

WF4313/6613-Fisheries Management

Class 17– Case study & habitat

In the news



Trout Run: Trail race meets fishing tournament at the Driftless Area Flyathlon

October 8, 2017 by Tom Hueston

40 Comments



Runners must carry a fishing rod and fish along the route. They're allowed to enter one fish, which they must measure with the ruler on their race bib, photograph, and then release. Each inch of trout reduces total run time, and native trout—in this case, brook trout—score double. This scoring scheme allows for lots of flexibility when it comes to race preparation.

Also, a trail race and fishing event, is taking place from 10am to 12pm on Saturday, October 8, at the Driftless Area Flyathlon.

With events in the fall, like so many staple events. The trick to capitalizing on these sunny days is to choose activities that mix together. Like the 2017 Driftless Area Flyathlon, which combines trail running with fly fishing along the route and craft beer at the finish line.

"Run, fish, beer. It's a fun concept for a race," says Ryan Kuhn, local fly fishing guide, running coach, and beer at the finish line.



Events Calendar

8-11	Mid City Farmers Market
9-11	October 14 @ 9:00 am - 1:00 pm Mid City Farmers Market
10-11	Beer - Drive of Wicked West Brewing Co.
10-11	October 14 @ 9:00 am - 8:00 pm Wicked West Brewing Co.
8-11	Mid City Farmers Market
9-11	October 14 @ 9:00 am - 1:00 pm Mid City Farmers Market

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In This Issue

Issue #8 | October 2017 | Padden & Gannon

Announcements



Paddlefish Lab

- Group 1
- Meet at Front of Thompson @ 1pm
- Bug spray, water, sunscreen, raingear
- Potential to get wet



Class Topics

Management case study

Habitat



Stripers

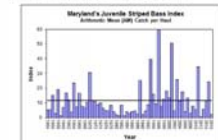


Poor Striper Spawn Reported in Chesapeake

17 APR 2007 10:55 A.M. - CHESAPEAKE STRIPER & BASS

The Maryland Department of Natural Resources announced yesterday that the annual juvenile striped bass survey indicates that the first stripers spent in the Chesapeake was well below average. However, if the first year-class of stripers does show up, it's very much a year-class in doubt.

Striper bass spawning success is strongly affected by environmental conditions such as rainfall and water quality from year to year, with occasional large year-classes interspersed with average or below-average year-classes.



<http://www.onthewater.com/poor-striper-spawn-reported-chesapeake/>

Striped bass life cycle
(Hint: Click on stages to learn about them)

Egg

Striped bass eggs hatch about 29-80 hours after they are fertilized, depending on water temperature. Older and larger striped bass tend to produce more eggs than younger and smaller striped bass. In addition, striped bass females which weigh 10 pounds or more produce eggs that are larger, have greater amounts of yolk, and have a greater chance of hatching than eggs produced by smaller females.

Photo courtesy of Ginger Johns, UMCEES

Striped bass egg as seen under a microscope.

Photo courtesy of Dennis Gagliardi

A striped bass egg is the size of one grain of rice.

http://teachmean.com/teaching_resources/education_modules/fish_and_physics/learn_about/

Striped bass life cycle
(Hint: Click on stages to learn about them)

Yolk-sac Larvae

When they hatch, striped bass larvae are 2.0-3.7 mm long and have a large yolk-sac that provides them with nourishment. They don't have a mouth, bones, scales, or pigment in their eyes. As they absorb their yolk-sac, they develop eye pigment, a mouth and a gut, and immediately must begin feeding. If they don't eat, they won't have energy to grow.

Photo courtesy of Ginger Johns, UMCEES

Yolk-sac larvae as seen under a microscope.

Photo courtesy of Tedders Vainio

After hatching, each larvae is about the size of a pea.

http://teachmean.com/teaching_resources/education_modules/fish_and_physics/learn_about/

Striped bass life cycle
(Hint: Click on stages to learn about them)

Feeding Larvae

Striped bass larvae begin feeding on zooplankton (tiny floating animals) about five days after hatching at a size of 5 mm. If they find enough food to eat, they start to grow soft fins and bones, longer guts, stronger muscles and better eyes. If water temperatures are warm and they have plenty of food, they grow faster than if water temperatures are cooler. If temperatures are too hot (> 23°C or 73.4°F) or too cold (< 11°C or 51.8°F), they will die.

Photo courtesy of Ginger Johns, UMCEES

Feeding larvae as seen under a microscope.

Photo courtesy of Tedders Vainio

Larvae are about the length of a kidney bean.

http://teachmean.com/teaching_resources/education_modules/fish_and_physics/learn_about/

Striped bass life cycle
(Hint: Click on stages to learn about them)

Juvenile

Striped bass larvae begin metamorphosis to the juvenile stage when they are about 20 mm in length. Juveniles look like tiny adults, with fully developed eyes, hard bones, spines in their fins, scales and stripes. As juveniles grow, they leave the nursery area and move progressively downriver towards larger prey like mysids (shrimp-like creatures) and worms. Shallow, nearshore areas are the preferred habitat of juvenile striped bass. The growth of striped bass depends on how much food they can find as well as properties of the water like salinity (amount of salt), temperature, and dissolved oxygen.

Photo courtesy of Tedders Vainio

Measuring a juvenile striped bass.

Photo courtesy of Tedders Vainio

When striped bass first enter the juvenile stage, they are as long as a cherry.

http://teachmean.com/teaching_resources/education_modules/fish_and_physics/learn_about/

Striped bass life cycle
(Hint: Click on stages to learn about them)

Adult

Adult striped bass migrate out of the estuary and into the coastal ocean. When spring arrives, the fish will migrate back into estuaries to spawn. Each year until they are three years old, striped bass grow about 120 mm (the size of a hot dog). In their first few years, striped bass swim in schools while pursuing food: small fish such as spot and menhaden. As the fish age, they become more independent hunters. Female striped bass live longer and grow larger than males. Most fish age eleven and older are females. Large striped bass, which may weigh as much as 125 pounds and be up to 59 inches long, are almost exclusively females.

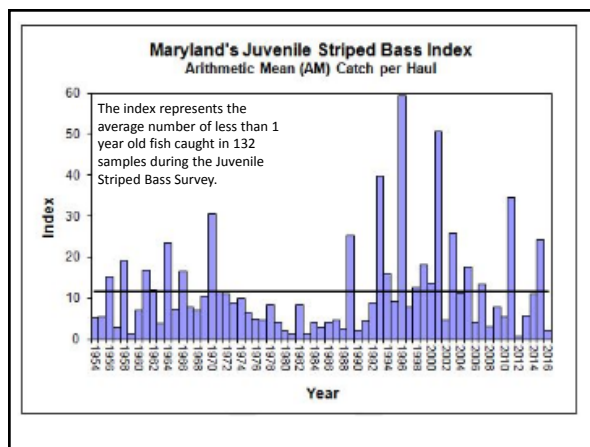
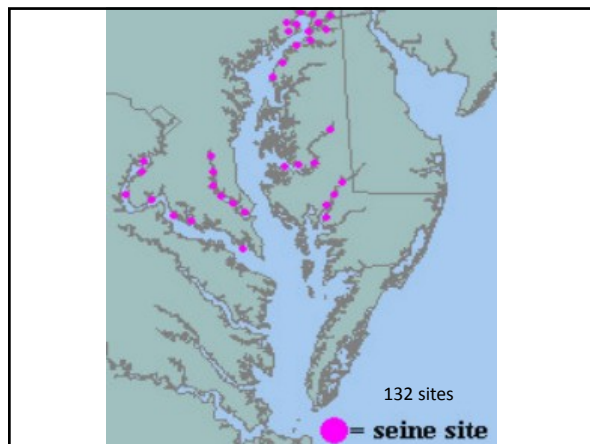
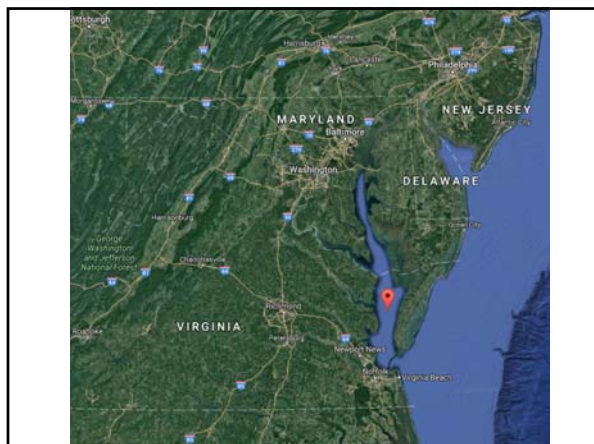
Photo courtesy of Tedders Vainio

Measuring an adult striped bass.

Photo courtesy of Dave Traylor

Adults can grow to be the length of five hotdogs placed end-to-end.

http://teachmean.com/teaching_resources/education_modules/fish_and_physics/learn_about/



Is it an issue?

- Recruit overfishing?
- Habitat?
- Environmental conditions?

"While this year's (2016) striped bass index is disappointing, it is not a concern unless we observe poor spawning in multiple, consecutive years," said Fishing and Boating Services Director David Blazer. "Very successful spawning years, as recently as 2011 and 2015, should more than compensate for this below-average year-class. Nonetheless, the department and our partners will continue to work to maintain a sustainable fishery for our commercial watermen and recreational anglers."



Why is habitat important?

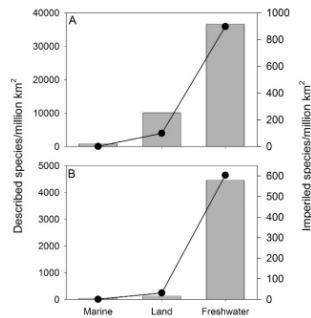


FIG. 3. The number of described (bars) and imperiled species (lines) of eukaryotes (A) and chondrates (B) in fresh water is much higher than would be expected from the area of the globe covered by freshwater habitats. This pattern holds true for chondrates, which have been well inventoried, and for all eukaryotes, for which the data are very incomplete and probably biased. Numbers of described species are from Palmer et al. (1997), Greenbridge and Jenkins (2002), and Italian et al. (2008). Imperiled species include species listed by IUCN (2007) in the following categories: extinct, extinct in the wild, critically endangered, endangered, and vulnerable.

Strayer, D. L., and D. Dudgeon. 2010. Freshwater biodiversity conservation: recent progress and future challenges.

Conservation status

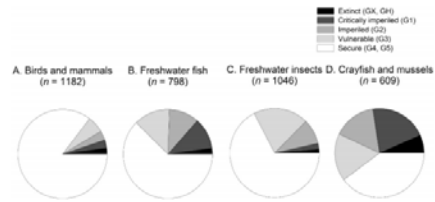


FIG. 4. Conservation status of birds and mammals (A), freshwater fishes (B), freshwater insects (C), and crayfish and mussels (D) in the US in the late 1990s (from Master et al. 2000), showing that freshwater animals, especially those that disperse poorly, are more highly endangered than their terrestrial counterparts. The number of species in each group (n) is given in parentheses. Freshwater insects includes only Odonata and Plecoptera. The conservation status of other freshwater insects was not assessed. Assessment codes are NatureServe designations.

Strayer, D. L., and D. Dudgeon. 2010. Freshwater biodiversity conservation: recent progress and future challenges.

Challenges to biodiversity

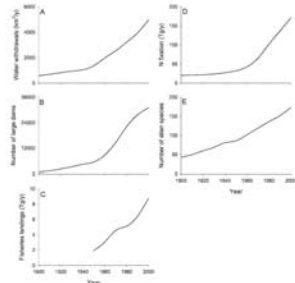
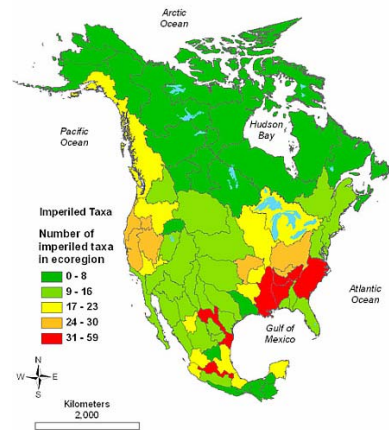


FIG. 5. Five examples of rising human pressures on the world's freshwater ecosystems. A.—Global water with biodiversity (after Chubb 1995). B.—Number of large (>10 m) high dams (International Commission on Large Dams 2008). C.—Fisheries landings from inland waters (Jain et al. 2005a). D.—Global aquaculture production (% input from all natural sources in >100 kg dry weight 1994, Galloway et al. 2006). E.—Number of known alien species in the Laurentian Great Lakes (Rusland 2008).

Strayer, D. L., and D. Dudgeon. 2010. Freshwater biodiversity conservation: recent progress and future challenges.



HABITAT AND HABITAT MANAGEMENT

habitat loss has been identified as the primary threat factor, more significant than invasive species or overexploitation (Dextrase and Mandrak 2006; Venter et al. 2006).

Where is the habitat?





Fish Habitat



What is habitat

NSW Fisheries Management Act 1994 fish habitat means: any area occupied, or periodically or occasionally occupied, by fish or marine vegetation (or both), and includes any biotic (living) or abiotic (non-living) component.

Water & Land

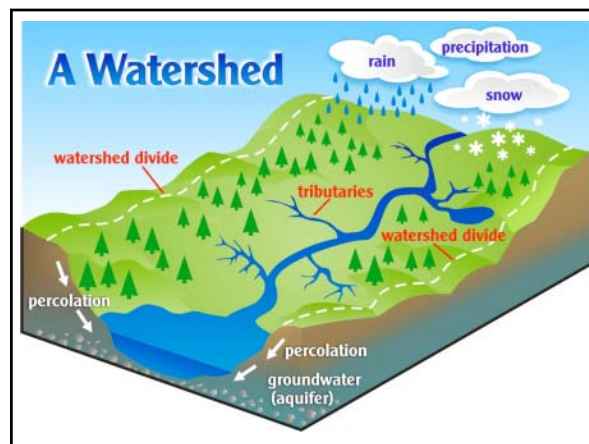
Inland habitat types

1. Streams
2. Lakes & Reservoirs



Habitat

- 119 public lakes
- 123,000 stream miles
- 225,000 freshwater acres



Hierarchical organizations

A Hierarchical Framework for Stream Habitat Classification: Viewing Streams in a Watershed Context

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ABSTRACT / Classification of streams and stream habitats is useful for research involving establishment of monitoring stations, determination of local impacts of land-use practices, generalization from site-specific data, and assess-

ment of basin-wide, cumulative impacts of human activities on streams and their biota. This article presents a framework for a hierarchical classification system, entailing an organized view of spatial and temporal variation among and within stream systems. Stream habitat systems, defined and classified on several spatiotemporal scales, are associated with watershed geomorphic features and events, variables selected for classification define relative long-term capacities of systems, not simply short-term states. Streams and their watershed environments are classified within the context of a regional biogeomorphic landscape classification. The framework is a perspective that should allow more systematic interpretation and description of watershed-stream relationships.

Managers of streams and their associated resources face problems of understanding and managing nonpoint source pollution, evaluating the complex, cumulative impacts of changing land use on stream habitats and biological communities, and assessing the effectiveness of fish habitat improvement projects and other mitigation procedures. Scientists have developed few generally applicable assessments

system is designed to intermesh with a biogeomorphic land classification system (Warren 1979, Lonspeich and Platts 1982, Warren and Liss 1988), and emphasizes a stream's relationship to its watershed across a wide range of scales in space and time, from the entire channel network to pools, riffles, and microhabitats.

Class roadmap

1. Elements of aquatic habitat
2. Elements of aquatic habitat management
3. Stream habitat Examples
 1. Lower Missouri River
 2. Pahsimeroi River

Elements of aquatic habitat

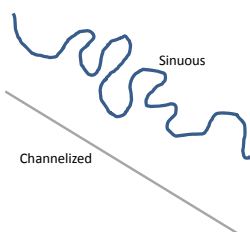
1. Amount
2. Chemical
 - Dissolved oxygen, pH, salinity
3. Physical
 - Sediment, turbidity, substrate
4. Biological
 - Macrophytes, Woody debris

Elements of aquatic habitat management

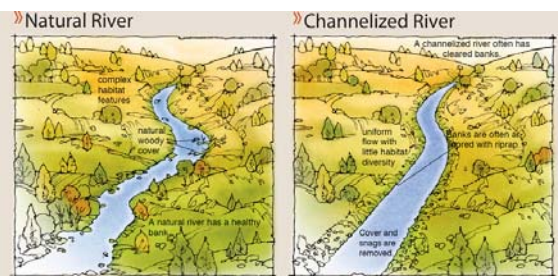
1. Restoration
2. Conservation
3. Mitigation

Amount

Sinuosity

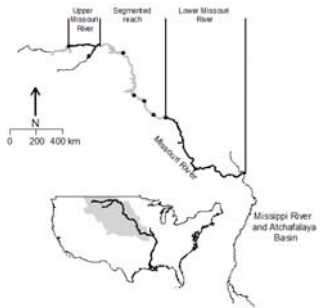


Stream channelization

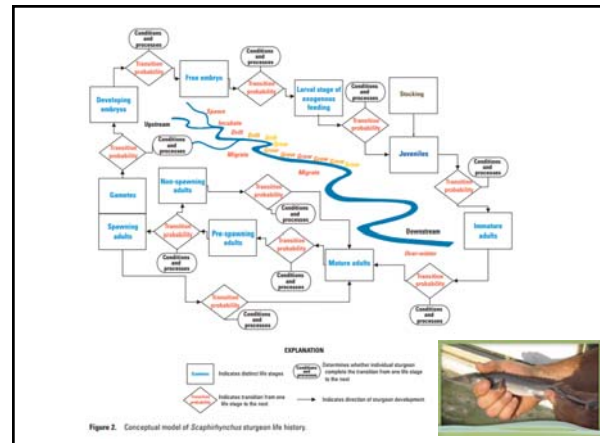
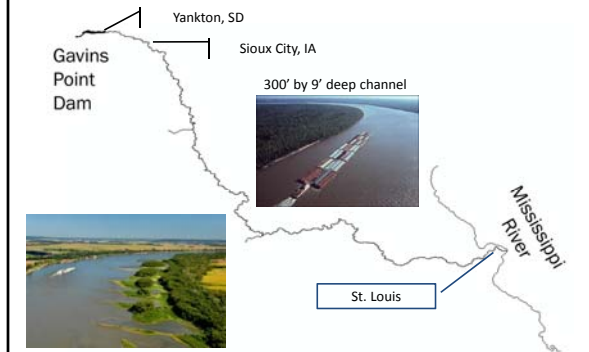


<http://www.in-fisherman.com/files/2014/06/Natural-Channelized-Rivers-in-Fisherman.jpg>

Restoration Example



Lower Missouri River



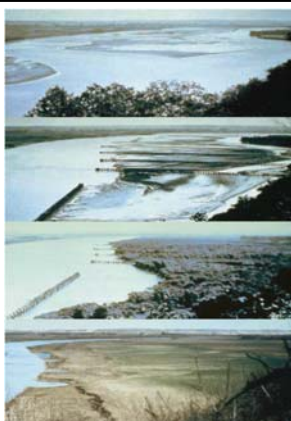
Lo. Mo. River @ Yankton



Channelization of the river



Indian Cave Bend on the Missouri River near river mile 517, about 18 miles upstream from Rulo, Nebraska. They illustrate the river before (1934; top photo) and after (1935, 1946, and 1977) the construction of brush dikes that narrowed and channelized the river.

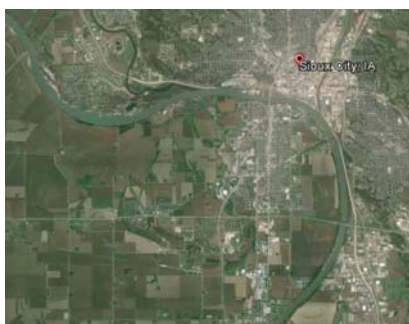


<https://www.nap.edu/read/13019/chapter/4#32>

Straightening Meanders



Lo. Mo. River @ Sioux City



Maintaining channels



Training outer bends

