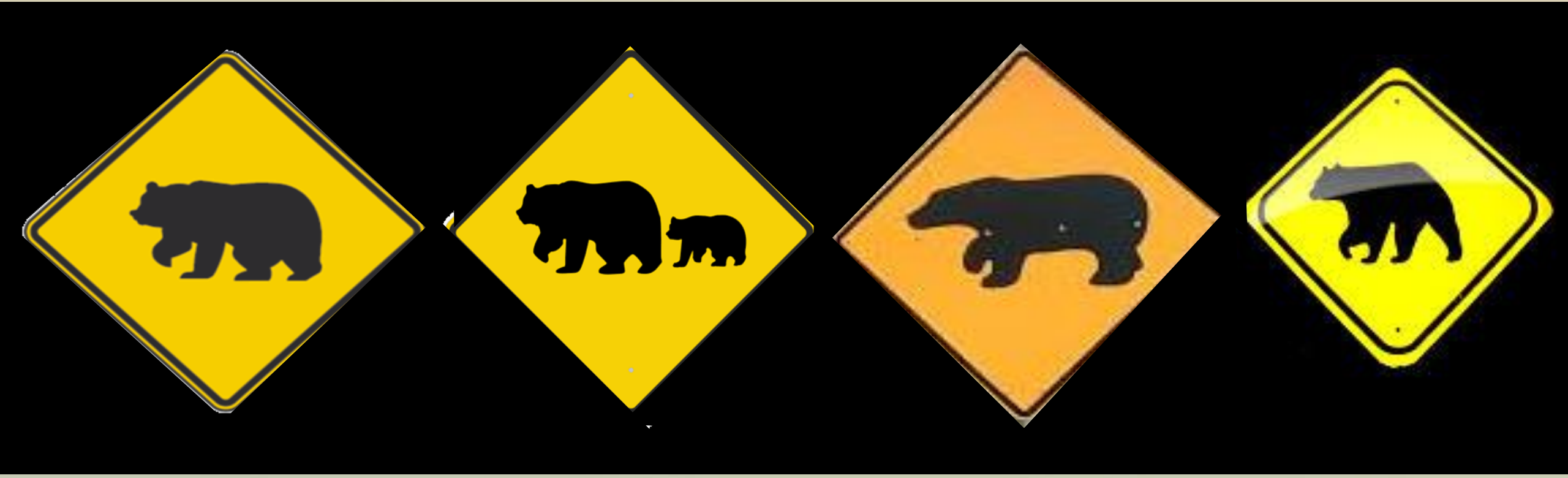
1 km Buffer Density per Sq.km	5 km Buffer Density per Sq.km
0 - 0.29	0 - 0.02
0.3 - 0.96	0.03 - 0.08
0.97 - 1.84	0.09 - 0.19
1.85 - 3.21	0.2 - 0.36
3.22 - 7.44	0.37 - 0.83

Wildlife Underpass
- EXISTING
- PLANNED

0 1.5 3 6 9 12 Km

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Bear Crossing Signs

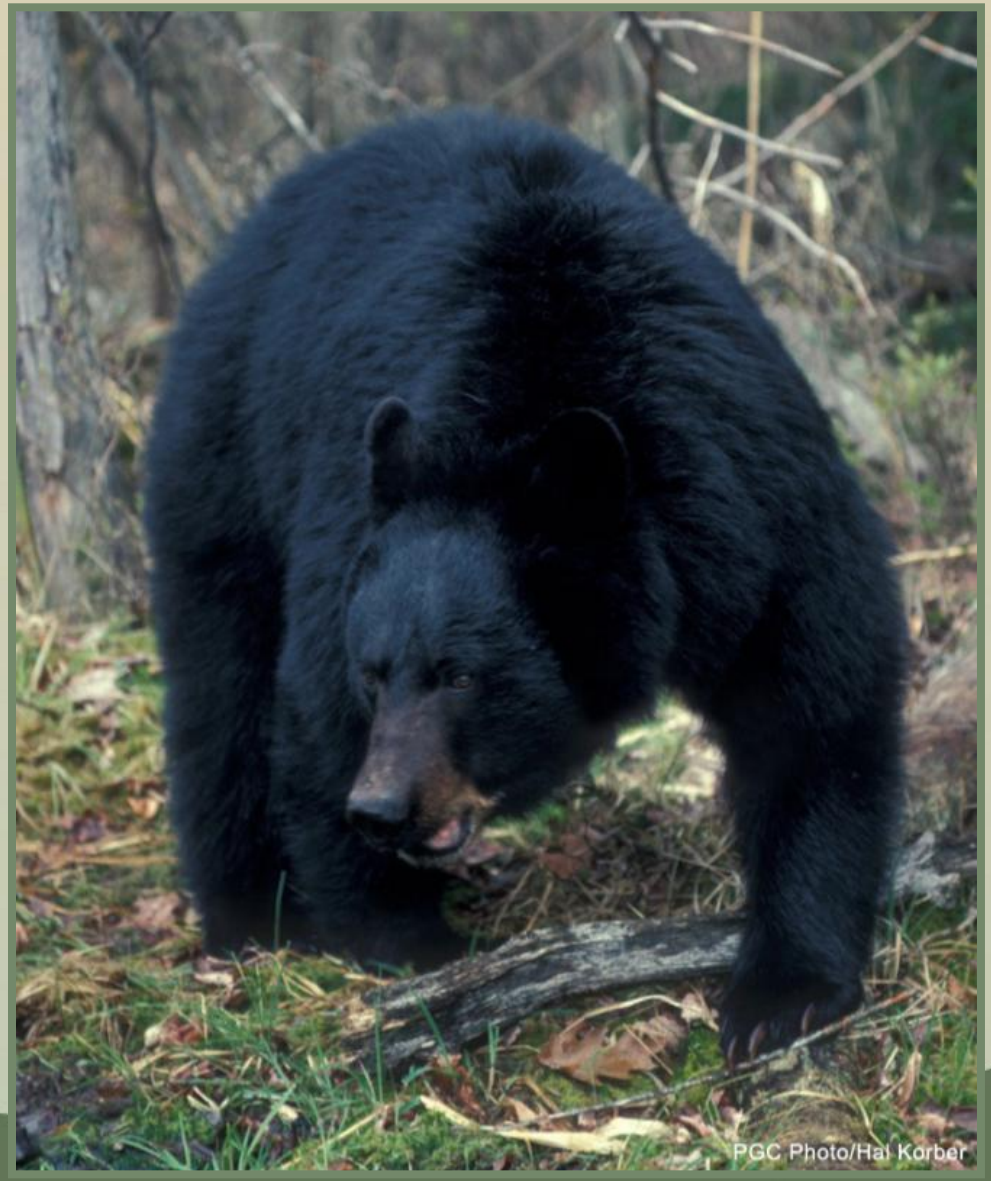


What if I see a Bear?

- 90% of time bears run/climb
- DO NOT run or play dead
- Raise arms, yell, honk horn
- Bear spray

Defensive/Warning Behavior

- Like a rattlesnake
- Personal space
- Stay still, then back away
- If makes contact, fight back

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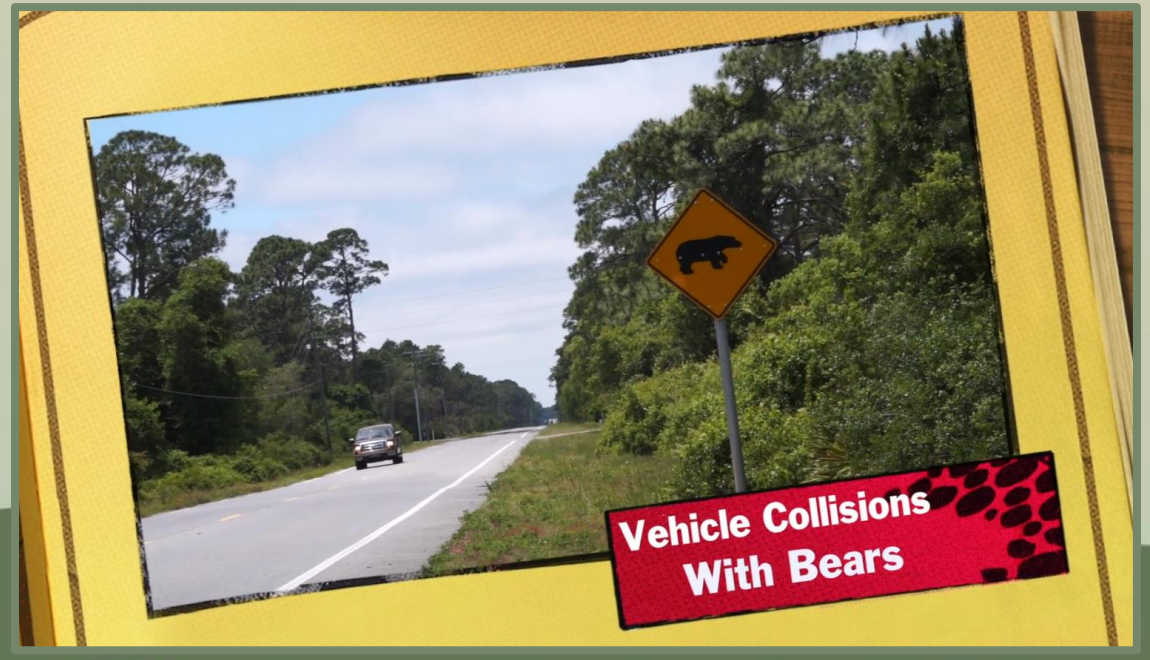
11/03/2018
05:47PM
FDOT5

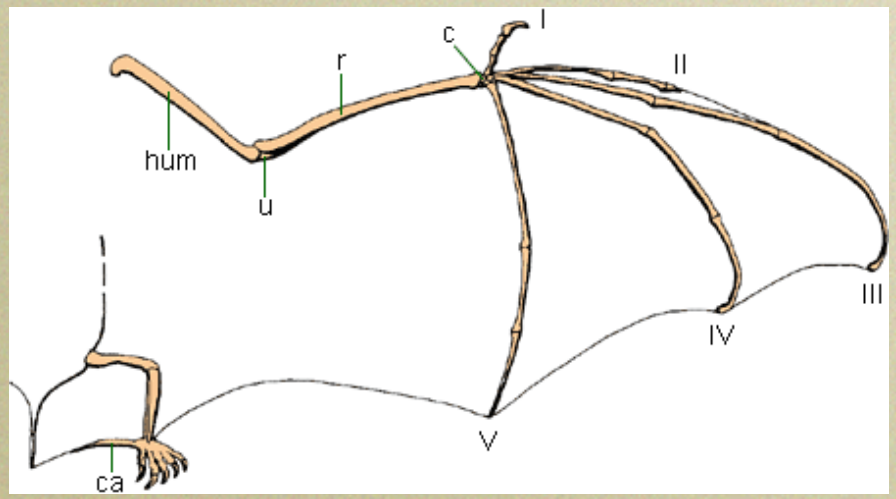

Vehicle Collisions
With Bears

Bat Conservation and Bridges and Other Transportation Structures

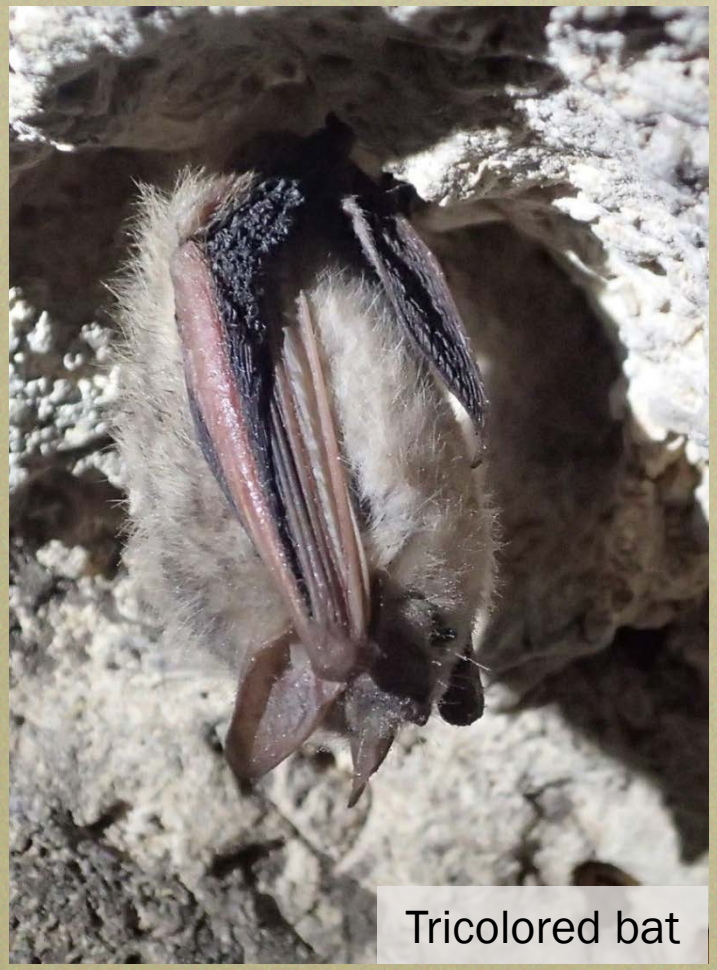
Terry J. Doonan, Ph.D.
Jeffery A. Gore, Ph.D.
Florida Fish and Wildlife Conservation Commission

Bat Biology

- The only mammals capable of true flight.
- Wings are supported by bones equivalent to those in our arms and hands.
- Many bats have very long life spans.
- Reproduction is slow for their size.



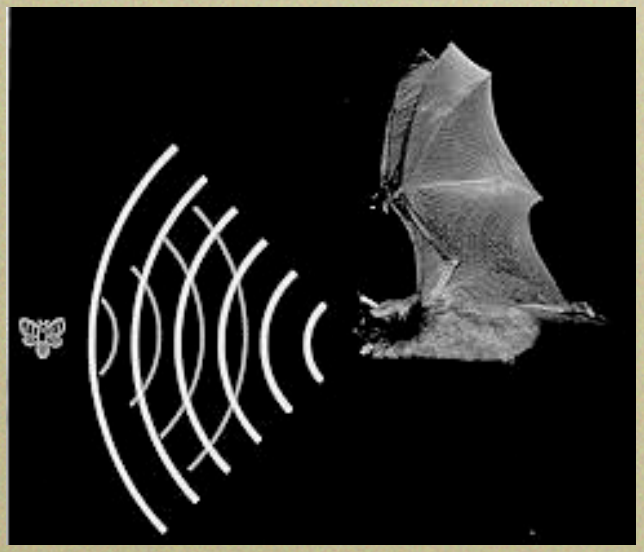
Bat Biology

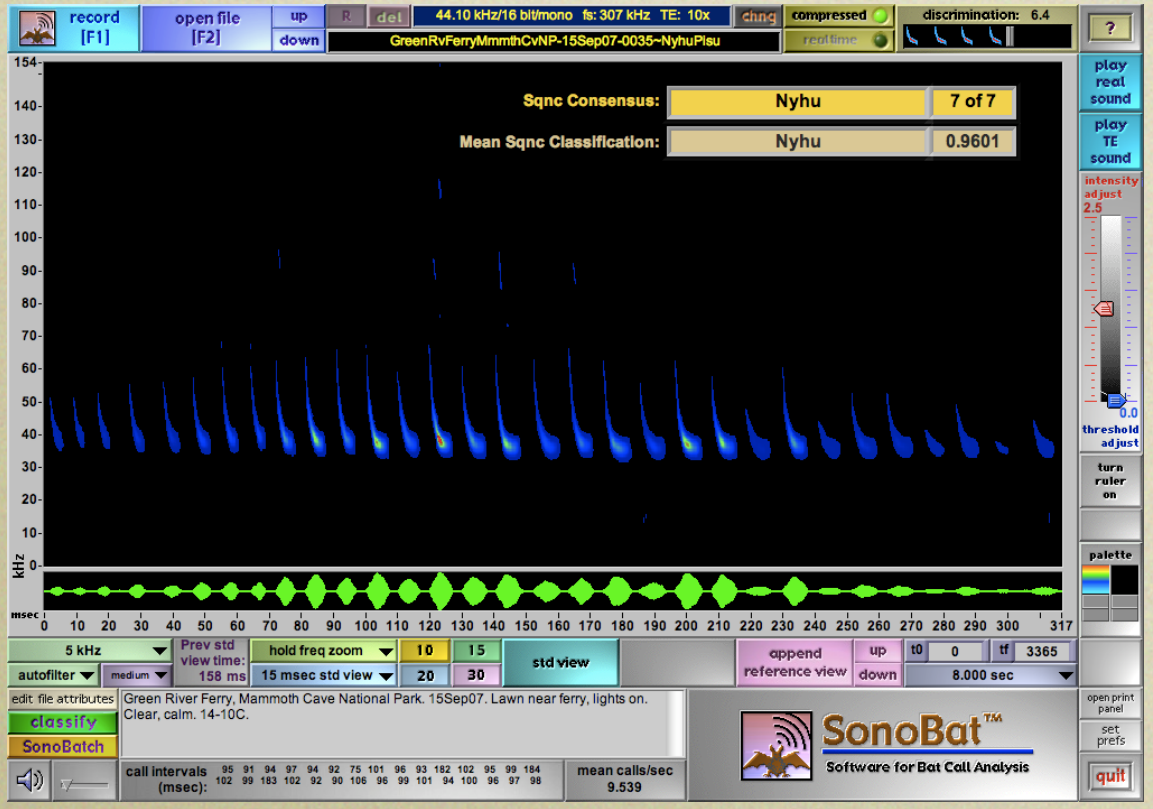


Tricolored bat

- Most bats do not have rabies.
- Many bats hibernate in the winter.
  - But that is rare in Florida.
- In Florida, bats may hibernate just on cold nights/days.
  - Lowers body temperature and metabolic activity.
- Bats can see very well in low light.
- Bats do not try to attack people.

Echolocation

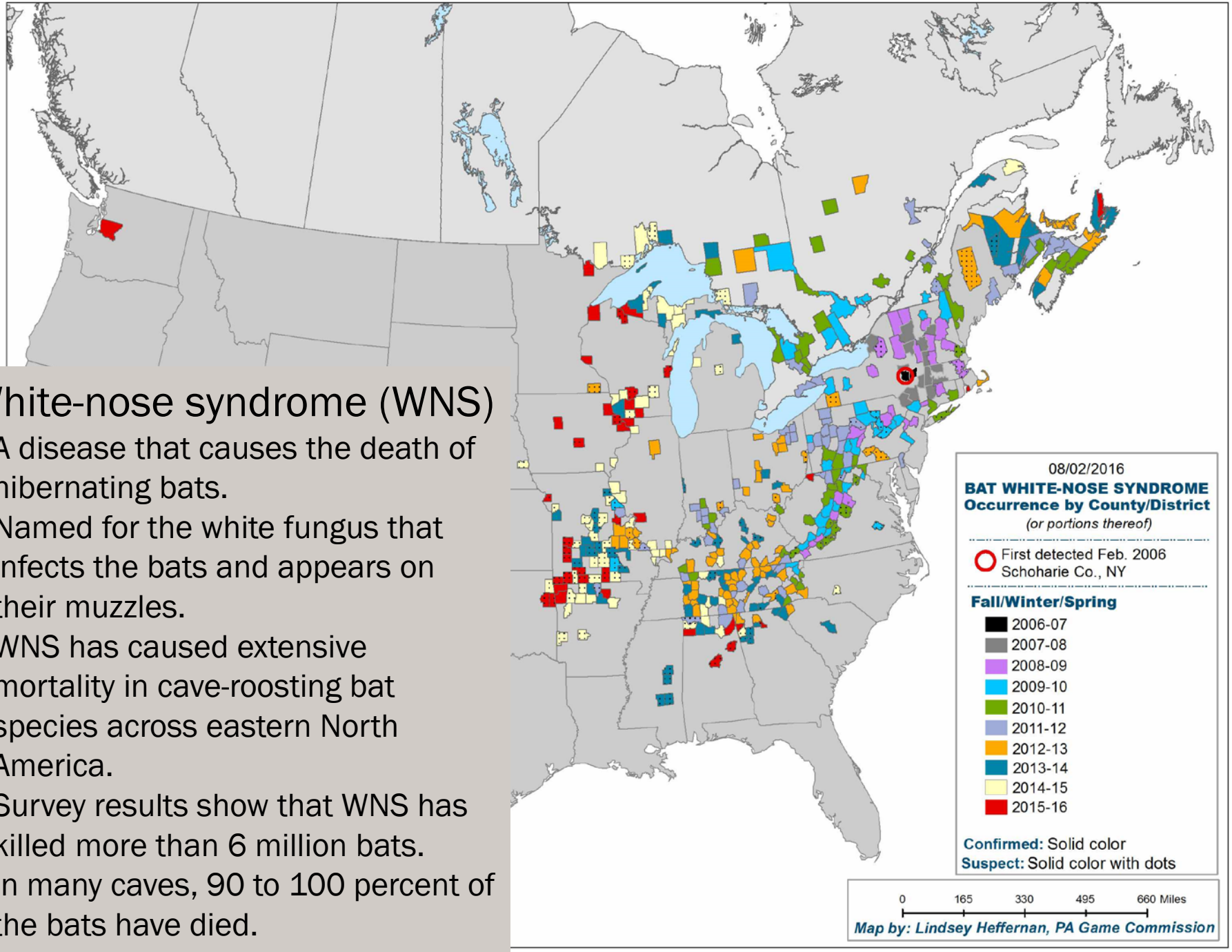




- Bats create ultrasonic calls to navigate and locate prey.
- Calls vary in frequency, pitch, and duration.
- Calls vary depending on a bat's activity.
- Acoustic monitoring equipment is used to identify bats by the frequency and duration of their ultrasonic calls.

White-nose syndrome (WNS)

- A disease that causes the death of hibernating bats.
- Named for the white fungus that infects the bats and appears on their muzzles.
- WNS has caused extensive mortality in cave-roosting bat species across eastern North America.
- Survey results show that WNS has killed more than 6 million bats.
- In many caves, 90 to 100 percent of the bats have died.



Bats in Florida

Florida is home to 13 resident bat species

- Twenty species of bats are found in Florida.
- Only thirteen are resident.
  - 7 considered accidental
- The Florida bonneted bat is found only in Florida.

Florida bonneted bat

- Two Resident bat species are listed as Endangered by USFWS:
  - Florida bonneted bat
  - Gray myotis bat

Legal Status of Bats in Florida

Bats are protected from take

68A-4.001

Young Brazilian free tailed bat
- Flightless
- Still dependent on its mother.

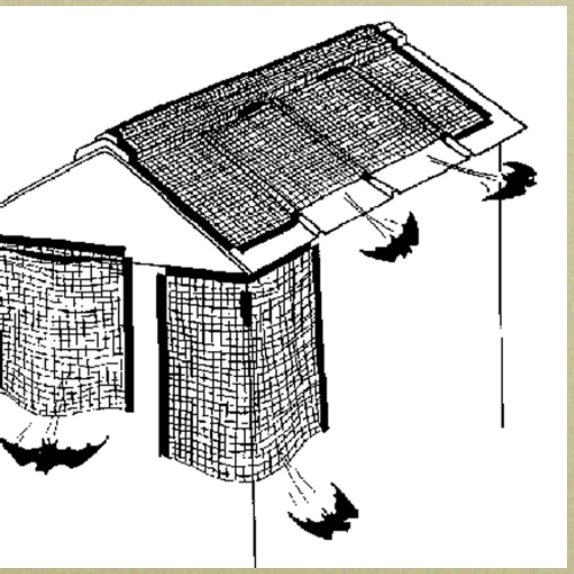
- There are additional protections during maternity season
  - Maternity season is 15 April -15 August
  - Populations are vulnerable because of loss of young and adults
  - Protects from having dead baby bats in buildings

Nuisance Wildlife Rule: 68A-9.010

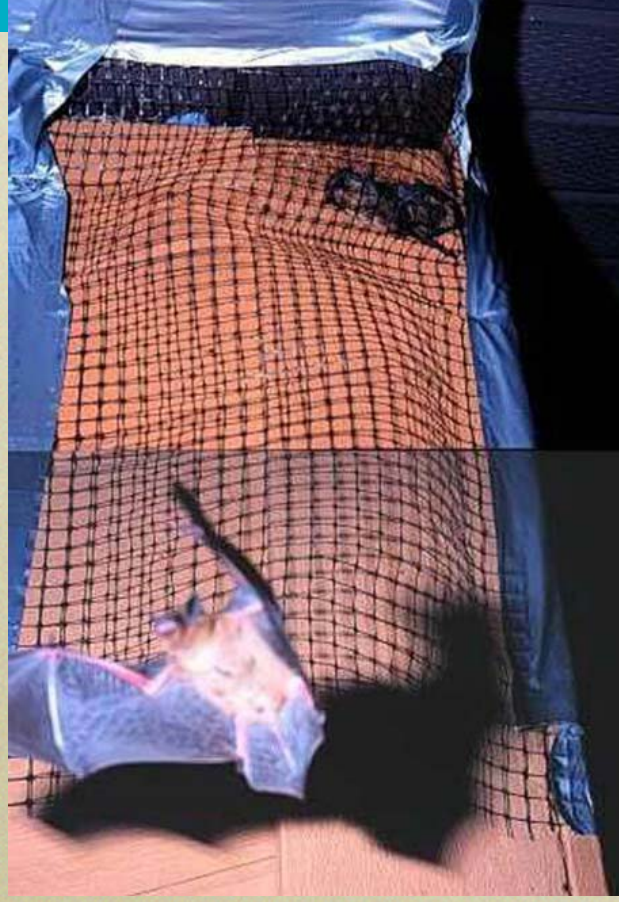
- States how and when bats can be removed from buildings.
- Exclusions are the ONLY legal removal method.
  - Requires a physical barrier that allows bats to exit and not re-enter
  - Only allowed from August 15th through April 15th
    - Outside the maternity season
  - At least 4 consecutive nights when the projected low temperature is above 50 degrees F.

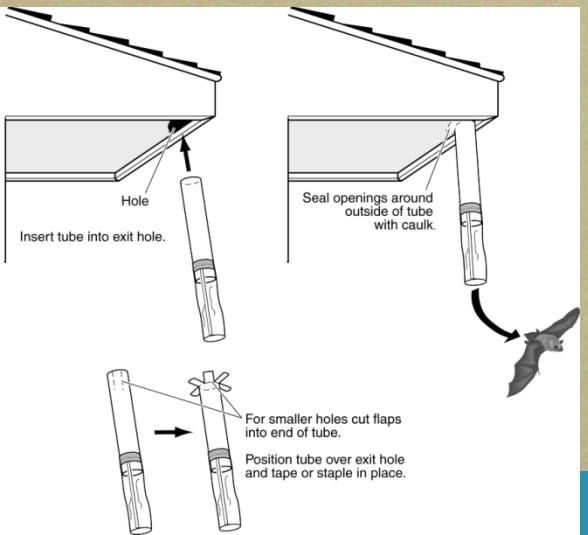
ALL 3 conditions must be met for an exclusion to be legal.

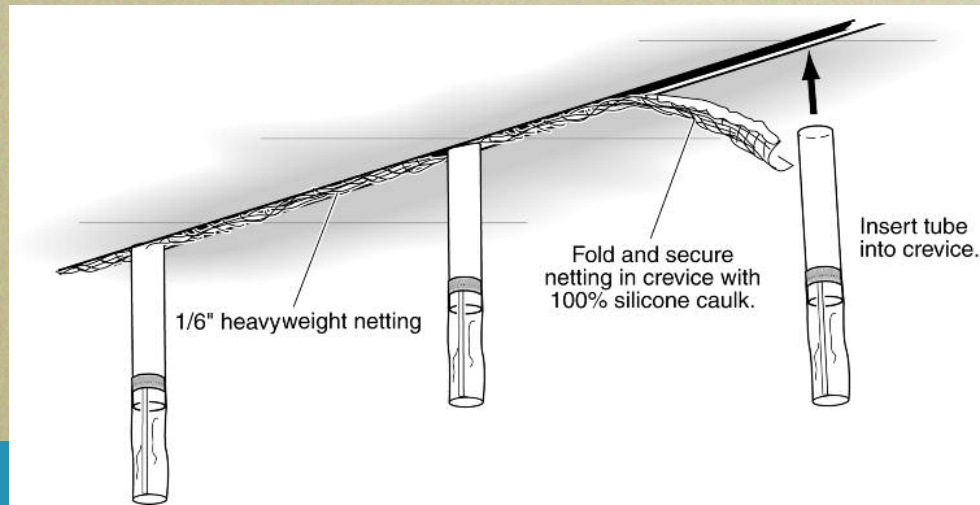
Bat Exclusions/Evictions



- Need to be done correctly
- Follow National Guidelines and FWC-UF Recommendations
- Use good materials
- Use appropriate procedures







Bridges Provide Important Roost Sites for Several Bat Species in Florida

5 species known to roost in Florida bridges.

- There are concerns about the Florida bonneted bat

• Free-tailed bat	*Tadarida brasiliensis*
• Big brown bat	*Eptesicus fuscus*
• Evening bat	*Nycticeius humeralis*
• Southeastern myotis	*Myotis austroriparius*
• Big-eared bat	*Corynorhinus rafinesquii*

?? Bonneted bat	*Eumops floridanus*

Brazilian Free-tailed Bat

- Named because tail extends beyond membrane.
- Most common bat in Florida.
- Roosts in many different man-made structures.
- Often found in very large numbers.

Evening Bat

- Dark brown, with muzzle that is unfurred.
- Colonial roosters in man-made and natural structures.
  - Colonies usually from a few to 70 or so bats.
  - Natural roosts include dead trees and woodpecker cavities.
- May roost with Brazilian free-tailed bats.

Big Brown Bat

- Similar in appearance to the evening bat, but slightly larger.
- Also roosts frequently in man-made structures.

Southeastern Myotis

- Small bat.
- Fur is wooly and dull.
- Primarily cave dwelling.
- Can be found in buildings, bridges, and bat houses.
- They sometimes roost in culverts.
- Females form large maternity colonies.
- They preferentially eat mosquitoes!!

Rafinesque's Big-eared Bat

- Enormous ears are distinctive.
- Roosts in small groups, in the open on bridges by hanging on exposed concrete surfaces.
- Rarely encountered in Florida, so status is unknown.

Florida Bonneted Bat

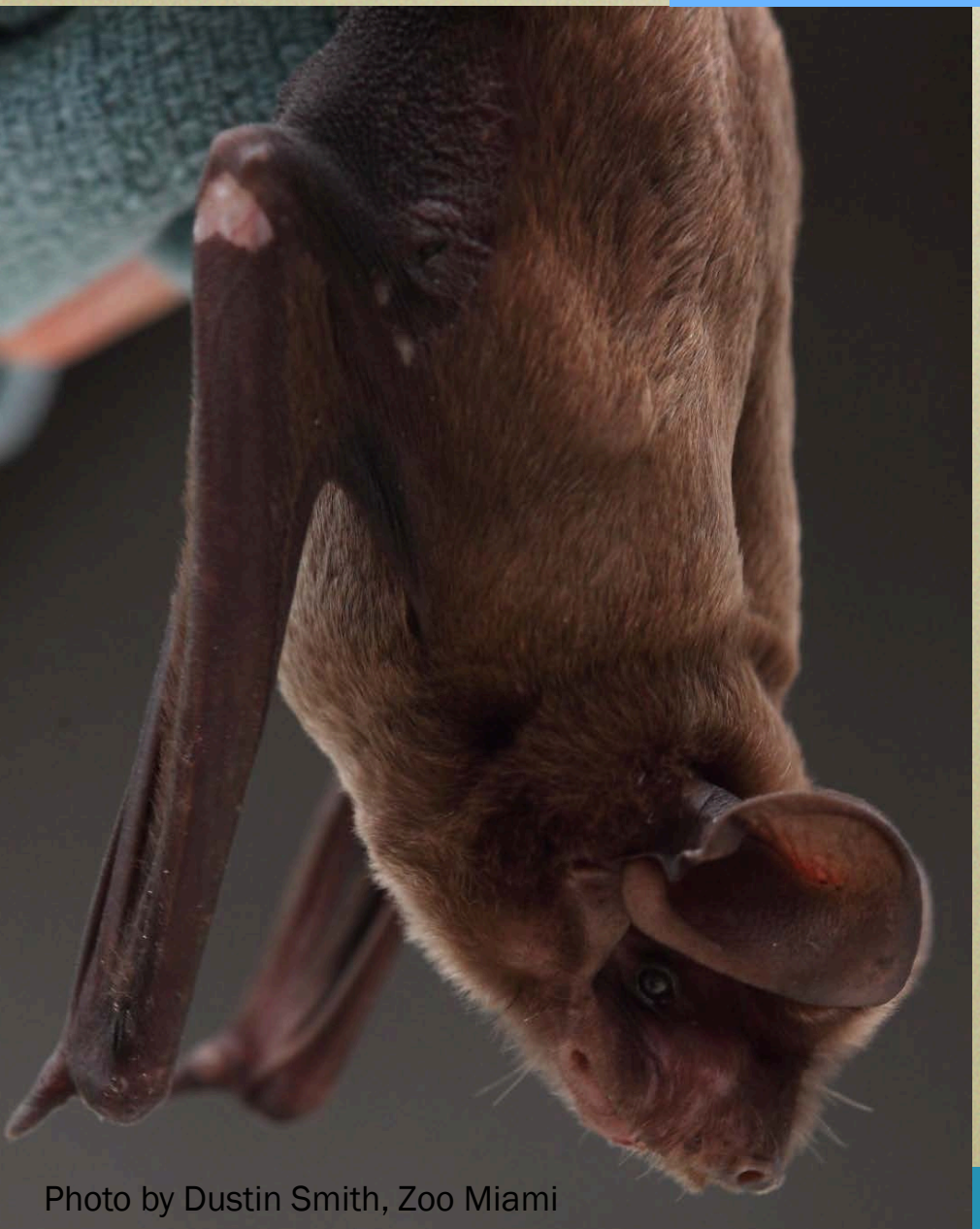
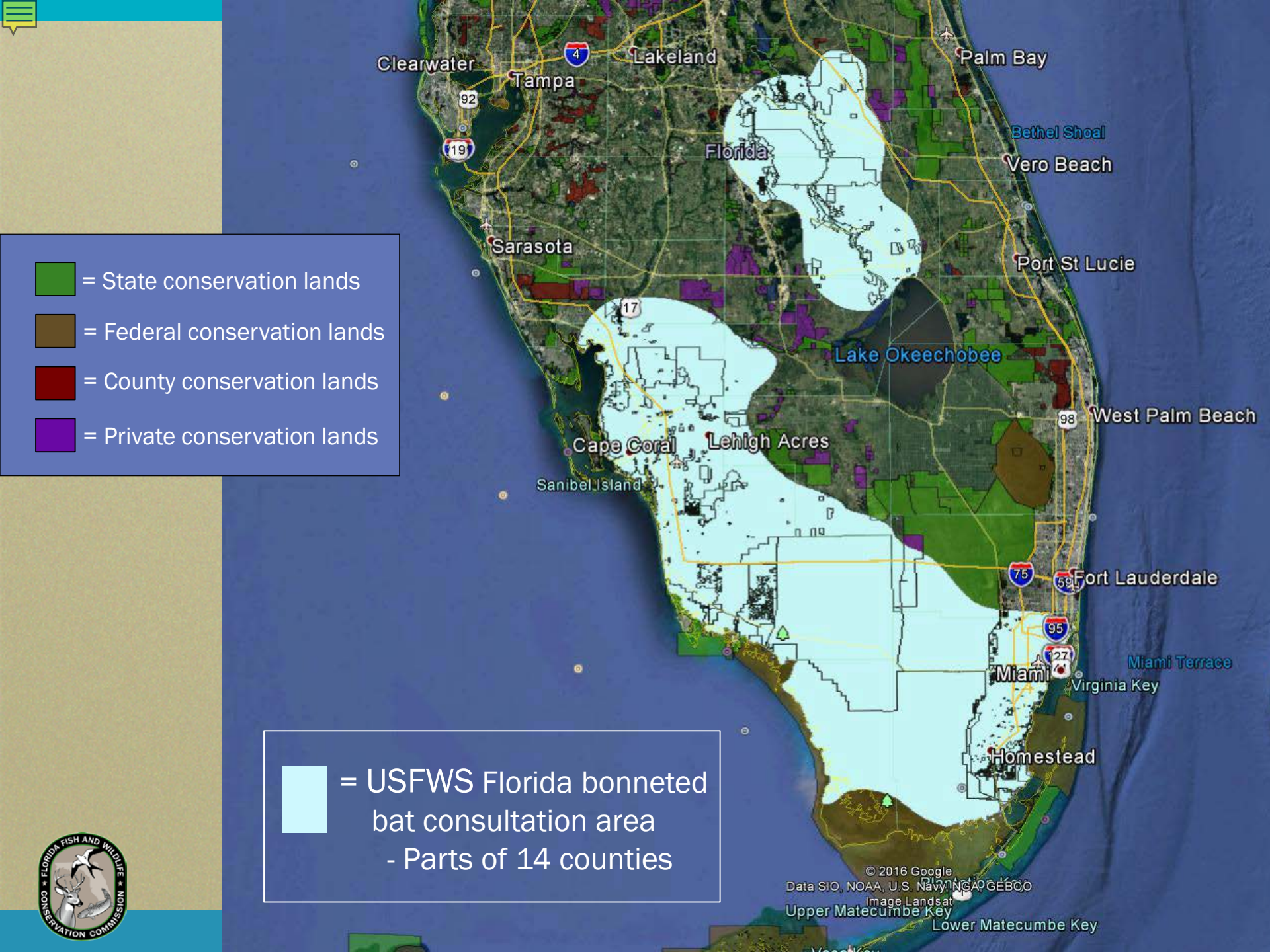


Photo by Dustin Smith, Zoo Miami

- Florida's largest bat – has a wingspan of 20 inches (50 cm).
- One of the rarest bats in North America – found only in Florida.
- We have limited information about this endangered species.
- Known to roost alone or in small groups.

Potential Issues Associated with the Federally Listed Florida Bonneted Bat

- Within the USFWS consultation area the USFWS typically will ask FDOT to conduct surveys to locate roosts if suitable habitat (including bridges and similar structures) occurs within a project site.
  - Initial inspection mainly is expected to be visual.
  - Where identification of bat presence or bat species ID cannot be made visually, USFWS is likely to ask for acoustic surveys.
- For the construction of new bridges or transportation-infrastructure projects, the USFWS general consultation guidelines would apply.
- The USFWS has draft protocols for conducting roost surveys and acoustic surveys.


= State conservation lands
= Federal conservation lands
= County conservation lands
= Private conservation lands
= USFWS Florida bonneted bat consultation area - Parts of 14 counties
Clearwater
Tampa
Lakeland
Palm Bay
Florida
Bethel Shoal
Vero Beach
Sarasota
Port St Lucie
Lake Okeechobee
West Palm Beach
Cape Coral
Lehigh Acres
Sanibel Island
Fort Lauderdale
Miami
Miami Terrace
Virginia Key
Homestead
Upper Matecumbe Key
Lower Matecumbe Key
© 2016 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat

Potential Issues Associated with the Federally Listed Florida Bonneted Bat

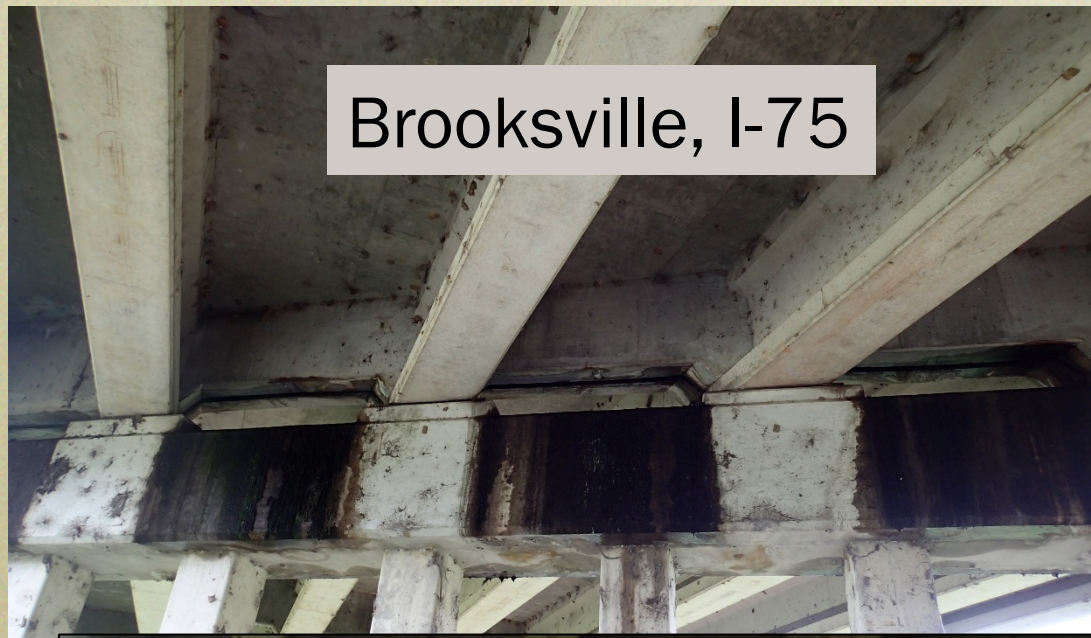
- Construction and maintenance of roads, highways, or bridges may require a consultation with USFWS
- Unauthorized maintenance or repair of bridges or overpasses that are being used as roost sites by the Florida bonneted bat could result in a take – a violation of Federal law.
- They "have been found to roost in tall, live trees or snags; within tree cavities, hollows, and under loose bark. [They also] have been found to use manmade structures (e.g., buildings, bat houses)." In Coral Gables, they have been found roosting in the shafts of royal palm leaves.

Potential Issues Associated with the Federally Listed Florida Bonneted Bat

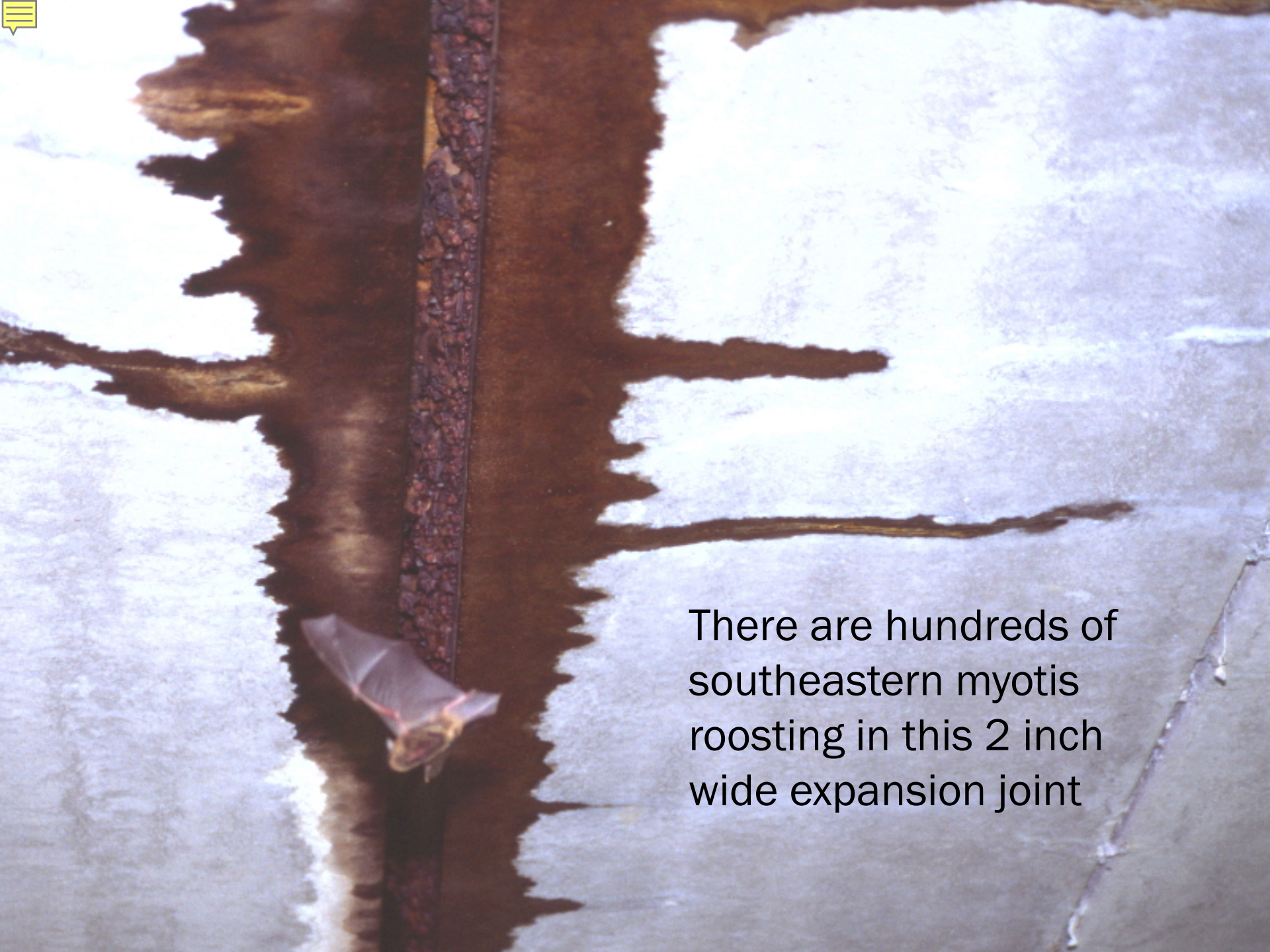
- The Florida bonneted bat's ability to adapt well to manmade structures may place it at risk from inadvertent or purposeful harm by humans.
- Problems caused by a lack of awareness can cause disturbance or mortality to colonies occupying either manmade structures or natural roost sites.
- To date, the Florida bonneted bat has not been documented using bridges or culverts as roosts.

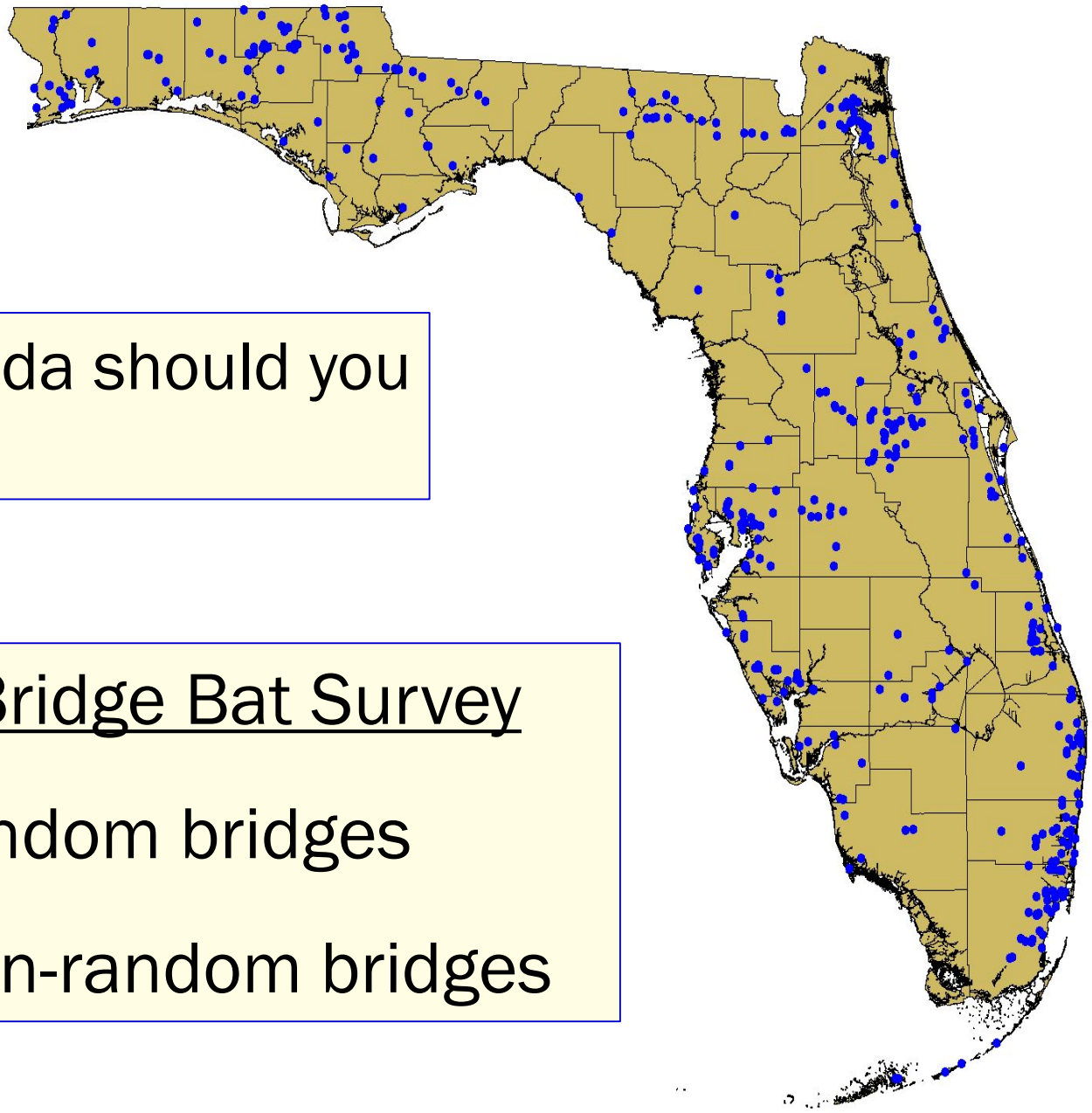
Staining and Guano are signs that bats have been, or are, present

Lots of Signs = Lots of Bats




Large numbers of bats can
be present in small spaces


There are hundreds of southeastern myotis roosting in this 2 inch wide expansion joint

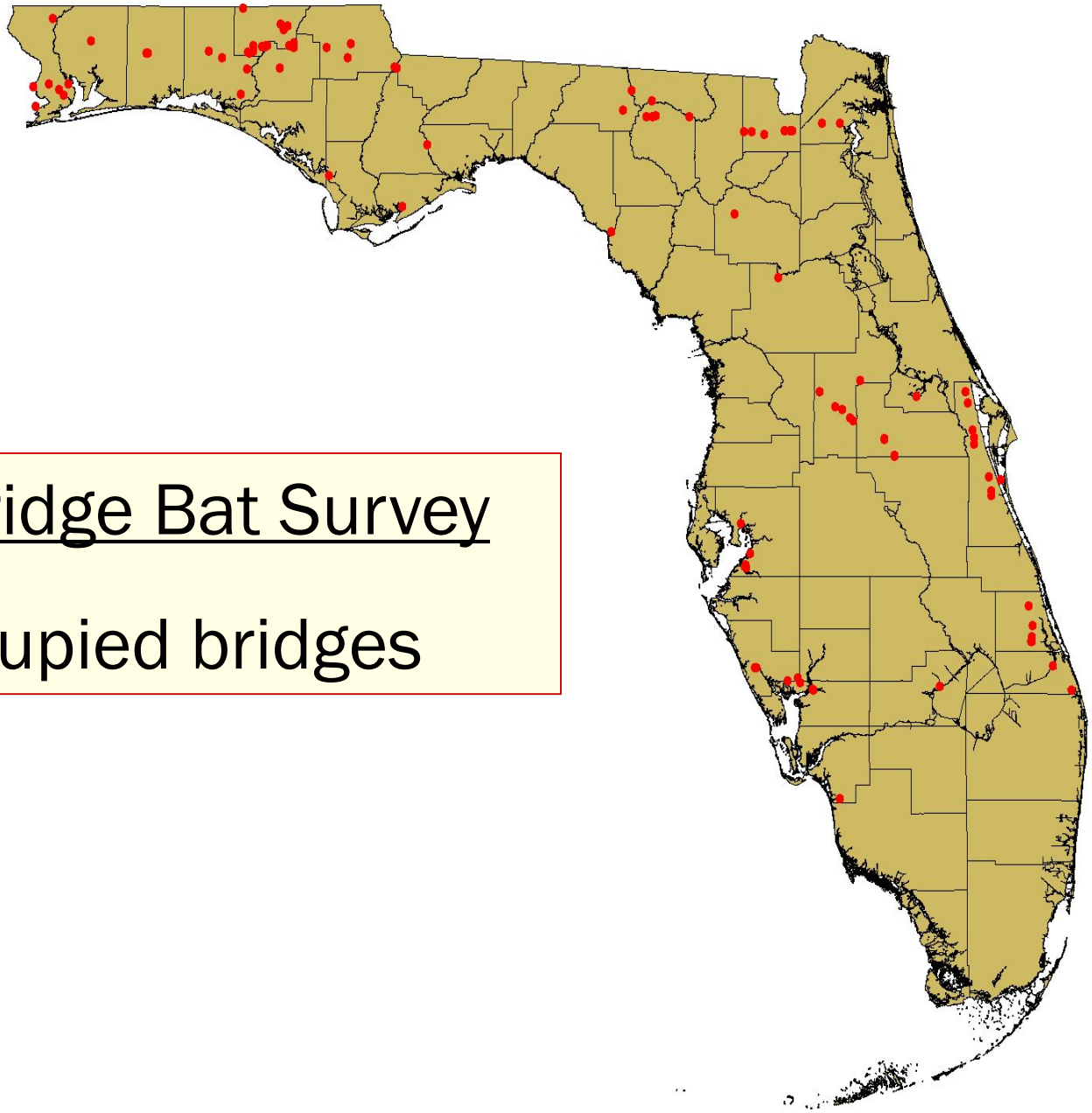


Where in Florida should you expect bats?

<u>2003 Bridge Bat Survey</u>

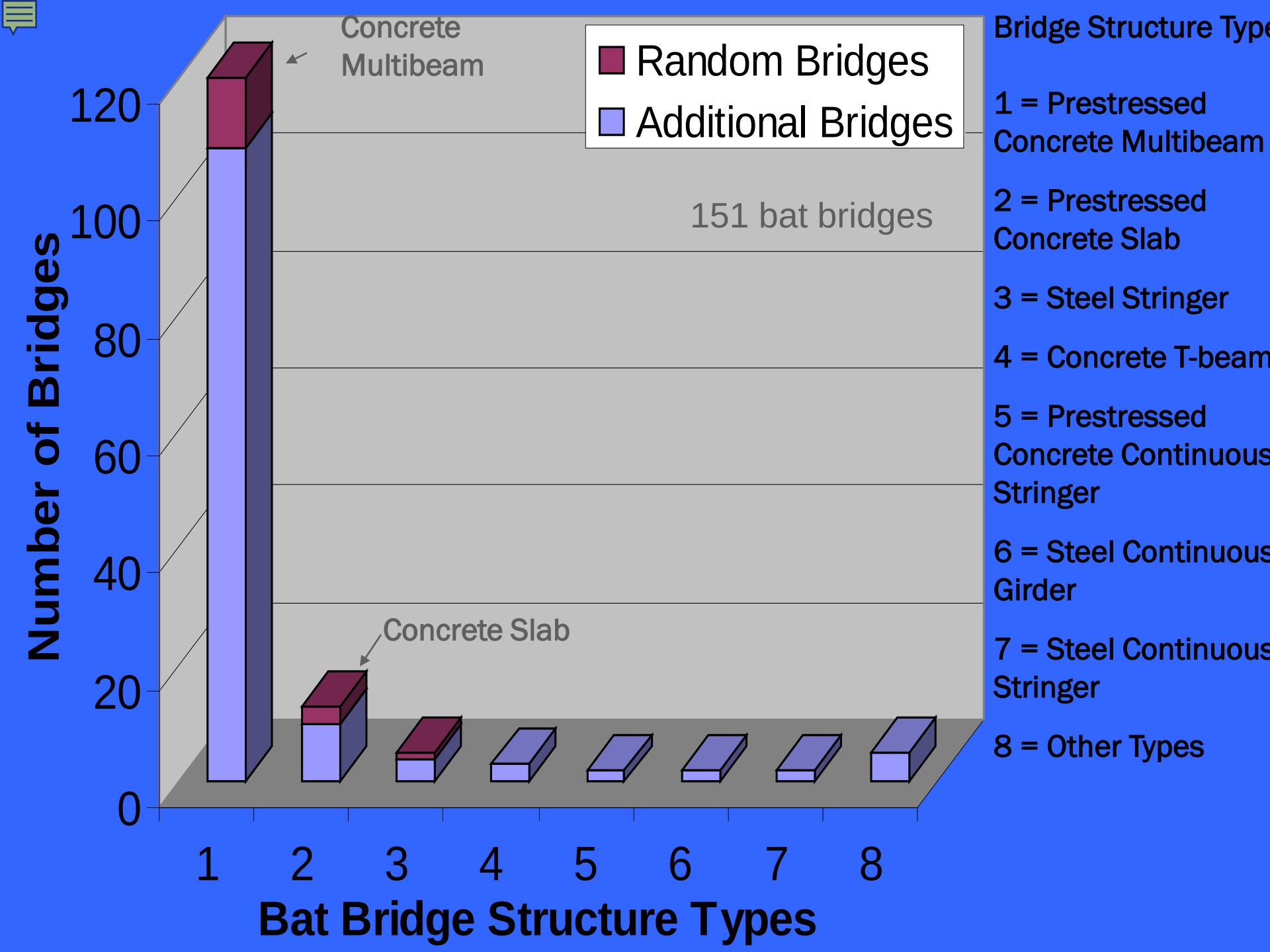
301 random bridges

186 non-random bridges



2003 Bridge Bat Survey

152 occupied bridges


Concrete Multibeam
Random Bridges
Additional Bridges
151 bat bridges
Concrete Slab
Number of Bridges
0
20
40
60
80
100
120
1
2
3
4
5
6
7
8
Bat Bridge Structure Types
Bridge Structure Type
1 = Prestressed Concrete Multibeam
2 = Prestressed Concrete Slab
3 = Steel Stringer
4 = Concrete T-beam
5 = Prestressed Concrete Continuous Stringer
6 = Steel Continuous Girder
7 = Steel Continuous Stringer
8 = Other Types

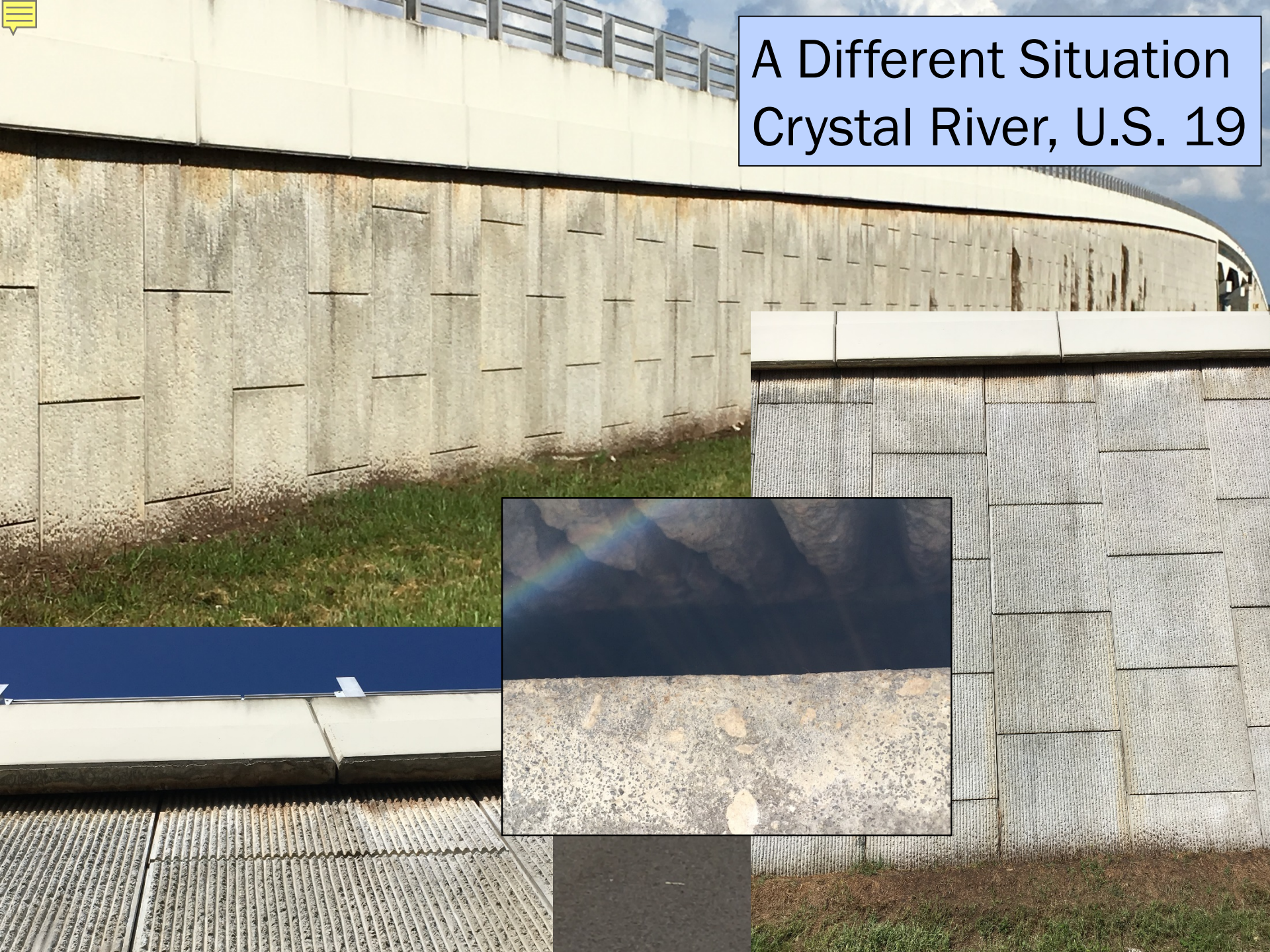
Bat Species Identified Roosting in the Bridges

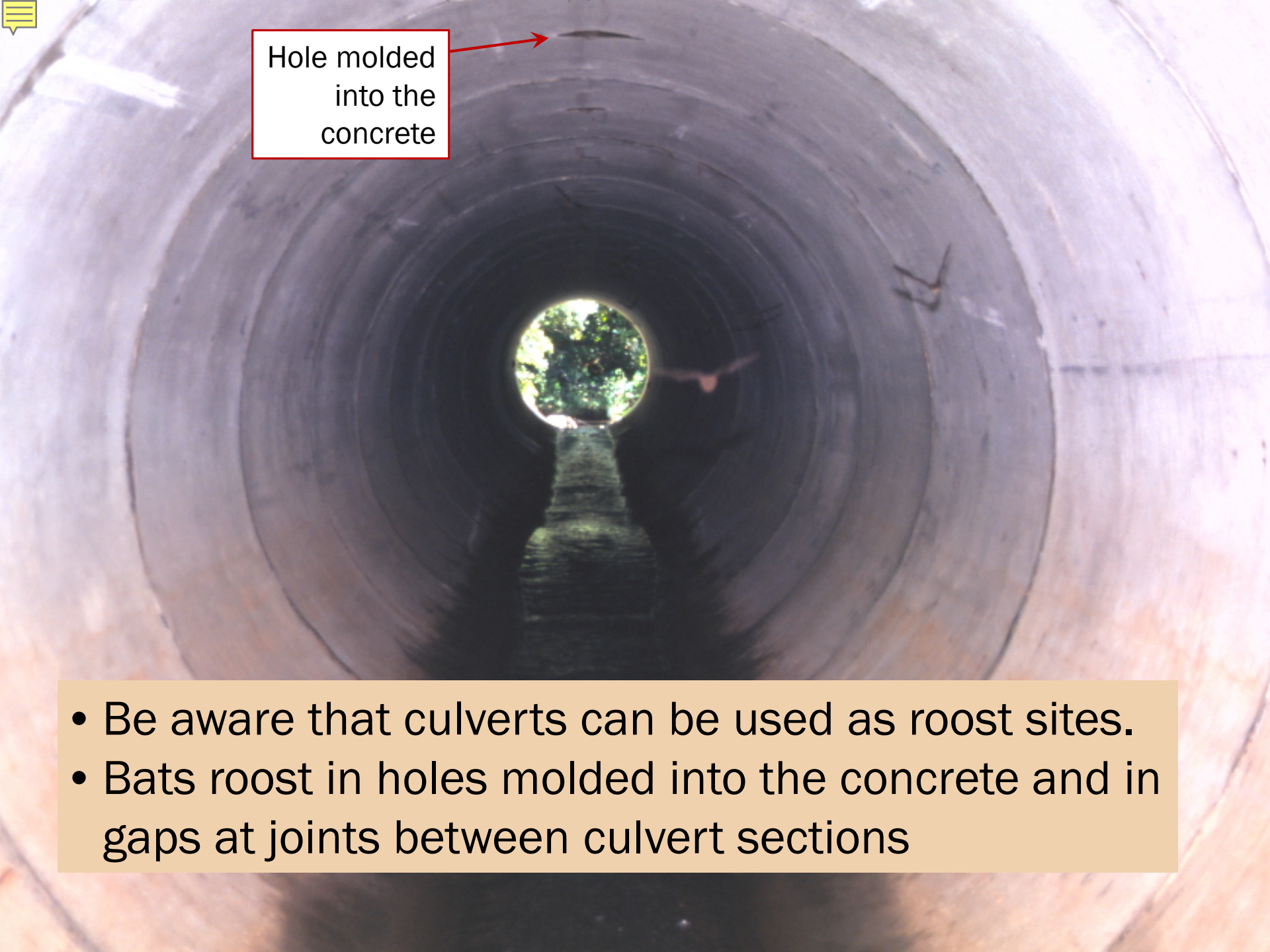
	Bridges Occupied			
Common Name	Random	Nonrandom	Total	(%)
Southeastern myotis	0	8	8	(5.3)
Big brown bat	2	33	35	(23.2)
Evening bat	2	8	10	(6.6)
Free-tailed bat	13	91	104	(68.9)

- Bats usually prefer small or narrow spaces in concrete bridges as roosting sites
- Some bats can enter spaces as small as ½ inch wide

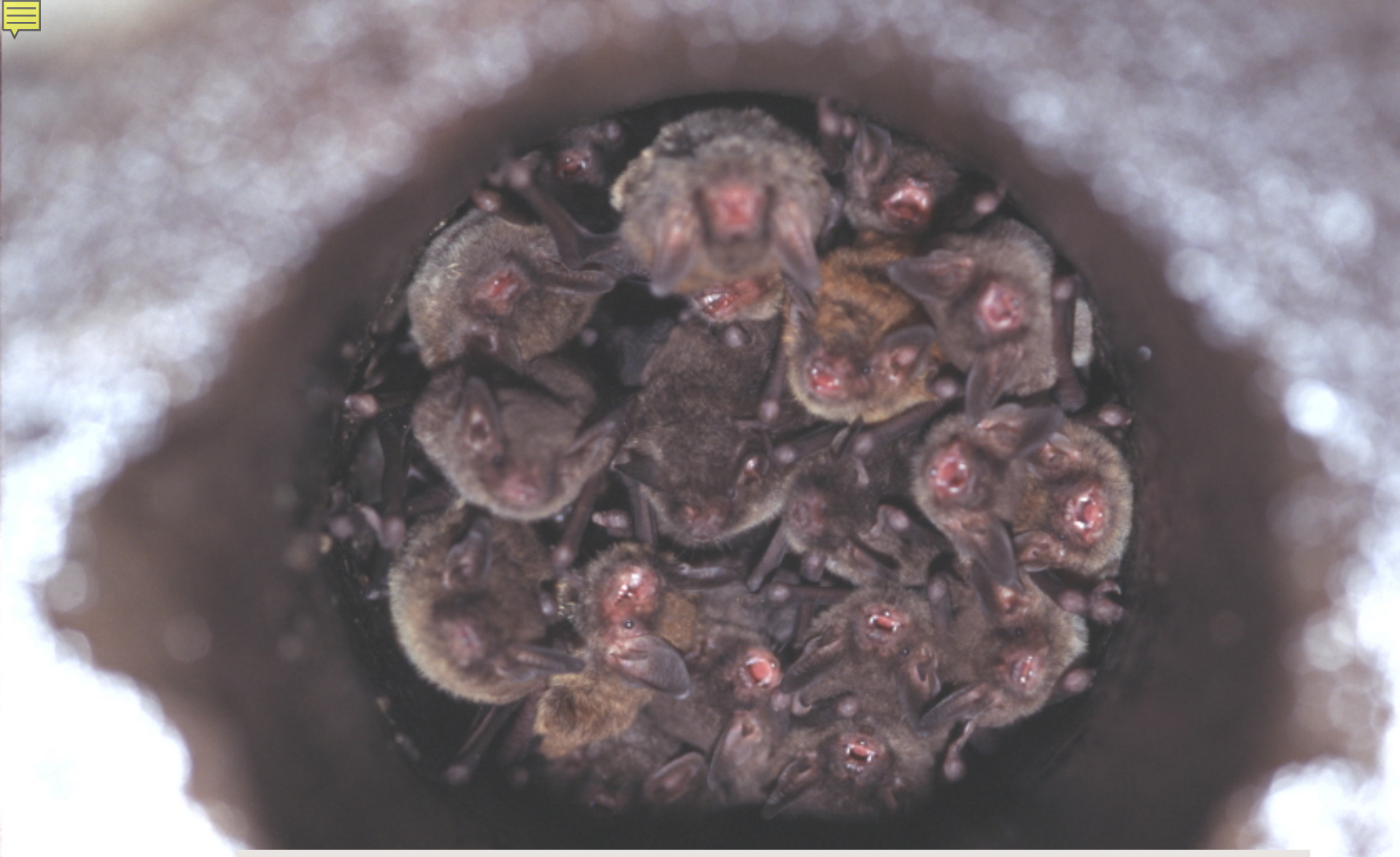

Big-eared bats like these typically roost in small groups, in open locations, not in holes or crevices.

A Different Situation
Crystal River, U.S. 19



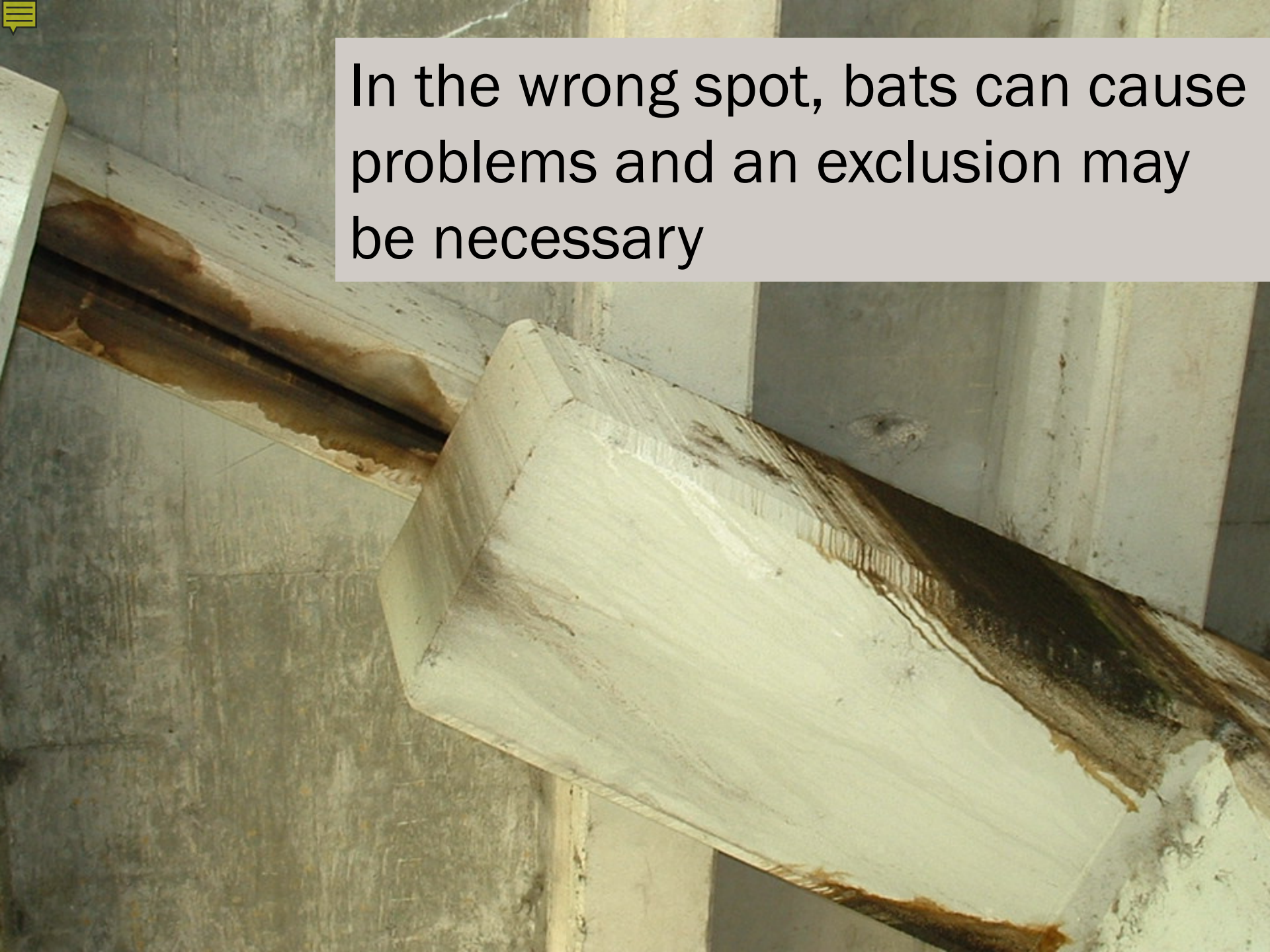


- Be aware that culverts can be used as roost sites.
- Bats roost in holes molded into the concrete and in gaps at joints between culvert sections

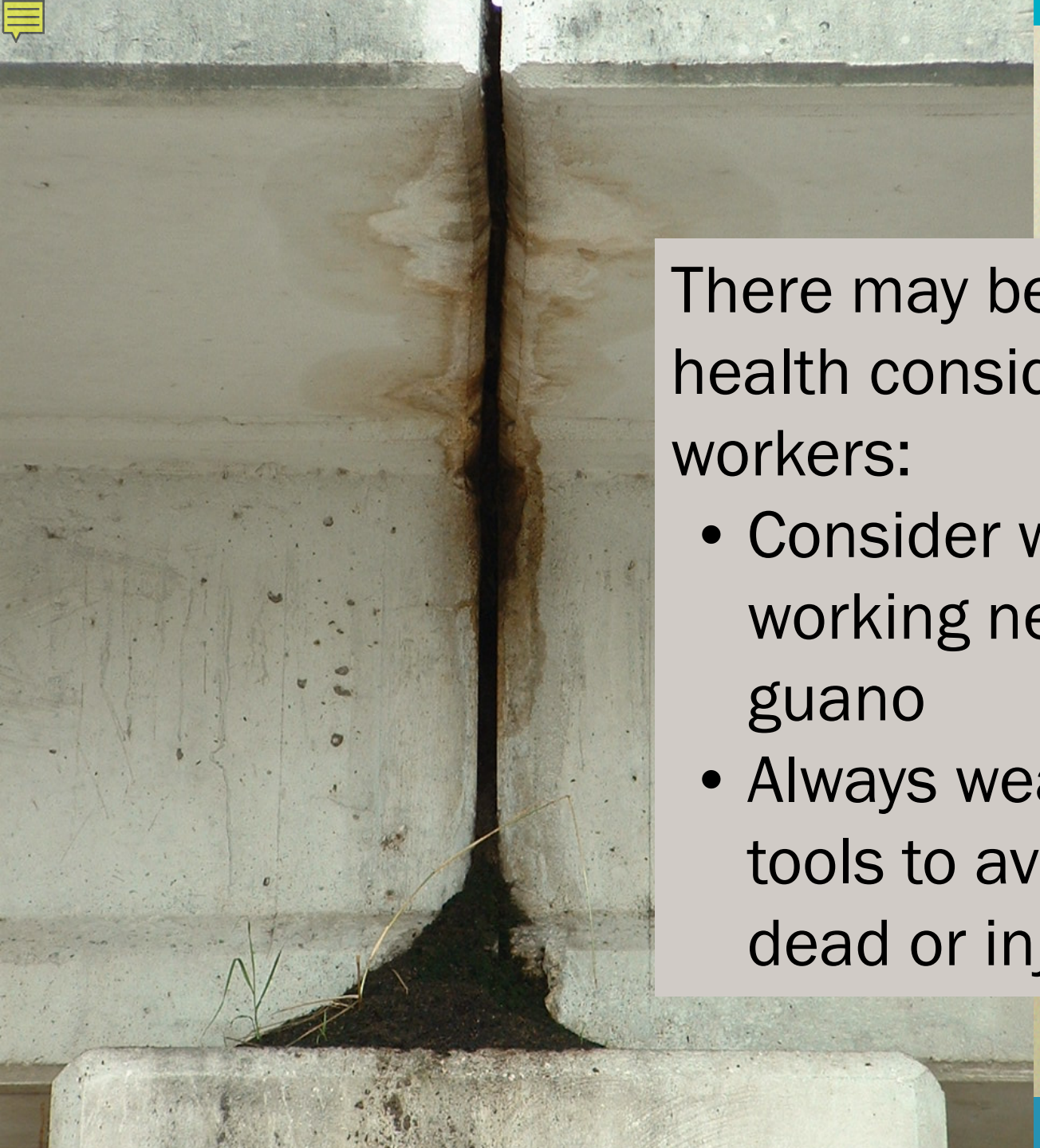


A cluster of bats in a pipe hole.

- Bats will use many different types of holes or crevices for shelter.


In the wrong spot, bats can cause problems and an exclusion may be necessary

When exclusions have to be done, it is important to have them done well



There may be some limited health considerations for workers:

- Consider wearing masks if working near accumulated guano
- Always wear gloves or use tools to avoid handling dead or injured bats

Recommendations

- Identify existing bat roost sites as early as possible
  - Avoid take issues, contract problems, and work delays
  - Contact FWC for input when necessary
- In South Florida it is important to identify bat species that are present – to avoid take of Florida bonneted bats

A Rafinesque's big-eared bat roosting under a bridge

Recommendations

- Exclude bats only where they create problems for required work
  - Protect them where they are not causing problems
  - Provide workers with information about the bats
- Retain roost sites or provide new roosts whenever possible

Conserving Bats

- Protect natural habitats.
  - Caves, tree roosts.
- More education about bats and their benefits.
- Avoid disturbance.
- If exclusion is necessary, use proper techniques
- Provide alternate roost sites whenever possible.

Box-type Cave Gate Structure

Two double bat houses

QUESTIONS?

Protections for Florida's Birds

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Avian Conservation Coordinator
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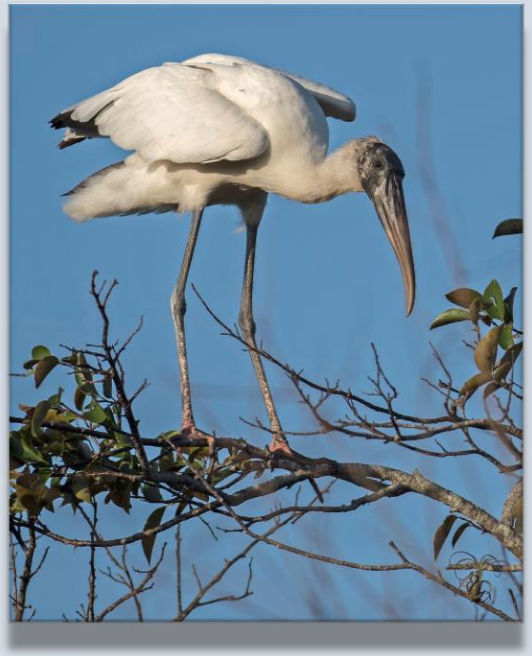
All Native Florida Birds are Protected

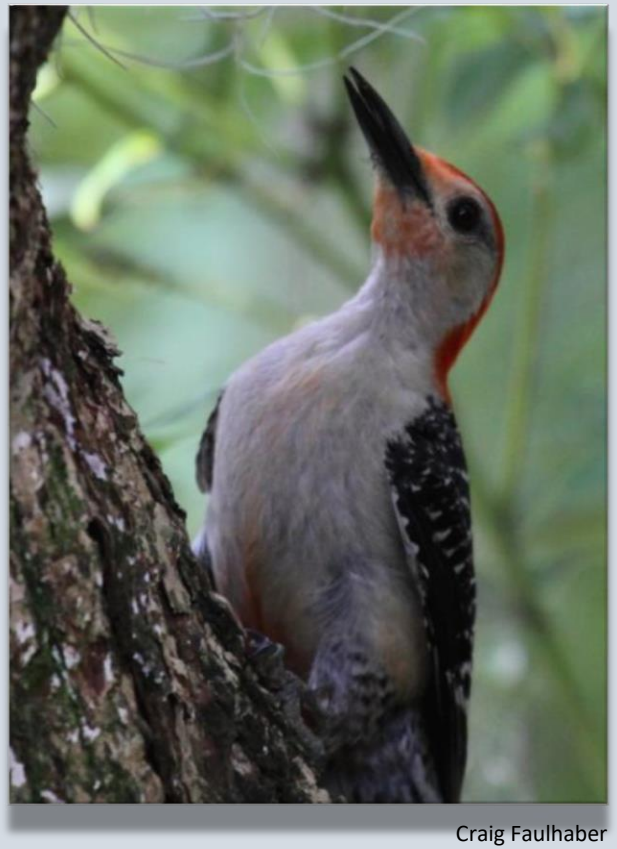
- Even **non-listed** birds are protected
- Some birds have special **federal** protection
- Some birds have special **state** protection



All Native Florida Birds are Protected

- All native birds in Florida are protected by…
  - —General prohibitions (68A-4.001 F.A.C.)
  - —Federal Migratory Bird Treaty Act (MBTA)
  - —State rule adopting MBTA (68A-16.001 F.A.C.)
  - —Bird trap rule (68A-16.006 F.A.C.)*

  * In effect as of Oct. 3, 2019



Craig Faulhaber

Non-listed Species

68A-4.001, F.A.C., General Prohibitions — No wildlife or freshwater fish or their nests, eggs, young, homes or dens shall be **taken**, transported, stored, served, bought, sold, or possessed…

68A-1.004, F.A.C., Take—The term shall include taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife…or their nests or eggs by any means…

Non-listed Species

- The **Migratory Bird Treaty Act (MBTA) & associated state rule (68A-16.001)**
  - — Prohibits the pursuing, hunting, taking, capturing, possessing, selling, purchasing, & transportation of native birds
  - — Also applies to nest, eggs, and parts

Craig Faulhaber

Non-listed Species

Craig Faulhaber

- The **MBTA** formerly covered both intentional and incidental take
- Now interpreted as covering only *intentional* take (M-37050)

Active Nests of Non-listed Birds

- Can *active* nests be taken under MBTA?
  - — Yes, if incidental
  - — No, if purposeful

Active Nests of Non-listed Birds

- Are active nests protected under state rule?
  - Yes, removal of active nest considered prohibited without state permit
    - — Typically, only issued for removal of active nest for human health/safety*

*Would also need federal permit if purposeful

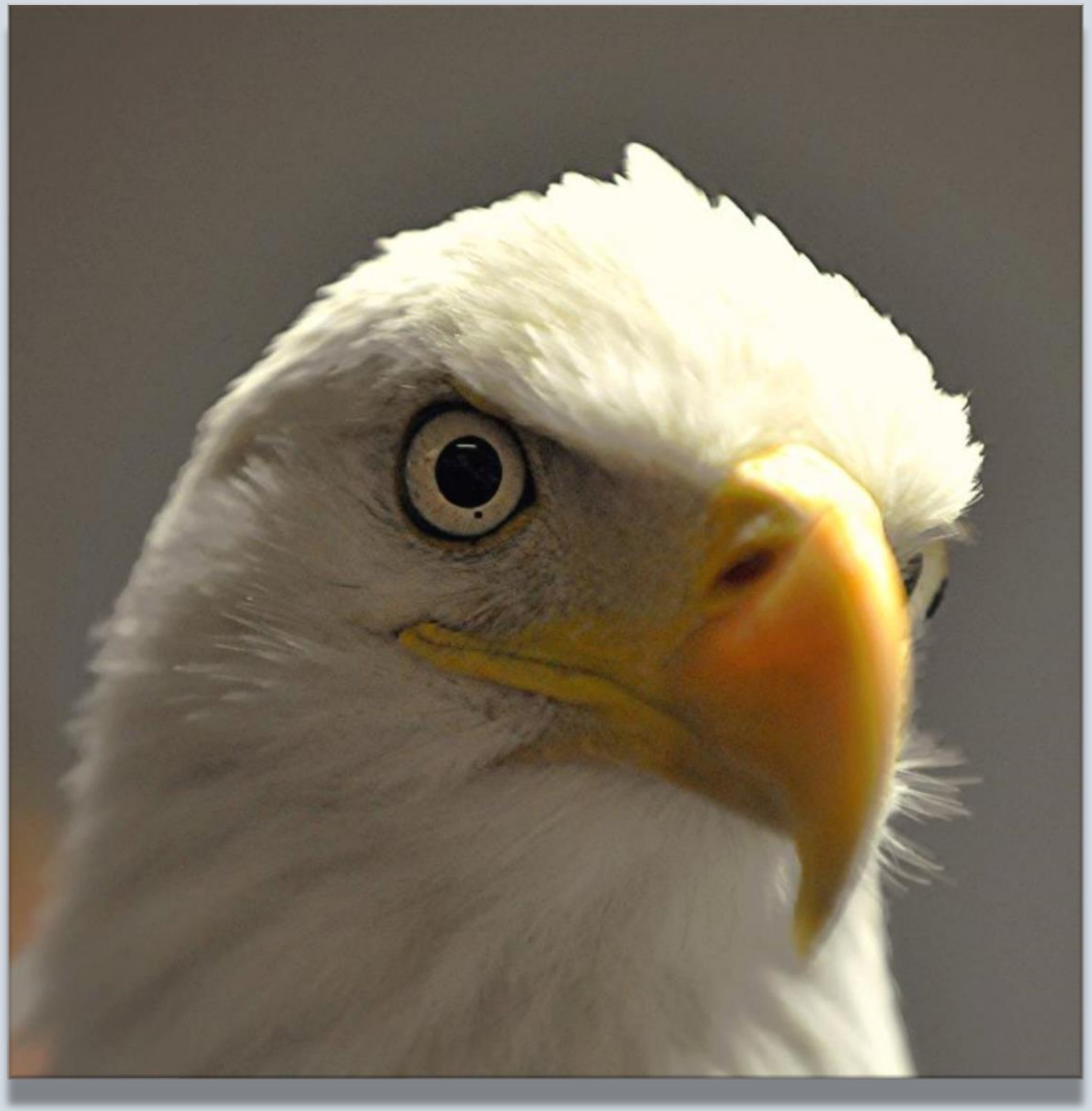
68A-16.006- Prohibitions Related to Bird Traps

- As of October 2019, regulates use & placement, or allowing placement, of bird traps without a permit, with exceptions
- To address illegal trapping of songbirds
- Please report bird traps to FWC law enforcement

Birds with Special Federal Protection

Bald Eagles

- Bald and Golden Eagle Protection Act
- State Eagle Rule (68A-16.002)

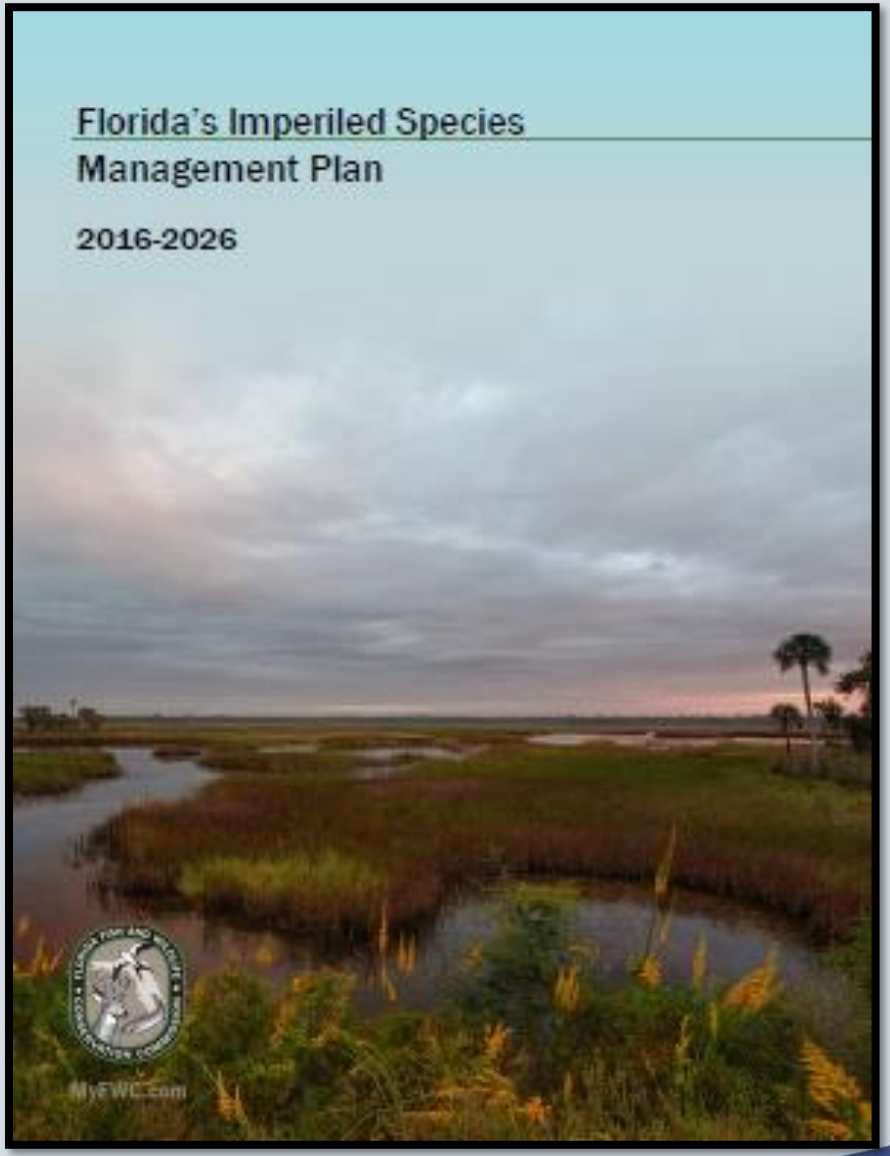


The Endangered Species Act

- Federal Law, prohibits “take”
- Definition same as for state Threatened
- USFWS handles permitting
- No separate FWC permit needed

Birds with Special State Protection

- Imperiled Species Management Plan
- Florida's Endangered and Threatened Species List



State Threatened Species

- 68A-27.003(a), F.A.C. No person shall **take**, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.

Ron Bielefeld, Whistling Wings Photography

What is “take?”

- 68A-27.001: “Take – to **harass**, **harm**, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct.”

What does it mean to “harm?”

- 68A-27.001: “The term ‘harm’…means **an act which actually kills or injures fish or wildlife**. Such act **may include significant habitat modification** or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.”

- An example: A beach-raker runs over an egg.

What does it mean to “harass?”

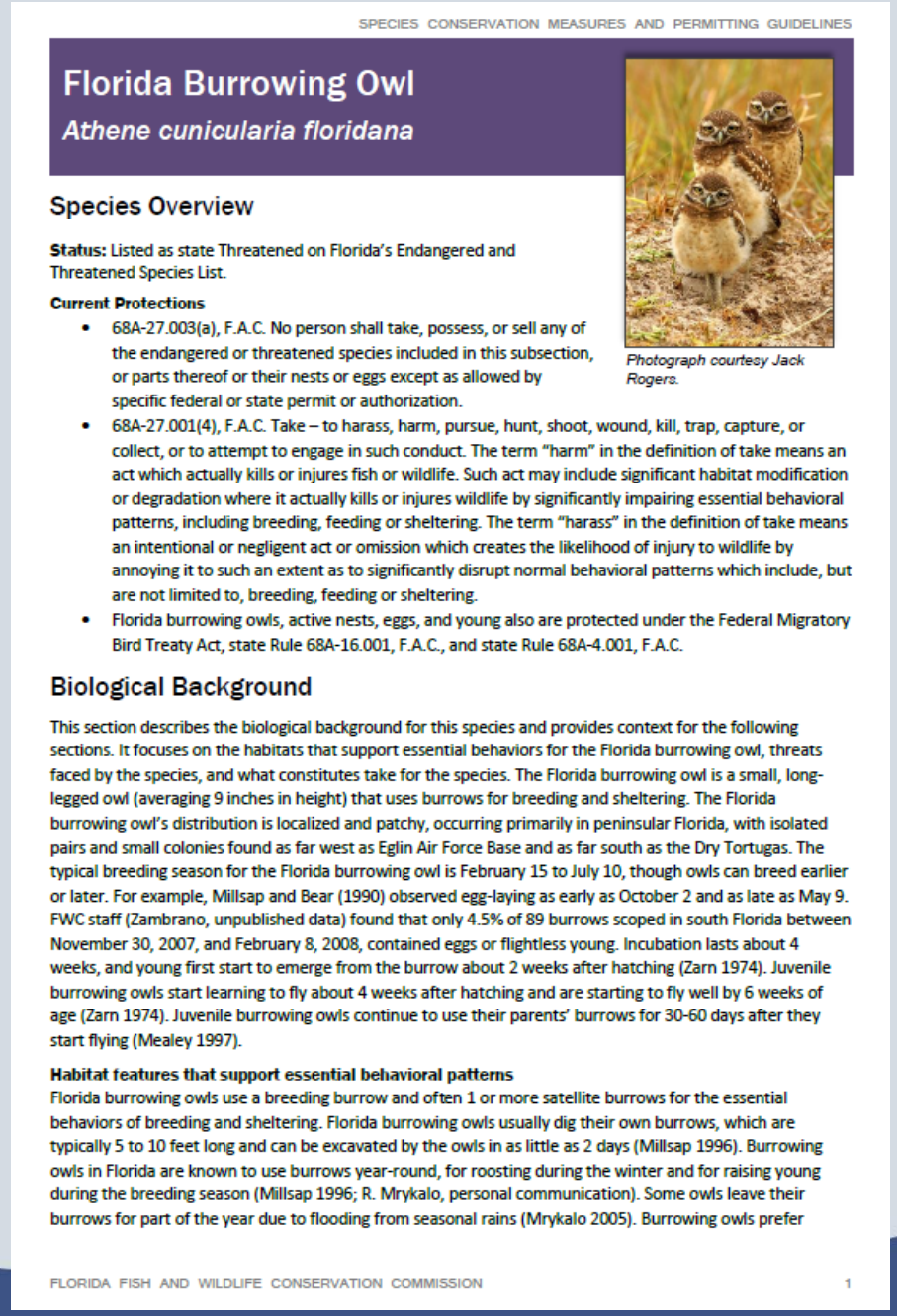
- 68A-27.001: “The term ‘harass’…means an intentional or negligent act or omission which **creates the likelihood of injury** to wildlife by annoying it to such an extent as to **significantly disrupt normal behavioral patterns** which include, but are not limited to, breeding, feeding or sheltering.”

- An example: A beach-raker repeatedly drives through an important breeding site to keep birds from nesting.

Ron Bielefeld, Whistling Wings Photography

Permitting Guidelines

- A single source for technical assistance and permitting
- Helps explain what constitutes take for each species
- Available for these birds:
  - — burrowing owl
  - — sandhill crane
  - — osprey
  - — white-crowned pigeon
  - — wading birds
  - — *more on the way!*



SPECIES CONSERVATION MEASURES AND PERMITTING GUIDELINES

Florida Burrowing Owl

Athene cunicularia floridana

Photograph courtesy Jack Rogers.

Species Overview

Status: Listed as state Threatened on Florida's Endangered and Threatened Species List.

Current Protections

- 68A-27.003(a), F.A.C. No person shall take, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.
- 68A-27.001(4), F.A.C. Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.
- Florida burrowing owls, active nests, eggs, and young also are protected under the Federal Migratory Bird Treaty Act, state Rule 68A-16.001, F.A.C., and state Rule 68A-4.001, F.A.C.

Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support essential behaviors for the Florida burrowing owl, threats faced by the species, and what constitutes take for the species. The Florida burrowing owl is a small, long-legged owl (averaging 9 inches in height) that uses burrows for breeding and sheltering. The Florida burrowing owl's distribution is localized and patchy, occurring primarily in peninsular Florida, with isolated pairs and small colonies found as far west as Eglin Air Force Base and as far south as the Dry Tortugas. The typical breeding season for the Florida burrowing owl is February 15 to July 10, though owls can breed earlier or later. For example, Millsap and Bear (1990) observed egg-laying as early as October 2 and as late as May 9. FWC staff (Zambrano, unpublished data) found that only 4.5% of 89 burrows scoped in south Florida between November 30, 2007, and February 8, 2008, contained eggs or flightless young. Incubation lasts about 4 weeks, and young first start to emerge from the burrow about 2 weeks after hatching (Zarn 1974). Juvenile burrowing owls start learning to fly about 4 weeks after hatching and are starting to fly well by 6 weeks of age (Zarn 1974). Juvenile burrowing owls continue to use their parents' burrows for 30-60 days after they start flying (Mealey 1997).

Habitat features that support essential behavioral patterns

Florida burrowing owls use a breeding burrow and often 1 or more satellite burrows for the essential behaviors of breeding and sheltering. Florida burrowing owls usually dig their own burrows, which are typically 5 to 10 feet long and can be excavated by the owls in as little as 2 days (Millsap 1996). Burrowing owls in Florida are known to use burrows year-round, for roosting during the winter and for raising young during the breeding season (Millsap 1996; R. Mrykalo, personal communication). Some owls leave their burrows for part of the year due to flooding from seasonal rains (Mrykalo 2005). Burrowing owls prefer

Example: State Threatened Wading Birds

- Reddish Egret – Coastal species
- Roseate Spoonbill – Mainly coastal, some inland
- Little Blue Heron and Tricolored Heron – statewide distribution

Photographs (clockwise from top left): little blue heron, reddish egret, and tricolored heron by Jack rogers; roseate spoonbill by FWC.

Example: State Threatened Wading Birds

- Survey seasons vary by region (North, Central, South) and species
- Known breeding sites are re-used and support breeding
  - Need a permit for actions that render part of all of an active or recent breeding site unsuitable for breeding

Photographs (clockwise from top left): little blue heron, reddish egret, and tricolored heron by Jack rogers; roseate spoonbill by FWC.

Example: State Threatened Wading Birds

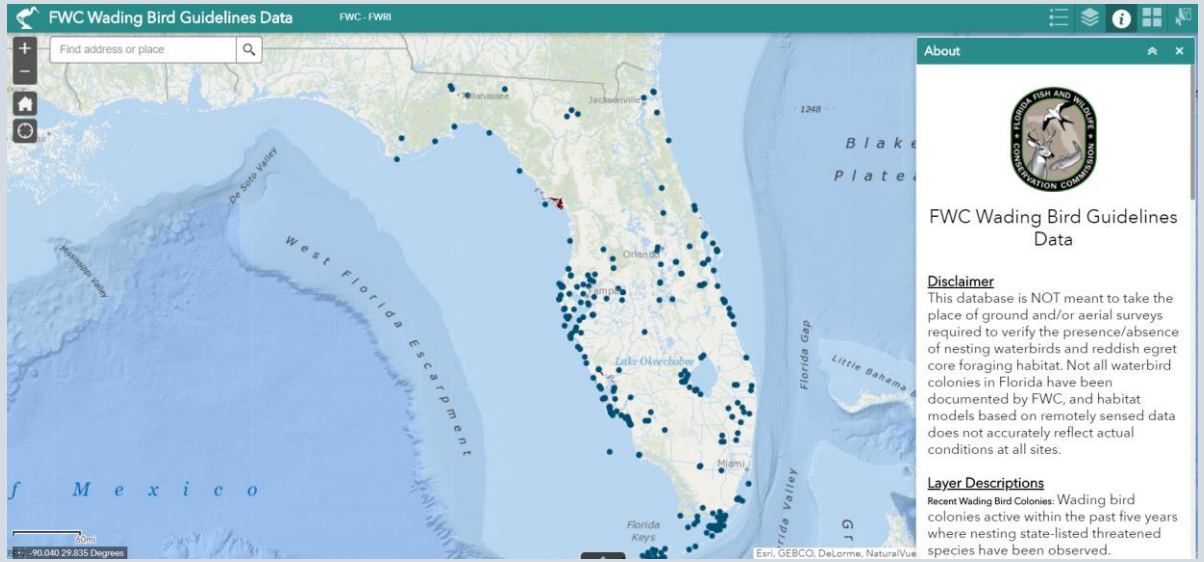
Definitions of take:

- Actions that result in loss of habitat within active or recent breeding sites
- Actions that could render a breeding site unusable (e.g. altering water levels, erecting permanent structures within 330 feet of breeding site)
- Ground, aerial, or water based activities that result in repeated flushing of active nests

Suggested buffer distance = 330 feet from active nests

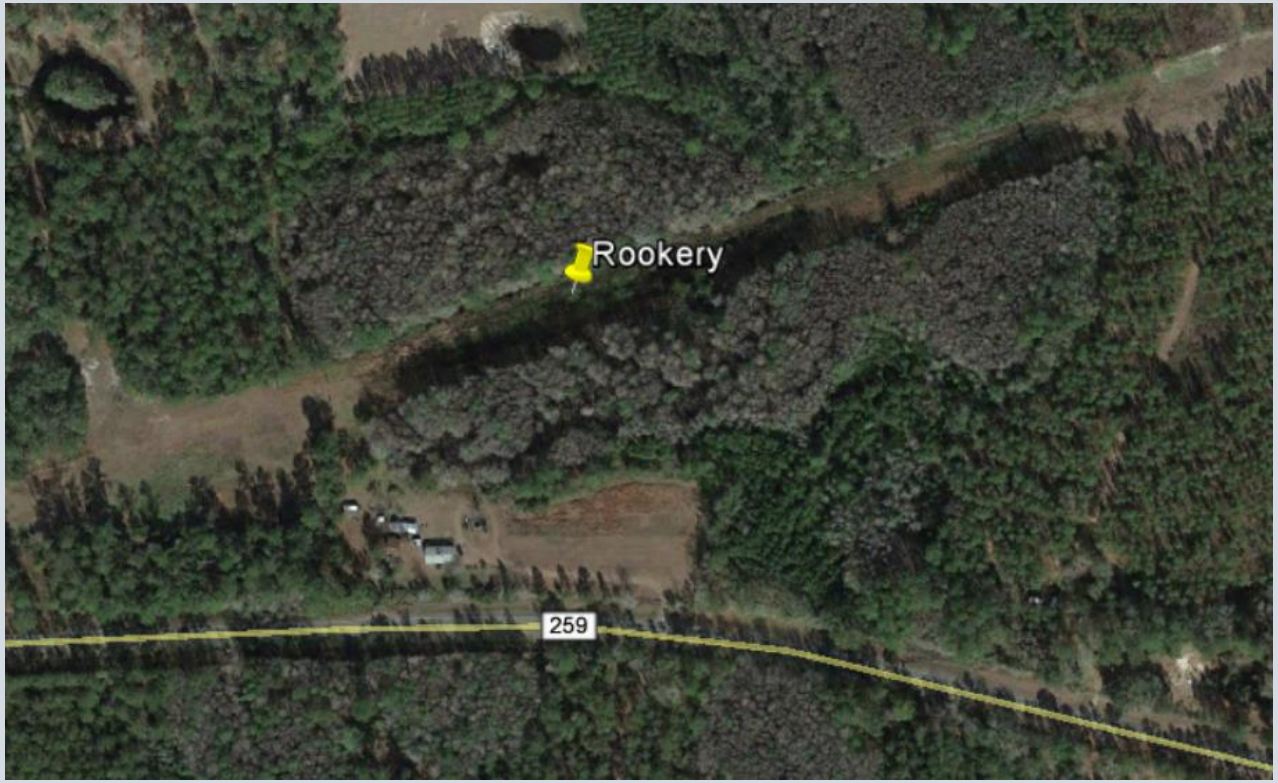
Example: State Threatened Wading Birds

- Database of recent breeding sites online: http://geodata.myfwc.com/pages/upland (under Wading Bird Guidlines)
- Not complete, recommend surveys during the breeding season in appropriate habitat



Threatened Wading Birds

- Not all breeding colonies are tree islands
- This wading bird colony in NW Florida is in a ROW that is not flooded year round
- To avoid take when the breeding colony is active, maintain 330-foot buffer



Example: State Threatened Wading Birds

Examples of activities not expected to cause take:

- Changes to canals, ditches or water control structures 330 feet from active breeding sites
- If activities are similar in nature, size, duration, and intensity
- Maintenance of existing roadways within 330 feet of breeding sites, provided outside of the breeding season and no degradation to the breeding site

Example: State Threatened Wading Birds

Other Authorizations:

- Emergency water management actions such as flood control
- Take due to loss of ***foraging*** habitat for Little Blue Herons, Tricolored Herons, and Roseate Spoonbills will be covered by ERP permits (does not apply to Reddish Egret or nesting sites)

Example: State Threatened Wading Birds

Other Authorizations:

- Routine vegetation maintenance activities within existing highway right of ways that avoid heavy equipment operation within 330 ft of active, known and visibly apparent nests.

Example: State Threatened Wading Birds

Mitigation options:

- Habitat protection or restoration
- Habitat enhancement
- Acquisition, mitigation bank credits or easements
- Funding options
- Information needs
- Programmatic options

Threatened Wading Birds

- Guidelines are available online at https://myfwc.com/wildlifehabitats/wildlife/species-guidelines/
- More information on surveys and definitions on take

Little Blue Heron, Reddish Egret, Roseate Spoonbill, Tricolored Heron

Egretta caerulea, Egretta rufescens, Platalea ajaja, Egretta tricolor

Photographs (clockwise from top left): little blue heron, reddish egret, and tricolored heron by Jack rogers; roseate spoonbill by FWC.

Species Overview

Status: The little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), roseate spoonbill (*Platalea ajaja*), and tricolored heron (*Egretta tricolor*) (hereinafter "wading birds") are listed as state Threatened on Florida's Endangered and Threatened Species List.

Current Protections

68A-27.003(2)(a), F.A.C. No person shall take, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.

68A-27.001(4), F.A.C. Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

State-Threatened wading birds, active nests, eggs, and young also are protected under the Federal Migratory Bird Treaty Act, Rule 68A-16.001, F.A.C., and Rule 68A-4.001, F.A.C.

Biological Background

Florida's Endangered and Threatened Species List includes 4 state-Threatened wading birds: the little blue heron, reddish egret, roseate spoonbill, and tricolored heron. The snowy egret (*Egretta thula*) and white ibis (*Eudocimus albus*) were removed from Florida's Endangered and Threatened Species List in 2017 and will be discussed in a separate set of Guidelines. This section describes the biological background for the 4 state-Threatened wading birds (hereafter, wading birds) and provides context for the following sections. This section focuses on the habitats that support essential behaviors for these species, threats faced by the species, and what constitutes take for the species. For more information about life history and conservation actions for wading birds, please refer to A Species Action Plan for Six Imperiled Wading Birds.

All 4 species are year-round residents in Florida (Greenlaw et al. 2014). Little blue herons, roseate spoonbills, and tricolored herons are found throughout the state, though roseate spoonbills currently nest only in peninsular Florida (Greenlaw et al. 2014; Florida Ornithological Society, unpublished data). Reddish egrets are found almost exclusively in coastal areas, with nesting occurring from south Florida to at least Levy County on the Gulf Coast and Brevard County on the Atlantic Coast (Lowther and Paul 2002, Cox et al. 2017*b*).


QUESTIONS?

Photo: T. Long, FWC

Sea Turtles and Lights

Balancing Property Rights, Safety, and Sea Turtle Survival

Tonya Long, Luke Davis, Rachael Stevenson

Imperiled Species Management

Florida Fish & Wildlife Conservation Commission

Sea Turtles Nesting in Florida

Loggerhead
(Caretta caretta)
Status: Threatened

Leatherback
(Dermochelys coriacea)
Status: Endangered

Green
(Chelonia mydas)
Status: Threatened

Kemp's Ridley
(Lepidochelys kempii)
Status: Endangered

Hawksbill
(Eretmochelys imbricata)
Status: Endangered

Sea Turtle Nesting 101

- Nesting season is May 1 – October 31 (March 1 – October 31 in Brevard through Broward)
- Nesting and hatching both occur at night.
- Nests contain ~100 eggs and incubate ~2 months
- Females return to nest in the same areas where they hatched.
- About 40% of worldwide loggerhead nesting occurs in Florida – more than anywhere else in the world!

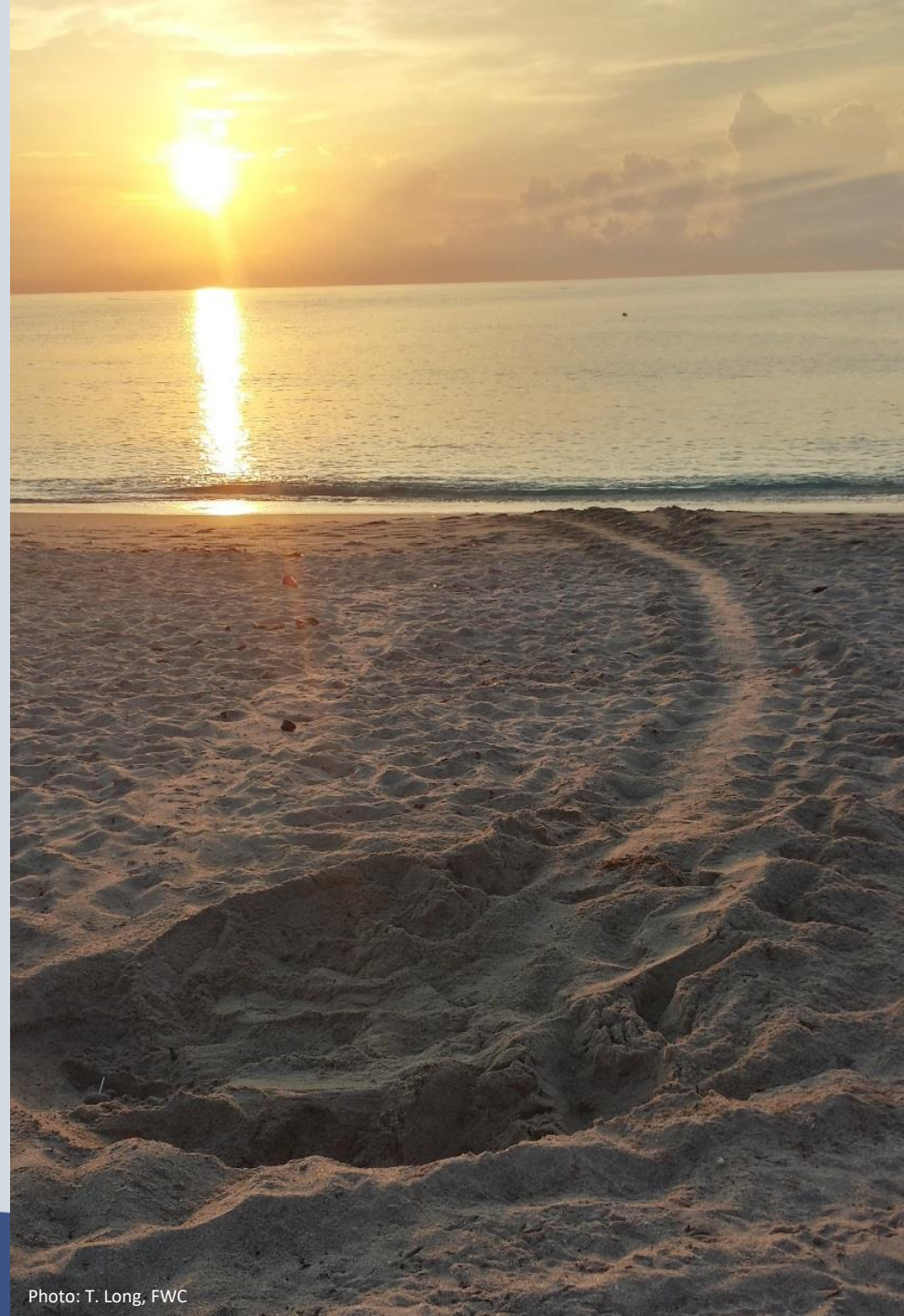
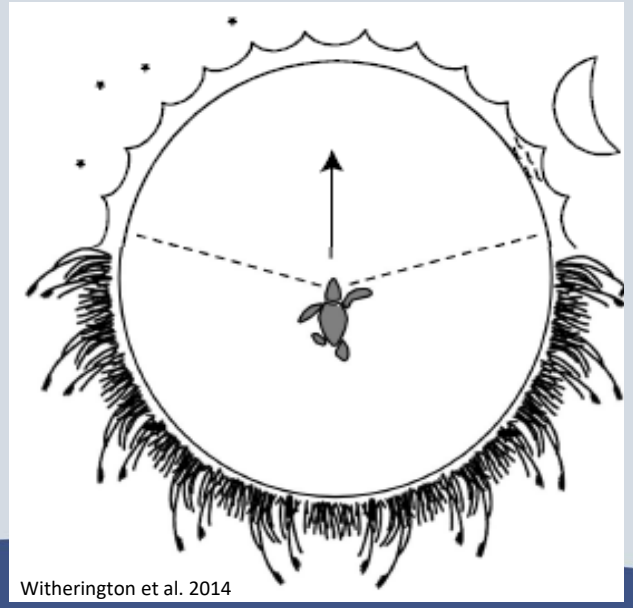


Photo: T. Long, FWC

Why is artificial lighting such a problem?

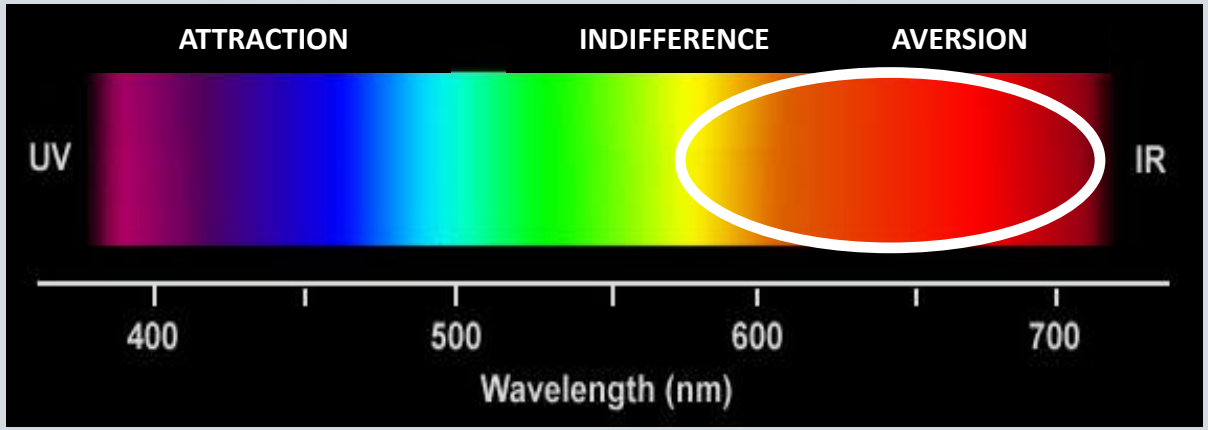
Hatchlings rely on multiple visual cues to find the water

- TOWARD bright open areas/horizons
- AWAY from dark silhouettes i.e. dunes and vegetation



Witherington et al. 2014

- Attracted to SHORT wavelength light
- Less disturbed by LONG wavelength light



Conflicting cues often lead to disorientation.


Photo: K. Schanzle, FWC

Undisturbed hatchlings: seaward orientation in a “V” formation

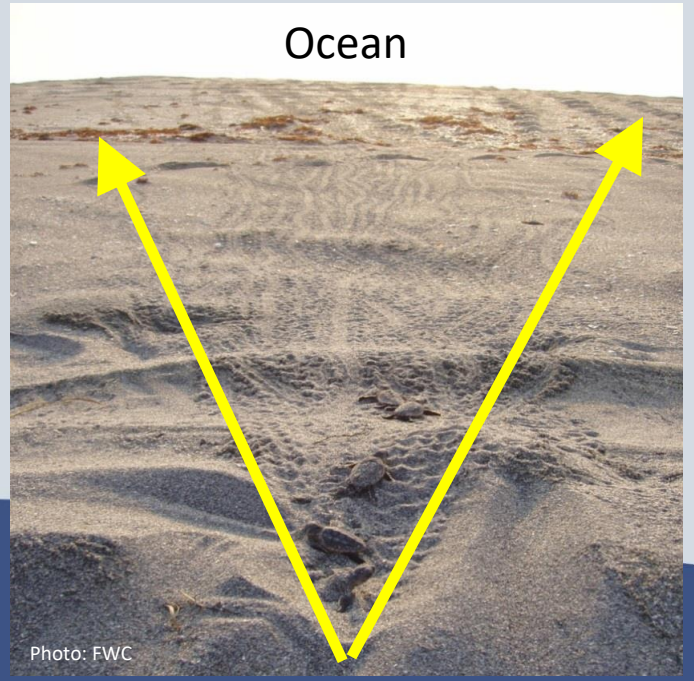


Photo: FWC

Disoriented hatchlings: circular orientation or not towards the ocean


Photo: K. Schanzle, FWC

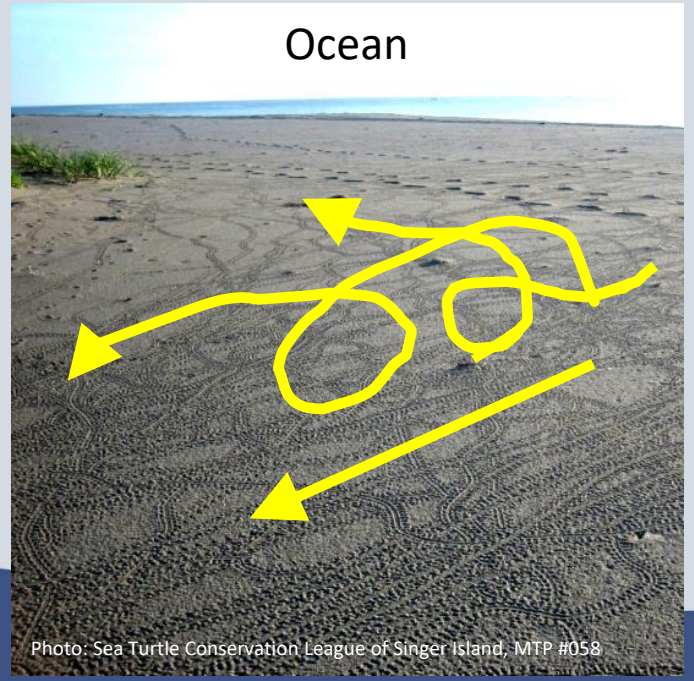


Photo: Sea Turtle Conservation League of Singer Island, MTP #058

Nesting females can disorient too!


Photo: S. Schaf, FWC

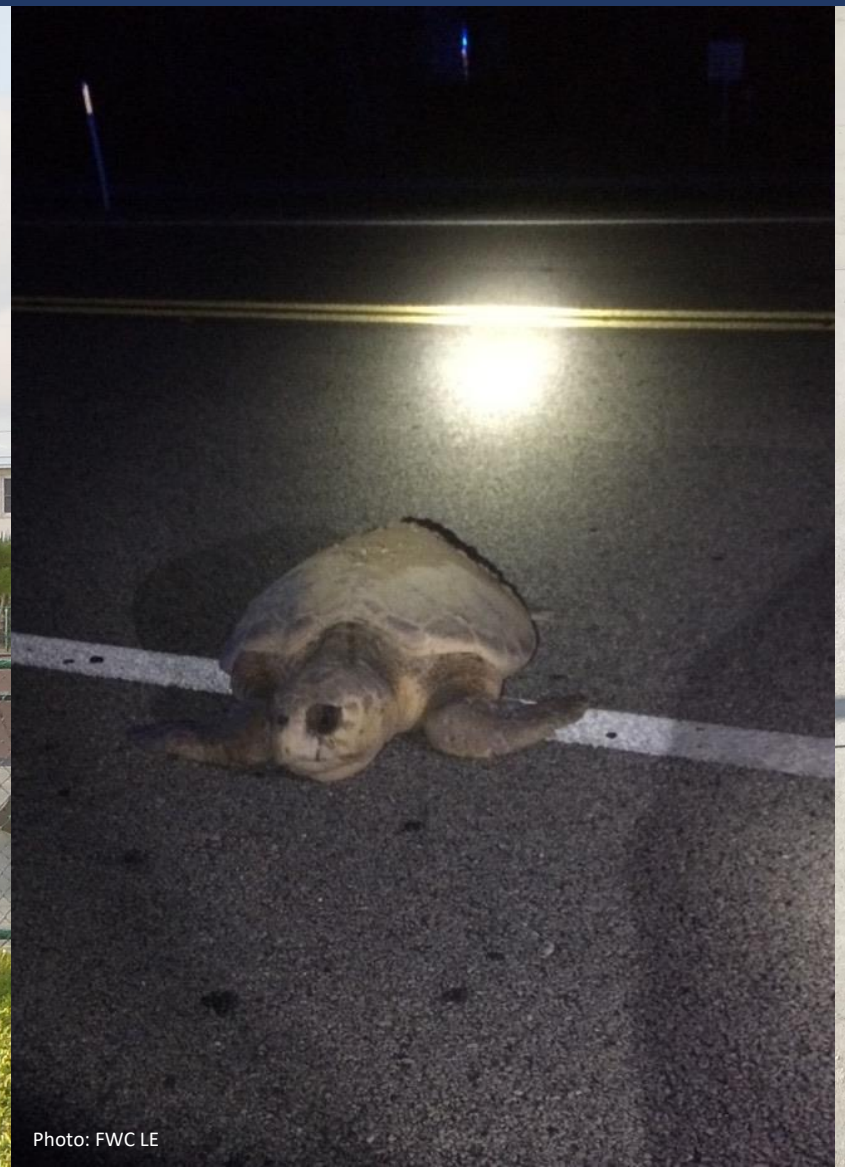


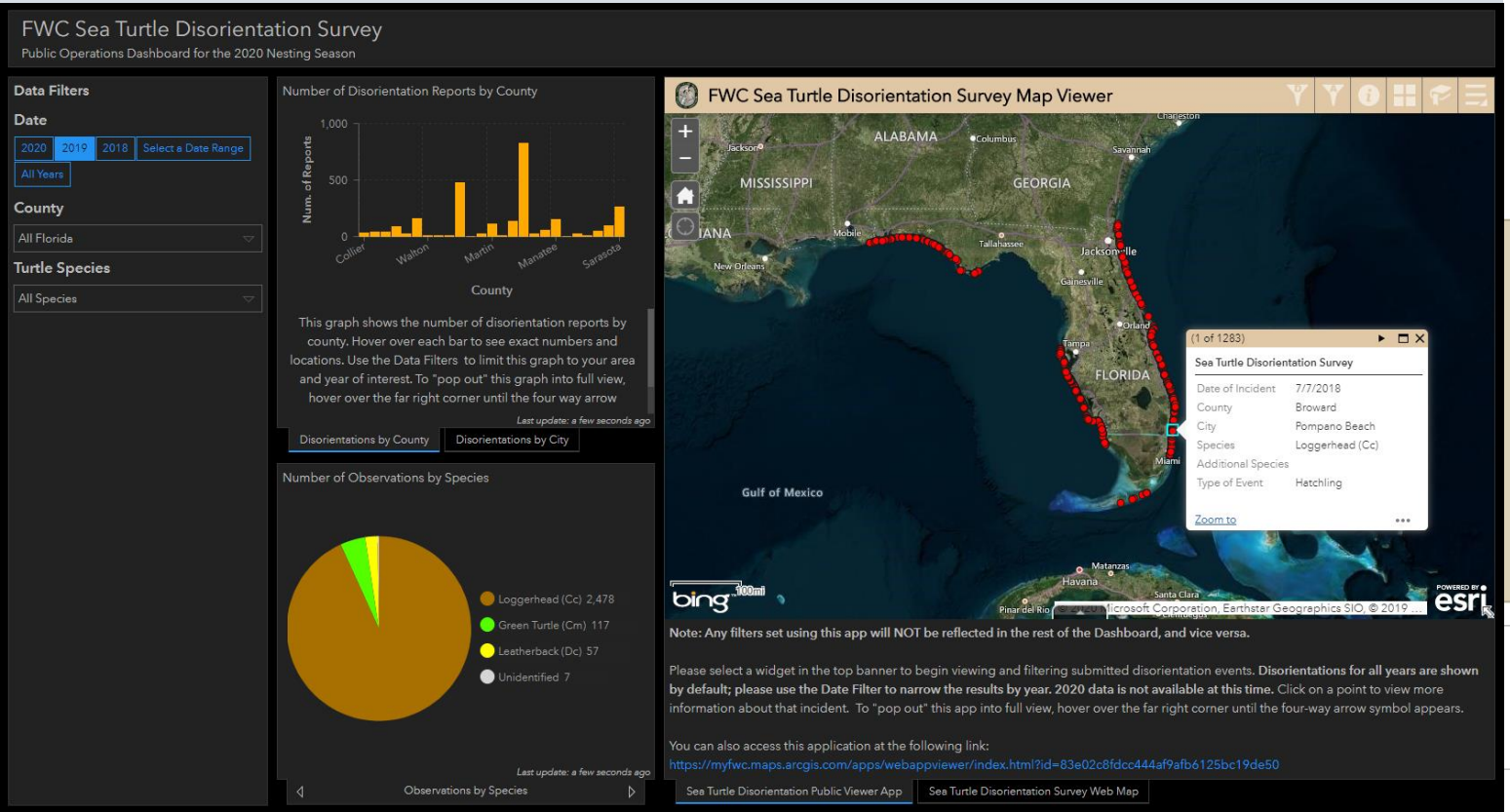
Photo: FWC LE

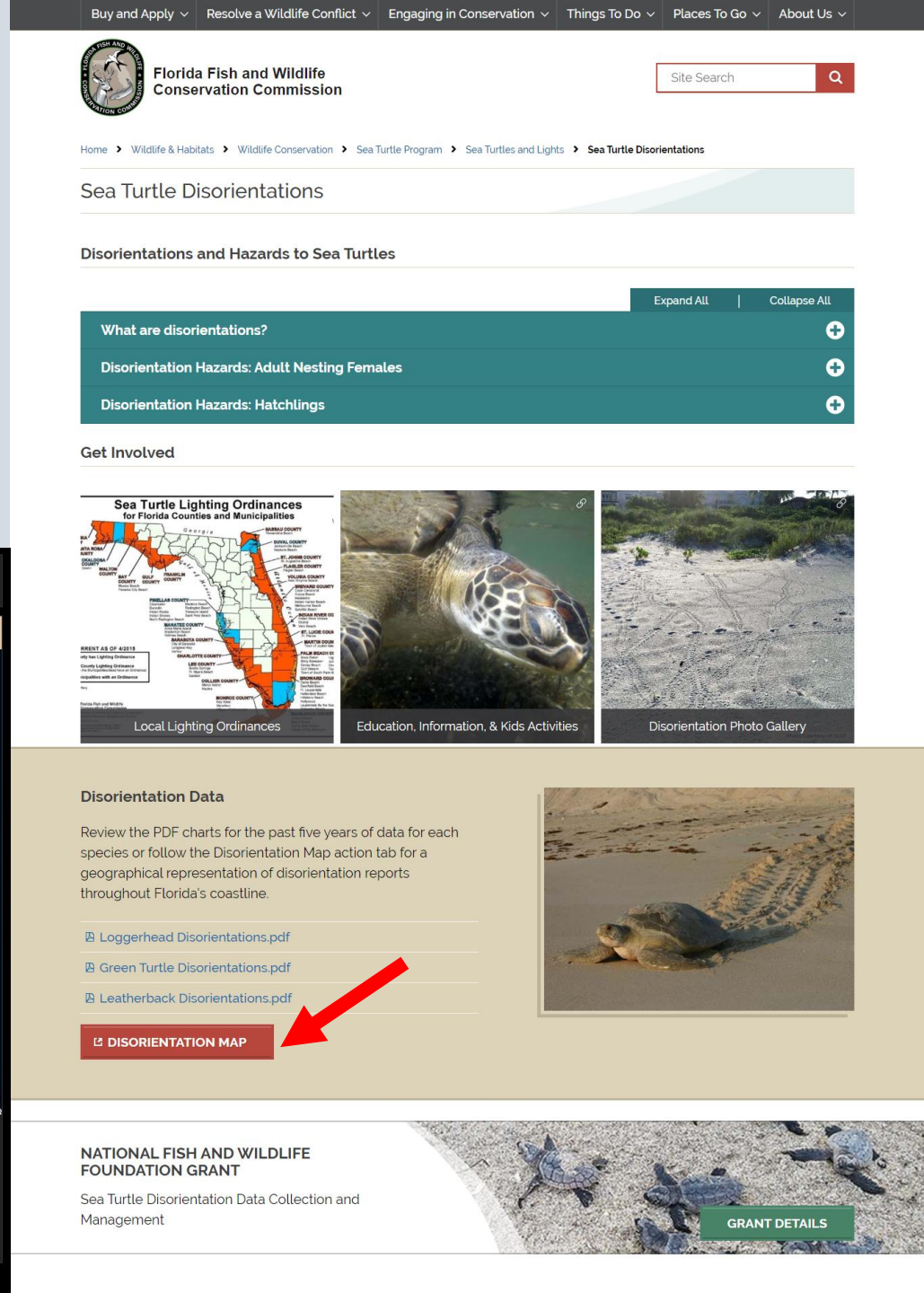

Photo: Ecological Associates, MTP #010

Tracking Disorientations

www.MyFWC.com

Search “disorientation”





You've identified the problems – now what?

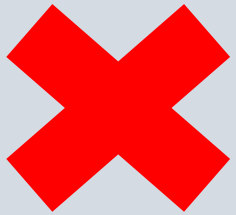
Lights should follow
FWC's Three Golden Rules:

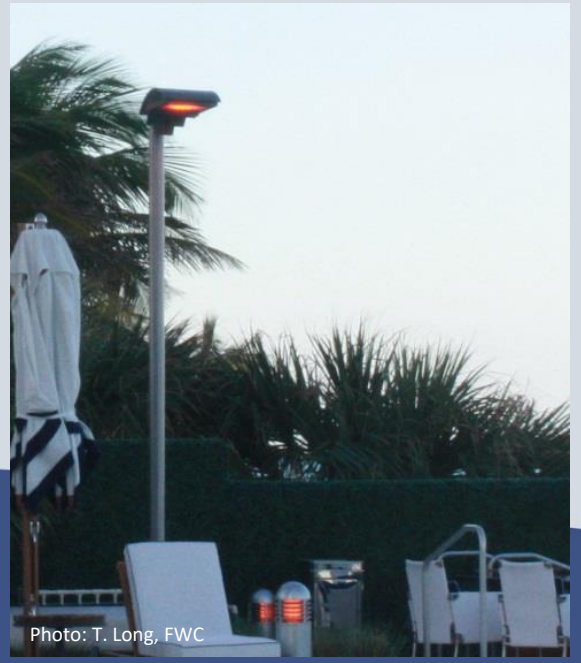
1) **Keep it Low**
2) **Keep it Long**
3) **Keep it Shielded**

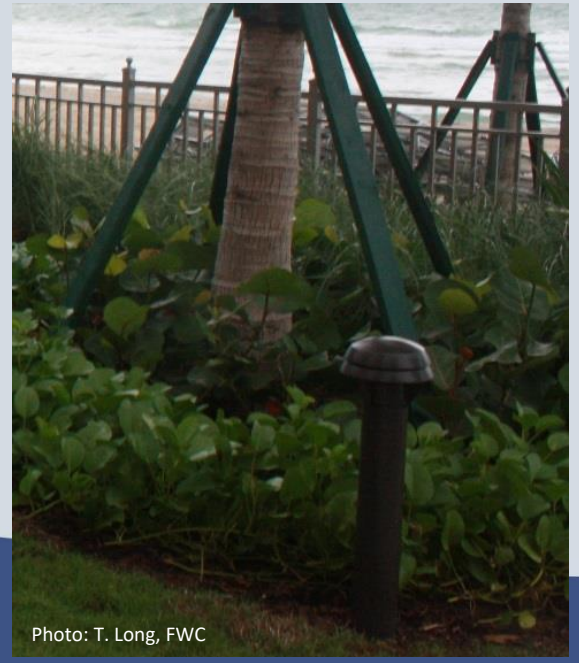
FWC Golden Rule Number 1

Keep it Low

- Keep mounting heights low to minimize light trespass.
- Keep it low also refers to lumens. Use only the lumen output needed. For most applications this can be minimal.







FWC Golden Rule Number 2

Keep it Low

Keep it Long (wavelength)

Use bulbs with wavelengths greater than 560 nm.

FWC Golden Rule Number 3

Keep it Low

Keep it Long

Keep it Shielded

Eliminate the point source of light.

- Use full cut-off or fully recessed fixtures.
- Use 180 to 270 degree external beachside shields when in proximity to the beach.

Photo: K. Schanzle, FWC

Photo: T. Long, FWC

Can streetlights really meet the Golden Rules?

YES!

Synergy Streetlight demo with FDOT – now being installed in Fort Lauderdale

Photo: T. Long, FWC

Cree RSW Series Streetlight demo with FPL – now on FPL approved products list

Photo: T. Long, FWC

FDOT Wildlife-Sensitive Roadway Designs

PROSECUTION AND PROGRESS – LIMITATIONS OF OPERATIONS – NIGHT WORK ALONG COASTAL ROADS. (REV 4-8-19) (FA 7-22-19) (1-2020)

SUBARTICLE 8-4.1 is expanded by the following new Subarticle:

- **8-4.1.1** Additional Requirements for Night Work Along Coastal Roads: The project is located adjacent to sea turtle nesting habitat. Direct all work zone lighting away from the beach to avoid illumination of or direct visibility from the beach. Shield luminaires to avoid lighting areas outside of the immediate construction area.

FDOT Design Manual (1/2020)

231.2.1 Wildlife-Sensitive Conventional Lighting

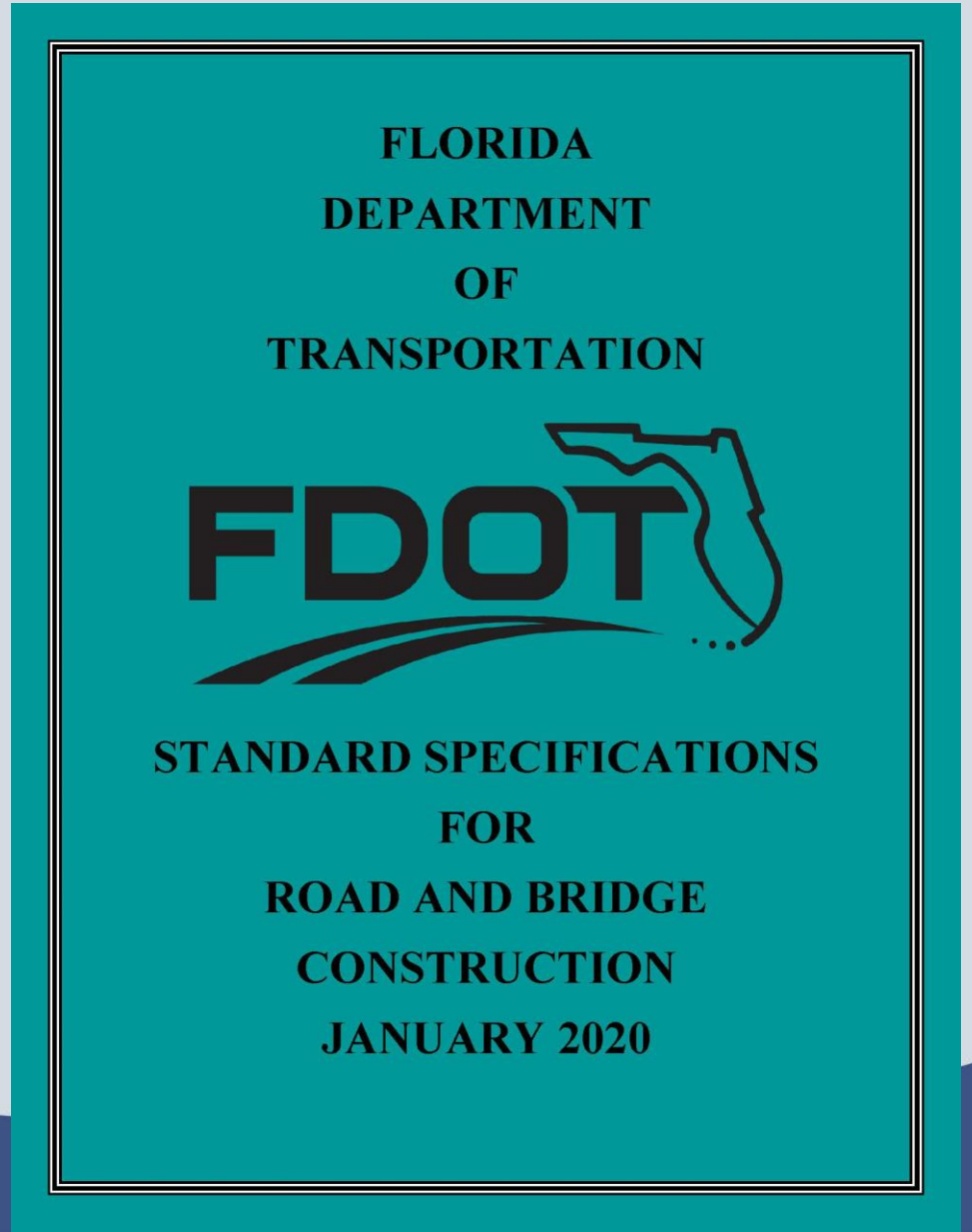
For conventional lighting near a wildlife area of concern (as determined by the Office of Environmental Management), incorporate the following design requirements:

1) Where feasible, orient luminaires away from the wildlife area of concern.
2) Design lighting system using luminaires from the Wildlife-Sensitive Conventional Lighting category of the APL.
3) Use the criteria for Wildlife-Sensitive Conventional Lighting from Table 231.2.1 in accordance with the requirements of FDM 231.3.

Standard Specifications for Road and Bridge Construction (1/2020)

992-2.4.2 Luminaires for Wildlife-Sensitive Conventional Lighting: Luminaires must meet the following additional requirements:

a. The light source for the luminaires must be true red, orange, or amber light-emitting diodes (LEDs) with no more than 1.75% of the spectral power distribution below 560 nm. Submit testing report.
b. The optics must have an IP 66 rating. Submit testing report.
c. The luminaire mounting assembly must be a slipfitter type designed to accommodate a nominal 2 inch pipe size (2-3/8 inch O.D.) arm or a pole top mounting assembly designed to accommodate a 2-3/8 inch pole top tenon.
d. Luminaires must have a IESNA light distribution curve (IES LM-79) designated by an EPA-recognized laboratory. Submit testing report.
e. Luminaires must meet a minimum pole spacing of 50 feet using the AGi32 lighting optimization tool in accordance with the settings shown in 992-2.4. Submit IES file.



“Halfway” Solutions to Lighting Problems

Timers, switching off lights, or changing LED colors seasonally are NOT recommended long-term solutions.

But WHY?

- Prone to malfunctions
- Turning off lights may create unsafe situations for drivers/pedestrians
- Switching colors fosters the perception that amber lighting is “less safe” than white lighting

Photos: T. Long, FWC

Thank you!

For questions, contact SeaTurtleLighting@MyFWC.com

Want more info?

www.MyFWC.com/seaturtle

Wildlife Crossings and Passage Structures

February 2020

Sean Greene, Land Use Planning Program

Office of Conservation Planning Services

Wildlife Passage Structures

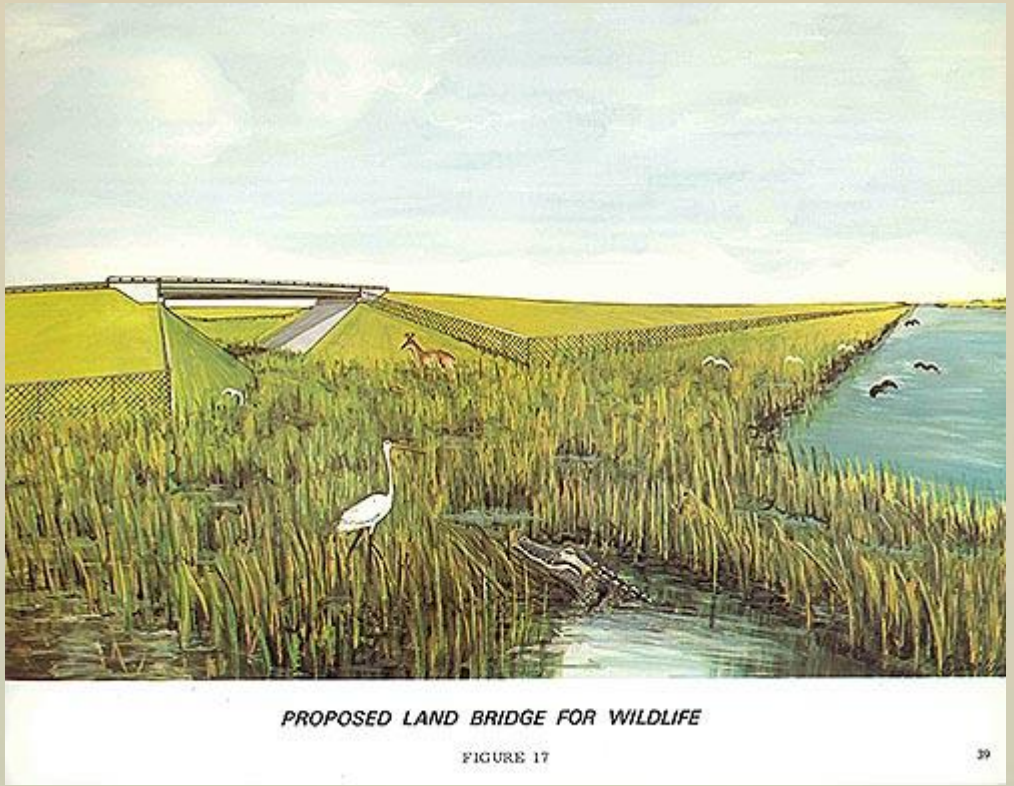
- Three primary types:
  - Bridge underpasses
  - Culverts
  - Bridge overpasses
- Most originally designed to pass water beneath road infrastructure
- Fencing must be used to direct wildlife to passage structures
- Tend to focus on large mammalian species

amusingplanet.com

humansandnature.org

arc-solutions.org

Wildlife Crossings in Florida



PROPOSED LAND BRIDGE FOR WILDLIFE

FIGURE 17

39

- Range in size from 12 inch culvert pipes to the bridge underpasses on I-75 that measure 8 feet high and 120 feet wide
- First wildlife crossings were included during the planning for the conversion of Alligator Alley to I-75 in 1972
- Nearly 100 wildlife crossings in Florida today (mostly in South Florida)
- FDOT, FWC, and USFWS consider the need for wildlife crossings in all new road construction and expansion

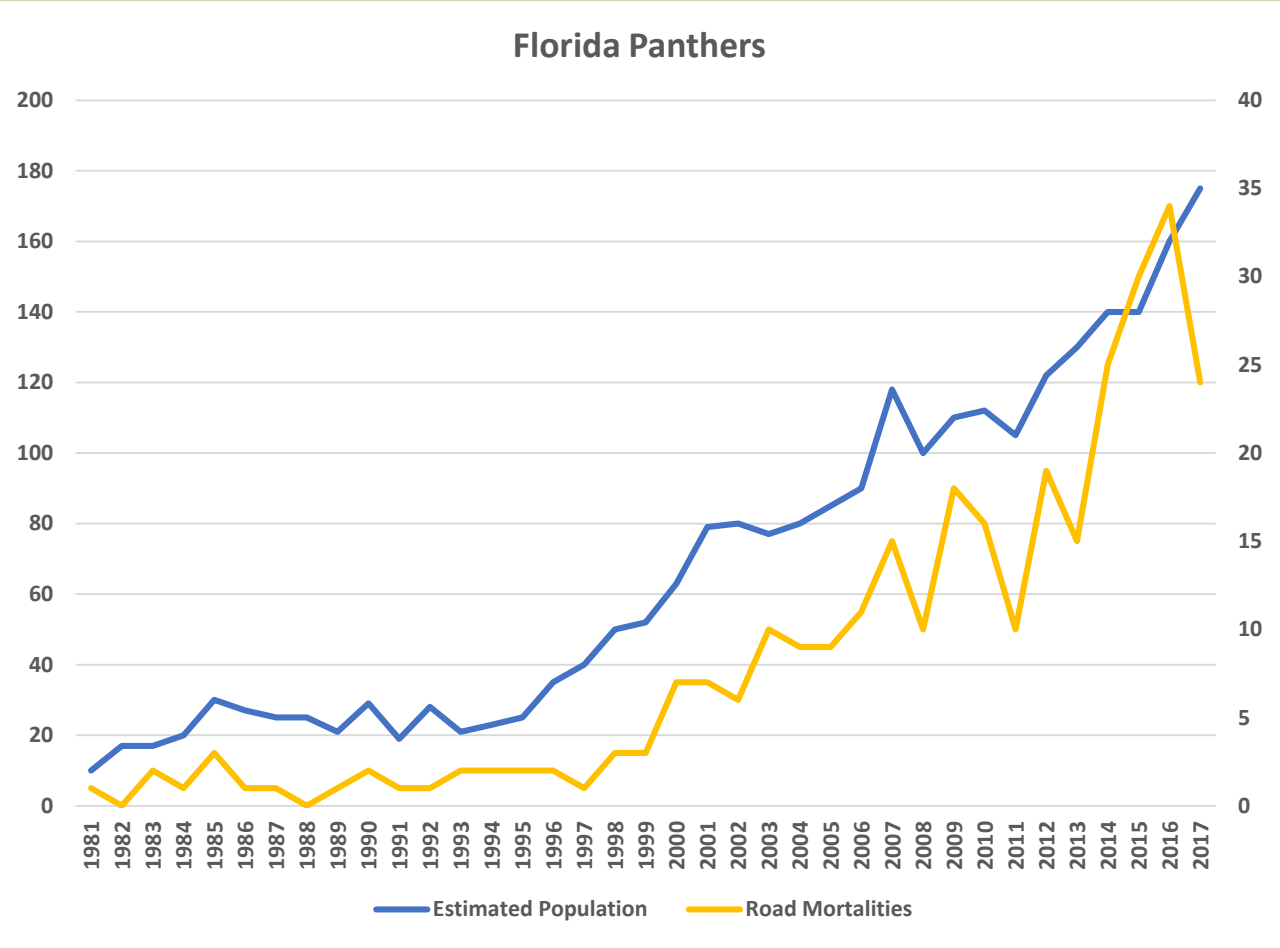
Wildlife Vehicle Collisions (WVCs)

- Reduce Wildlife Vehicle Collisions (WVCs)
  - 2 million WVCs per year
  - 29,000 human injuries
  - 200 human deaths
  - $8.4 billion in damages
  - 8-20% increase per year
- Florida Black Bears
  - WVCs account for over 90% of bear deaths in FL
  - WVCs with bears have increased steadily since 1981
    - Over 50% increase in last 10 years

K. Gunson, G. Mountrakis, L. Quackenbush (2011)

Florida black bears can weigh up to 740 pounds.

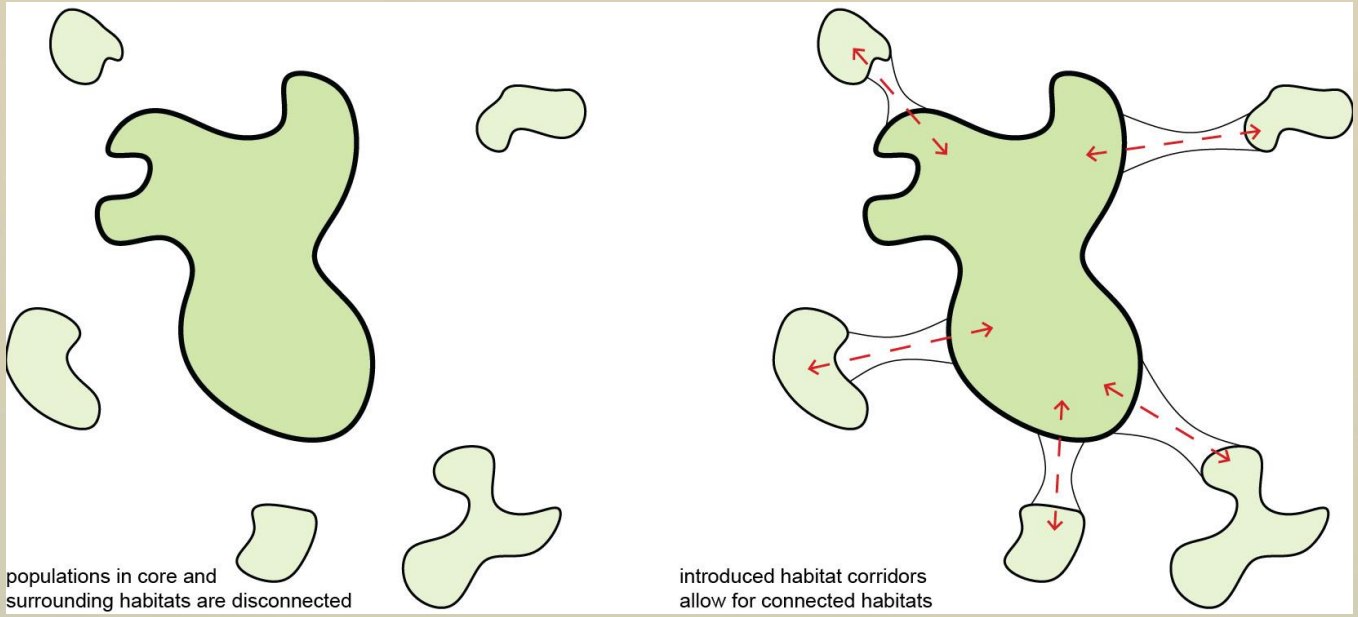
Florida Panther



- 1981-1999: 1.5 mortalities per year
- 2000-2017: 15+ mortalities per year
- Early measures:
  - Lower speed limits at night
  - Widening road shoulders
  - Reflectors
  - Rumble strips
  - Public information
- Most effective (and most expensive) measure remains wildlife crossings
- Early measures reduce WVCs, wildlife crossings can eliminate them

Wildlife Populations

- Habitat Connectivity
  - Deer – 7 square miles
  - Black Bear – 15 square miles
  - Coyote – 60 square miles
  - Panther – 200 square miles
- Genetic Isolation
  - “Island Populations”
  - Increased inbreeding and disease risk
  - Approximately 20 black bears isolated at Chassahowitzka



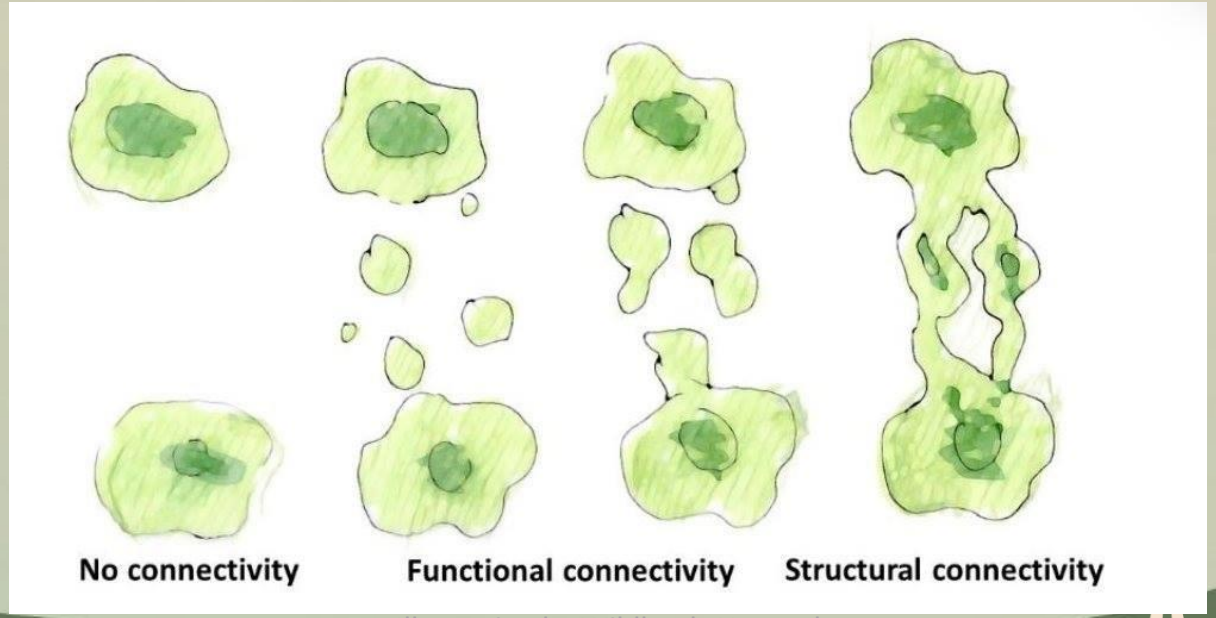


Illustration by Wildlands Network

Case Study: Lake Jackson Ecopassage

- 4000 acre sinkhole lake bisected by US 27
- Turtles regularly cross in search of water
  - 2,710 crossing attempts per year per mile
- 11,000+ WVCs over 5 year period
  - 98% mortality rate for crossings
- FDOT, Capital Regional Transportation, Leon County, and NGOs work to address issue
- Construction of solid wall and multiple culverts in 2010
  - $3.4 million in federal stimulus money
  - 0 recorded mortalities since

Lake Jackson Turtle Rescue

Small Animal Design

- Entrance coverage
  - Especially for prey species
  - 2013 Montana Study
    - 42.9% increase in passage rate when coverage added
- Shelving throughout crossing
  - Especially when water present
  - 2013 Montana Study
    - 0 small animal species use of wet culvert without shelving
    - 14 species once shelving added

Illustration by Summer Ortiz

Use of Elevated Paths

Large Animal Design

- Require a large cross-sectional space (passage height x width)
  - Limited to large (7+ foot diameter) culverts or bridge underpasses
- More sensitive to influence of human co-use
  - Large mammals will develop strategies to minimize human interactions
  - Temporal divergence (humans at day, wildlife at night)
  - Physical divergence (humans cross on north path, wildlife on south)
- In Washington study, one side of bridge underpass had a cement trail frequented by humans during the day
  - Over 90% of wildlife crossings occurred on the opposite side

Conclusions

- Bridge underpasses and culverts play a valuable role in maintaining habitat connectivity and reducing wildlife vehicle collisions
- Wildlife crossings are the only method proven to fully eliminate wildlife vehicle collisions on targeted sections of roadway
- A wide variety of species will make use of wildlife crossings
- Specific design elements can increase the utility of wildlife passage structures for specific types of species

- Jason Hight, Program Administrator
  Land Use Planning Program Administrator
  (850) 413-6966

- Sean Greene, Land Use Planning Biologist
  14495 Harllee Road
  Palmetto, FL 34221
  (386) 406-0814

Questions?

Gopher Tortoise

Biology, Conservation, and Regulation

FDOT - 2020

Gopher Tortoise (*Gopherus polyphemus*)

- Only tortoise in North America east of Mississippi River
- Candidate for Federal Listing (ESA)

Gopher Tortoise (*Gopherus polyphemus*)

- Live to 40-60 years old
- Adults average 10 inches long
- Slow to reach sexual maturity
  - Between ages of 9 to 21

Adults

Juveniles

Nests

- High predation on nests/juveniles
- Juvenile's shell stays soft for up to 7 years

Diet

- Herbivores
  - Low-lying vegetation
  - Broadleaf grasses, gopher apple, prickly pear, cactus, berries, and more
- Opportunistic
- Go up to 160 ft for food

Behavior & Home Range

- Active 60° to 95° F
  - Foraging, burrowing
- Bask in sun to increase body temp
- Stay close to burrow, except on foraging journeys or to mate
- Males tend to have a larger range

Adult Females	Adult Males	Juveniles (<4 yrs)
0.2-1.4 ac	1.1-3.2 ac	0.02-0.9 ac

Habitat

Scrub

Longleaf pine

Pine flatwoods

Coastal dunes

Habitat

Burrows

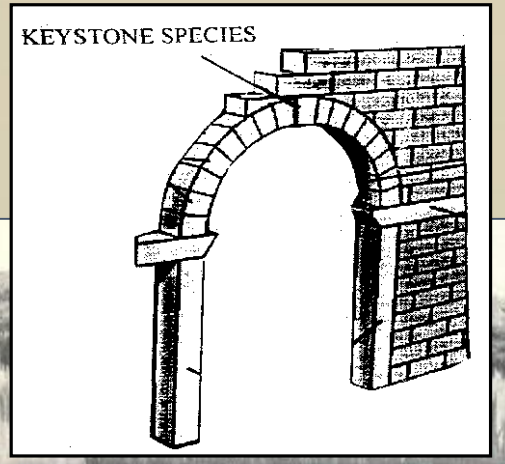
- Average 7 ft deep and 15 ft long
  - Up to 40 ft long
- Can have more than 1 burrow within home range
- Half-moon shape

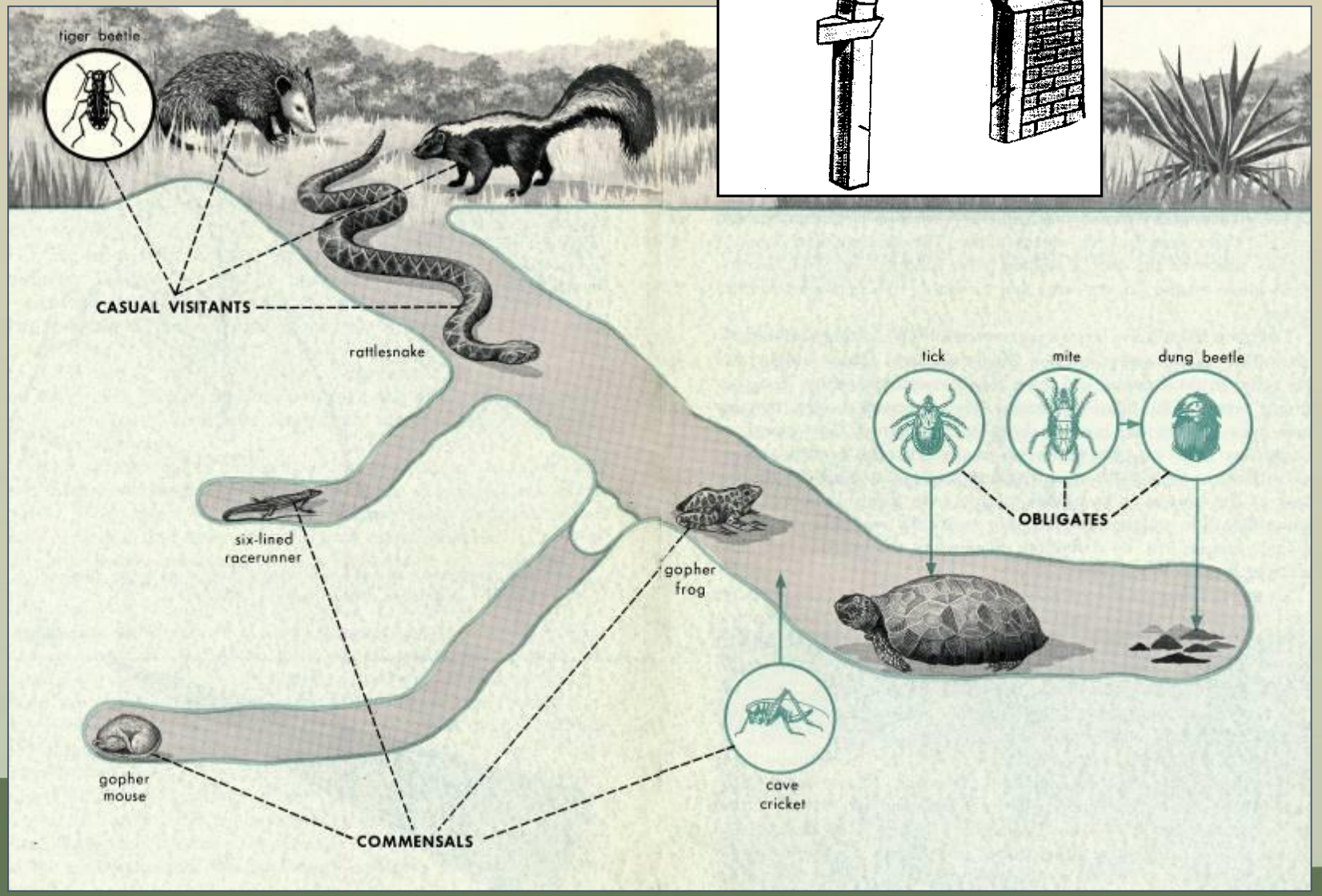
Burrows

- Proportional to size of tortoise
- Spend 80% of life in burrow
- Refresh burrow in fall and rest in winter

Burrows

Keystone Species





Identifying GT Burrows

- Potentially Occupied
  - Active
  - Inactive
- Abandoned

Potentially Occupied

- Active
  - Half-moon shaped entrance
  - Clear of vegetation
  - Good repair
  - Loose soil
  - Tortoise tracks

Potentially Occupied

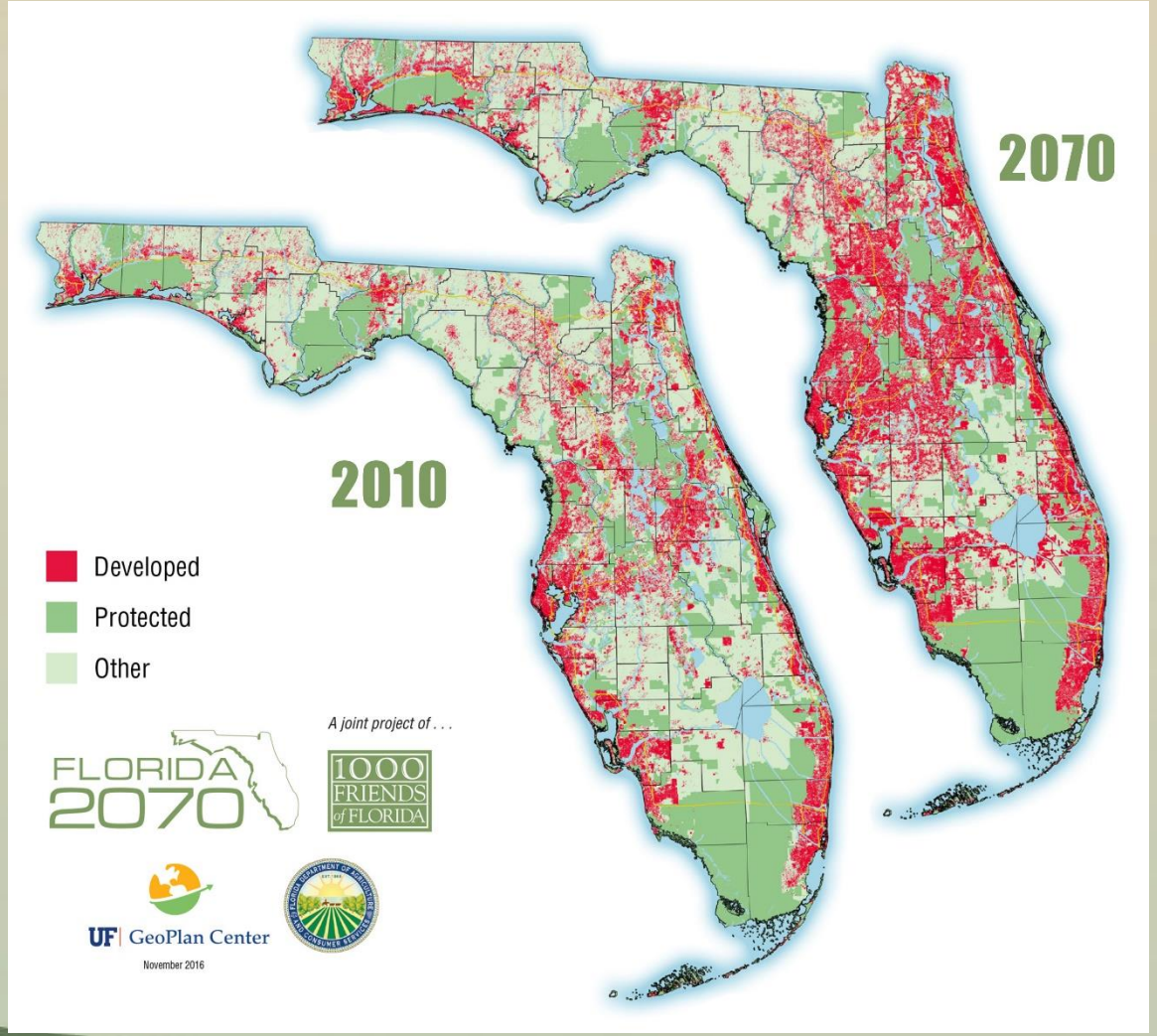
- Inactive
  - Half-moon shaped entrance
  - Vegetation growing
  - Good repair
  - Hard-packed soil
  - No tortoise tracks
  - Partially covered with leaves

Abandoned

- Appears unused or dilapidated
- Entrance partially or completely collapsed
- Filled partially or completely with leaves or soil

Why are populations declining?

- Habitat loss
- Fragmentation
- Degradation
- Disease
- Illegal harvest



Why are populations declining?

Upper Respiratory Tract Disease (URTD)

- Symptoms = discharge from nasal passage or eyes, swelling of area around eyes

Illegal Harvesting

What Actions Are Being Taken?

- Permitting
- Local Gov't Coordination
- Law Enforcement
- Habitat Preservation
- Habitat Management
- Population Management
- Disease Management
- Incentives
- Monitoring
- Education and Outreach
- Future Research

Photo Courtesy of www.floridastateparks.com

Management Plan (approved 2012)

- Goal = Restore/maintain viable populations so GT no longer needs listing
- Conservation action = regulation, permitting, law enforcement, etc.

Permitting Guidelines

- Permits provide authorization to impact tortoises and their burrows

Protections

- F.A.C. 68A-27.003(2)(d)3

  No person shall:

  - take or attempt to take
  - pursue, hunt, harass, or capture
  - possess, sell, or transport any gopher tortoise or parts thereof or their eggs
  - OR molest, damage, or destroy gopher tortoise burrows

Burrow Protections

- Without a permit, no person shall:
  - Place harmful substances or devices inside a burrow
  - Collapse any part
  - Block, cover, or fill
  - Exclude tortoises

Activities that **Do Not** Require a Permit

Bona fide…

- Routine agricultural practices
- Silvicultural activities
- Wildlife management activities
- Linear utility and highway right-of-way vegetation maintenance
- Routine yard maintenance that **does not damage a burrow**
- Hand trimming vegetation

Tips for Vegetation Maintenance

- Do not stand/drive equipment directly on top
- Mow at least 5 ft radius around burrow
- Hand trim up to burrow entrance

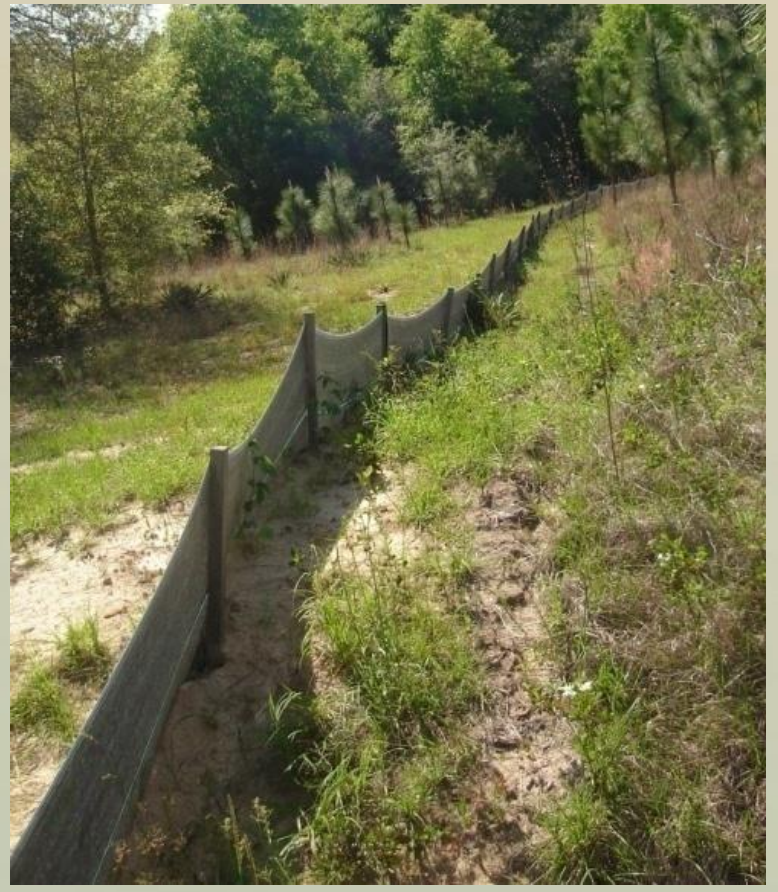
- Flag/stake hard-to-see burrows
- Use pesticides and herbicides according to label instructions + not immediately around burrow entrance

Activities that **Do** Require a Permit

- Any activity that may cause take, harassment, or molestation of GTs, or destruction of their burrows:
  - Clearing, grading, paving
  - Bulldozing, digging
  - Construction
  - Site preparation for development

Permit Types

- Authorized GT Agent
- Relocation
  - 10 or Fewer Burrows
  - Conservation
  - Temporary Exclusion
  - Disturbed Site
- Recipient Site
  - Long-term protected
  - Short-term
  - Public Conservation Lands
- Burrow Structure
- Scientific Collection

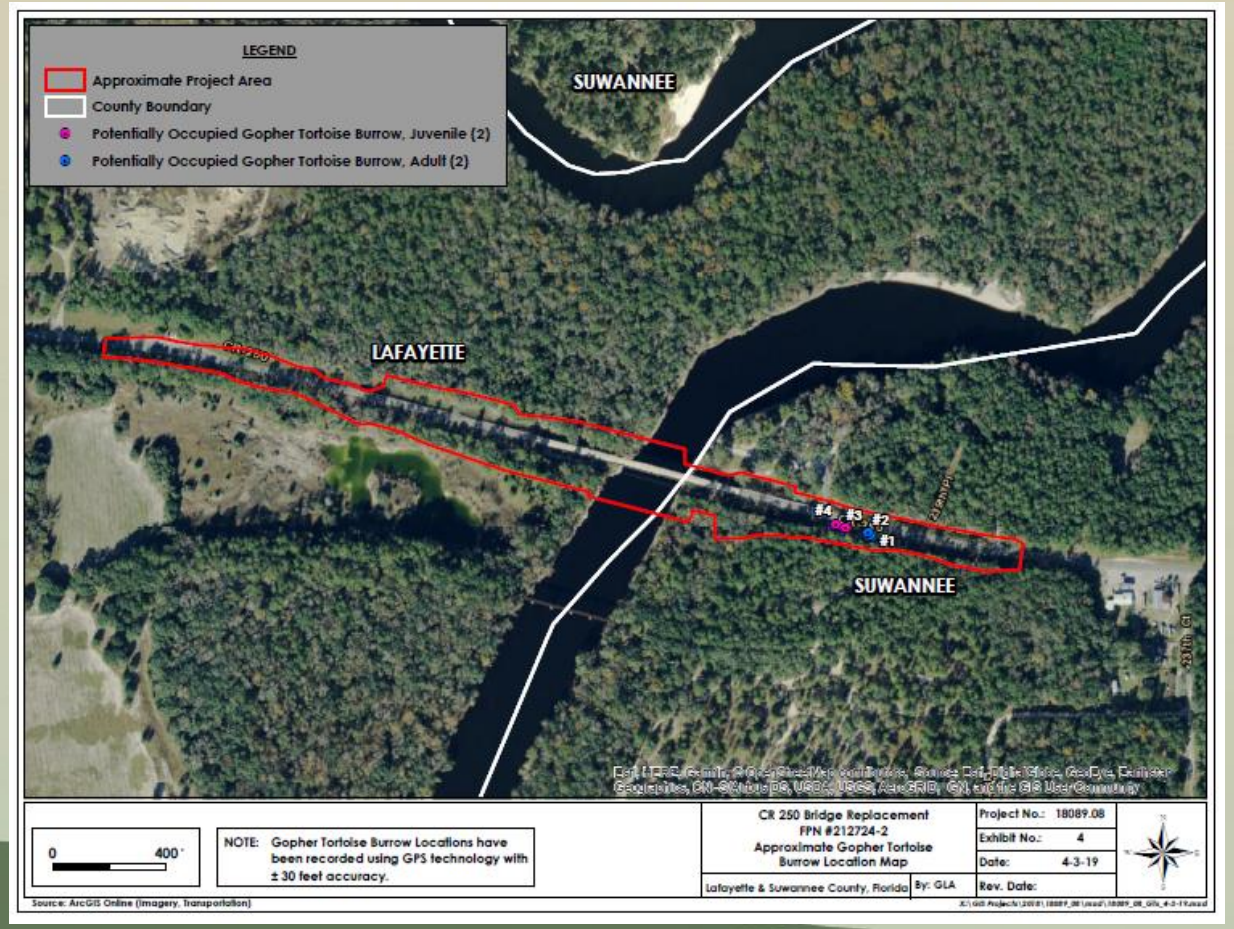


Authorized GT Agent Permit

- Required when relocating tortoises to off-site location, for temporary exclusion permits, and for disturbed site permits
- Not all agents are permitted to perform every task

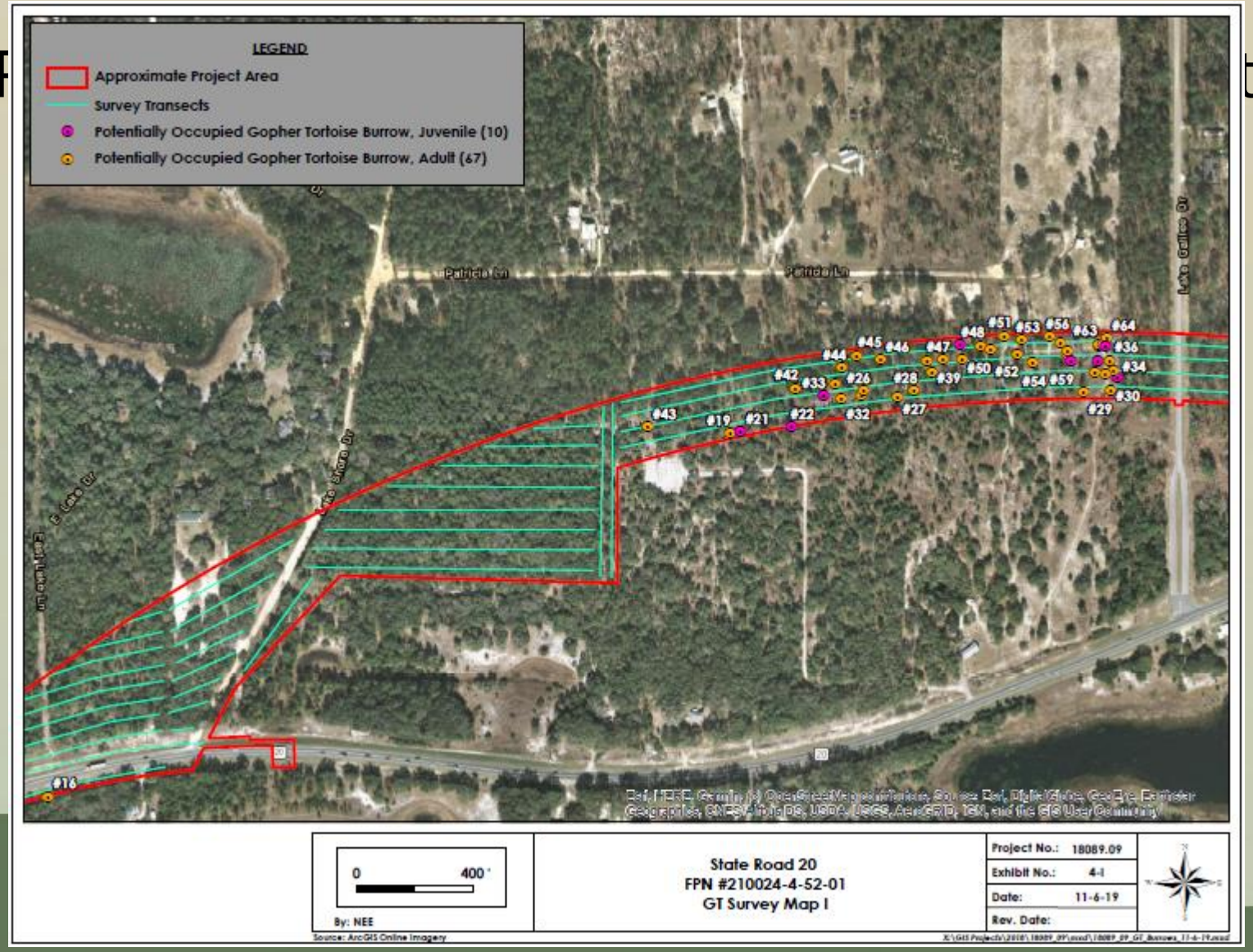
10 or Fewer Burrows Permit

- Projects with no more than 10 burrows impacted



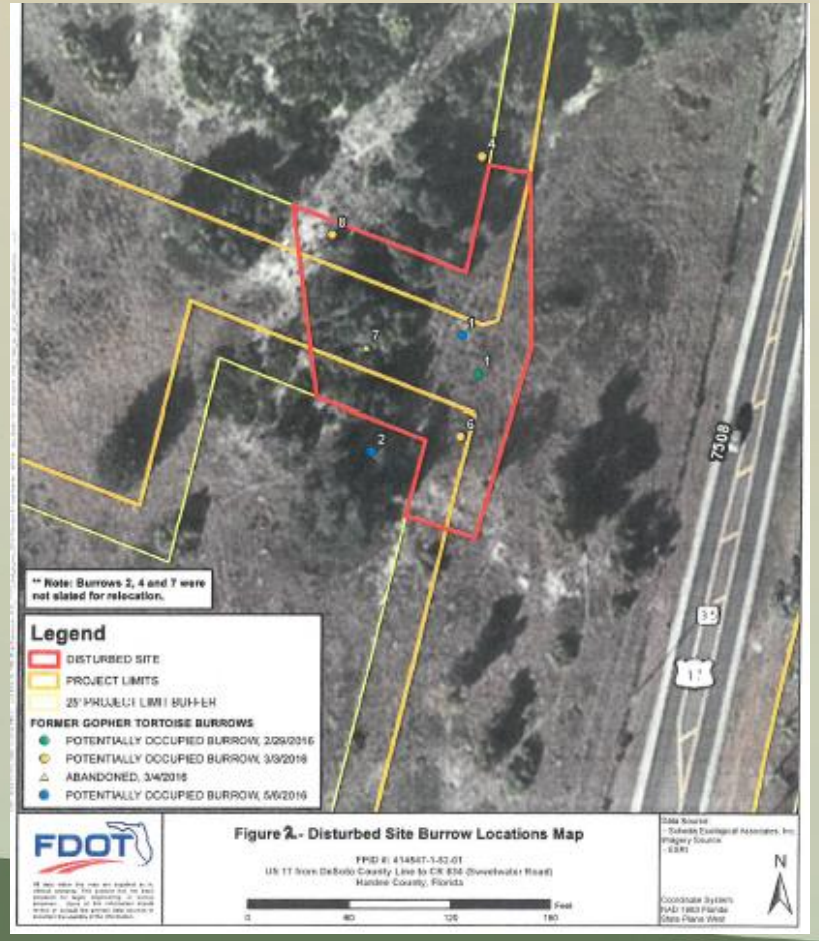
Conservation Permit

- F ted



Disturbed Site Permit

- Site prep activities occur before GTs are moved



How to Avoid Need for a Permit

- Maintain 25-ft radius buffer during ground disturbance (e.g., fence installation, clearing vegetation or construction)

Avoid Creating “Islands”/“Crop Circles”

Tortoise-wise Community Program

- Tortoises do live in neighborhoods!
- Landscape with native plant species
  - Florida Guide to Gopher Tortoise Friendly Plants
  - Available at MyFWC.com/GopherTortoise
- Keep dogs away from burrows and tortoises
- Help tortoises across roadways
- Download GT App
- Report mortalities

Tortoises and Roads

- Move it to other side

  → in direction it was headed

- If injured: Contact Assistant Biologist to locate Rehabber (850) 921-1030

Tortoises and Dogs

- Owner is legally responsible for dogs
- Contact Assistant Biologist for options (850) 921-1030

Waif Tortoises

- Waif = GT from unknown location, or
  kept as pets for many years
- Contact Assistant Biologist for options
  (850) 921-1030
- Please **DO NOT**
  relocate to parks, etc.
  → possible disease
  transmission!

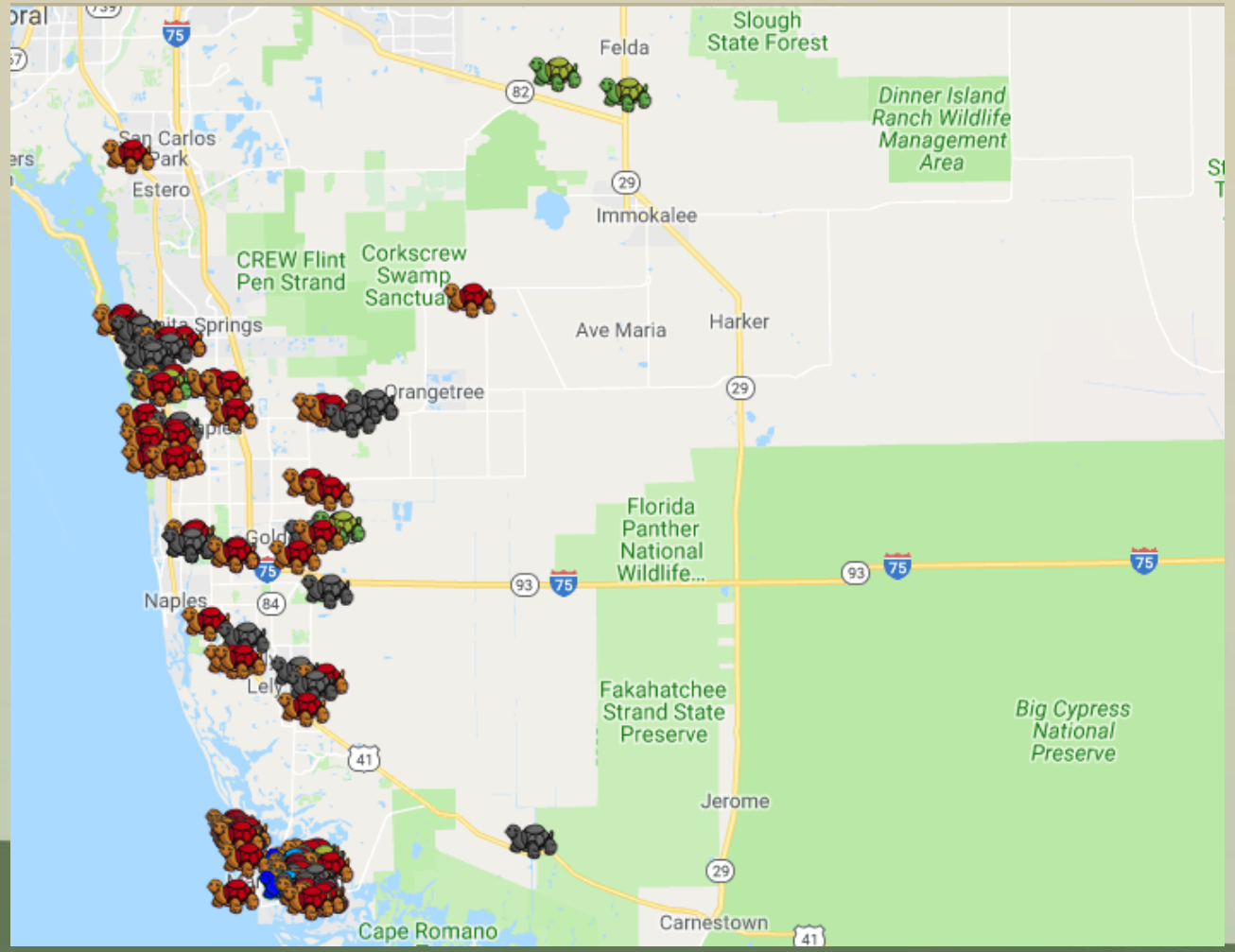
Online Access to Permits

- Public online map shows issued permits

  MyFWC.com/GopherTortoise/Permitting

Online Permit Locator Map

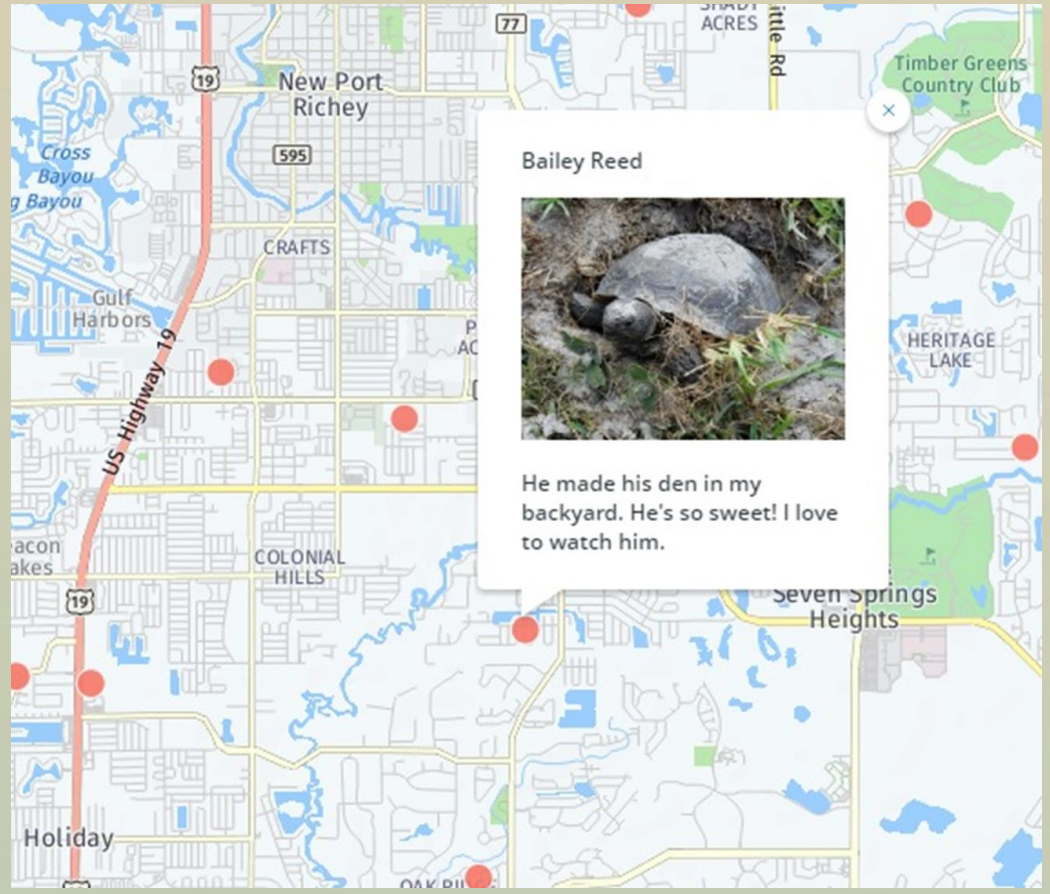
https://public.myfwc.com/maps/gtmapping/default.aspx

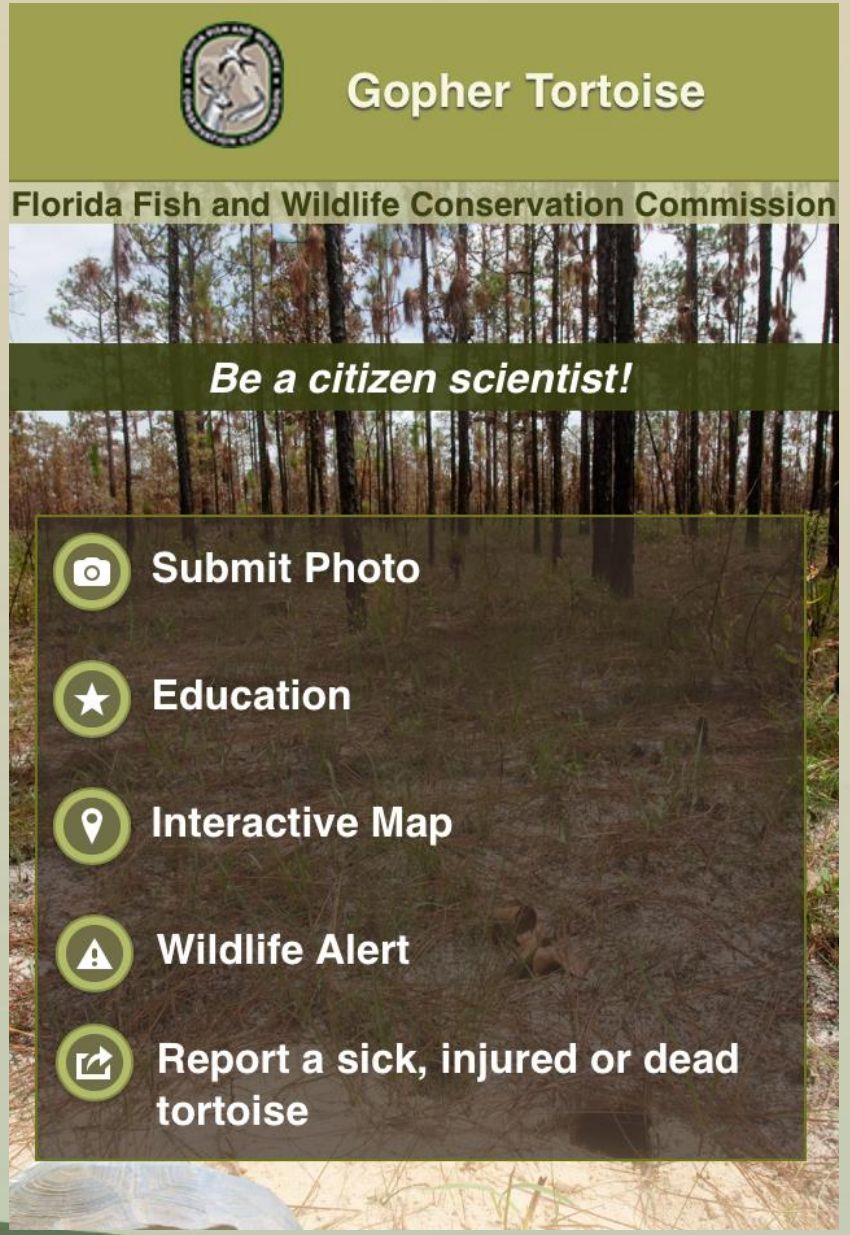


Wildlife Alert Hotline

- Wildlife Alert Hotline: 888-404-FWCC (3922)
- Tip Line: Text or email Tip@MyFWC.com
- Wildlife violations vs Permit violations

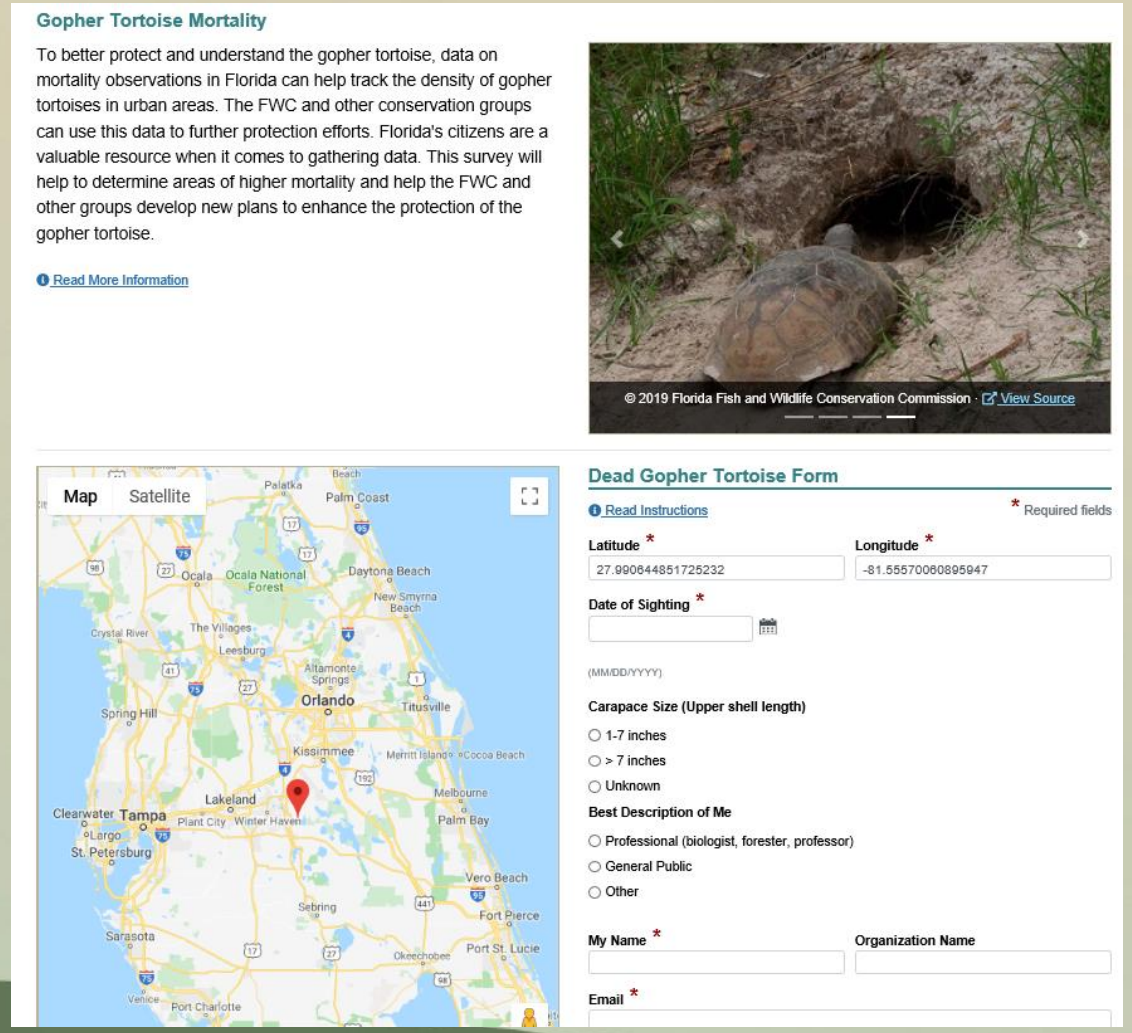
Tortoise App





https://myfwc.com/wildlifehabitats/wildlife/gopher-tortoise/app/

Report Mortalities



Gopher Tortoise Mortality

To better protect and understand the gopher tortoise, data on mortality observations in Florida can help track the density of gopher tortoises in urban areas. The FWC and other conservation groups can use this data to further protection efforts. Florida's citizens are a valuable resource when it comes to gathering data. This survey will help to determine areas of higher mortality and help the FWC and other groups develop new plans to enhance the protection of the gopher tortoise.

Read More Information

Dead Gopher Tortoise Form

Read Instructions

* Required fields

Latitude * 27.990644851725232

Longitude * -81.55570060895947

Date of Sighting *

(MM/DD/YYYY)

Carapace Size (Upper shell length)

- 1-7 inches
- > 7 inches
- Unknown

Best Description of Me

- Professional (biologist, forester, professor)
- General Public
- Other

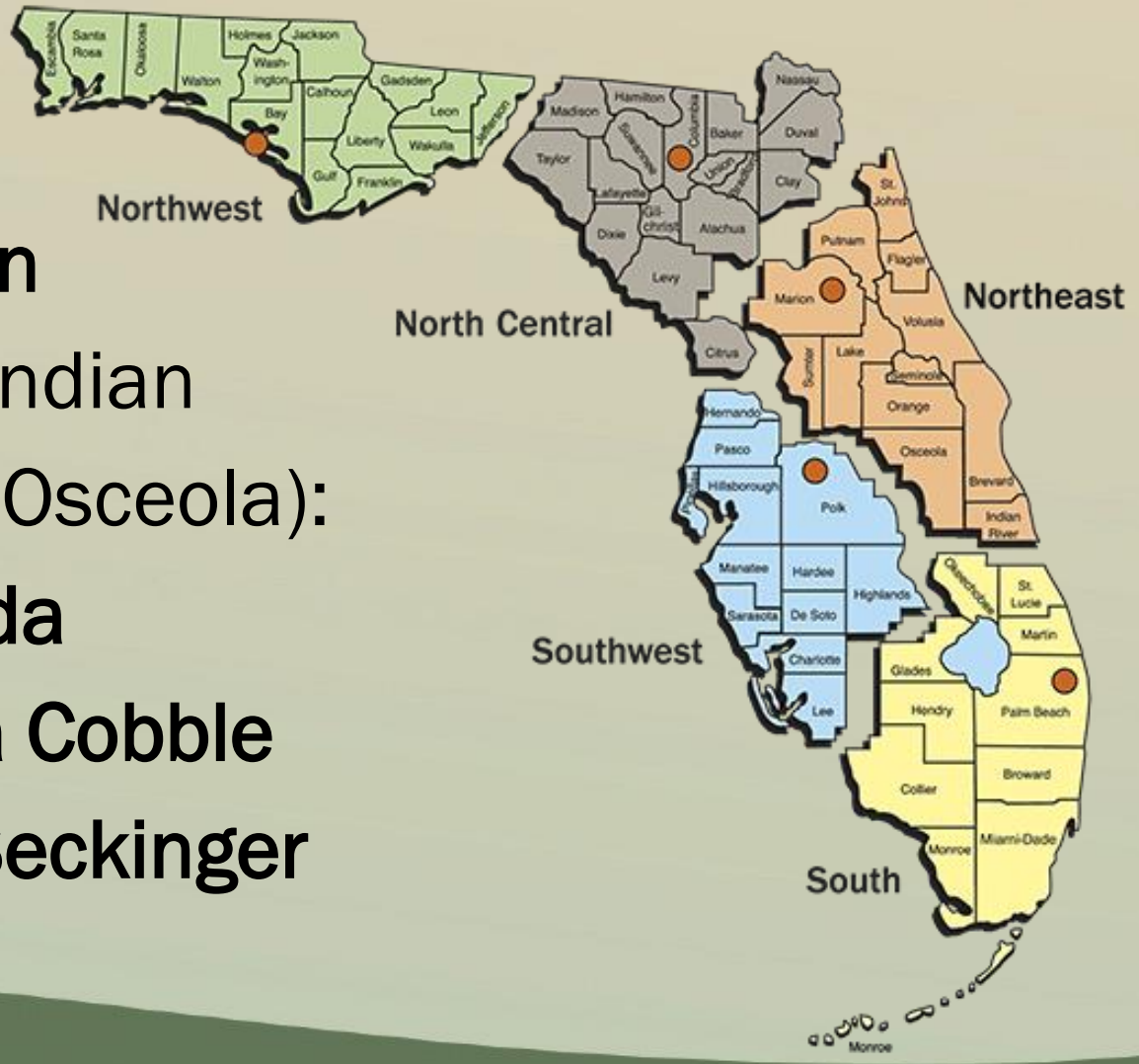
My Name *

Organization Name

Email *

http://MyFWC.com/GopherTortoise

Regional GT Biologists



- SW: **Kyle Brown**
- S (+ Brevard, Indian River, Orange, Osceola): **Momoka Maeda**
- NE: **Samantha Cobble**
- NW/NC: **Eric Seckinger**

http://MyFWC.com/GopherTortoise

THANK YOU!

http://MyFWC.com/GopherTortoise

Wildlife Safety in the Field

Bryce Pierce
Wildlife Assistance Biologist
Florida Fish and Wildlife Conservation Commission

All Photos by FWC Unless Specified

Overview of FWC

❑State agency – managing fish and wildlife resources for their long-term well-being and the benefit of the people

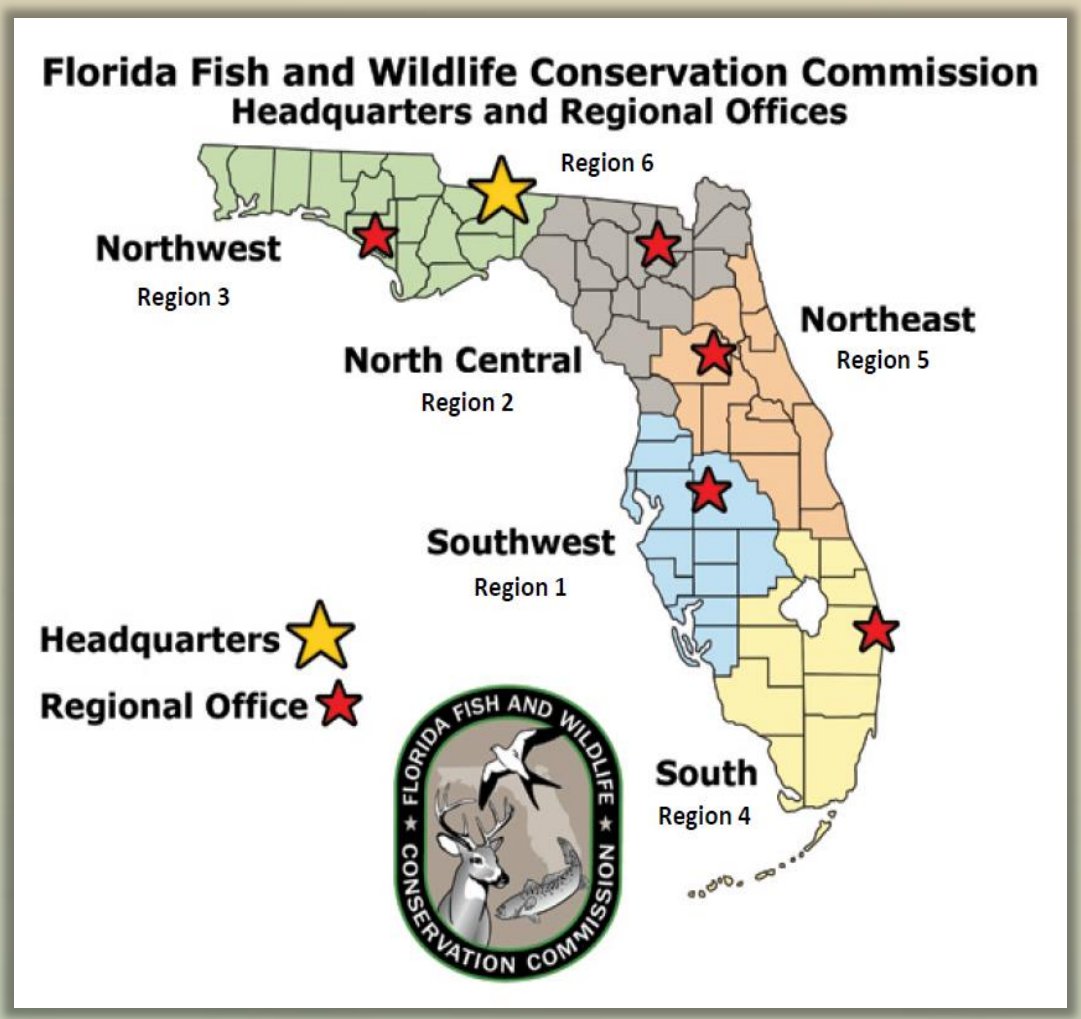
❑Headquarters Tallahassee, 5 regional offices, 76 field offices and facilities

- Freshwater & Marine Fisheries Mgmts.
- Fish and Wildlife Research Institute
- Hunting and Game Mgmt.
- Law enforcement: Protect, patrol, and preserve
- Habitat & Species Conservation
  - Wildlife Impact Management
    - Wildlife Assistance Program – assisting the public with nuisance wildlife and conflict issues thru education and outreach
    - Non-native Wildlife Program

Wildlife Assistance Program

…Addressing Conflict, Fostering Coexistence

- Six regional staff providing technical assistance to foster coexistence
  - Primarily over the phone
  - Site visits
- Partnerships and coordination with other agencies and NGOs
- Pro-active engagement of communities and neighborhoods



Some thoughts on wildlife…

- Wildlife is not inherently dangerous to people
- Most people injured by wildlife are doing something they shouldn't
  - Getting between the animal and it's food or offspring
  - Trying to capture the animal
  - Trying to kill the animal
  - Trying to feed the animal
- Prevent encounters with wildlife by paying attention to your surroundings, securing attractants, and using common sense
- Know the species in your geographic area
  - Knowing how to identify wildlife and a little about their biology can help reduce encounters and conflicts.

Distinguishing Behaviors of Wildlife

Avoidance

- Most common behavior by far
- Running or flying away
- Hiding
- Climbing trees
- Stay still and hope not to be noticed

Curiosity

- Stays in place
- May stand upright (bears, raccoons)
- Smelling the air
- Ears, nose, eyes, alert and directed toward the person
- Not aggressive

Indifference

- Not reacting to human presence at all
- May come close to humans without seemingly acknowledging them
- May continue to engage in its activities

Distinguishing Behaviors of Wildlife

Defensive

- May produce noises such as growls, yelps, other calls
- Circling the threat but not coming closer
- Bared teeth, hair or feathers puffed up trying to look threatening or larger, snake in s-shape, rattling tail (not just rattlesnakes)
- Produces musky odors (skunk, snake)
- Animal feels threatened

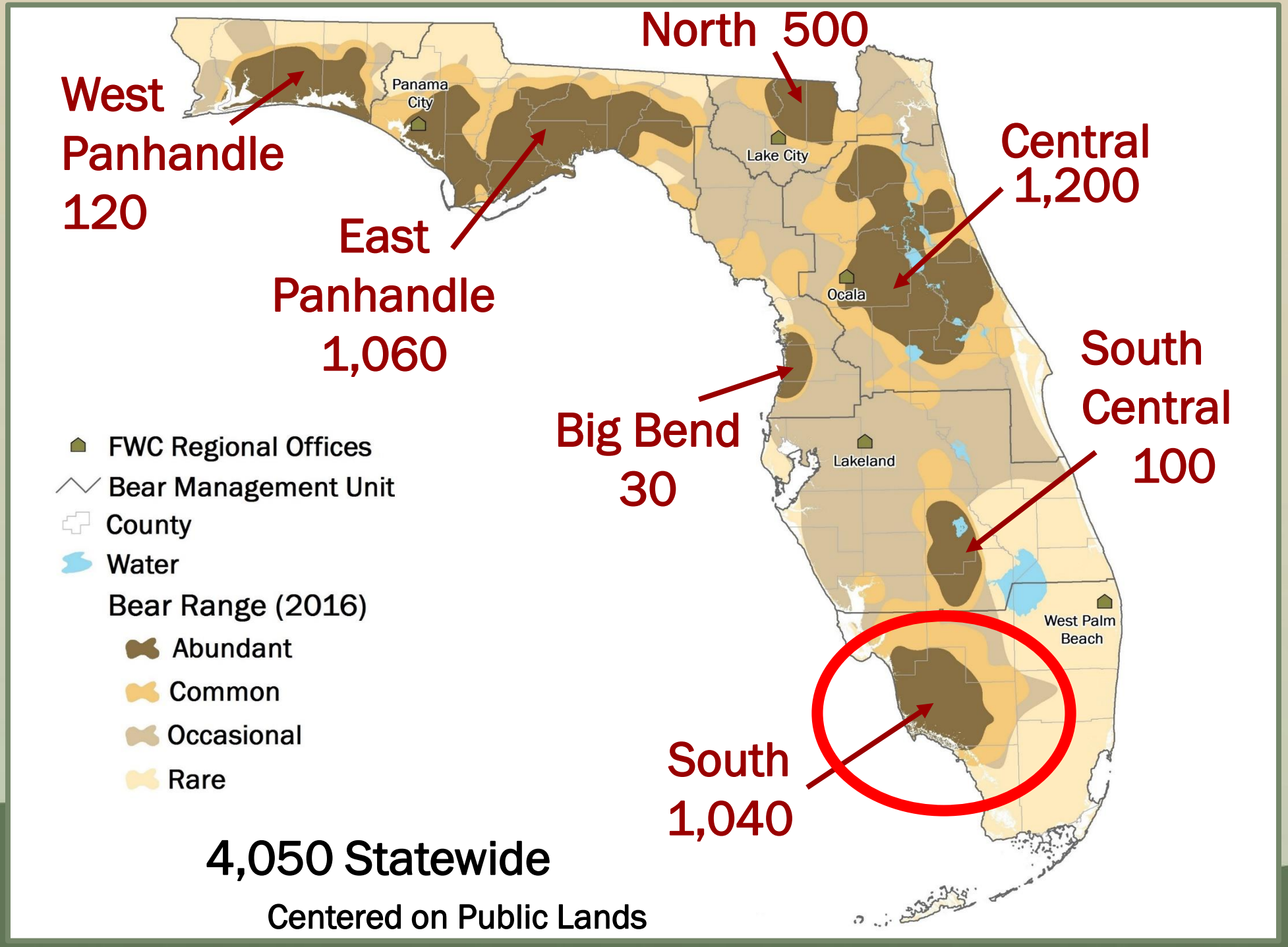
Aggressive

- May or may not produce noise – sneaking up on prey
- Unprovoked physical contact
- Charging or diving at a person can be confused for aggressive but is defensive if the animal feels threatened (such as birds diving at a person near their nest or an animal bluff-charging a threat)

Florida Black Bear

- Weight: Males avg. 250-450lbs (max 760), females 125-250lbs (max 400)
- Diet primarily consists of plants and insects
- Commonly attracted to neighborhoods by unsecured household garbage, bird feeders, grills, and pet food

Males range wider than females



Coyotes

- 25-40lbs, ~3-4ft long, ~2ft shoulder height, fur color varies greatly
- Found from Alaska to Panama
- Naturalized in Florida
  - Major range expansion – benefited from wolf removal, forest clearance and urban food sources
- Highly adaptable diet and behavior (foxes similar)

Grey Foxes

- Found throughout much of USA and Cen. Am. to N. S Am.
- ~8 to 15lbs, ~30-45in total body length, ~12-15in shoulder height, grizzled fur on back and sides

Red Foxes

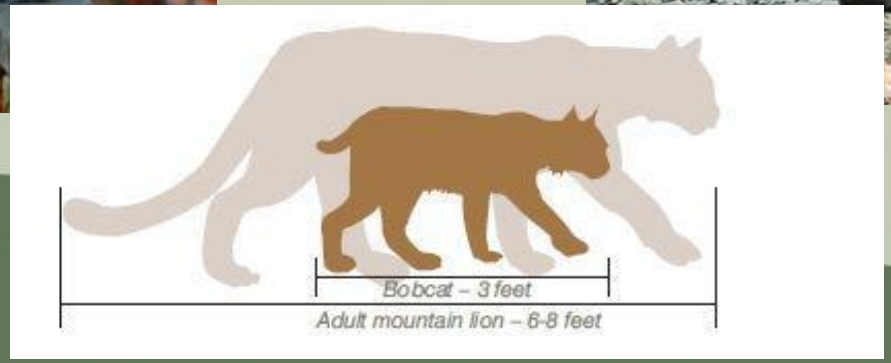
- Many subspecies around the northern hemisphere
- ~5 to 24 lbs, ~18-35in body length, ~12-22in tail length, ~14-20in shoulder height
- Also naturalized

Bobcats

- Found from S. Canada to Cen. Mexico
- Fur mostly a spotted tan, pointed ears, short tail
- Weight: 8-40 lbs
- Often confused for a panther

Florida Panthers

- Endangered Subpopulation found only in SW FL
  - Species is found from from SW Canada to Tierra del Fuego
- Fur mostly solid tan, young can be spotted like a bobcat, long, thick tail
- Weight: 55-176 lbs



Raccoons

- Found throughout much of N and Cen. Am.
- Weight: 10 – 30 lbs
- Commonly attracted to human dwellings and farms

Opossums

- Found across most of E US and US W Coast, and in Cen. Am.
- Weight: 1.7 to 14 lbs
- Florida's only marsupial
- Can "play possum" – playing dead

River Otters

- Found throughout Canada, Alaska, NW US, and E US
- Weight: 11-30 lbs
- Found in a variety of aquatic habitats

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

Wild Hogs

- Invasive/non-native species
- Weight: 200 lbs or more
- Found in every county in Florida
- Travel alone or in small groups
- Most common in areas with dense vegetation nearby

Rabies in Florida: 1997-2016

20-Year Animal Rabies Summary by Species: 1997-2016*

	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999	1998	20 Year Total	20 Year Average	Last Year of Positive Rabies Case
Bat	19	13	15	19	19	14	18	15	23	20	19	20	28	21	19	23	19	17	6	17	364	18	
Beaver	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	
Bobcat	0	1	0	0	2	3	2	4	2	3	4	1	2	1	0	3	1	3	3	4	39	2	
Cat	11	4	8	15	9	8	11	15	11	9	14	10	26	7	15	7	15	9	13	13	230	12	
Coatimundi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1969
Cow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	
Coyote	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Deer	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Dog	2	0	2	2	0	2	1	0	1	0	1	2	5	1	2	3	1	6	2	2	35	2	
Ferret	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1996
Fox	8	6	10	5	2	11	6	15	21	20	20	27	29	31	27	29	34	28	32	21	382	19	
Goat	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1947
Horse	0	2	0	1	0	2	1	1	1	2	1	3	0	0	0	1	1	0	1	2	19	1	
Mule	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1911
Opossum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1981
Otter	0	1	0	0	0	0	0	3	1	0	4	1	1	1	1	0	2	1	3	0	19	1	
Panther	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1989
Pig	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1969
Raccoon	37	31	45	50	71	59	79	75	92	88	66	111	108	146	127	115	124	97	126	153	1800	90	
Skunk	2	0	1	0	2	2	1	0	2	2	2	1	2	1	0	0	0	1	0	2	21	1	
Squirrel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1961
	79	59	83	92	105	102	119	128	154	144	131	176	201	209	191	181	198	162	186	215	2915		

*Florida Department of Health only performs rabies testing on suspect rabid animals that have potentially exposed a person, pet, livestock, or captive wildlife.

Source: Florida Department of Health

Wild Turkeys

Sandhill Cranes

- Protected species in Florida
- Will approach people if being fed, turkey toms can have breeding aggression
- May peck at reflective surfaces
- Can be scared away with loud noises, etc. (cannot be done around nests)

Ospreys, Hawks, and Songbirds

- Birds, eggs, and active nests are protected by federal law
- Nests in trees or in a structure
- Defensive of their nests, especially between Feb-May
- Use umbrella, hats, or hazing techniques to keep aggressive bird away from contacting you
- Keep distance from nest as much as possible

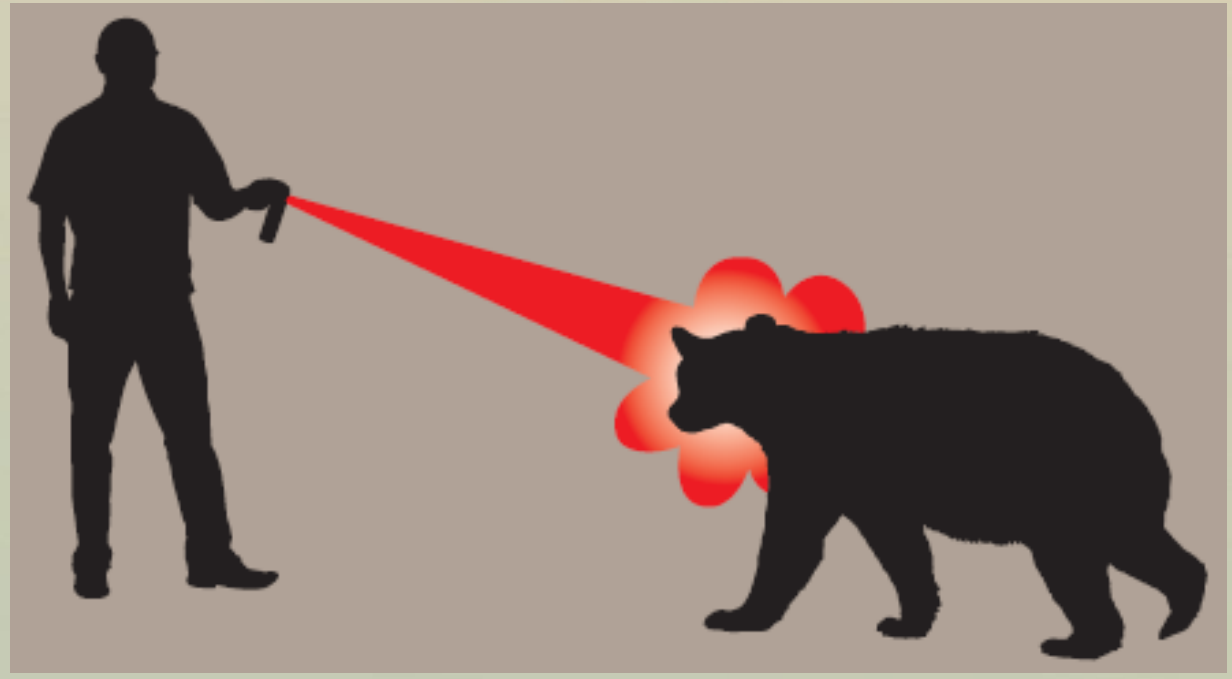
N. Mockingbird By Captain-tucker - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=6930319

Prevent Problems with Mammals and Birds: Hazing

Establish Human Dominance

- Rocks & sticks
- Whistles
- Pots & Pans
- Car & air horns
- “Coyote shaker”
- Motion-activated sprinklers
- Water pistols
- Motion lights
- Firecrackers
- *Bear spray*

Bear Spray



- For mammals only
- Have easily accessible
- Aim just below face
- 2-3 second bursts
- 25 feet
- More effective than a gun
- Account for wind direction
- Have a container to store can in

Notes about Hazing

- Do not haze birds when you are very close to the nest
  - This could cause nests to fail from the disturbance
- Make sure the animal has a safe place to escape to
- Be mindful of where the wildlife will retreat to. Wildlife may try to escape towards a busy road, endangering the animal and people on the road, or into a building

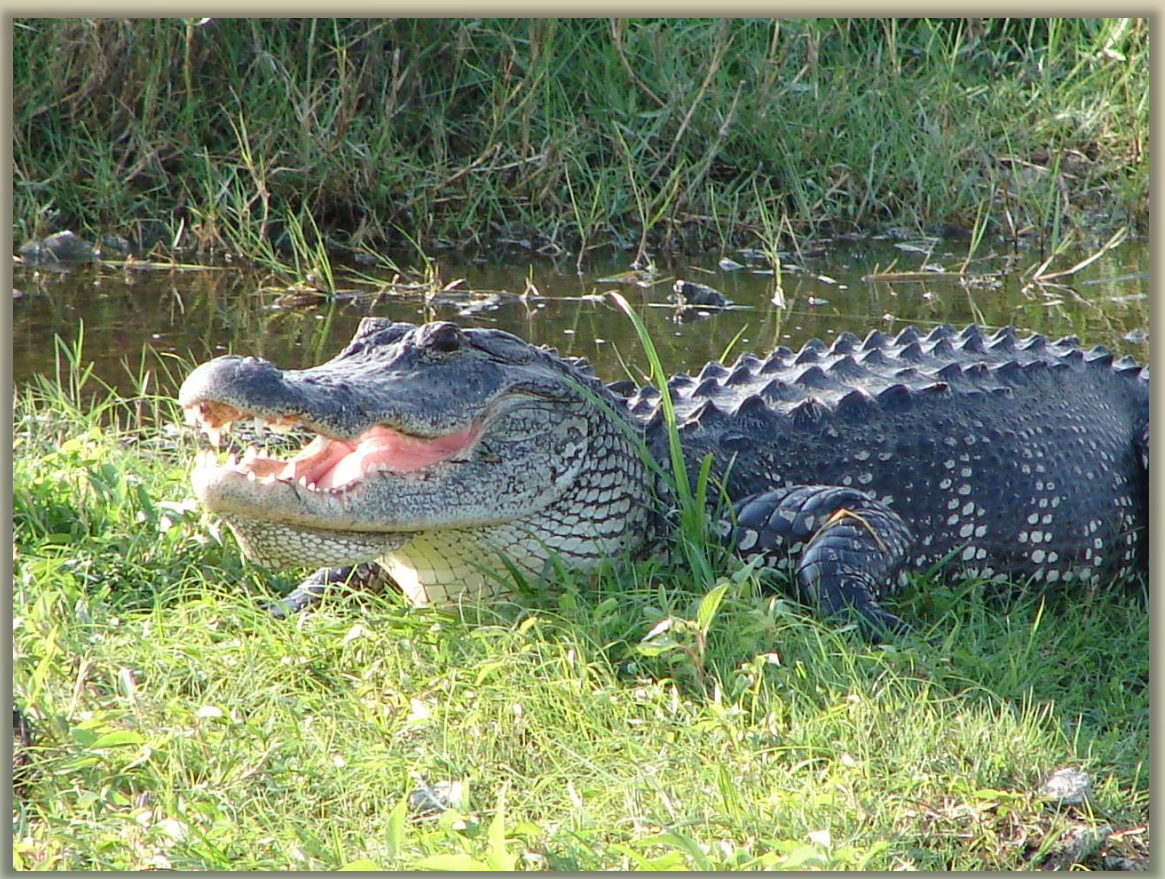
American Alligator (*Alligator mississippiensis*)

- Conservation success in Florida
- Included on original Federal Endangered Species List in 1967
- Today, population estimated at 1.3 million alligators of every size
- Population stable for many years

American alligator U.S. range

American Alligator Biology and Ecology

- Can’t tell males and females apart by outward appearances
    - Males can grow to 14 feet in length
    - Females smaller than males. Can grow to 8-9 feet in length
- More visible and active when temperatures rise
    - Bask in sun to regulate body temperature
- Courtship begins in the spring, with mating occurring in late May or June
    - Nests constructed after courtship
    - Eggs hatch from August to September



American Alligator Biology and Ecology

Why alligators are an important part of freshwater ecosystems:

Keystone species:

- Help keep prey species populations in balance
- Create holes and caves that store water during dry seasons

Avoiding Conflicts with American Alligators

- Any fresh or brackish water could have alligators - crocodiles in far southern Florida
- Be on the lookout for alligators when working in water or near water's edge
- Seek medical attention if bitten, serious infections can occur
- Alligators are most active at dawn and dusk

Avoiding Conflicts with American Alligators

- Never feed an alligator
- When fed, alligators can overcome their natural wariness and learn to associate people with food
- Also prohibited: harassing, killing, or possessing alligators w/o permit
- If you see or have knowledge of an alligator being fed, report it to Wildlife Alert Rewards Program

FWC Statewide Nuisance Alligator Program (SNAP)

- If you encounter an alligator that you believe poses a threat to people, pets or property, call:

  FWC's Nuisance Alligator Hotline at:

  866-FWC-GATOR (866-392-4286)

  Please be aware, nuisance alligators are killed, not relocated.

- SNAP uses contracted nuisance alligator trappers throughout the state.
- If a complaint meets the criteria, SNAP will issue a permit to a contracted nuisance alligator trapper authorizing the removal of the animal.

Complainant must be able to grant legal access to the property on which the alligator is located. SNAP does not permit the removal of nuisance alligators from private or publicly managed property without first obtaining permission from the property owner or management authority.



South Florida's Snakes



Introduction to South Florida's Snakes

About Snakes

- Cold-blooded, smooth- or keel-scaled, no eyelids
- All are carnivorous
- Lay eggs or live birth
- Young do not require parental care
- 45 species native to the state - 6 venomous

Snake Lookalikes

- Legless lizards (e.g. skink)
- Glass lizards

Eastern Glass Lizard

Sand Skink (Federally threatened)

Southern Black Racer

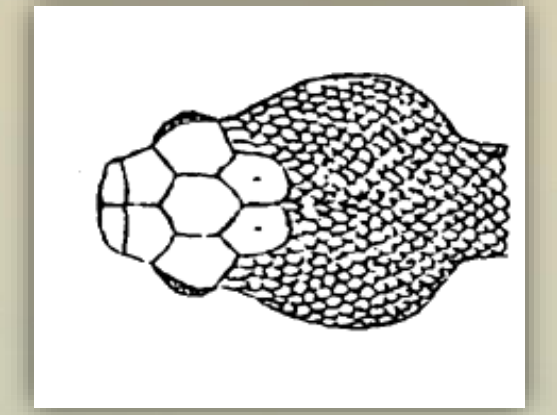
Red Rat Snake

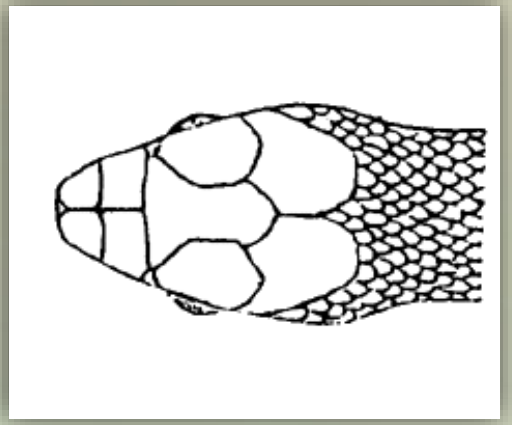
Common Species

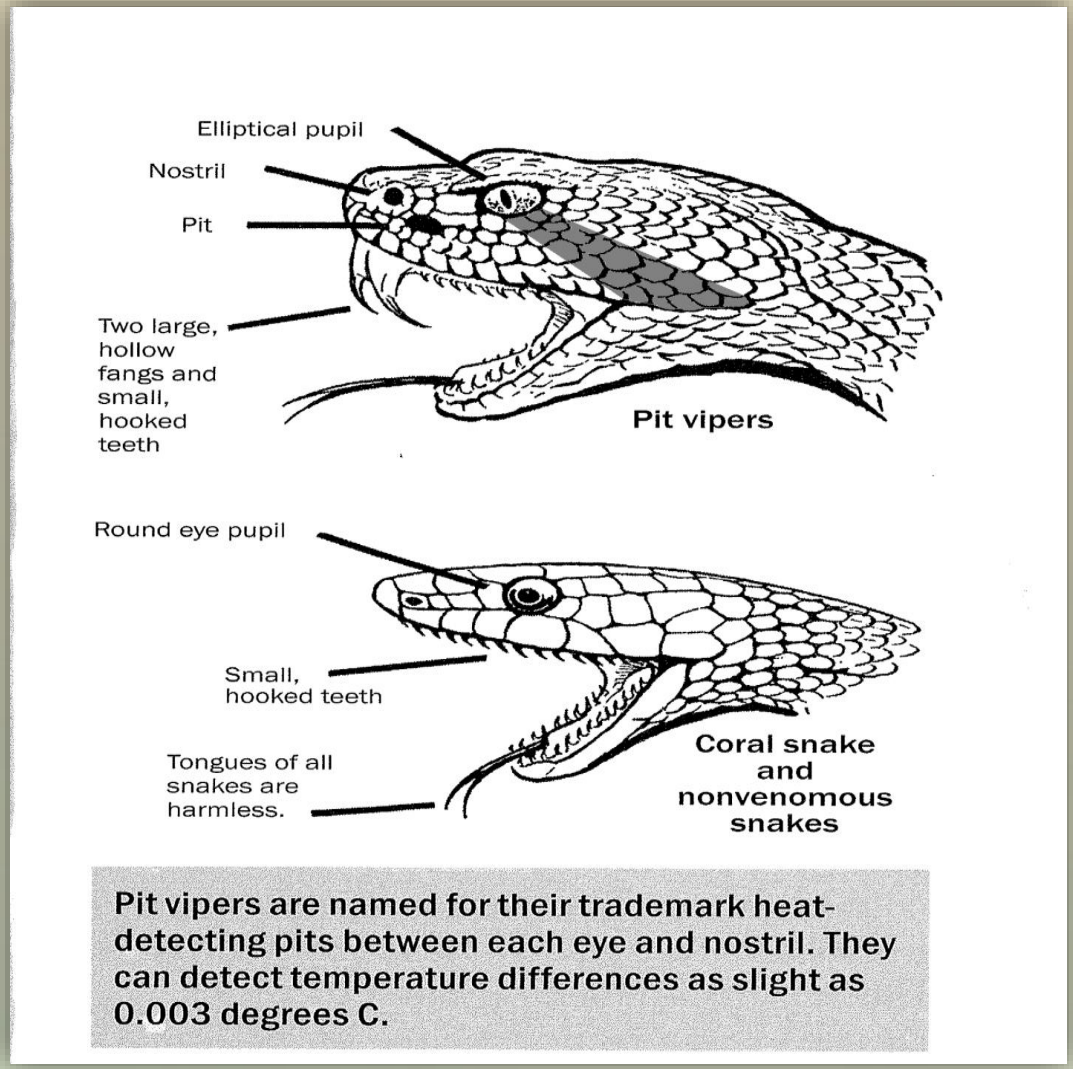
Know Your South Florida Snakes

Southern Ring-necked Snake

Identifying Venomous Snakes







Cottonmouth/Water Moccasin

- Broad, angular head & thick body, up to 4ft
- When threatened will open jaws and reveal white inside mouth
- Usually found in wet habitats, eats primarily aquatic animals
- Look alikes: Water snakes, genus *Nerodia* – notice round pupils

Juvenile Cottonmouth

Banded Water Snake (nonvenonmous)

Adult Cottonmouth

Pygmy Rattlesnake

- Small, has black patches on a lighter body, with variable amounts of red or other colors. Rattle very small if present
- Usually flees from danger or stay still. Sometimes are quite docile
- Similar Species: Hog nosed snakes
  - Non-venomous
  - 2 species in Florida: both possess prominent up-turned nose used for burrowing
  - Defensive strategies: puff up their necks like a cobra, play dead

Pygmy Rattlesnake

Eastern Hog-nosed Snake

Eastern Diamondback Rattlesnake

- Broad, angular head, length up to 6ft
- Diamond-shaped designs on keeled scales, sometimes possesses distinct rattle on tip of tail
- Can be found in a variety of habitats, prefers gopher tortoise burrows
- Will warn a threat by shaking its tail, may form an s-shape with its body
  - May possess rattle but it can be broken off
- NOTE: Many species of snake rattle their tail to scare off a threat

Eastern Coral Snake

- Black nose, red with yellow on either side (red on yellow – kill a fellow), avg. length to 30in
- Rear-fanged elapid (cobra family) - will only bite if handled or severely harassed
- Spends much time hidden underground, in debris, or in rotting logs
- Similar Species: Scarlet snake and scarlet kingsnake
  - Non-venomous
  - Very similar to each other
  - Red-tipped nose, red bands surrounded by black bands (red on black – friend of jack / venom lack)

Eastern Coral Snake

Scarlet Kingsnake

Preventing Encounters

- Stack materials neatly on a platform above ground
- Check behind objects
- Avoid thick vegetation or tread lightly through it
- Leave the snake alone so it doesn’t become defensive
- Toss objects towards it to scare it away

Venomous Snakebite Do's

Most people bitten are capturing them or killing them

- If struck, move away from the snake.
- Seek medical treatment immediately.
- Keep victim warm and as comfortable as possible.
- Note any symptoms and allergies of victim.
- Remove bracelets, rings and constrictive clothing.
- Keep the bite area lower than victim's heart.
- Wash the bite wound with soap and water.

Venomous Snakebite Don’ts

- Do not wait for symptoms to develop!
- Do not apply “traditional” remedies.
- Do not apply ice, heat, or a tourniquet.
- Do not draw an “X” incision and suck out the venom.
- DO NOT ATTEMPT TO CATCH OR KILL THE SNAKE!

High Priority Non-Native Species
Please Report Sightings to 888-IVE-GOT1

- Always use caution
- Park a short distance away
- Take photos while approaching
- Keep a distance of 15 ft
- If bitten, wash wound with soap and water
  - Seeking medical attention recommended

Burmese python

Burmese pythons/Photo credit Edward Mercer

Boa Constrictor

Tegus
(Argentine Black-and-White)

Monitor Lizards (Nile)

Seen something exotic? Report your sighting!

1. Take a picture
2. Note the location
3. Report your sighting

By phone: 888-Ive-Got1 (888-483-4681) **Online:** IveGot1.org
or download the IveGot1 reporting app.

Knowing the distribution of nonnative species in Florida helps wildlife biologists plan more effective management strategies.

MyFWC.com/Nonnatives

Things to Remember...

1. Be aware of your surroundings
2. Know the attractants
3. Stop and stay calm
4. Haze the animal if needed
5. Defend yourself
6. Seek medical attention
7. Respect wildlife

FWC Contact Information

- South Regional Office Phone:
  (561) 625-5122
- Wildlife Alert Hotline / Rewards Program:
  (888) 404-3922

  Text/email Tip@myfwc.com
- Exotic Species Hotline:
  (888) 483-4861
- South Region Wildlife Assistance Biologist email:
  Bryce.Pierce@myfwc.com
- AskFWC for online inquiries

THANK YOU!