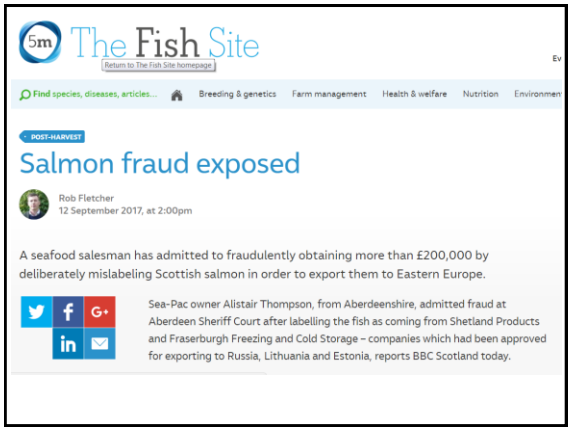
WF4313/6613-Fisheries Management

Class 9– Management Case Study & Age Structure continued

Announcements

- 9/18 Guest lecture on a day in the life of a fisheries professional
- Exam I September 20th…


The Fish Site

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POST-HARVEST

Salmon fraud exposed

Rob Fletcher
12 September 2017, at 2:00pm

A seafood salesman has admitted to fraudulently obtaining more than £200,000 by deliberately mislabeling Scottish salmon in order to export them to Eastern Europe.

Sea-Pac owner Alistair Thompson, from Aberdeenshire, admitted fraud at Aberdeen Sheriff Court after labelling the fish as coming from Shetland Products and Fraserburgh Freezing and Cold Storage – companies which had been approved for exporting to Russia, Lithuania and Estonia, reports BBC Scotland today.

Management case study

FWC tightens rules on use of certain stone crab traps

Saturday, September 5, 2015

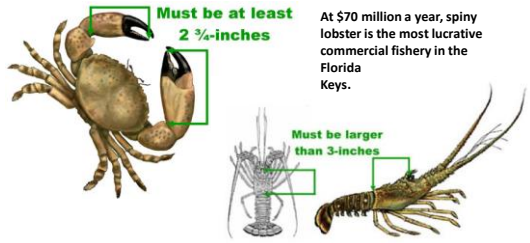
BY TIMOTHY O'HARA Citizen Staff
tohara@keysnews.com

State fishery managers have removed a loophole that gave some unscrupulous commercial trap fishermen a leg up on fellow fishermen and had serious impact on the lucrative spiny lobster fishery, which is centered in the Florida Keys.

The Florida Fish and Wildlife Conservation Commission (FWC) amended its regulations for stone crab traps used in Collier, Monroe and Miami-Dade counties. The FWC board approved the new rules this week.

http://keysnews.com/print/69399

What is the problem?

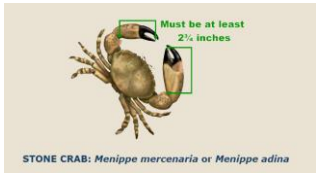


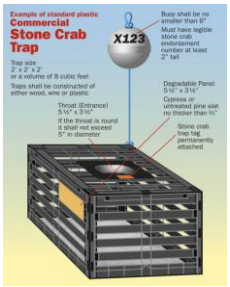
Up to 90% bycatch in stone crab traps

At $70 million a year, spiny lobster is the most lucrative commercial fishery in the Florida Keys.

Species Overlap

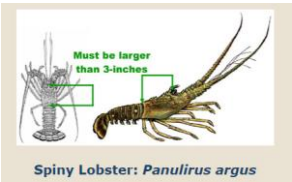
Stone Crab & Gear





http://myfwc.com/fishing/saltwater/commercial/stone-crab/

Spiny Lobster & gear



http://myfwc.com/fishing/saltwater/commercial/spiny-lobster

Gear comparison

Proposed rule change

- To prevent this unintended use of stone crab traps in the lobster fishery, industry has requested rule changes to eliminate their use in the primary areas where the lobster fishery and stone crab fishery overlap.
- Large stone crab entrances capture more lobster
- To prevent the use of stone crab traps in the lobster fishery industry has requested rule changes to eliminate the use of atypical stone crab traps in the primary areas where the lobster fishery and stone crab fishery overlap.

Gear

What is bycatch

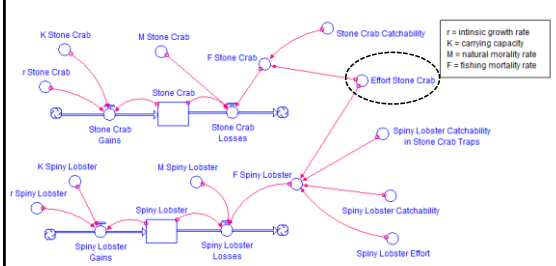
The definition of bycatch, as stated in the Magnuson-Stevens Fishery Conservation and Management Act, is:

Fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch and release fishery management program.

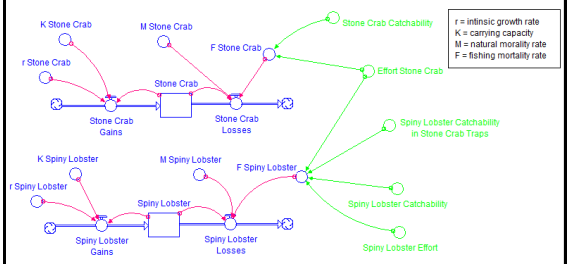
http://www.nmfs.noaa.gov/by_catch/bycatch_whatis.htm

Conceptually

Conceptually



Control variables



Management: control

Management Objective: Minimize Spiny Lobster catch in Stone Crab Gear

1. Stone crab effort
2. Spiny lobster effort
3. Stone Crab catchability in Stone Crab gear
4. Spiny Lobster catchability in Spiny Lobster gear
5. Spiny Lobster catchability in Stone Crab gear

Managing control variables

Objective: Minimize Spiny Lobster catch in Stone Crab Gear

~~1. Stone crab effort~~

~~2. Spiny lobster effort~~

~~3. Stone Crab catchability in Stone Crab gear~~

~~4. Spiny Lobster catchability in Spiny Lobster gear~~

5. Spiny Lobster catchability in Stone Crab gear

Gear

Rule Change-Approved by Commission

Proposed Rule Language:
Stone Crab Trap Gear Specifications

Draft Rule Hearing
April 16, 2015

68B-13.008 Gear, Trap Construction, Commercial Trap Marking Requirements, Trap Working Regulations, Trap Transfer.

(1) No change.

(2) TRAP CONSTRUCTION. No person, firm, or corporation shall transport on the water, fish with, or cause to be fished with, set, or placed, in the harvest of stone crabs, any trap which does not meet the following requirements:

(a) Each trap shall be constructed of either wood, plastic, or wire.

(b) Except as described in subsection (c), such ~~Such~~ traps shall have a maximum dimension of 24 inches, by 24 inches, by 24 inches or a volume of 8 cubic feet.

(c) In Collier, Monroe, and Miami-Dade counties, such traps shall have a maximum dimension of 16 inches, by 20 inches, by 12 inches or a volume of 3,840 cubic inches.

(d) ~~(c)~~ 1. The throat or entrance to all wood and plastic traps shall be located on the top horizontal section of the trap.

a. The use of round throats is prohibited in state and federal waters off Collier, Monroe, and Miami-Dade counties. In state and federal waters off Collier, Monroe, and Miami-Dade counties, the inside of the throat in the longer dimension shall not exceed 5 1/2 inches and in the shorter dimension shall not exceed 3 1/8 inches.

b. For traps fished anywhere other than state or federal waters off Collier, Monroe, or Miami-Dade counties, if If the throat is longer in one dimension, the throat size in the longer dimension shall not exceed 5 1/2 inches and in the shorter dimension shall not exceed 3 1/2 inches. If the throat is round, the throat size shall not exceed 5 inches in diameter.

2. through 4.: No change.

(3) – (5): No change.

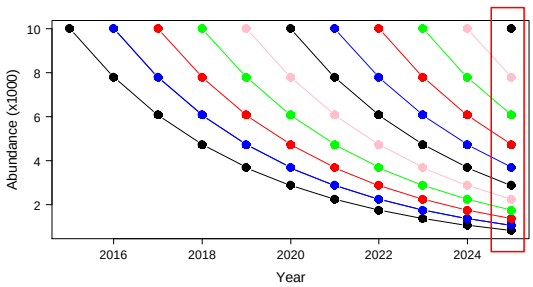
Governance

"The Florida Constitution authorizes the Fish and Wildlife Conservation Commission to enact rules and regulations regarding the state's fish and wildlife resources.

To do this, the seven Commissioners meet five times each year to hear staff reports, consider rule proposals, and conduct other Commission business. Because stakeholder involvement is a crucial part of the process, we conduct Commission meetings in different locations across the state offering citizens the opportunity to address the Commission about issues under consideration."

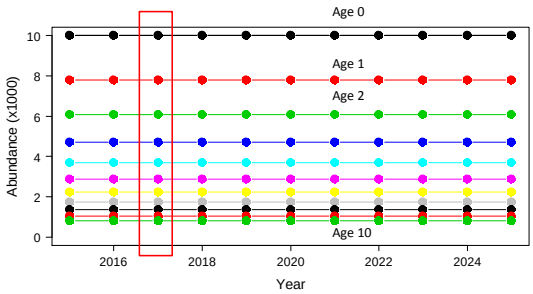
http://myfwc.com/about/commission/

At any given year

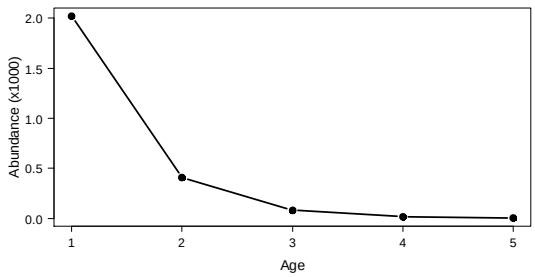


Stable age distribution

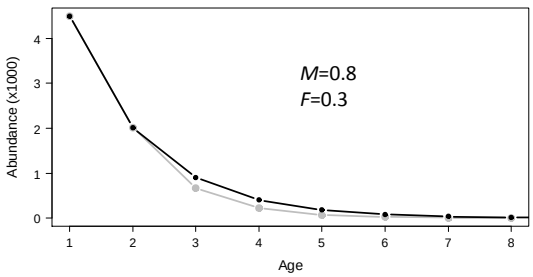
Equilibrium age distribution



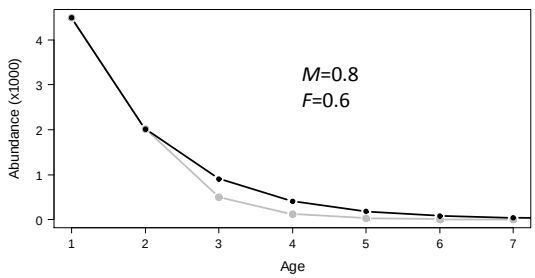
Fishing mortality depends on size



Effect of fishing



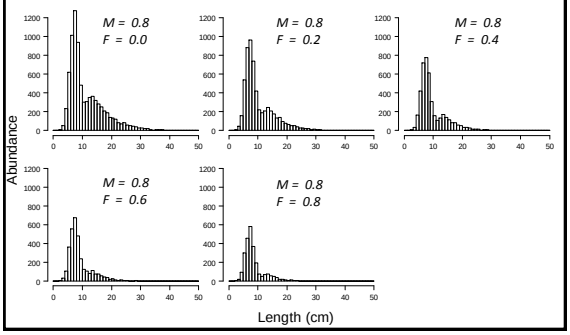
Effect of fishing



Size structure

Lets look at a population of Black Crappie with a natural mortality rate (*M*) of 0.8 for the following levels of fishing mortalities: 0.0, 0.2, and 0.4, 0.6, 0.8

Size structure



A yield predicting primer

Yield(age) = Harvested(age)•Weight(age)

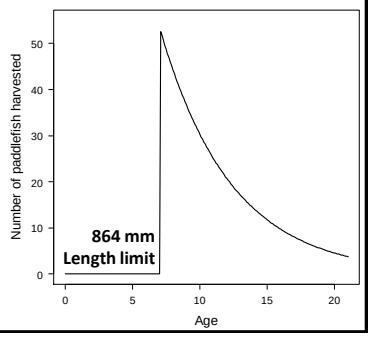
Harvested (age=3.5)		Weight(age=3.5)		Yield(age=3.5)
	X	50 kg	=	300 kg

Paddlefish can live up to 21 years (λ_{max})…So how is total cohort yield calculated?

Catch-at-age

Convert length limit to years

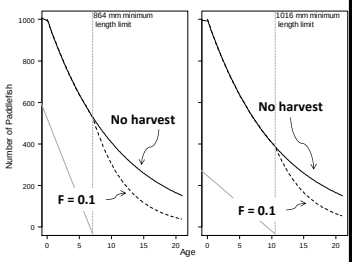
- vonBertalanffy growth function



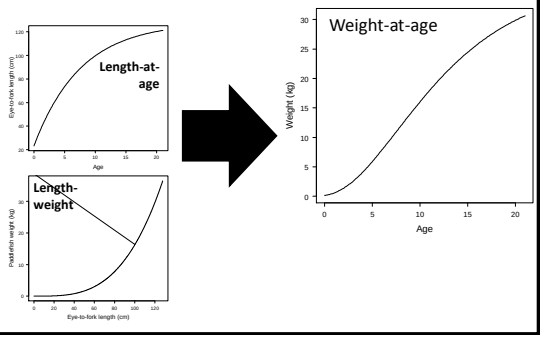
A yield predicting primer

Need 2 parts for simulated cohort

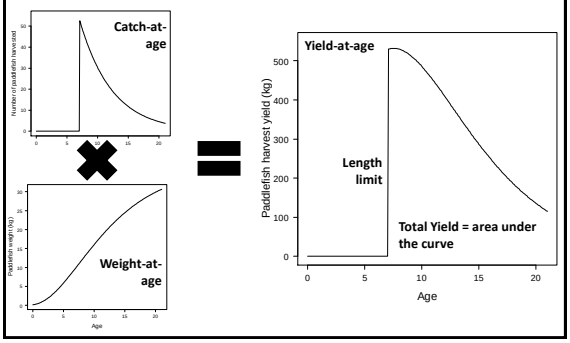
1. Catch-at-age
2. Weight-at-age



Weight-at-age



Putting it all together



Trade off

1. Harvesting a lot of fish
2. Harvesting fewer, but larger fish

Lets look at this

Total mortality (*Z*)

$Z = F + M$

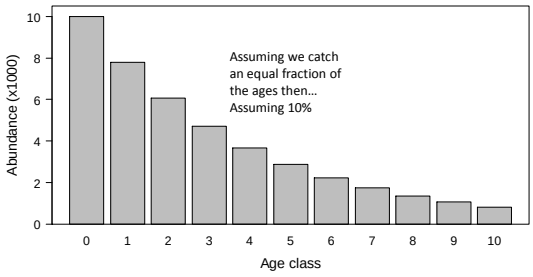
Where,

F = Fishing mortality

M = Natural mortality

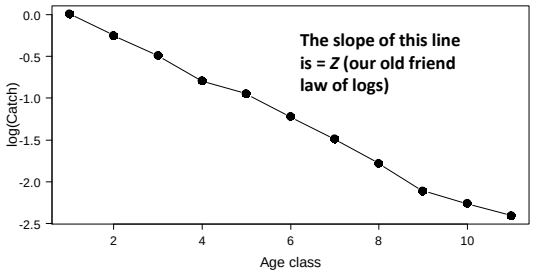
Difficult to estimate *F* and *M*

How do we estimate mortality?

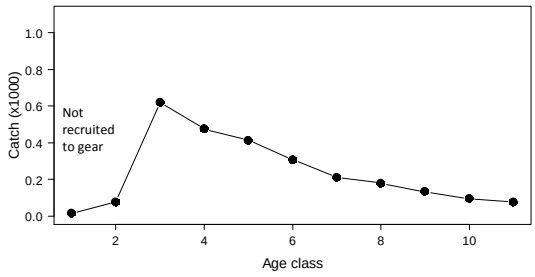


Catch curve

Catch curve



Practical realities: catch curve



Practical realities: catch curve

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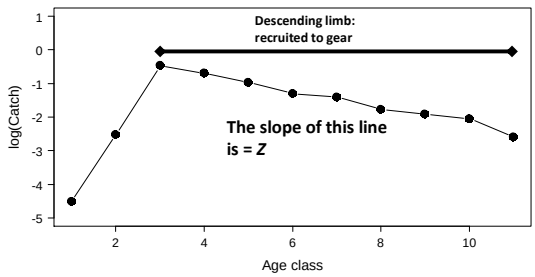
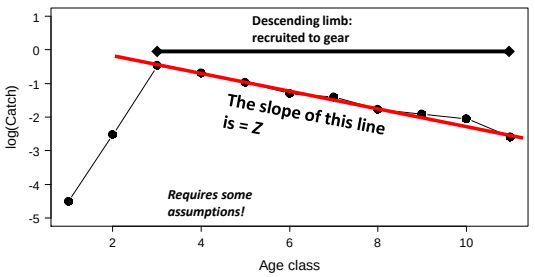


Practical realities: catch curve



Catchability?

$$Z = F + M$$

$$F = Catchability \cdot Effort$$

Links effort and catch

Hard to estimate!