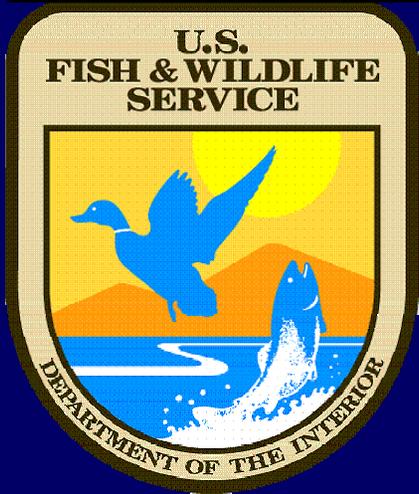


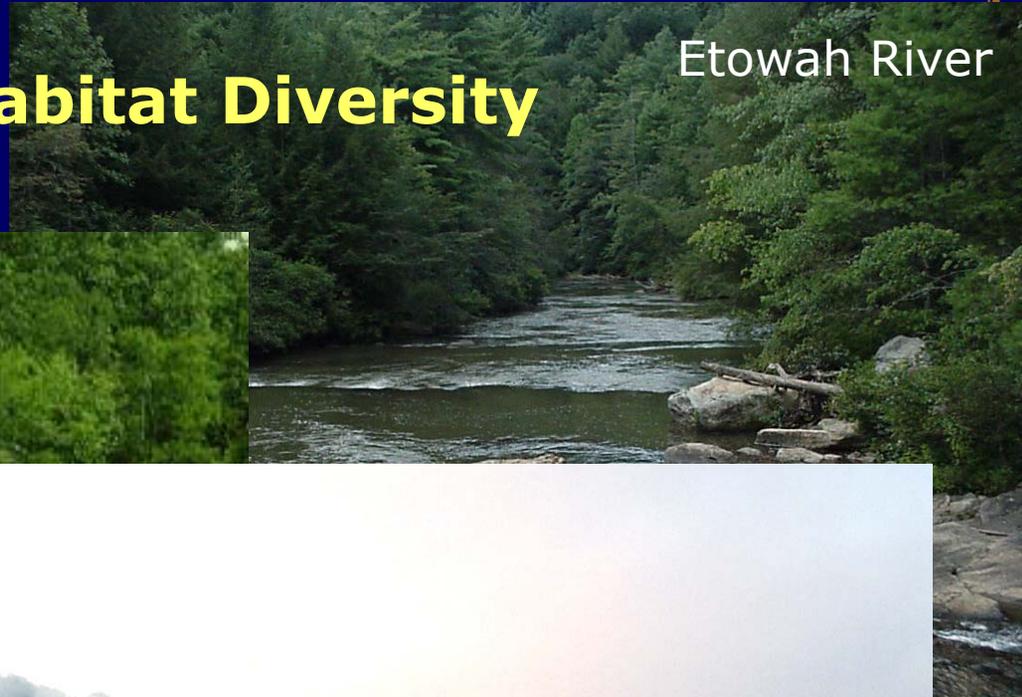


# Fish and Wildlife Considerations

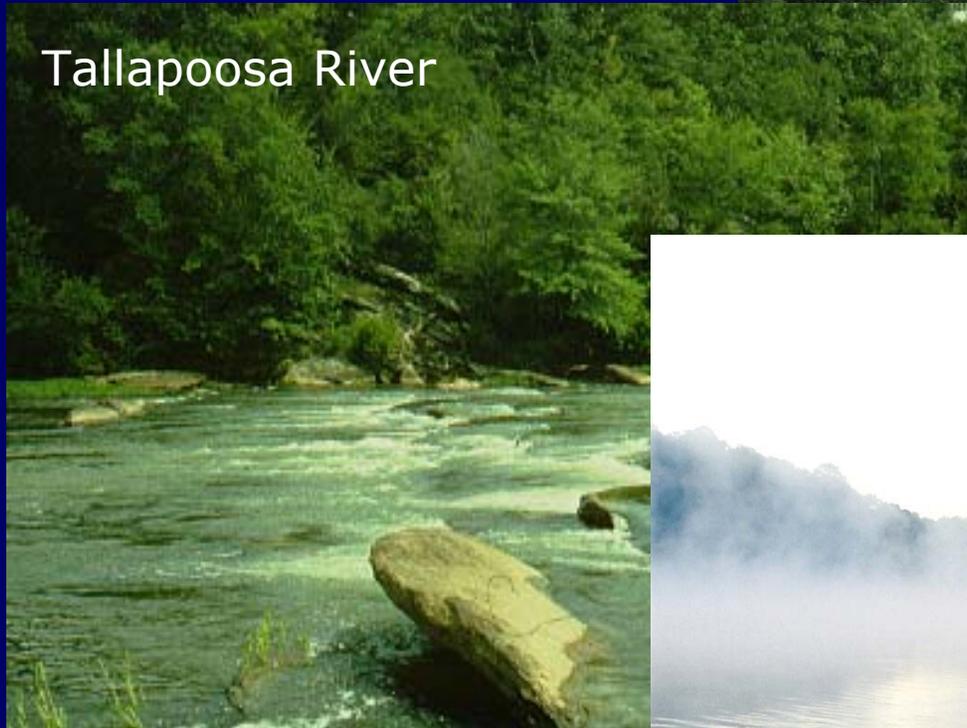


# ACT Basin Aquatic Habitat Diversity

Etowah River



Tallapoosa River



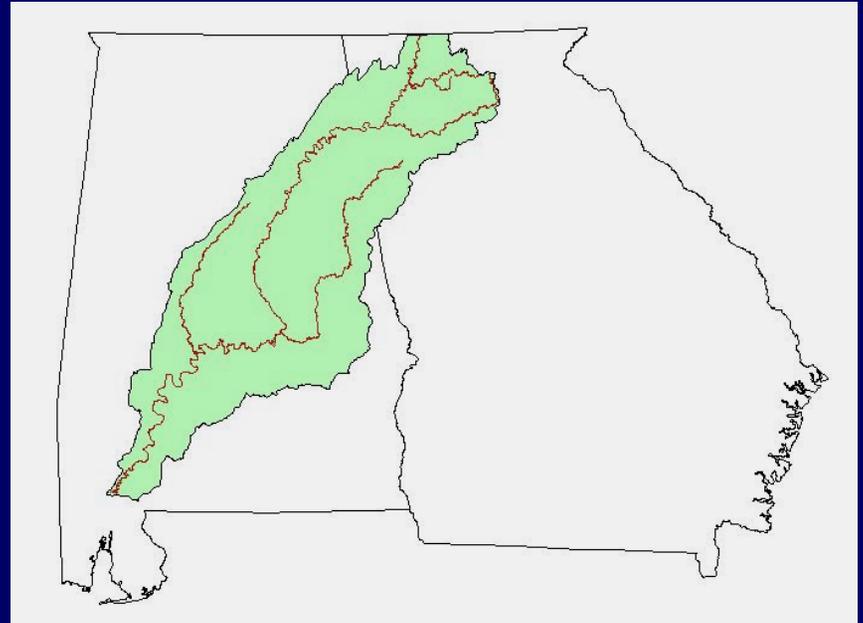
Alabama River



## ACT Basin Aquatic Biodiversity



- Fish: 173 species
- Mussels: 45 species
- Aquatic snails: 78 species (Coosa Basin historic)
- Cahaba River: 194 miles without a dam



## ACF Basin Aquatic Habitat Diversity

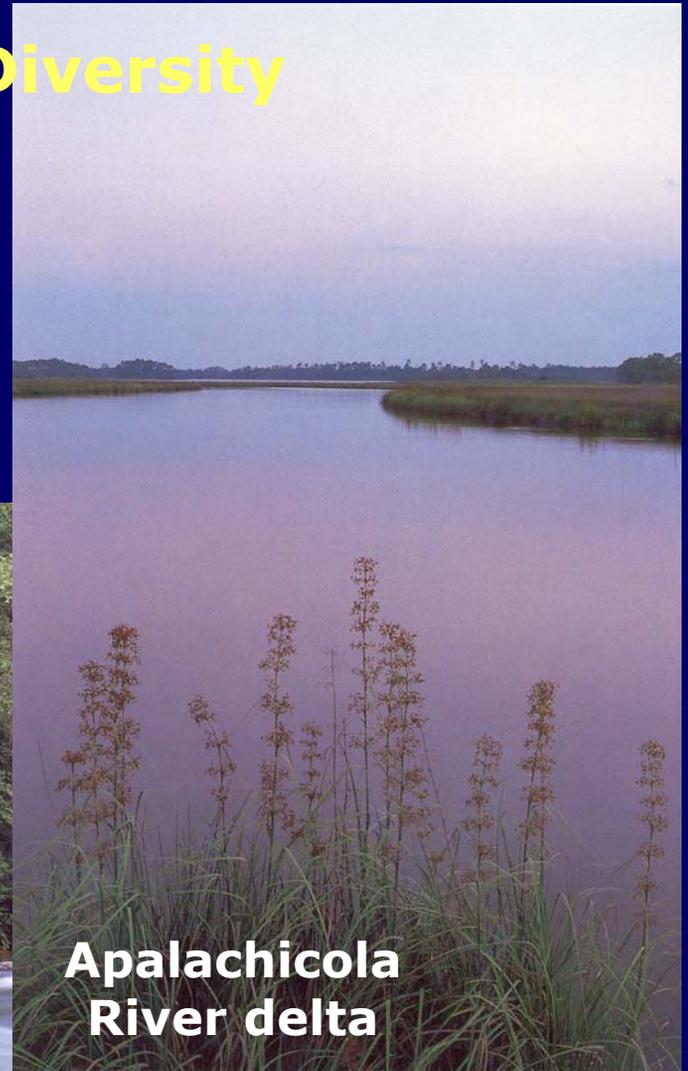


**Flint River**

Photo by R.T. Bryant



**Chattahoochee River headwaters**

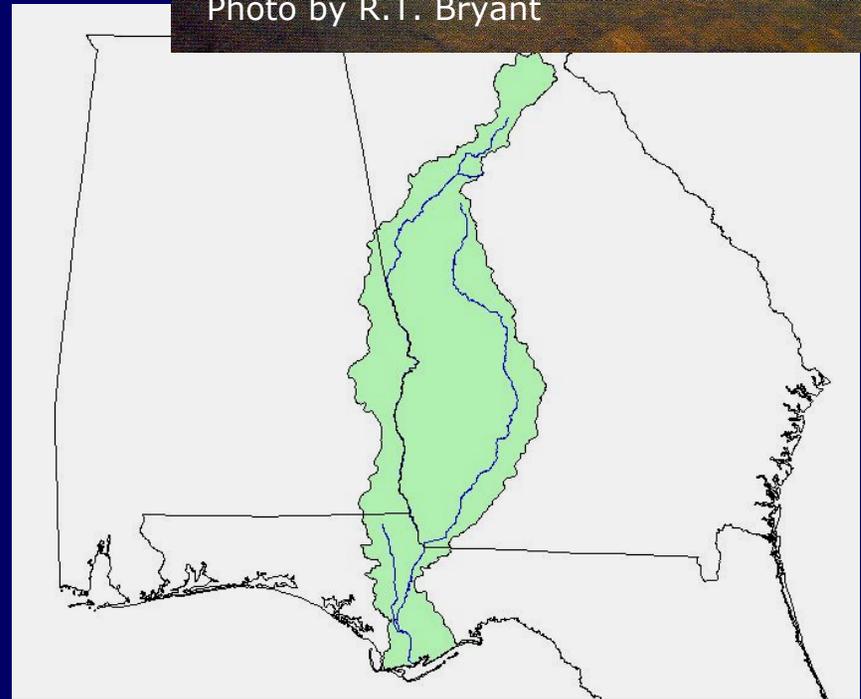


**Apalachicola  
River delta**

Photos by J. & M. Cook

# ACF Basin Aquatic Biodiversity

- Fish: 122 species
- Mussels: 29 species
- Crayfish: 30 species
- Highest US density reptiles & amphibians
- Estuary one of most productive fisheries in North America
- Flint River: 214 miles without a dam



# Reservoir/Tailwater Fishing and Hunting Resources



# National Wildlife Refuges/Hatcheries

Warm Springs NFH and  
Fisheries Tech. Center

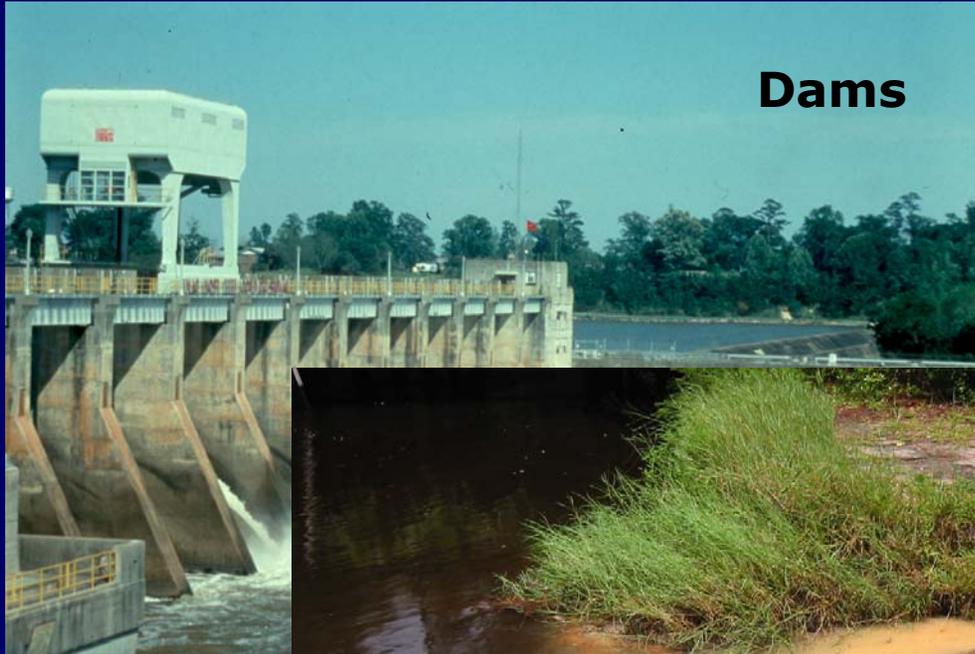


Eufaula NWR



St. Vincent NWR

# Impacts to ACT and ACF Aquatic Ecosystems



**Dams**



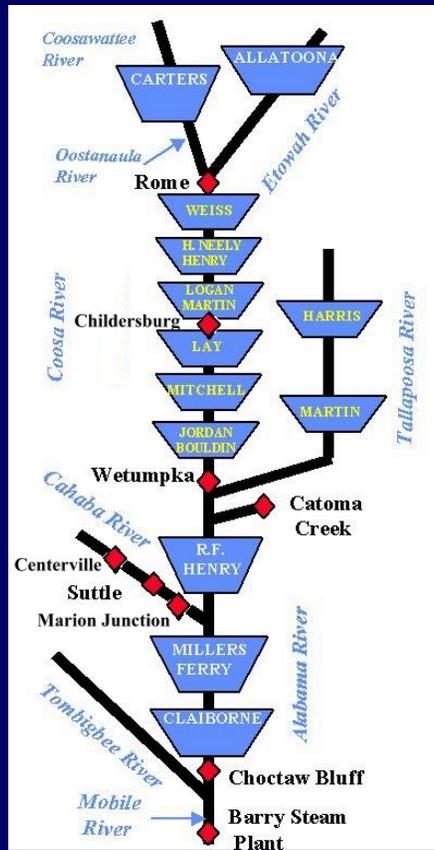
**Pollution**



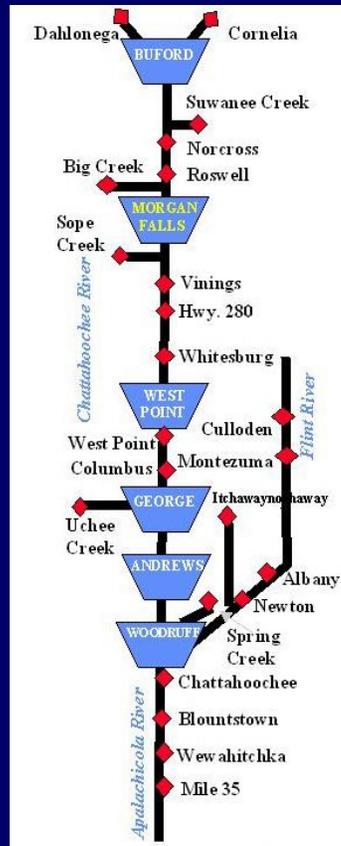
**Sedimentation**

# Dams in the ACT and ACF

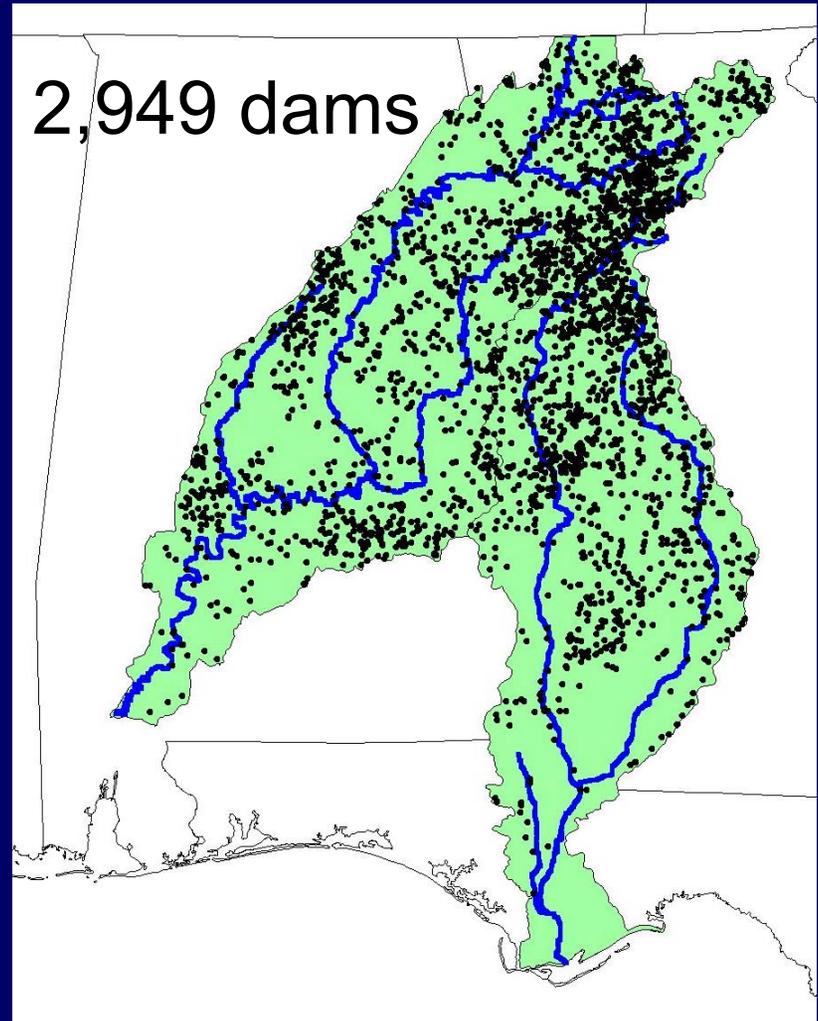
## ACT



## ACF



2,949 dams



## Aquatic Ecosystem Impacts (continued)

### Flow regime alteration

**Flow regime = variation over time in:**

**Magnitude**

**Seasonality**

**Frequency**

**Duration**

**Rate-of-change**

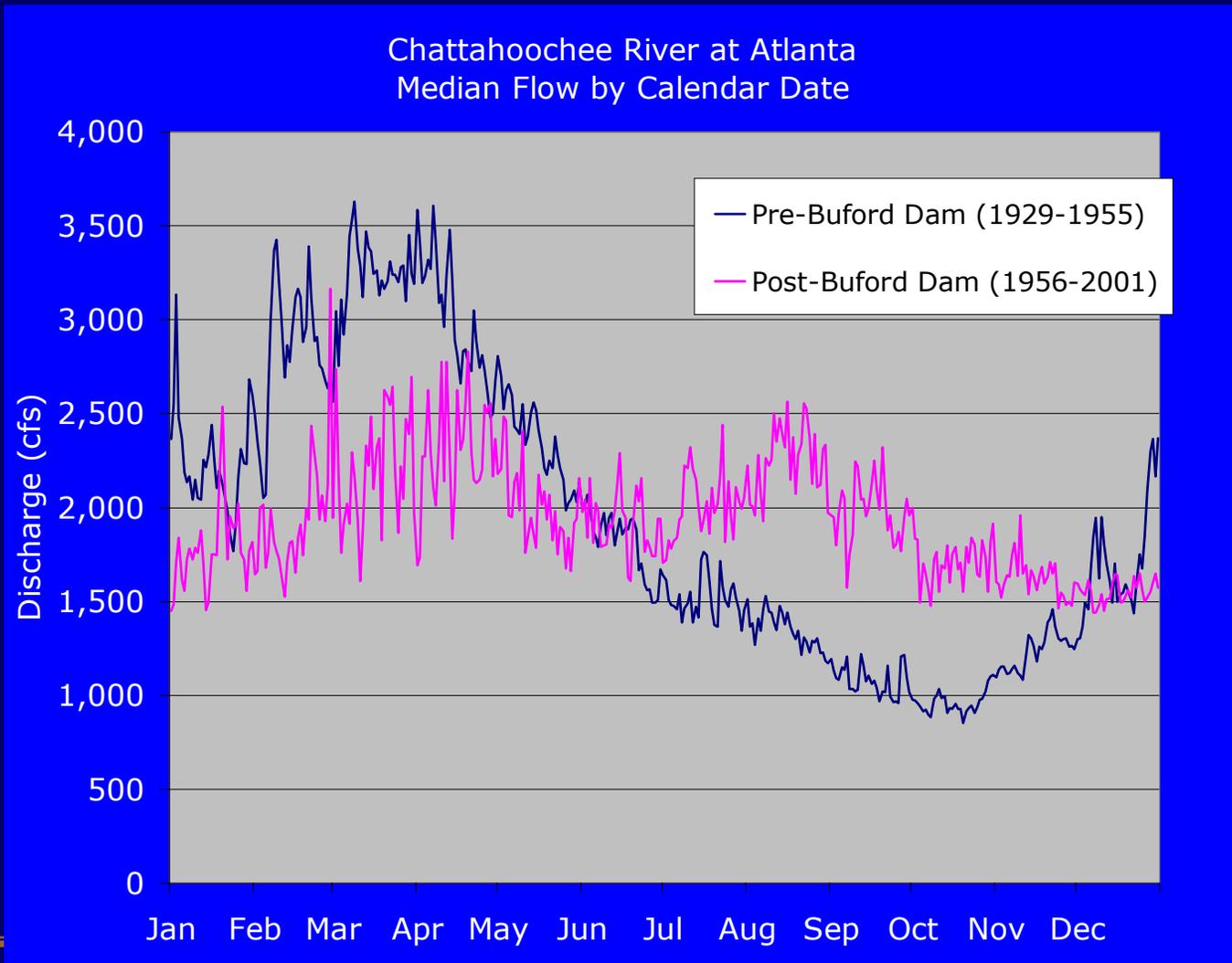
**Flow regime = “master variable” in  
riverine ecosystems**

**Altering regime patterns alters the  
ecosystems**



Photo by R.T. Bryant  
Sprewell Bluff  
Flint River

# Flow regime alteration: example of magnitude and season alteration in the ACF



# Aquatic Ecosystem Impacts (continued)

## Flow regime alteration

### Unvegetated Land uses



Agricultural

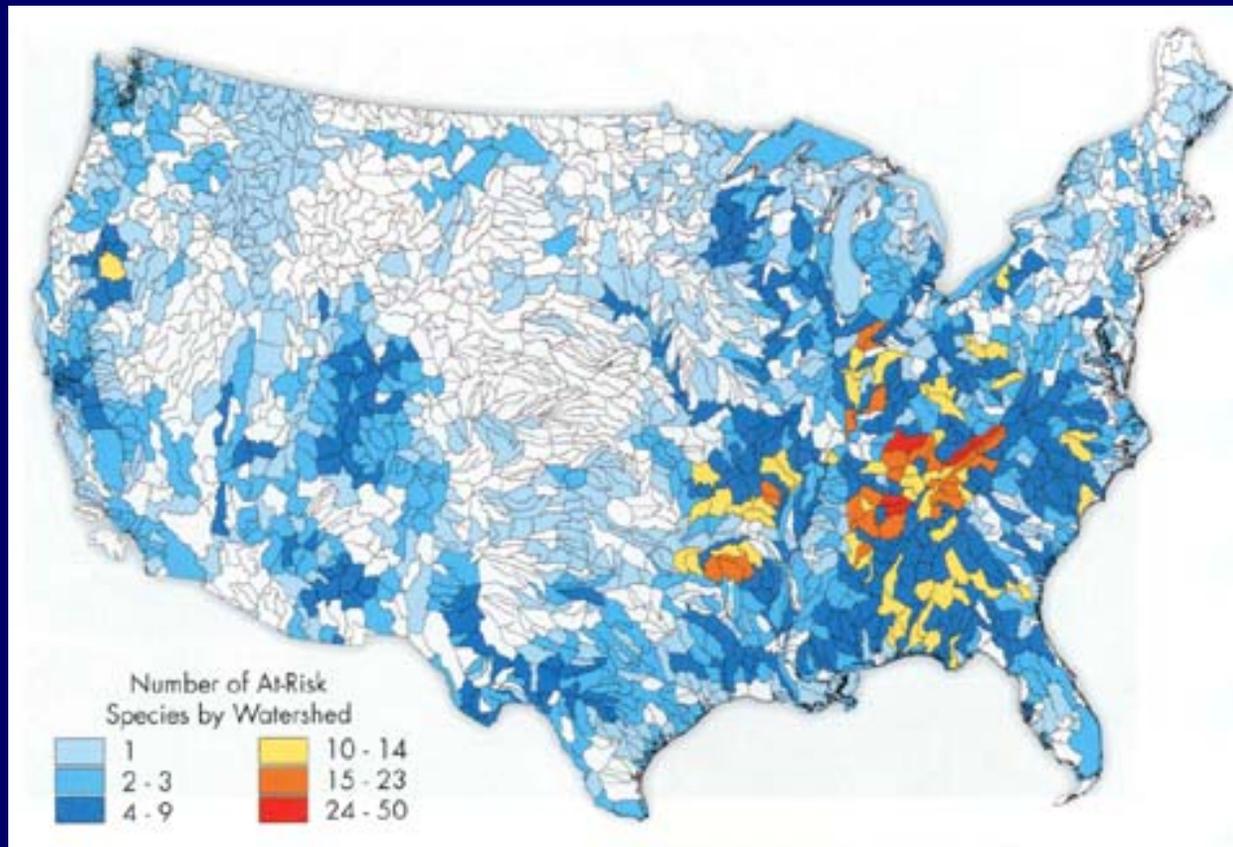


### Water Consumption

#### Municipal & Industrial



# Hot Spots for Imperiled Fish and Mussel Species



Source:  
The Nature  
Conservancy's  
*Rivers of Life*  
publication

## **Federal laws for protecting aquatic fish and wildlife and their habitats**

- **National Environmental Policy Act** – consider the environmental impacts of federal actions, invite public participation, document the basis for decisions affecting the environment in impact statements and assessments.
- **Clean Water Act** -- restore and maintain the chemical, physical and biological integrity of the nation's waters
- **Magnuson-Stevens Fishery Conservation and Management Act** – management of fisheries within the exclusive economic zone. 1996 amendments require federal agencies to consult with NMFS on actions that may adversely affect essential fish habitat

## **Federal laws for protecting aquatic fish and wildlife and their habitats (continued)**

- **Fish and Wildlife Coordination Act** -- equal consideration to fish and wildlife in federal projects and permits
- **Federal Power Act** -- equal consideration to fish and wildlife, recreation, and other aspects of environmental quality in federal licensing of hydropower facilities
- **Water Resources Development Act of 1990** -- environmental protection is one of the primary purposes in planning, designing, constructing, operating and maintaining water resource projects
- **Endangered Species Act** -- conserve listed species and the ecosystems upon which they depend

# Endangered Species Act -- Overview

- Sec. 4 requires listing if a species is endangered or threatened with possible extinction; requires recovery planning
- Sec. 7 directs Federal agencies to conserve listed species and requires consultation with the Service on actions that may adversely affect listed species or adversely modify designated critical habitats
- Sec. 9 prohibits unauthorized take of listed animal species
- Sec. 10 authorizes take under certain circumstances

## ESA-Listed Aquatic Species in the ACT Basin

### Fish

Gulf sturgeon(T)  
Blue shiner (T)  
Etowah darter (E)  
Cherokee darter (T)  
Cahaba shiner (E)  
Amber darter (E w/CH)  
Goldline darter (T)  
Conasauga logperch (E w/CH)  
Alabama sturgeon (E)

### Plants

Harperella (E)  
Kral's water plantain (T)

### Mussels

Upland combshell (E)  
Fine-lined pocketbook (T)  
Orange-nacre mucket (T)  
Alabama moccasinshell (T)  
Coosa moccasinshell (E)  
Southern clubshell (E)  
Southern pigtoe (E)  
Ovate clubshell (E)  
Heavy pigtoe (E)  
Inflated heelsplitter (T)  
Triangular kidneyshell (E)

### Snails

Lacey elimia (T)  
Round rocksnail (T)  
Cylindrical lioplax (E)  
Painted rocksnail (T)  
Flat pebblesnail (E)  
Tulotoma (E)

**29 species**

### Reptiles

Alabama red-bellied turtle (E)

# ESA-listed species in the ACT

**Conasauga logperch**



**Alabama red-bellied turtle**



**Tulotoma snail**



**Fine-lined pocketbook**



## ESA-Listed Aquatic Species in the ACF Basin

**7 species**

### Fish

Gulf sturgeon(T)

### Mussels

Fat threeridge (E)

Chipola slabshell (T)

Purple bankclimber (T)

Shiny-rayed pocketbook (E)

Gulf moccasinshell (E)

Oval pigtoe (E)

# ESA-listed species in the ACF

**Gulf sturgeon**



**Fat three-ridge**



**Purple bankclimber**



**Shiny-rayed pocketbook**

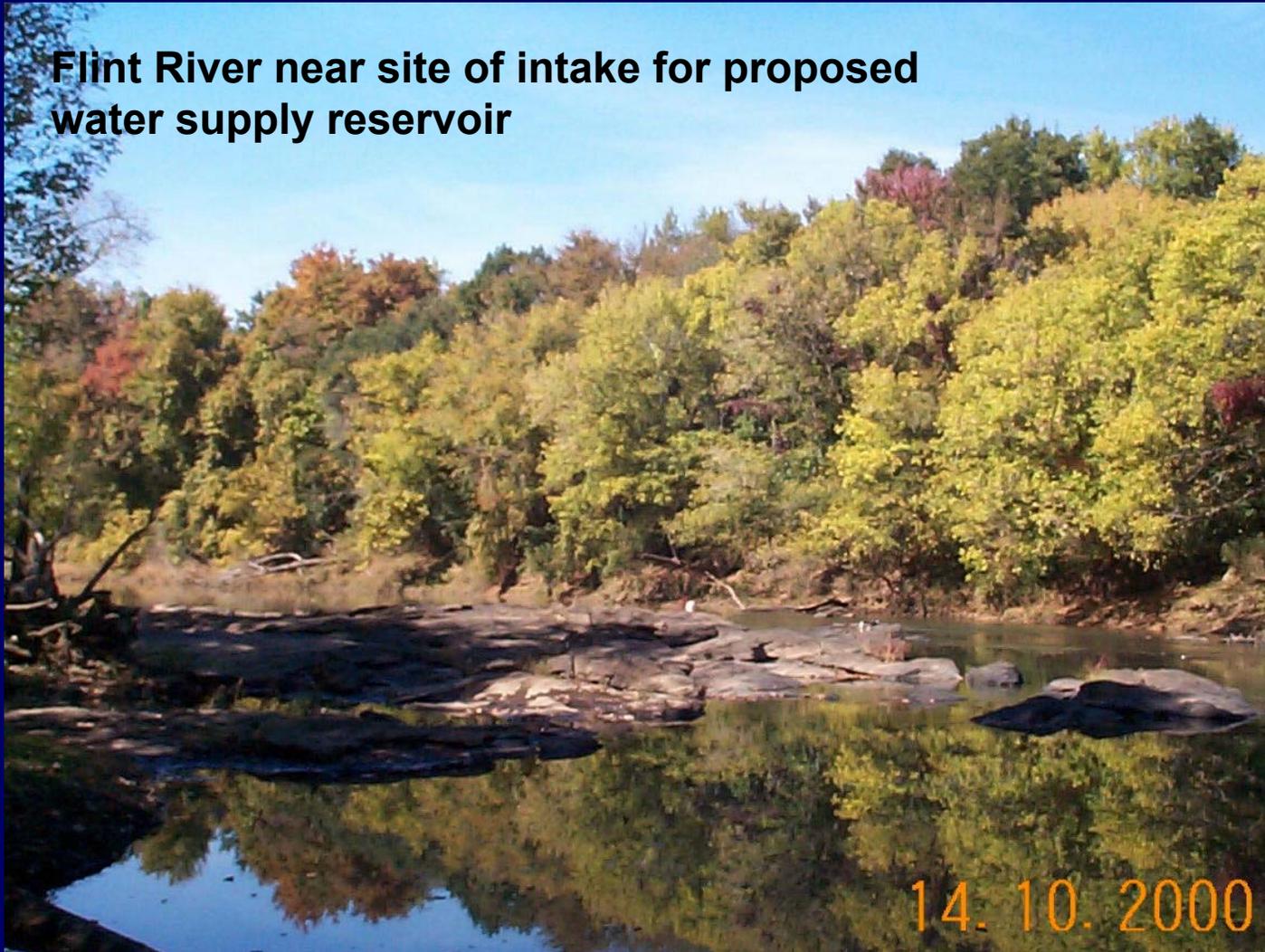


## ESA Section 7: the steps

1. Federal agency determines whether listed species or designated habitats occur in proposed action area and if so, whether the action may affect these
2. For an action that may affect, Federal agency prepares information necessary for formal consultation, including results of surveys, assessment of impacts, proposed conservation measures, etc.
3. The Service prepares a biological opinion that evaluates whether the proposed action is likely to jeopardize the continued existence of a species or destroy its critical habitat
4. For actions likely to jeopardize or destroy, the Service will propose reasonable and prudent alternatives. For other actions, the Service will require measures to avoid and minimize take.

# ESA Section 7: an ACF example

Flint River near site of intake for proposed  
water supply reservoir



## **ESA Section 7: example water supply project**

**Step 1. Federal agency determines whether listed species or designated habitats occur in proposed action area and if so, whether the action may affect these.**

- Project sponsor applied for permits, incl. CWA §404 permit with the Corps.
- Corps began informal consultation with the Service, and requested applicant to conduct surveys and prepare a biological assessment.

## ESA Section 7: example water supply project

**Step 2. For an action that may affect, Federal agency prepares information necessary for formal consultation, including results of surveys, assessment of impacts, proposed conservation measures, etc.**

**Applicant conducted survey and prepared assessment.**

**Corps determined that the project may adversely affect a listed species, and initiated formal consultation with the Service.**



## **ESA Section 7: example water supply project**

**Step 3. The Service prepares a biological opinion that determines whether the proposed action is likely to jeopardize the continued existence of a species or destroy its critical habitat**

- Early in formal consultation, the applicant, Corps, and Service explored options for building and operating the project consistent with the project purpose while minimizing adverse impacts. The Service recommended, and the applicant adopted, a revised non-depletable flow schedule for diversions from the Flint River.
- The biological opinion evaluated project impacts, including the revised flow schedule as part of the proposal, and concluded that the project would not jeopardize the continued existence of the oval pigtoe.

## **ESA Section 7: example water supply project**

**Step 4. For actions likely to jeopardize or destroy, the Service proposes reasonable and prudent alternatives. For other actions, the Service requires measures to avoid and minimize take. Reinitiate consultation if the action is modified or new information warrants.**

- Take in the form of impaired feeding, respiration, and breeding was anticipated resulting from the increased frequency and duration of low-flow events and was authorized.
- Mandatory terms and conditions for the authorized take included various hydrological and biological monitoring tasks.
- Discretionary conservation recommendations included water conservation and education, and erosion control measures for project construction.

## **ESA Section 7: application to a water allocation agreement under the ACT or ACF Compacts**

- Step 1: federal agencies outline how they would implement the agreement and determine whether their actions would affect any listed species or designated habitats.
- Step 2: federal agencies prepare the consultation package for proposed implementation actions that may affect listed species/habitats.
- Step 3: the Service would consult on “may affect” actions and prepare a biological opinion.
- Step 4: the Service would propose reasonable and prudent alternatives for jeopardy actions, terms and conditions for actions that take listed species but don’t result in jeopardy.

# **Adaptive management and federal implementation of a water allocation agreement under the ACT or ACF Compacts**

- ESA – reinitiation of consultation when the action is modified or when new information is available.
- CWA – periodic reviews of NPDES permits, water quality standards.
- Corps' authorities and regulations – as project operating policies and practices change over time, NEPA, CWA, FWCA, and other reviews are prepared.