WF4313/6613-Fisheries Management

Class 21–FMP & Invasives

In the news

Sex that moves mountains: Spawning fish can influence river profiles

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By Eric Sorensen, WSU News

PULLMAN, Wash. – It turns out that sex *can* move mountains.

A Washington State University researcher has found that the mating habits of salmon can alter the profile of stream beds, affecting the evolution of an entire watershed. His study is one of the first to quantitatively show that salmon can influence the shape of the land.

Alex Fremier, lead author of the study and associate professor in the WSU School of the Environment, said female salmon "fluff" soil and gravel on a river bottom as they prepare their nests, or redds. The stream gravel is then more easily removed

Ecological Recovery of a River Fish Assemblage following the Implementation of the Clean Water Act

Daniel K. Gibson-Reinemer, Richard E. Sparks, Jerrod L. Parker, Jason A. DeBoer, Mark W. Fritts, Michael A. McClelland, John H. Chick, Andrew F. Casper

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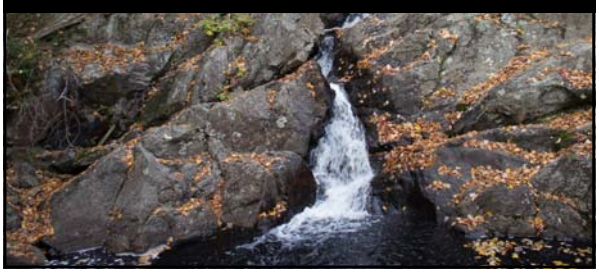
Abstract

The twentieth century spanned an era that included nadirs in environmental quality and subsequent efforts to improve ecological conditions. The Illinois Waterway, a large river system in Illinois, experienced prolonged degradation followed by a dramatic recovery. In the 1950s, a standardized sampling program was initiated that has continued for six decades. The resulting record documents profound ecological changes, demonstrating the

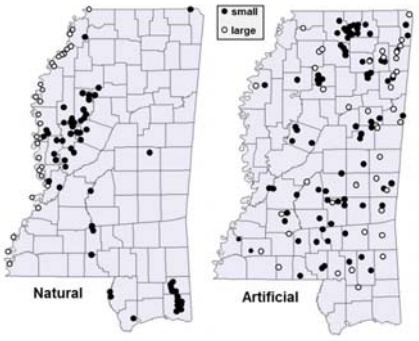
Announcements

Exam November 1…



MDWFP LAKE MANAGEMENT PLANS

MDWFP State lakes



Only lakes ≥ 4 ha (2.5 acres) accessible to the public and monitored by MDWFP are shown.

Development of fishery management plans (FMP)

- Primary water bodies had to have a management plan and be sampled 1 out of 3 years
- Secondary was 1 out of 5 or so, forced biologist to get out to other systems

Elements of a FMP

- Introduction
- Goals and objectives
- Actions
- Monitoring results
  - Fish: electrofishing, trap netting
  - Fishery: creel
  - Habitat and facilities
- Discussion of monitoring

S.M.A.R.T. Goals & Objectives

- **Specific**: Goals should be simplistically written and clearly define what you are going to do.
- **Measurable**: Goals should be measurable so that you have tangible evidence that you have accomplished the goal. Usually, the entire goal statement is a measure for the project, but there are usually several short-term or smaller measurements built into the goal.
- **Achievable**: Goals should be achievable; they should stretch you slightly so you feel challenged, but defined well enough so that you can achieve them. You must possess the appropriate knowledge, skills, and abilities needed to achieve the goal.
- **Results focused**: Goals measure outcomes, not activities.
- **Time bound**: Goals should be linked to a timeframe that creates a practical sense of urgency, or results in tension between the current reality and the vision of the goal. Without such tension, the goal is unlikely to produce a relevant outcome.

Fishery Management Plan
Lake Washington
January 2015

Lake Washington is a 1,000 acre oxbow lake located in Washington County about 20 miles south of Greenville, MS and near the towns of Glen Allen and Chatham. It is one of Mississippi's largest natural lakes with scenic cypress forests in both south and most of the western shore. Water levels seasonally fluctuate around 2-3 feet with average and maximum depths of 8 feet and 20 feet, respectively. The main line levee prevents a direct hydrological connection with the Mississippi River. A low level dam on Washington Bayou, the outlet of Lake Washington, elevates lake level four feet and permits boat navigation through much of the cypress forest. The dam has two culverts used mainly to drain excess water after heavy rains. The eastern shore and a section of the western shore are mostly residential development and fishing camps. There are two public boat ramps, one in Glen Allen which is maintained by Washington County and another in Paul Love Park on the Washington Bayou dam. There are six privately-operated, public fee camps along with a marina, two fishing piers, bait shops, rental cabins, and trailer hook-ups.

The watershed of Lake Washington is approximately 27,840 acres. The watershed is generally flat and composed of around 45% cropland, 22% pasture land, 32% bottomland hardwood forest swamp, and ~ 1% residential acres. Agriculture activities on the watershed greatly influence Lake Washington water quality, and problems with poor water quality have plagued the lake for over 30 years. The lake was closed to commercial fishing between 1973 and 1977 due to the pesticide contamination. There have also been problems with high nutrient levels and organic enrichment leading to extensive algal blooms, low DO levels, and partial fish kills (Lucas 1988). Lake Washington and two of its tributaries were listed on the 303(d) list in 1996 as impaired water bodies due to sediment siltation, and TMDLs have been developed by MDEQ and approved by the USEPA to reduce sedimentation and to increase DO levels (Tetra Tech 2003).

Historically, Lake Washington has had a valuable multifaceted fishery that receives substantial fishing pressure and has positively influenced the local economy by attracting out-of-state anglers. Fish surveys show that sportfish populations were high in the 1960s with over 100 pounds of game fish per shoreline acre in 1992 (Lucas and Vyles 1998). Catfish are abundant in Lake Washington and have been since at least the 1950s when a fish community survey found a high percentage of the fish population to be catfish (Smith 1950). Recent surveys reveal that catfish are still abundant, and angler catch rates of catfish have increased dramatically since the early 1990s. In addition to traditional pole fisheries, jug and limblines are used extensively for crappie and catfish during certain times of the year. Trotlines and hand grabbling are also used for catfish. Sport fishing effort is usually the highest when high water as the Mississippi River makes it difficult to fish oxbow lakes directly connected to the river.

In the 1990s, fisheries management efforts focused on biomanipulation (Jones 1988) as a means to address the eutrophic status of Lake Washington (Lucas 1988). This top-down approach to water quality management contends that water quality in highly eutrophic lakes can be improved

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Terminology

- Goals and objectives are used interchangeably
  - I use the word objective
- Outcome-the result of an action, outcomes should be related to the objective

Forming Objectives…

- What are some objectives for LMB angler satisfaction?
- What are some actions to achieve those objectives?
- What are the expected outcomes of those actions?
- How can you monitor the outcomes of the actions?

INVASIVE & INTRODUCED SPECIES MANAGEMENT

Early fish introductions

- 1800-1950
- Revitalize commercial fishing post civil war by importing European sportfishes
  - Common carp
  - Brown trout
- US Fish Commission formed to explore introductions

Second wave fish introductions

- 1950-1975
- advent of intercontinental jet cargo aircraft in the early
- live fish could be rapidly transported from one continent to another
- Ornamental fish
- Ramsey (1985) estimated over 100 million fish were imported by air annually during the early 1980s

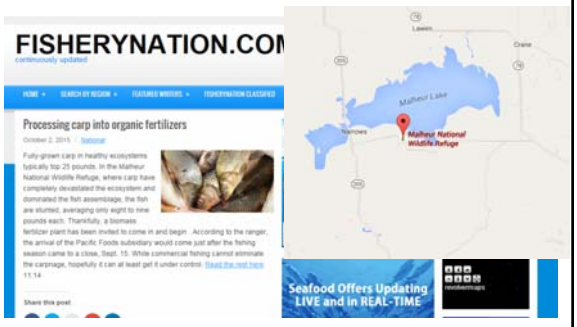
Third wave aquatic spp. introductions

- 1975 to present day
- 3 species of Asian carps were imported into North America
  - biological control of nuisance phytoplankton in sewage treatment ponds
  - enhancement of water quality in aquaculture ponds
  - potential as food fishes

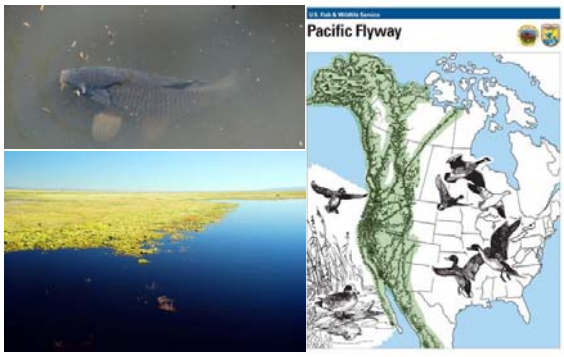
Third wave aquatic spp. introductions

- Zebra and quagga mussels
- Controlling invasive mussels cost electric power generating facilities on the Great Lakes alone an estimated US$10–30 million annually between 1989 and 2004!


Applied Management



Why is carp management important?



Management Objectives

- Refuge: Duck Use Days
- Carp have a negative effect on water quality and macrophytes
- Ducks do not use poor areas if they don't have to
- Don't meet management objectives…

Carp Suppression at Malheur NWR

Malheur National Wildlife Refuge was established on August 18, 1908 by President Theodore Roosevelt as the Lake Malheur Bird Reservation. Roosevelt set aside unclaimed lands encompassed by Malheur, Mud and Harney Lakes "as a preserve and breeding ground for native birds." The newly established "Lake Malheur Bird Reservation" was the 19th of 51 wildlife refuges created by Roosevelt during his tenure as president. At the time, Malheur was the third refuge in Oregon and one of only six refuges west of the Mississippi.

Background and Context