

Functions & Values of Wetlands



What functions do wetlands provide?



Filtration for clean water
Retention for flood control
Groundwater recharge



Habitat for unique species of wildlife & plants

Filtration for Clean Water

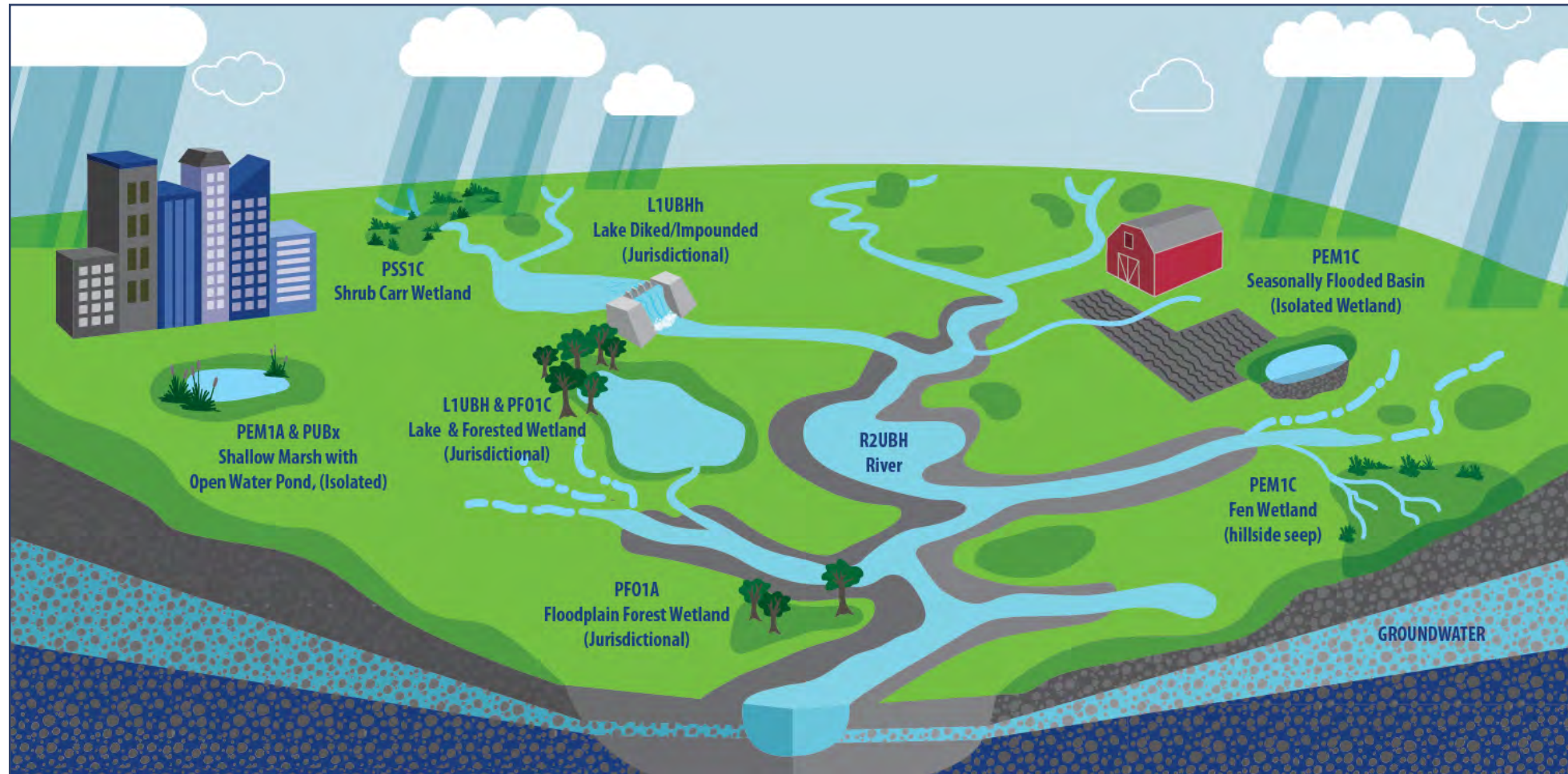
Water filtration functions:

- Trap sediment and sediment-carrying contaminants
- Store and process excess nutrients (e.g. nitrogen, phosphorous)
- Filter out harmful chemicals from the water (e.g. pesticides, industrial chemicals)



Sediment plume from tributary, image courtesy of IDEM

Filtration for Clean Water



Biogeochemical processes allow wetlands to store large quantities of carbon, filter nutrients and provide many other ecosystem services.

Water Retention for Flood Control

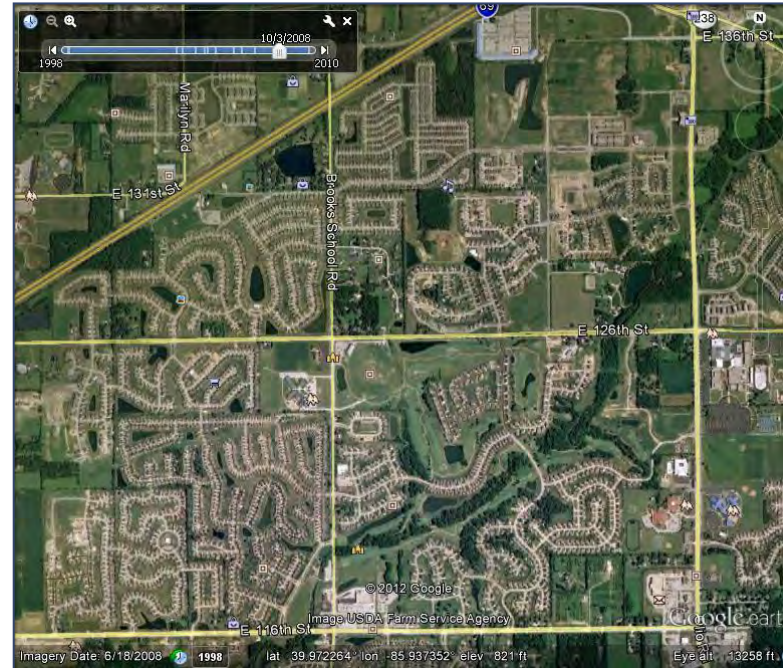
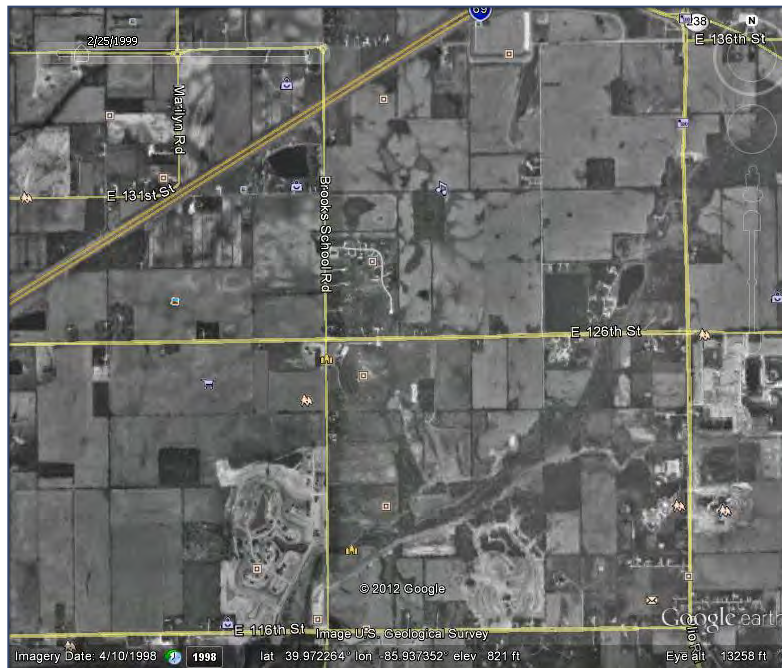
Benefits:

- Wetlands act as natural sponges that store & slowly release water, reducing peak flows downstream, recharging groundwater and reducing erosion.
- The cost of mitigating flood risks & damages is **HUGE!**
- An acre of wetland can store 1 – 1.5 million gallons of floodwater.



Water Retention for Flood Control

1.6 million acres are lost annually to development in U.S.



Water Retention for Flood Control

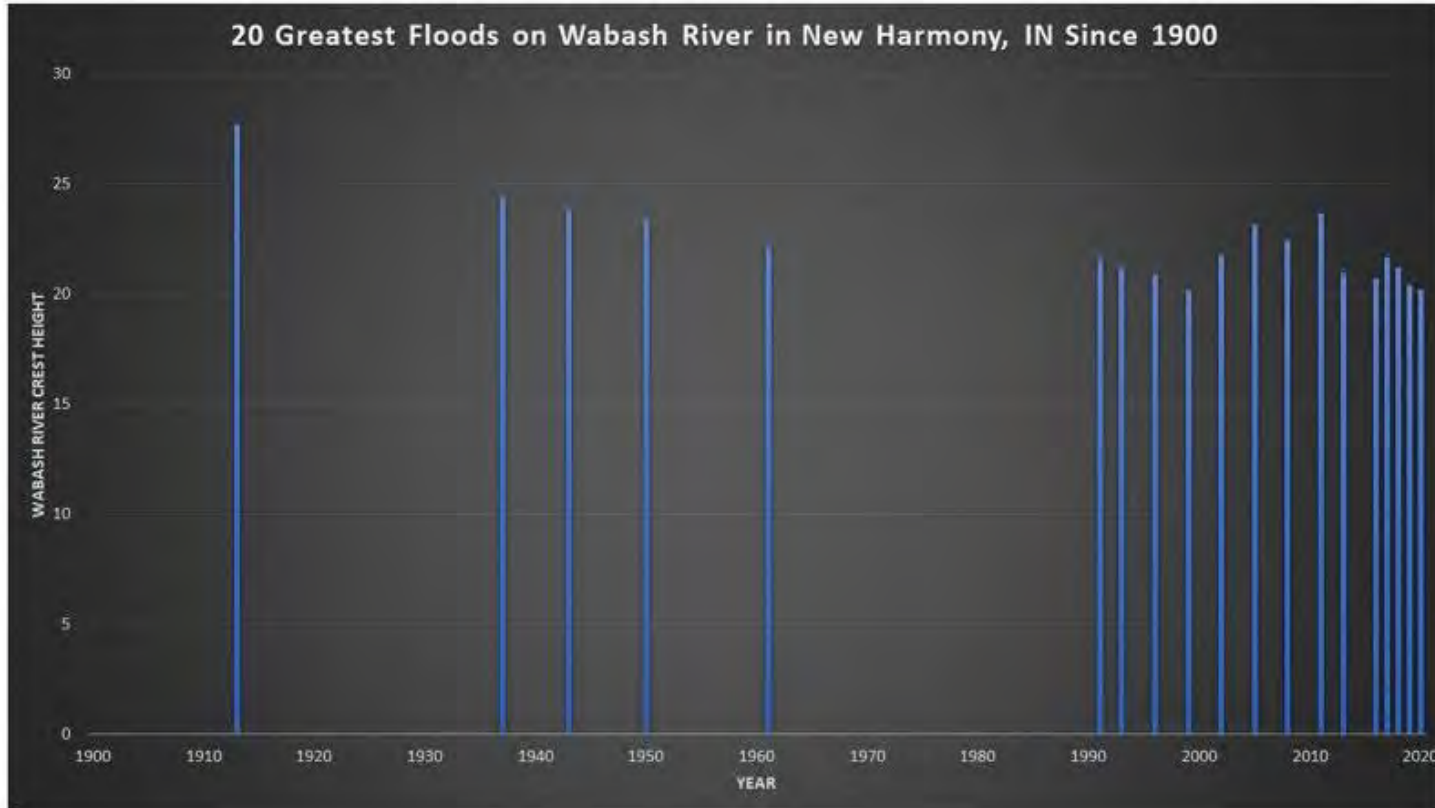


Image courtesy of National Weather Service



Wildlife Habitat

Up to one-half of all threatened or endangered species in the U.S. rely on or utilize wetlands at some point in their life cycle.



*American Bittern, Joseph Mahoney,
Audubon Photography Awards*



Green Salamander, courtesy of IDNR



Whooping Cranes, courtesy of IDNR



Eastern massasauga rattlesnake, courtesy of IDEM



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Blanding's turtle, courtesy of IDEM



King Rail, courtesy of IDEM

Wildlife Habitat

Up to one-half of all North American bird species rely on wetlands for nesting or feeding



Wildlife Habitat

Species' wetland needs can change seasonally



Wildlife Habitat

Although wetlands comprise only about 5% of the land surface in the conterminous U.S., they are home to 31% of our plant species. (EPA)



Thousands of plant species occur in Indiana wetlands; some are present in both upland & wetland habitats, but many are found only in wetlands.

Examples of Indiana wetland types & their wildlife



Spatterdock damner, IDEM

Emergent Marsh, Northeastern Indiana



Marsh Wren



American Bittern



Blue-Winged Teal

Images courtesy of USFWS

Examples of Indiana wetland types & their wildlife



Images courtesy of USFWS

Examples of Indiana wetland types & their wildlife



Forested Wetland, Southeastern Indiana



Prothonotary Warbler



Indiana Bat



Hooded Merganser

Images courtesy of USFWS

Examples of Indiana wetland types & their wildlife

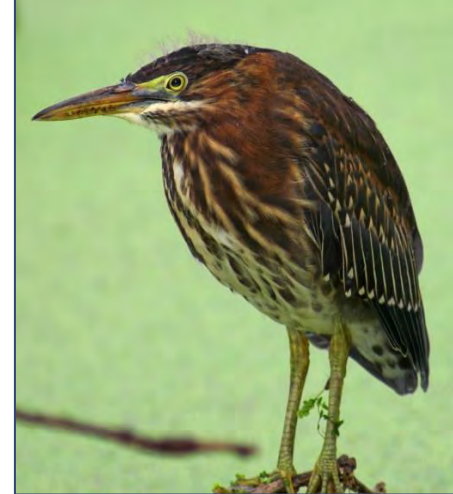
Scrub-Shrub Wetland, Northeastern Indiana



Wood Duck



Green Heron



Copperbelly Water Snake



Images courtesy of USFWS

Shoreline Protection

Bank stabilization is often required at lake shorelines subject to wave crashing.

Natural shorelines provide a protective buffer from wave-related erosion.



Shoreline, image courtesy of IDEM

Shoreline Protection

Bank stabilization efforts can be very costly, especially when importing fill material to replace an eroded shoreline.

Natural shorelines provide stabilization, reduce maintenance costs, provide habitat, and help with water filtration.



Shoreline, image courtesy of IDEM

Monetary Value of Wetlands



Monetary Value of Wetlands

“Wetlands provide real financial benefits too, according to the Indiana Department of Natural Resources. Just 1 acre of wetlands, which is less than the size of a football field, provides more than \$3,500 in benefits to Hoosiers each year. Those services include water purification and storage and erosion prevention.”

Indy Star, Op-Ed: Wetlands are hugely important to have. Indiana needs to restore and preserve them. Larry Clemens & Bob Barr

Monetary Value of Wetlands

(Druckenmiller and Taylor, Wetlands, Flooding and the Clean Water Act, October 2021)

Estimate the flood mitigation value of wetlands (\$), so these benefits can be compared to the (\$) costs of conservation. Study found that the removal of one hectare (ha) of wetlands (size of 2.5 football fields, or 2.5 acres):

- Increases flooding insurance claims by **\$1,840/ha** annually
 - Increases to **>\$8,000/ha** in developed (>10% built-up) areas
 - Increases to **>\$12,000/ha** if the wetland is converted to developed land

Monetary Value of Wetlands

(Druckenmiller and Taylor, Wetlands, Flooding and the Clean Water Act, October 2021)

The background of the slide is a dense, overlapping pattern of US dollar bills, including \$1, \$2, and \$5 denominations, scattered across the entire area. The bills are slightly faded and semi-transparent, creating a textured, financial backdrop.

The 47 million hectares of U.S. wetlands are worth \$1.2 - \$2.9 trillion in flood mitigation value.

Recreation in Wetlands



Recreation in Wetlands

- Recreational activities such as hiking, fishing, boating, photography & bird-watching constitute multi-billion-dollar industries.
- Indiana has many federal and state properties that preserve natural areas, including wetlands, where opportunities for both recreation & habitat are abundant.



Wetland fishing, image courtesy of IDEM



Canoeing in wetlands, image courtesy of USFWS

Recreation in Wetlands

Birdwatching is one of the largest recreational activities taking place around wetlands.

The USDA Forest Service estimates 81 million people participate in bird watching, producing an estimated \$41 billion dollars in revenue each year.



Wood Ducks, image courtesy of IDEM

Wood Ducks often enjoy the wetlands at Shiawassee National Wildlife Refuge. Photo: Peter Brannon/Audubon Photography Awards



Sandhill cranes, image courtesy of Donna Stanley/USFWS

Recreation in Wetlands

Waterfowl hunting is another industry that relies on healthy wetlands for waterfowl populations & their food sources.



Image courtesy of Mossy Oak

Waterfowl & other hunters contribute millions of dollars annually to habitat conservation through the purchases of licenses, habitat stamps and excise taxes.

Thank you!