

# **Making Wetlands Science Work for Wetlands:**

## **Understanding and Valuing Wetlands in the Watershed**



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- The Clean Water Act's watershed principle and framework provides the ethical, legal, scientific foundation for sustaining healthy watersheds and the communities they support.
- An important opportunity and challenge going forward is to harness and respect evolving science and technology to:
  - Better UNDERSTAND/assess ecosystem functions in a watershed context
  - Better VALUE the ecosystem services – and the loss of those services – in a watershed context
  - Better INFORM communities and citizens of these costs, benefits, and connections in the watershed.



# 1972 Clean Water Act: A Watershed Approach

**Goal:** to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

**Watershed approach:** Pollution and destruction upstream in wetlands, headwaters, intermittently flowing streams harms communities and wildlife downstream.

**Pollution must be controlled at its source:** in the headwaters, small streams and wetlands.

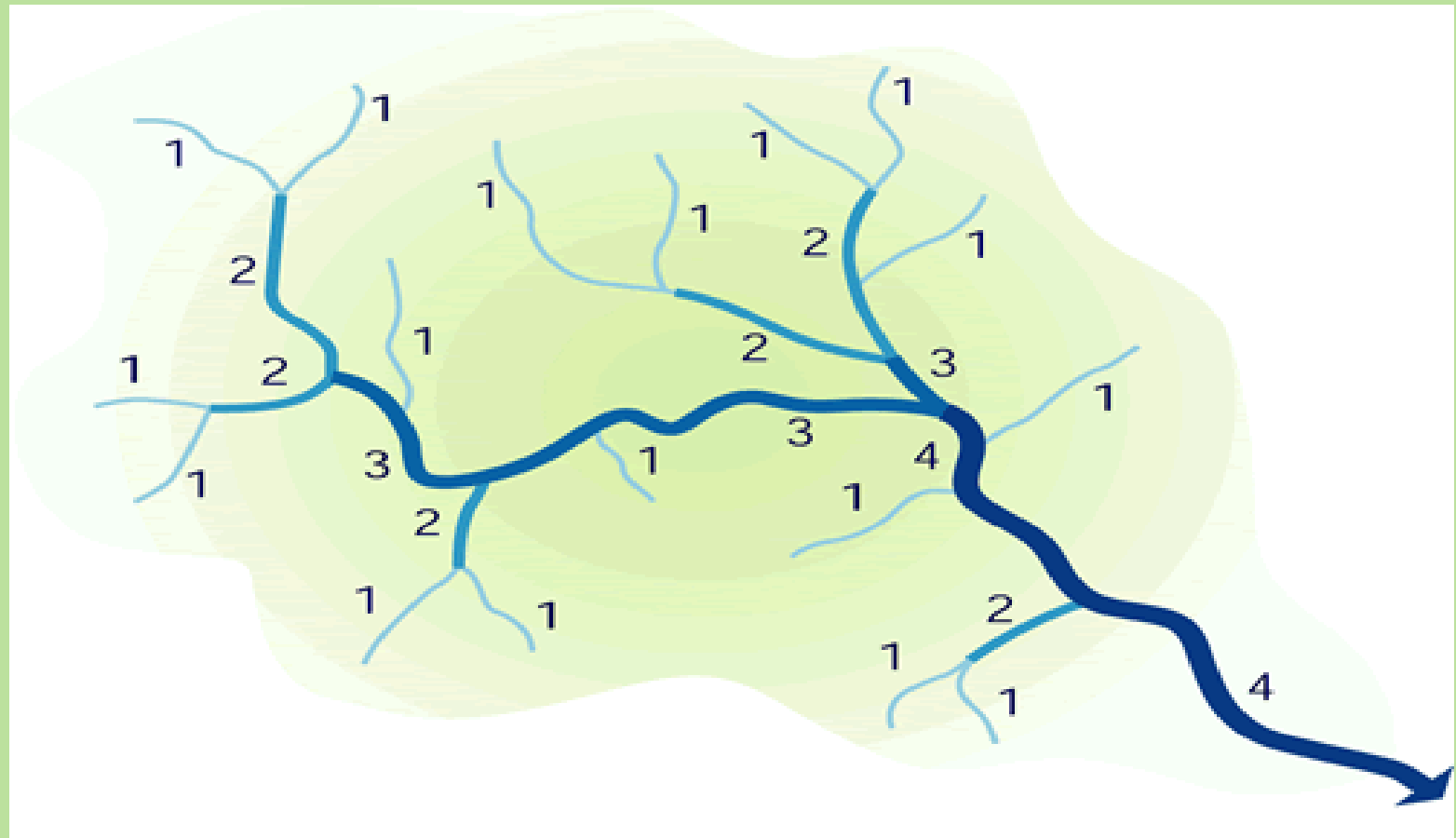


# 1972 Clean Water Act: A Watershed Approach

***"The once seemingly separable types of aquatic systems are, we now know, interrelated and interdependent. We cannot expect to preserve the remaining qualities of our water resources without providing appropriate protection for the entire resource."***

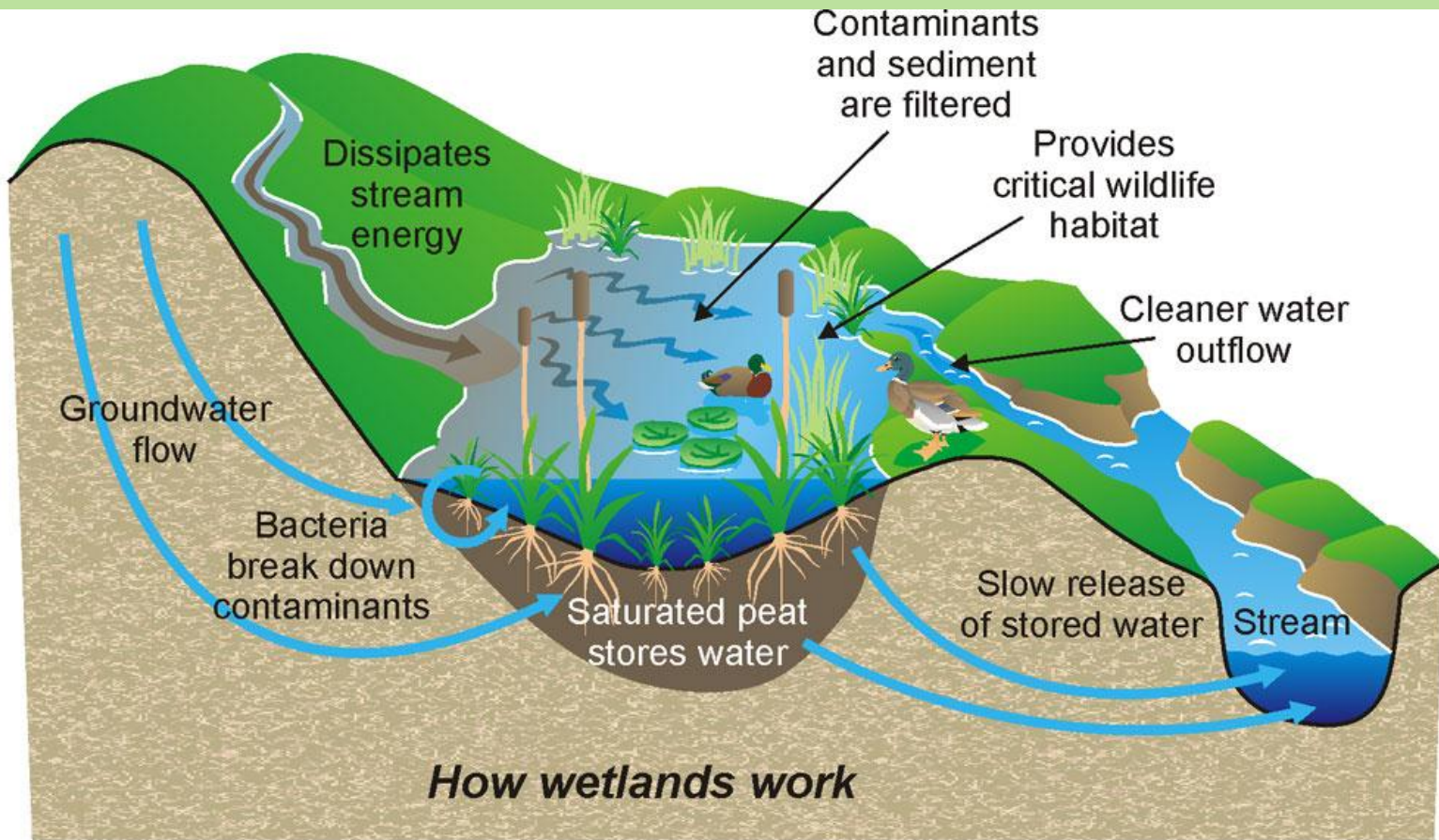
Senator Howard Baker (R-TN) 1977





## Order Classification within a Watershed





## Wetland Functions within a Watershed



# Wetlands and Small Streams –

- **Filter water supplies**
- **Absorb and store flood waters**
- **Recharge and release water during droughts**
- **Support a diversity fish and wildlife**
- **Support local hunting, fishing, bird-watching and boating recreation**







# 1993 Midwest Floods: *Largest flood disaster in U.S. history* *\$16 billion in damages*

## Wetland Loss:

Illinois – 89%

Iowa – 85%

Missouri - 87%

75% of the damage  
*(\$11.8 billion)*  
in IL, IA, & MO



# “Waters of the United States”

- Congressional history and the Act’s focus on comprehensive water protection shows that Congress intended to broadly protect waters
- The EPA and Corps have historically defined “WOUS” to cover virtually all important surface waters, including so-called “isolated” waters and intermittent and ephemeral streams
- Historically, courts have upheld broad protections

# "Significant Nexus" test

- [W]etlands possess the requisite nexus, and thus come within the statutory phrase "navigable waters," if the wetlands, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as "navigable." When, in contrast, wetlands' effects on water quality are speculative or insubstantial, they fall outside the zone fairly encompassed by the statutory term "navigable waters."

404(b)(1) Guidelines ***PROHIBIT*** permit issuance if:

There exists an environmentally preferable **practicable alternative**;

An **endangered species** would be jeopardized;

The discharge will ***cause or contribute to significant degradation***;

Impact **minimization and mitigation** are insufficient;

The Corps fails to make **specified factual determinations**; OR

The Corps lacks **sufficient information to make a reasonable judgment** of compliance with the Guidelines.



# Significant Degradation 40 CFR 230.10 (c):

**“...effects contributing to significant degradation considered individually or collectively, include” effects on:**

- **Municipal water supplies**
- **Fish**
- **Wildlife**
- **Special aquatic sites (wetlands)**
- **Loss of fish and wildlife habitat**
- **Loss of wetland capacity to assimilate nutrients, purify water ...**



# Mandatory Factual Findings: 230.11

“The determinations of effects ... *shall* include ....”  
**individual and cumulative adverse effects on:**

- **Hydrology:** water fluctuations, downstream flows, and downstream salinity (230.11 (b); 230.23-.25)
- **Endangered species** (230.30)
- **Fish** (230.11 (e); 230.31)
- **Other wildlife** (230.32)
- **Sanctuaries and refuges** (230.40)
- **Wetlands** (230.41) --
  - losses of **fish and wildlife habitat**
  - loss of **water pollution filtration**
  - loss of aquifer recharge of **water supplies**
  - loss of **flood storage** capacity

# The Mitigation Rule Watershed Approach

**332.3(c)(1)/230.93(c)(1):** “The district engineer **must** use a watershed approach to establish compensatory mitigation requirements in DA permits **to the extent appropriate and practicable.**”

**“The ultimate goal of a watershed approach is to maintain and improve the quality and quantity of aquatic resources within watersheds through strategic selection of compensatory mitigation sites.”**



# The Mitigation Rule Watershed Approach

73 FR 19598: Objective of the watershed approach accomplished by strategic site selection AND **“ensuring that both authorized impacts and mitigation are considered on a watershed scale ...”**).

**73 FR 19610:** “In general, watershed plans will be developed by governmental and/or non-profit resource planners, in consultation with watershed stakeholders. **The purpose of a watershed plan is to maintain and improve the quality and quantity of aquatic resources within a watershed, not to facilitate development.”**





# The Mitigation Rule Watershed Approach

**332.3(c)(3)/230.93(c)(3): Absent an available and appropriate watershed plan,** “the district engineer will use a watershed approach based on analysis of information regarding watershed conditions and needs, including ....”:

- current trends in habitat loss and conversion;
- cumulative impacts of past development activities;
- current development trends;
- presence and needs of sensitive species;
- site conditions that help/hinder mitigation success;
- flooding, poor water quality, other chronic environmental problems.



# Scientifically Credible Functional Assessments

**332.3(f)/230.93(f):** “[T]he amount of required mitigation must be, **to the extent practicable**, sufficient to replace lost aquatic resource functions.” In cases where **appropriate** functional or condition assessment methods or other suitable metrics are available, these methods should be used **where practicable** to determine how much compensatory mitigation is required.”

“We are moving towards greater reliance on functional and condition assessments .... We believe that more frequent use of such assessment methods will help improve the quality of aquatic resources in the United States.” 73 FR 19601, 19633.



# Mandatory Ecological Performance Standards

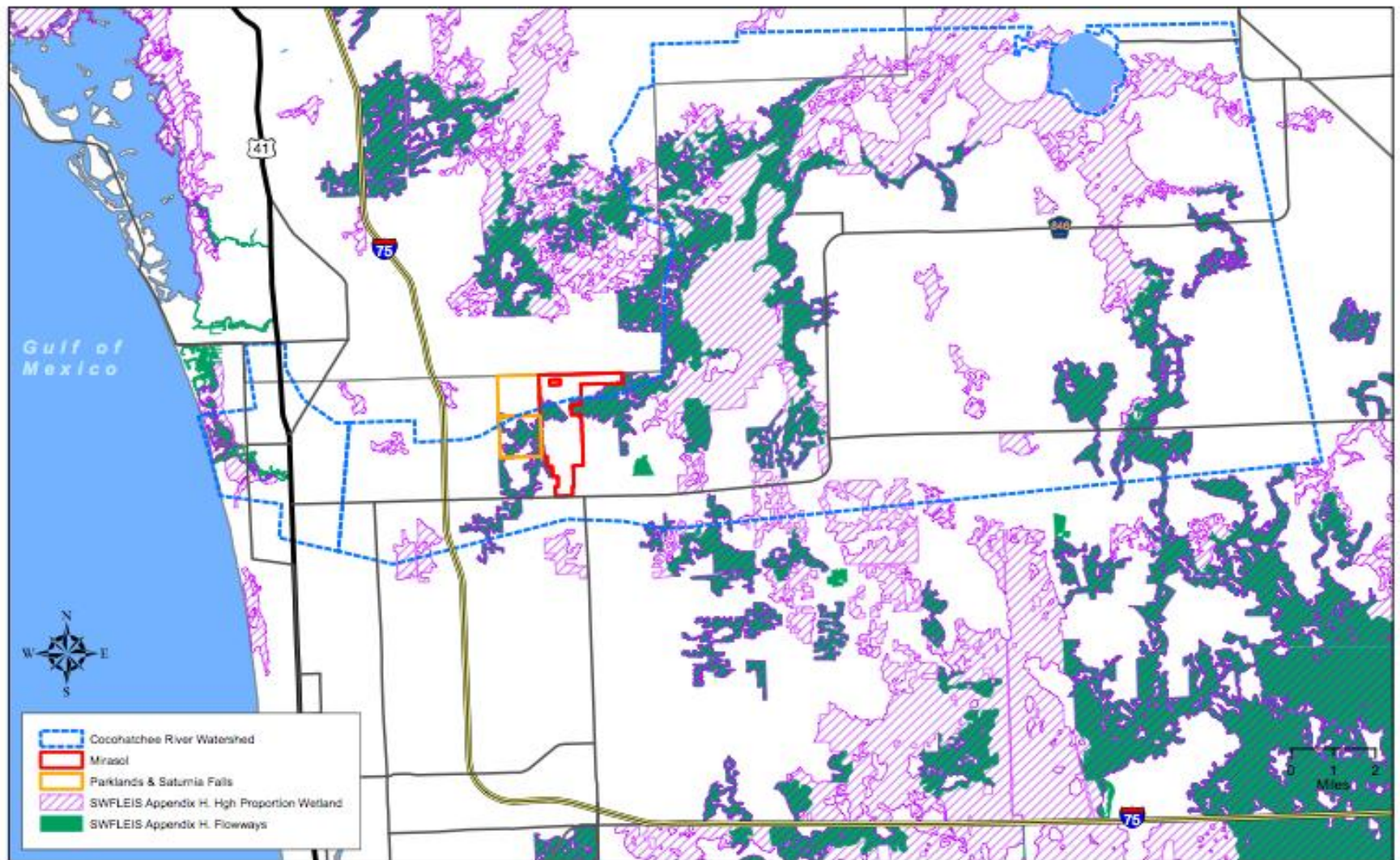
**332.4(c)(1),(9)/230.94(c)(1),(9):** The final mitigation plan “must include” “ecologically-based” performance standards.

**332.5/230.95:** “Ecological performance standards must be based on the best available science that can be measured or assessed in a practicable manner.”



# The Cocohatchee Flowway (AR 533)





Data provided by EPA, FGDL, USACE, & Collier County Government.  
Map prepared by Brad Nunley, National Wildlife Federation.

# Mirasol

## Water Resources: Flowways & High Proportion Wetlands

# Wetland, Headwater Functions Even More "Significant" Given Climate Change

- More floods/droughts; changes in flow rates
- More sedimentation, erosion, increase in nutrients, pathogens, toxins
- Increased eutrophication
- Warmer waters
- Sea-level rise, coastal flooding.



# Headwaters and Wetlands as Climate Change Adaptation Tools

Headwater streams and wetlands provide:

- Flood storage
- Groundwater and flow recharge
- Cool water
- Aquatic habitat
- Pollutant filtration



# Making Wetlands Science Work for Wetlands:

- Better UNDERSTAND/assess ecosystem functions in a watershed context
- Better VALUE the ecosystem services – and the loss of those services – in a watershed context
- Better INFORM communities and citizens of these costs, benefits, and connections in the watershed
  - Technical papers, peer-reviewed articles documenting wetland hydrological, biochemical connections, functions and ecosystem services in the watershed context
  - Scientist comments, letters re wetland connections, functions, and services -- advancing broad CWA jurisdiction and strong CWA permitting standards and decisions.

