

Shoreline Stabilization Practices



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Causes of Erosion

- Human
 - Clearing of riparian areas
 - Fishing access areas



Causes of Erosion

- Wind and wave action



What are the Effects of Erosion

- Property loss and damage
- Added nutrients and sediment to the lake
- Loss of water depth along shoreline



What Does Erosion Look Like?



There are Many Different Ways to Manage Erosion

- Slope the shoreline and create a buffer
- Bioengineering
- Armoring
- Or combination of all the above



Creating a Riparian Buffer

- Slope the bank to a 3:1 ratio
- Establish a reasonable buffer width
- Let nature runs its course (with reasonable management)
- Plant native grass, shrubs, and trees



Buffer Comparison

Advantages

- Addresses the issue
- Easy to create
- Easy to maintain
- *Fairly inexpensive (Except for Live Stake Plantings)*

Disadvantages

- Block scenic view
- May limit access to lake
- ✓ Little or no fish habitat value



Bioengineering

- Bio-logs, fascine Bundles and Vegetated Gabions
- Expensive
- ✓ Little or no fish habitat value



Armoring the Shoreline

- Miscellaneous objects (Formed concrete, blocks, tires)
- Bulkheads
- Stone Gabions
- Riprap
- Wave Breaks
- Deflectors



Bulkheads

Advantages

- Stops Erosion
- Longevity

Disadvantages

- Expensive
- Labor intensive
- ✓ Little fish habitat value



Stone Gabions

Advantages

- Temporarily stops Erosion



Disadvantages

- Cages break down with time
- Fairly expensive
- ✓ Provides little fish habitat value



Riprap

Advantages

- Slows or stop Erosion
- ✓ Moderate fish habitat value when placed irregular



Disadvantages

- Somewhat expensive
- Boat Mooring



Wave Breaks

Advantages

- Helps disperse energy from waves
- ✓ Good fish habitat value

Disadvantages

- Fairly expensive
- Construction????



Stone Deflectors

Rock Structure design to manage wave action and relieve the pressure off the bank

Advantages

- Slows or stops erosion
- Lots of options (different styles)
- ✓ Great fish habitat value

Disadvantages

- Somewhat expensive



Stone Frame Deflector



Stone Deflector with Root Wad



Stone Deflector with single log



Saw-tooth deflectors



Pymatuning Reservoir

The Problem



Construction



Construction



Completed Project



Rubble Humps



Pymatuning Reservoir

Pymatuning State Park

Before



After



Memorial Lake

Memorial State Park

Before



After



Raystown Reservoir

U.S. Army Corp of Engineers

Before



After



Raystown Reservoir

U.S. Army Corp of Engineers

Before



After

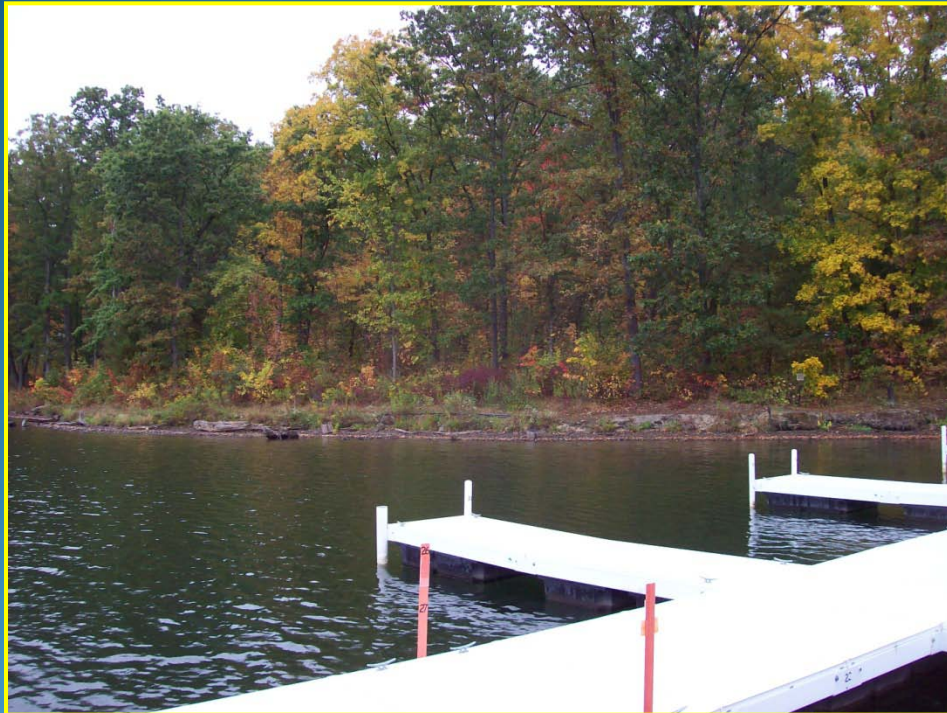


Cowansque Lake

U.S. Army Corp of Engineers

Before

After



Greenlick Reservoir

PFBC



Greenlick Reservoir

PFBC

Before

After

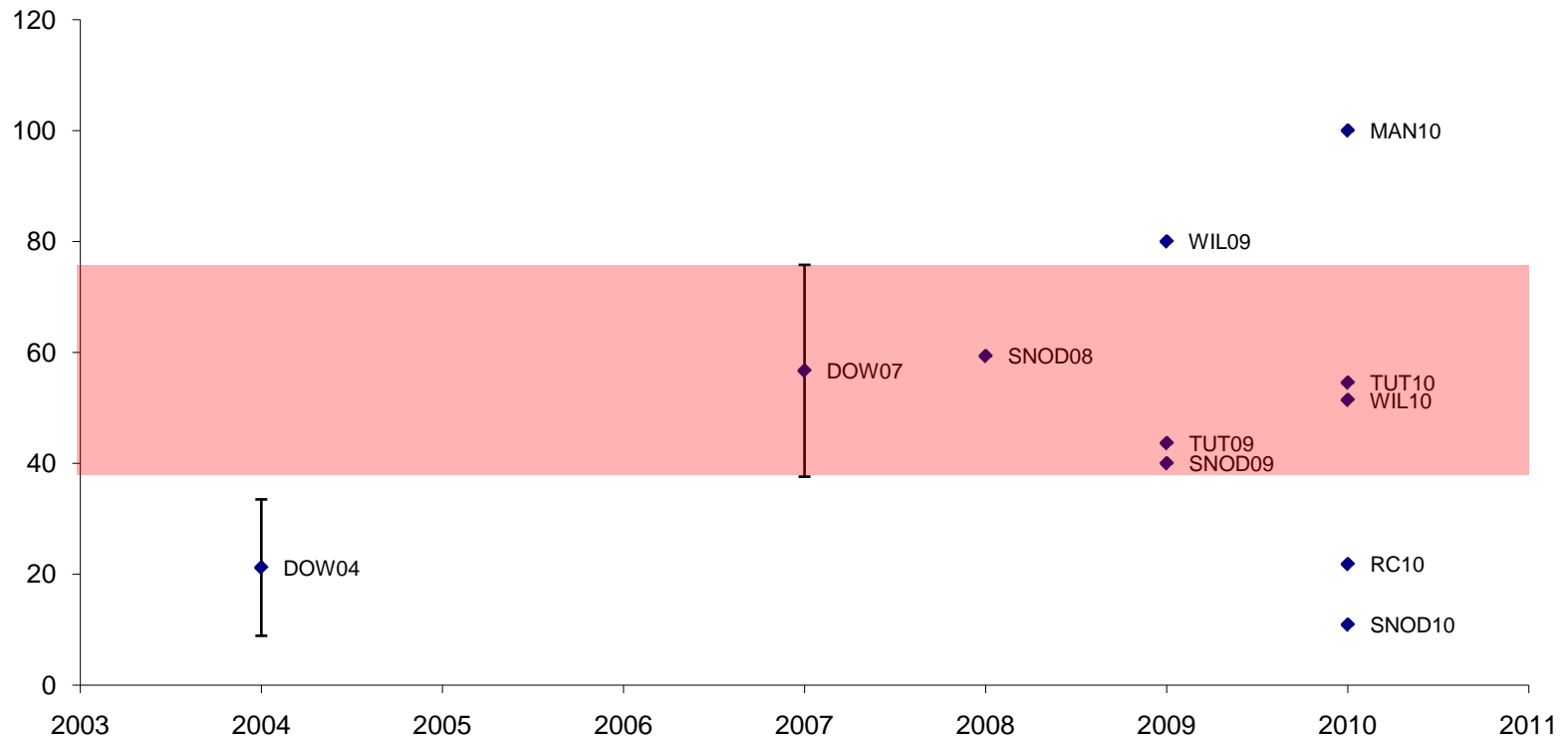


Sampling



Sampling Results

Black Bass Comparison at Pymatuning Res.

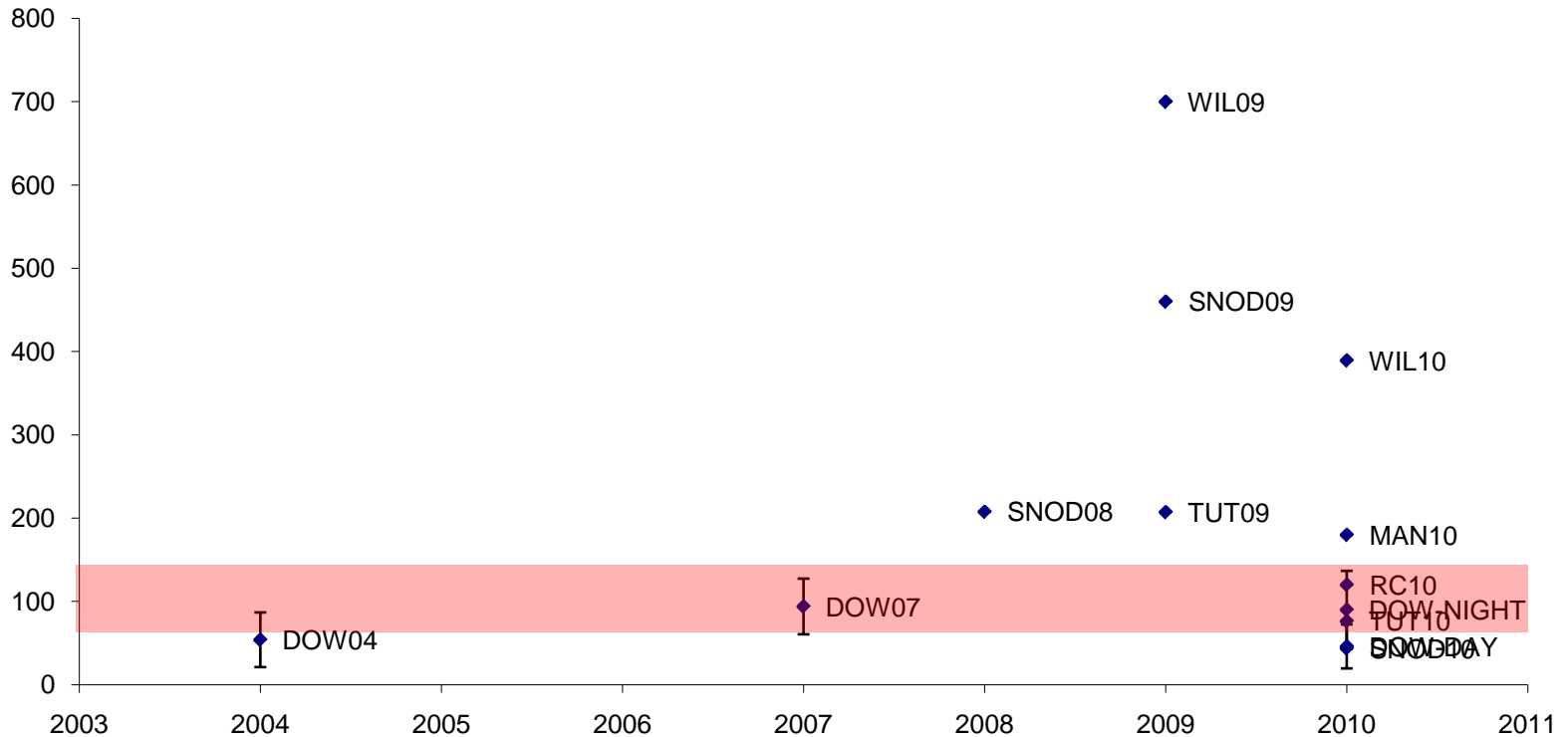


Notice: Wil09 and Man09 two treated shorelines have higher catch rates vs. non-treated shorelines



Sampling Results

Sunfish Comparison at Pymatuning Res.



Notice: Wil09, Tut09, Wil10 and Man10 all treated shorelines have higher catch rates vs. non-treated shorelines



Any Questions



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