Potential Hook Modifications in Coastal Waters

DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

Steve Poland

May 14, 2020

Origination

August 2019 – "Direction to staff to provide information on the science supporting the use of circle hooks and bent-barbed treble hooks and provide input on the efficacy of requiring their use"

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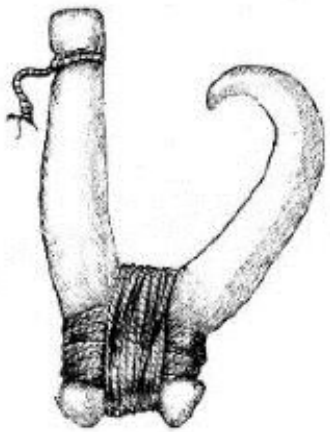
Workgroup Membership

- Steve Poland, Director's Office
- Chris Batsavage, Director's Office
- Chris Lee, Marine Patrol
- Dr. Dallis Tucker, Recreational Statistics
- Dr. Drew Cathey, Recreational Statistics
- Chris Wilson, Recreational Statistics
- Kat Rawls, Fisheries Management
- Lee Paramore, Fisheries Management
- Randy Gregory, Fisheries Management
- Jordan Byrum, Artificial Reefs

Overview

Background
- Literature review
- Defining a Circle Hook
- Current Management

Management considerations
- Enforceability
- Available gear
- Exclusions
- Education
- Conservation benefits



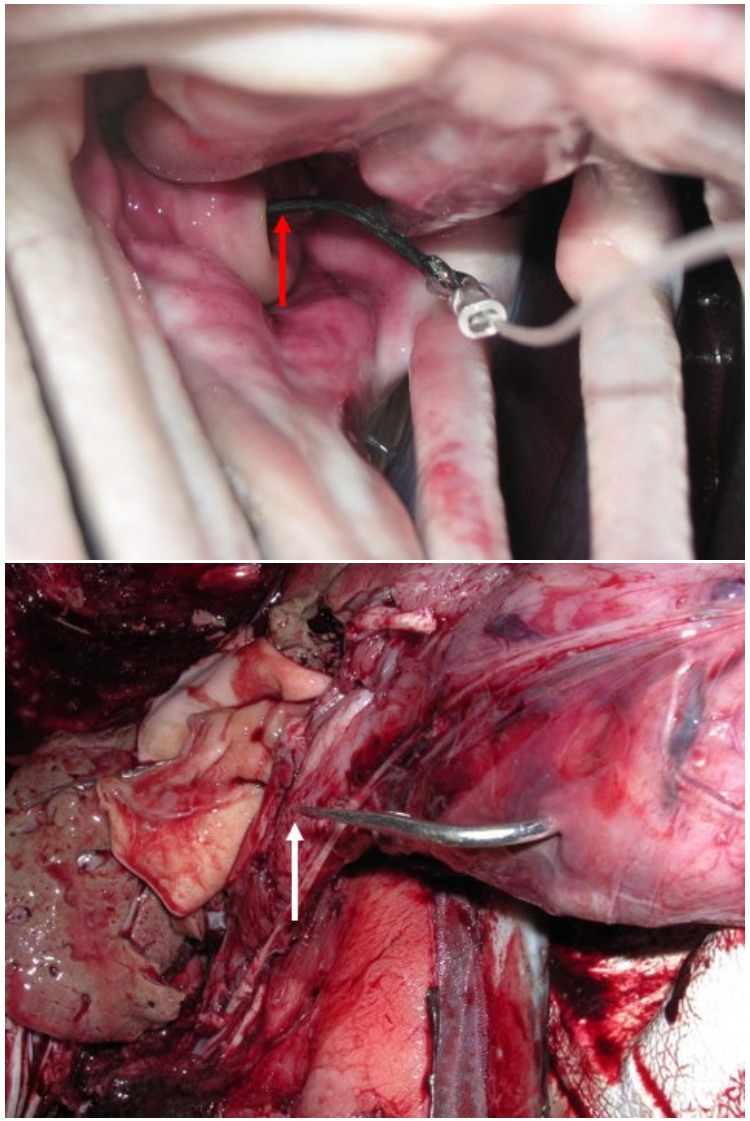
Arana 2014

Catch All Tackle

NOAA Fisheries

Literature Review

Reduce hooking injury ⟶ Increased survival

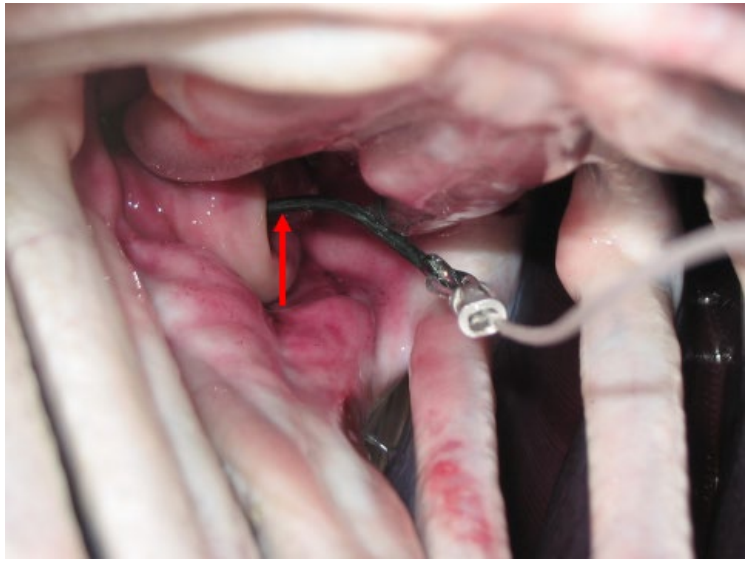


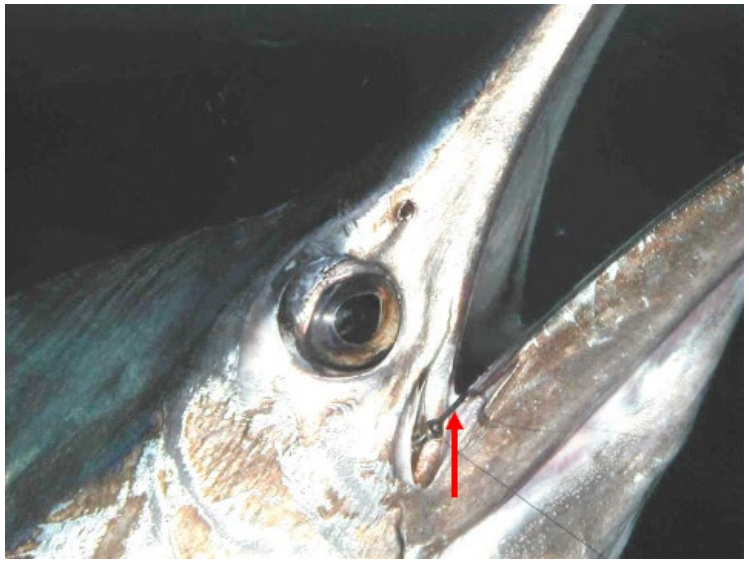
Literature Review

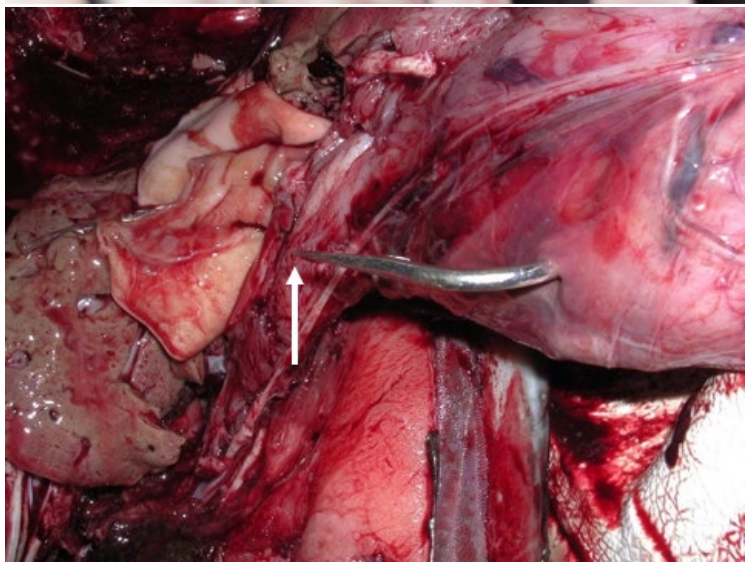
Reduce hooking injury ⟶ Increased survival

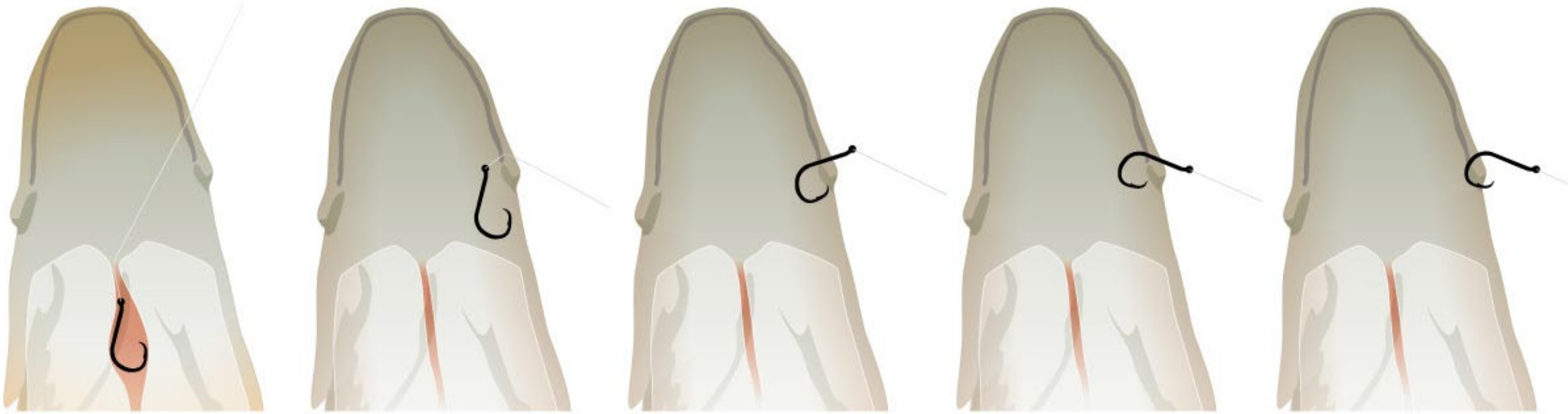
Circle Hooks and barbless hooks

- Lower occurrence of deep-hooking
- Reduce damage









Source: Tom Jones, Minnesota Dept. of Natural Resources

PIONEER PRESS

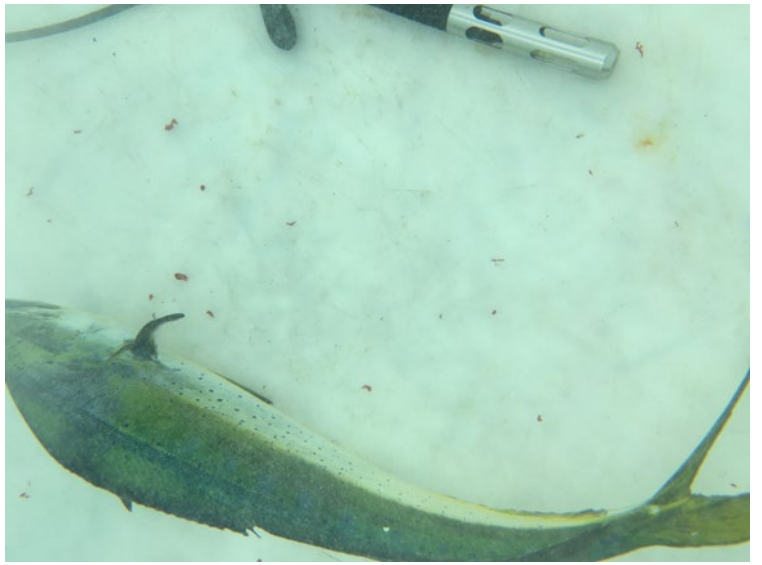
Literature Review

Reduce hooking injury ⟶ Increased survival

Two methods:

Literature Review

Reduce hooking injury ⟶ Increased survival



Two methods:

- Observational studies

Capture fish with different treatments

i.e. hook types

Hold fish in tanks/pens and observe mortality

Literature Review

Reduce hooking injury ⟶ Increased survival

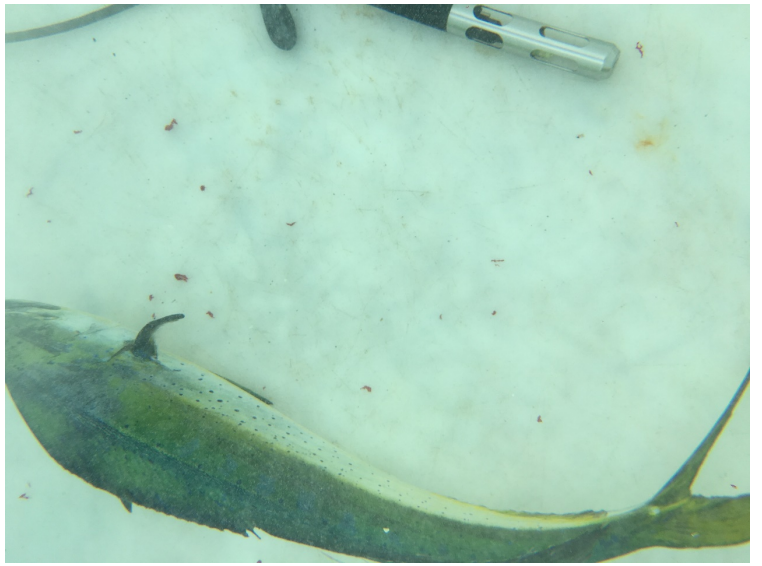
Two methods:

- Observational studies
- Tagging

Capture fish with different treatments

i.e. hook types

Tag and release → survival inferred by time at large



Literature Review

Effects of circle versus J-style hooks on target and non-target species in a pelagic longline fishery

D.W. Kerstetter*, J.E. Graves

Virginia Institute of Marine Science, College of William and Mary, Route 1208 Greate Road, Gloucester Point, VA 20362, United States

Received 22 April 2005; received in revised form 21 March 2006; accepted 30 March 2006

Does Hook Choice Matter? Effects of Three Circle Hook Models on Postrelease Survival of White Marlin

JOHN E. GRAVES* AND ANDRIJ Z. HORODYSKY

Virginia Institute of Marine Science, College of William and Mary, Post Office Box 1346, Gloucester Point, Virginia 23062, USA

Are circle hooks an effective tool for conserving marine and freshwater recreational catch-and-release fisheries?

S.J. COOKE[a,*] and C.D. SUSKI[b]

[a] *Centre for Applied Conservation Research, Department of Forest Sciences, University of British Columbia, Vancouver, British Columbia, Canada*

[b] *Department of Biology, Queen's University, Kingston, Ontario, Canada*

CIRCLE HOOKS IN COMMERCIAL, RECREATIONAL, AND ARTISANAL FISHERIES: RESEARCH STATUS AND NEEDS FOR IMPROVED CONSERVATION AND MANAGEMENT

Joseph E Serafy, Steven J Cooke, Guillermo A Diaz, John E Graves, Martin Hall, Mahmood Shivji, and Yonat Swimmer

A Comparison of Circle Hook and "J" Hook Performance in Recreational Catch-and-Release Fisheries for Billfish

ERIC D. PRINCE, MAURICIO ORTIZ, AND ARIETTA VENIZELOS

National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149, USA

Large circle hooks and short leaders with fixed weights reduce incidence of deep hooking in angled adult red drum

George H. Beckwith Jr.[a], Peter S. Rand[b,*]

[a] *Down East Guide Service, P.O. Box 403, Oriental, NC 28571, USA*
[b] *The Wild Salmon Center, 721 NW 9th Avenue, Suite 280, Portland, OR 97209, USA*

Received 29 December 2003; received in revised form 2 July 2004; accepted 2 August 2004

Caveats

Mouth morphology, feeding behavior, bait type, etc. can change circle hook effectiveness (Cooke et al. 2003, Matlock et al. 1993)

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- Only Red Drum fully studied in North Carolina (Beckwith and Rand 2005)

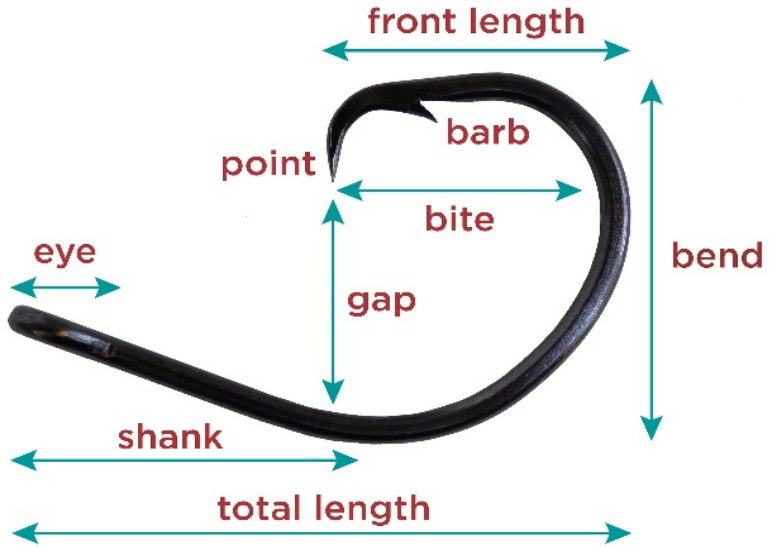
Studies on treble hooks are inconclusive (Matlock et al. 1993; Stunz and McKee 2006)

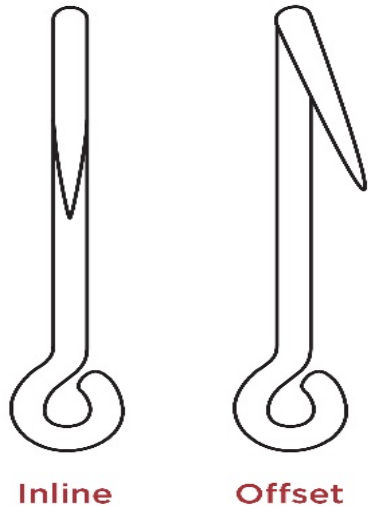
What is a Circle Hook?

- "*A hook with the point turned perpendicularly back to the shank to form a generally circular or oval shape*." – National Marine Fisheries Service

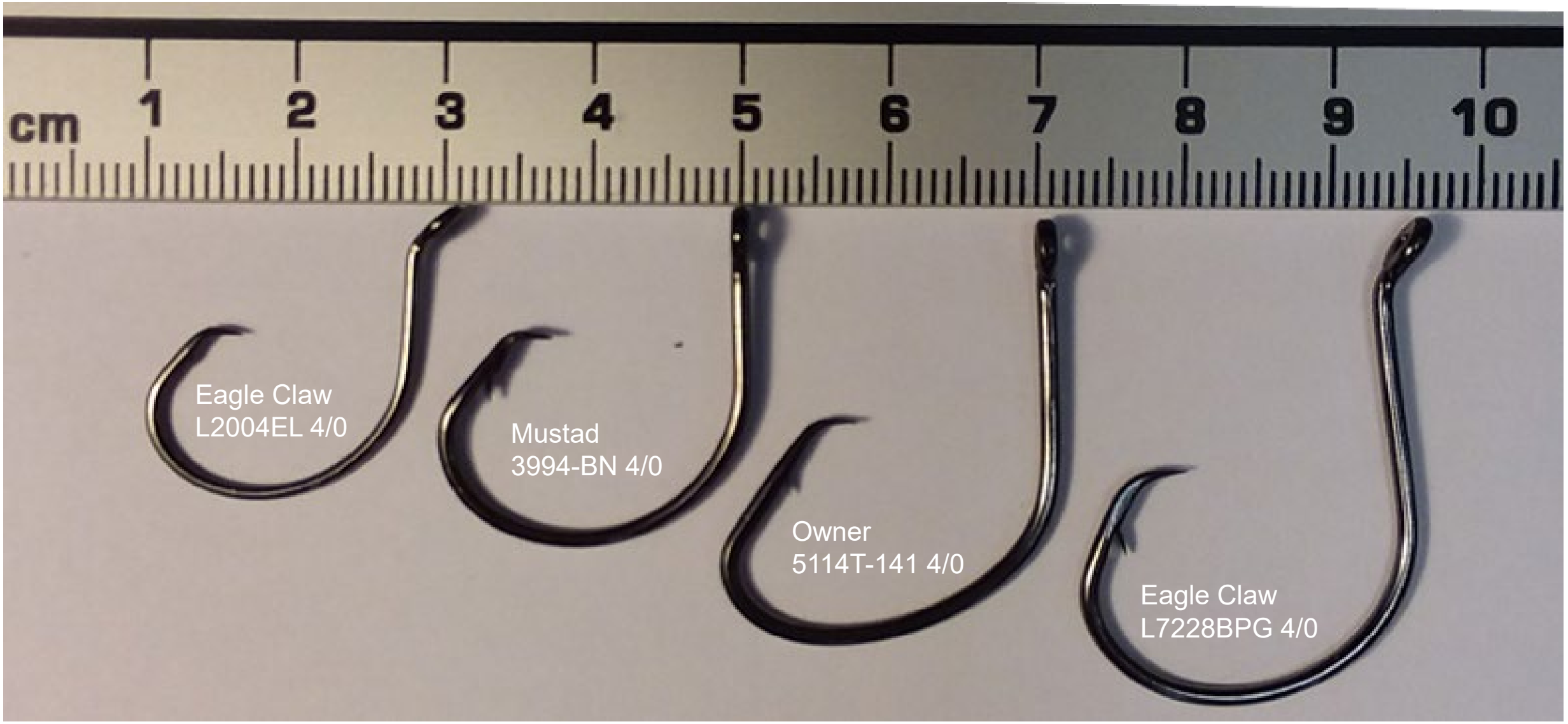
- "A hook with the point of the hook directed perpendicularly back toward the shank, and with the barb either compressed or removed" – North Carolina Marine Fisheries Commission rule

- "Non-offset hook with the point turned perpendicularly back to the shank." – Atlantic States Marine Fisheries Commission





Does size matter?



Current "Hook" Management

Atlantic States Marine Fisheries Commission requires use of non-offset, corrodible circle hooks when fishing for sharks; use of circle hooks when targeting striped bass in the Ocean

- **Must implement by 2020**

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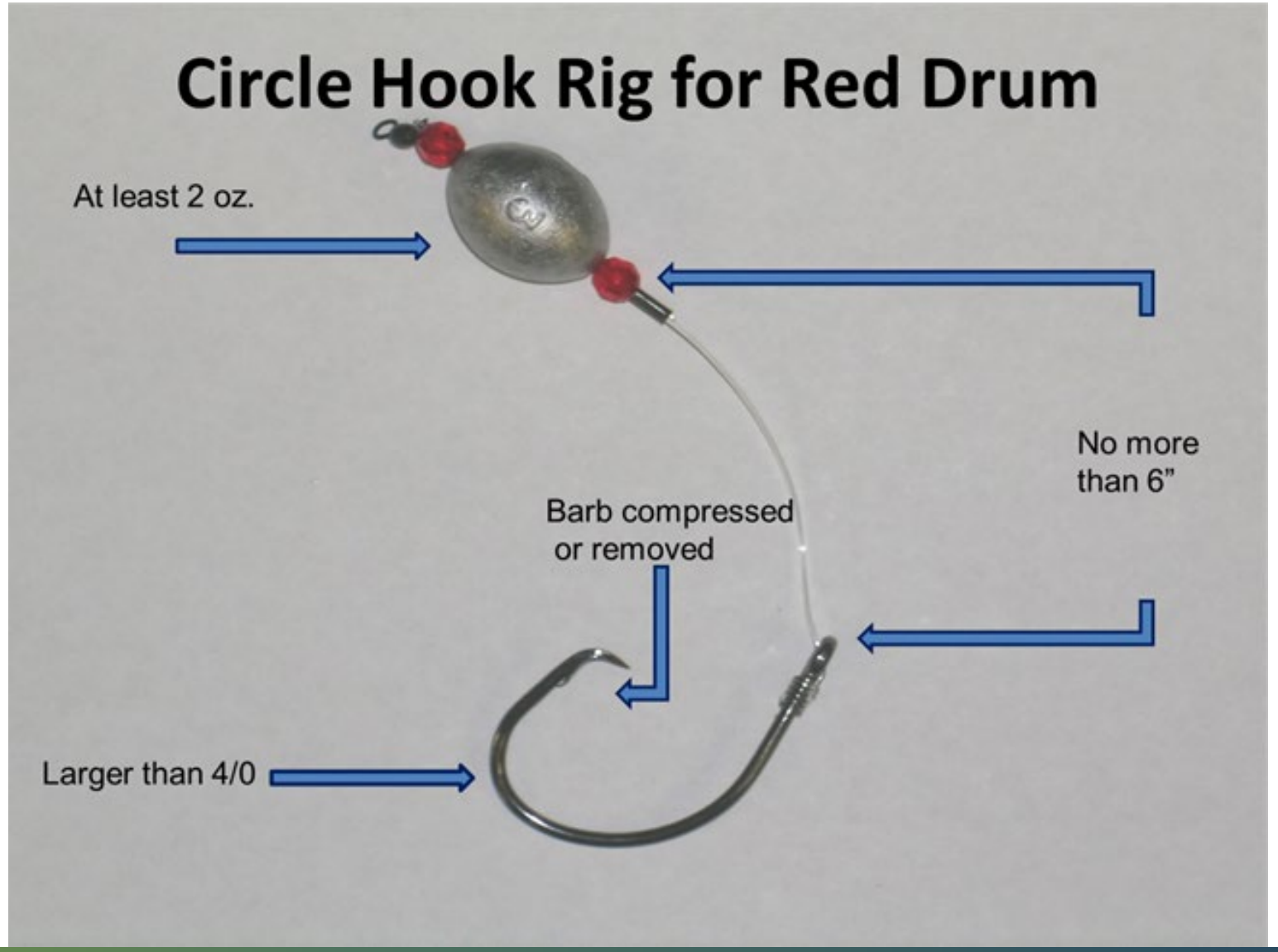
Marine Fisheries Commission requires use of circle hooks in Pamlico sound for Red Drum

MFC Rule:15A NCAC 03J .0306



Management considerations

1. Enforceability
2. Gear Availability
3. Exclusions
4. Education
5. Conservation benefits

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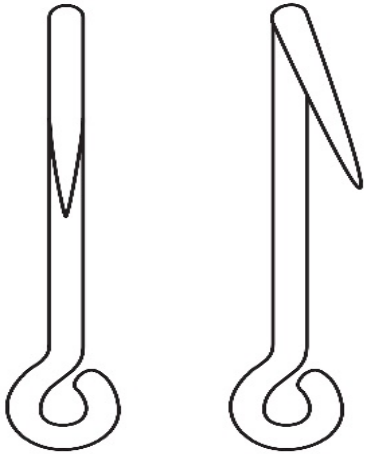
1. Enforceability

Clear definition of circle hook

- Offset? Barbless?

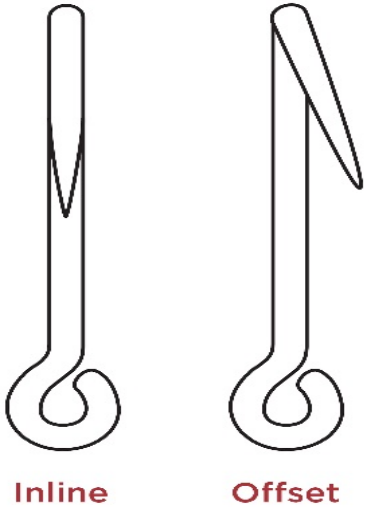


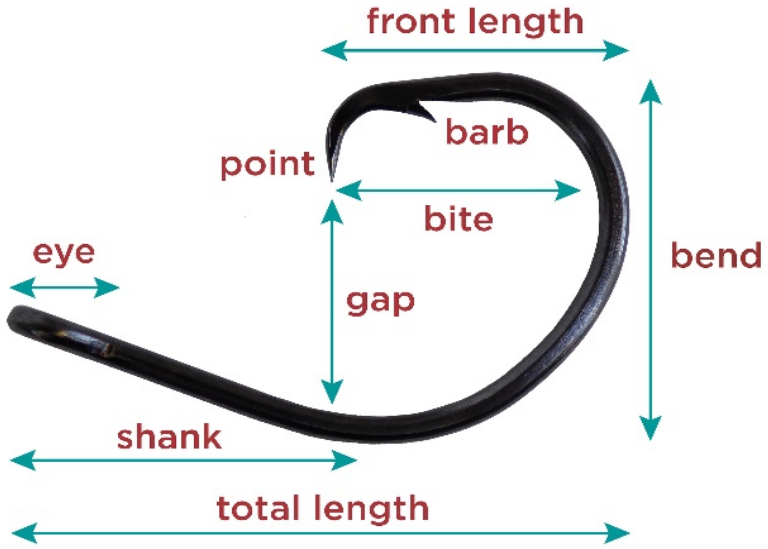
1. Enforceability

Clear definition of circle hook

- Offset? Barbless?

Hook size? → Other measurement, i.e. gap





1. Enforceability

Clear definition of circle hook

- Offset? Barbless?

Hook size? → Other measurement, i.e. gap

Natural bait definition

- Live? Dead? Synthetic?

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Are circle hooks readily available? → YES!

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Do they comply with requirements? → Depends

- Inconsistency within industry
- Measurements not on packaging

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Barbless treble hooks not readily available

- Anglers can modify?
- Inline alternatives?

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3. Exclusions

Are there fisheries that may need to be excluded?

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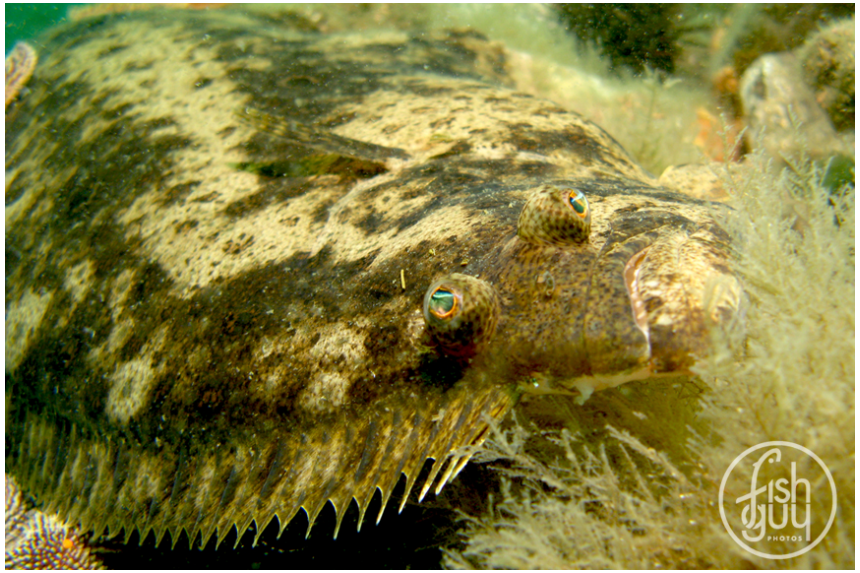
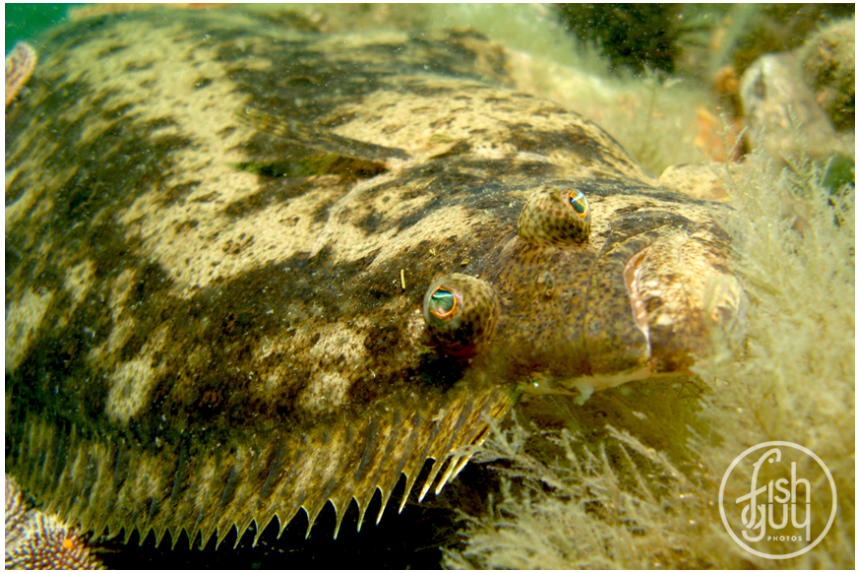


3. Exclusions

Are there fisheries that may need to be excluded?

- Mouth morphology?
- Feeding behavior?
- Fishing Technique?



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Fish handling and angler inexperience can also lead to post-release mortality (Stunz and McKee 2006)

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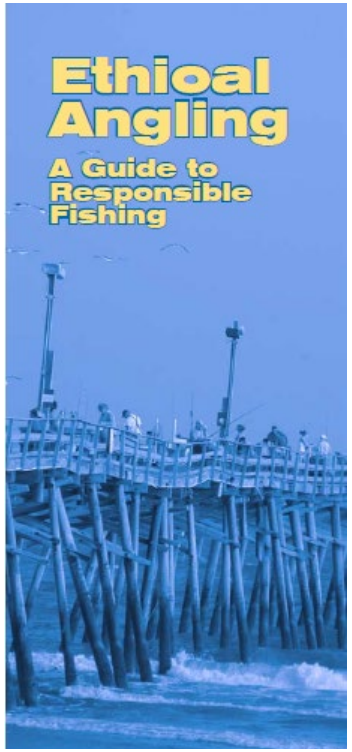
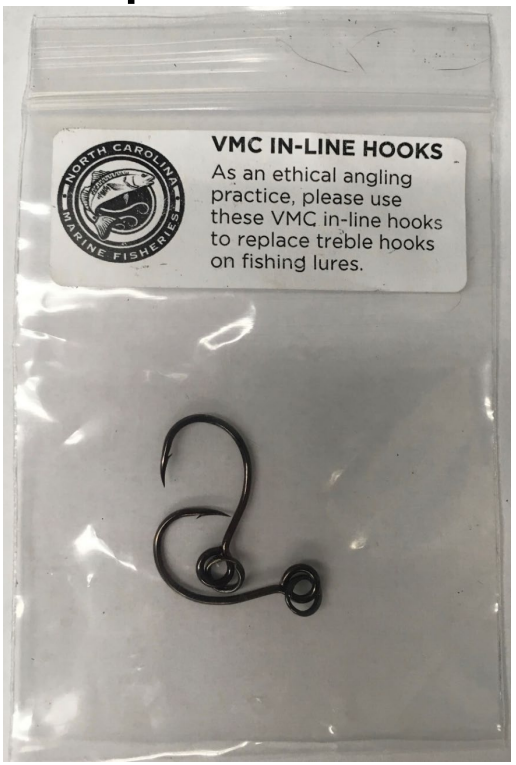
Education leads to change in behavior i.e. compliance

- New regulations
- Educate in new techniques





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Obvious but difficult to quantify

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Research and monitoring

- Species specific survival
- Hook sizes
- Compliance survey

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Comprehensive management through Fishery Management Plans

- Species specific evaluation

Questions?