WF4313/6413-Fisheries Management



In the news & announcements

Lab this week

- WADERS
- Bug Spray
- Water
- Sunscreen

Group 1 will go! Meet in the parking lot in front of Thompson

I know you will be sad, but...



No class or lab next week! @ Sturgeon & Paddlefish Society meeting...

WE LEFT OFF DISCUSSING SIZE STRUCTURE IN AGE STRUCTURED POPULATIONS



MANAGEMENT CASE STUDY LAKE WASHINGTON CRAPPIE HARVEST

What is the problem?

- 595 anglers sign petition
 - Increase length limit to 12"
 - Claimed catch rates and size had decreased
- Recreational anglers and subsistence anglers

Harvest per Hour



Average Weight



2. Length-Weight Relationship







Conditional fishing mortality below min. length limit = 0.1

YPR: Fishing Mortality under MLL = 0.1

Press Release

Thursday, May 26, 2016

Mississippi Wildlife, Fisheries, and Parks 1505 Eastover Drive, Jackson, MS, 39211 Phone: 601-432-2400

Fishing Regulation Changes Approved for Lake Washington

JACKSON - The Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) Fisheries Bureau announced new fishing regulations on Lake Washington. The new regulation sets the minimum length limit for crappie at 11 inches, but anglers will be allowed to harvest five fish under the length limit each day. The daily creel limit for crappie will remain 30 per angler. The new crappie regulations and the current black bass regulations will include the outlet channel from Lake Washington to the weir at Paul Love Park.

In addition, anglers fishing with yo-yos are required to attend these fishing devices at all times. Attend means that the anglers must remain in sight of the yo-yos if the gears are set and baited or set and tripped. Anglers will be allowed to leave their yo-yos unattended between 11 a.m. to 1 p.m. Yo-yos must be tripped with the hook out of the water during this two hour time period. MDWFP Law Enforcement officers have the authority to seize or confiscate unattended untripped yo-yos during this two hour period and unattended yo-yos other times of the day.

The new regulations become effective on June 23, 2016.

For more information regarding fishing in Mississippi, visit our website at www.mdwfp.com or call us at (601) 432-2212.

Find us on Facebook & follow us on Twitter

Share with your friends!

Caveat emptor- on growth overfishing....



Recruitment overfishing

when there aren't enough fish of reproducing age to replenish the population

What is it & how do we do it? RECRUITMENT MANAGEMENT

Conceptually



Adding age structure



Conceptually



Bits of information needed



Bits of information needed

- 1. Natural Mortality
- 2. Length-Age
- 3. Weight-Length
- 4. Fecundity
- 5. Maturity
- 6. Sex ratio

Management parameters

Fecundity is a function of spawning stock abundance or biomass

Minimize recruitment overfishing

- Maintain enough spawning abundance or biomass in system
- Reproductive potential

Fishing mortality & Length limit

Management parameters



We do we want to manage recruitment?

- Angler satisfaction
 - Recruitment drives year to year variability in abundance and biomass
 - Recruitment drives fish abundance and biomass









Fecundity

Number of eggs an animal produces during each reproductive cycle; the potential reproductive capacity of an organism or population. Usually increases with age and size









Fecundity & Age



Fecundity & Age



Maturity

A stage at which fish are able to develop ripe gonads and to participate in spawning.

Length at first maturity

Mean length at which fish of a given population develop ripe gonads for the first time.

Determining sexual maturity & ratio

- Link maturity (yes or no) to length
- Sex ratio













Maturity function & MLL



Maturity

Abundance



Complex interactions? You bet!



Evaluation of recruitment overfishing

- Limited in practice
- Set regulations that are **robust** to recruitment overfishing
 - Ratio of spawning biomass to unfished biomass (SSR)
 - Ratio of spawning potential to unfished potential (SPR)

Spawning potential ratio

- **Spawning potential:** The number of eggs that could be produced by an average recruit over its lifetime
- Ratio: the fished stock is divided by the number of eggs that could be produced by an average recruit over its lifetime when the stock is unfished.
- Compares the spawning ability of a stock in the fished condition to the stock's spawning ability in the unfished condition.

Example

- 10 fish survive the first couple of years of life and are now large enough to be caught (recruited) in the fishery.
- Four are caught before they spawn (no eggs produced)
- Three others are caught after they spawn once (some eggs produced),
- The last three live to spawn three times (many eggs produced) before dying of old age.
- During their lifetime, the 10 fish produced 1 million eggs and the average recruit produced 100,000 eggs (1 million divided by 10).
- Unfished population, 10 fish survive as before. Three die of natural causes after spawning (some eggs produced) and the other seven spawn three times (very many eggs produced) before dying of old age.
- During their lifetime, these 10 fish produced 5 million eggs and the average recruit produced 500,000 eggs (5 million divided by 10).
- The spawning potential ratio is: 100,000 eggs produced by the average fished recruit divided by the 500,000 eggs produced by the average unfished recruit and is equal to 0.20 or 20 percent.

Spawning stock biomass (SSB) & Spawning stock biomass per recruit (SSBR)

- Biomass (weight):
 - entire adult stock,
 - mature females in the stock,
 - eggs they produce. These measures are called

Spawning stock biomass (SSB) or spawning stock biomass per recruit (SSBR)

What is the SPR for Crappie?



Stock specific SPR?

- Studies show that some stocks (depending on the species of fish) can maintain themselves if the spawning stock biomass per recruit can be kept at 20 to 35% (or more) of what it was in the unfished stock.
- Lower values of SPR may lead to severe stock declines.

Conceptually







SPR-Mature female biomass



Adding a 6 inch MLL



Adding a 6 inch MLL

