

# Weathervane scallop dredge comparison project and results

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ADFG

# Introduction slide

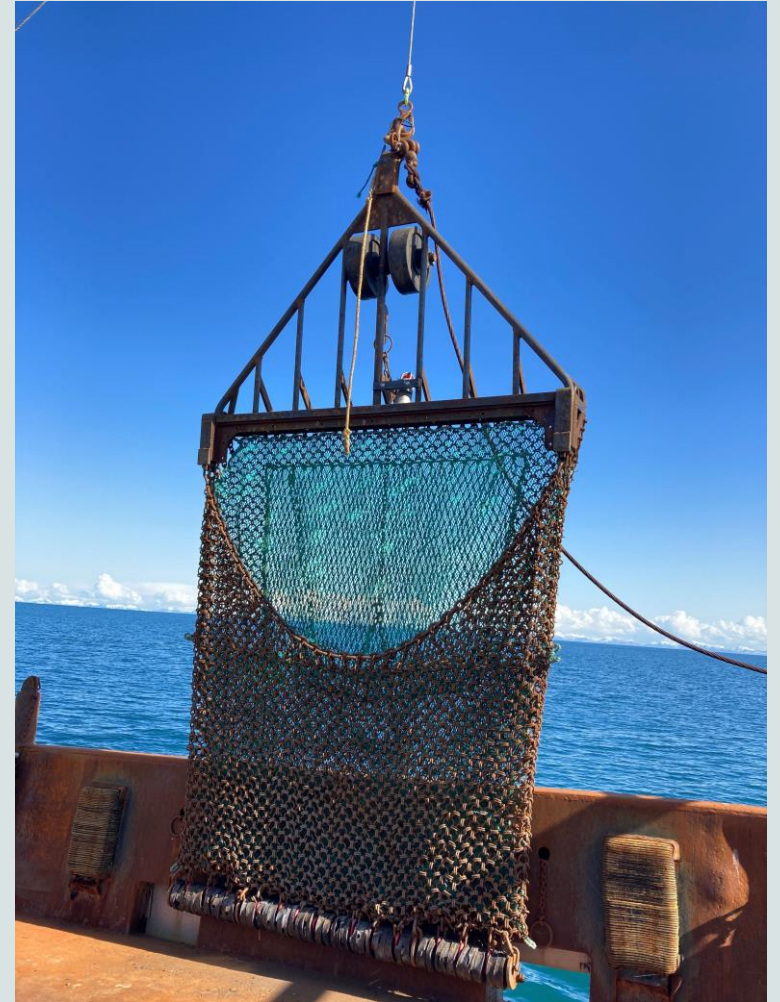


# Background

HOMER (OLD) DREDGE

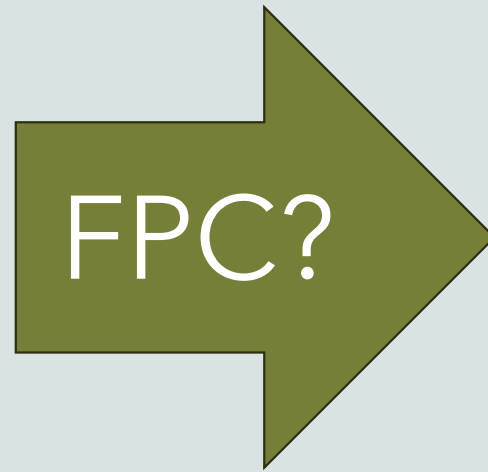


KODIAK (NEW) DREDGE



# Is a fishing power correction factor (FPC) needed?

HOMER (OLD) DREDGE

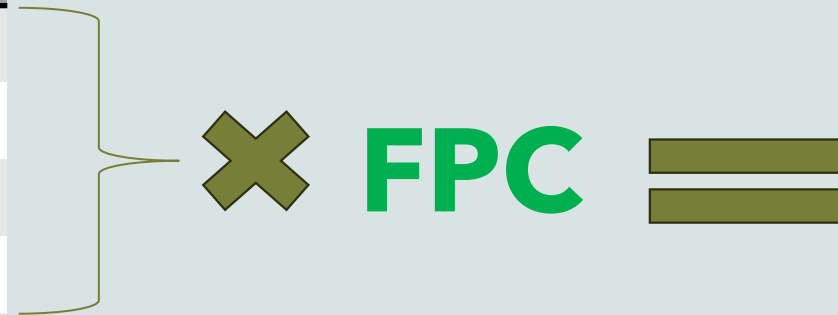


KODIAK (NEW) DREDGE



# FPC example: gear 1 and gear 2

Year	CPUE
2019	30
2020	20
2021	25
2022	26
2023	40
2024	45
2025	50
2026	42
2027	43

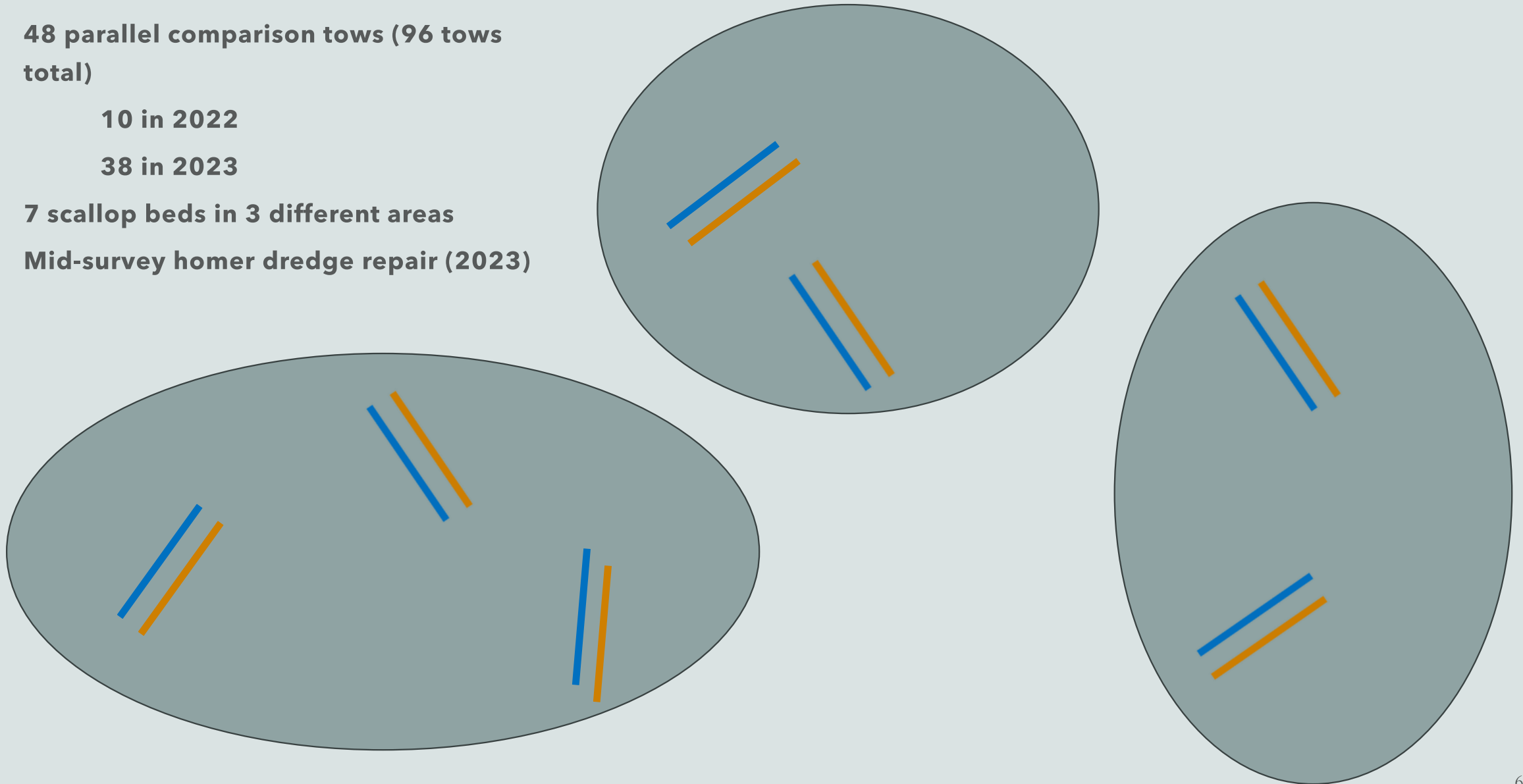


Year	CPUE
2019	30 *FPC
2020	20 *FPC
2021	25 *FPC
2022	26 *FPC
2023	40
2024	45
2025	50
2026	42
2027	43

In this study, the FPC is calculated to be applied to the Homer dredge values to make them comparable to the Kodiak dredge values

# Survey design

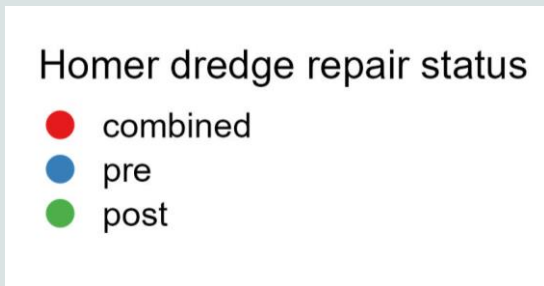
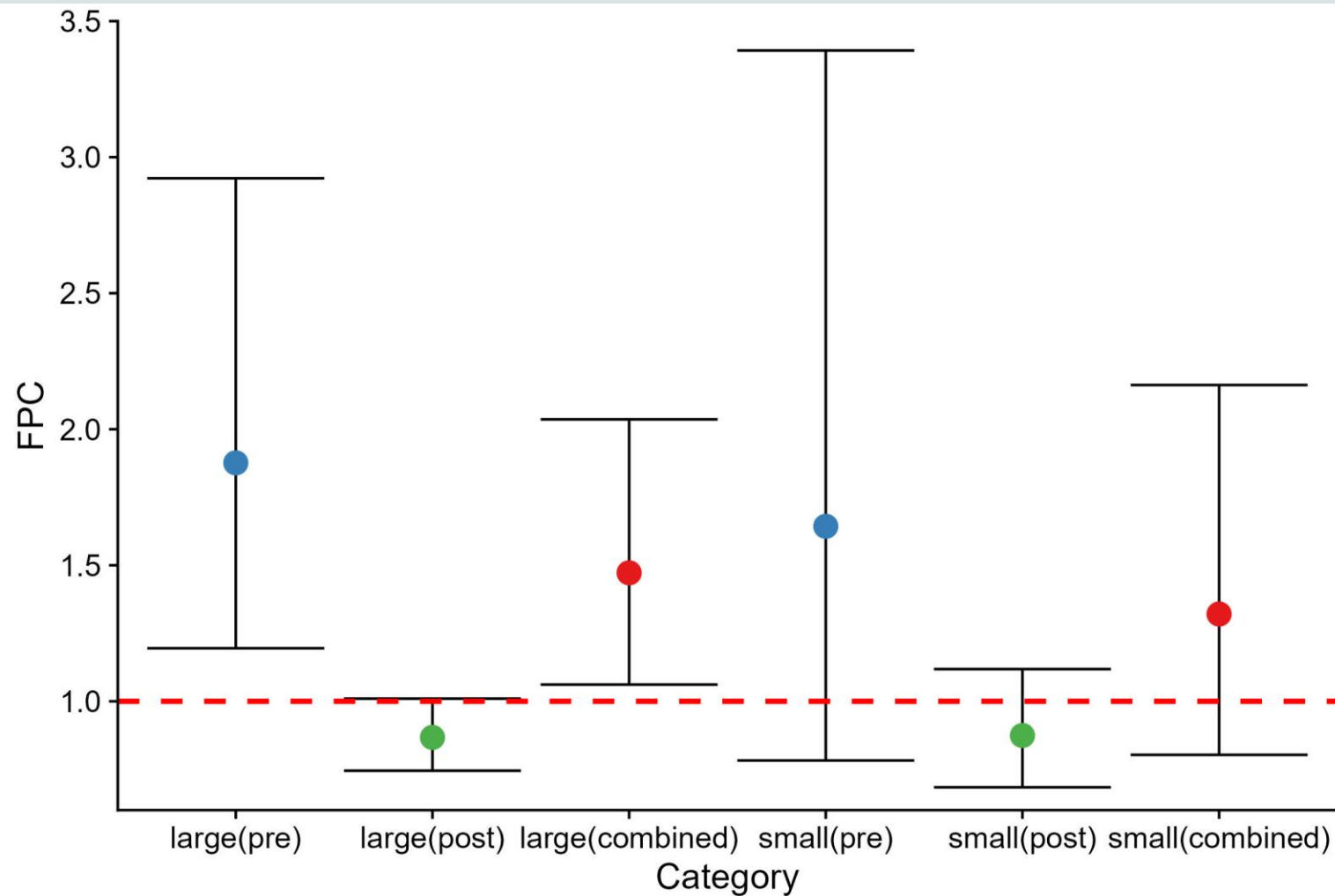
- **48 parallel comparison tows (96 tows total)**
  - 10 in 2022**
  - 38 in 2023**
- **7 scallop beds in 3 different areas**
- **Mid-survey homer dredge repair (2023)**



# Data analysis

- **Large, small scallops analyzed separately**
- **Removed paired tows of 0 catch**
- **Calculated the CPUE (in #'s of scallops) for each tow**
- **Randomized block ANOVA**
  - **$\ln(\text{CPUE} + 1) = \mu + \text{gear code (Homer or Kodiak)} + \text{haul \#} + \varepsilon$**
  - **$FPC = e^{2g(1+0.5s^2)}$**  where g is the gear code estimate from the model and s is the standard error of the gear code
- Mean square error (MSE) simulation to compare the error of the corrected and uncorrected CPUE's
- FPC decision factors:
  - FPC has confidence intervals (CI's) outside of 1
  - Applying the FPC lowers the MSE
  - Before/after Homer dredge repair FPC's are comparable
- **Catch size distribution comparison**
  - Kolmogorov-Smirnov test - distribution comparison

## FPC Results



Category	Randomized block ANOVA		
	FPC	Lower CI	Upper CI
large(pre)	1.88	1.20	2.92
large(post)	0.87	0.75	1.01
large(combined)	1.47	1.06	2.04
small(pre)	1.64	0.78	3.39
small(post)	0.87	0.68	1.12
small(combined)	1.32	0.80	2.16



# FPC decision: NO

HOMER (OLD) DREDGE



KODIAK (NEW) DREDGE



No FPC because

- **For large scallops**

FPCs in different directions (greater or less than one) pre- and post-repair

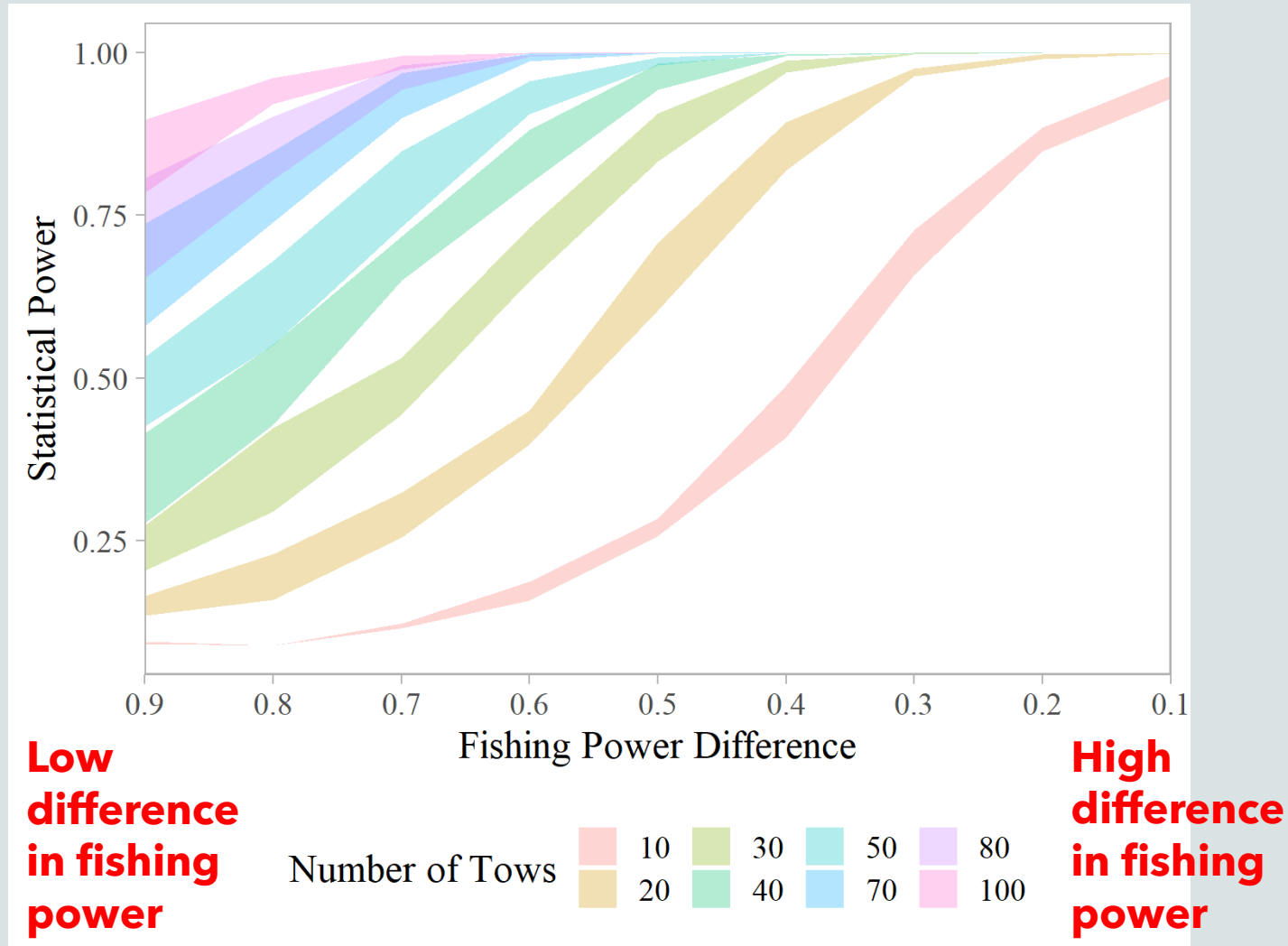
- **For small scallops**

FPCs' CI's overlap with one

FPCs in different directions pre- and post-repair

**MSE sims run, but not used for decision**

# Limited power of dredge comparison experiment

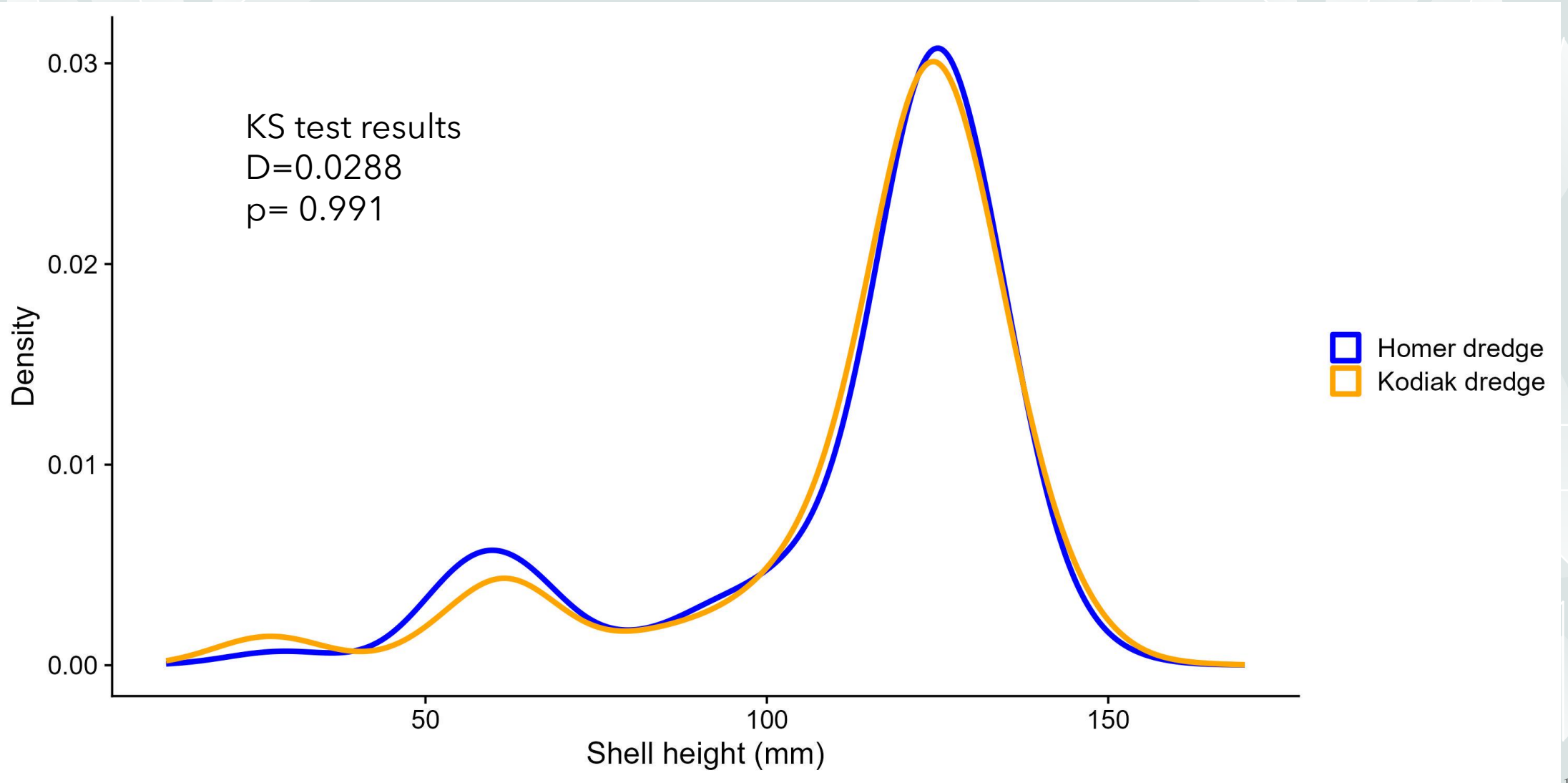


Jackson 2022, unpublished

Number of tows by bed.

Bed	Tows	Year	Pre or post Homer dredge repair
KNE3	10	2022	pre
YAK2	1	2023	pre
YAK3	4	2023	pre
YAK4	14	2023	pre
YAK5	4	2023	pre
WK1	11	2023	post
YAK1	4	2023	post

# Relative catch size distributions



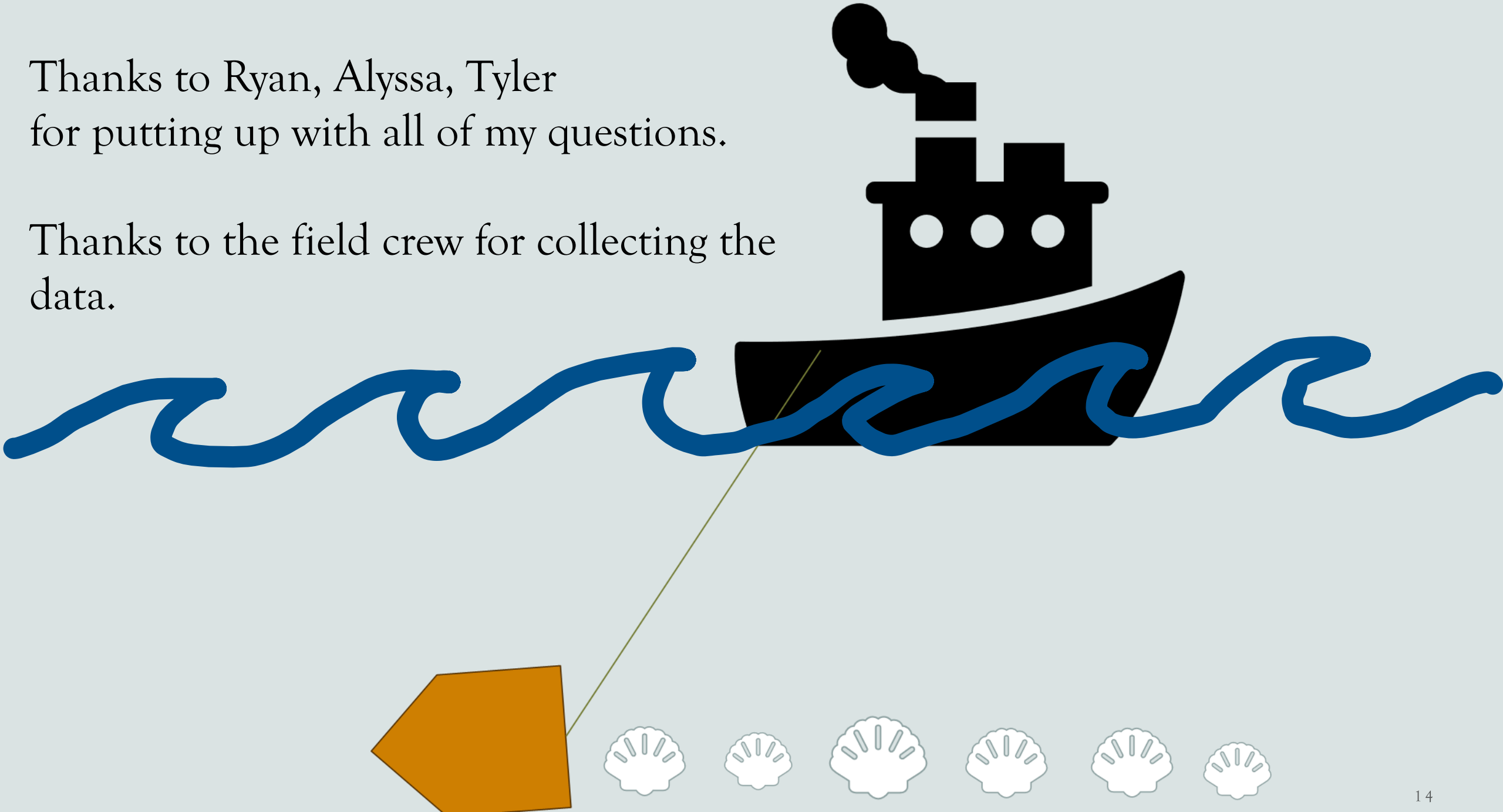
# TAKEAWAYS

1. No FPC

2. Catch size distributions between Homer and Kodiak dredges are similar

Thanks to Ryan, Alyssa, Tyler  
for putting up with all of my questions.

Thanks to the field crew for collecting the  
data.



# Questions

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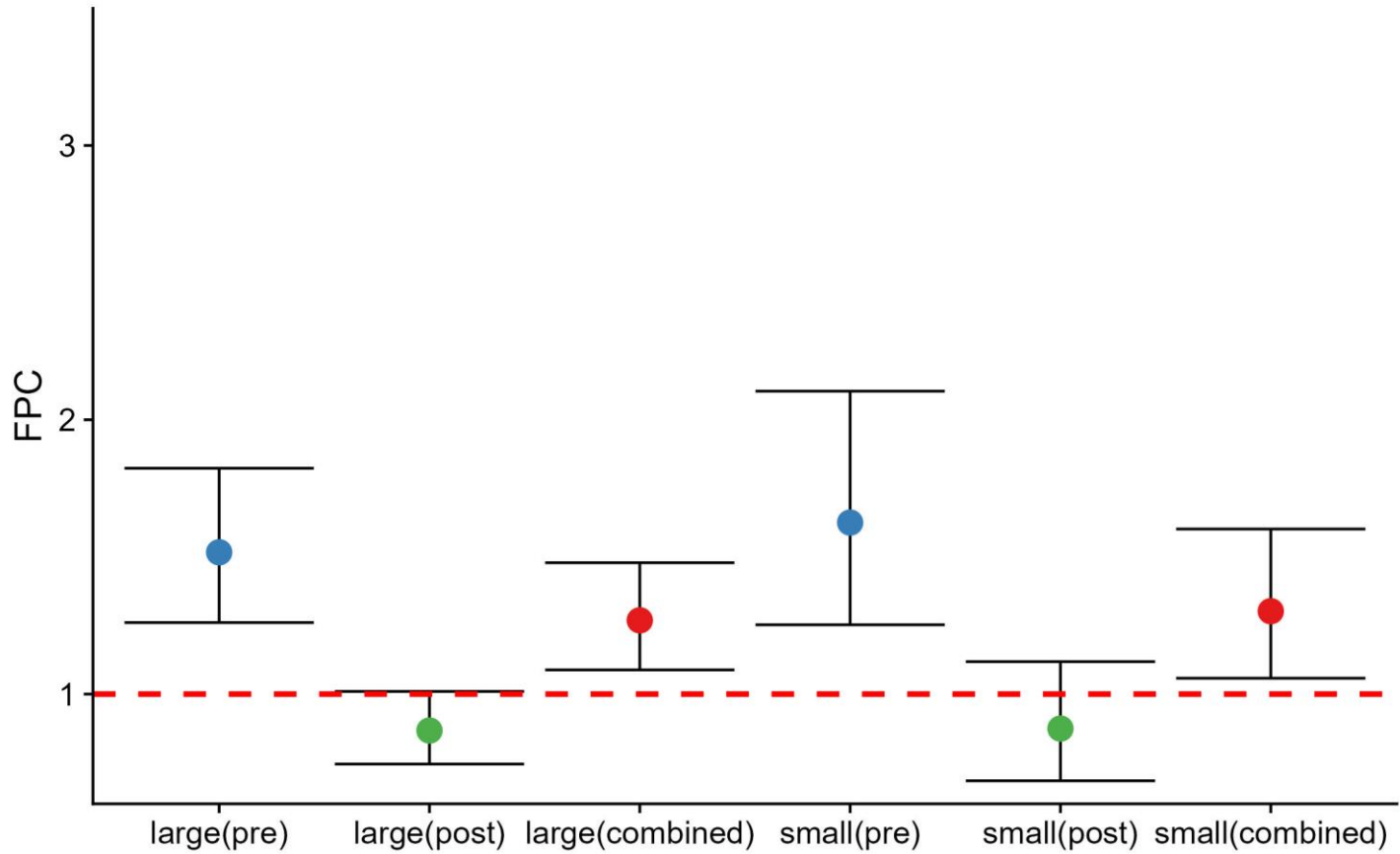


Supplemental slides  
after this:

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### Randomized block ANOVA without outliers



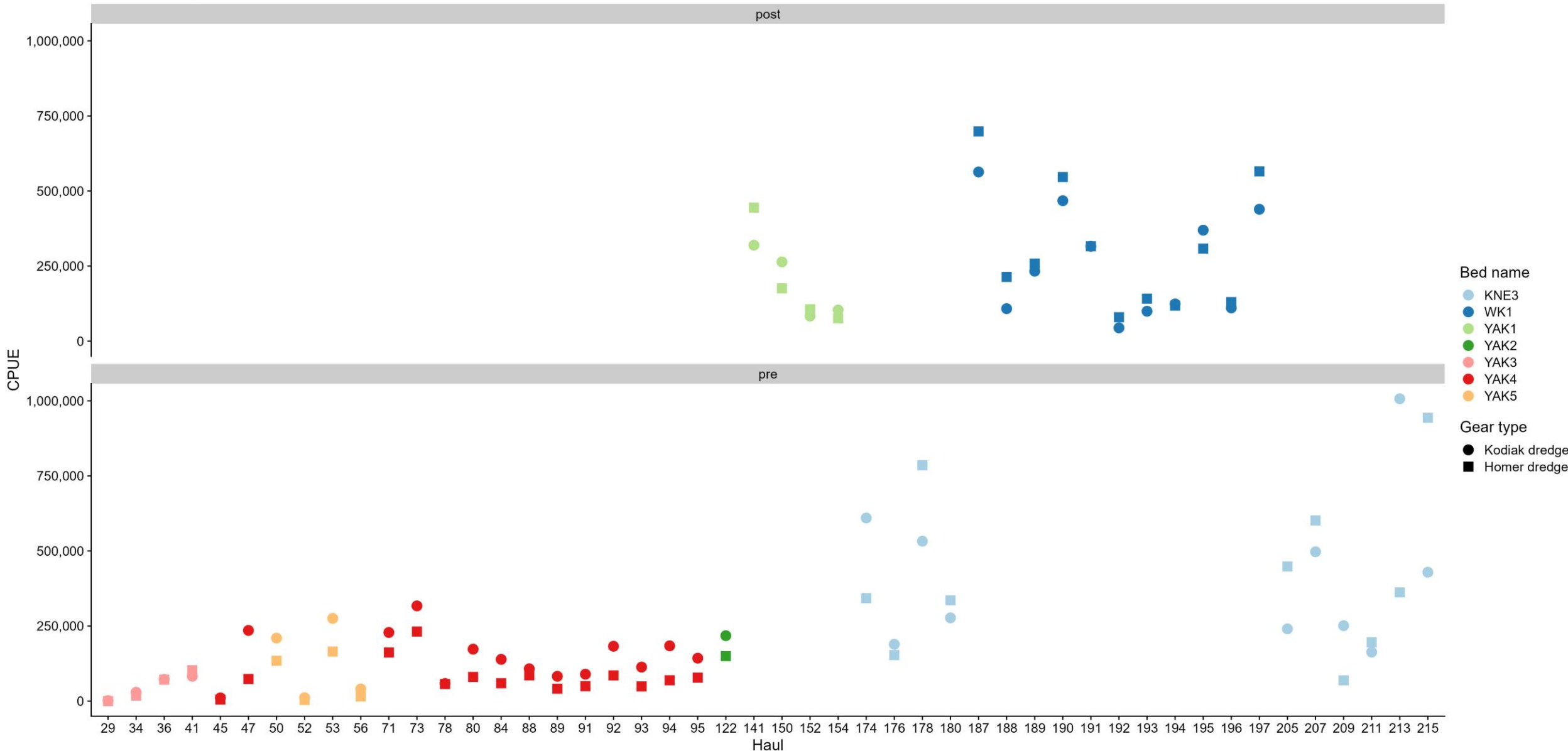
Homer dredge repair status

- combined
- pre
- post

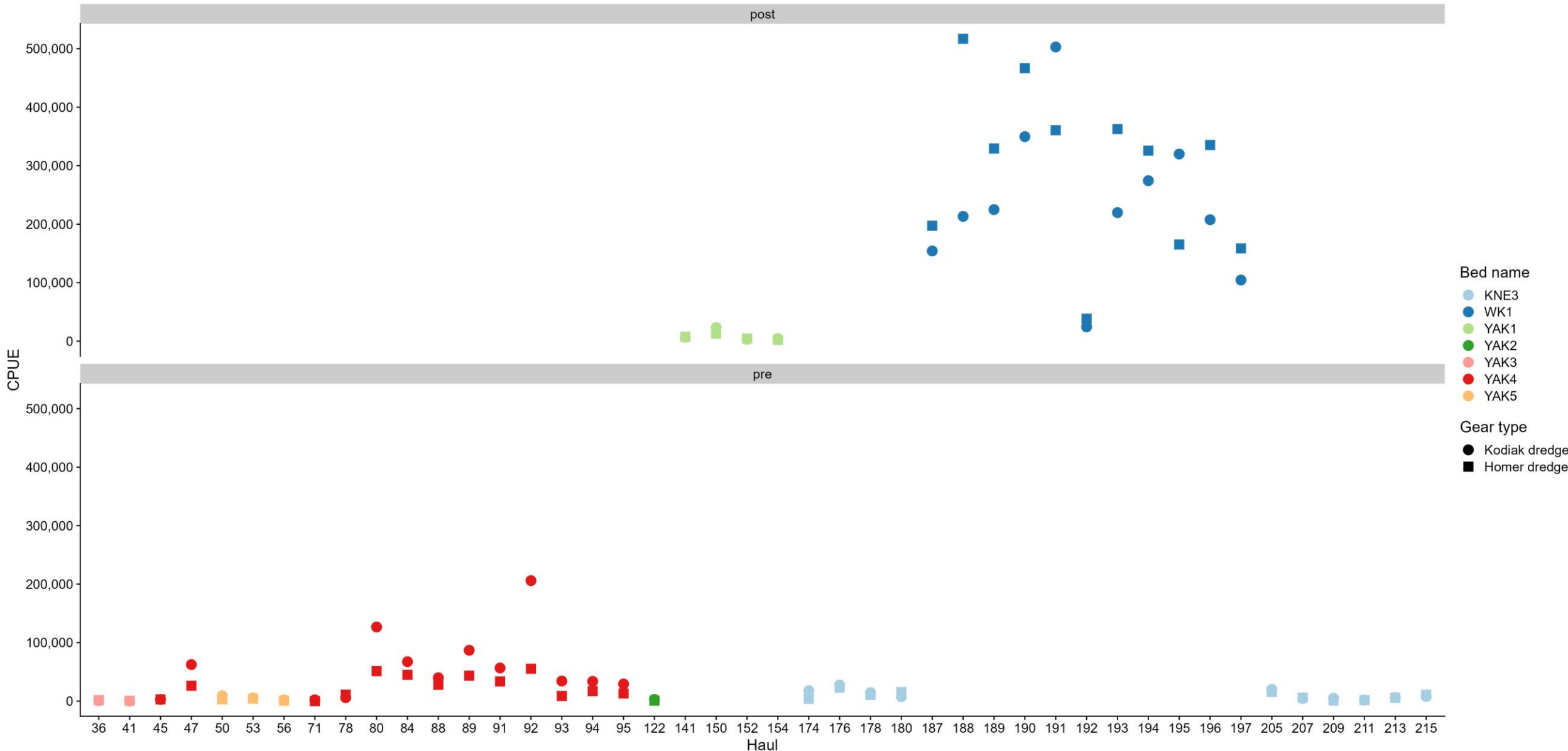
### FPC Results

Category	FPC	Upper_CI	Lower_CI
large(pre)	1.52	1.82	1.26
large(post)	0.87	1.01	0.745
large(combined)	1.27	1.48	1.09
small(pre)	1.63	2.10	1.25
small(post)	0.87	1.12	0.684
small(combined)	1.30	1.60	1.06

# Large scallops



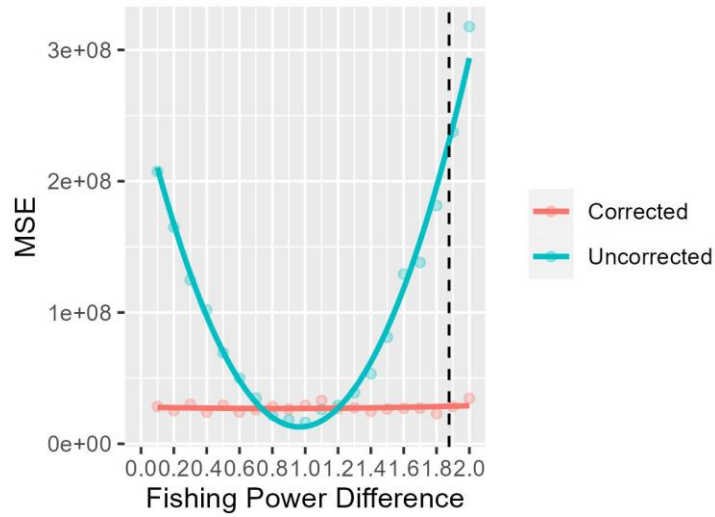
# Small scallops



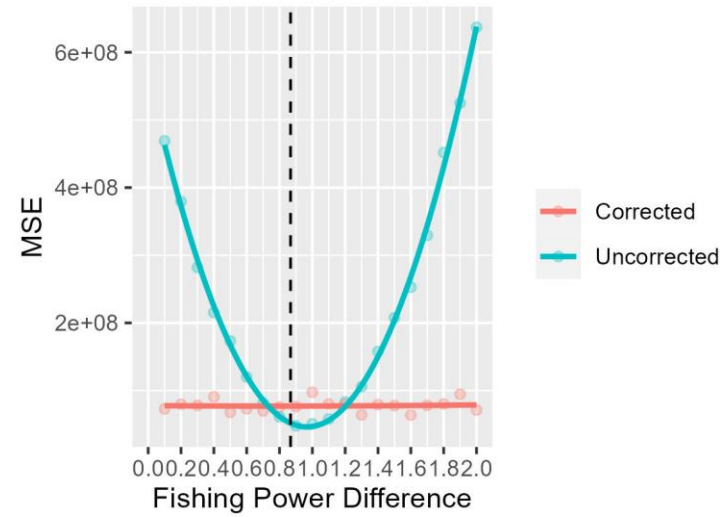
# MSE graphs

Large scallops

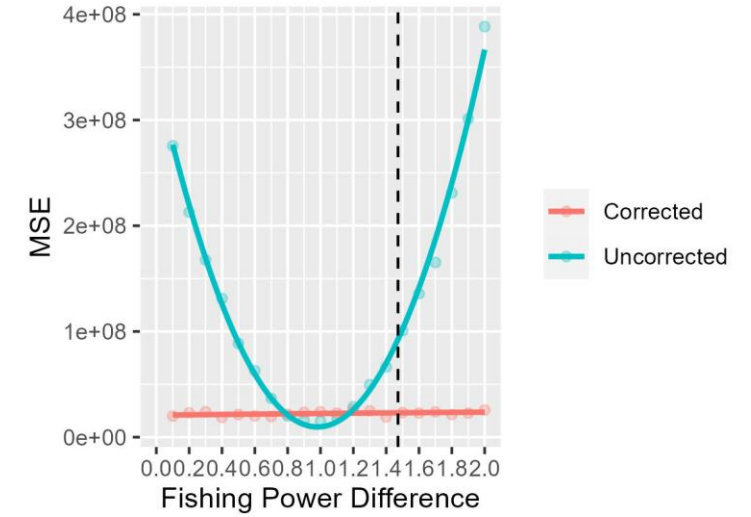
Pre



Post



Combined



Small scallops

