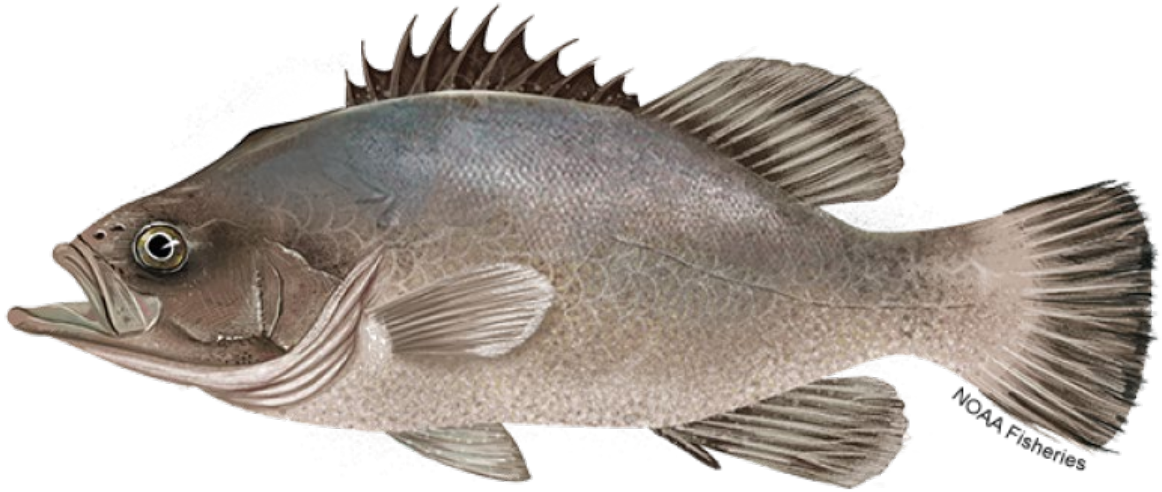
Stock Assessment of U.S. Atlantic wreckfish, *Polyprion americanus*



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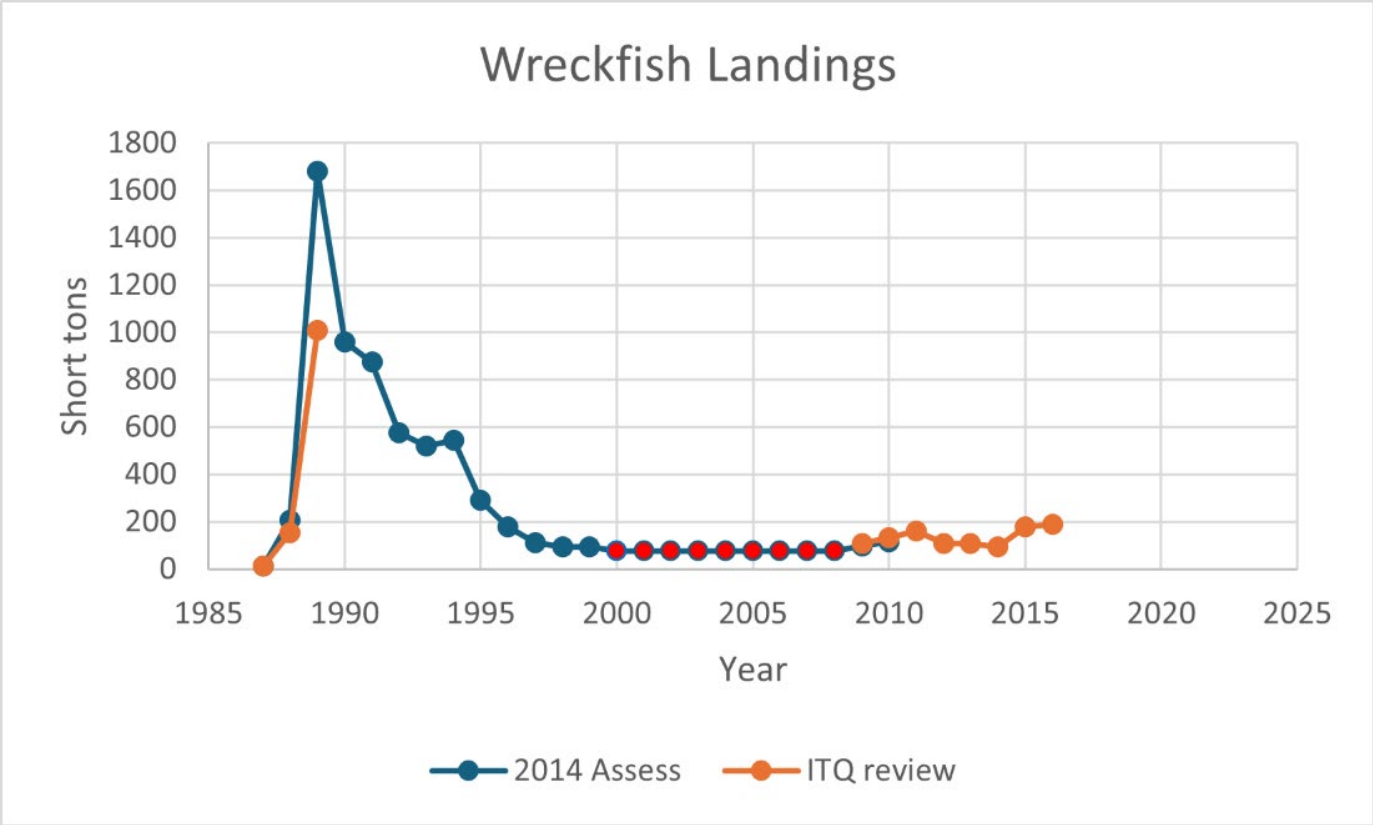
Introduction

- This project is being conducted as part of a Climate Response Strategy for a Data-Limited Fishery.
- The last wreckfish stock assessment was based on data up to 2010 (Rademeyer & Butterworth 2014).
- The primary assessment tool was a statistical age/length model, with a dynamic production model used as a secondary tool.
- The current assessment will provide an update with 13 years of additional data.
- This presentation will focus on the available data and their interpretation.
- An assessment model will be presented at the next SSC meeting.

Data Sources



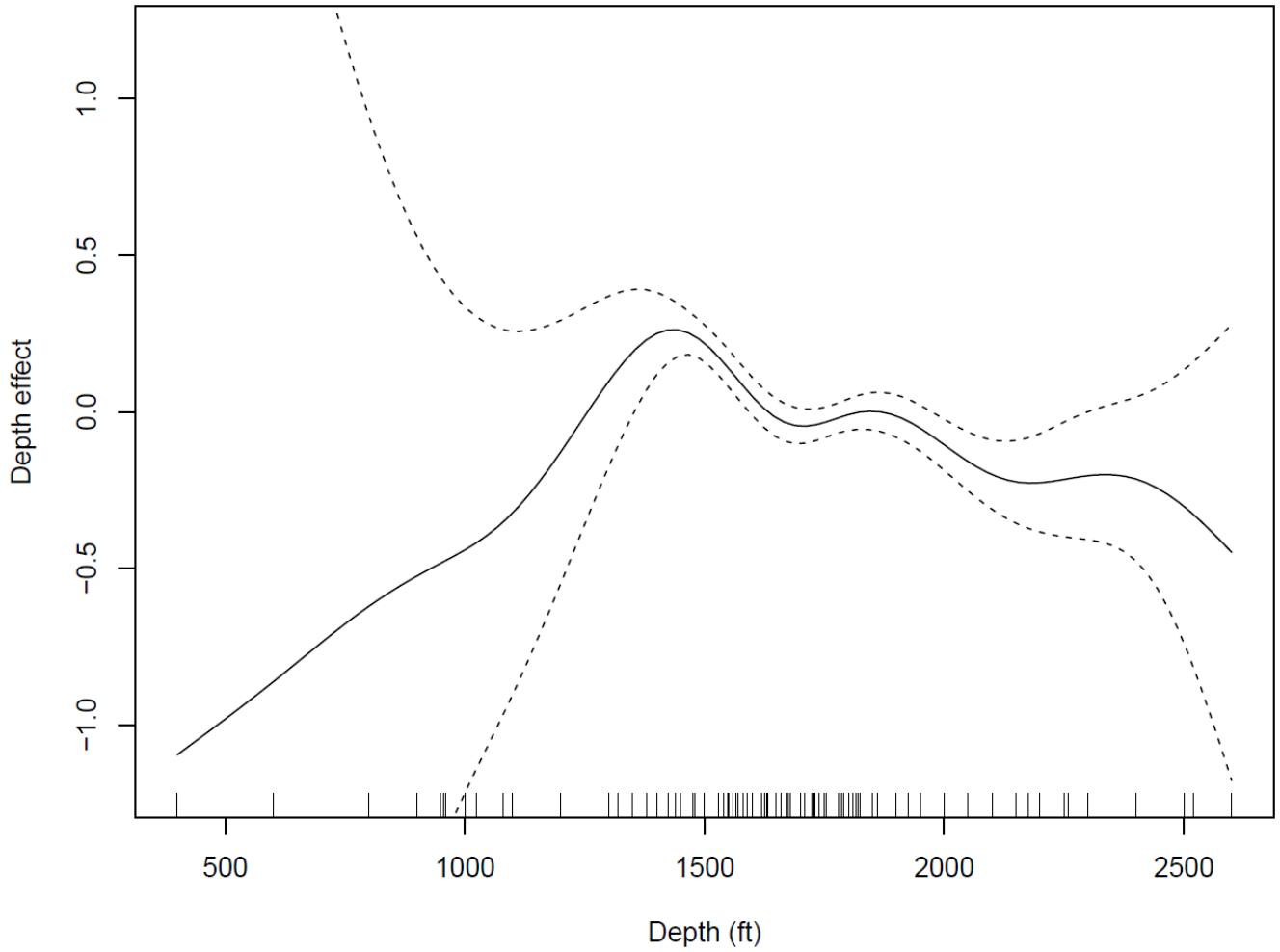
- Fishery started ~ 1986
- First U.S. fishery with ITQs

Commercial wreckfish landings reported by Rademeyer & Butterworth (2014, blue points) and by SAMFC (2019 orange points). Red points from 2000 to 2008 are the average for that period due to low number of participating vessels.

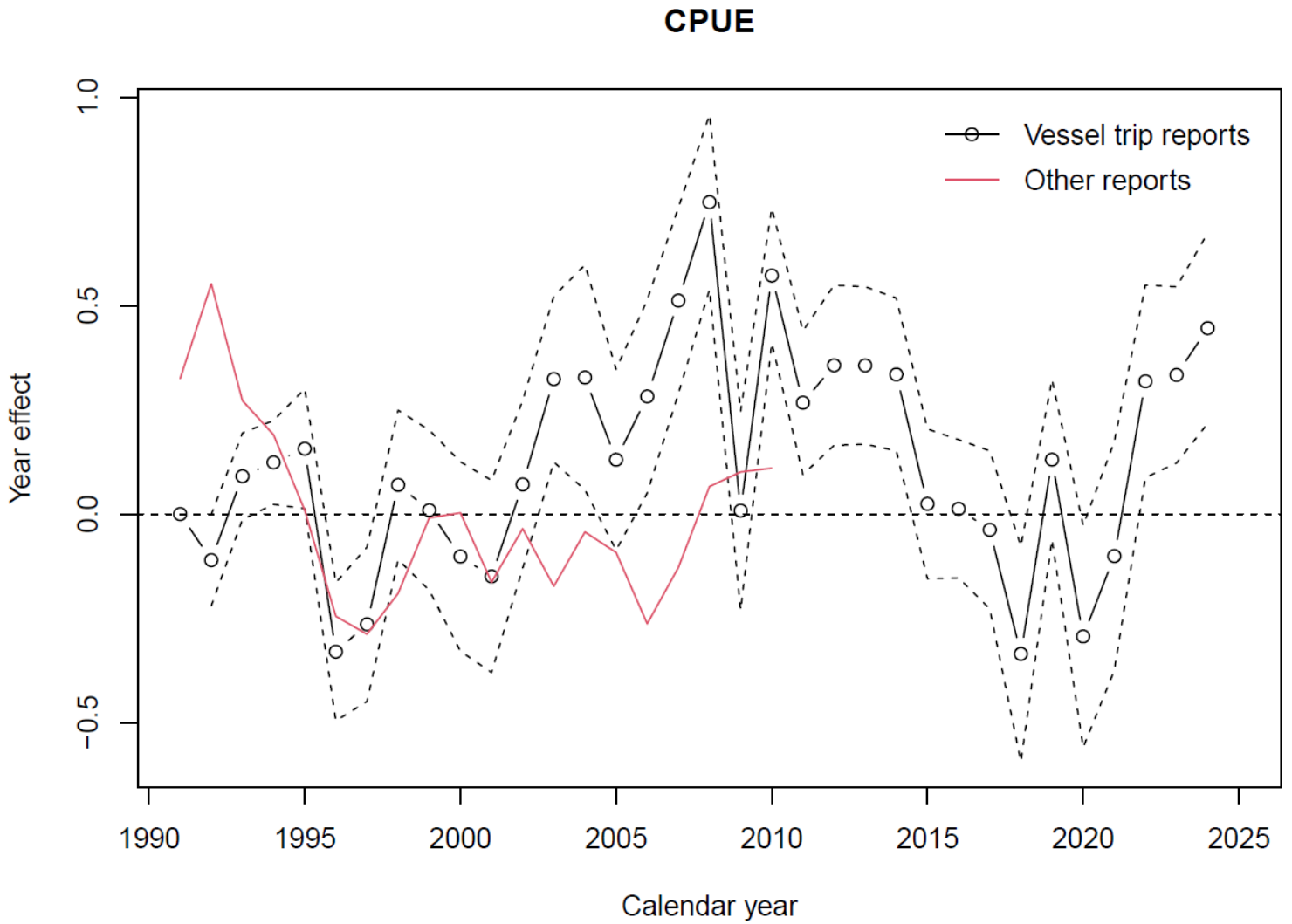
Fishery-dependent Abundance Index

Generalized Additive Model of Vessel Trip Reports Data

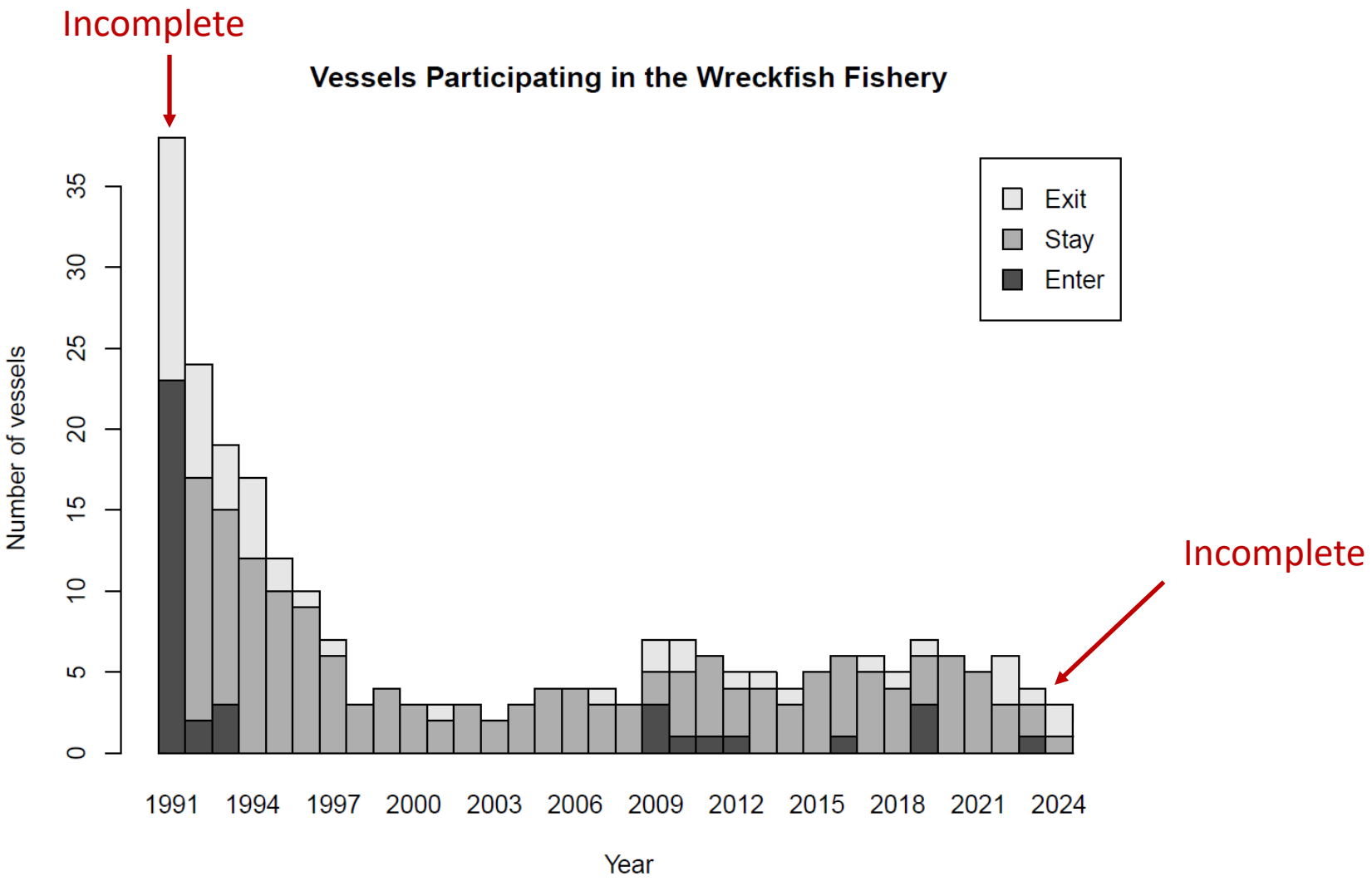
log(catch) ~ **gam**(lines + hooks per line + hours fished + **year** + area + s(depth))



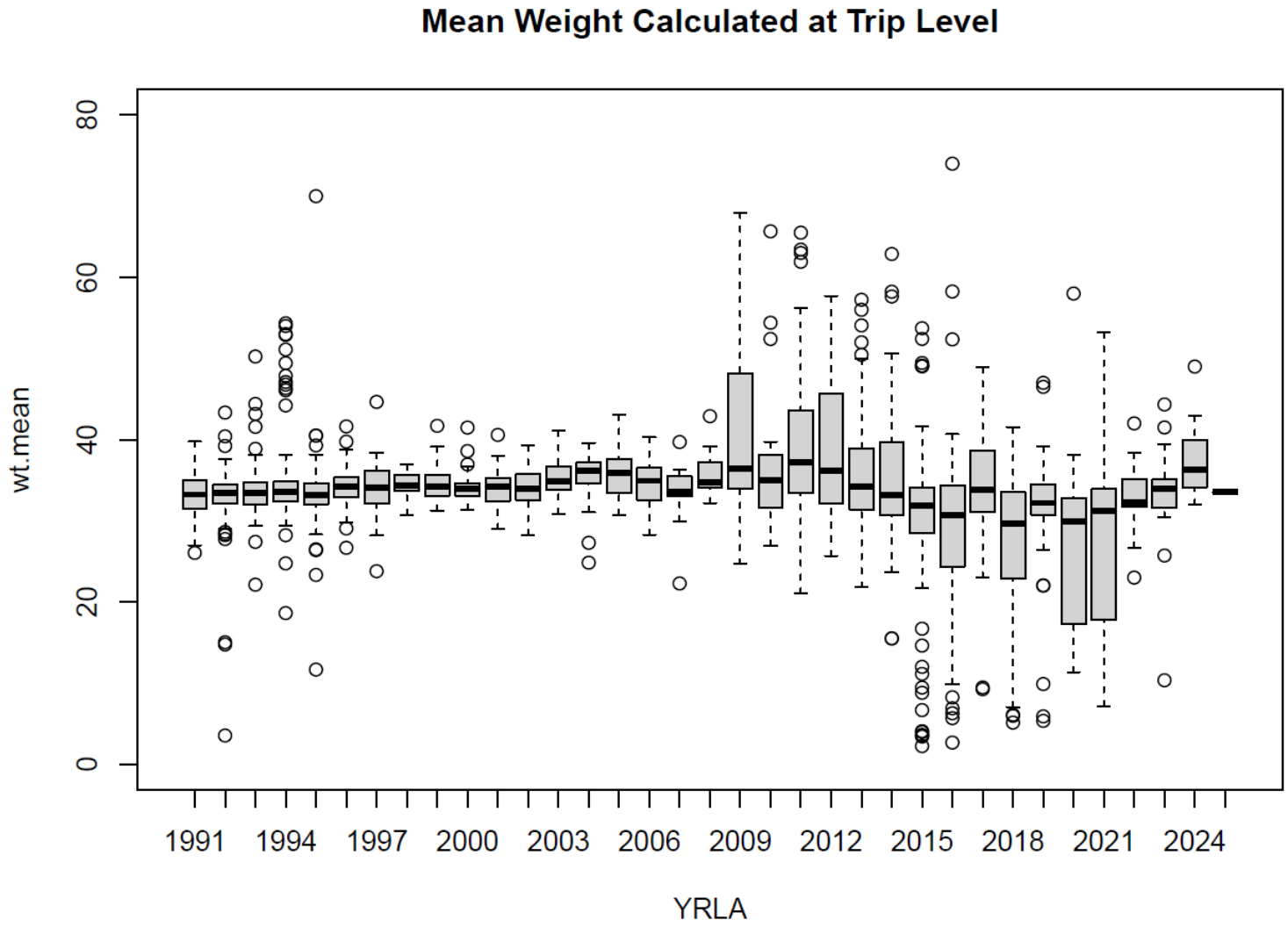
Depth effect on catch estimated with the GAM. The partial depth effect is calculated for constant values of the other independent variables. Solid line is the estimated effect and the dotted lines are ±2 times the standard error of the estimates. The rug plot at the bottom of the figure shows the distribution of sampled depths.



Year effect on catch estimated with the GAM. Solid line with point is the estimated effect and the dotted lines are ±2 times the standard error of the estimates. For comparison, the red line is the CPUE index used by Rademeyer & Butterworth (2014) standardized to mean 0.



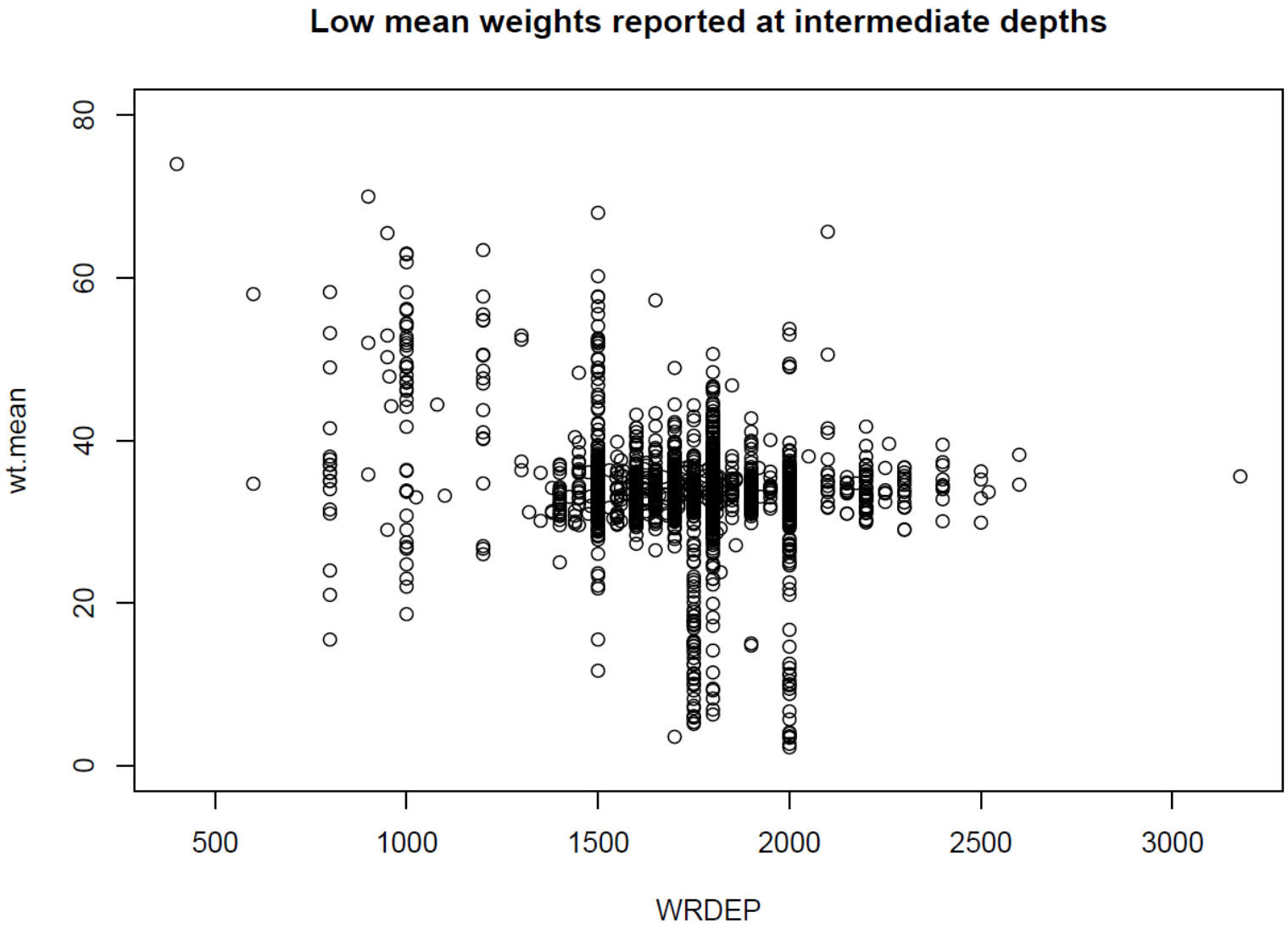
Bars at the start and end of the series need special interpretation. Some of the "entrants" in 1991 likely participated in 1990. Data for 2024 are preliminary and don't anticipate vessels that fished in 2025.



Mean weight (lbs) per trip plotted against fishing depth (ft).
Each point represents one fishing trip.

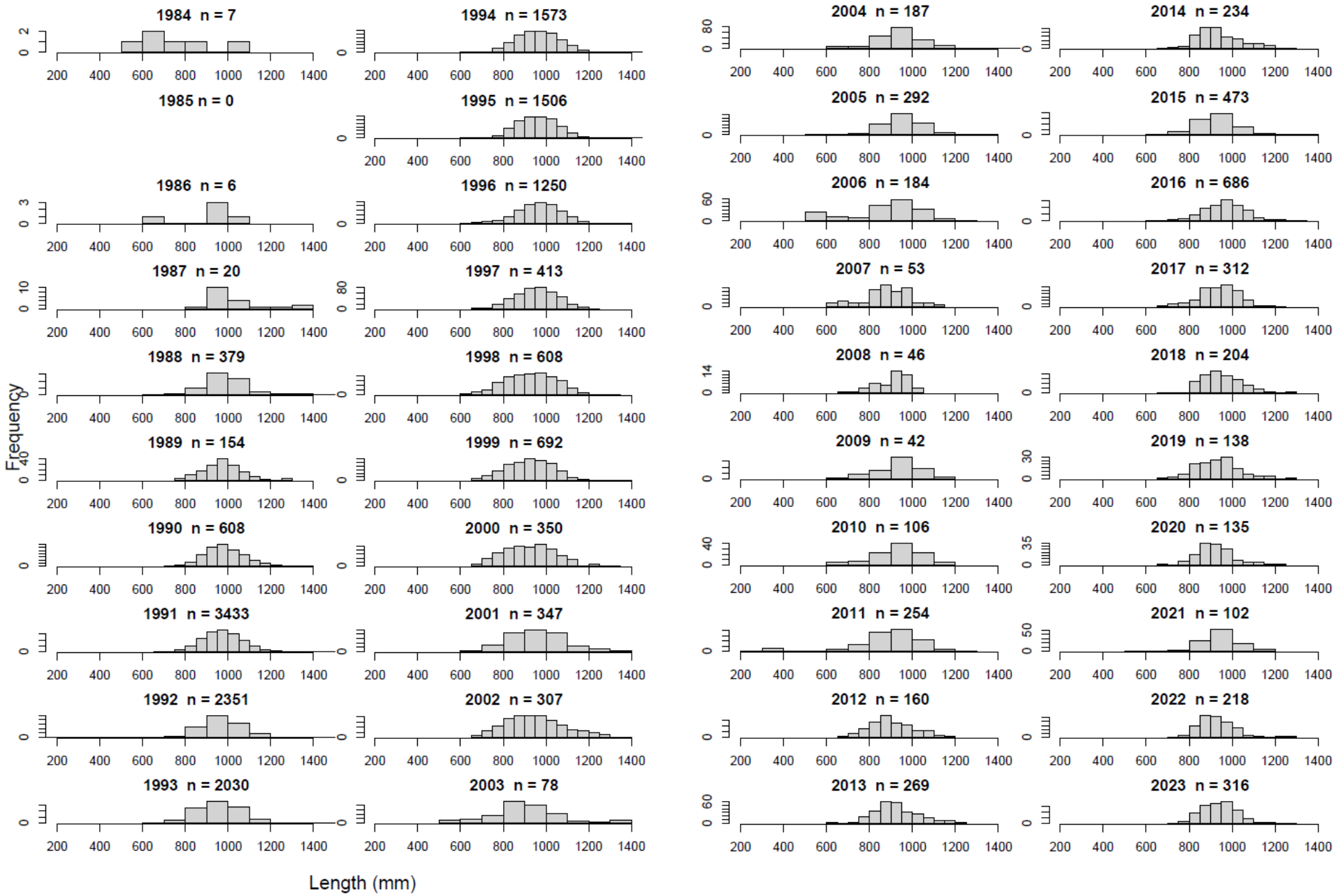
Possible explanations of low mean weight from 2015-2021:

1. ~~fishing in shallower areas~~
2. ~~fishing in a nursery area~~
3. recruitment event
4. immigration of small individuals from the eastern or southern Atlantic
5. low mean weights were predominantly reported by one vessel in the main fishing area.



Mean weight (lbs) calculated as reported numbers divided by reported weight. Box plots show the median (black line) interquartile ranges (boxes), range (dashed lines), and outliers (points).

Wreckfish length-frequency data



Wreckfish length-frequency considerations

- Most landed fish are between 800 and 1200 mm (32-46 inches);
- Some larger fish were caught in the 1980s;
- Little evidence of smaller fish between 2015 and 2021;
- Length distribution is stable over time?
- Length distributions have been normalized by landing weight;
- Data are suitable for Stock Synthesis Catch and Length model.

Table A3: Wreckfish size frequency data (summarized in Figure 3 of Anon. 2011a).

Total Length (in)	Frequency of Measured Lengths by Fishing Year					
	88-91	92-95	96-99	00-03	04-07	08-10
20	0	0	0	0	0	0
22	0	0	0	1	0	0
24	0	0	1	1	22	0
26	3	5	5	3	14	0
28	7	18	35	9	8	3
30	22	37	59	17	15	6
32	93	205	130	64	10	4
34	316	635	276	110	34	16
36	626	1125	406	137	85	21
38	937	1388	501	157	126	25
40	979	1456	526	152	149	46
42	745	1196	455	142	108	36
44	469	785	308	101	75	14
46	226	381	175	82	36	12
48	76	126	55	43	13	3
50	36	54	13	21	8	3
52	14	12	8	18	2	0
54	10	15	4	11	3	0
56	8	10	1	5	1	0
58	1	7	1	4	0	0
60	1	0	0	0	1	0
>60	1	0	0	0	0	0

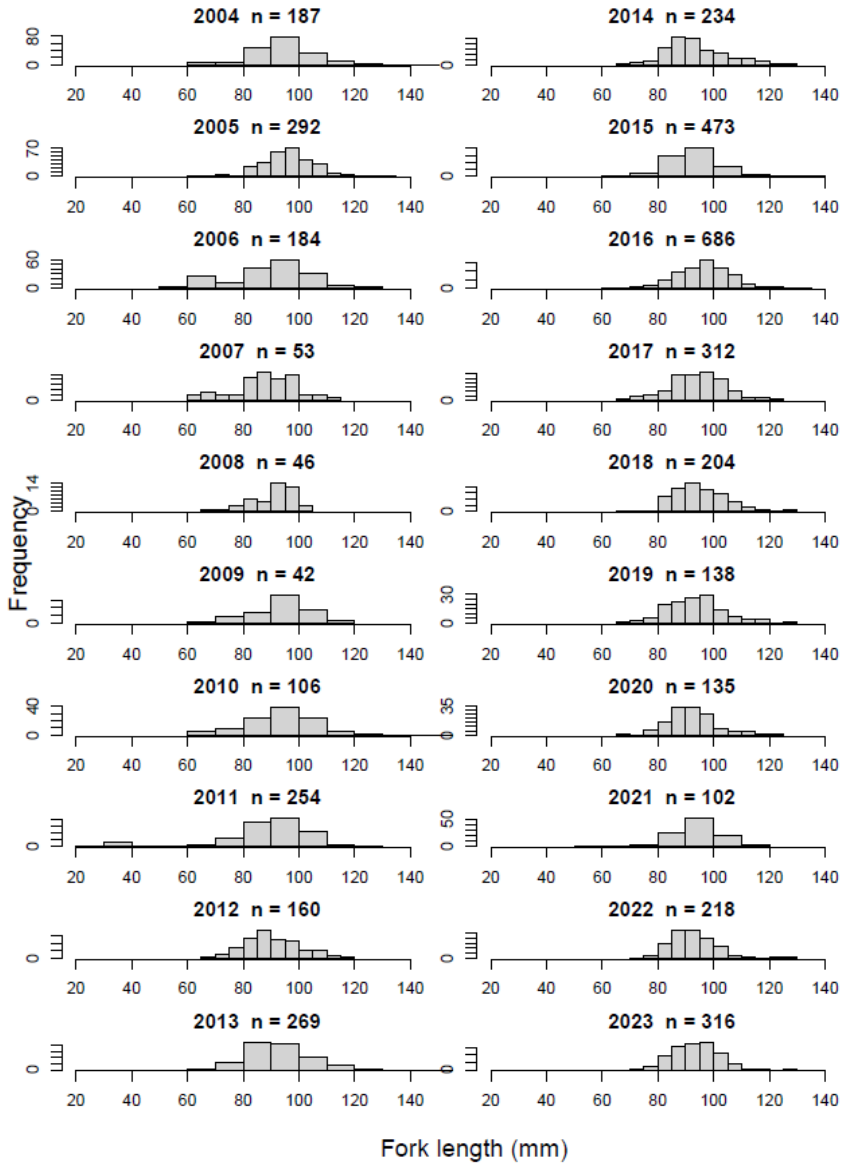
800 mm

1000 mm

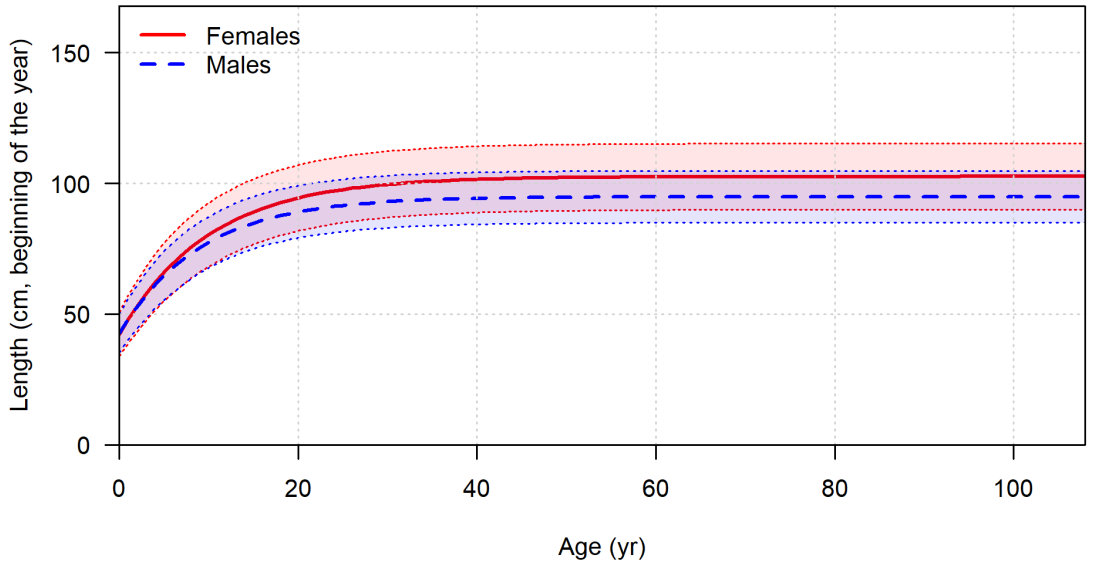
1200 mm

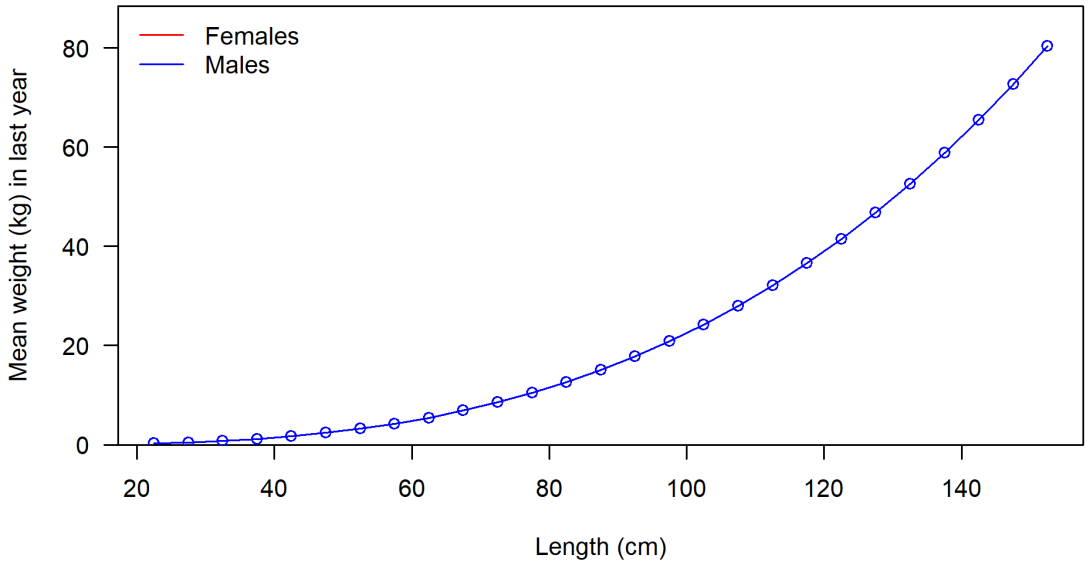
Wreckfish Assessment – Input data

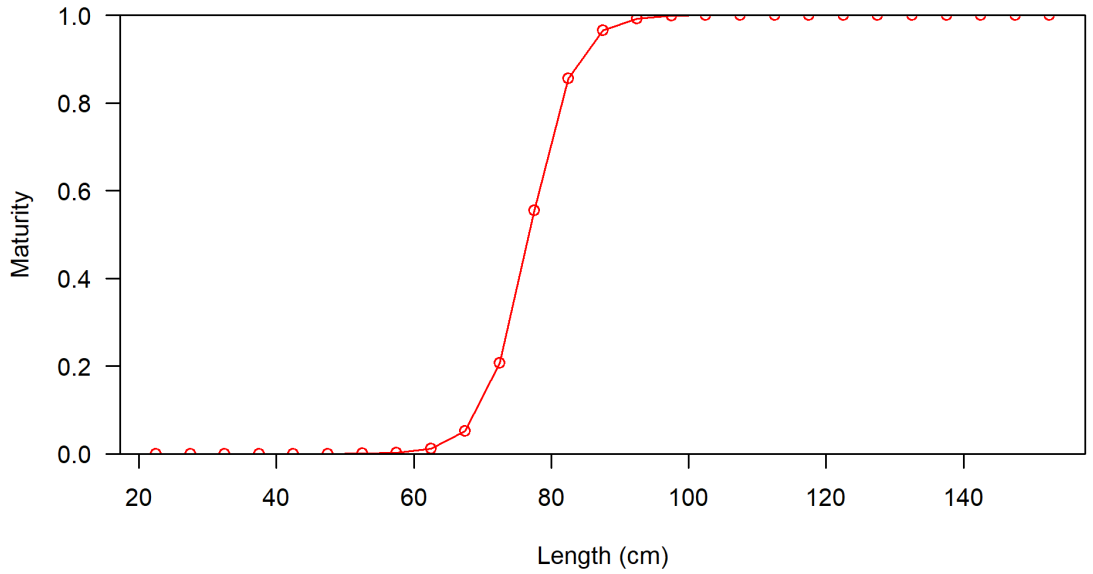
1. Life-history information: length at age, maturity at age, length-weight conversions (Bubley et al. 2025);
2. Length composition of catches from 1984 to 2024;
3. Commercial landings from 1991 to 2024 (SAFIS);
4. Commercial fishing effort from 1991 to 2024 (number of lines, hooks per line, hours fished, days fished).
5. No age composition data available.



Wreckfish Life-history Information (Bubley et al. 2025)







Wreckfish Assessment – Model Platform

- Cope, J. (2024). Stock Assessment Continuum Tool (Version 1.1.0). https://github.com/shcaba/SS-DL-tool;
- The Stock Synthesis Catch Length (SS-CL) module is appropriate for a data-moderate stock such as Wreckfish;
- A relative abundance index (e.g. CPUE) can also be incorporated;
- What is the level of stock depletion since the fishery started in the late 1980s?