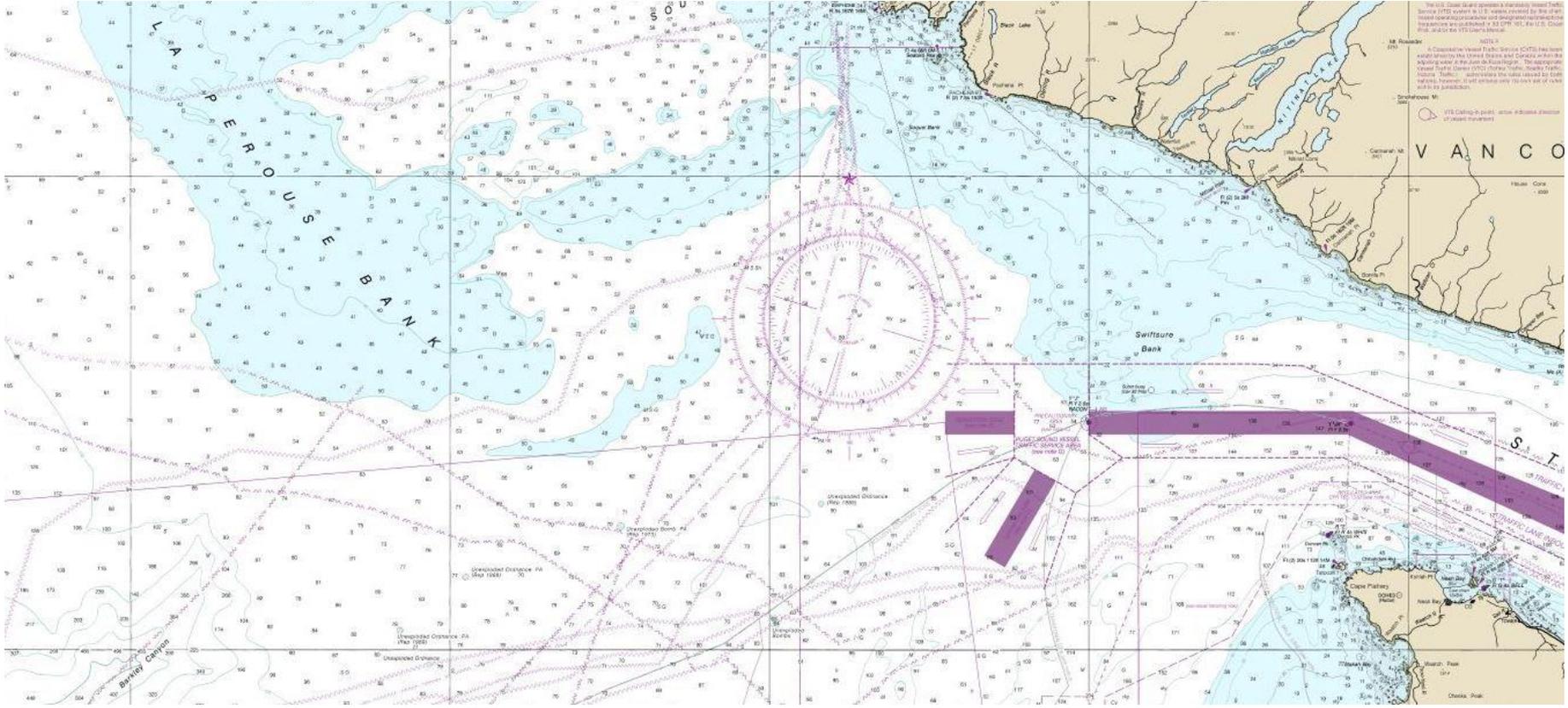




MAKAH TRIBE

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The U.S. Coast Guard operates a Mandatory Vessel Traffic Service (VTS) system in U.S. waters covered by the present operating procedure and navigational maintenance program as established in 43 CFR 901.401-2, Coast Pilot, and in VTS User Manual.

18.000000
123.000000

A Cooperative Vessel Traffic Service (CVTS) has been established between the United States and Canada in the adjoining waters of the Juan de Fuca Region. The appropriate vessel traffic center (VTC) for the United States (Pacific) waters, Traffic, is accessible to the radio calls used by both national flagships. It will operate only 24 hours a day, subject to conditions.

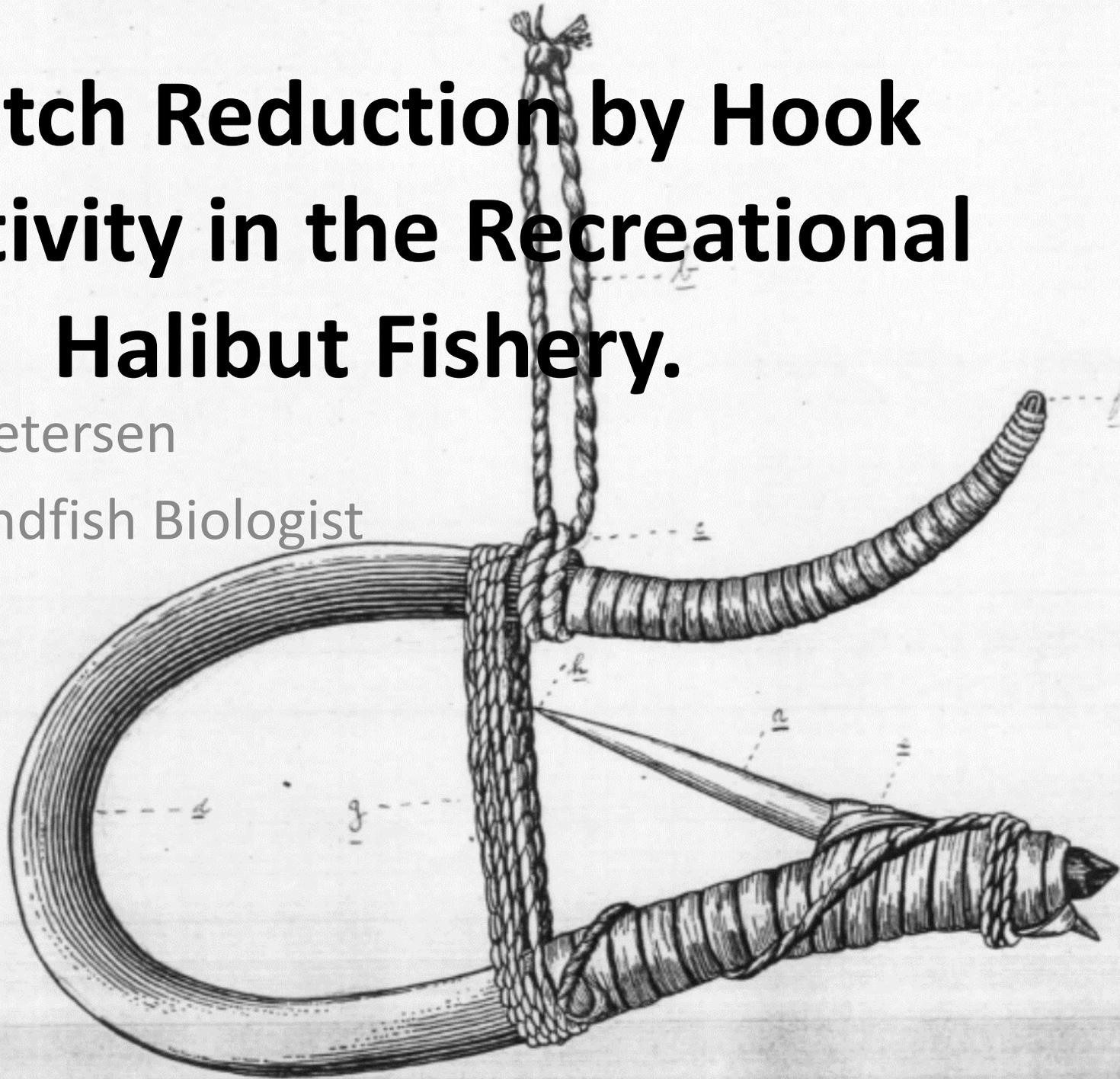
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VTS (Call-in) point, under a distance restriction of 1000 meters

Bycatch Reduction by Hook Selectivity in the Recreational Halibut Fishery.

Joe Petersen

Makah Groundfish Biologist



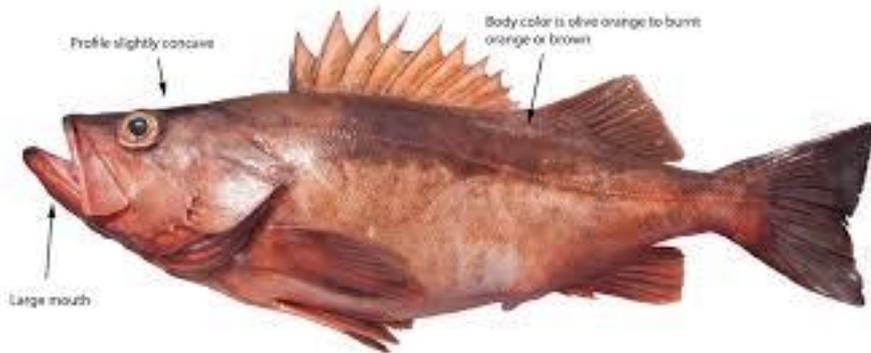
Bycatch

- Bycatch is a fish or other marine species that is unintentionally caught while fishing for a different species.
- Small fish of the same species that are not retained are also bycatch.
- Many fisheries are limited by bycatch quotas and not the quotas of the targeted species.



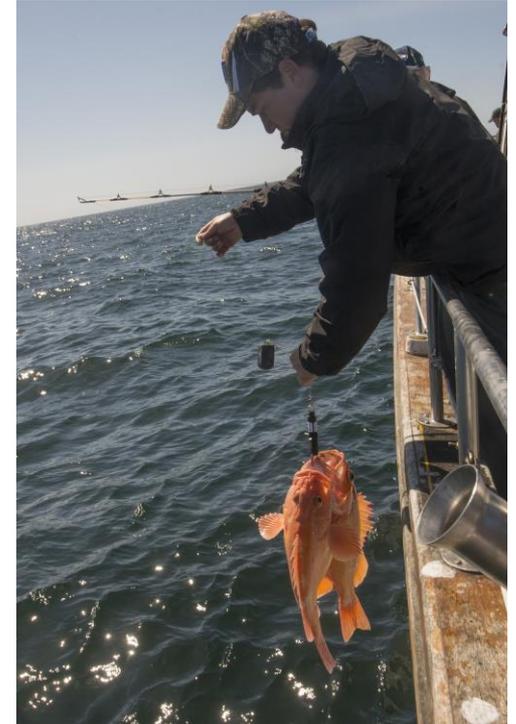
What are Washington's Bycatch Concerns?

- Yelloweye rockfish
- Canary rockfish
- Boccacio – Puget Sound



How do I Reduce my Impact on Bycatch?

- Barbless hooks for salmon help reduce the damage caused by hooks.
- Rockfish descending devices exist to get non-targeted rockfish back to depth quickly.
- Net the fewest fish possible, if at all possible never net a fish you think you may release.



Hook Selectivity

- Avoiding hooking non-target fish significantly reduces bycatch mortality.
- Fishermen may use larger hooks to avoid small fish.
- My project uses historical fishing methods and common fishing practices to test the hook selectivity between two different hook types.

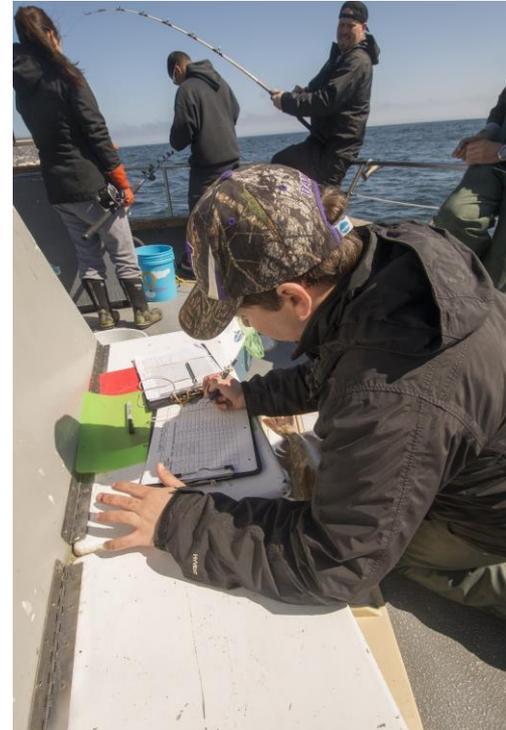
Circle Hook

- Introduction into the halibut fishery in the mid 1980's
- Significantly decreases bycatch mortality vs. J hooks.
- Typically hooks corner of mouth or on the lip of the fish.



Study Design

- We were able to attain funding to charter a charter boat capable of fishing up to 12 people for 17 days on the water.
- $\frac{1}{2}$ the anglers fish with a circle hook.
- $\frac{1}{2}$ the anglers fish with a čibu·d.
- Every 30 minutes anglers rotate around the boat and switch hook types.
- All bait on hooks were identical.
- All halibut that were assessed in viable condition were released halibut that were not viable were donated to the Makah senior center.















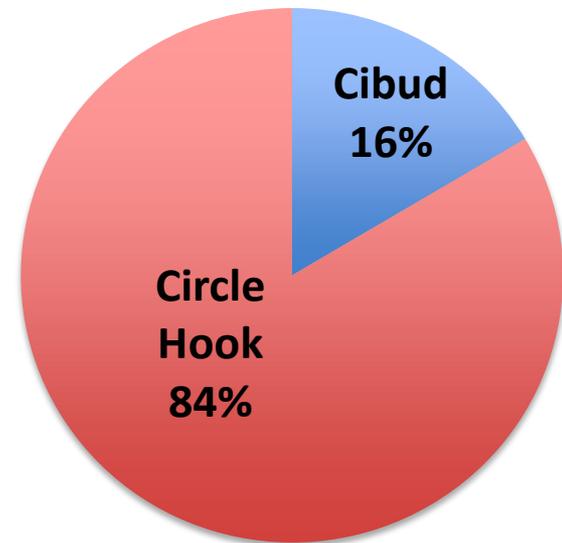


Results

- 516 fish total were landed in the study.
- 85 on čibu·d and 431 on circle hooks.

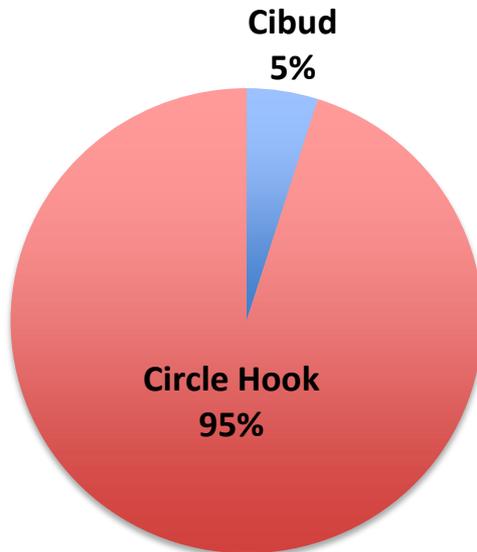


Total Catch

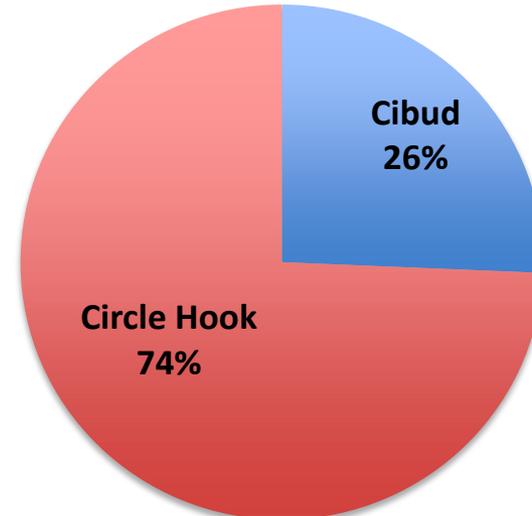


Differences in Catch Between Hook Types

Percentage of Total Bycatch



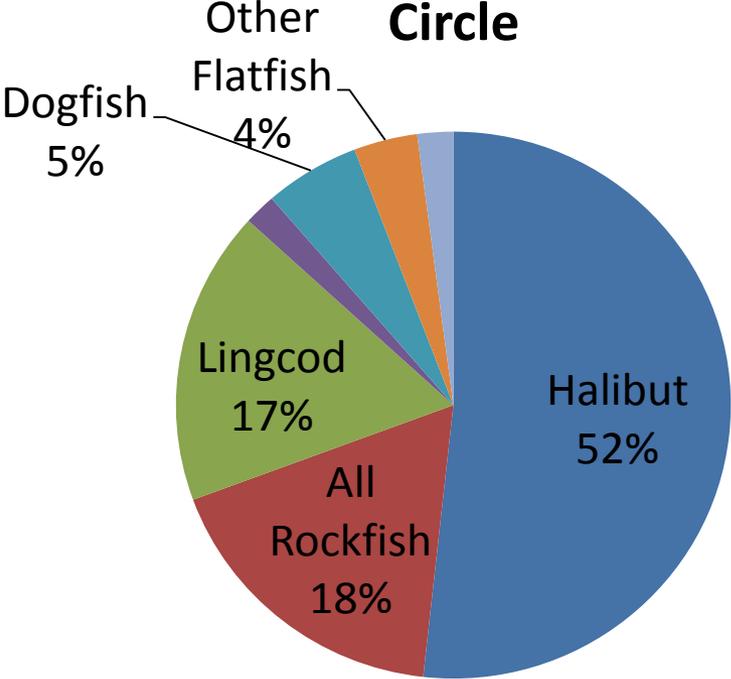
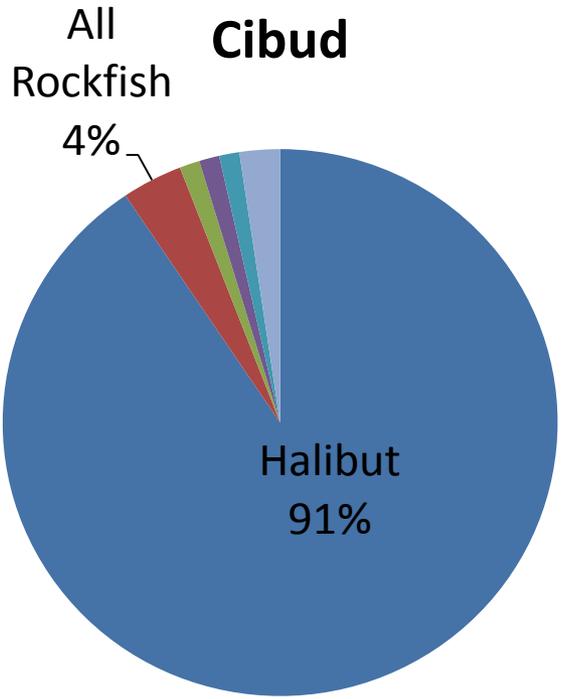
Percentage of Total Halibut Landed



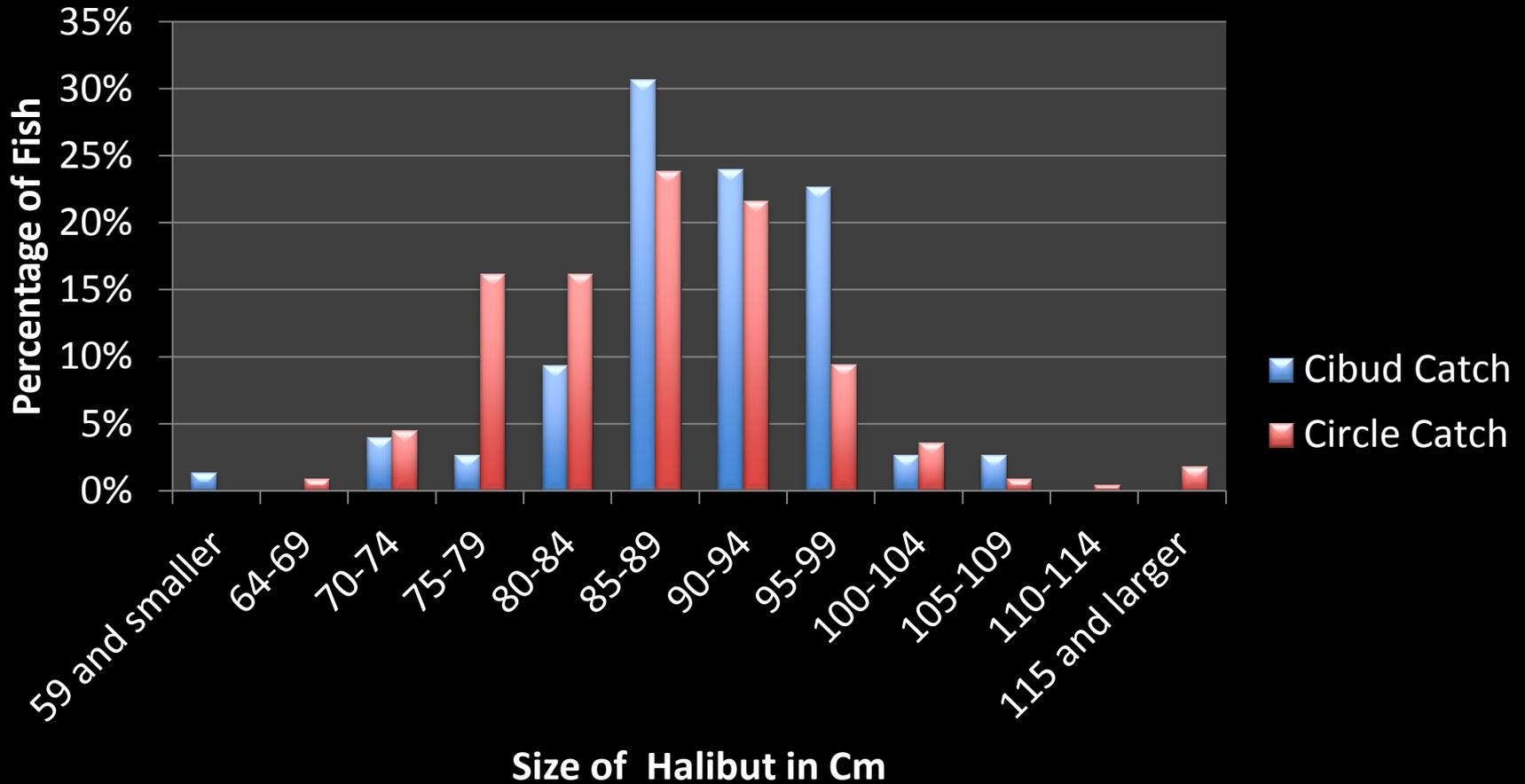
Of the 300 halibut landed in the study 78 halibut were landed on a čibu·d and 222 were landed on circle hooks. Our permit allowed for interaction with 300 halibut, once we had interacted with 300 halibut the study ended.

Twenty halibut were killed in the course of this study, 11 hooked on circle hooks and 9 hooked on čibu·d. Fish handling was the main cause for halibut mortality.

Species Landed by Hook Type

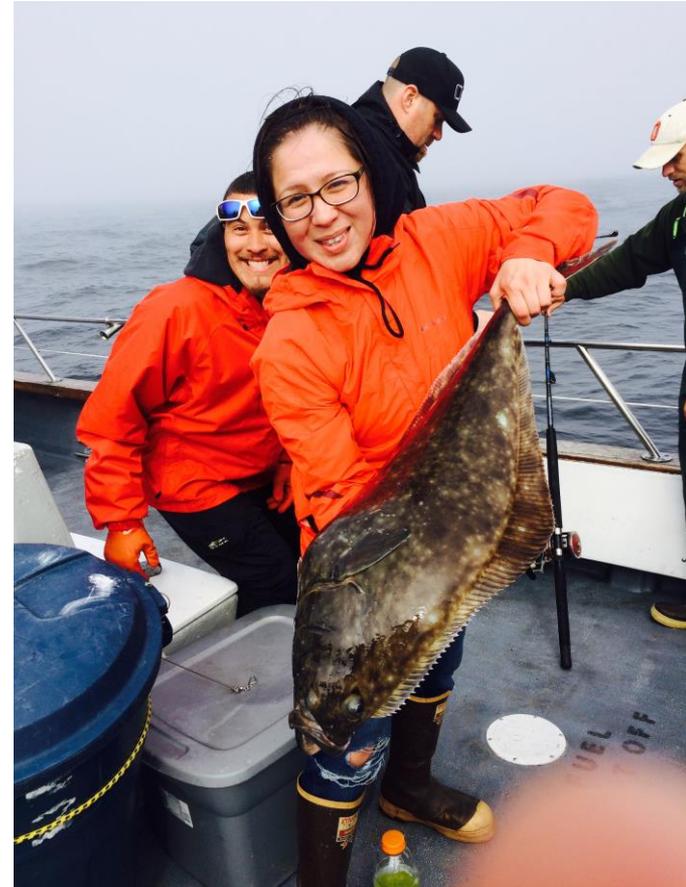


Size Distribution of Halibut by Hook Type



Trends in Size of Fish Between Hooks

- The average size fish for a čibu·d was 85 cm, approximately 16.4 lbs.
- The average size fish on a circle hook was 82 cm, approximately 14.6 lbs.
- There is a statistically significant difference between the size distribution of halibut landed on čibu·d and circle hooks.
- Additionally, with a more robust hook design the size distribution may change even more as large halibut broke or bent the barbs on many čibu·d.



Individual Hook Performance

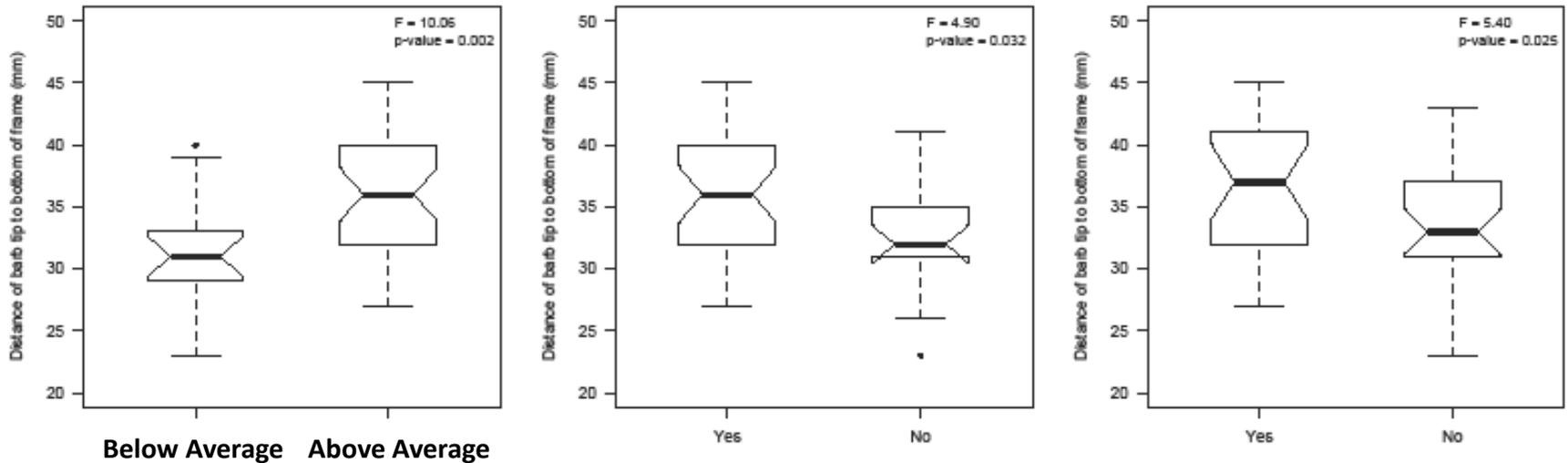
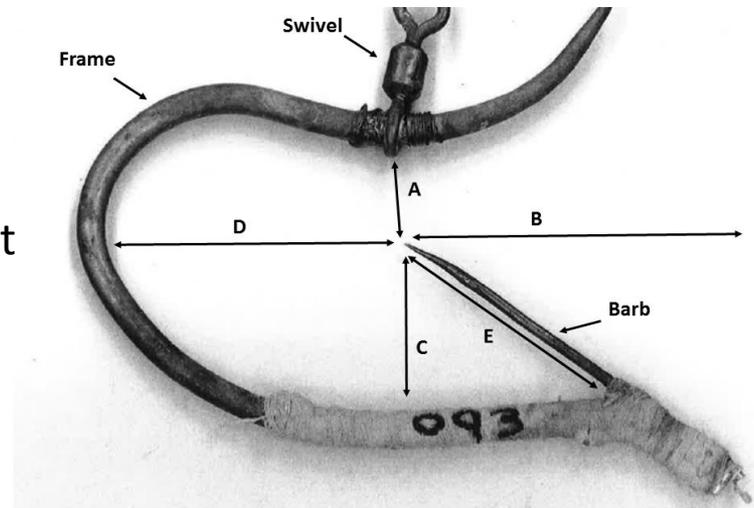


Figure 1. Observed differences in the measured distance between the barb tip and the bottom of the čibu·d frame for whether a čibu·d caught a fish (left panel), caught halibut (middle panel), and whether caught a halibut at a rate above or below the average for all čibu·d (right panel).



Limitations of the čibu·d

- The style that we used in the study all varied slightly from each other.
- The barbs were wrapped in wire and soldered on and were prone to breaking off.
- The hook barbs were thin and were prone to bending.
- A swivel was put on the top and caused a slight bump for fish trying to strike the bait.
- We had a fisherman that was so interested that he took all our complaints and built new hooks. New designs have a thicker barb and are welded in place and no longer have a swivel near the top of the hook.



Future Projects

- In 2016 we have acquired a permit to do a bait study testing different bait types while using the čibu·d. We will be conducting this study with interns this summer.
- Pending funding, we would like to test variations in čibu·d in the 2017 Spring and Summer to find a design that improves the catch rate of Pacific Halibut.
- We have already applied for funding from the Saltonstal – Kennedy Grant Opportunity.

Thank you

I would like to thank you all for your undivided attention and the invitation to present the project results.

Scordino, J., Petersen J., Monette, J., Scordino, J. (2016).
Evaluation of the čibu·d, traditional halibut hook of the Makah
Tribe, for reducing catch of non-target species in recreational
Pacific halibut fisheries. *Fisheries Research*. In review.

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