Southeast Reef Fish Survey

2022 Sampling Activities and Relative Abundance

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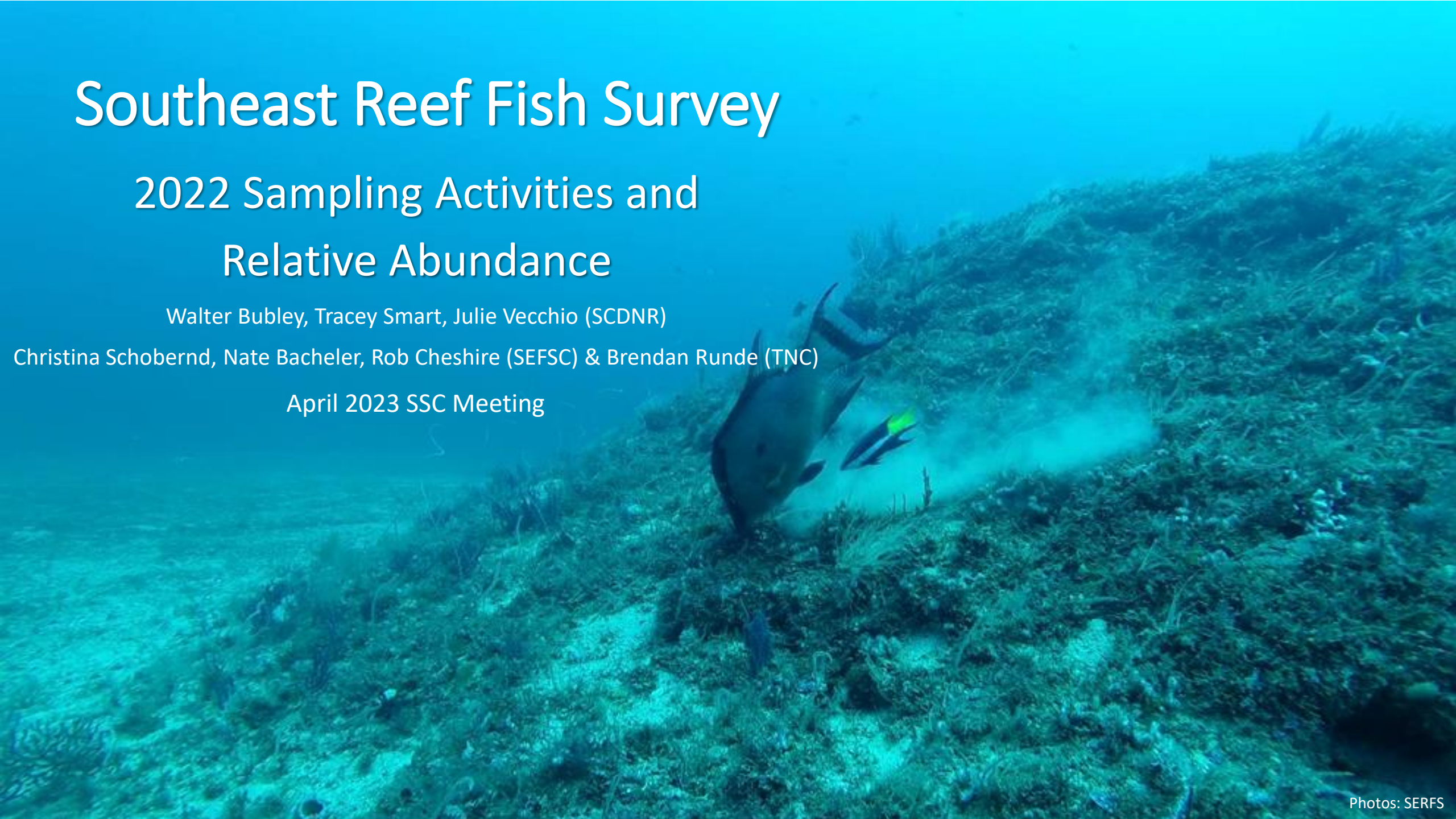
Christina Schobernd, Nate Bacheler, Rob Cheshire (SEFSC) & Brendan Runde (TNC)

April 2023 SSC Meeting



Photos: SERFS

Southeast Reef Fish Survey Overview

Survey Design

2022 Activities

Abundance, Length & Distribution for Selected Spp.

2023 Planned Activities

Photos: SERFS

Southeast Reef Fish Survey (SERFS)

Current Funding & Sampling:

MARMAP + SEAMAP-SA + SEFIS

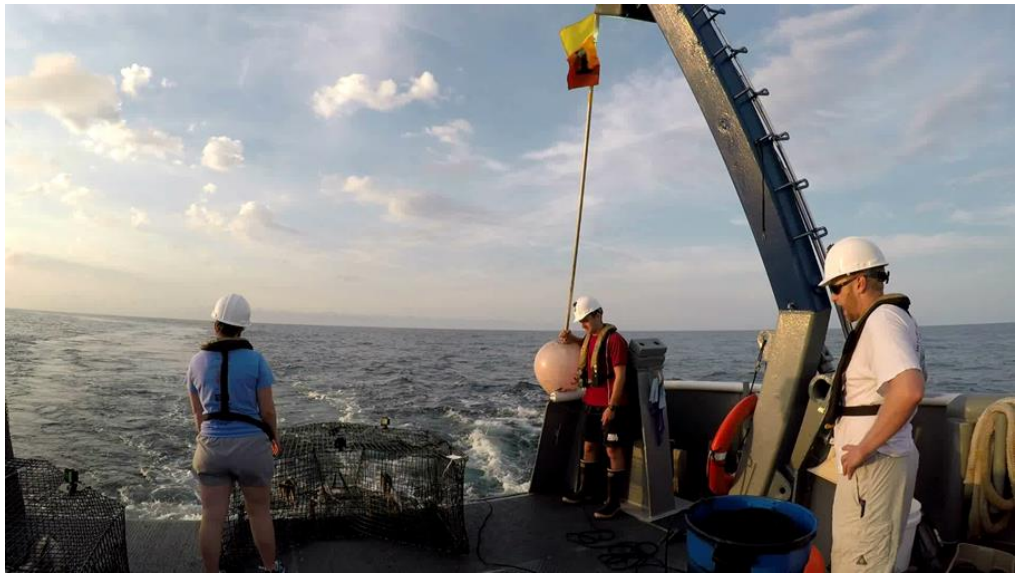
Historical Funding & Sampling:

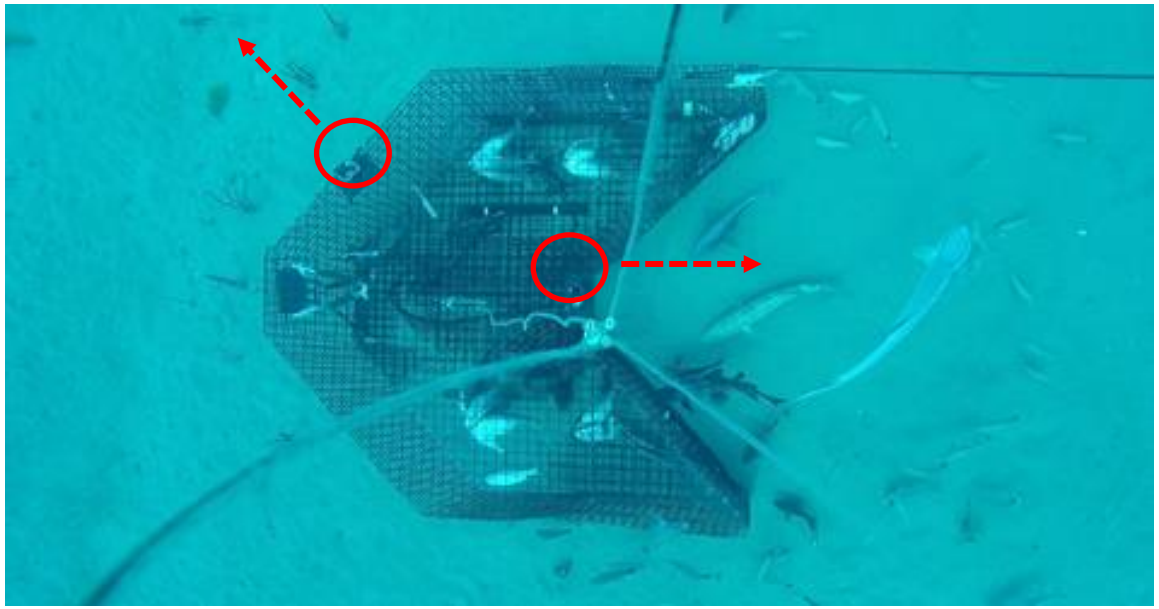
MARMAP

Marine Resources Monitoring, Assessment & Prediction Program (SCDNR)
Southeast Area Monitoring & Assessment Program - South Atlantic (SCDNR)
Southeast Fishery-Independent Survey (SEFSC)

Chevron Video Trap (CVT) Sampling

- Target low to medium relief, live-bottom habitats
- Depths ~15-110 m
- Trap used consistently and standardized since 1990
- Baited with menhaden, soak time ≈90 minutes
- Since 2011: all traps have 2 video cameras





CVT Universe

- ≈ 4,300 trap sampling stations (NC– FL)
- ≈ 1,500 randomly selected in 2022
- Sampling mid-April – mid-October

Sample and data processing & analyses

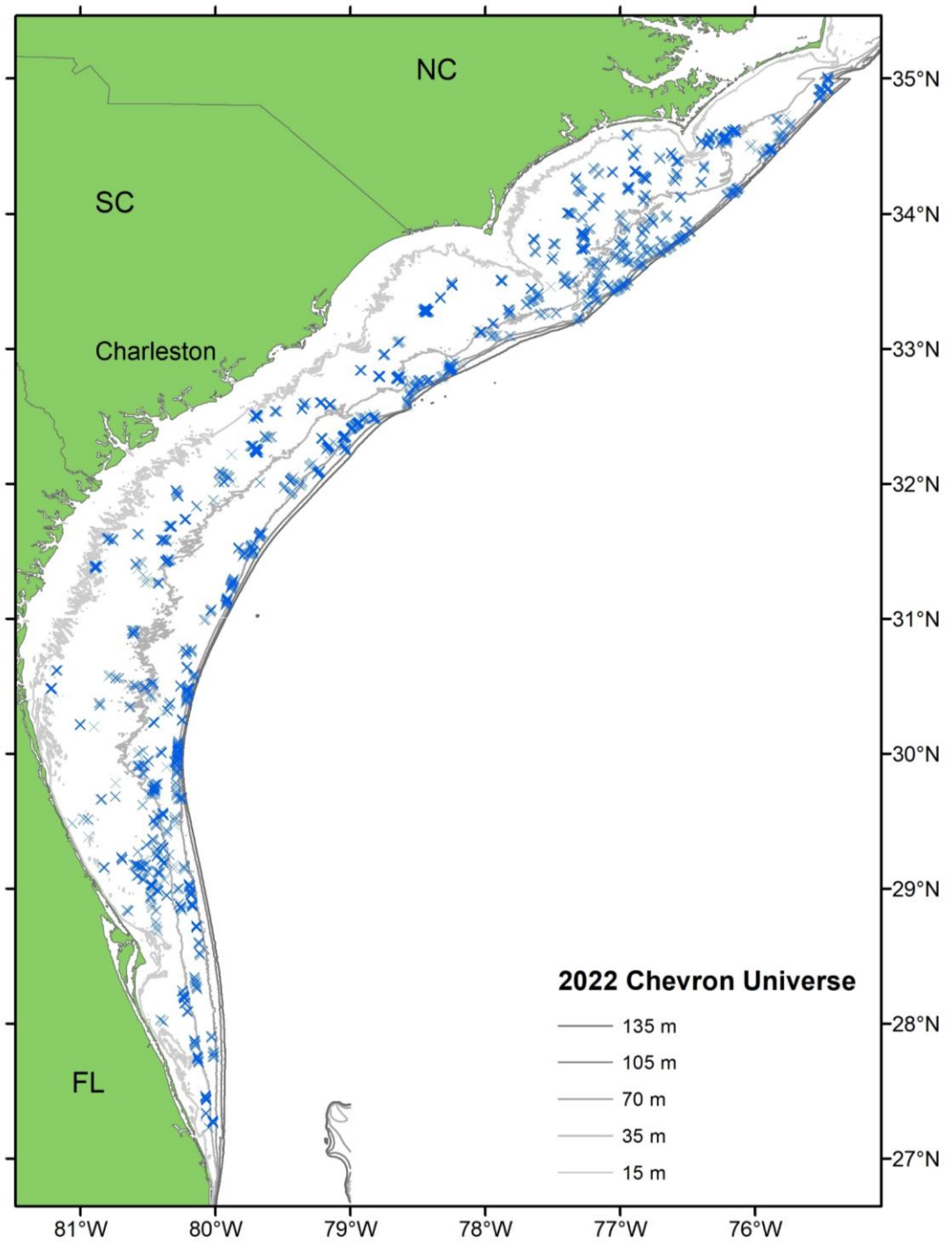
MARMAP/SEAMAP-SA (SCDNR):

- Trap indices
- Life history

SEFIS (SEFSC)

- Video indices

One combined database (SEAMAP.ORG)

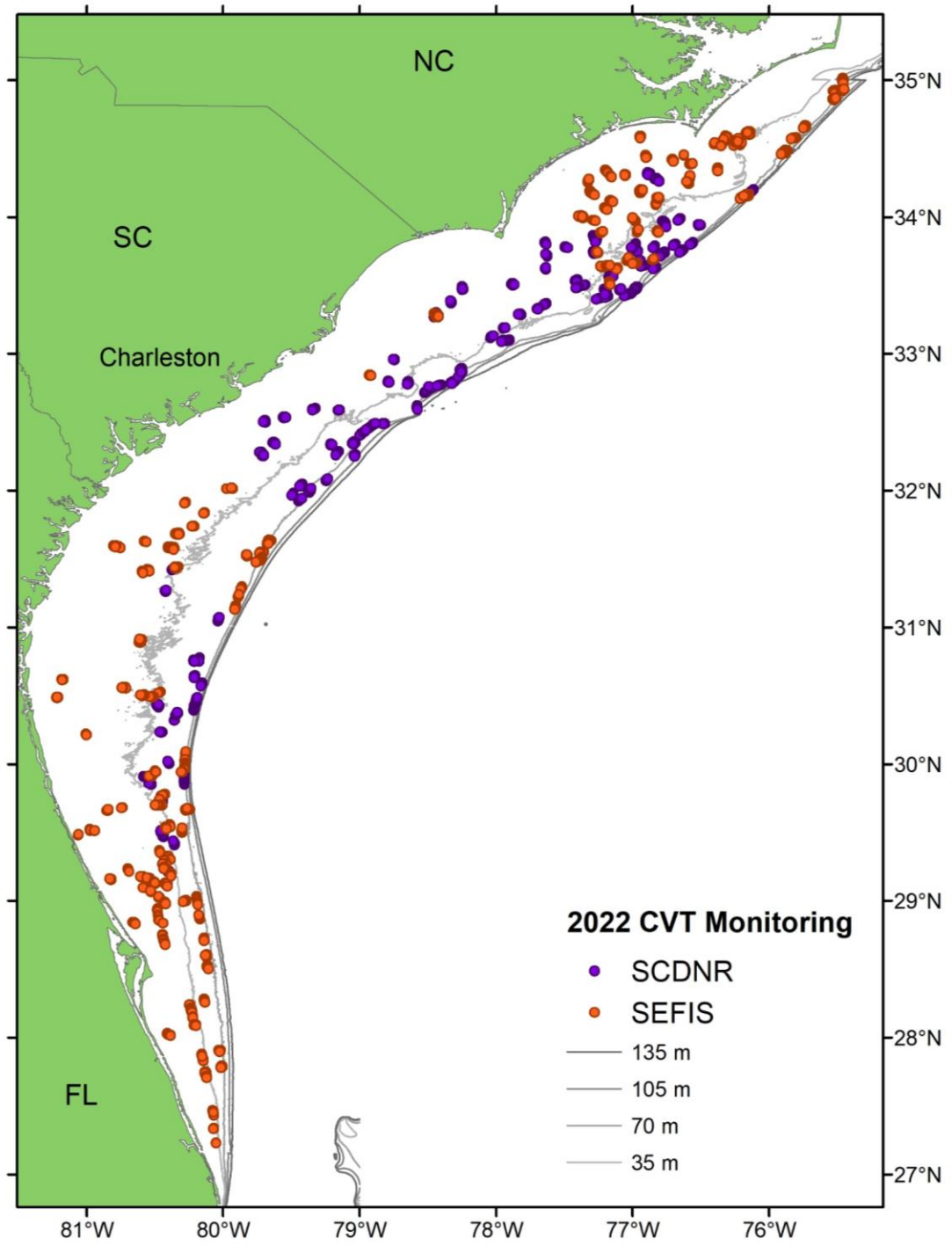


2022 SERFS Activities

- **86** days at sea
- **1,945** gear deployments

  1,667 Chevron Video Traps

  278 CTD casts
- **CVTs = 28,814** fish (**59** species) collected, measured, weighed
- **9,102** fish (**25** species) retained for life history (age, repro., DNA)



Overview of Relative Abundance

- Chevron index (1990-2022)
- Video index (2011-2021)
- No sampling in 2020
- Standardized using Zero-Inflated Negative Binomial model (ZINB)

  Most appropriate method, reduces uncertainty

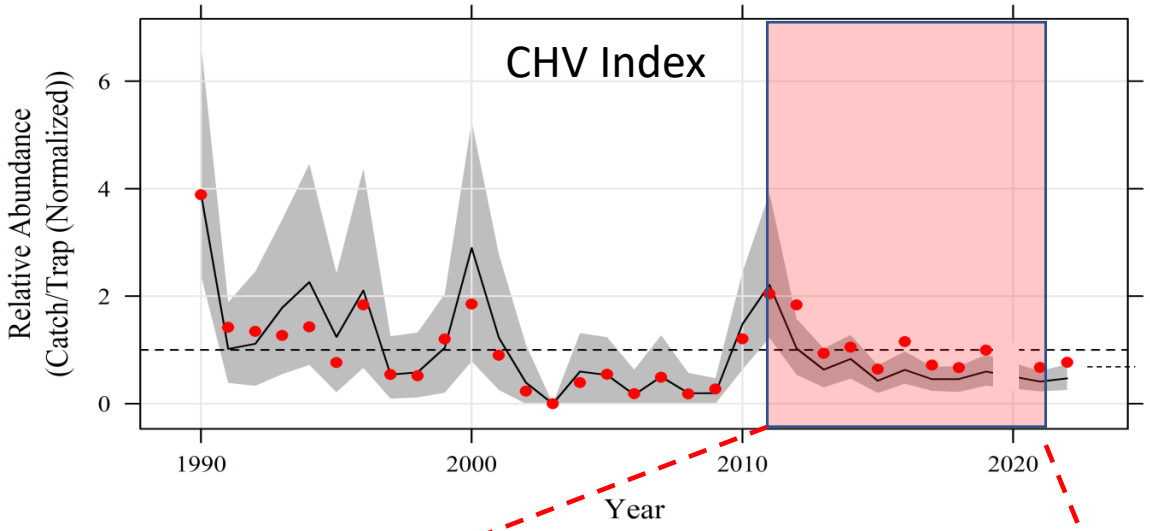
Traps:

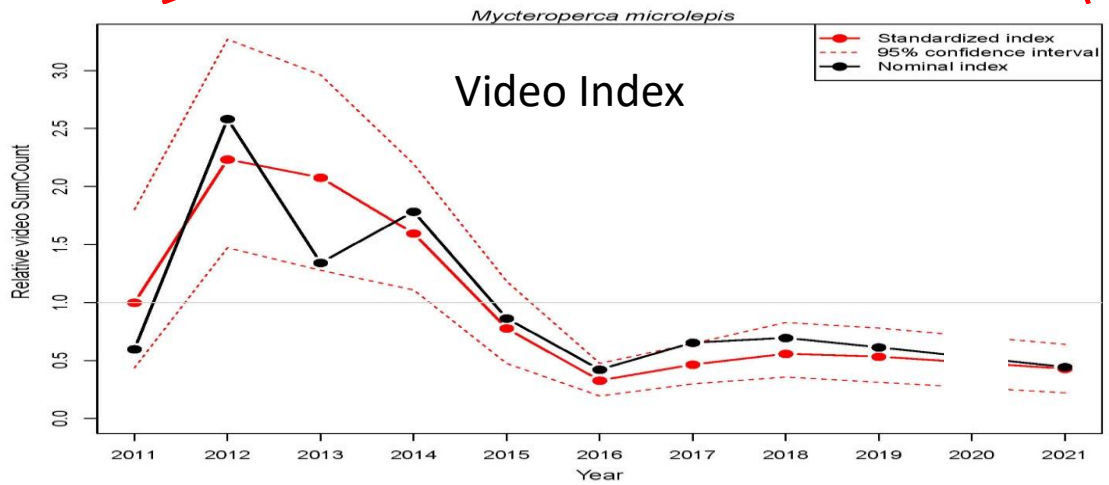
- Number of fish
- Trap soak time

Videos:

- MeanCount
- 10 min after trap lands on bottom
- One snapshot every 30 s for 20 min

Indices- Example





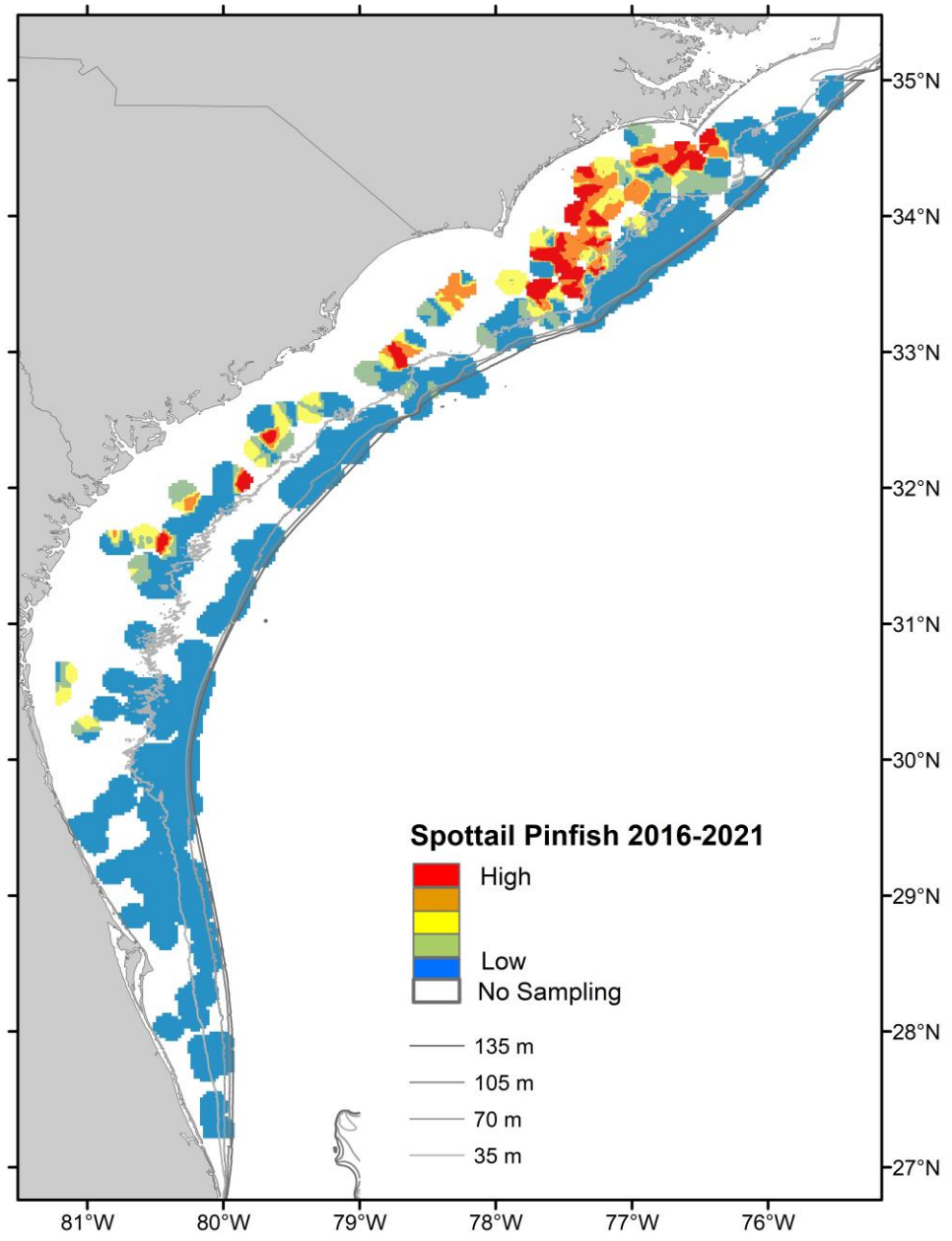
Normalized to long-term average
(dashed or solid line at 1)

e.g. 2 = twice long-term average, and 0.5 = half long-term average

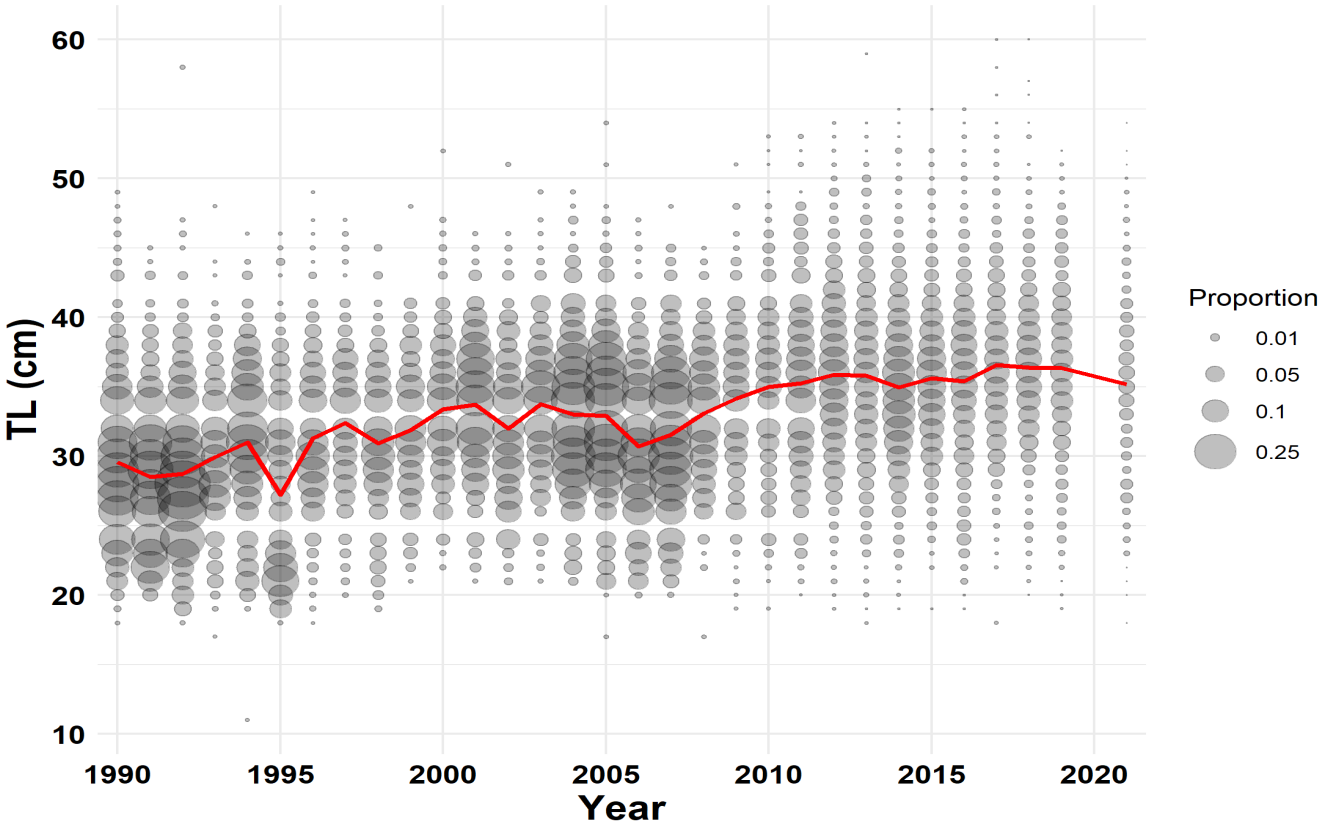
Gear	ZINB Index	95% C.I.	Nominal Values
CHV	Black Line	Gray Shading	Red Dots
Video	Red Line	Dotted Lines	Black Dots + Line

Maps- Example

- Nominal CHV abundance in quintiles (5 bins)
  - # fish / trap hour
- 2016-2019 & 2021
- Cooler colors => lower nominal abundance
- Warmer colors => higher nominal abundance
- White => no sampling
- Not updated since last year



Length Compositions- Example

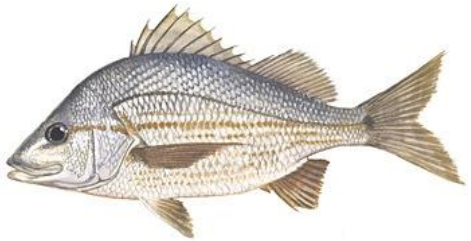


- Chevron Trap Only
- Maximum (Pinched) Total Length (cm)
- 1-cm Length Bins
- Bubble size = # fish in length bin / total fish measured in a year
- Red Line = Average TL
- "Missing" length bins in some graphs are result of converting between FL & TL and rounding to cm

Relative Abundance Overview
Caveats

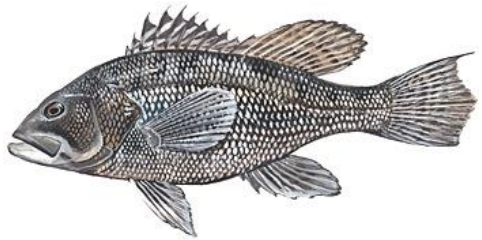
- Not an update of stock status
- Trap: Constraints, stratification, units, and models may be different from those used in (SEDAR) stock assessments
- Video: Index for species that have been assessed through SEDAR, with video index model used in the assessment
- Not all species have been assessed or updated (SEDAR) and not all updated trends and analyses have been discussed in assessment framework

Selected Species
2022 CHV Catch Rankings

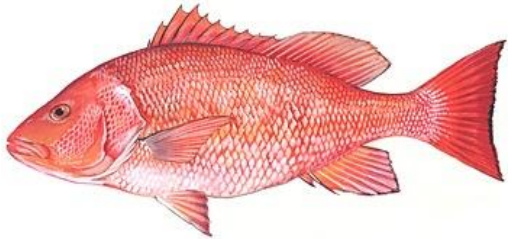


1. Tomtate

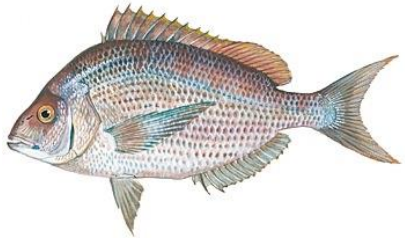
2. Vermilion Snapper



3. Black Sea Bass



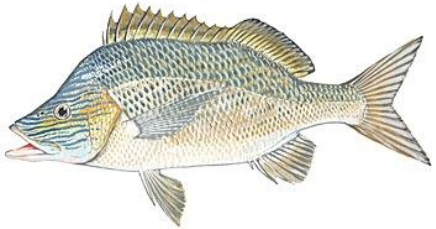
4. Red Snapper



5. *Stenotomus* spp.

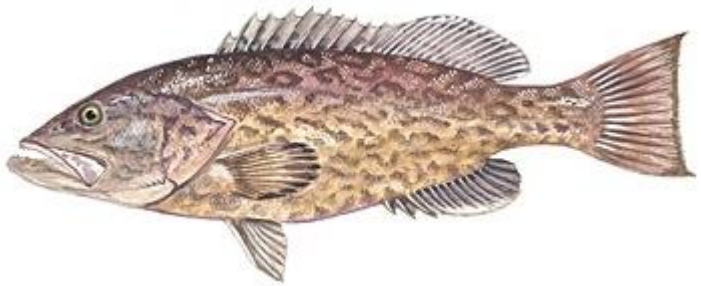
6. Gray Triggerfish

7. Red Porgy

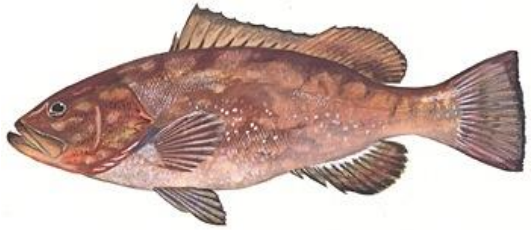


8. White Grunt

18. Scamp

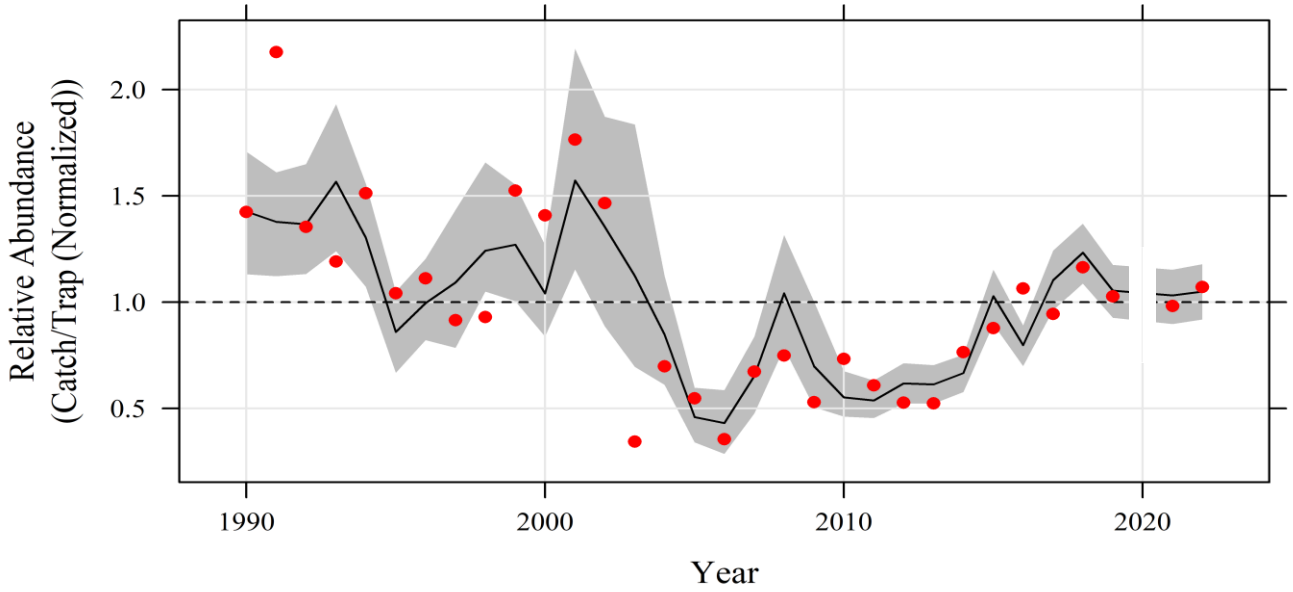


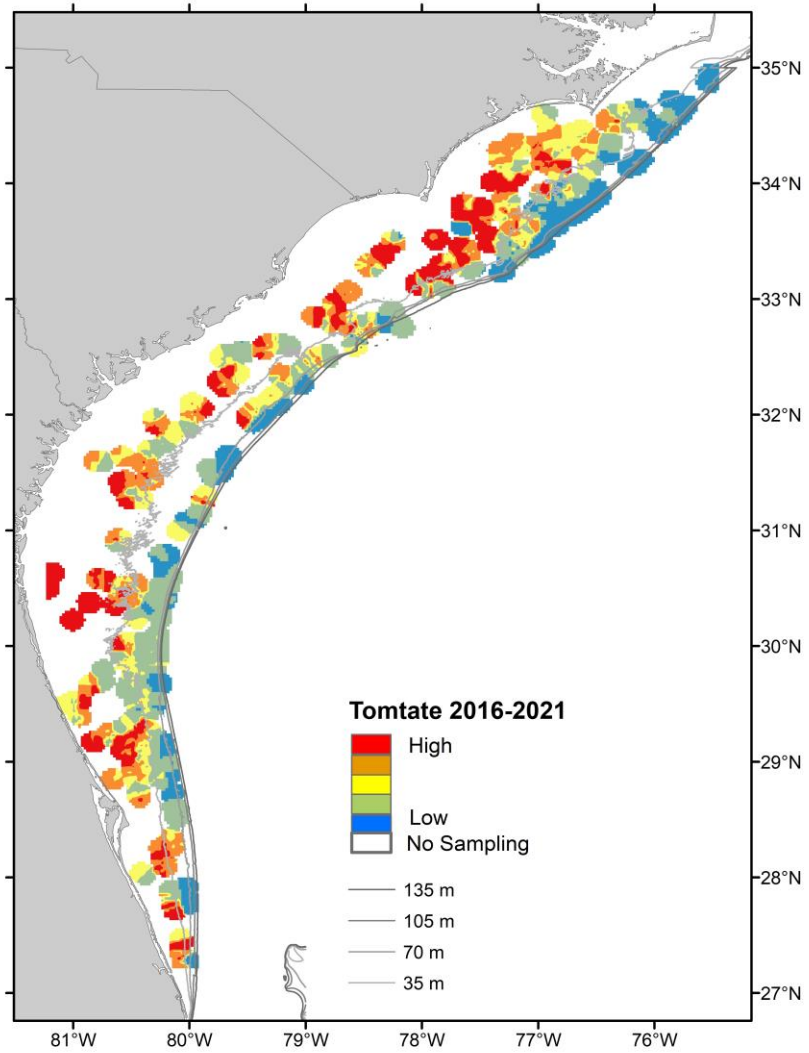
22. Gag



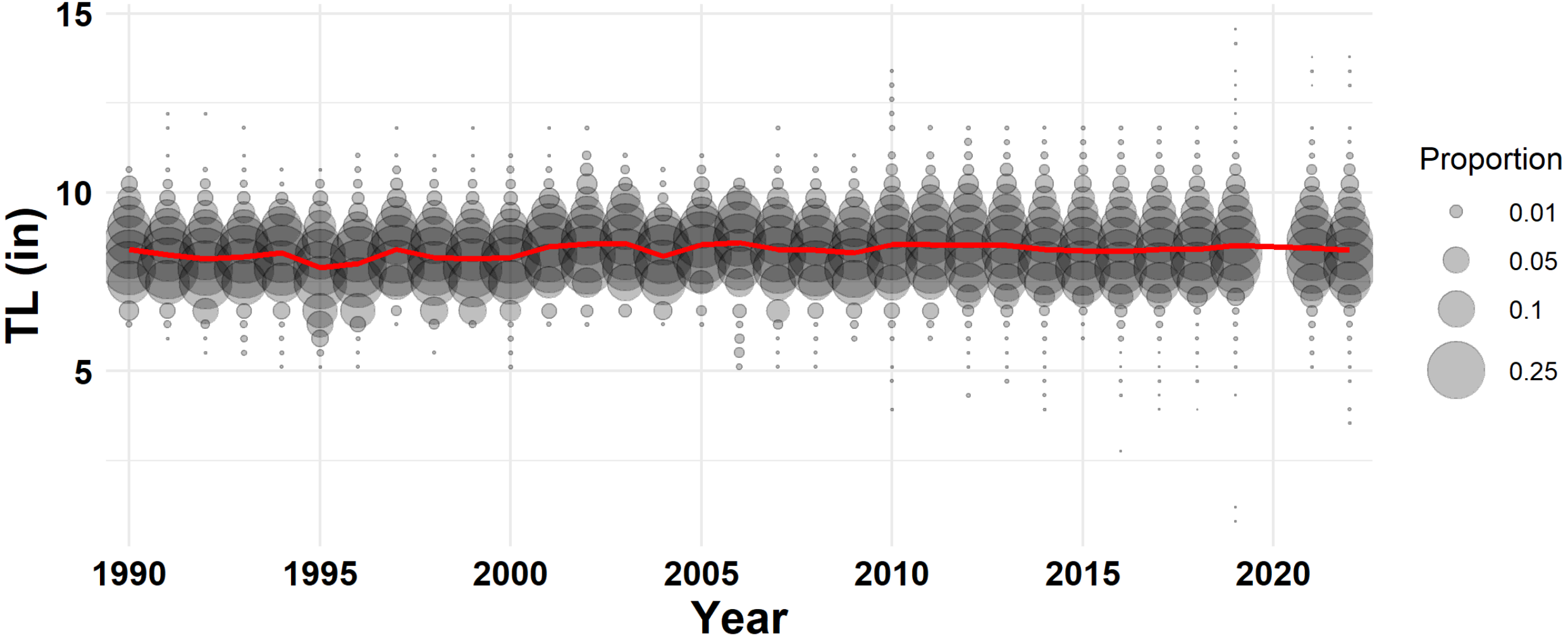
28. Red Grouper

Tomtate

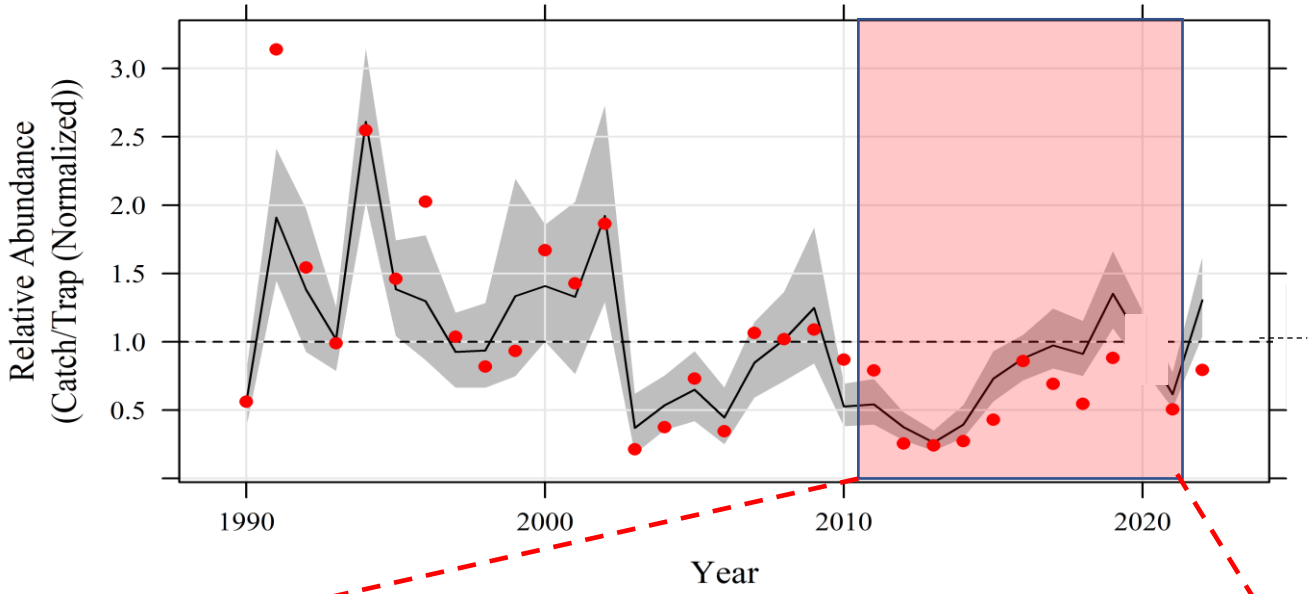

Relative Abundance
(Catch/Trap (Normalized))
2.0
1.5
1.0
0.5
1990
2000
2010
2020
Year

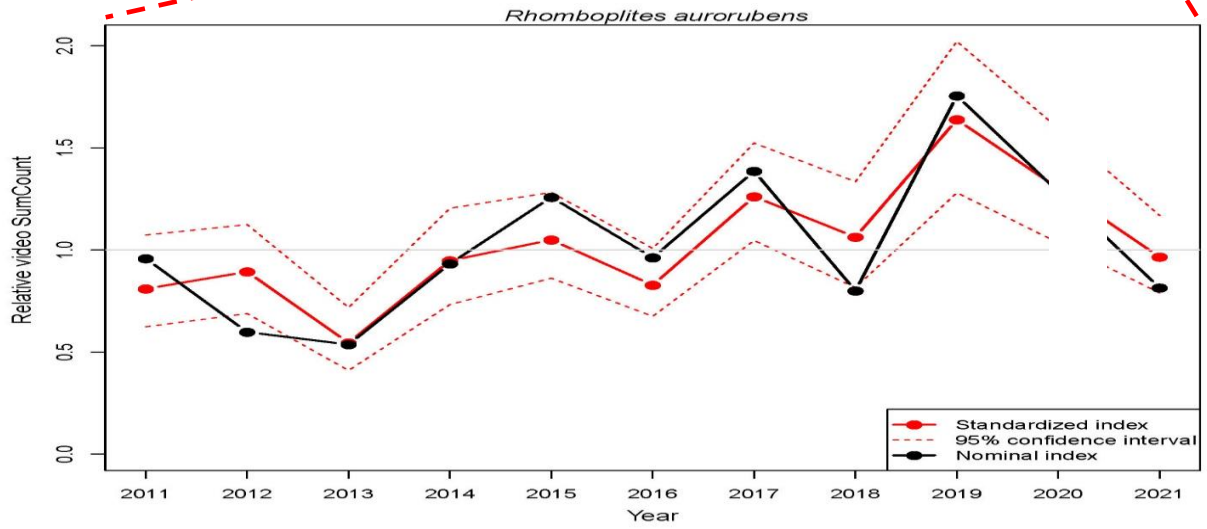

35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W
Tomtate 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m

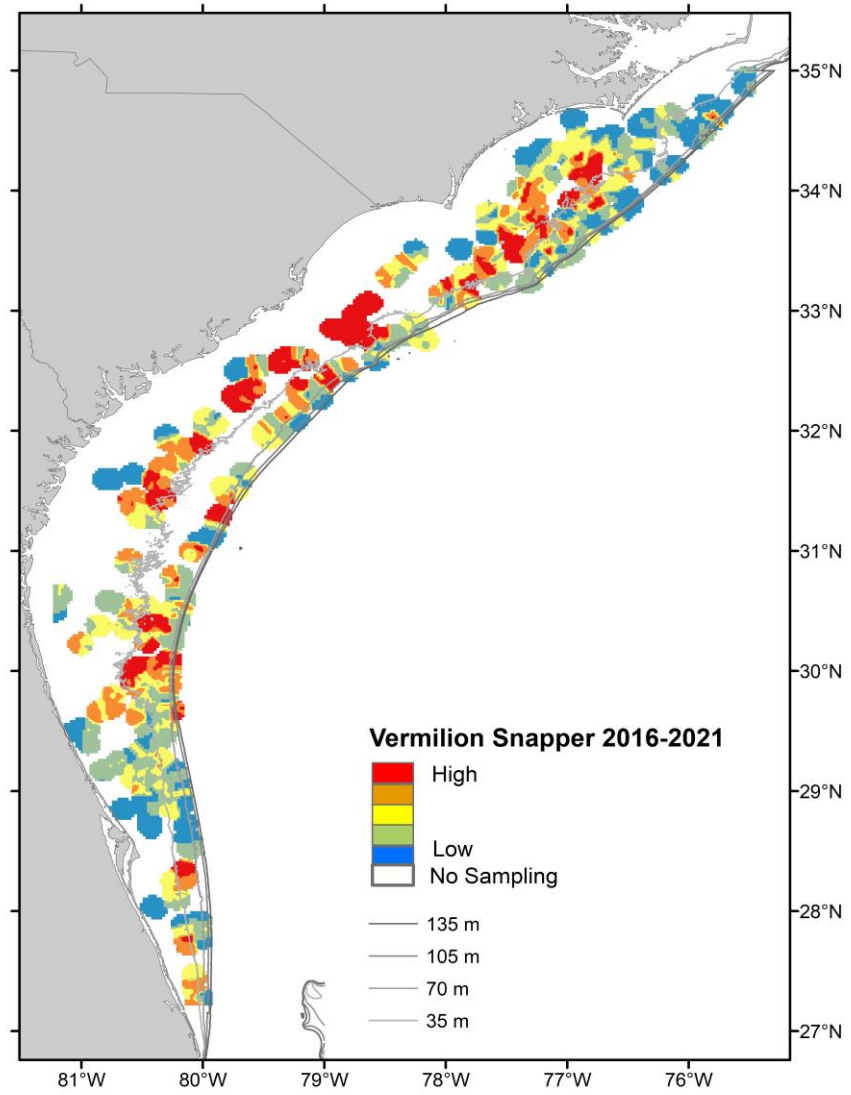
Tomtate


15
10
5
TL (in)
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.01
0.05
0.1
0.25

Vermilion Snapper







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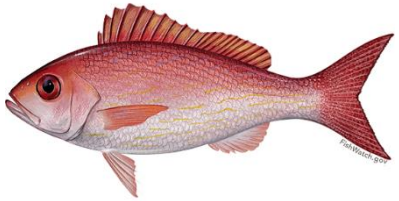
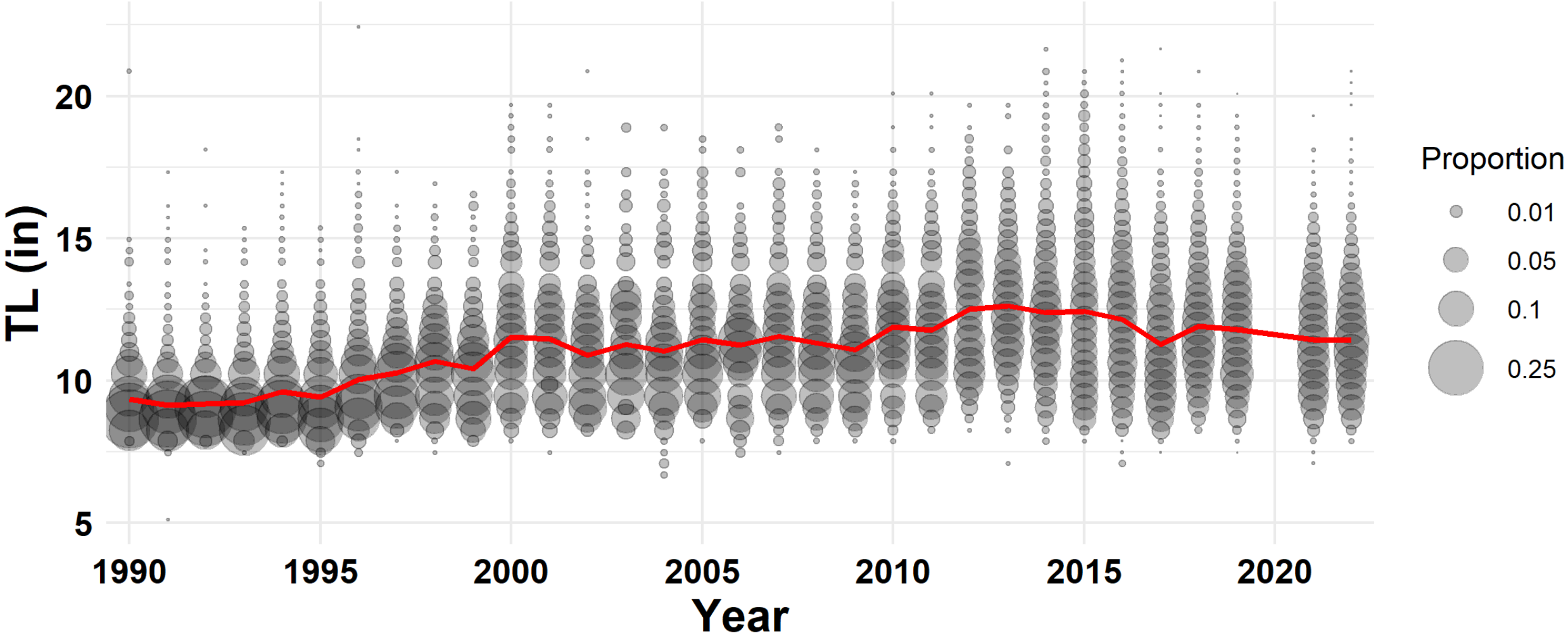
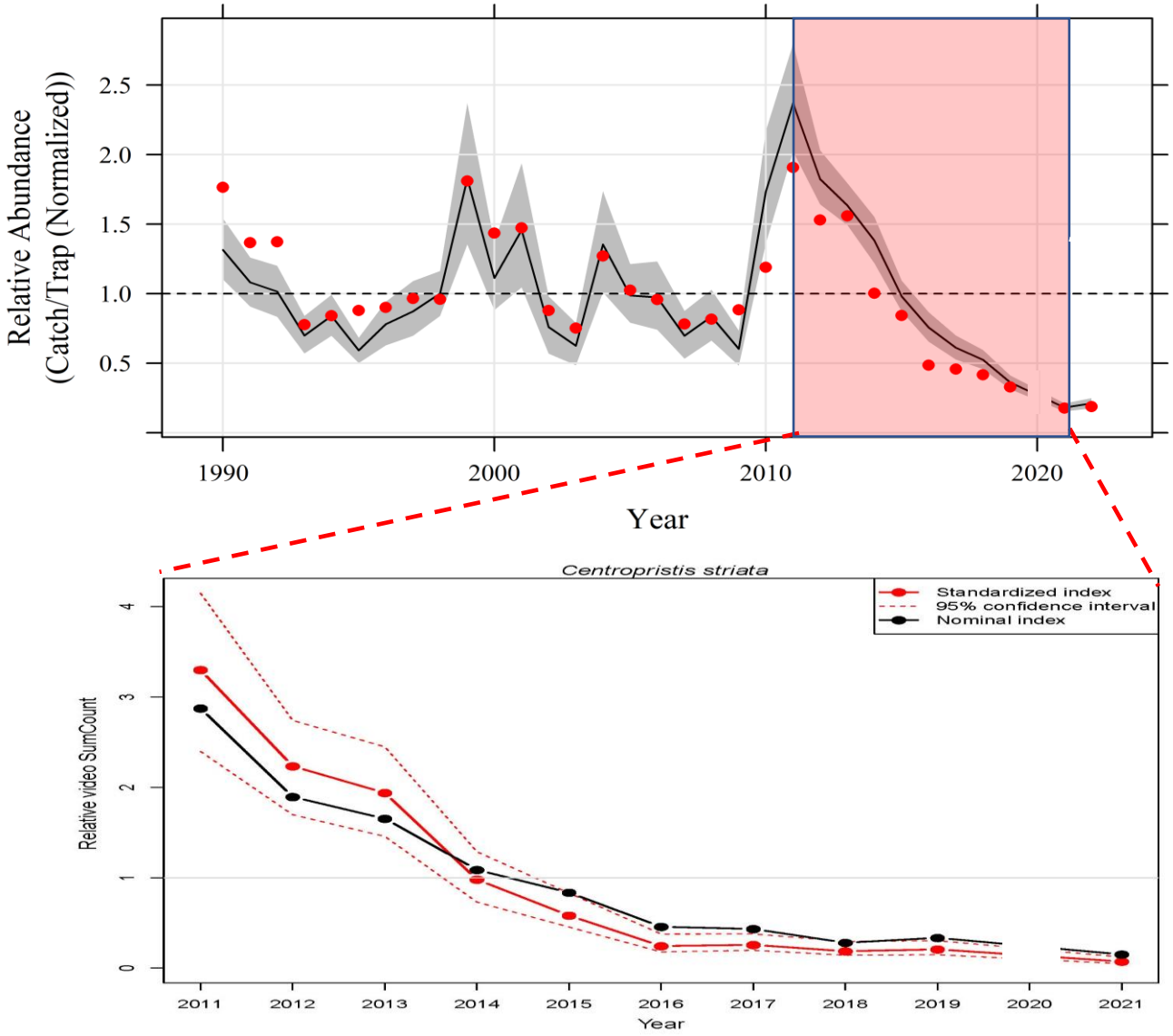
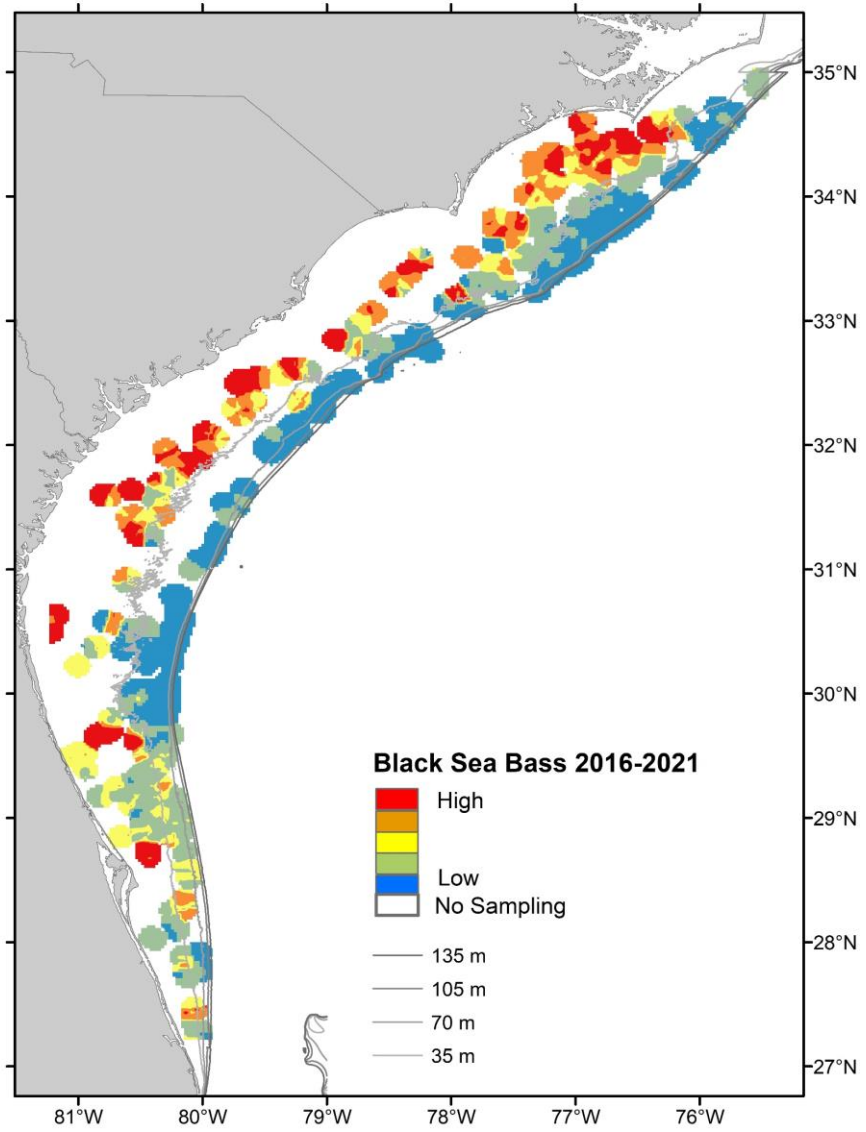


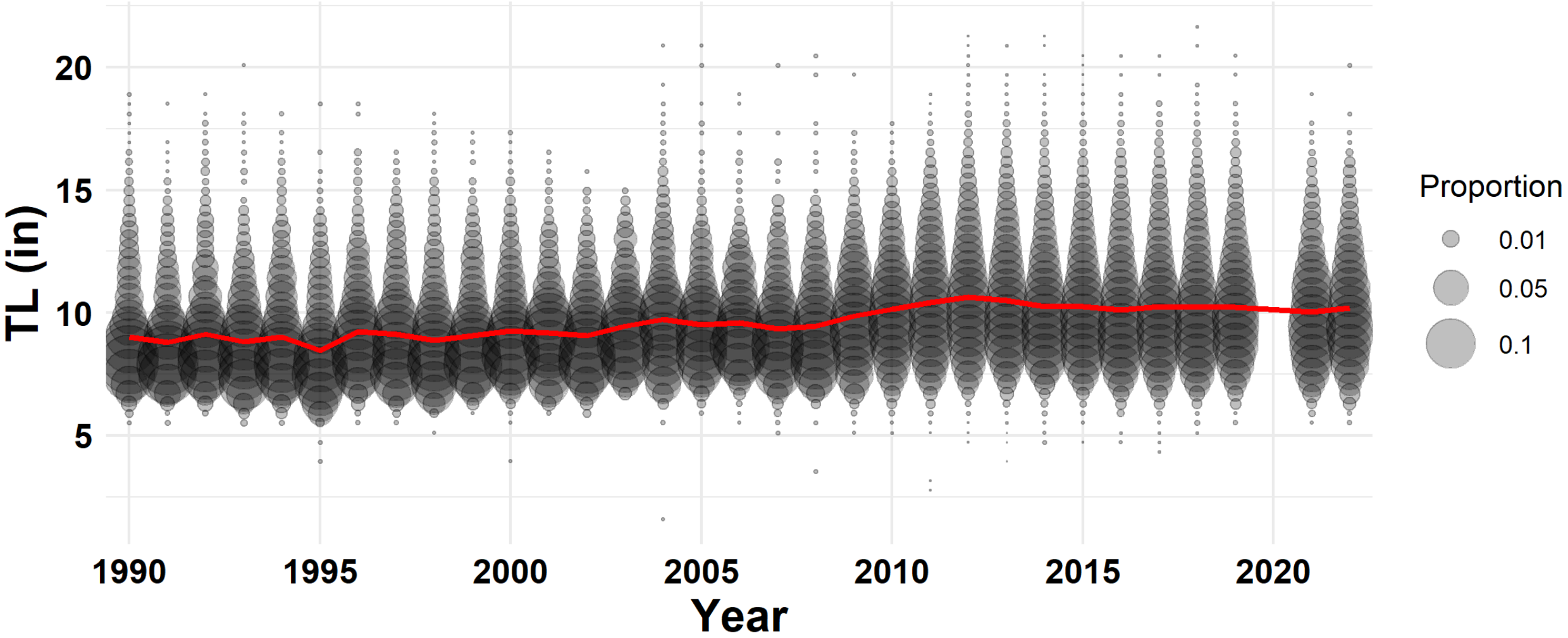


Black Sea Bass

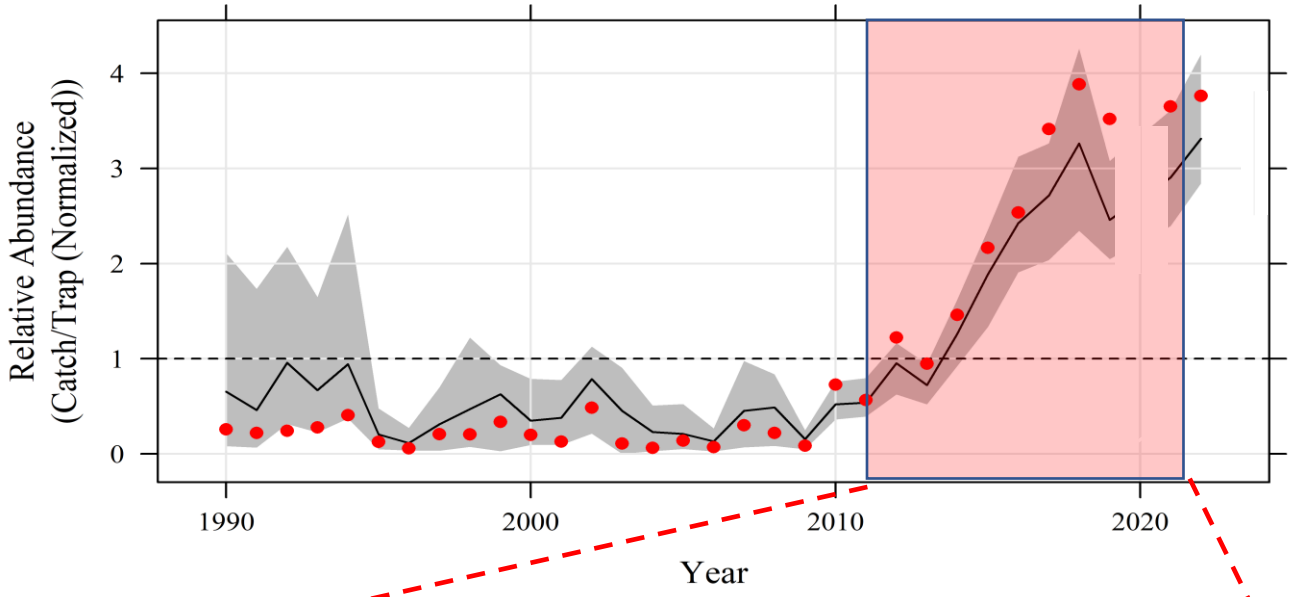


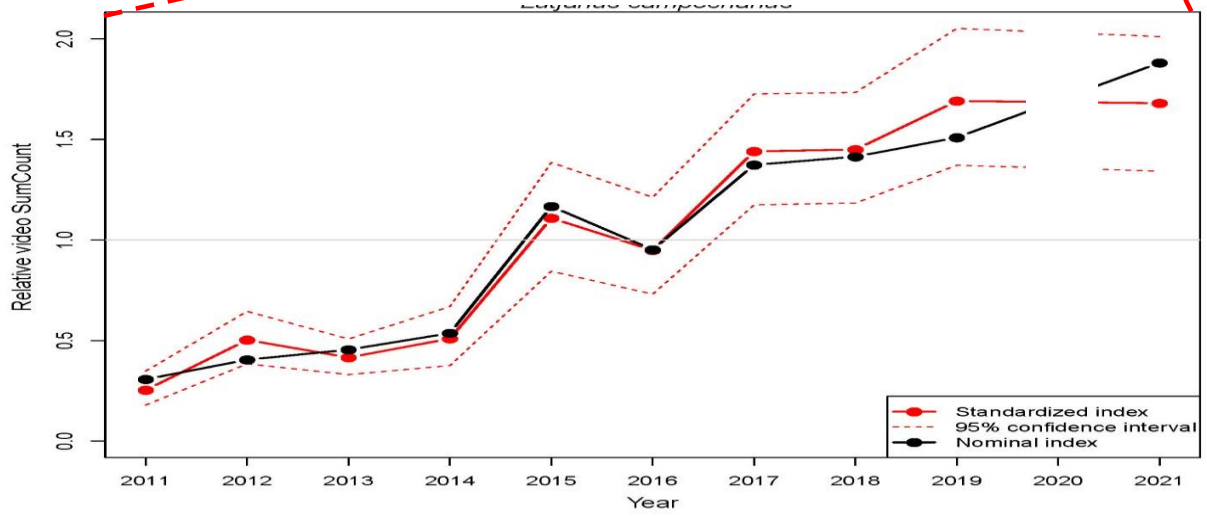


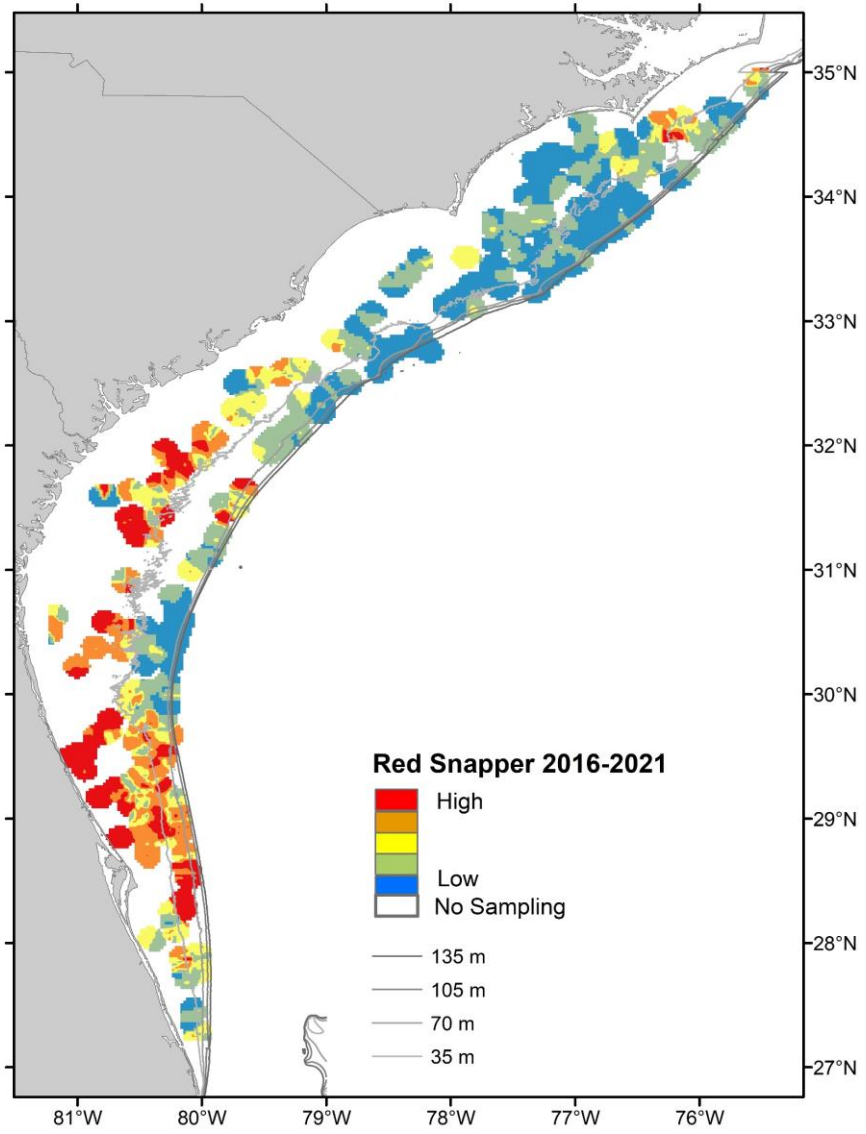
Black Sea Bass



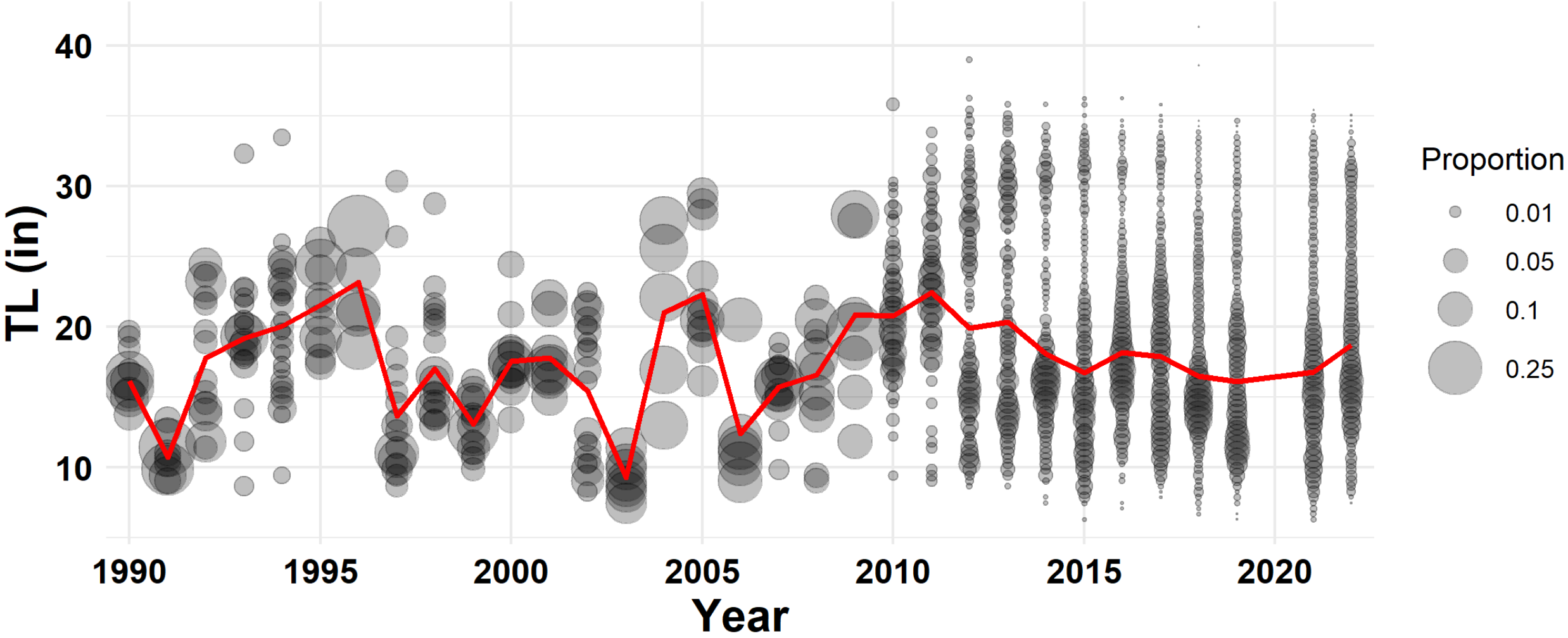
Red Snapper


Relative Abundance
(Catch/Trap (Normalized))
0
1
2
3
4
1990
2000
2010
2020
Year

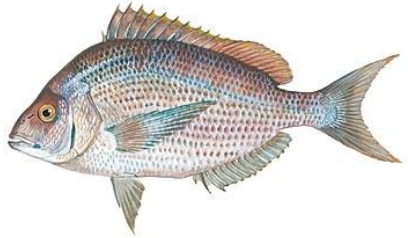

Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year
Standardized index
95% confidence interval
Nominal index

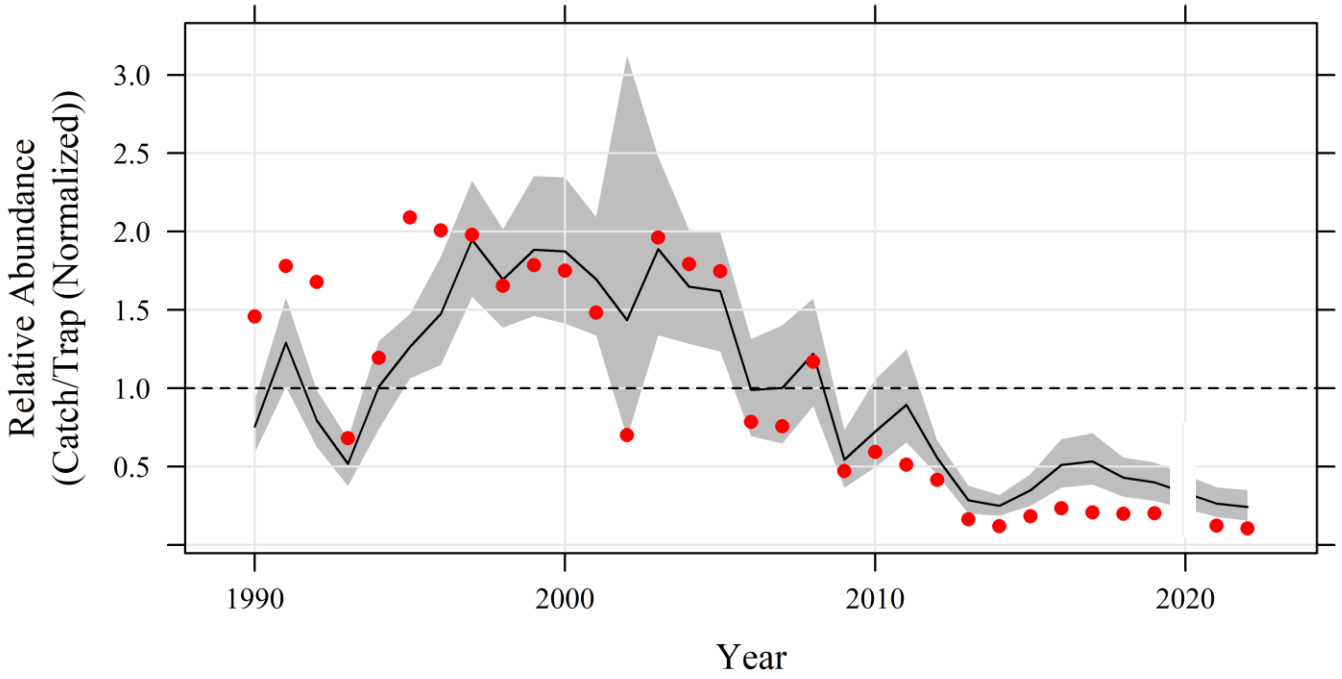

Red Snapper 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m
35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W

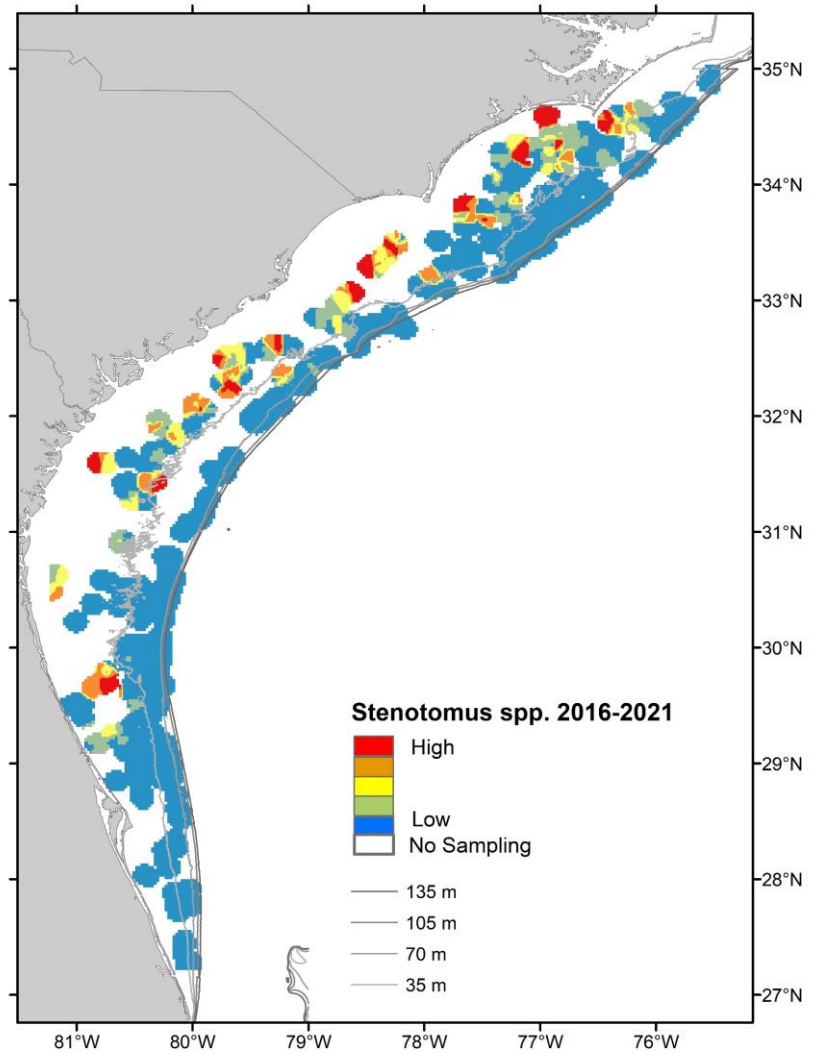
Red Snapper


40
30
20
10
TL (in)
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.01
0.05
0.1
0.25

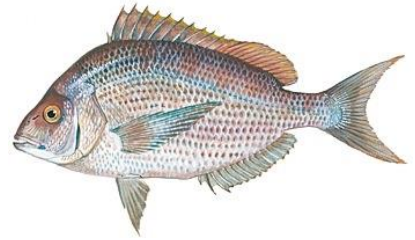
Stenotomus spp.

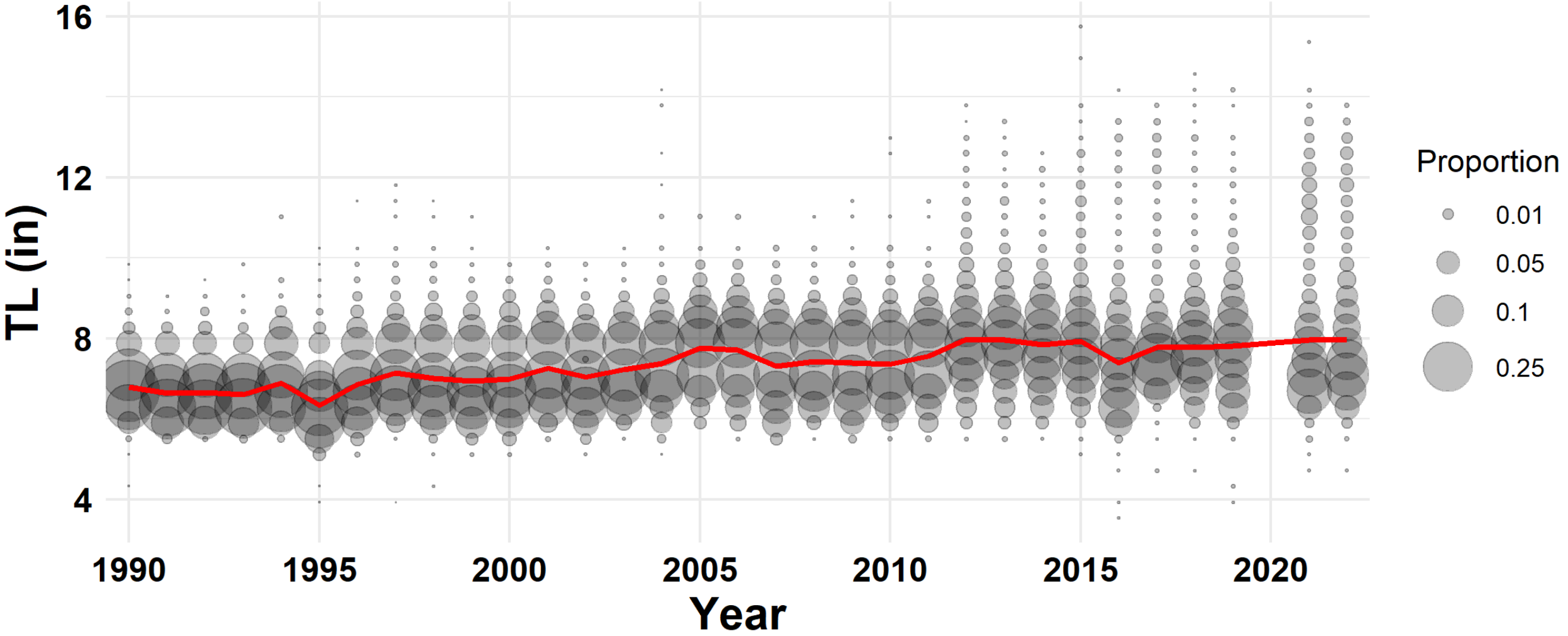




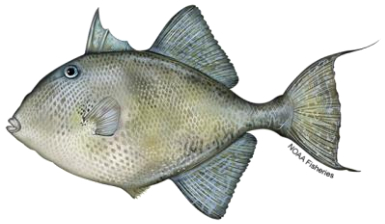


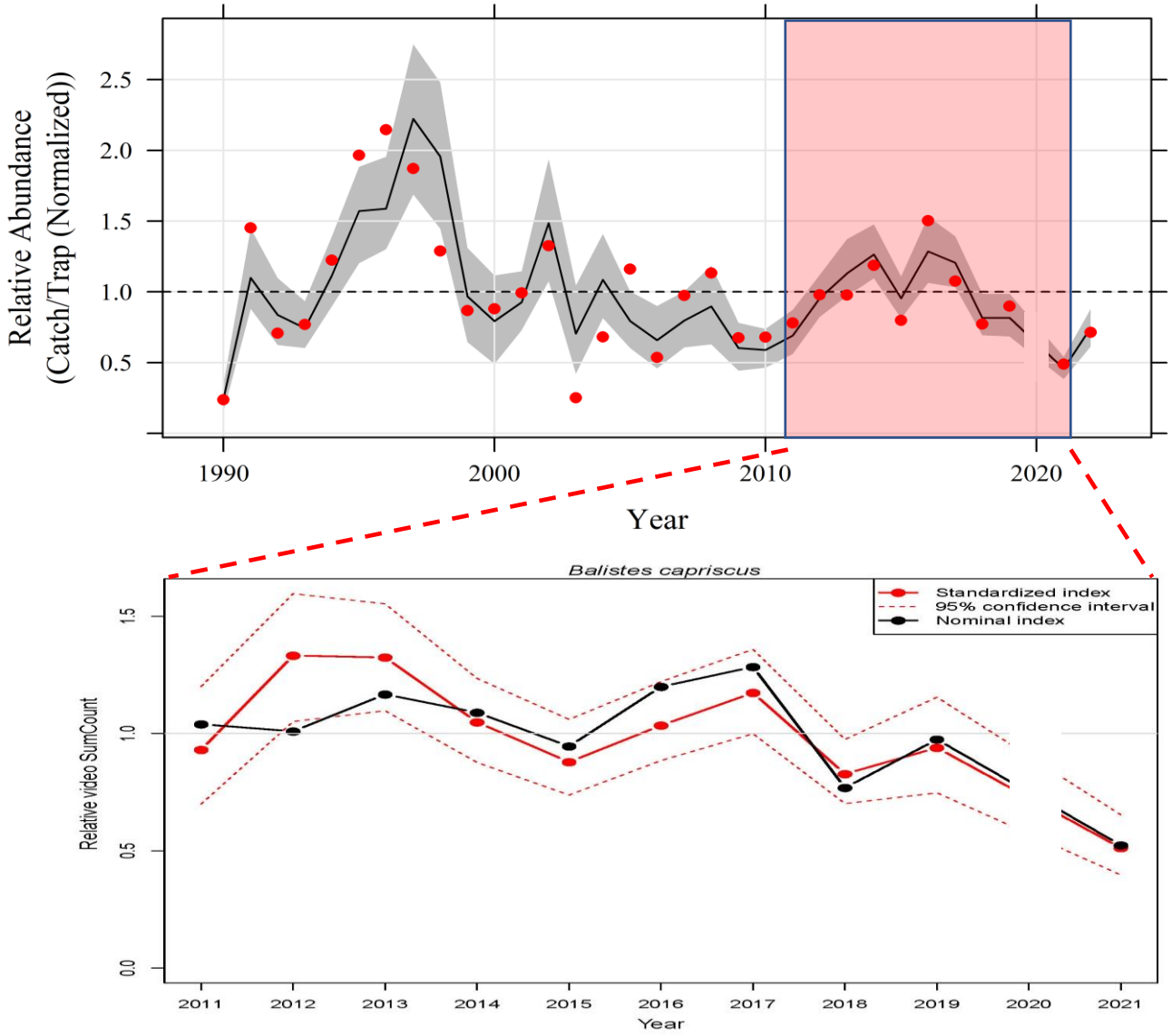
Stenotomus spp.

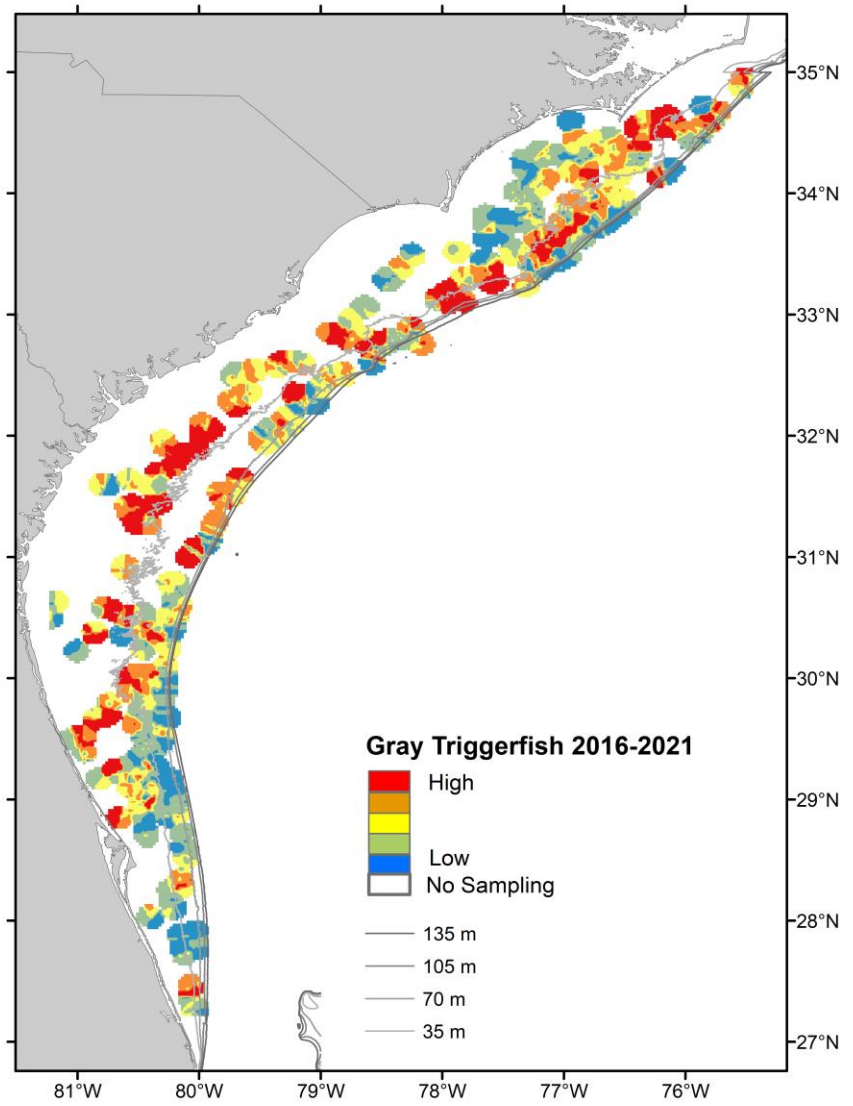




Gray Triggerfish







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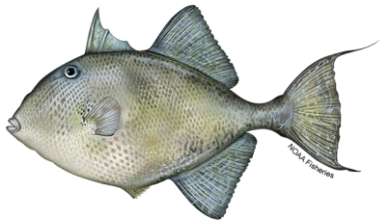
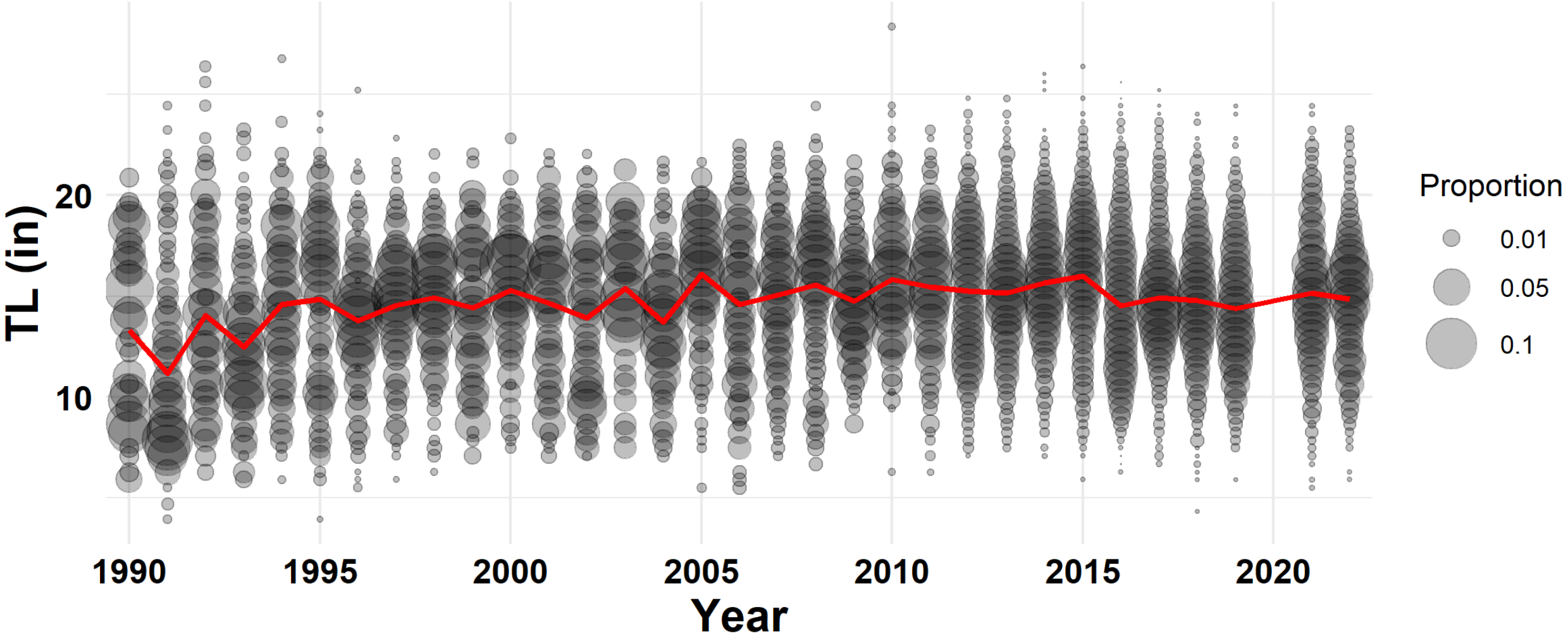
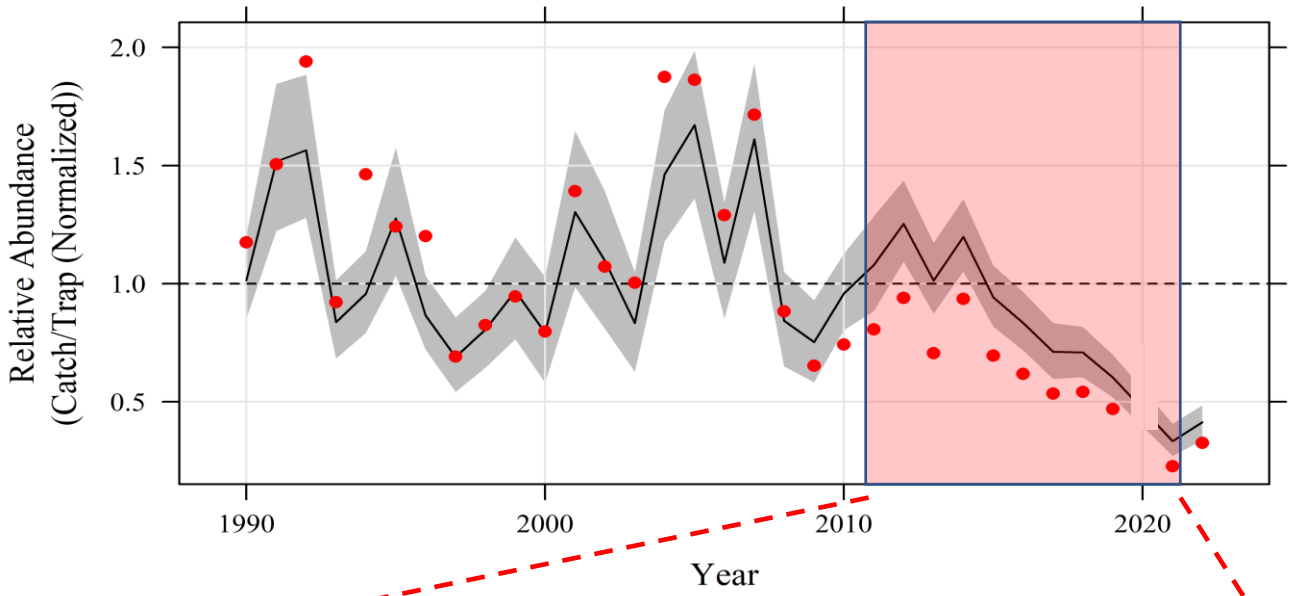
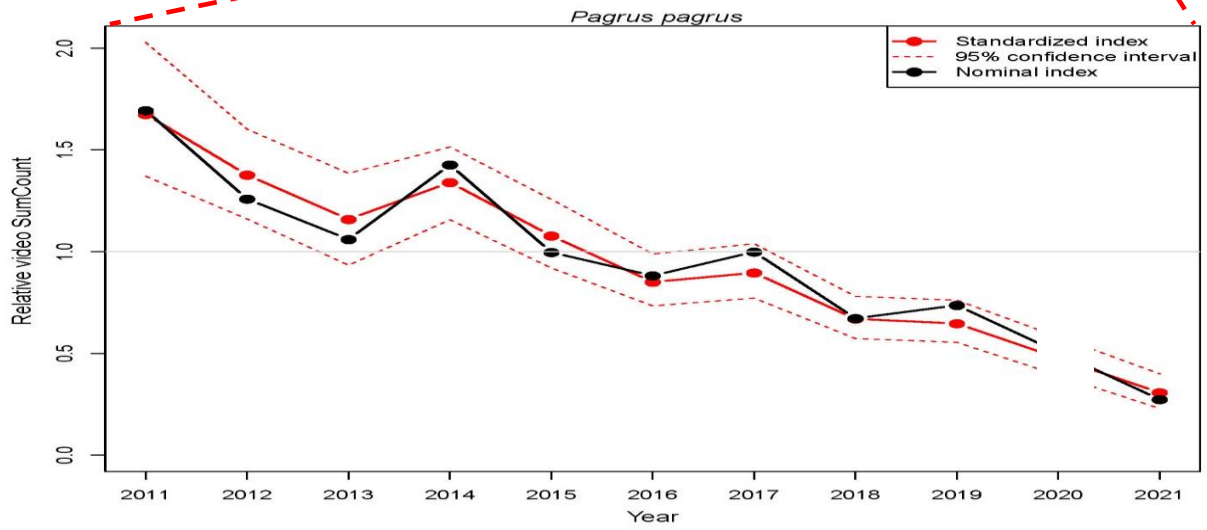
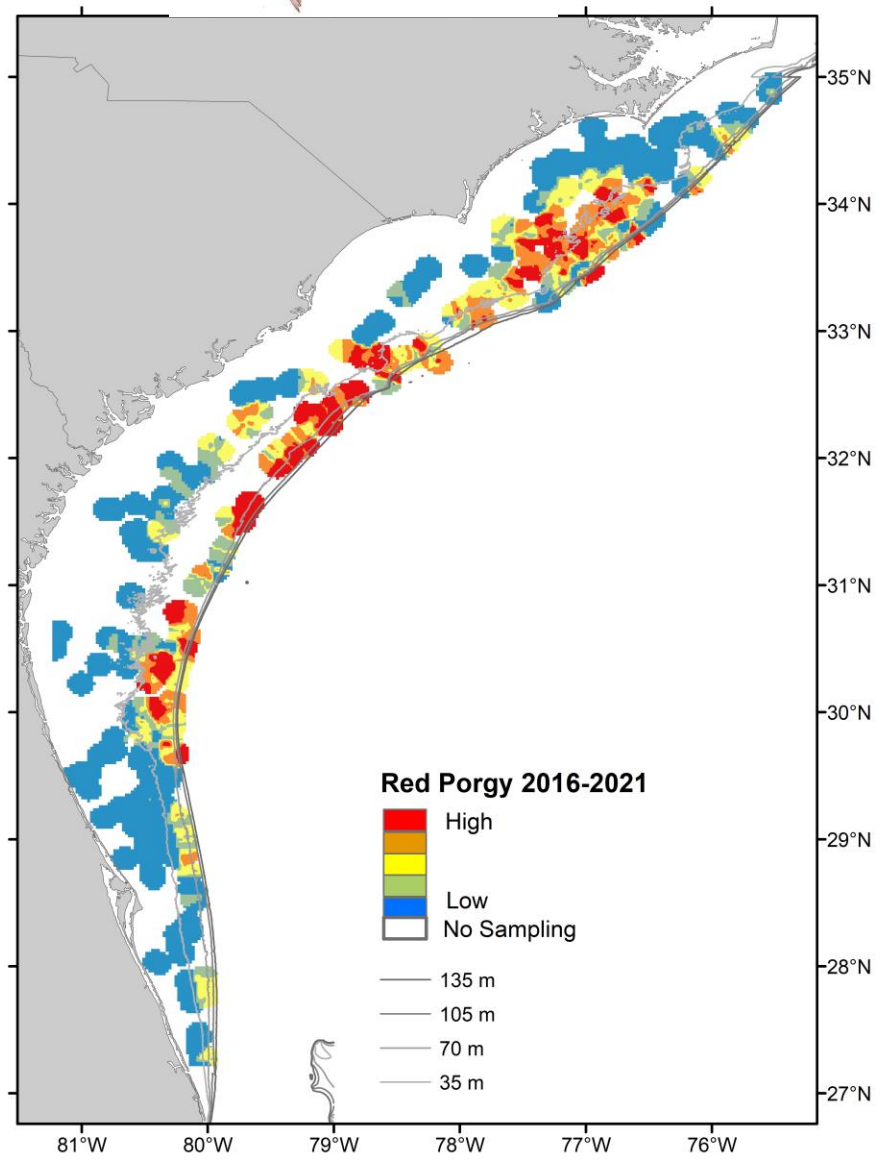




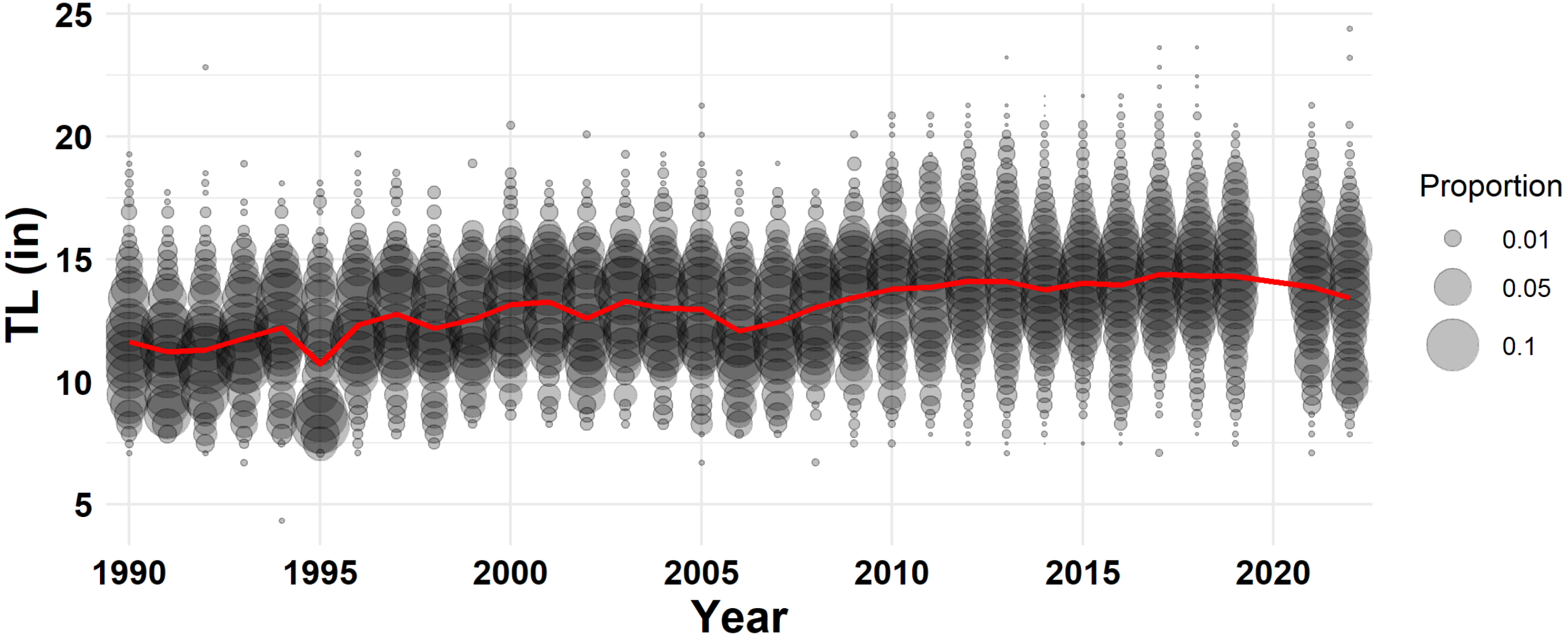
Red Porgy


Relative Abundance
(Catch/Trap (Normalized))
2.0
1.5
1.0
0.5
1990
2000
2010
2020
Year

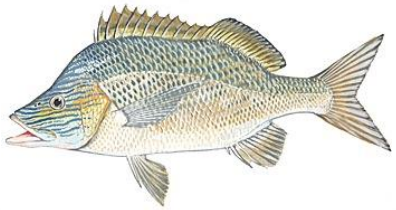

Pagrus pagrus
Standardized index
95% confidence interval
Nominal index
Relative video SumCount
2.0
1.5
1.0
0.5
0.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year

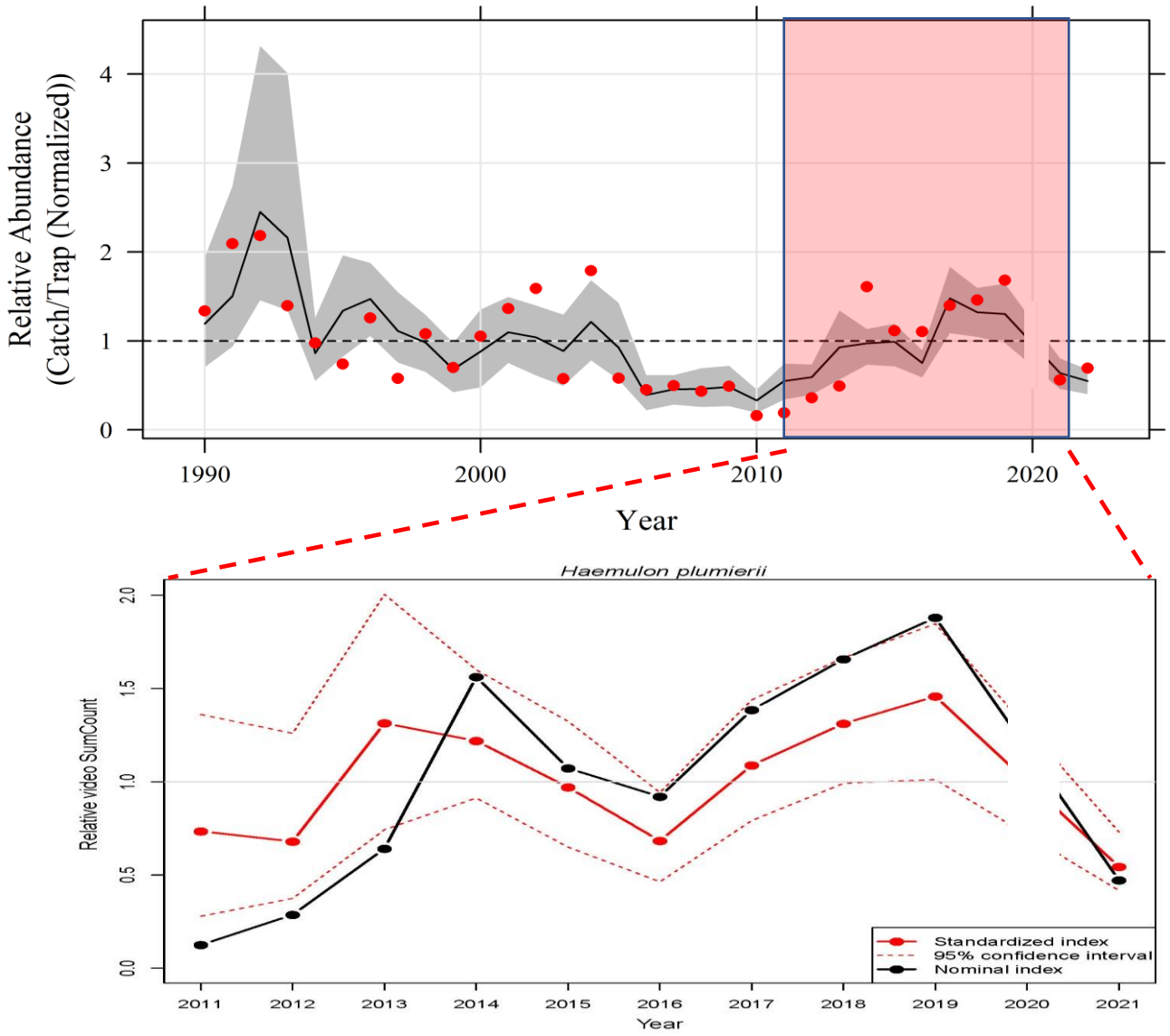

Red Porgy 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m
35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W

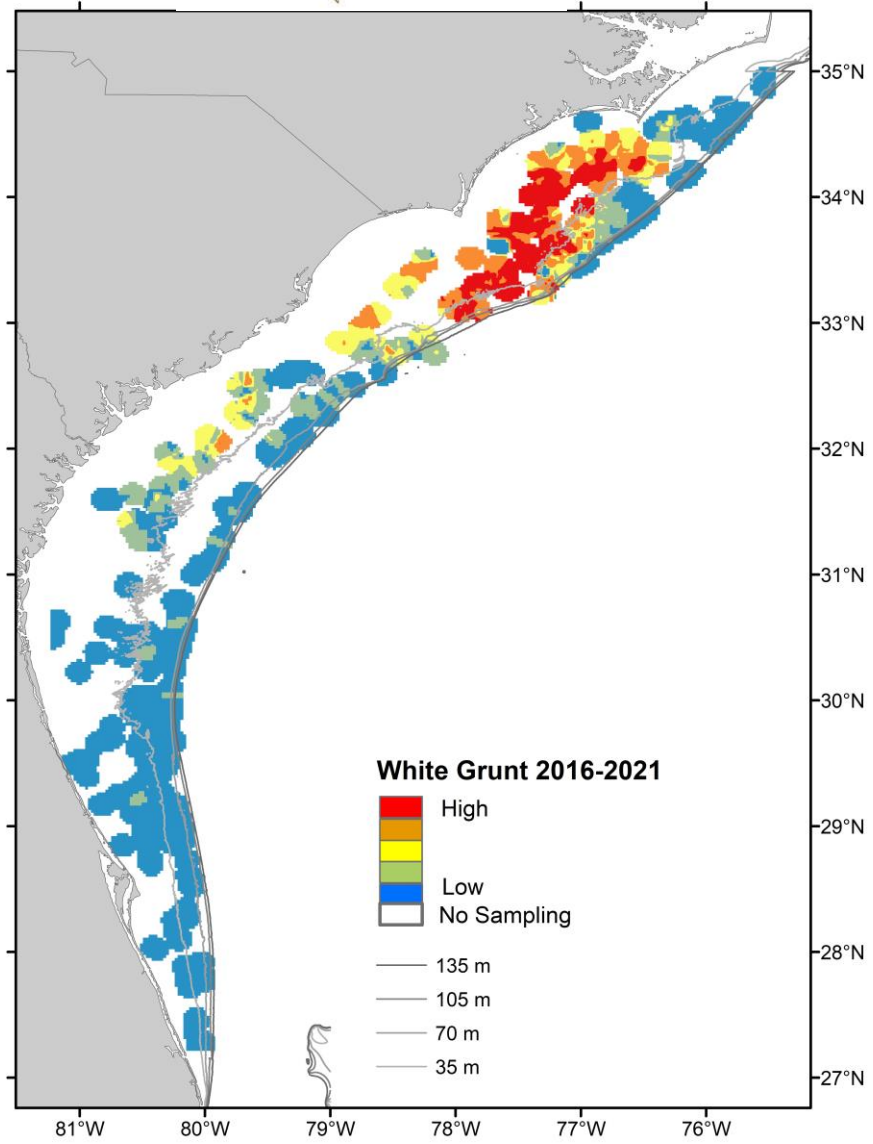
Red Porgy


25
20
15
10
5
TL (in)
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.01
0.05
0.1

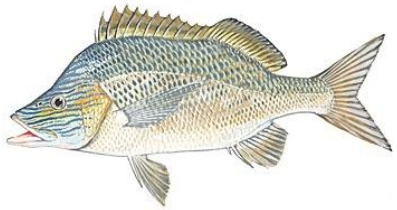
White Grunt

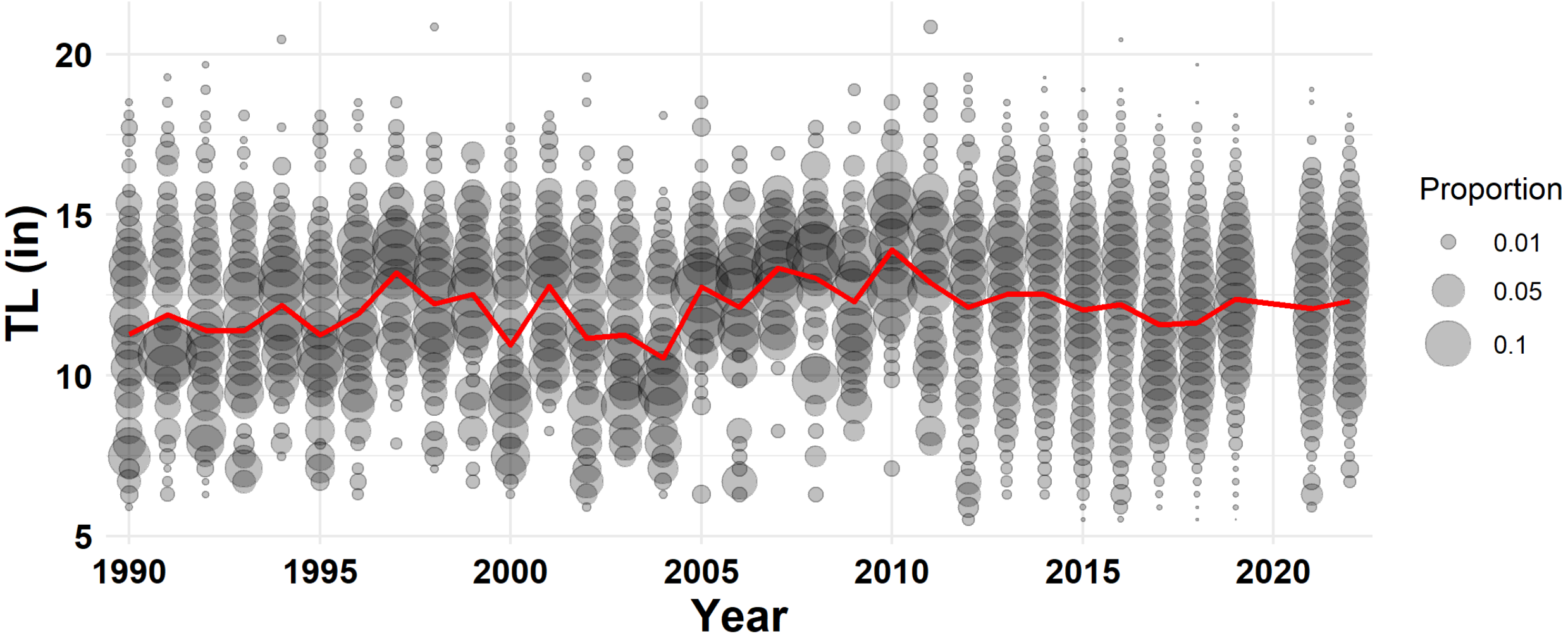



Relative Abundance
(Catch/Trap (Normalized))
0
1
2
3
4
1990
2000
2010
2020
Year
Haemulon plumierii
Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year
Standardized index
95% confidence interval
Nominal index

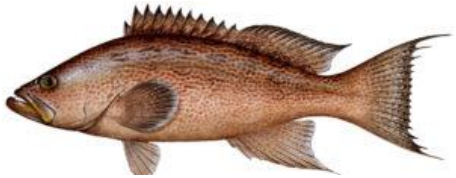

White Grunt 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m
35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W

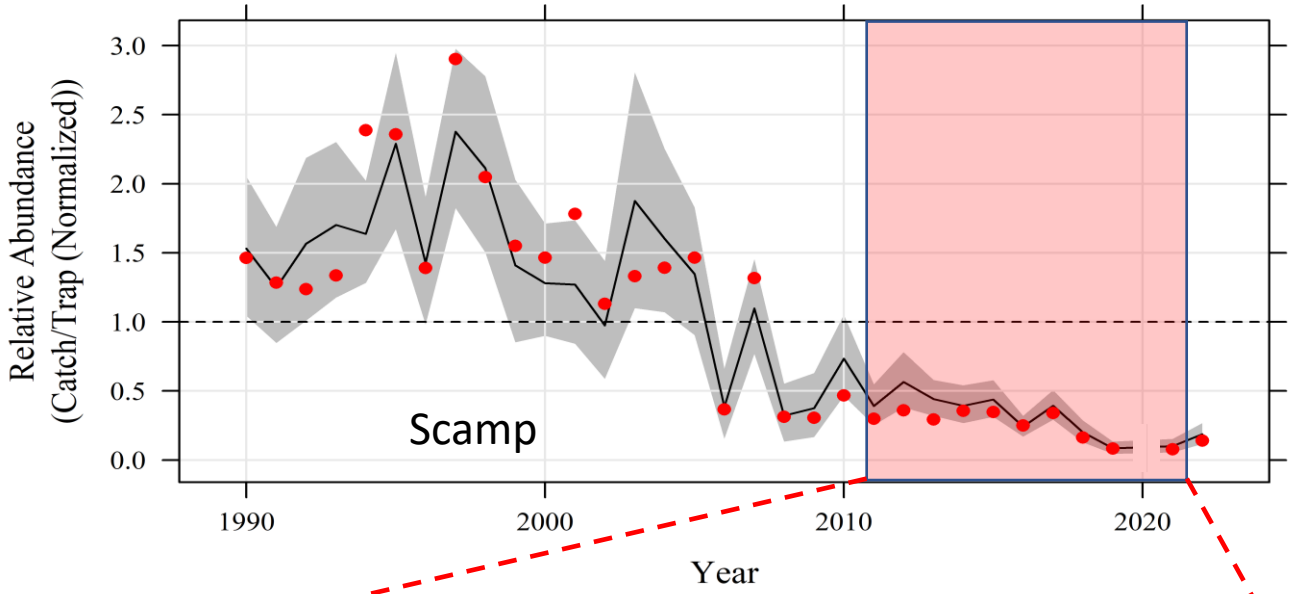
White Grunt

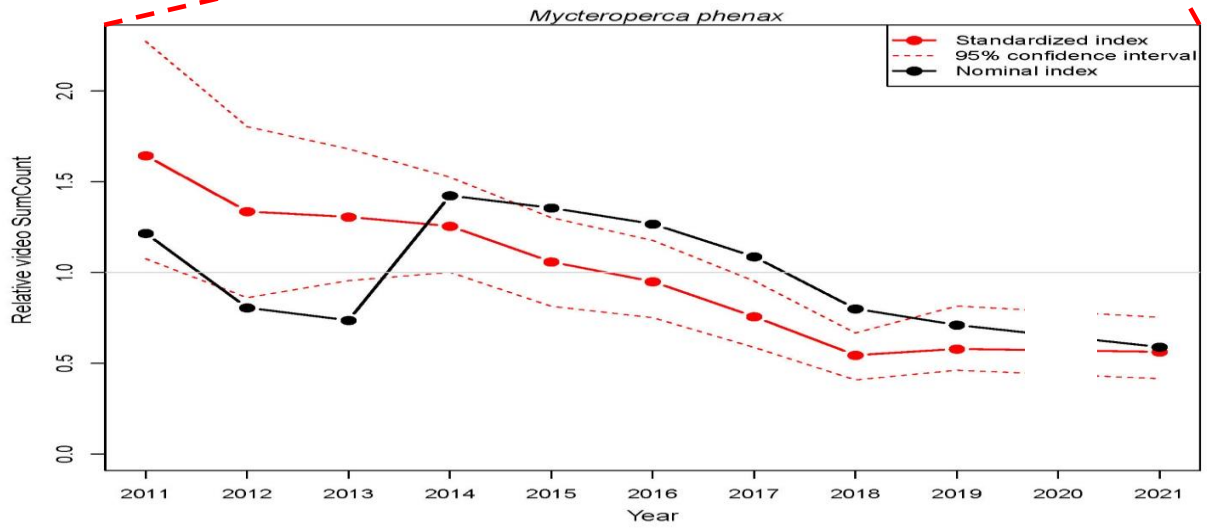


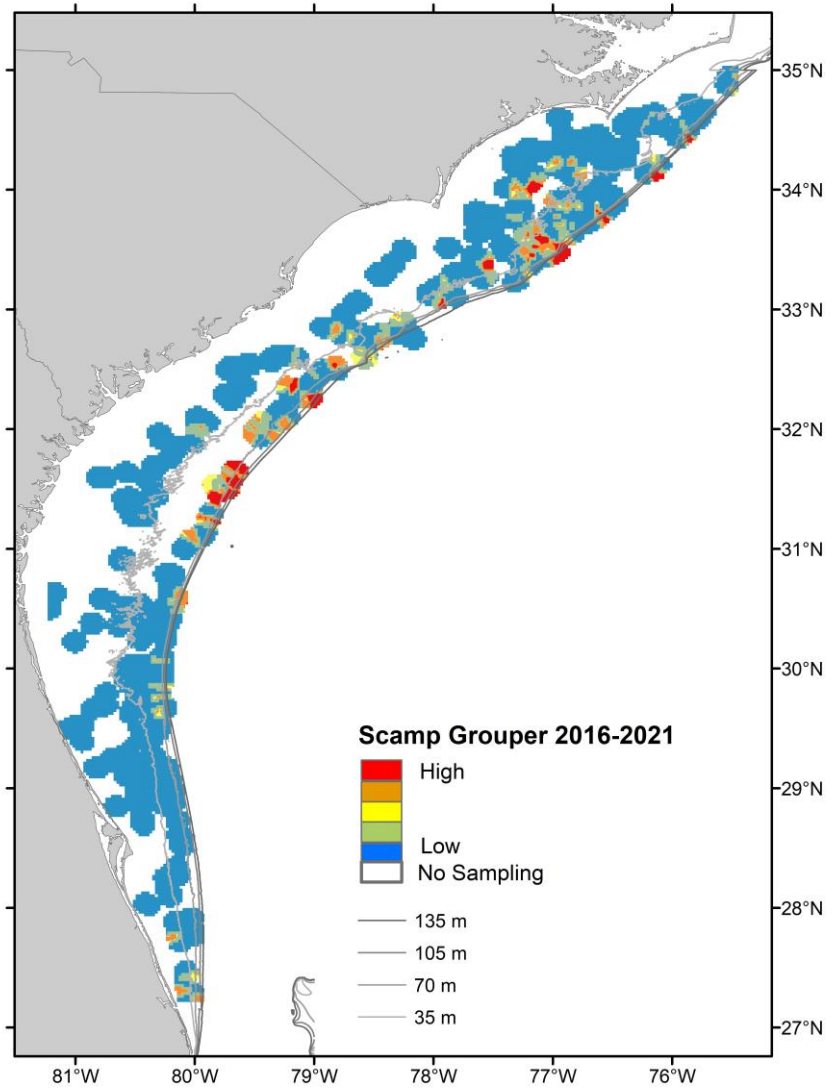

TL (in)
20
15
10
5
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.01
0.05
0.1

Scamp

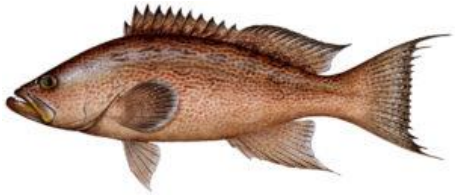


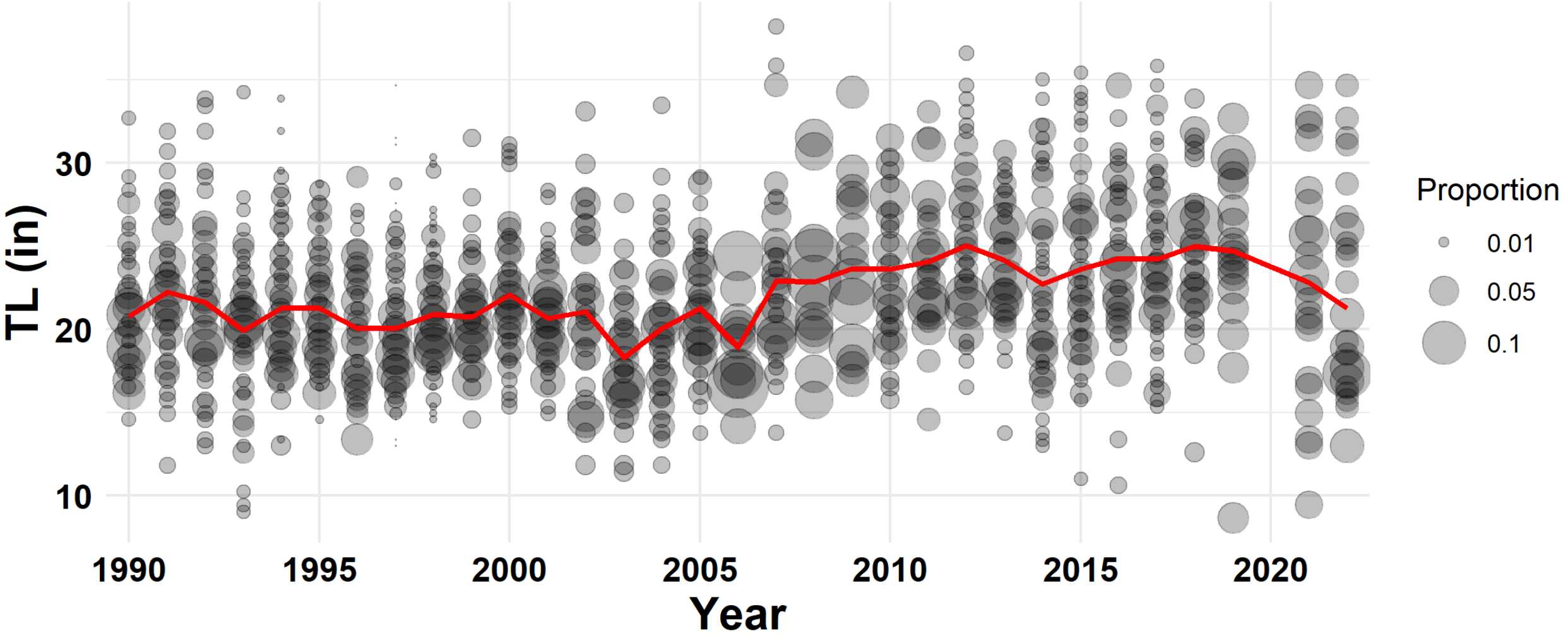

Relative Abundance
(Catch/Trap (Normalized))
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Scamp
1990
2000
2010
2020
Year


Mycteroperca phenax
Standardized index
95% confidence interval
Nominal index
Relative video SumCount
2.0
1.5
1.0
0.5
0.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year

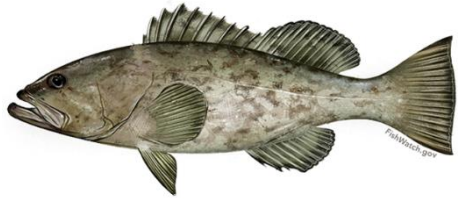

Scamp Grouper 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m
35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W

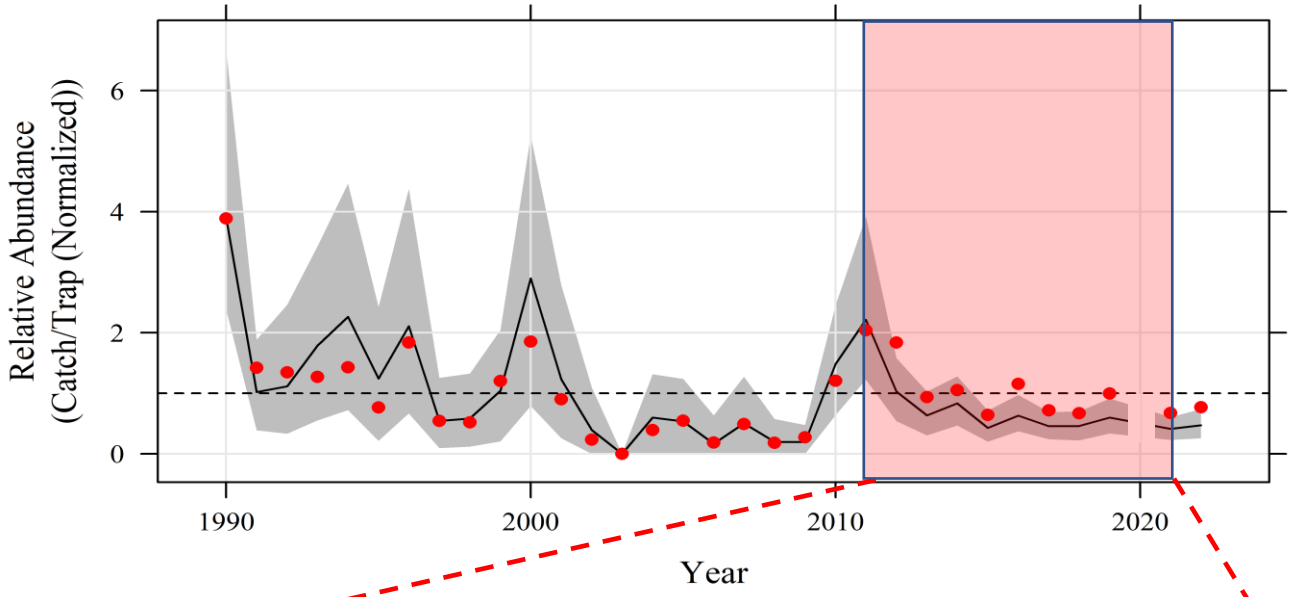
Scamp

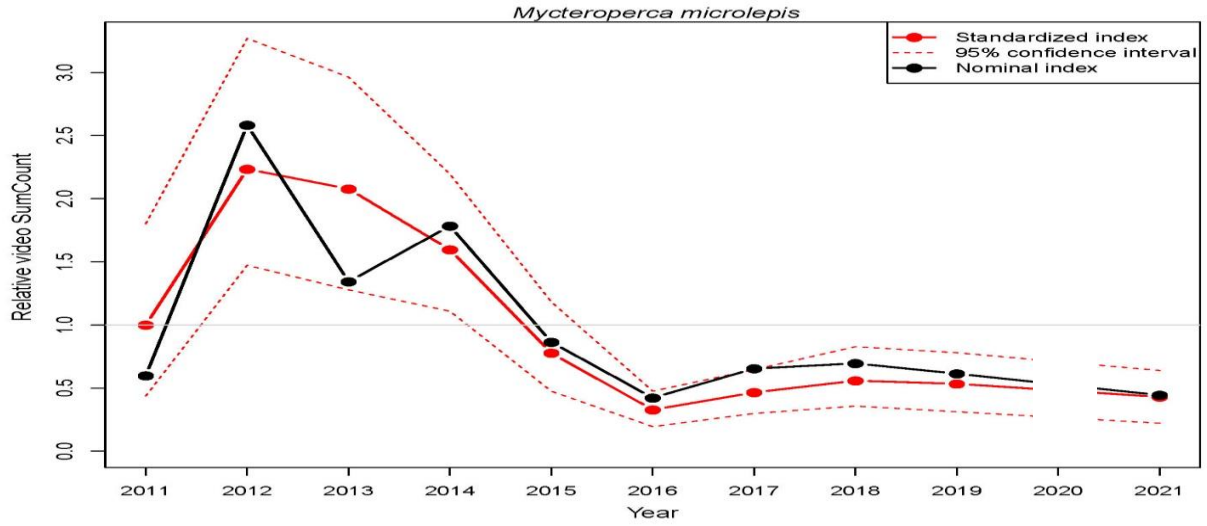


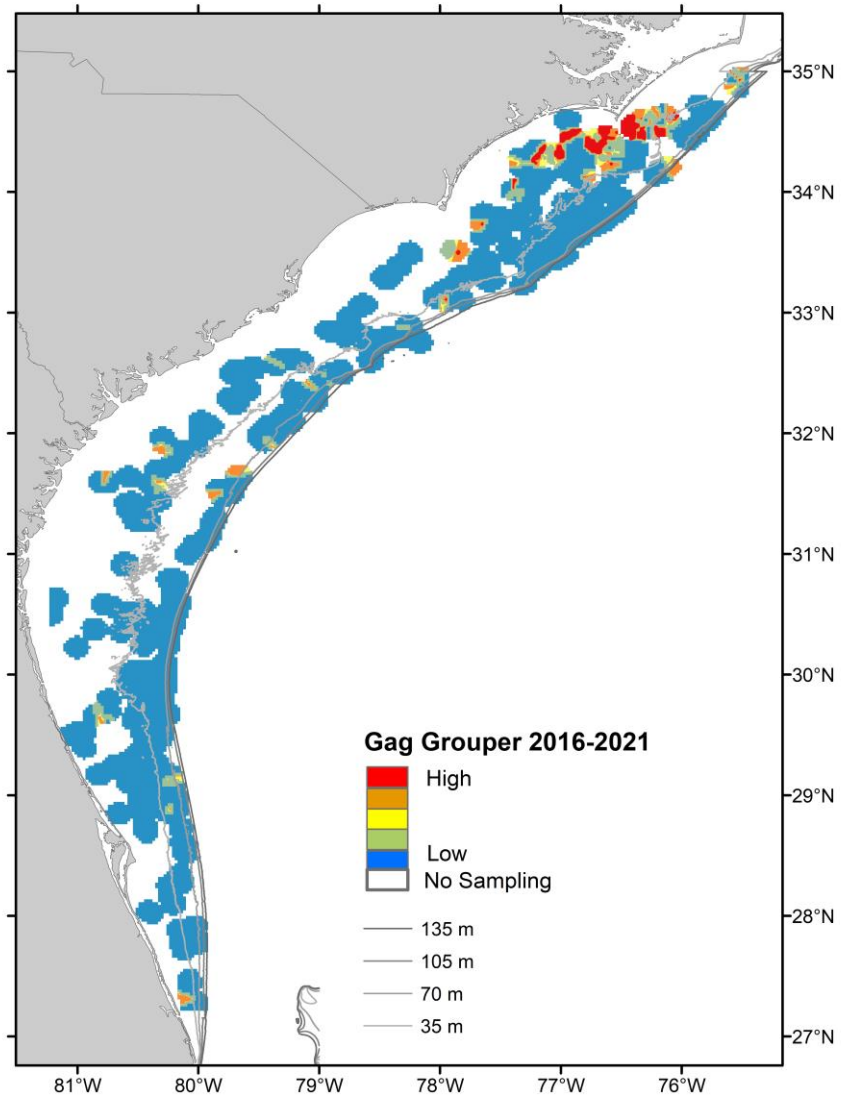

TL (in)
30
20
10
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.01
0.05
0.1

Gag

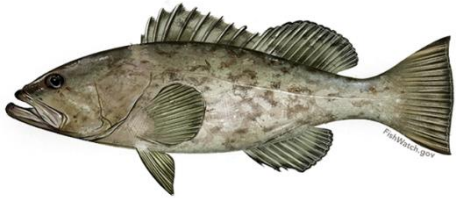


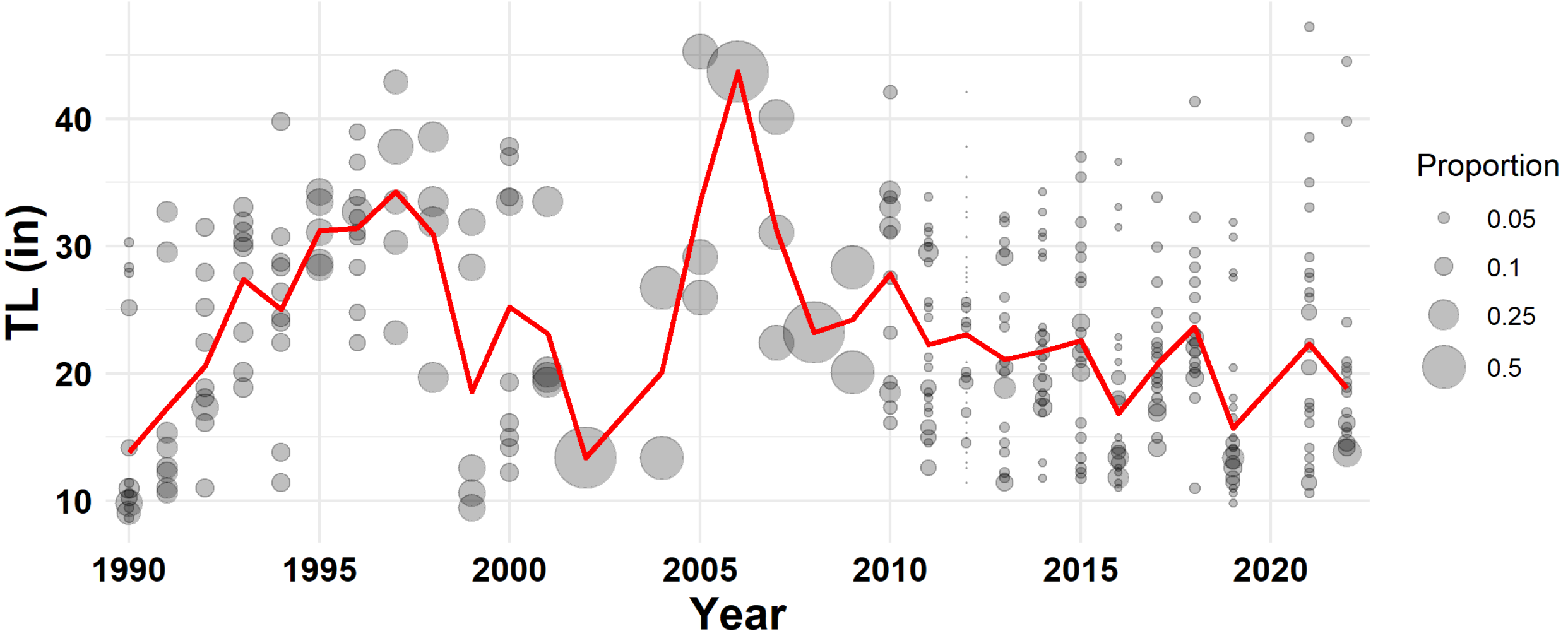

Relative Abundance
(Catch/Trap (Normalized))
0
2
4
6
1990
2000
2010
2020
Year


Mycteroperca microlepis
Standardized index
95% confidence interval
Nominal index
Relative video SumCount
0.0
0.5
1.0
1.5
2.0
2.5
3.0
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year

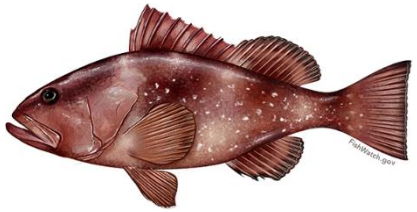

Gag Grouper 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m
35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W

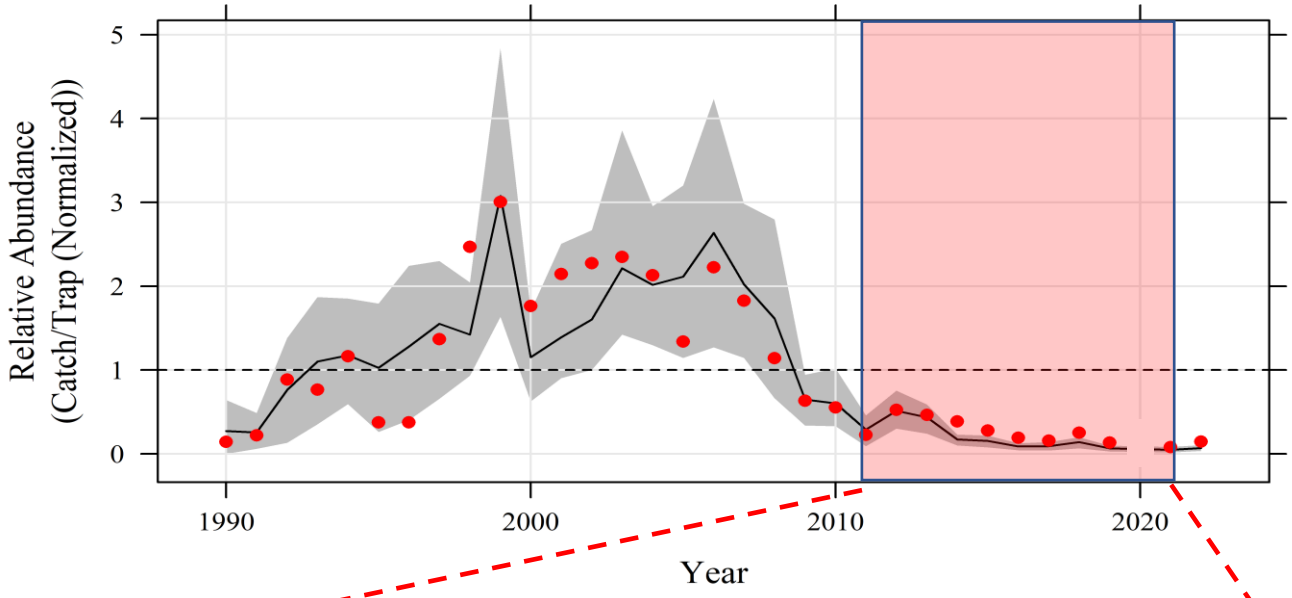
Gag

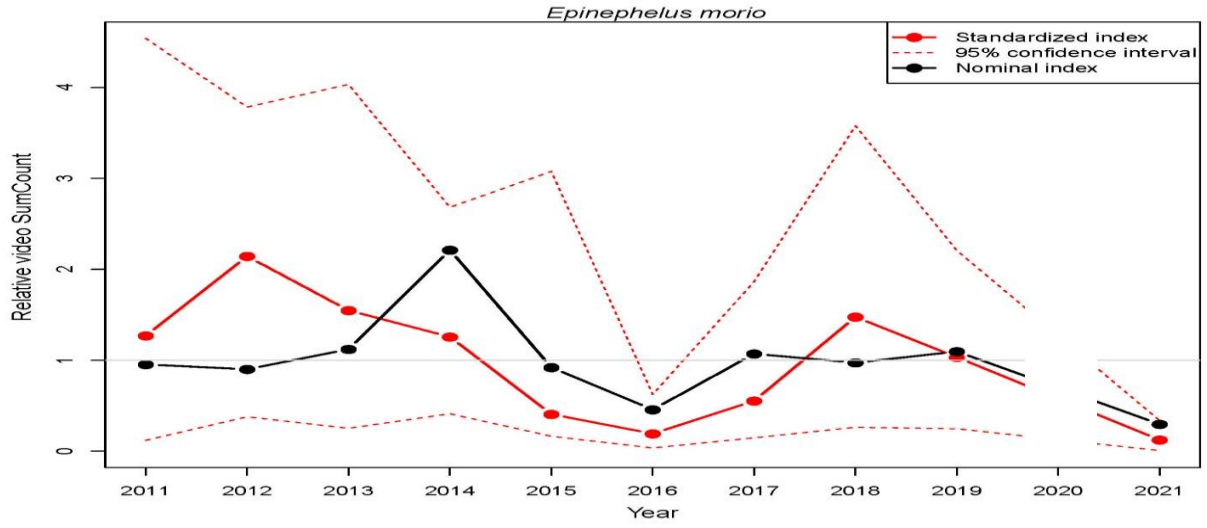


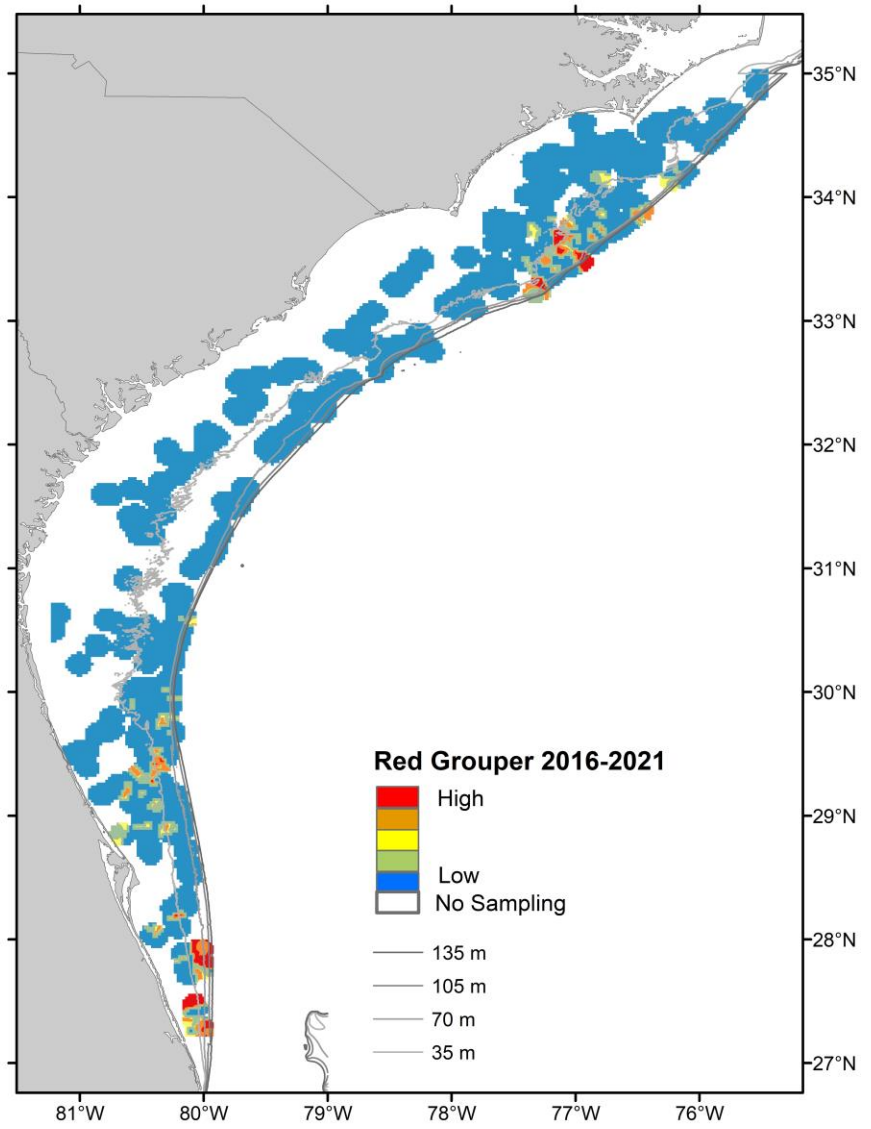

TL (in)
40
30
20
10
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.05
0.1
0.25
0.5

Red Grouper

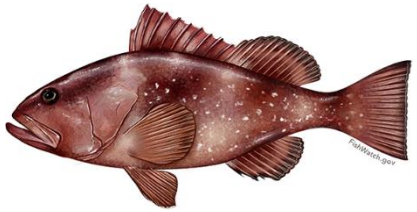


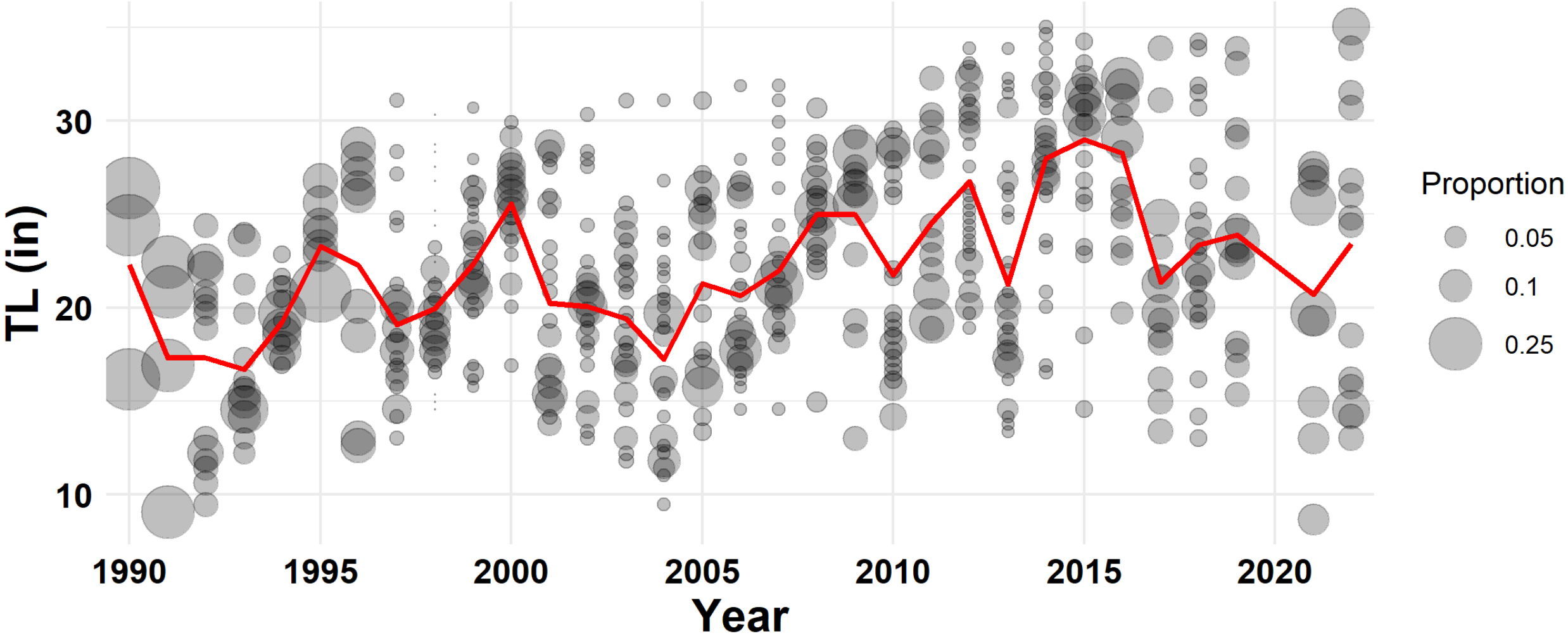

Relative Abundance
(Catch/Trap (Normalized))
0
1
2
3
4
5
1990
2000
2010
2020
Year


Epinephelus morio
Standardized index
95% confidence interval
Nominal index
Relative video SumCount
0
1
2
3
4
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
Year

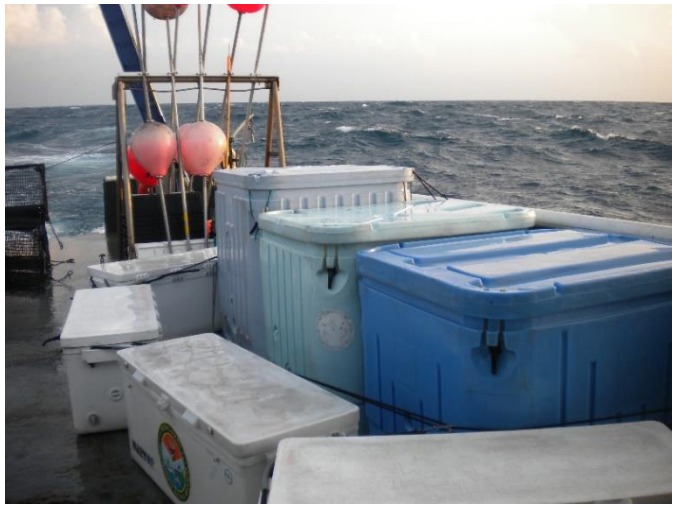

Red Grouper 2016-2021
High
Low
No Sampling
135 m
105 m
70 m
35 m
35°N
34°N
33°N
32°N
31°N
30°N
29°N
28°N
27°N
81°W
80°W
79°W
78°W
77°W
76°W

Red Grouper




TL (in)
30
20
10
1990
1995
2000
2005
2010
2015
2020
Year
Proportion
0.05
0.1
0.25

2023 SERFS Plans



Sampling Season:

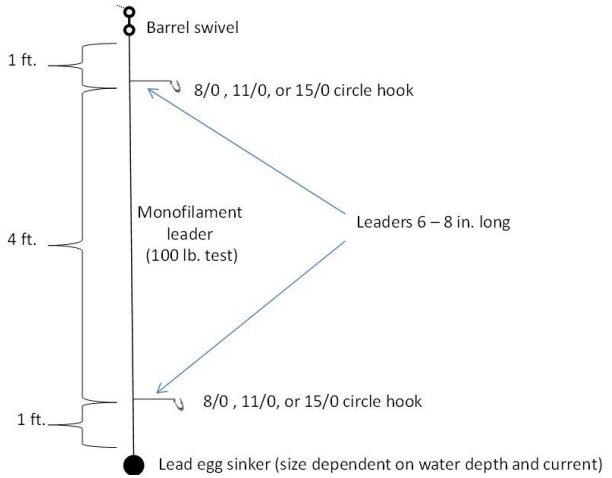
- Mid-April –> Mid-October
- ≈ 85 days at sea
- 3 vessels- Chevron Video Trap
- Complete scientific crew
- Full life history sampling

Other Reef Fish Activities (SCDNR)

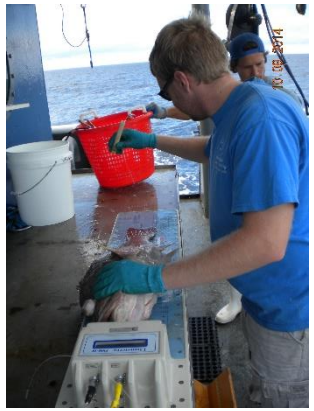
Short Bottom Longline Expansion

MARFIN-funded

Gear Selectivity



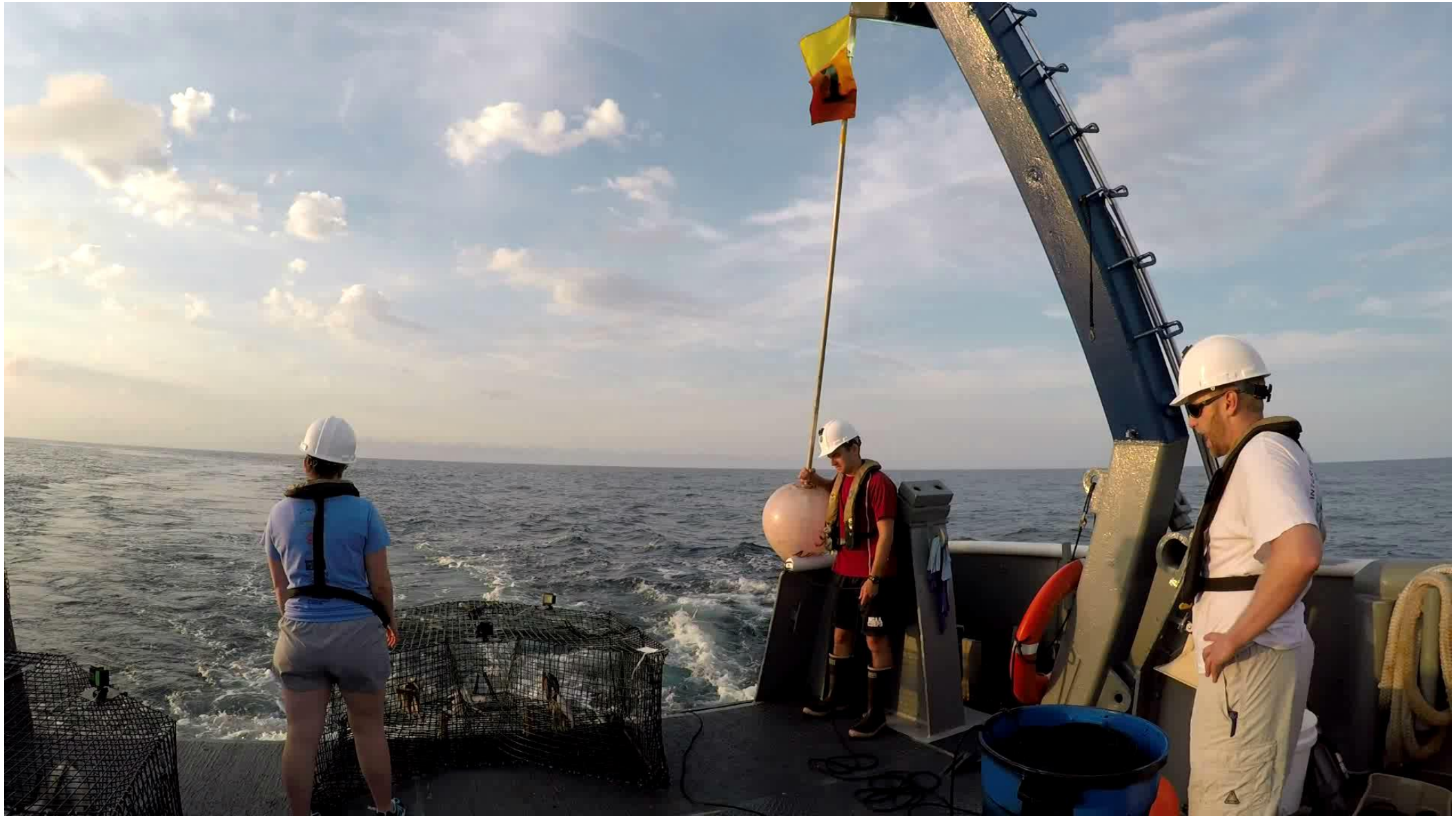
Juvenile Snapper-Grouper Survey



Acknowledgements:

MARMAP/SEAMAP-SA/SEFIS
Staff & Students
Research Vessel Crews
Past and Present

NOAA funding
SCDNR support



Questions?