

Can Groundgear Modifications Minimize Bycatch of Flatfish

in the New England Trawl Fishery?

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The groundfish fishery in the New England region in the Northwest Atlantic has transitioned to a catch-share management system with annual catch limits for regulated groundfish. Within this management scheme, the ability to reduce bycatch of sub-legal and non-retention flatfish could allow for optimization of catch allocations while promoting sustainable fishing practices. A modified groundgear with “escape windows” was tested during two separate projects to examine if the catch of American plaice (*Hippoglossoides platessoides*) and winter flounder (*Pseudopleuronectes americanus*) could be reduced. The objective of the first project was to reduce the catch of sub-legal American plaice while maintaining commercial catches of legal plaice, while that of the second project was to minimize the catch of winter flounder, a non-retention stock, while retaining Atlantic cod (*Gadus morhua*). Comparative fishing sea trials were conducted onboard commercial otter trawl vessels in March of 2011 and April of 2012. Dimensions of the “escape windows” differed between the projects based on the varying project objectives and target species. Results indicated that the window sizes tested to reduce the catch of sub-legal American plaice were ineffective, and the use of the groundgear in conjunction with a large mesh panel resulted in a significant loss of Atlantic cod. Modified escape windows without a large mesh panel showed a reduction in the catch of the flatfish and juvenile Atlantic cod while maintaining catch rates of legal sized cod. Continued research is warranted to refine groundgear modifications for effective bycatch reduction.

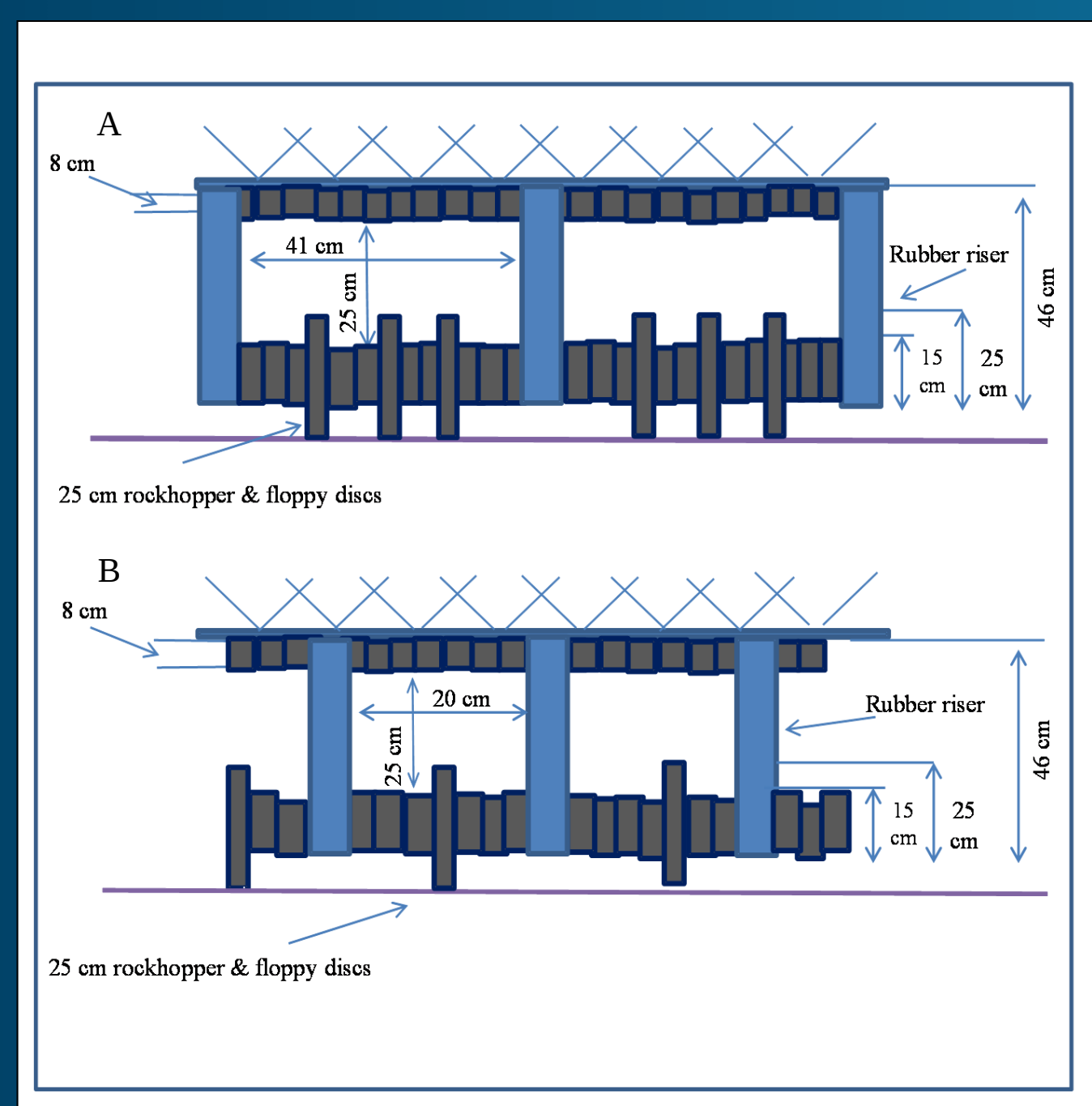
American Plaice



Objectives

- ❖ Separate legal and under-sized American plaice
- ❖ Maintain commercial catch rates of legal American plaice

Gear



Reidar's Manufacturing Inc. riser groundgear with “escape windows” was tested in two configurations (A & B).

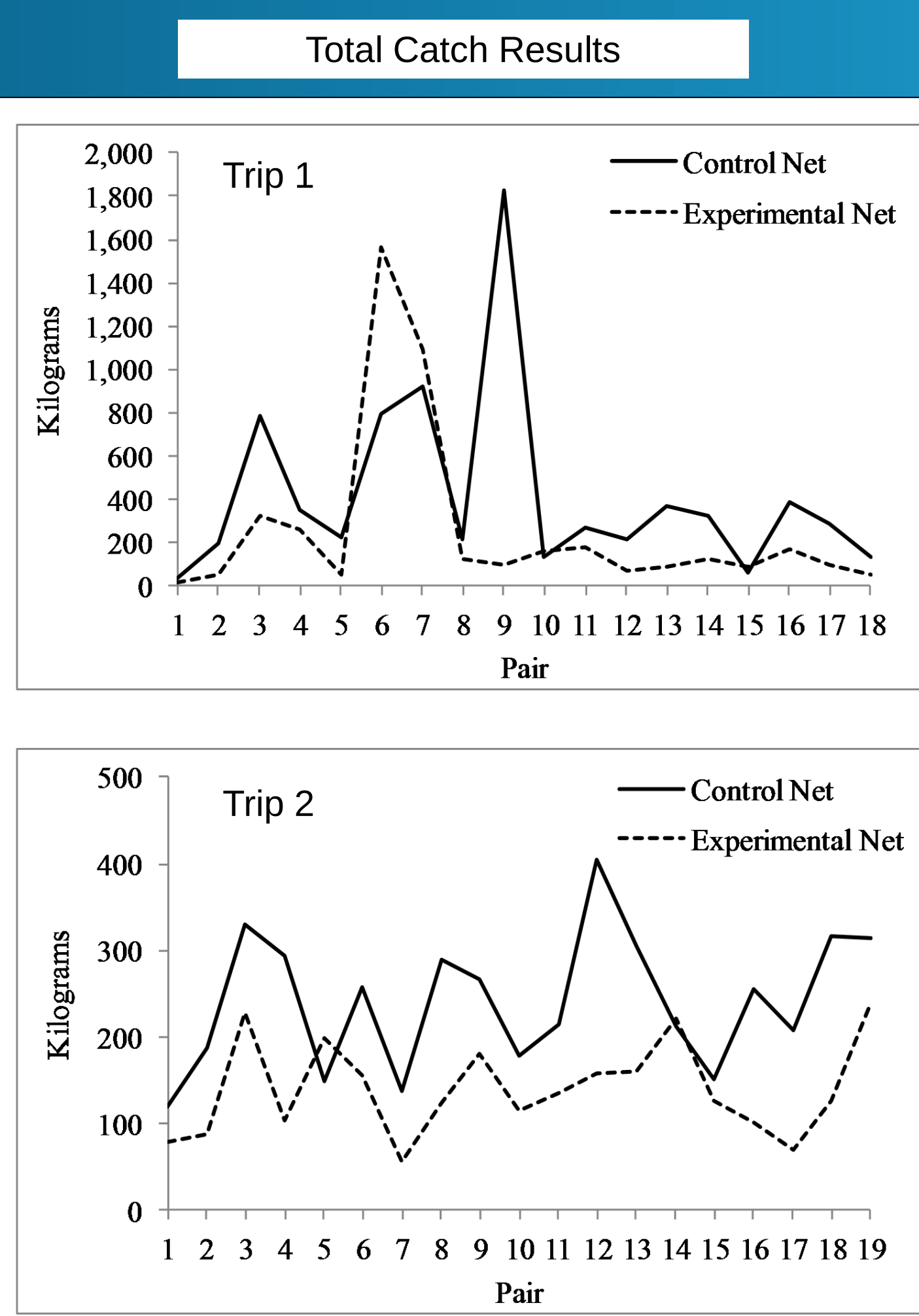
- ❖ Gear A had “escape windows” of 41 cm by 25 cm
- ❖ Gear B reduced the width of the “escape windows” with a window of 20 cm by 25 cm

Results

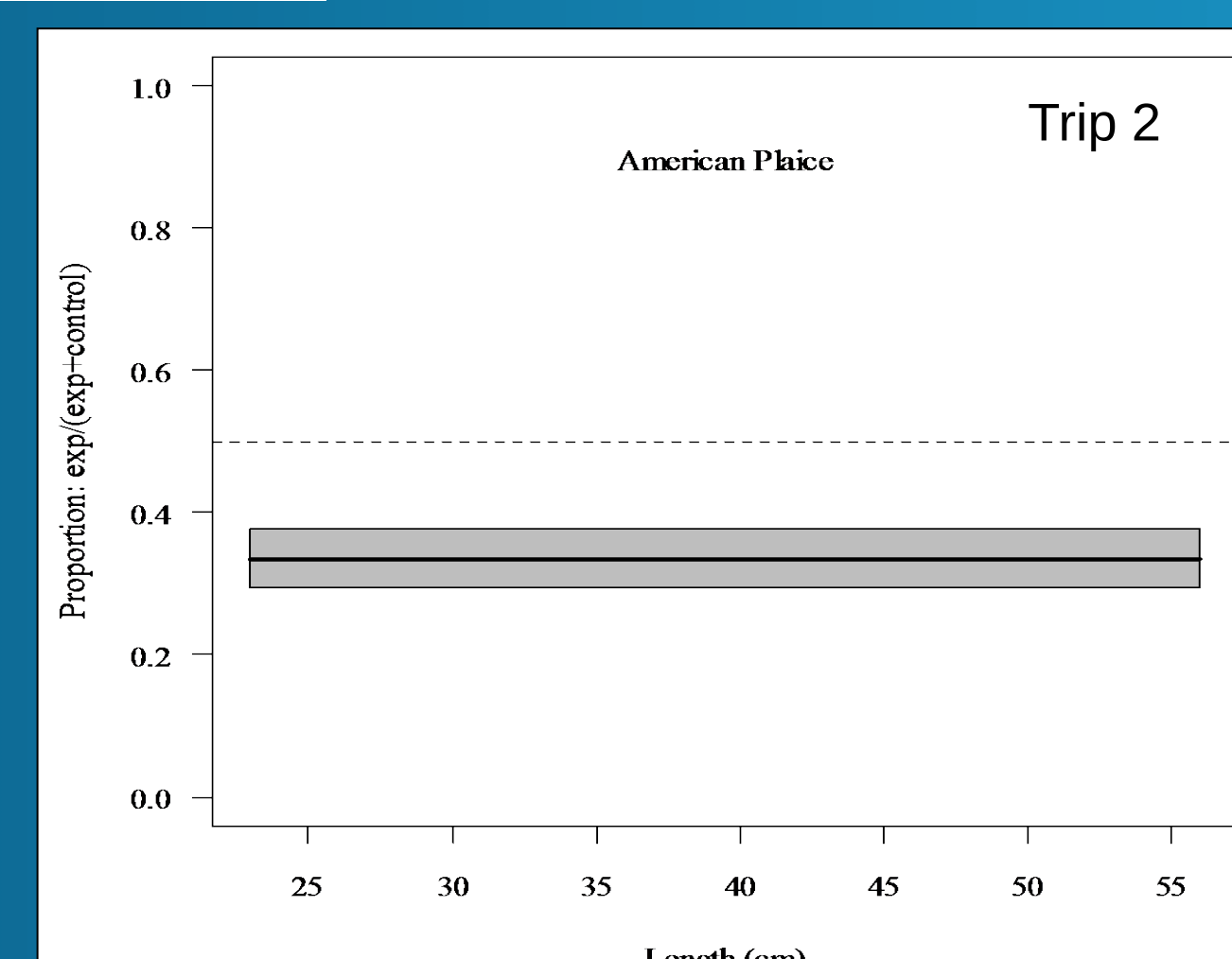
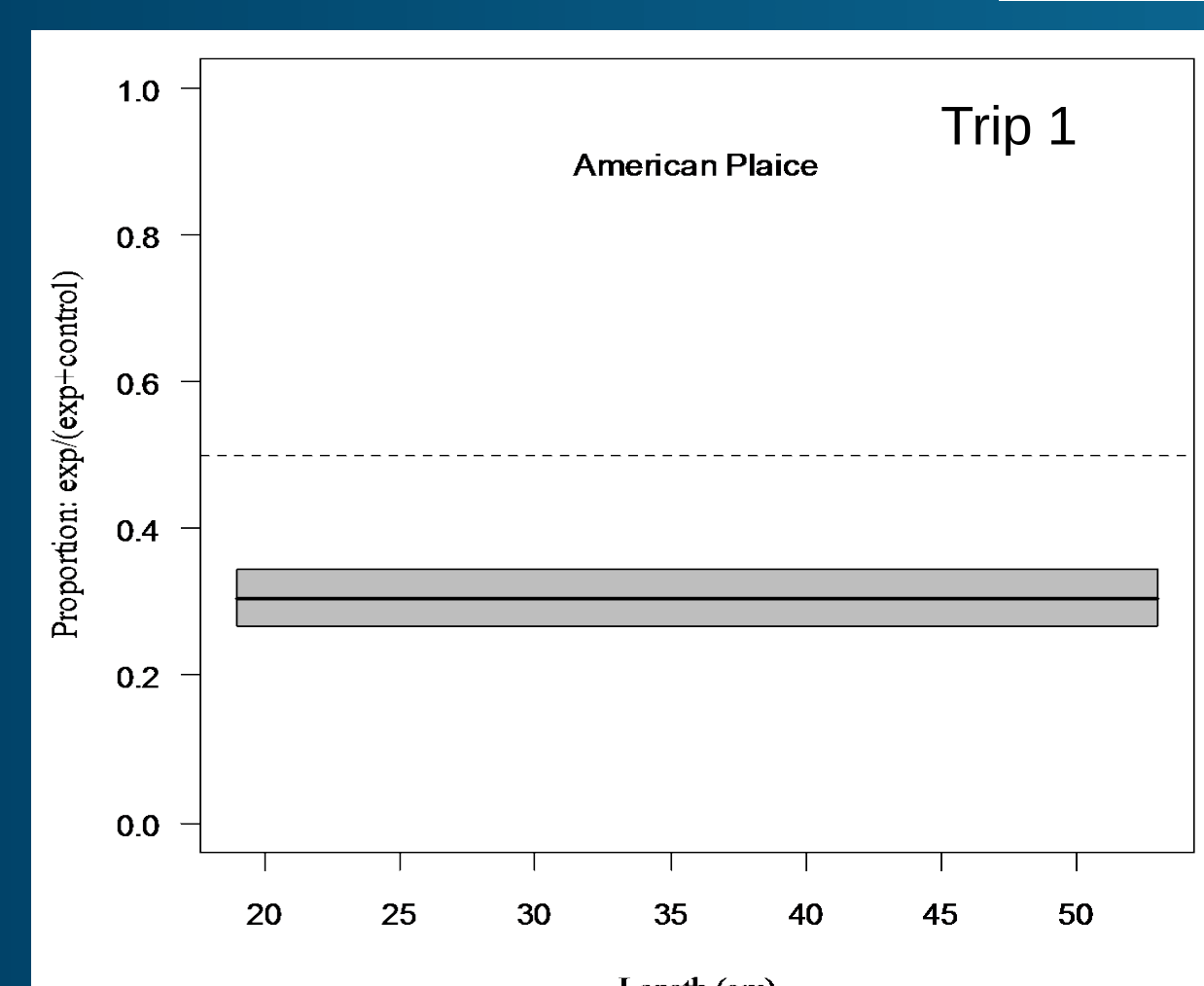
For both trips

- ❖ Significant decreases in total catch for the majority of commercial species
- ❖ Significant decrease in the catch of legal & sub-legal American plaice
- ❖ Generalized linear models (GLMM) showed that the experimental gear had a lower constant relative efficiency for all sizes of American plaice

Changes to the “escape window” width did not affect catch rates, separation or relative efficiency for American plaice



GLMM Results



GLMM modeling of mean proportions of fish retained in relation to length. Dashed horizontal lines (0.5) indicate that the catch efficiency is the same between the experimental net and the control net. The experimental net is less efficient if the proportion is less than 0.5. Shaded area indicate 95% confidence level.

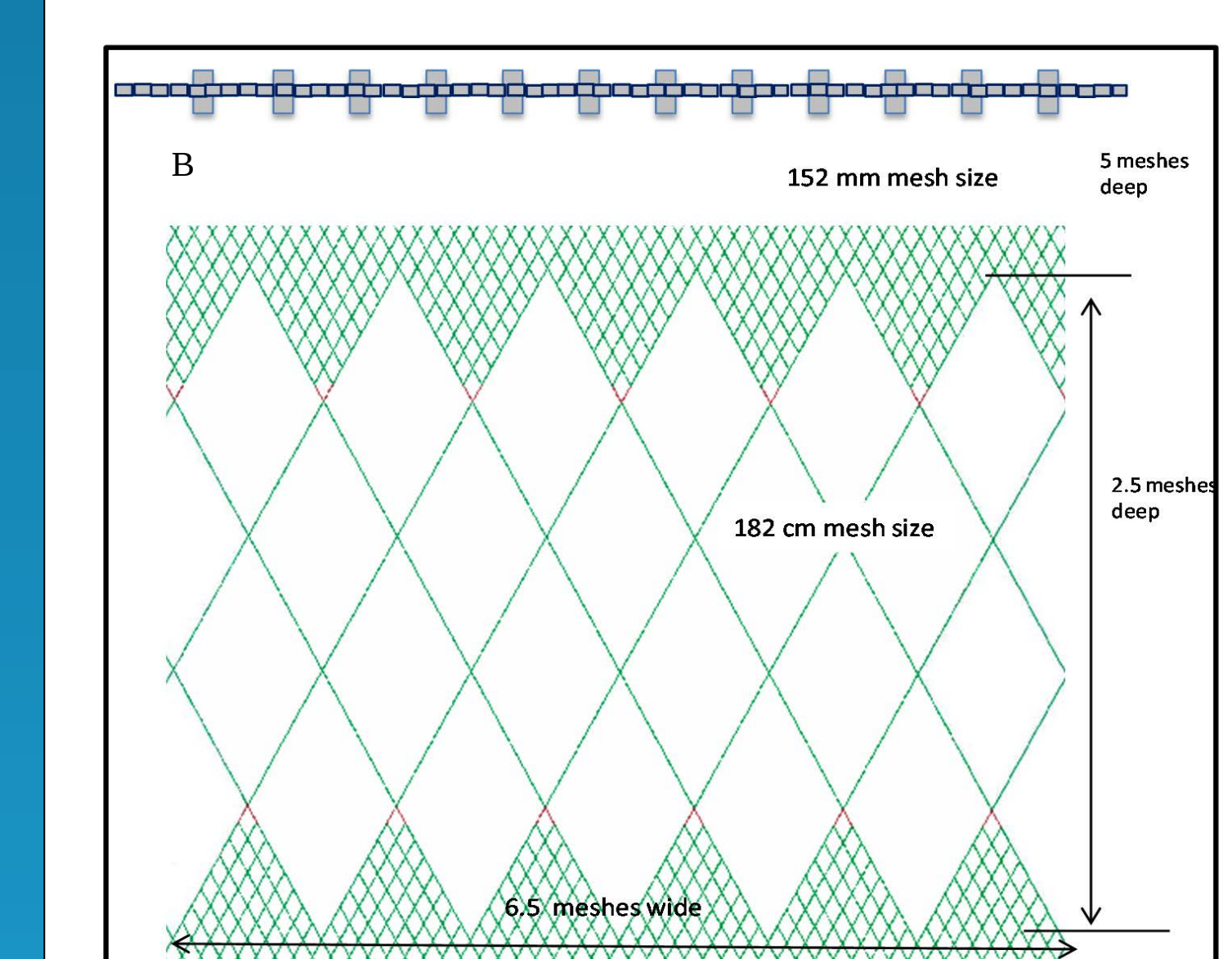
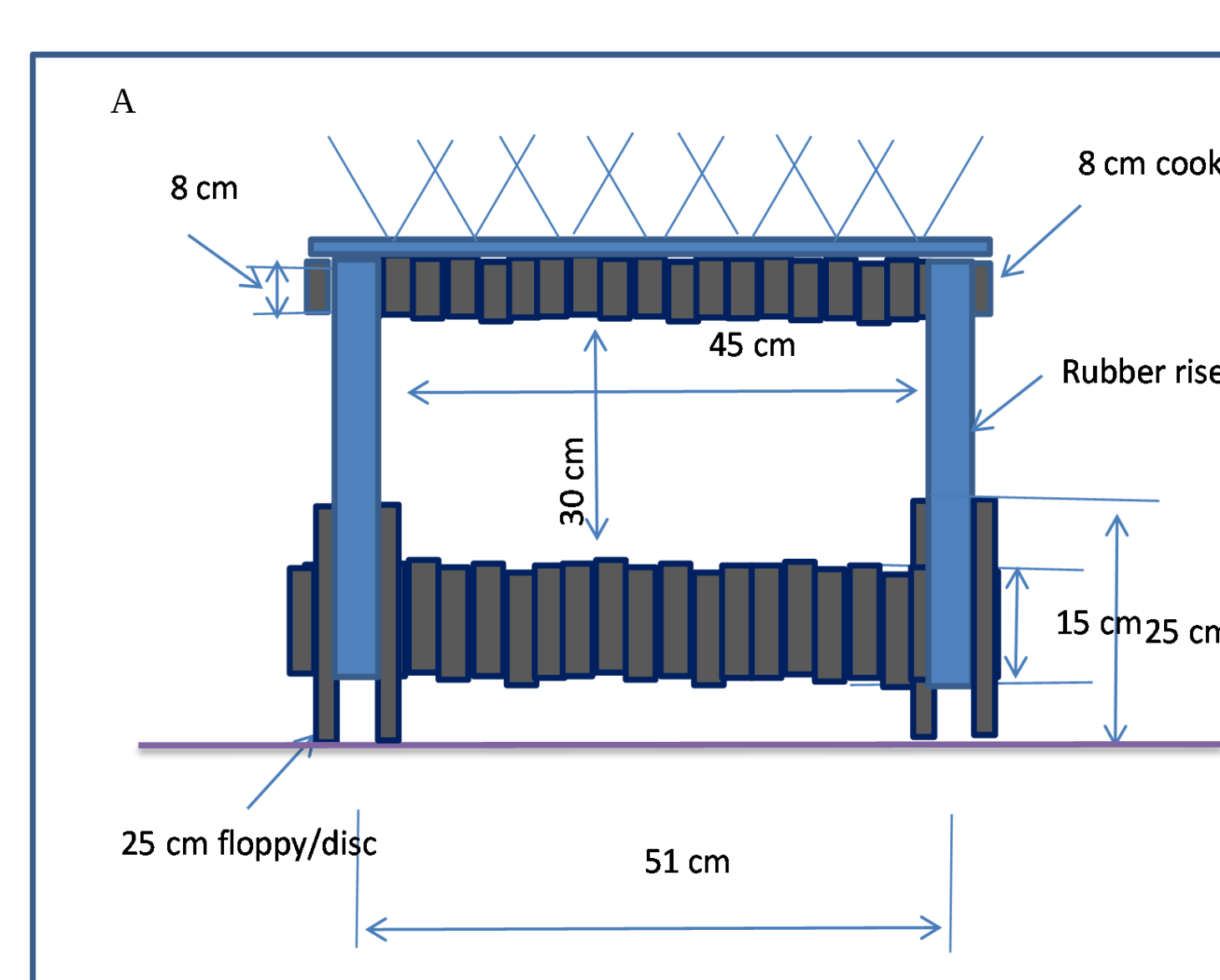
Winter Flounder and Atlantic Cod



Objectives

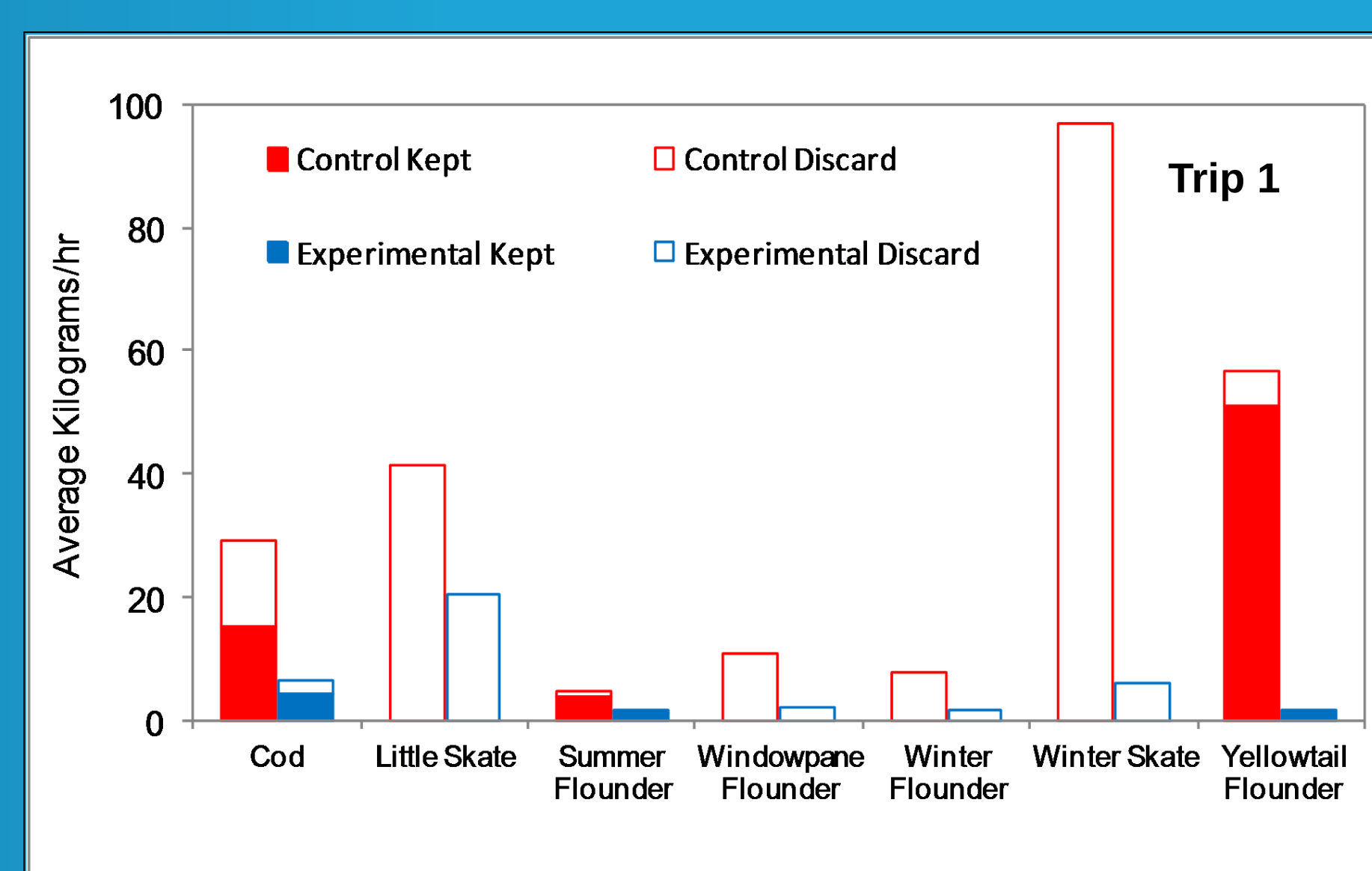
- ❖ Reduce the catch of all size classes of winter flounder
- ❖ Reduce the catch of sub-legal Atlantic cod
- ❖ Maintain commercial catch rates of legal size Atlantic cod

Gear



- ❖ Trip 1: Reidar's Manufacturing Inc. riser groundgear with “escape windows” (A) and a large mesh panel in the belly (B)
- ❖ Trip 2: Only the groundgear with escape windows was tested
- ❖ Escape windows dimensions were 45 cm by 30 cm

Results

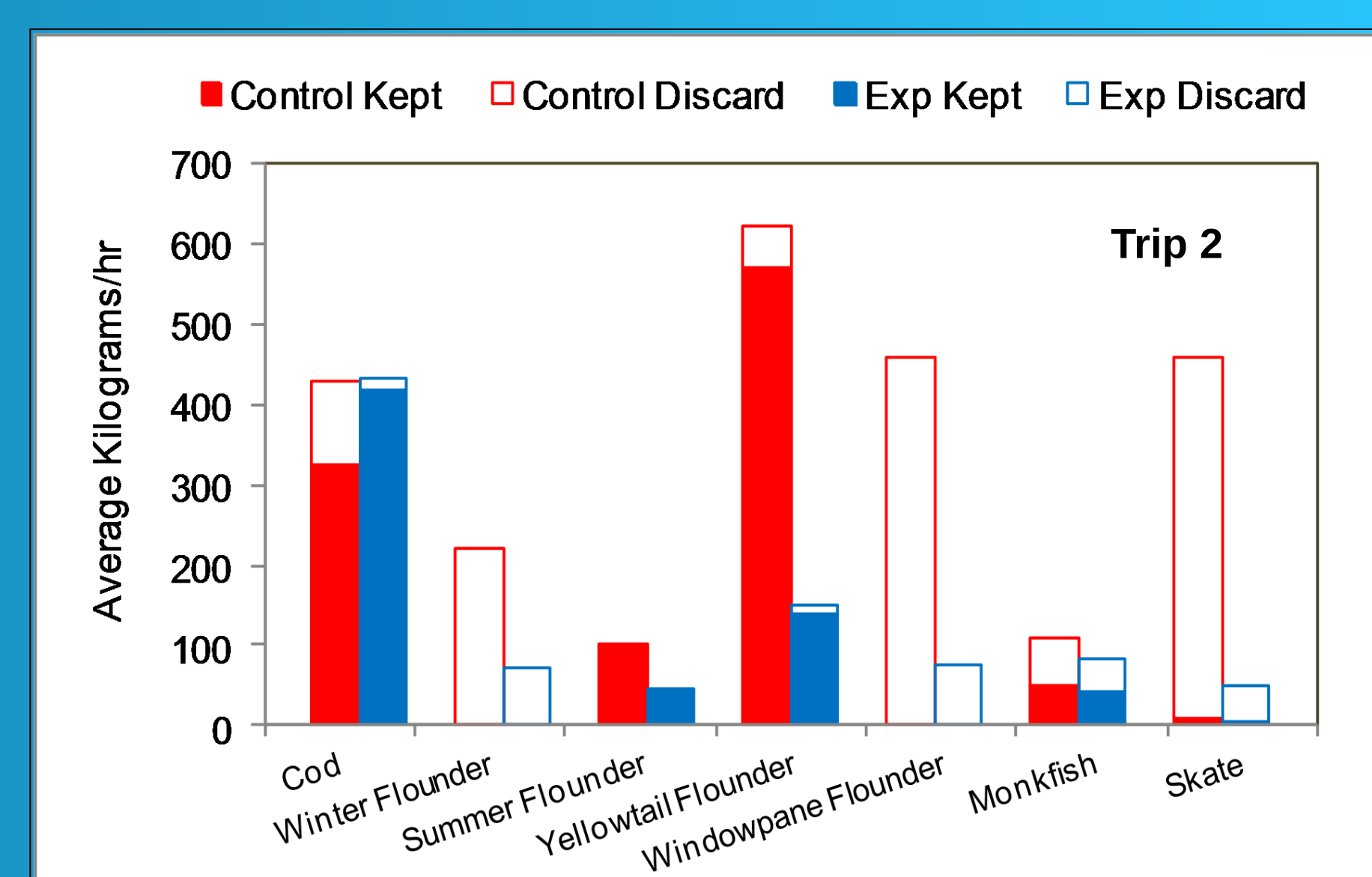


Trip 1

- ❖ Significant decrease in the catch of legal cod
- ❖ Significant decrease in the catch of all winter flounder
- ❖ Significant decrease in the catch of yellowtail flounder

Trip 2

- ❖ Similar catches of legal cod between trawls
- ❖ Significant decrease in the catch of sub-legal cod
- ❖ Significant decrease in the catch of all winter flounder
- ❖ GLMMs showed that cod catch efficiency of the experimental gear generally increased with size
- ❖ The experimental gear had a lower efficiency for all sizes of winter flounder



GLMM Results for Trip 2

