

WF4313/6613-Fisheries Management

Class 15– Yield Management Case Studies

In the news



Share your bay scallop input with the FWC; workshops scheduled for October

News Release

Thursday, October 05, 2017

Media contact: Amanda Nalley, 850-410-4943 or Amanda.Nalley@MyFWC.com

This summer, the Florida Fish and Wildlife Conservation Commission (FWC) implemented staggered season start and end dates for bay scallop harvest. The FWC needs your feedback on this staggered season structure before determining how to manage the season in the future.

The FWC will be hosting five public workshops including areas of the state where scallop harvest is allowed as well as in Pasco County, where harvest currently is not allowed. The goal of these workshops will be to gather input on the bay scallop fishery, including whether this year's staggered season made for a more enjoyable time on the water and whether it had any economic impact on the coastal communities that depend upon this fishery. Input from these workshops will be discussed at a future Commission meeting and will help the FWC determine what the bay scallop season structure should be in future years.

Upcoming in-person workshops are scheduled as follows (scheduled 6 to 8 p.m. local time except for Port St. Joe):

- Oct. 12: Port St. Joe, Gulf County Board of County Commissioners, Robert M. Moore Administration Building, 1000 Cecil G. Costin Sr. Blvd. (this meeting only is from 5:30 to 7:30 p.m. ET).
- Oct. 16: Steinhatchee, Steinhatchee Landing Resort, 219 NE Highway 51.
- Oct. 17: Land O' Lakes, Land O' Lakes Recreation Complex, Meeting Rooms 3 & 4, 3032 Collier Parkway.
- Oct. 18: Crystal River, City Council Chambers, 123 NW Highway 19.
- Oct. 26: Carrabelle, Franklin County Senior Center, 201 NW Ave. F.

Goliath grouper in-person workshops scheduled for October; online workshops also available

News Release

Thursday, October 05, 2017

Media contact: Amanda Nalley, 850-410-4943 or Amanda.Nalley@MyFWC.com

The Florida Fish and Wildlife Conservation Commission (FWC) will continue gathering public input on the management of goliath grouper this month at several in-person workshops scheduled across the state. The FWC is seeking input on goliath grouper management, including the possibility of a limited harvest in Florida state waters.

A total of 16 in-person workshops will be held altogether, including workshops held previously in July and August.

For those who missed a workshop in their area or cannot make an in-person workshop, an on-demand virtual workshop is available. This newly-added online feature can be found on the public workshops webpage at MyFWC.com/Fishing by clicking on "Saltwater Fishing," "Public Comments/Workshops" and "Workshops." Once you've viewed the workshop, you can take a workshop survey, which is identical to a survey given at the in-person workshops. Additional written comments may be submitted online at MyFWC.com/SaltwaterComments.

Announcements



Announcement

1. Lab tomorrow 10/3-Stream electrofishing
2. Waders, bug repellent, sunscreen, water



10/3-Group 1

Yasko, S
Rush, H
Gerhart, B.
Yarber, C.
Shannon, A.
Wilson, A.
Lundy, F.
Woodyard, E.
Munter, Z.
Tipton, J.

10/10-Group 2

McAllister, B.
Cook, M.
Pigott, W.
Thompson, W.
Lucore, A.
Virden, M.
Hopson, E.
Pettigrew, C.
Roberson, H.
Gammon, T.

Class Topics

Yield and biomass management
Management case study



MANAGEMENT CASE STUDY PADDLEFISH ROE HARVEST

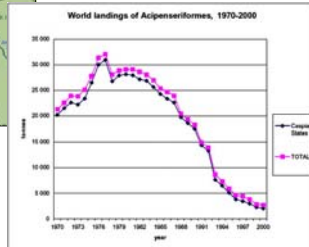


Caviar sources

- Salmon
- Mullet
- Herring
- Carp
- Bowfin
- Acipenseriformes
 - Sturgeon
 - Paddlefish



Eurasian caviar stocks decline



<http://www.fao.org/docrep/006/Y5261E/y5261e06.htm>

NA Acipenseriformes harvest

- High market price
- Increased harvest in North America
- At-risk to overfishing?

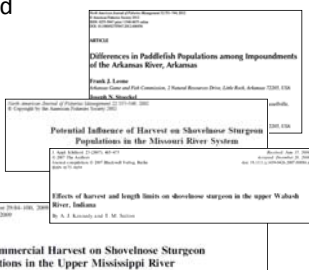


220 \$/kg roe; 500-650\$ per fish

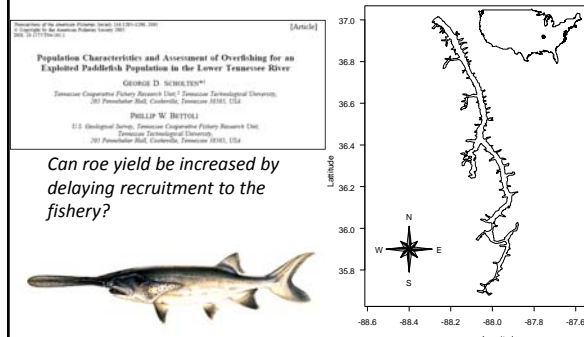


Yield-per-recruit (YPR) models

- Predicts fishery yield
- Age structured
- Evaluate varying:
 - Fishing mortality
 - Length limits
 - Natural mortality



Paddlefish harvest



Potential for overfishing?

- Growth overfishing
 - 864-mm
 - Exploitation > 30%
 - Weak at 965
- Suggests increasing length limit

But, commercial fishery targets ovarian tissue not biomass!

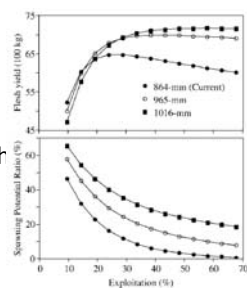
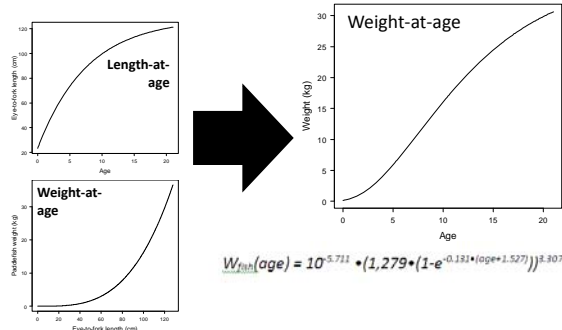
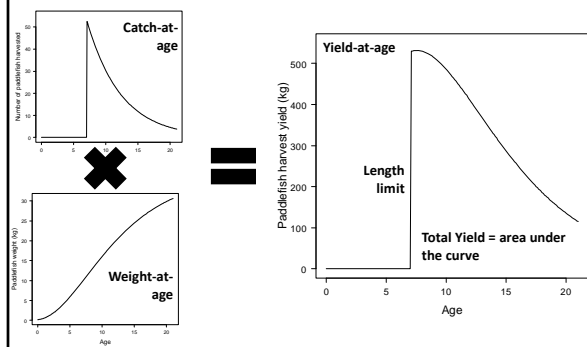


FIGURE 6.—Predicted paddlefish flesh yield (per 1,000 recruits; top) and spawning potential ratio (bottom) versus exploitation for three different minimum length limits in Kentucky Lake in 2003–2004.

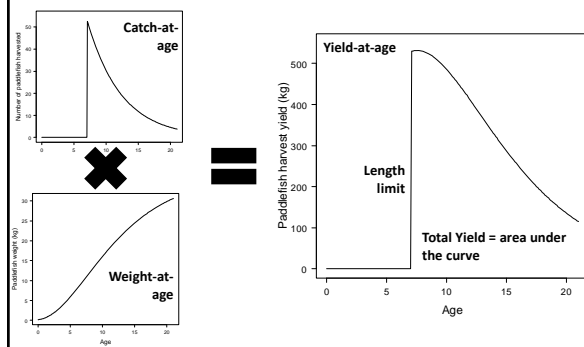
Weight-at-age



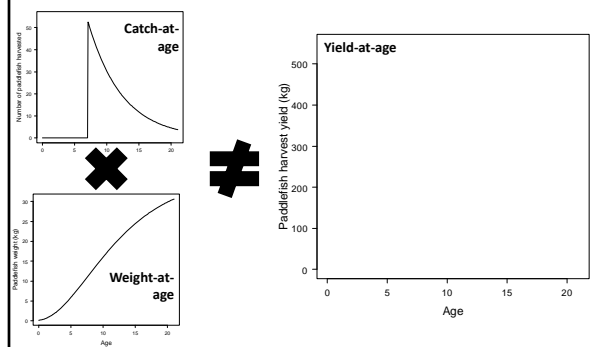
Putting it all together



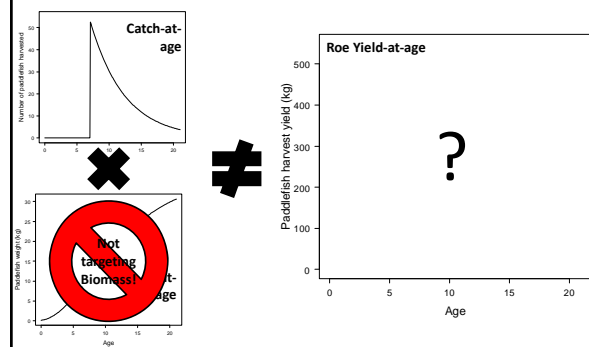
Putting it all together



Roe yield?



Putting it all together

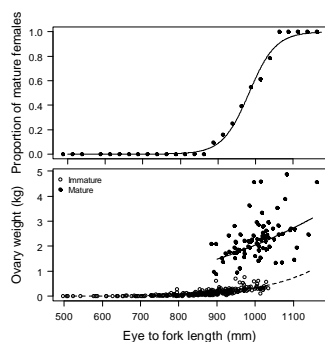


Simulating roe yield

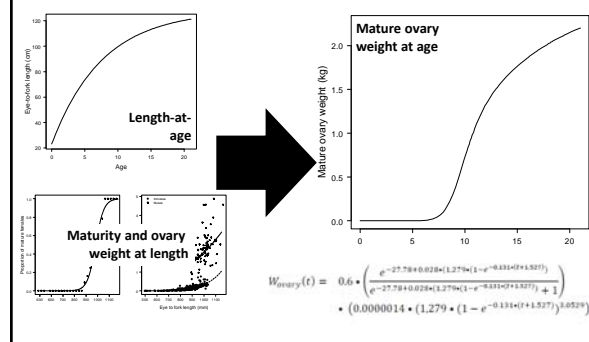
Ovary weight-at-EFL

Account for:

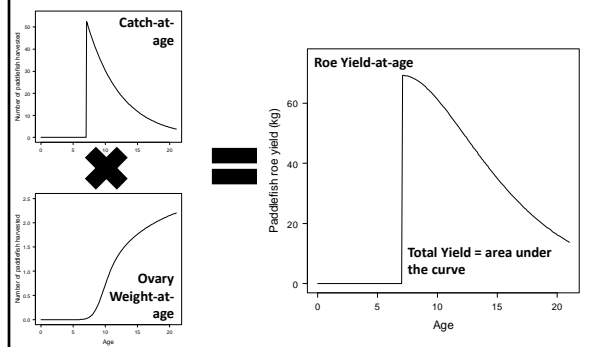
- Maturity
- Ovary weight



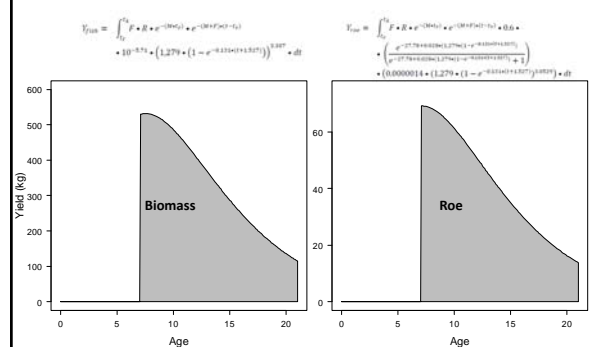
Simulating roe yield



Finally...roe yield!

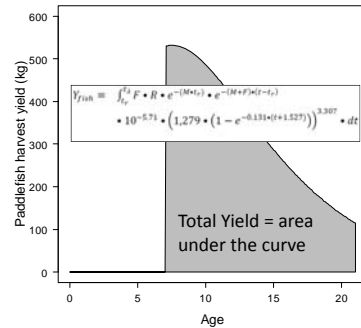


Finally...yield!



Predicting total yield

Analytical?
Approximate?
Jones (1957)
– Incomplete
β function
— FAST
— FAMS



Numerical approaches

Box the region
- Age recruited to fishery
- Maximum age
- Known area

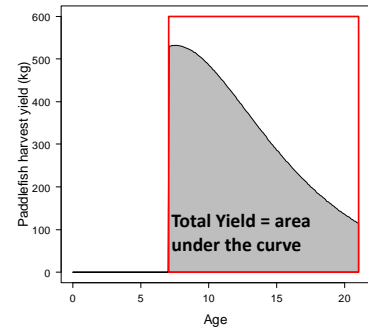
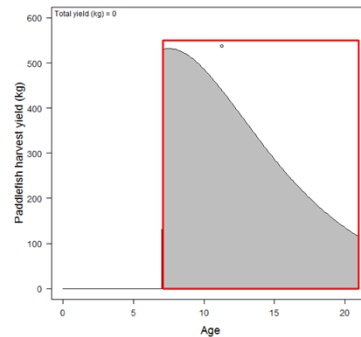


Illustration of numerical integration

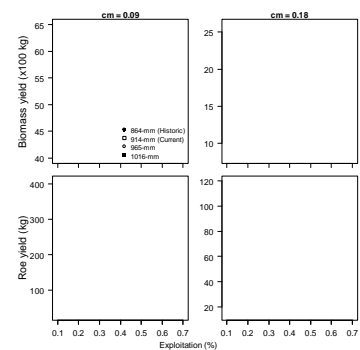
Monte Carlo
numerical
integration
- Do for many
random draws
within box
- Very Flexible



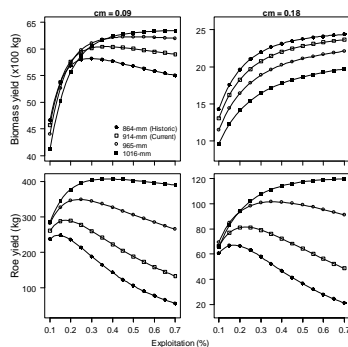
Predicted biomass and roe yields

Varying:

- Exploitation
- Natural Mortality
- Length limit



Predicted biomass and roe yields



Key points

- Growth overfishing (roe)
 - Occurs at **lower** exploitation rates
 - **More severe** in terms of roe
 - Suggests higher minimum length limits
- Less sensitive to uncertainty to natural mortality

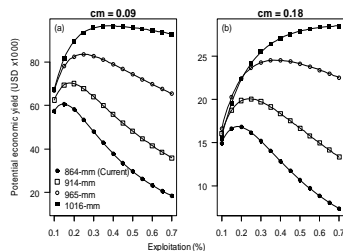
Multiple tissue harvest?



Multiple tissue harvest

Economic yield

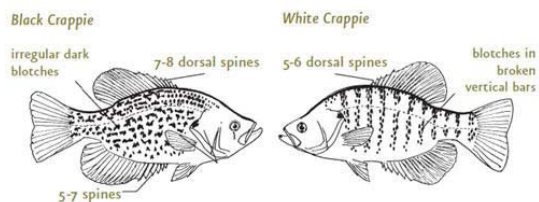
- Roe (200 \$/ounce)
- Flesh (1 \$/pound)
- Domestic culture?



MANAGEMENT CASE STUDY LAKE WASHINGTON CRAPPIE HARVEST

Species Description

- Black and White Crappie
- Managed as one species



Study Area

- 25 miles from Greenville MS in Washington County
- One of state's largest natural lakes (5,000 acres)
- World renowned crappie fishing



Current Regulations

- Minimum length limit was 10"
 - 30 fish bag limit
 - 5 fish under 10"



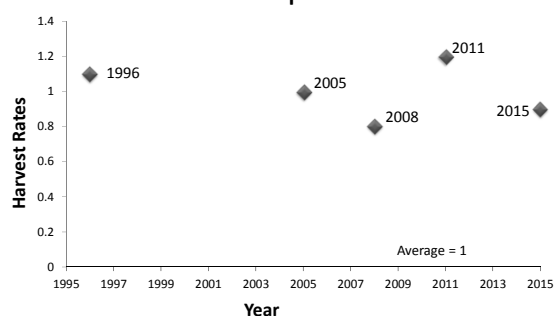
"5 Under Rule"

- Anglers allowed to keep 5 crappie under 10" limit
- Most say they would keep an 8" or above fish
- Provides subsistence

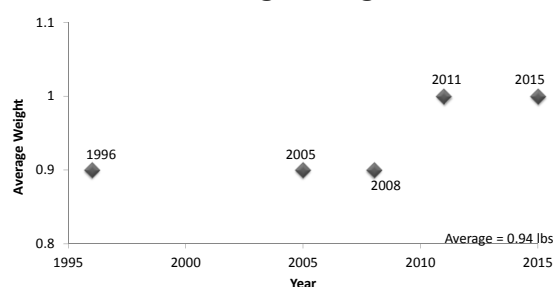
What is the problem?

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

Harvest per Hour



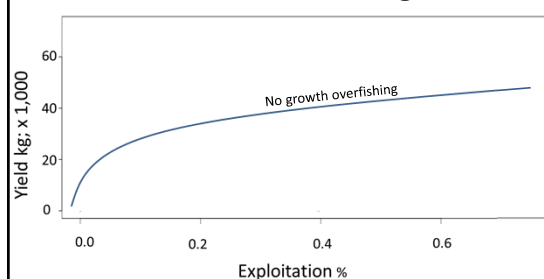
Average Weight



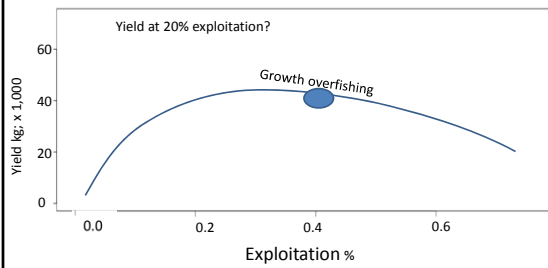
Objectives

- Evaluate potential for growth overfishing at current and proposed length limits
- Evaluate at different mortality rates between 8" and MLL
 - "5 under" rule

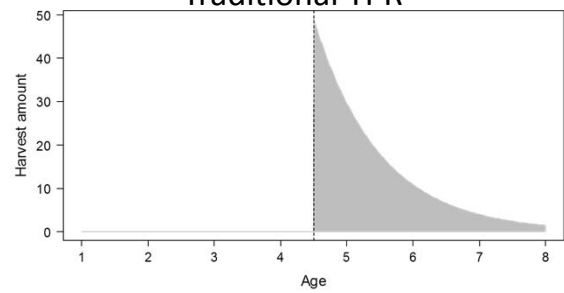
What are we looking for?



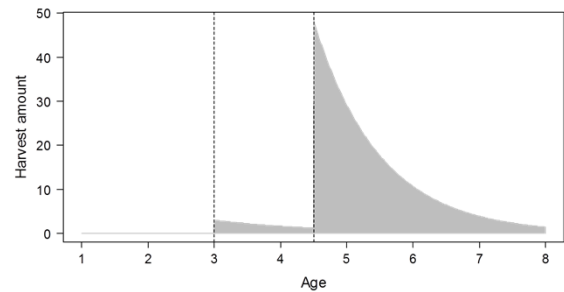
What are we looking for?



Traditional YPR



New and improved



What we need?

1. Mortality
2. Length Weight Relationship
3. VBGF (Age & Growth)
4. Yield per Recruit Models

1. Mortality

- 66% annual mortality
 - Weighted catch curve done in 2012
- 41% annual exploitation rate
 - 400 tagged fish > 10"

2. Lengths & Weights

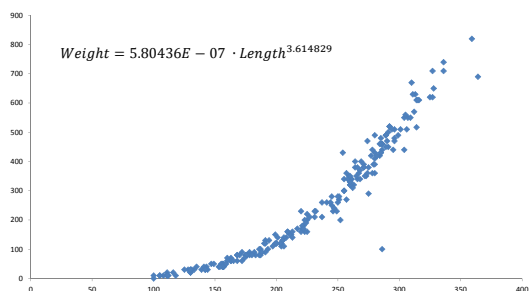
- Lead nets and trap nets
- 12 of each at 24 different locations



2. Lengths & Weights

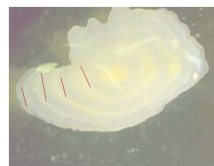
- Every fish caught was measured
- Species other than crappie were released
- 5 crappie from each cm bin kept to be weighed

2. Length-Weight Relationship

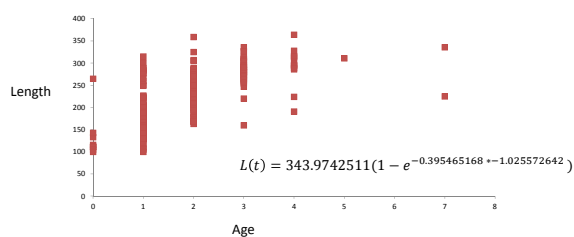


3. VBGF

- Aged by 2 technicians and consensus reached when a disagreement occurred
- Ages used to make VBGF

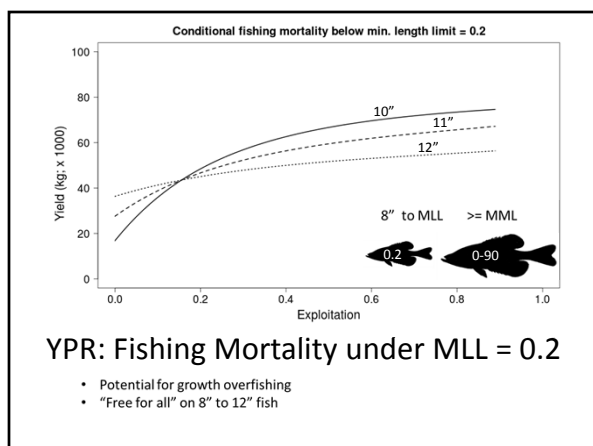
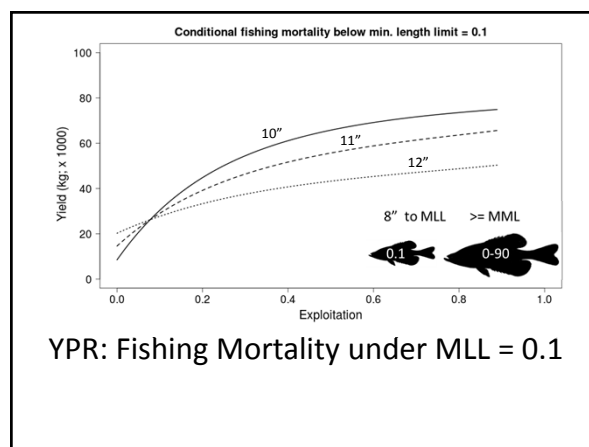
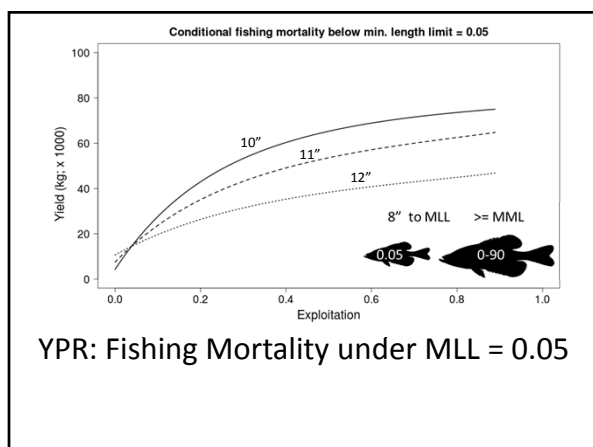
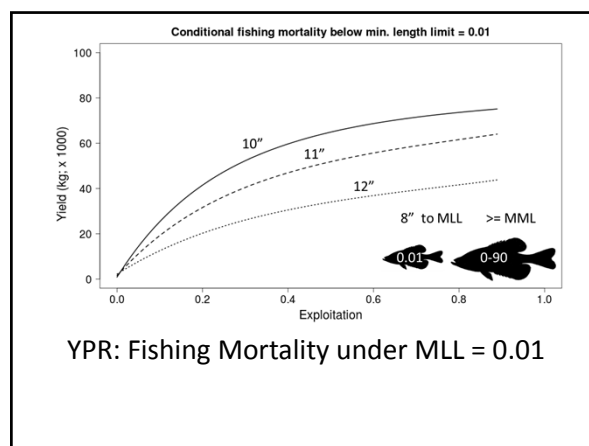
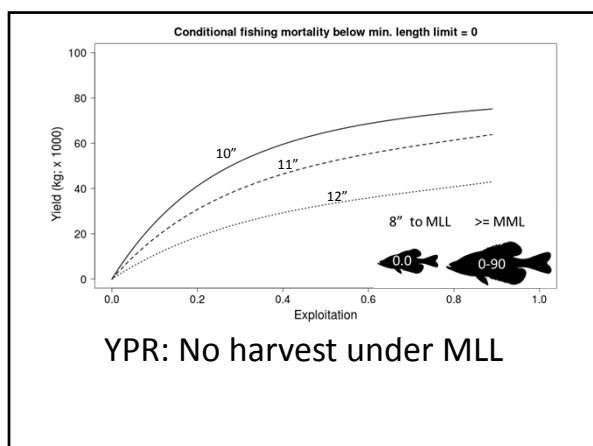


VBGF



4. Models

- Using length limits 10", 11", and 12"
- 5 models showing different rates of conditional fishing mortality below MLL
 - 0, 0.01, 0.05, 0.1, and 0.2
- Evaluate potential for growth overfishing



In a nutshell

- Growth overfishing potential-NO
- Supports data from MDWFP
 - Harvest rates and Average Weight
- Effect of "5 under" is minimal when MLL is low
- Management impact?

Press Release

Thursday, May 26, 2016

Mississippi Wildlife, Fisheries, and Parks
1555 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 untipped 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.mshelp.com or call us at (601) 432-2212.

Find us on Facebook & follow us on Twitter

Share with your friends!

Caveat emptor

- But on growth overfishing....

