



Observing Response of Halibut to Fishing Gear

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BACKGROUND

- Bycatch can lead to overfishing which negatively impacts fish populations.
- We can reduce bycatch by studying fish behavior relative to fishing gear and by using that knowledge we can make proper modifications to current gear being used.
- This will allow for more catch of fish we want while reducing catch of fish we don't want.
- But it's difficult to study behavior of species in their natural environment.
- Underwater video addresses this challenge.

RESEARCH QUESTION

- How do California halibut (CAHB) fish-gear responses differ between a light touch trawl system (modified) and a traditional trawl system?

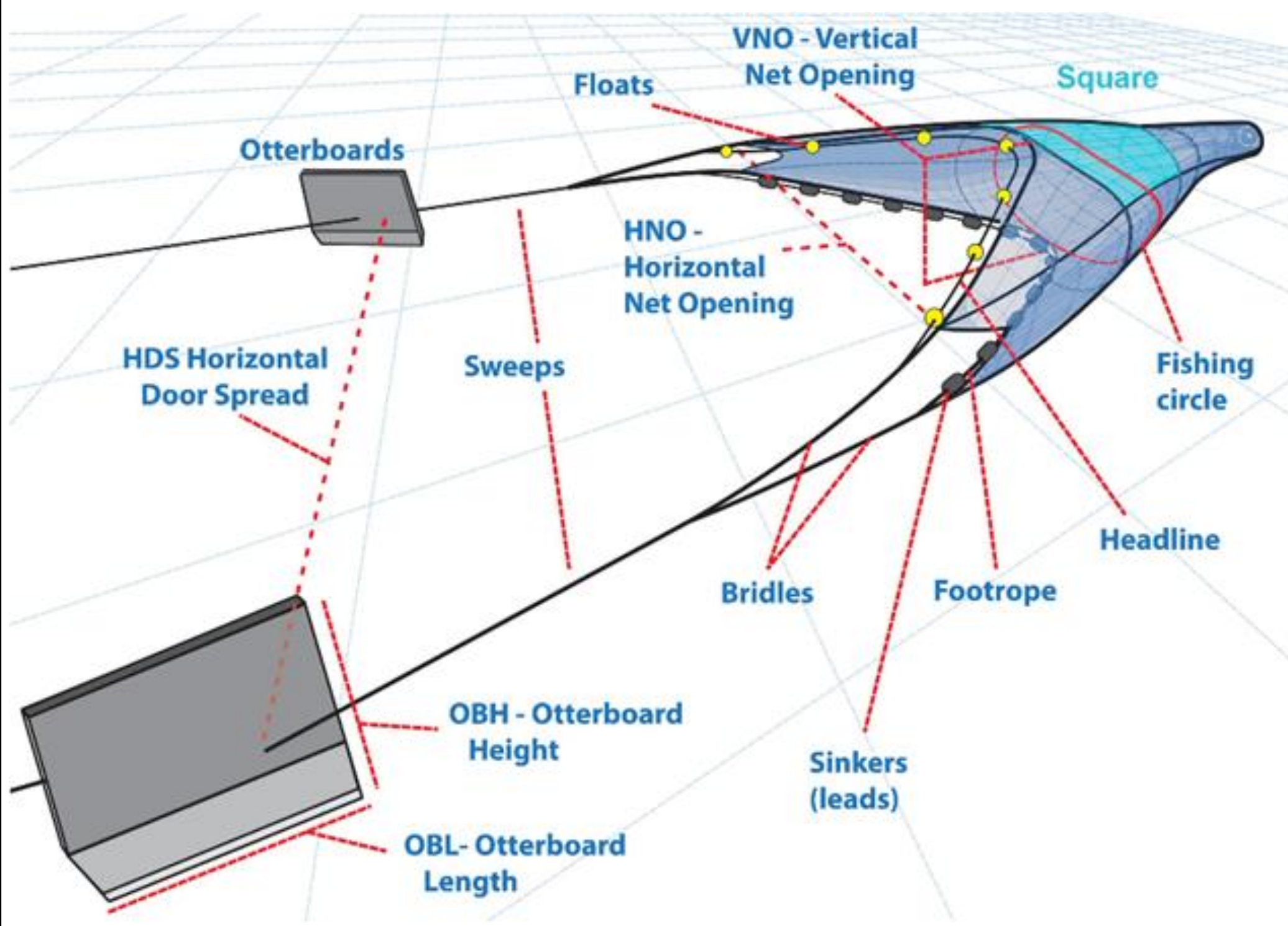
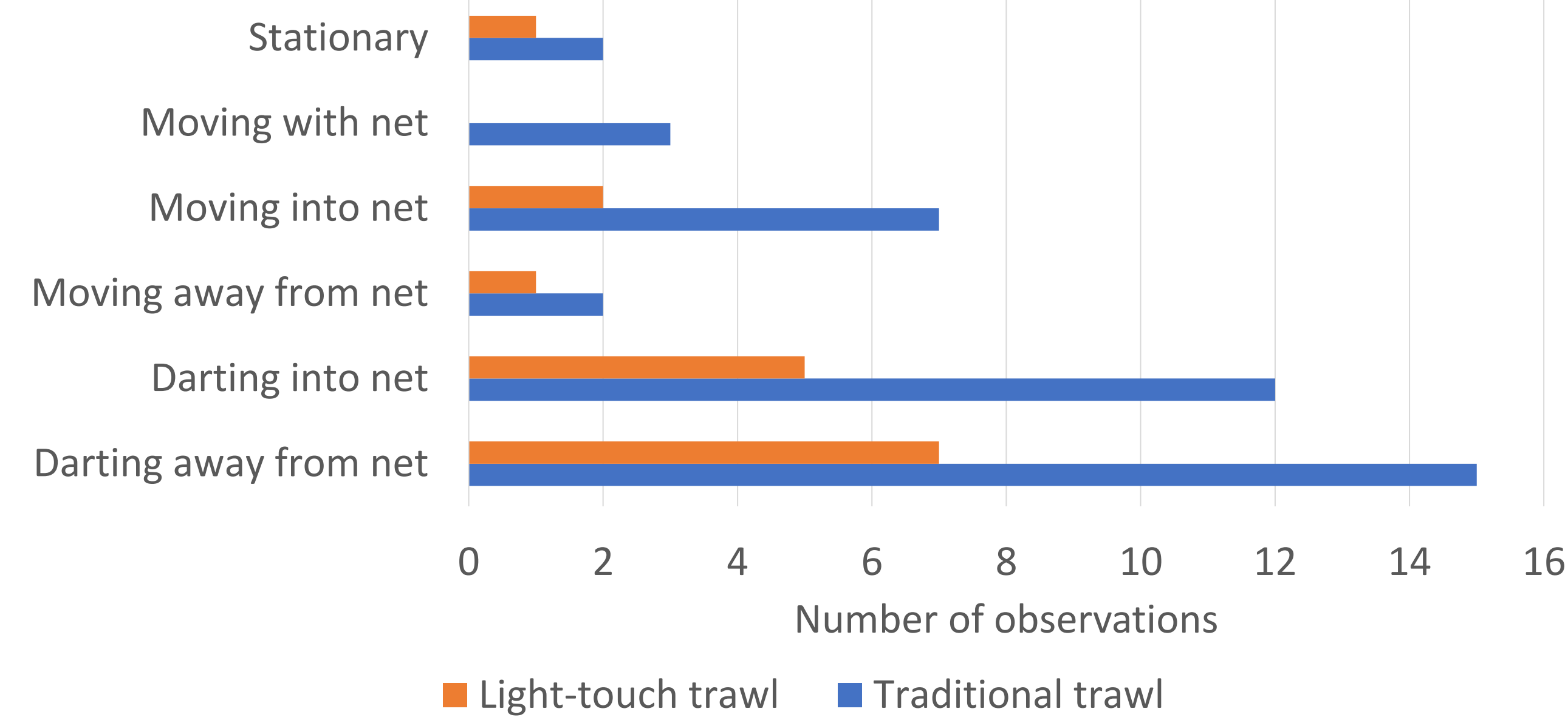


Figure 1: A diagram of a standard bottom trawl gear setup that is hauled along the ocean floor to herd and capture the targeted species. A traditional trawl will use weighted rollers on the footrope while the light touch trawl uses chain loops instead to reduce ecological damage and increase escapement of nontargeted species.

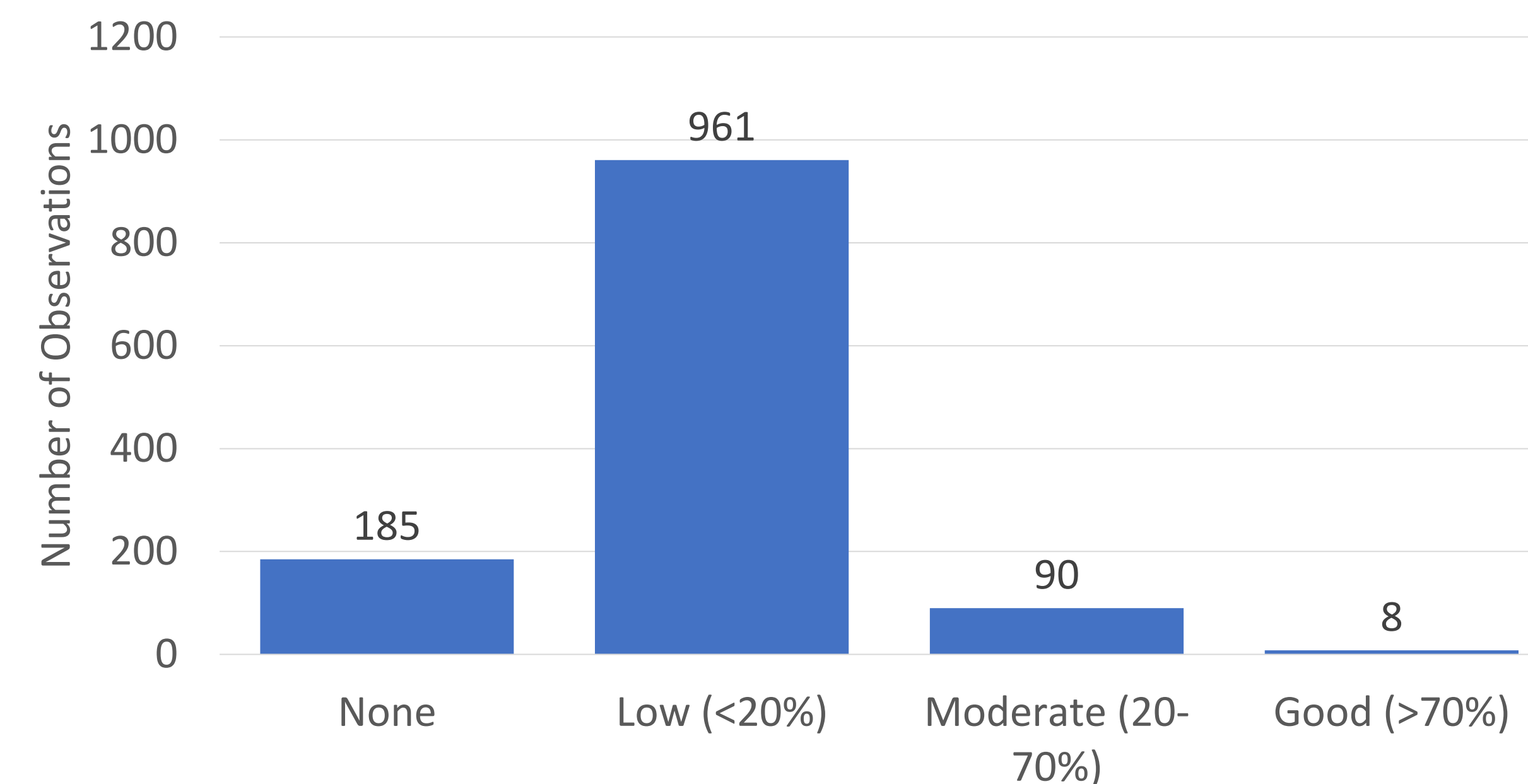
RESULTS

CAHB behavior relative to trawl type



Graph 1: Horizontal bar graph on the behaviors observed from CAHB between a light touch trawl and a traditional trawl. Total observations for the traditional trawl = 48, and the light touch trawl = 16.

Visibility During Video Observation



Graph 2: Vertical bar graph on the level of visibility entered for each observation made. Total observations = 1244.

RESULTS(continued)

- Due to technical and environmental challenges there was a lack of observations where synthesis resulted in insignificance.
- But, based on the observations made, there is no clear difference of CAHB behavior between the Light-touch trawl and the traditional trawl for this sample.
- 77.25% of total observations made were labeled "low" visibility and 14.87% were labeled "none" (Graph 2).
- Identifying observations down to their species is another challenge since identification is very difficult on video compared to sampling catch on deck.



Figure 5: a picture of some of the fishermen that have helped with this project showing the footrope of a light touch trawl.

SIGNIFICANCE

- Underwater video analysis has the potential to study fish behavior relative to fishing gear in their **natural element**.
- Further developing methods/technology involved will **improve knowledge** on CAHB (and other species observed) so modifications to fishing gear can target more CAHB while reducing bycatch/non-targeted catch of other species.
- Data on other species can be used to answer a multitude of fisheries management questions.

NEXT STEPS

- Continue with development of the project and to gather enough data to draw significant conclusions.
- Research methods to overcome the issues of visibility to achieve more consistent and accurate observations

ACKNOWLEDGEMENTS

- I would like to give a big thanks to Andre Punt, Kristine Lesyna, Benson Chow, and Susan Wang for all their help and guidance!

INTERNSHIP/METHODS

- Virtual internship with NOAA Fisheries.
- Assisted with developing the framework used to record species behavior, developed a written protocol for the next intern and analyzed underwater video.

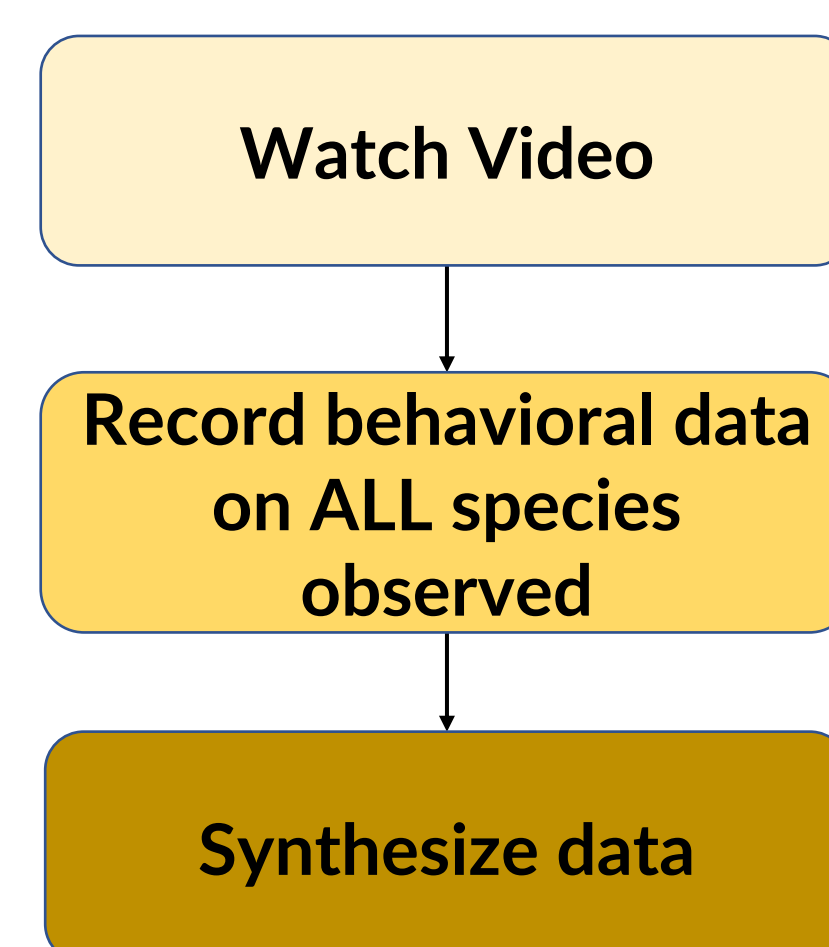


Figure 2: Flatfish species local to the area where the tows were conducted. The task of identification is more difficult when observing these species via video.

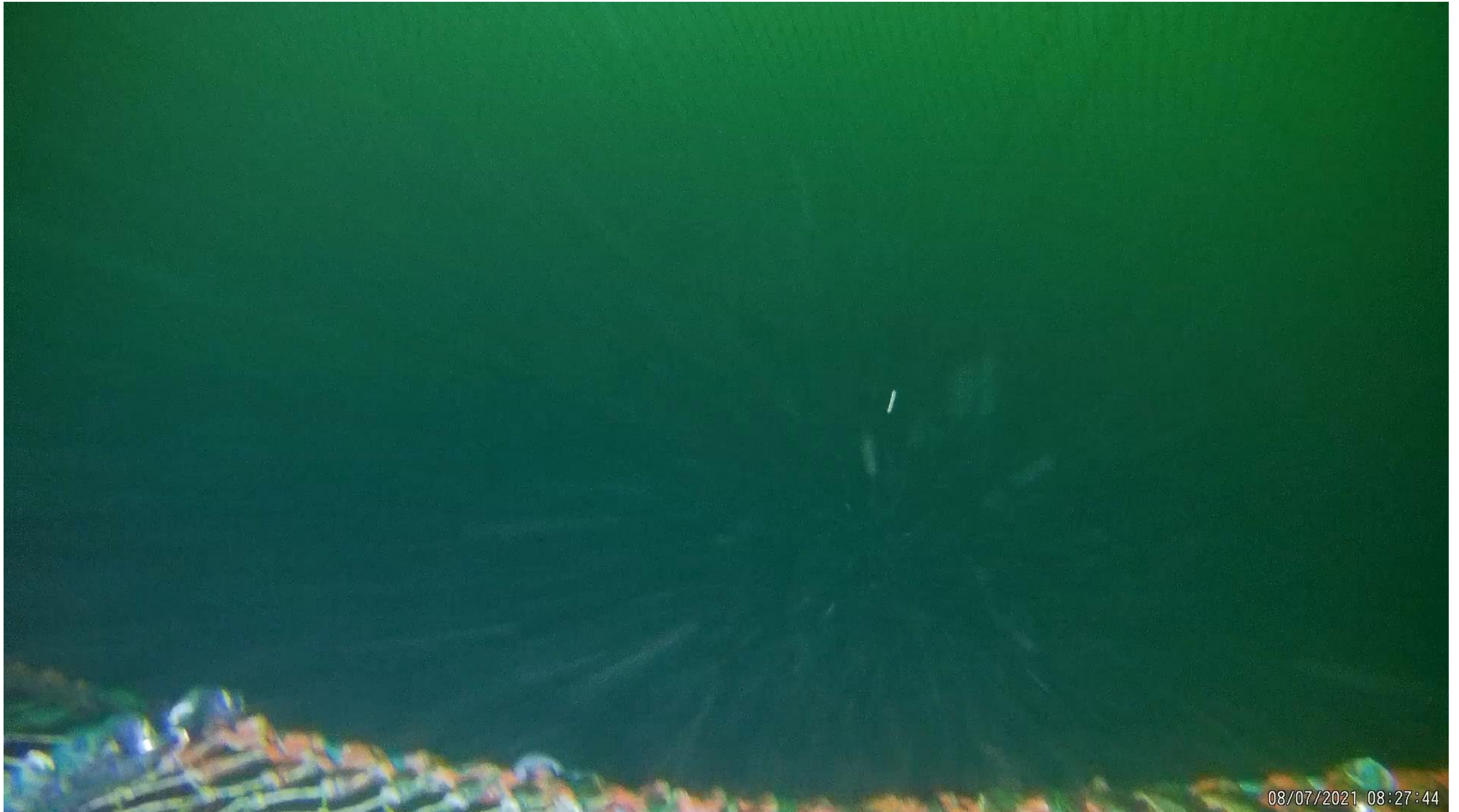


Figure 3: one of the better quality pictures that makes for easy identification of a CAHB darting into the net.

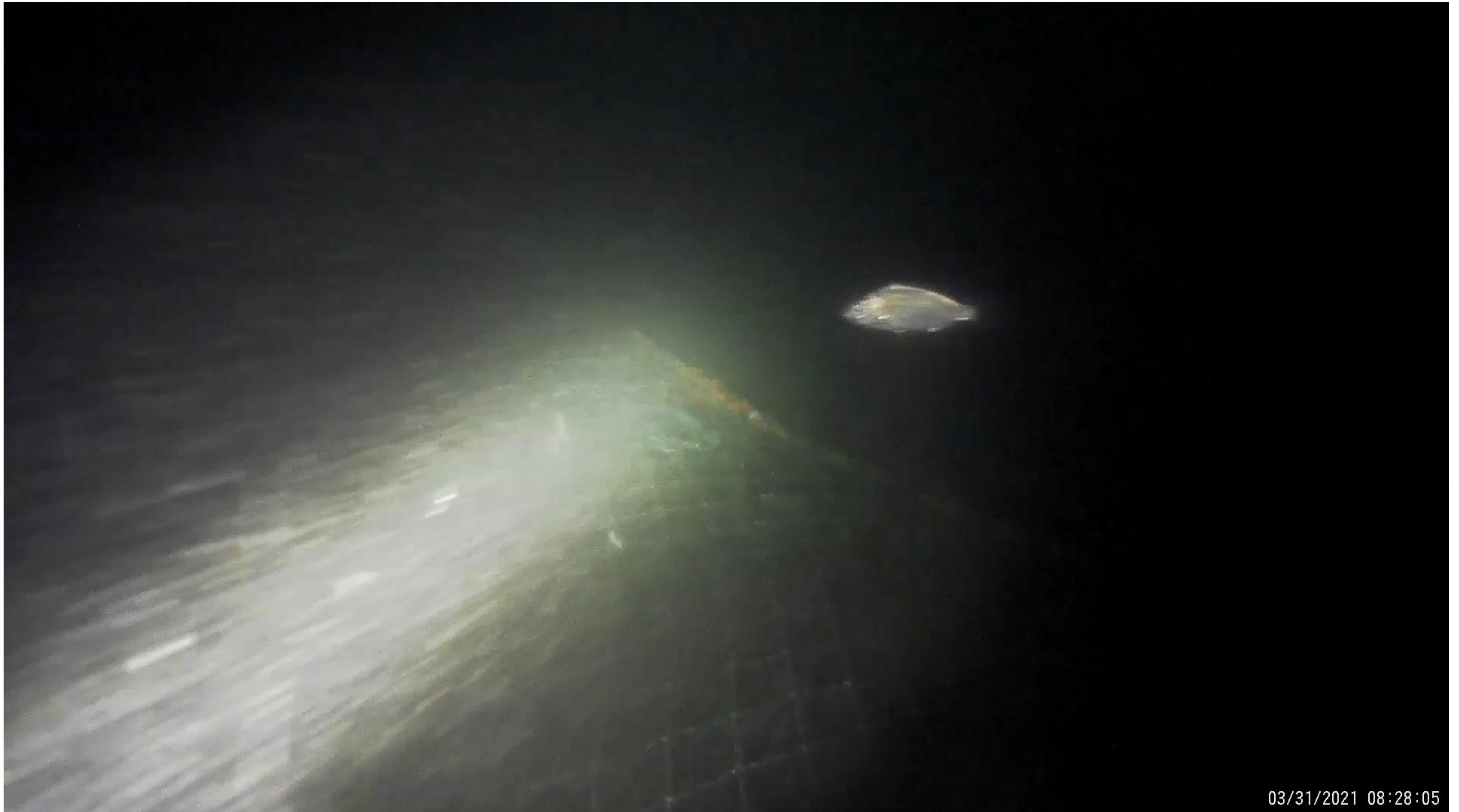


Figure 4: another one of the better quality pictures of CAHB swimming with the net.

CAHB: darting into the net



CAHB: darting into the net



CAHB: swimming with and darting away from net

