Forest management with embedded wetlands: a tale of the Gopher Frog

Nathan Shepard, Eastern Region Field Biologist

www.ncnhp.org

1

Speaker Bio

Nathan Shepard is an Eastern Regional Field Biologist with the NC Natural Heritage Program, working on various topics related to conservation of rare and uncommon animal, plant, and natural communities within North Carolina. His main area of interest is with the natural history and conservation biology of Reptiles and Amphibians. His herp work largely focuses on species endemic to the Longleaf Pine Forest of the Carolinas. He works through agency partners and land managers to help maximize management efforts for at risk species.

2

Isolated Wetlands

- Not connected to other waterbodies
- Open canopy
- Emergent vegetation

3

Isolated Wetlands

- Not connected to other waterbodies
- Open canopy
- Emergent vegetation
- Ephemeral
- Rich herbaceous layer

4

Isolated Wetlands

- Not connected to other waterbodies
- Open canopy
- Emergent vegetation
- Ephemeral
- Rich herbaceous layer
- Fire maintained

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

5

The Purpose of Isolated Wetlands

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

6

Isolated Wetlands Embedded in the Landscape

- Ecological Regulated by:
  - Hydroperiod
  - Fire
- Vary in:
  - Size
  - Abundance
  - Permeability
  - Geology (bay, depression, sink hole)

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

7

Isolated Wetlands Embedded in the Landscape

Vary in Natural Community Types:

- Small Depression Shrub Border
- Coastal Plain Depression Swamp
- Vernal Pool
- Cypress Savanna
- Small Depression Drawdown Meadow
- Small Depression Pond

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

8

Gopher Frog – *Rana capito*

- Endemic to Longleaf
- Typically a winter breeder
  - February – March
  - Occasionally Fall with hurricanes

9

Gopher Frog – *Rana capito*

- Endemic to Longleaf
- Typically a winter breeder
  - February – March
  - Occasionally Fall with hurricanes
- Co-evolved with summer fire

10

Gopher Frog – *Rana capito*

- Endemic to Longleaf
- Typically a winter breeder
  - February – March
  - Occasionally Fall with hurricanes
- Co-evolved with summer fire
- Dependent on underground refugia (stumpholes)

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

11

Gopher Frog – *Rana capito*

- Endemic to Longleaf
- Typically a winter breeder
  - February – March
  - Occasionally Fall with hurricanes
- Co-evolved with summer fire
- Dependent on underground refugia (stumpholes)
- Requires large tracts of high-quality habitat

Humphries and Sisson 2012

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

12

Gopher Frog – *Rana capito*

- Endemic to Longleaf
- Typically a winter breeder
  - February – March
  - Occasionally Fall with hurricanes
- Co-evolved with summer fire
- Dependent on underground refugia (stumpholes)
- Requires large tracts of high-quality habitat
- State listed – Threatened
- Pending federal listing (ESA)

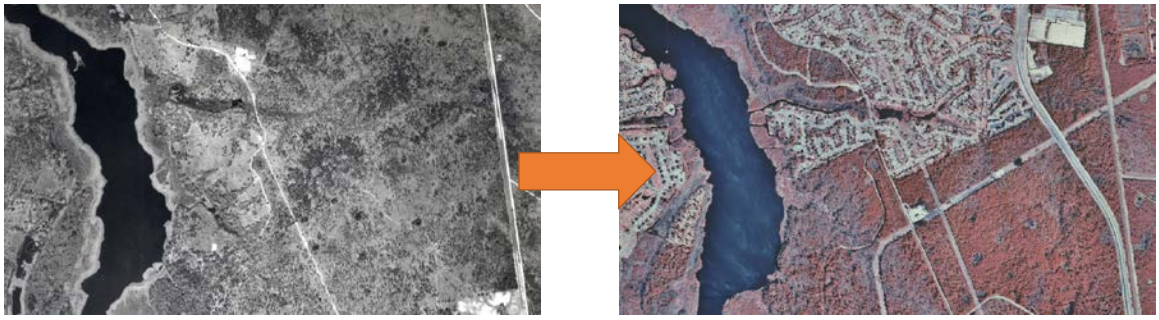
13

Wetland Threats and Pressures

- Habitat alteration, destruction
- Poor habitat management
  - Dormant season fire
  - Fire suppression
- Loss of quality breeding wetlands
- Roads and urbanization
- Natural factors / climate change
- Water usage
- Intensive ground disturbance

14

Conservation Issues with Embedded Wetlands



15

Conservation Issues with Embedded Wetlands

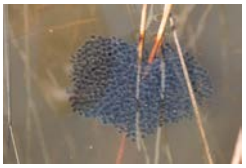
16

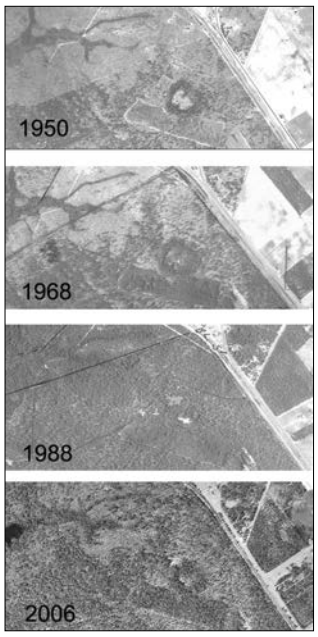



17

What happened?!

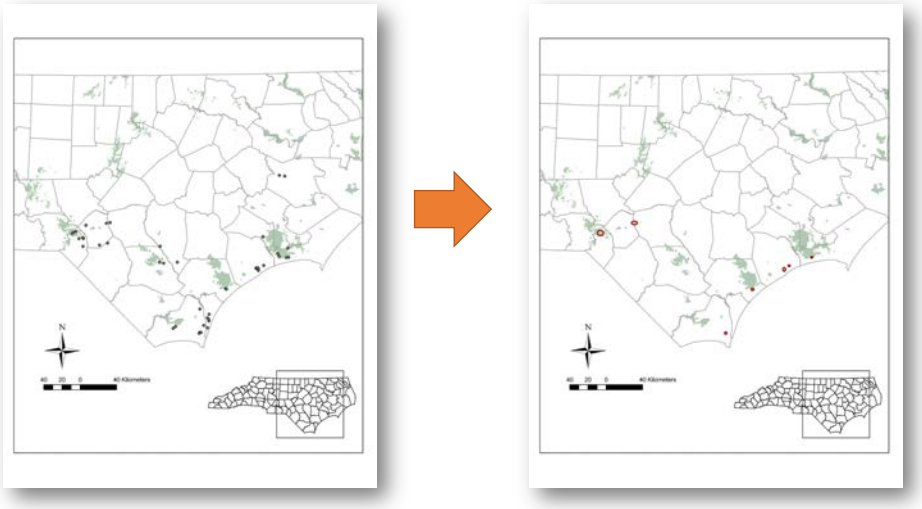
- Ditched and drained
- Fire suppression
- Fire exclusion
- Made into fishing ponds
- Connectivity issues





18

Status of Gopher Frogs in North Carolina



19

Management Strategies for Embedded Wetlands

- Growing season fire is best
  - Rotation of ~3 years
  - Burn through the pond basin
  - No burning during any breeding windows
    - Spring/fall
- Limit ground disturbances
- Leave wetlands intact

20

Conservation Strategies for Embedded Wetlands

- Wetlands Restoration
  - Remove tree/shrub cover
  - Fill in ditches
  - Introduce fire
  - Choose appropriate wetlands
  - This process takes time and should be done in stages

21

Conservation Strategies for Embedded Wetlands

- Wetlands Restoration
  - Remove tree/shrub cover
  - Fill in ditches
  - Introduce fire
  - Choose appropriate wetlands
  - This process takes time and should be done in stages
- Wetland Creation
  - Artificial wetlands
    - Methods vary

22

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

23

NC DEPARTMENT OF NATURAL AND CULTURAL RESOURCES

24


NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

25


NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

26


NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

27


NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

28

29

Acknowledgements

- **Colleagues:** Dr. Jeff Humphries, Jeff Hall, Jeff Beane, Brady Beck, Jeff Marcus, Mike Sisson, Dustin Smith, Chris Shupp, Alvin Braswell, Jeff Beane
- **Photo Credits:** Jeff Hall, Dr. Jeff Humphries, Brady Beck, and Mike Martin

30