

*In the end, we will conserve only what we love,  
we will love only what we understand,  
and we will understand only what we are taught.  
~ Baba Dioum, Senegalese Forester*



# Intro to Rare Aquatic Species

A Focus on the Tar and Neuse River Basins

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# Objectives

- Introduce federally listed and at-risk aquatic animals
- Listing status under Endangered Species Act
- Basic needs of the species
- Overview of where they occur and critical habitat
- How they're doing – current condition & stressors
- Connecting forest management and protected species



# Federal Trust Species

Endangered, Threatened, and At-Risk Aquatic Animals



# Federal Trust Species in the Tar and Neuse



# Federal Trust Species in the Tar and Neuse



# Endemic Species

1. Tar River Spiny mussel
2. Neuse River Waterdog
3. Carolina Madtom



*These species occur in the Tar and Neuse Basins  
and nowhere else on the planet.*



# Species Listing Status

Species	Listing Status
Tar River Spiny mussel	Endangered
Dwarf Wedgemussel	Endangered
Carolina Madtom	Proposed Endangered*
Yellow Lance	Threatened
Atlantic Pigtoe	Proposed Threatened
Neuse River Waterdog	Proposed Threatened*
Green Floater	At-risk

**Endangered:** at risk of becoming extinct in all or portion of range

**Threatened:** at risk of becoming endangered in the foreseeable future

**At-risk:** in decline; petitioned or Candidate, but has not been listed



# Life History Basics – Carolina Madtom

- Lives at stream bottom over gravel/sand; avoids fine silts
- Needs structure – boulders, woody debris, other shelter
- Nests under structure, males guard nest
- Shallow, flowing water
- Eats aquatic insects
- Mature in 2-3 years
- May live only 4 years



Chris Wood, NCWRC



# Life History Basics – Neuse R. Waterdog

- Lives at stream bottom over gravel/sand, hard clay
- Needs structure – boulders, woody debris, holes in banks
- Eats insects, worms, small fishes
- Nests under structure
- Flowing water
- Mature in ~6 years
- Lifespan unknown (30+)

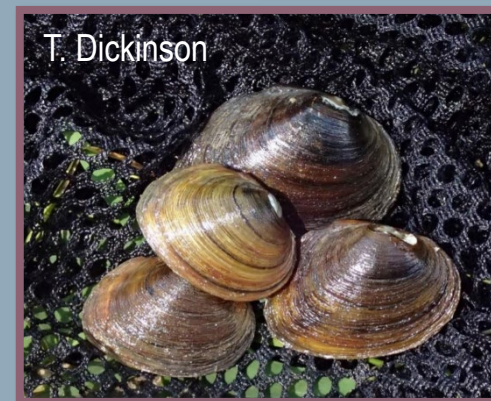


Jeff Beane, NCMNS

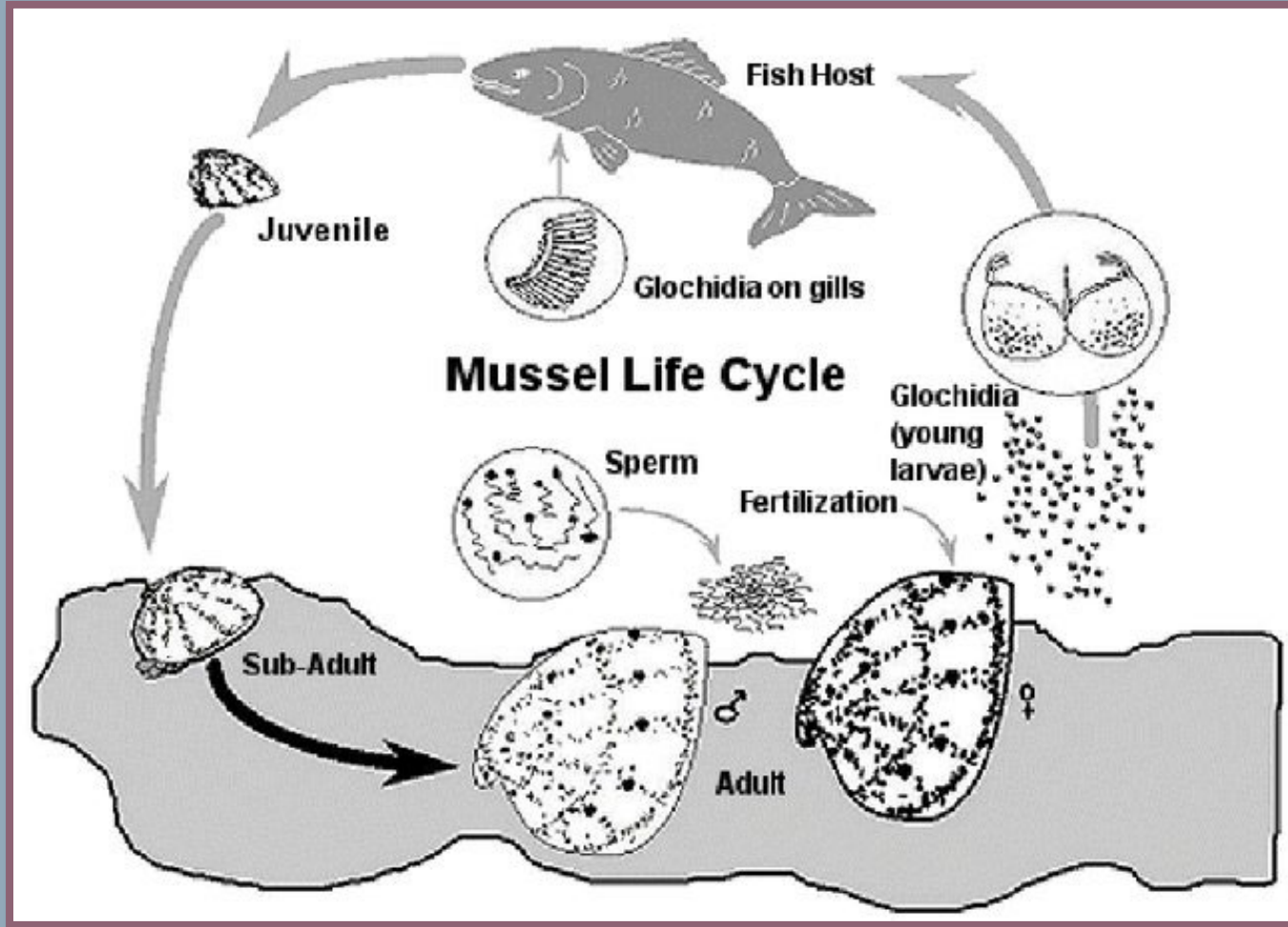


# Life History Basics – Mussels

- Live in stream substrates – coarse sand, gravel, rocks
- Need flowing water, stable streams, clean bottom
- Need fishes for development & dispersal
- Filter feeders on algae, bacteria
- Mature in few to several years
- Lifespans ~10 to 100 years



# Life History Basics – Mussels





# Critical Habitat

Endangered and Threatened Species



# What is Designated Critical Habitat?

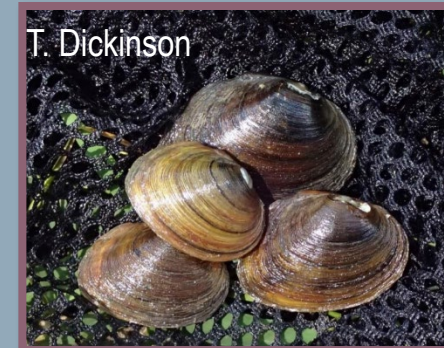
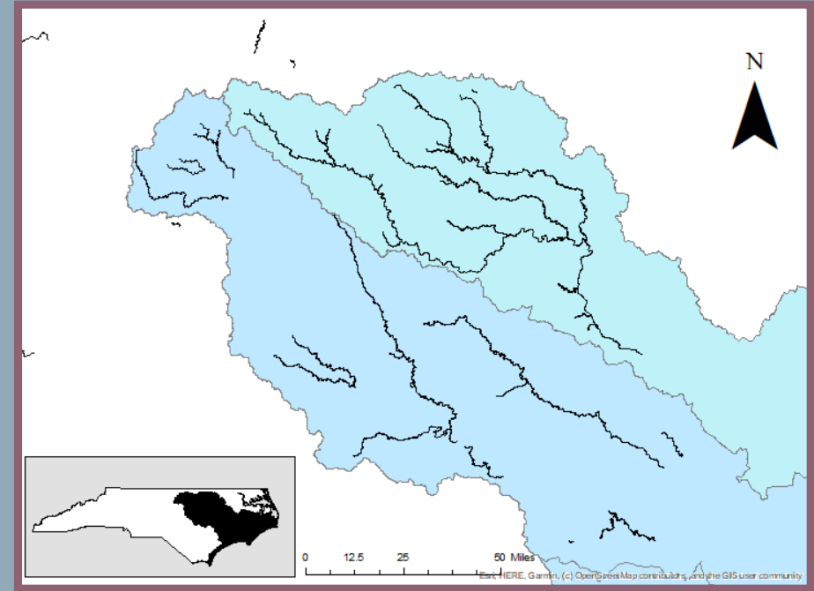
*Habitat that contains features essential to the conservation of a species, and may require special management and protection.*

- Specific to the Endangered Species Act
- Specific habitat areas that are needed for recovery
- Has not been designated for all species
- Species may and do occur outside designated critical habitat areas
- Public awareness tool
- Consultation tool for other federal agencies



# Designated Critical Habitats in FHW area

1. Yellow Lance – designated April 2021
2. Carolina Madtom – final CH imminent
3. Neuse River Waterdog – final CH imminent
4. Atlantic Pigtoe – final CH imminent



# Designated Critical Habitats in FHW area



Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

## Tar River Basin

Fishing Creek  
Little Fishing Creek  
Sandy-Swift Creek  
Tar River  
Stony Creek  
Tabbs Creek

## Neuse River Basin

Little River

## Roanoke River Basin

Aarons Creek



# Status of the Species

How they're doing

Stressors

Importance of Eastern NC habitats



# How do we measure species status?

## Five-year Status Review

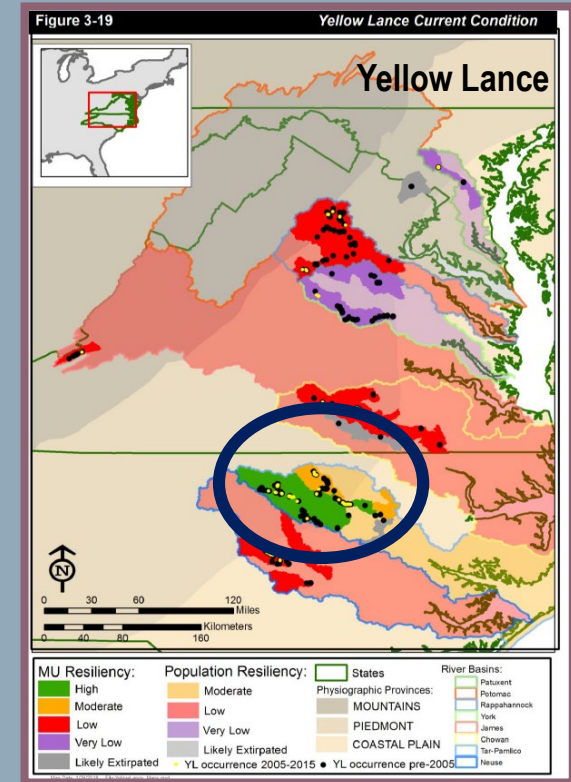
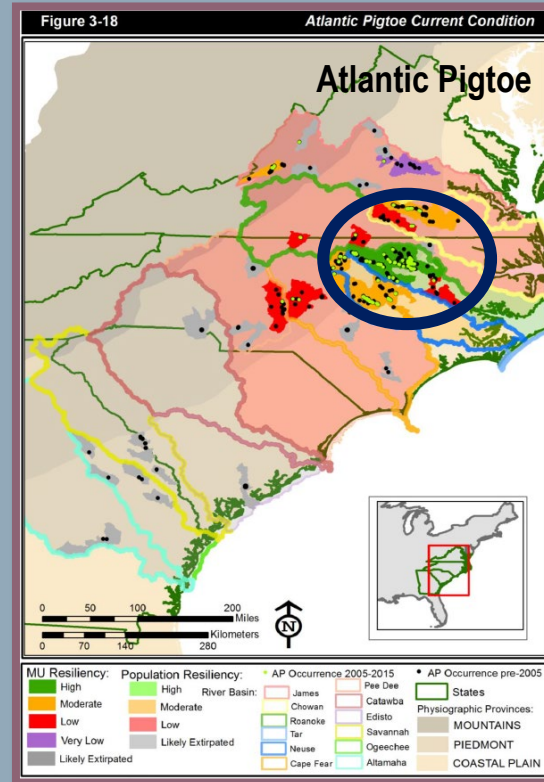
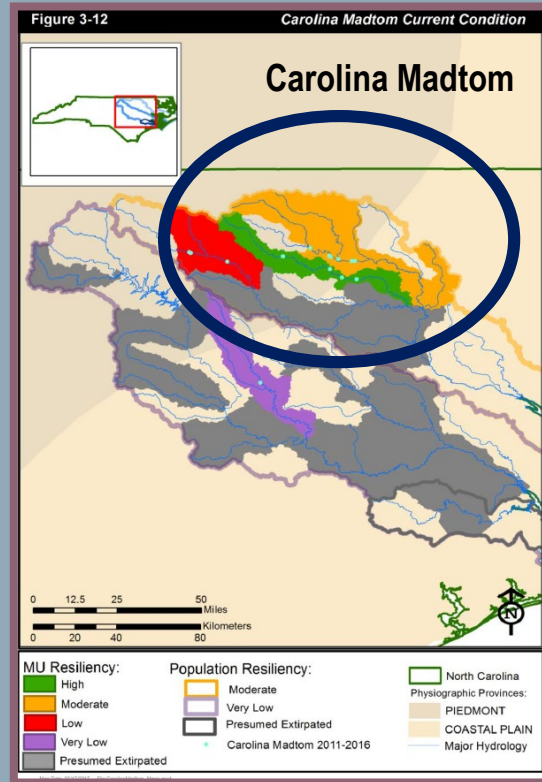
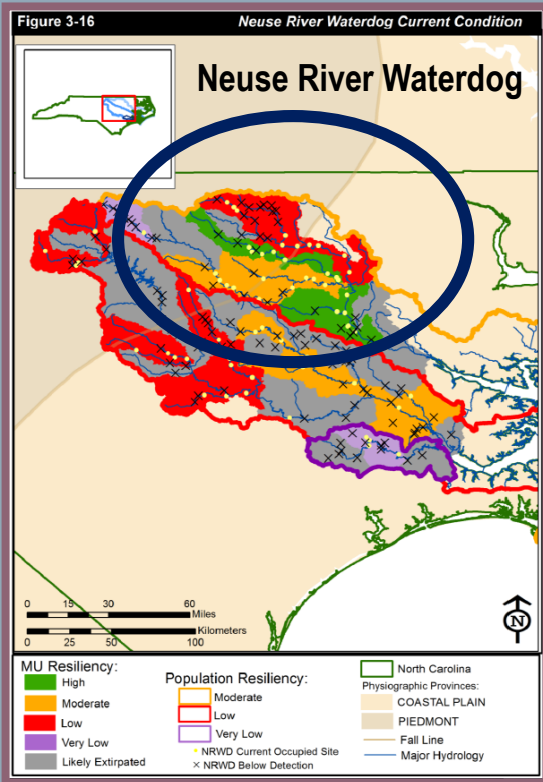
- Is the species increasing, decreasing, or stable?
- Have recovery criteria been met?
- Recommendations: no change, uplist, downlist, delist

## Species Status Assessments (SSA)

- Assess population and habitat factors
- Determine population condition (low, medium, high resiliency)



# Current Condition (green = good)



**Tar River Spiny mussel** – declining, last stronghold in Tar

**Dwarf Wedgemussel** – declining in southern portion of range

**Green Floater** – declining; low condition or extirpated in many Tar/Neuse watersheds



# Current Stressors

Habitat loss/degradation – leads to reduced, fragmented, isolated populations



# Current Stressors

Invasive species – predation or competition



# Foresters for Healthy Waters area

- High quality habitats
- Key to conservation strategies
- Essential to preventing extinction
- Important for recovery



ncfishes.com



Rachael Hoch, NCWRC



# Connecting Forest Management

## Clean Water Act

"The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters...

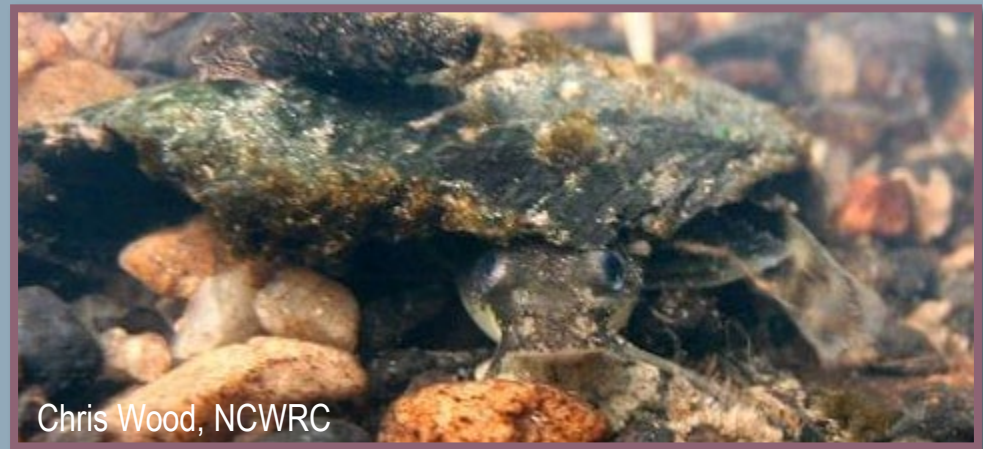
...water quality which provides for the protection and propagation of fish, shellfish, and wildlife..."

## Forestry Best Management Practices

- Focus on physical and chemical parameters
- Can directly address protection of biological parameters



# Summary



- FHW project area supports 7 federally listed and at-risk species
- All need clean, flowing water and good stream bottom habitat
- Many streams are designated as Critical Habitat for recovery
- All species are declining
- Stressors = sedimentation, water quality, invasive species
- Best populations in the FHW Project Area (Upper Tar)
- Let us help you support good aquatic habitat and stewardship!

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