



Mission: Iconic Reefs RVC Analysis

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1 Introduction

fish fish fish

count fish

big fish little fish

test

1.1 Map of M:IR Sites



2 The Data

NCRMP fish surveys use the Reef Visual Census (RVC), stationary-point-count method modified from Bohnsack and Bannerot (Bohnsack and Bannerot 1986). Non-extractive visual surveys are conducted on shallow (<30 m), hard-bottom coral reef habitats. A stratified-random, one-stage survey design was used to select and sample within 50 m x 50 m grid cells (Smith et al. 2011). This dataset includes reef fish data collected from sample locations in the Florida Keys. For parity, the larger NCRMP dataset is restricted to strata types (i.e., depth and rugosity combinations) that occur within the M:IR areas (table 1).

2.1 Strata

Table 1: Table 1. Number of sites sampled by year.

PROT	STRAT	description	2022	2024
Outside	FK01	Inshore reefs, all depths	0	15
Outside	FK02	Mid-channel patch reefs, all depths	101	100
Outside	FK03	Offshore patch, all depths	61	36
Outside	FK04	Forereef, low rugosity, <12m	95	105
Outside	FK05	Forereef, high rugosity, <12m	88	87
Inside	FK01	Inshore reefs, all depths	0	12
Inside	FK02	Mid-channel patch reefs, all depths	12	13
Inside	FK03	Offshore patch, all depths	7	8
Inside	FK04	Forereef, low rugosity, <12m	5	15
Inside	FK05	Forereef, high rugosity, <12m	61	64

2.2 Fish Species

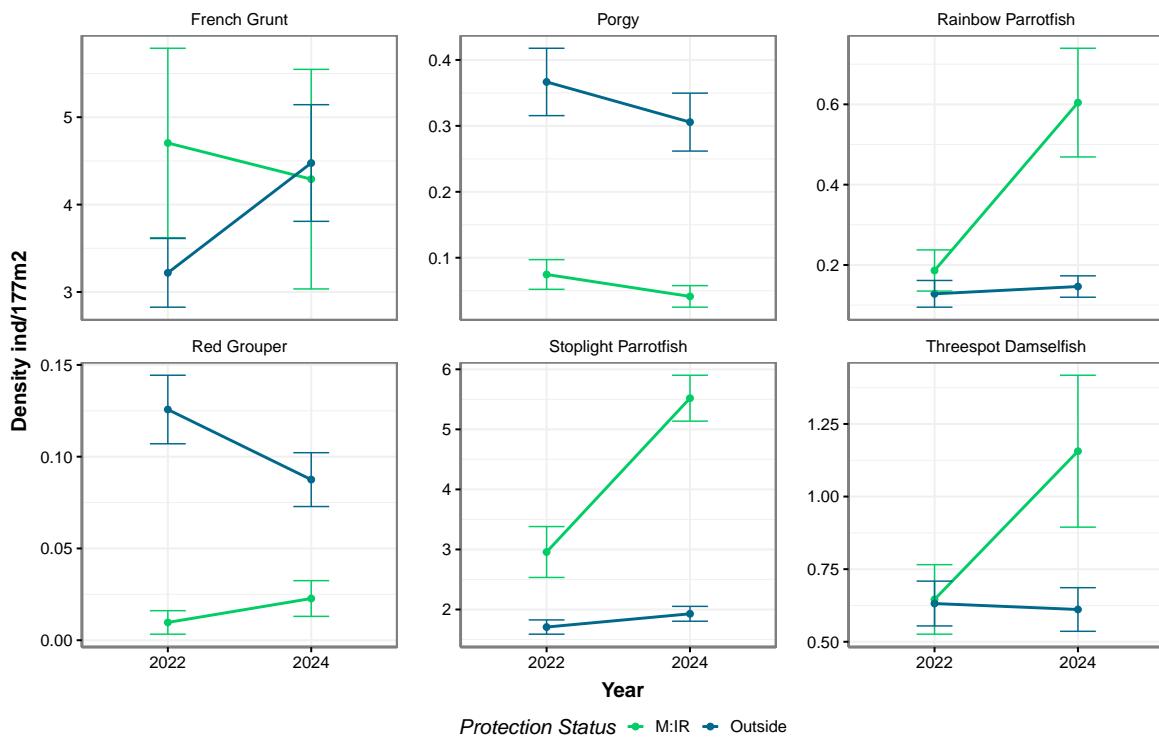
Six reef fish species were chosen to represent different trophic levels and functional roles.

Table 2: Table 2. Fish species with representative photos. For analysis, both porgy species were combined.

Species Code	Common Name	Scientific Name	Photo
HAE FLAV	French Grunt	<i>Haemulon flavolineatum</i>	
SPA VIRI	Stoplight Parrotfish	<i>Sparisoma viride</i>	
SCA GUAC STE PLAN	Rainbow Parrotfish Threespot Damselfish	<i>Scarus guacamaia</i> <i>Stegastes planifrons</i>	
CAL CALA CAL NODO	Saucereye Porgy Knobbed Porgy	<i>Calamus calamus</i> <i>Calamus nodosus</i>	
EPI MORI	Red Grouper	<i>Epinephelus morio</i>	

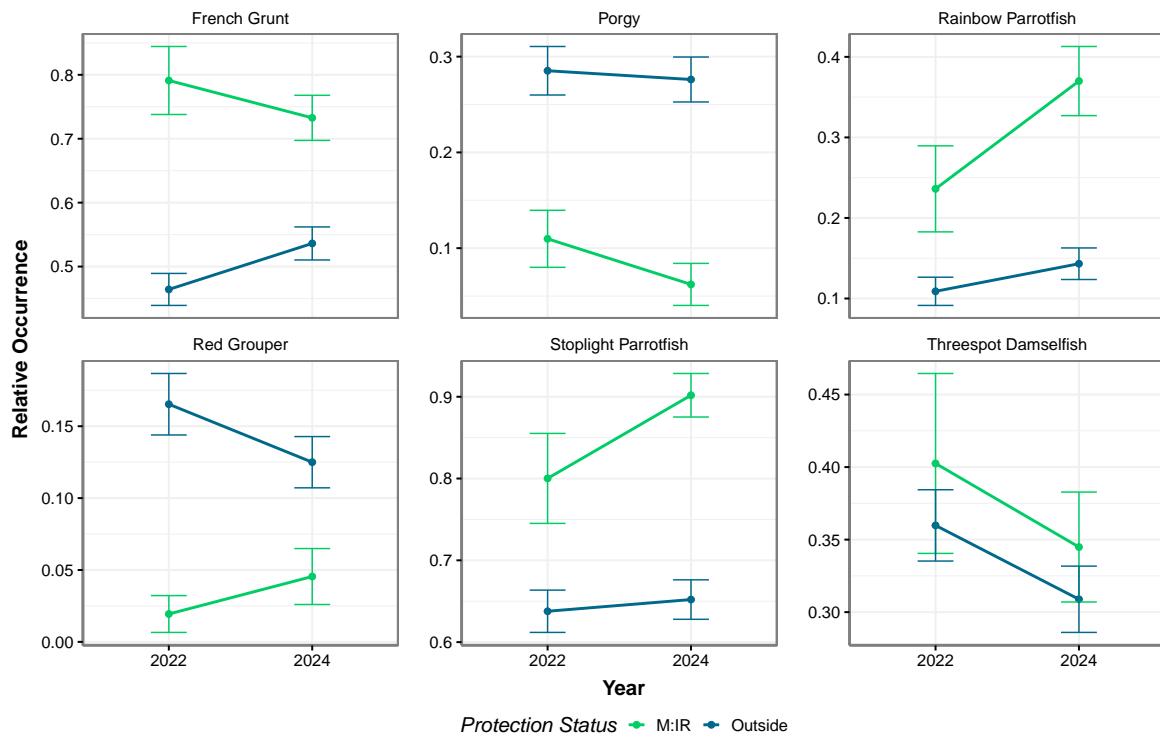
3 Density

NCRMP's comprehensive sampling design provides a broad, population-level perspective on the status and trends of the reef fish community. In particular, trend data can provide insight into how species respond to events including regional management actions such as targeted coral restoration efforts within the M:IR sites. Density results are shown as the number of individuals per survey area $177 \text{ m}^2 \pm \text{SE}$.



4 Occurrence

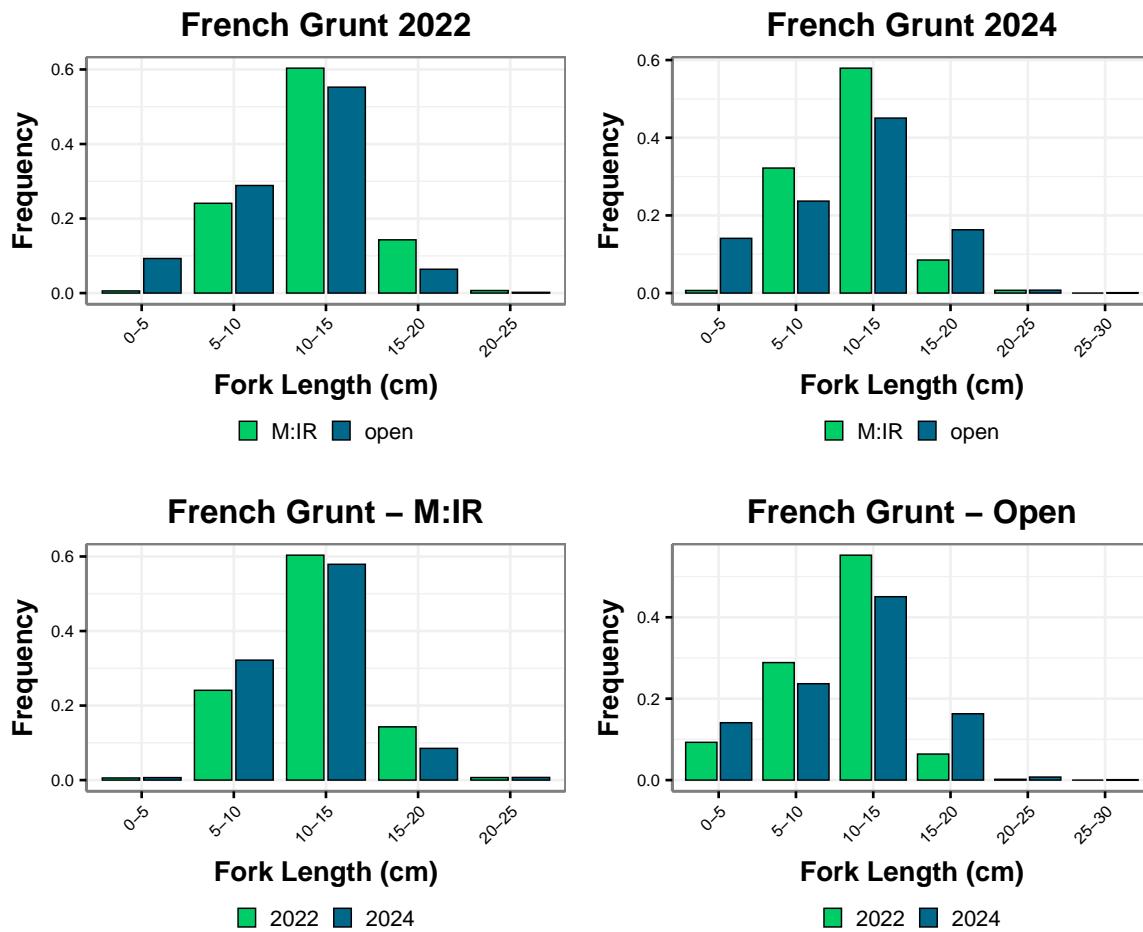
Occurrence measures how often a species is detected in surveys, providing insight into its distribution within M:IR sites and outside of M:IR sites in the Florida Keys. Results show presence regardless of abundance, helping to identify widespread versus rare species. Survey occurrence results are shown within M:IR sites (inside) and in the Florida Keys (outside) \pm SE.



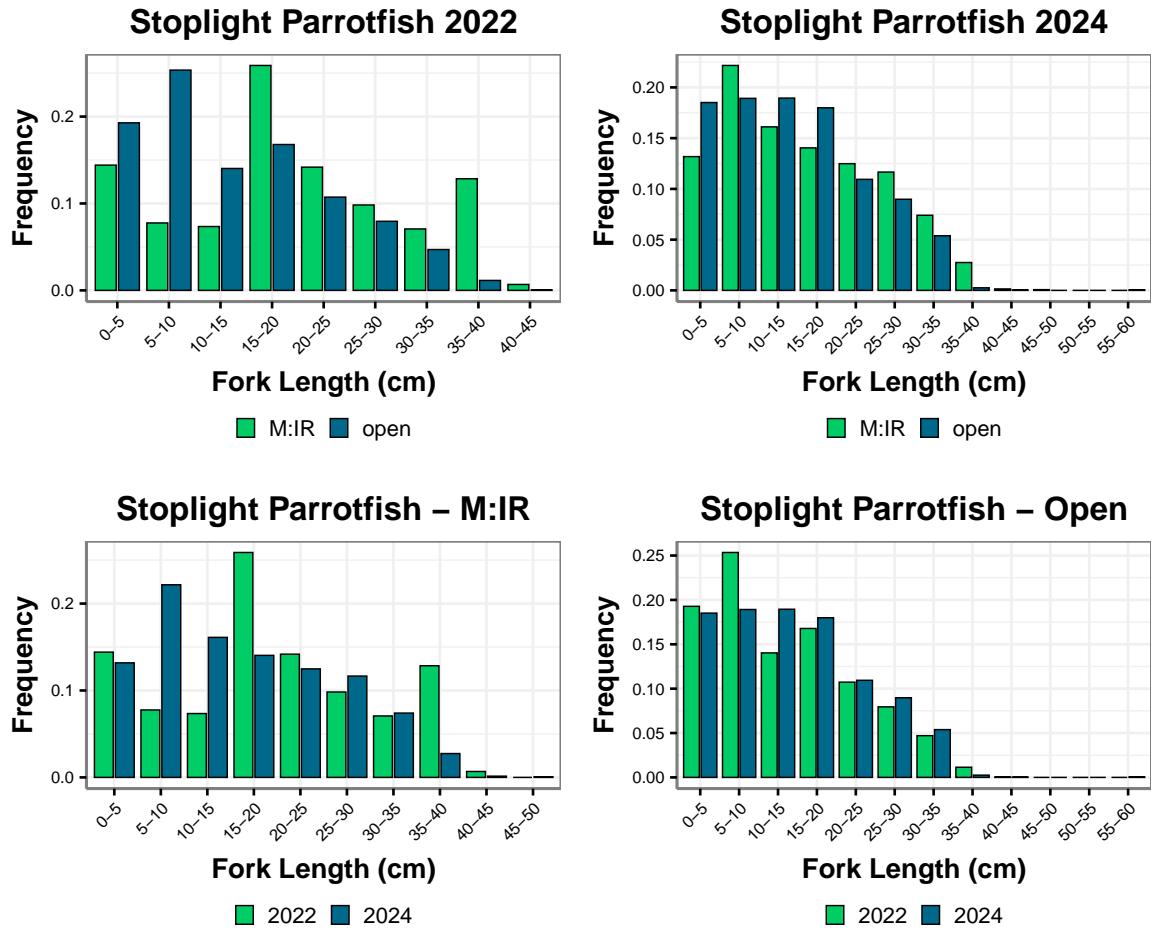
5 Length Frequency

Length compositions provide a detailed description of a selected fish's population structure. These highly informative figures can show the length at which a fish species recruits to the coral reef (i.e., young of year or from nursery habitat), length classes removed by the local fisheries, and the effectiveness of management actions

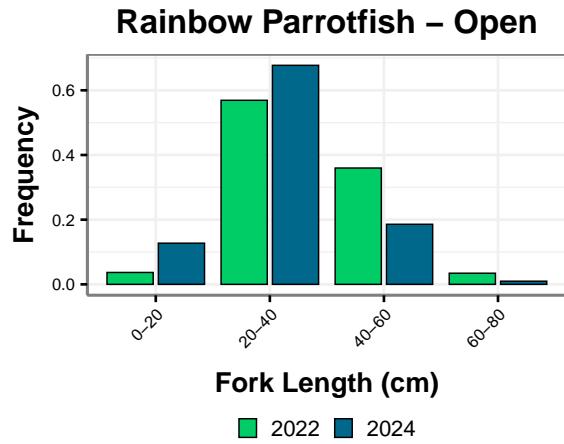
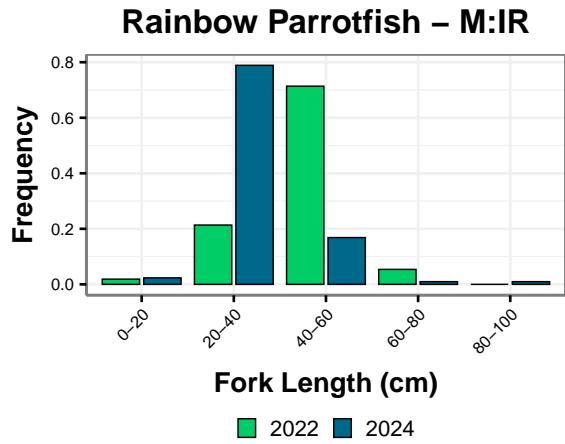
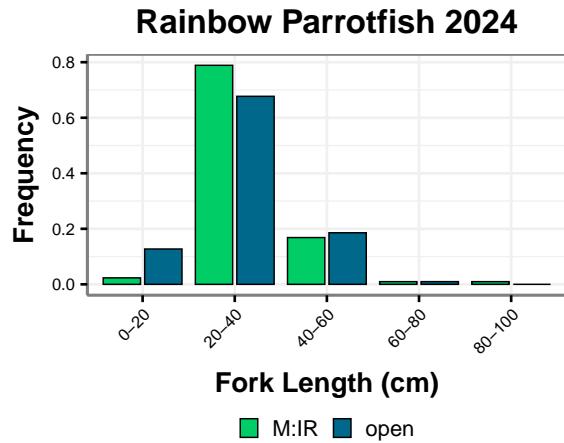
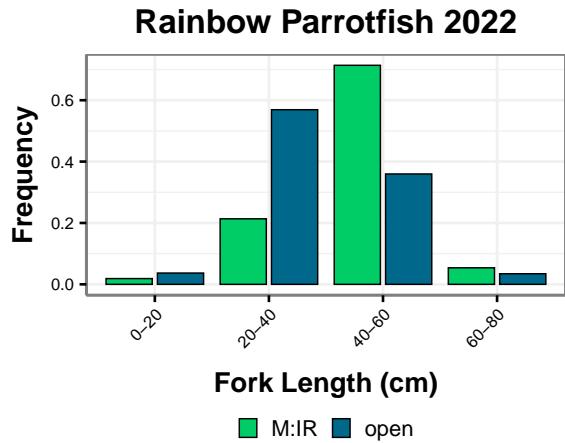
5.1 French Grunt



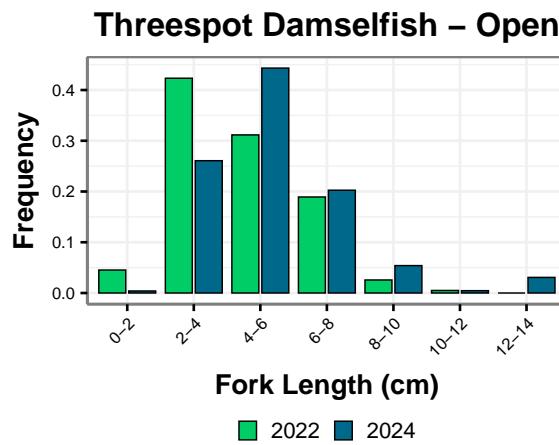
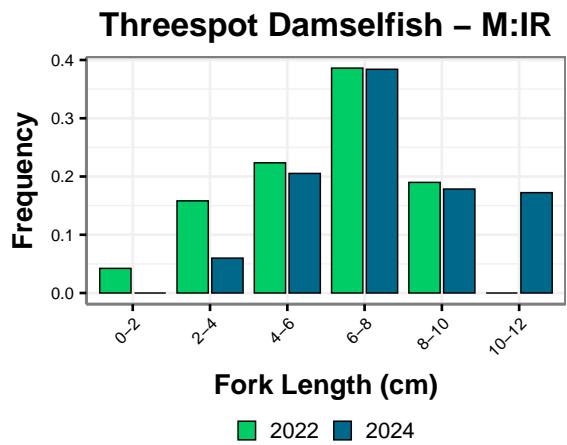
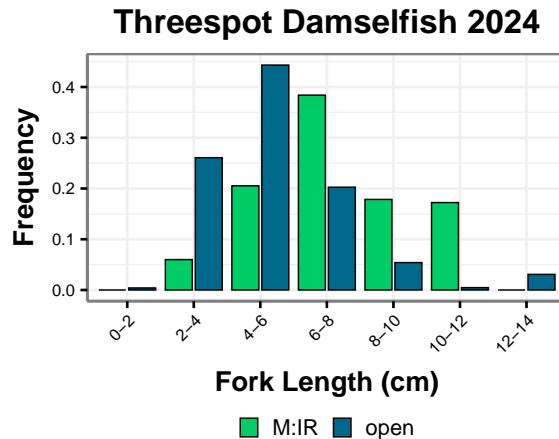
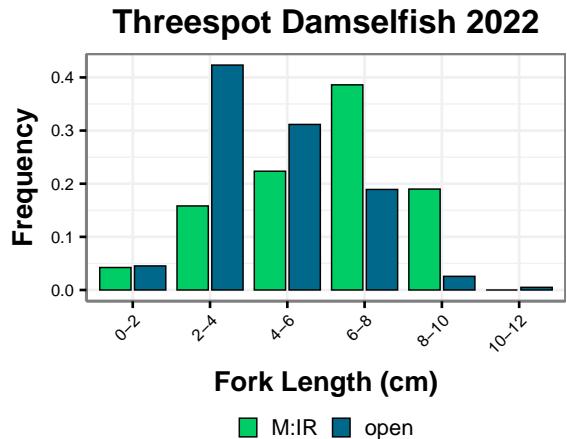
5.2 Stoplight Parrotfish



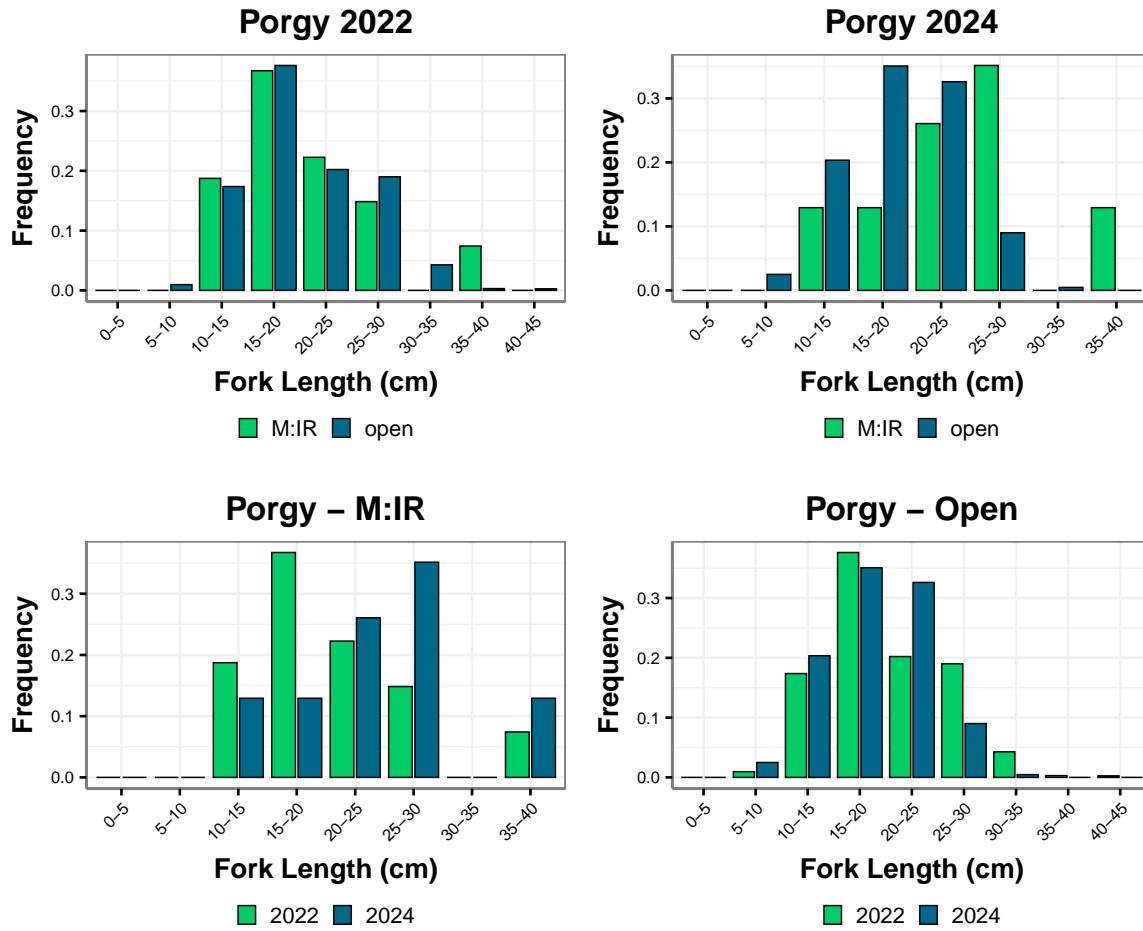
5.3 Rainbow Parrotfish



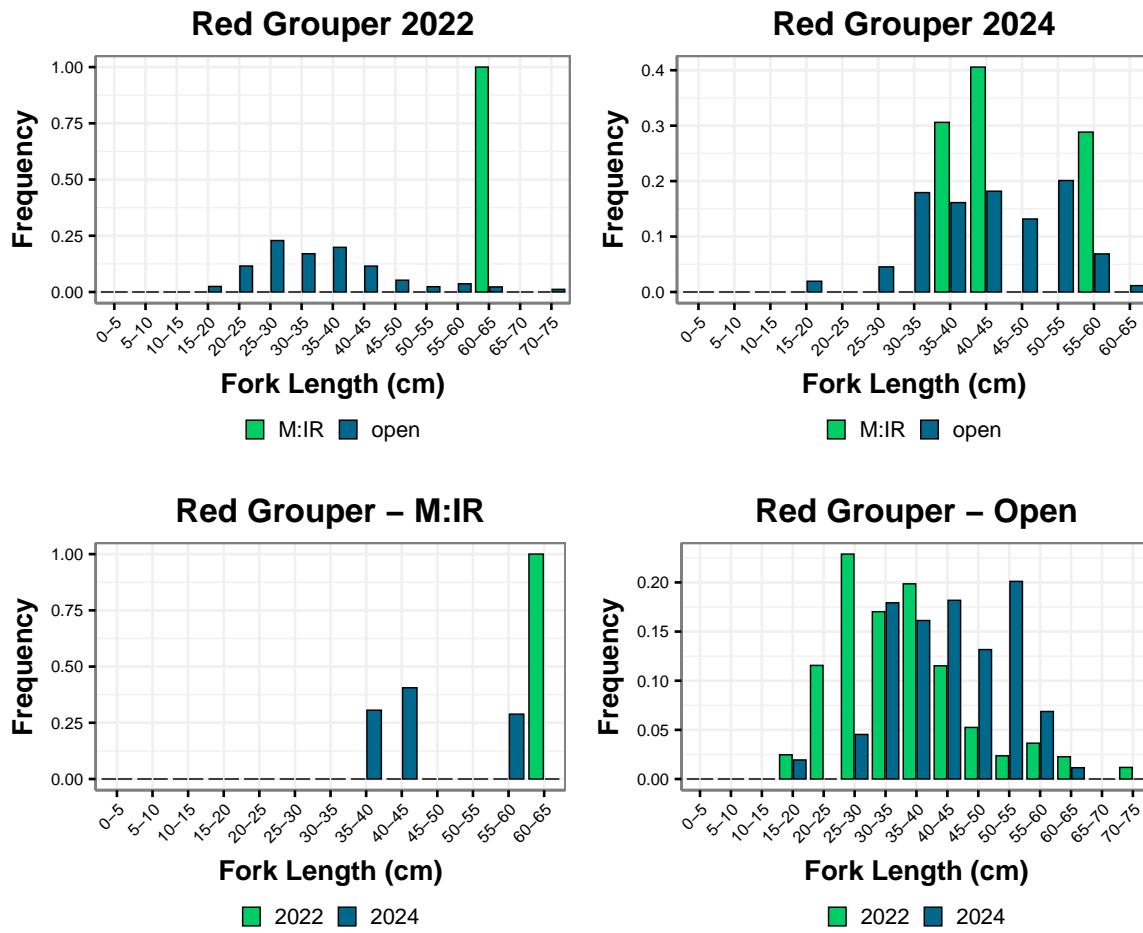
5.4 Threespot Damselfish



5.5 Porgy



5.6 Red Grouper



Bohnsack, James A., and Scott P. Bannerot. 1986. "A Stationary Visual Census Technique for Quantitatively Assessing Community Structure of Coral Reef Fishes." *NOAA Technical Report NMFS* (41).

Smith, S. G., J. S. Ault, J. A. Bohnsack, D. E. Harper, J. Luo, and D. B. McClellan. 2011. "Multispecies Survey Design for Assessing Reef-Fish Stocks, Spatially Explicit Management Performance, and Ecosystem Condition." *Fisheries Research* 109 (1): 25–41. <https://doi.org/10.1016/j.fishres.2011.01.012>.