SEDAR 94: Florida Hogfish Review Workshop

West Florida Shelf



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USF | FWC-FWRI Marine Fisheries Research

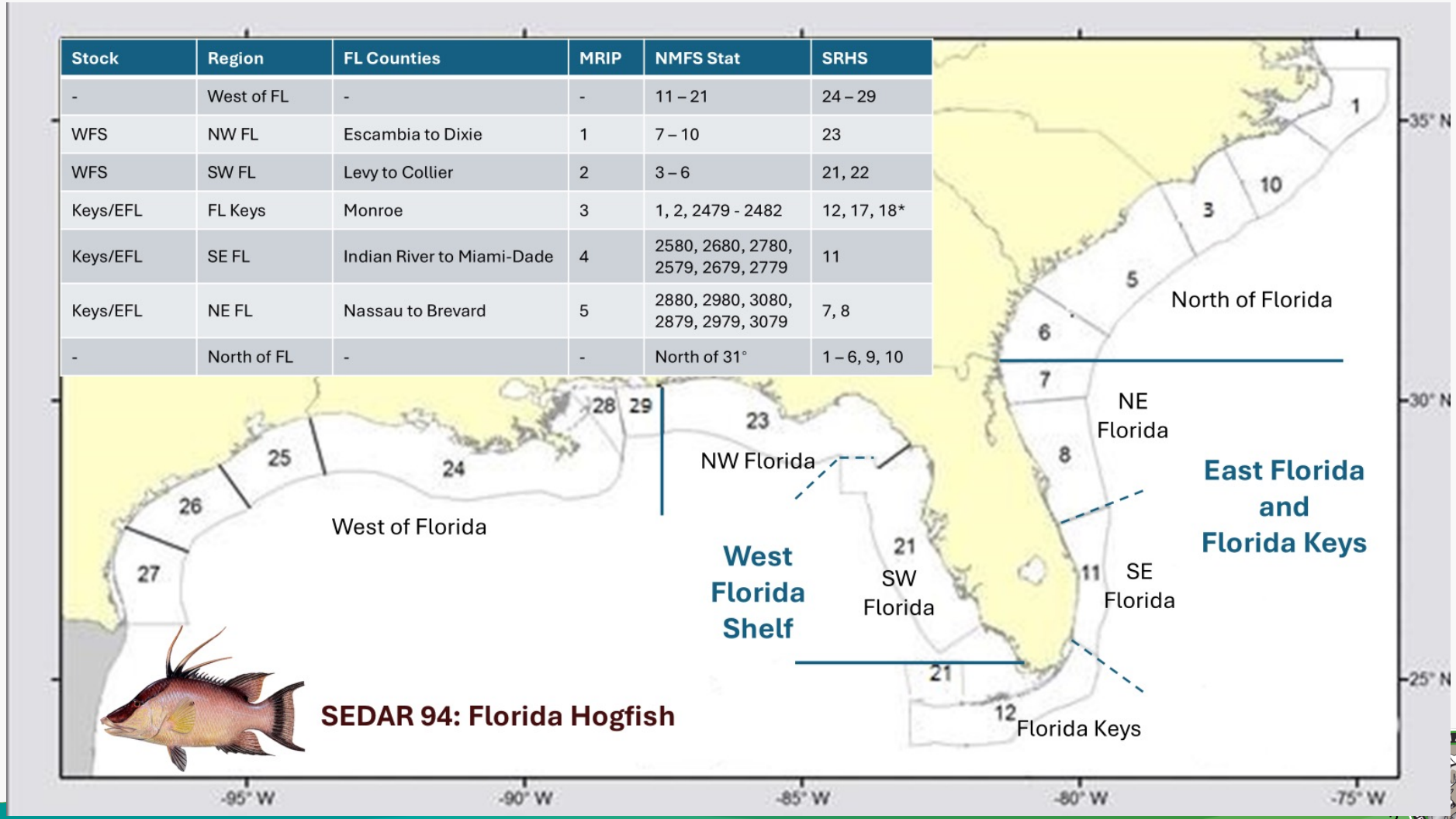
7/15/2026

Goals

- Data Input
  - Life history
  - Fishery landings and releases
  - Indices of abundance
  - Length compositions
  - Conditional age-at-length
- Base Model Configuration
- Base Model Fits



Stock	Region	FL Counties	MRIP	NMFS Stat	SRHS
-	West of FL	-	-	11 – 21	24 – 29
WFS	NW FL	Escambia to Dixie	1	7 – 10	23
WFS	SW FL	Levy to Collier	2	3 – 6	21, 22
Keys/EFL	FL Keys	Monroe	3	1, 2, 2479 - 2482	12, 17, 18*
Keys/EFL	SE FL	Indian River to Miami-Dade	4	2580, 2680, 2780, 2579, 2679, 2779	11
Keys/EFL	NE FL	Nassau to Brevard	5	2880, 2980, 3080, 2879, 2979, 3079	7, 8
-	North of FL	-	-	North of 31°	1 – 6, 9, 10



SEDAR 94: Florida Hogfish

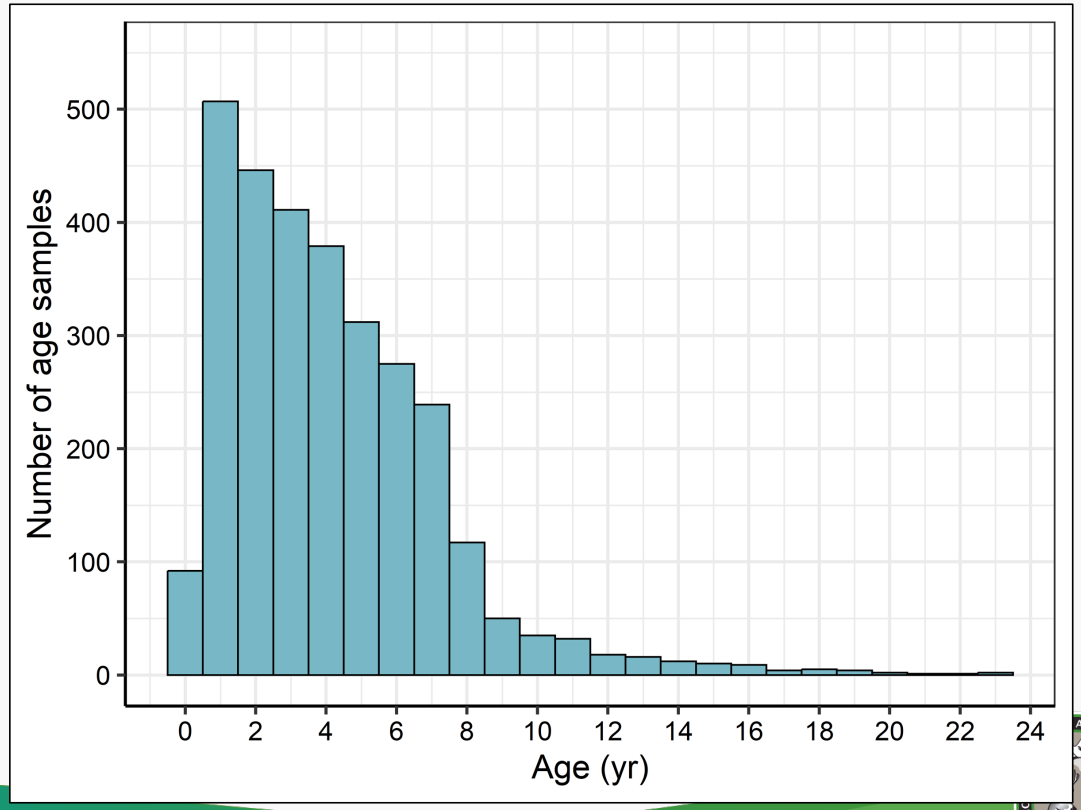
Data: Life History



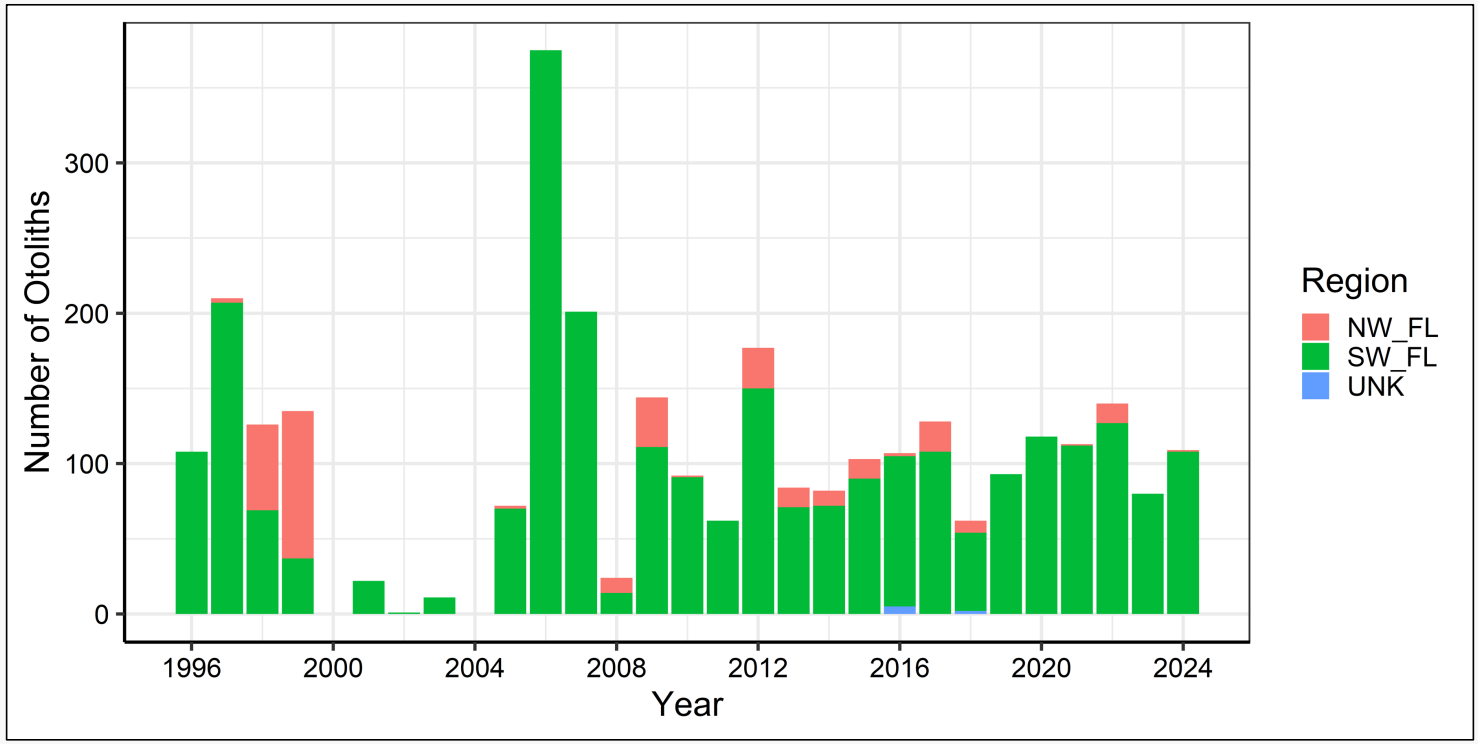
Age: WFS Overview

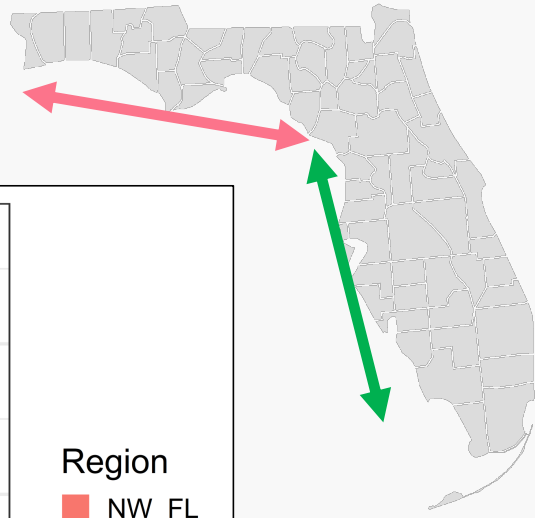
Quantile	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
Age	0	1	1	1	1	2	2	2	3	3	4	4	4	5	5	6	6	7	8	10	23

- 27 years of data: **1996 – 2024**
- **2,979 otoliths**
- Maximum age **23 years**
  - No change from SEDAR 37
- 95% fish are <=10 years old
  - 29% of observed max age on WFS (23 yrs.)



Otolith Samples: Region

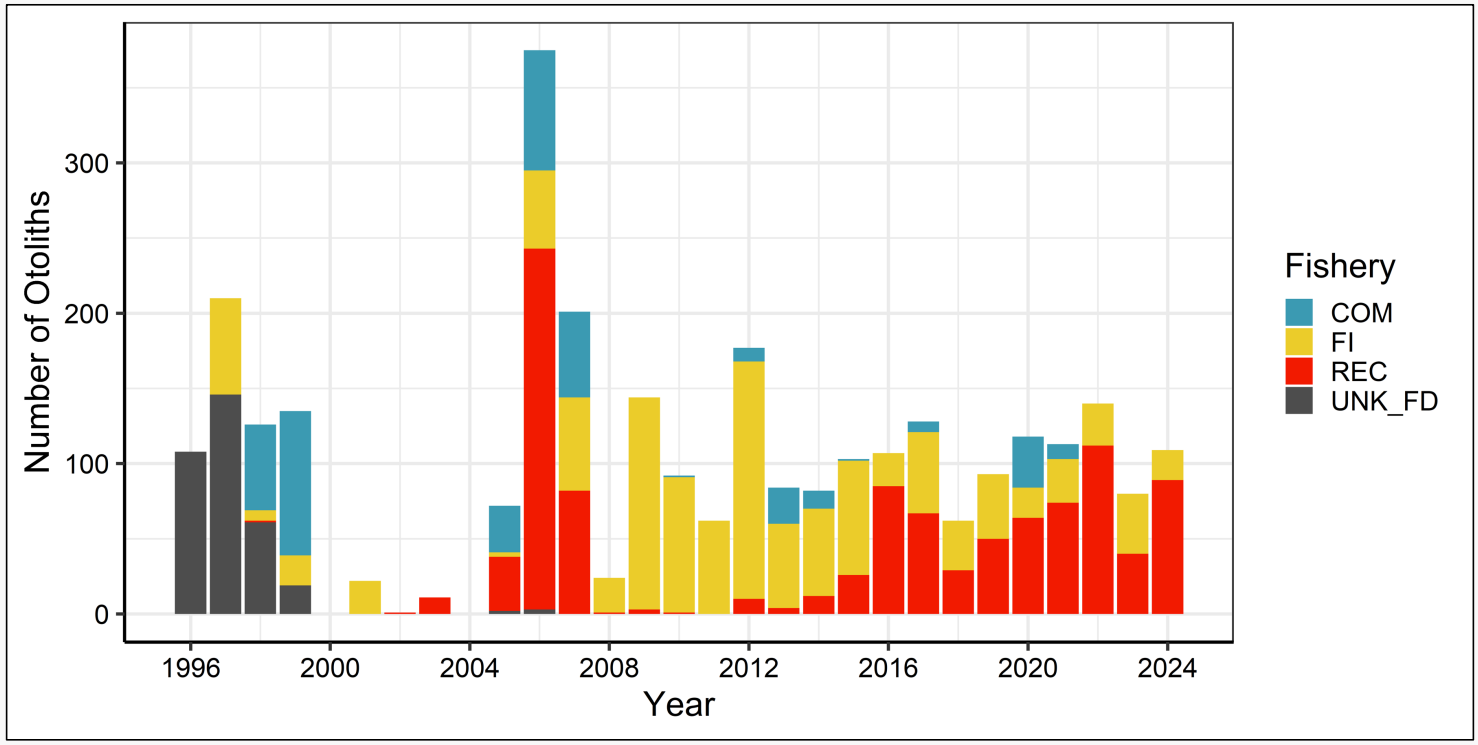




DW Report
Figure 2.13.3b

Region	N	%
NW FL	312	10.5%
SW FL	2660	89.5%

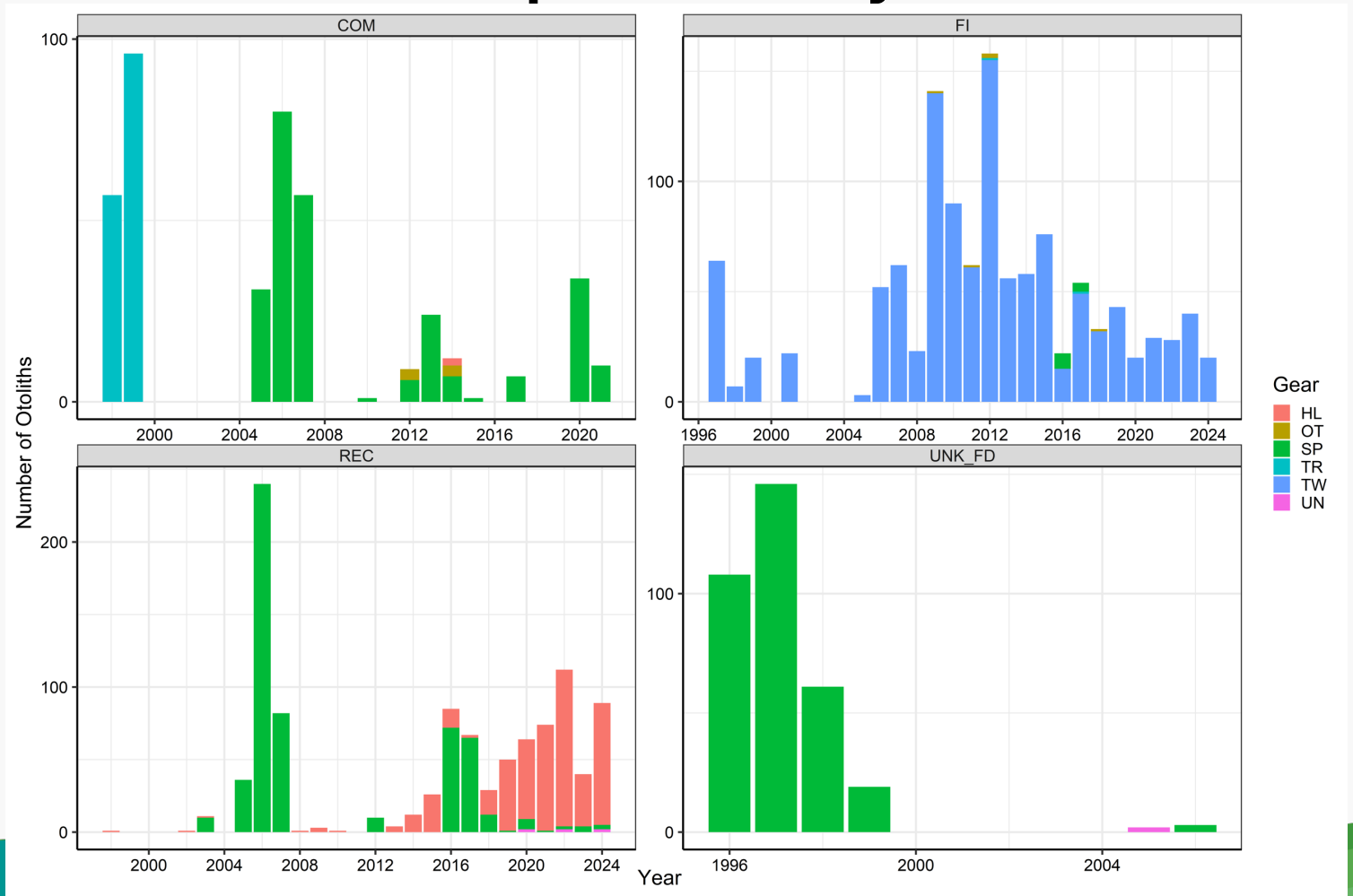
Otolith Samples: Fishery



DW Report
Figure 2.13.15a

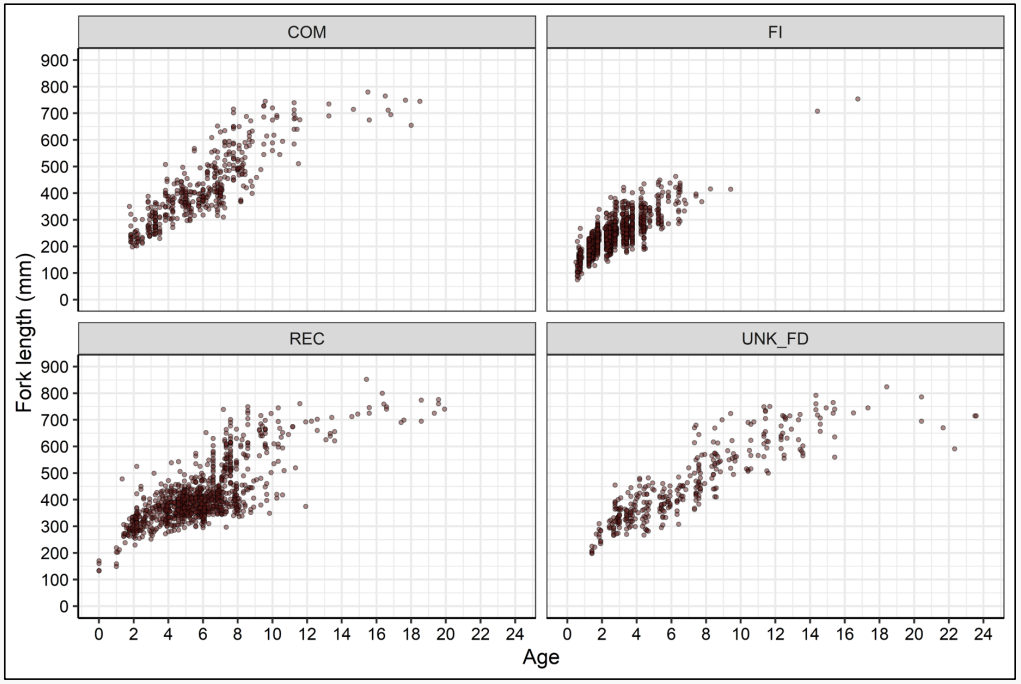
Fishery	n	%
Commercial	419	14.1
Recreational	1038	34.8
Fishery-Independent	1183	39.7
Unknown FD	339	11.4

Otolith Samples: Fishery and Gear

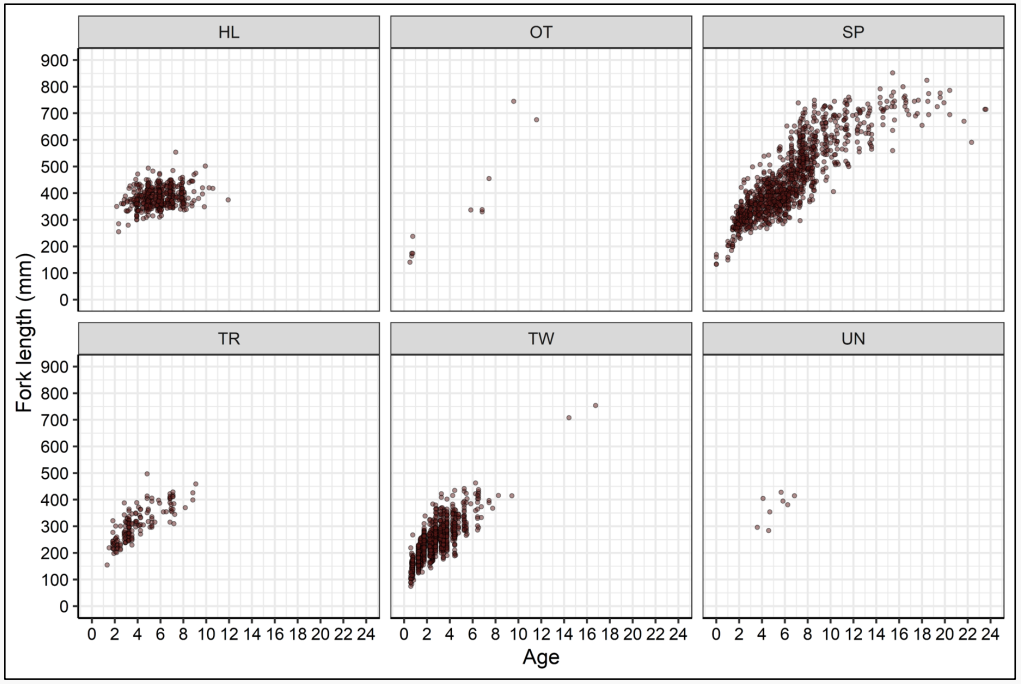


Length-at-age: Fishery and Gear

DW Report
Figure 2.13.34

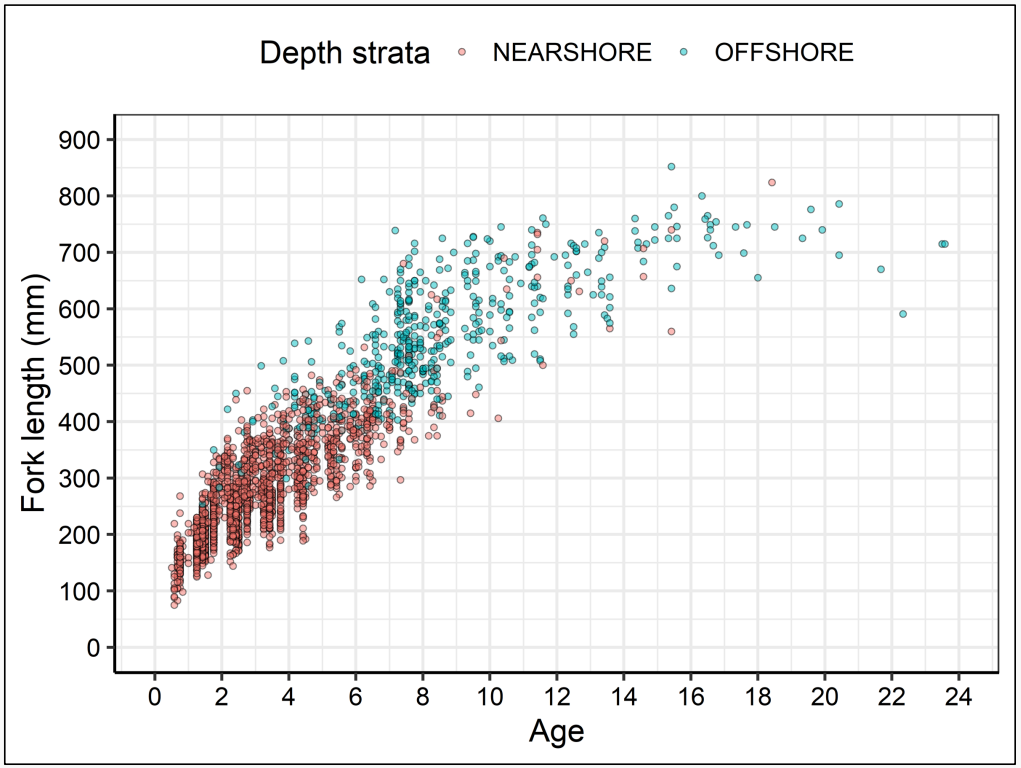


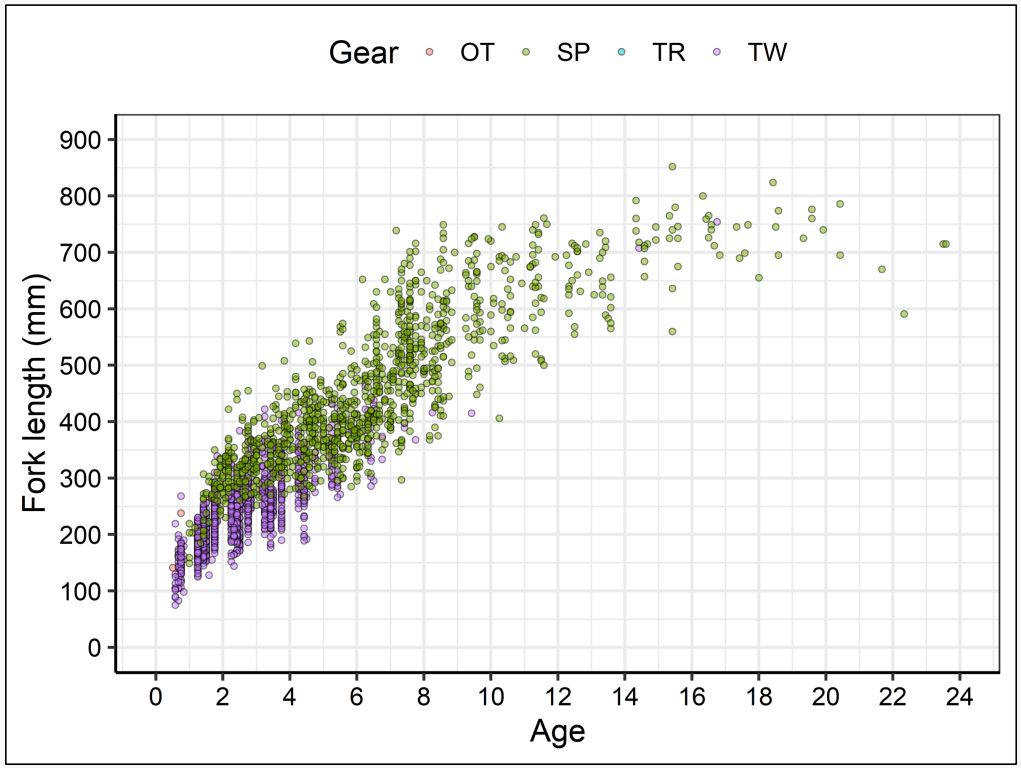
DW Report
Figure 2.13.35



Length-at-age: External Growth Model

DW Report
Figure 2.13.36a-b

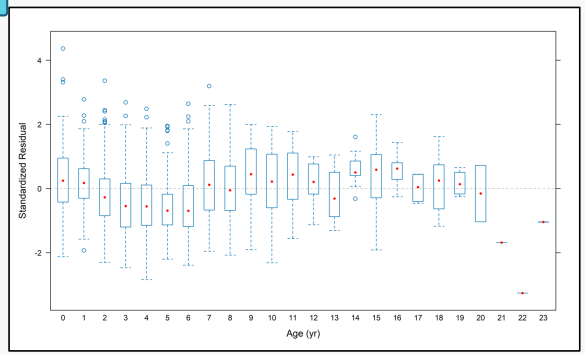


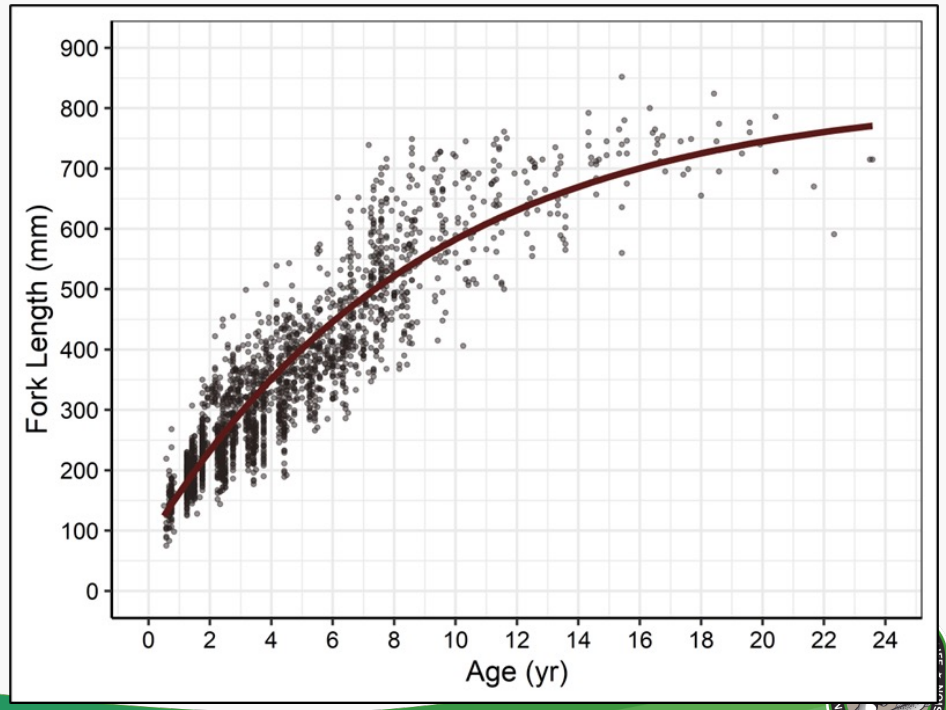


- Data isolated by spear gear plus any fishery-independent sources
  - n = 2,317 otoliths
- Nearshore (<30 m) and offshore (>=30 m) depths

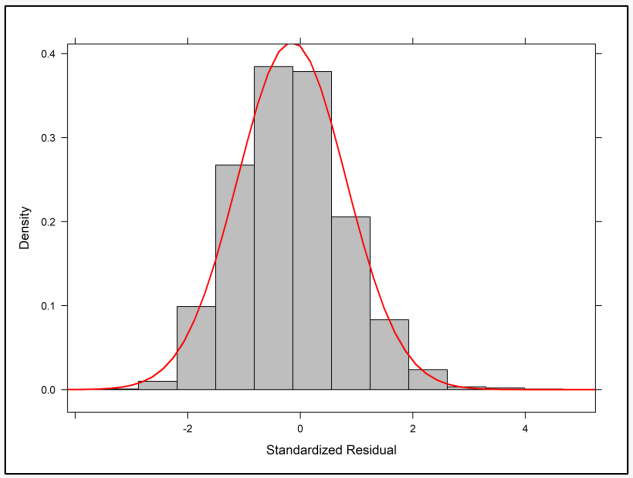
External Growth Model

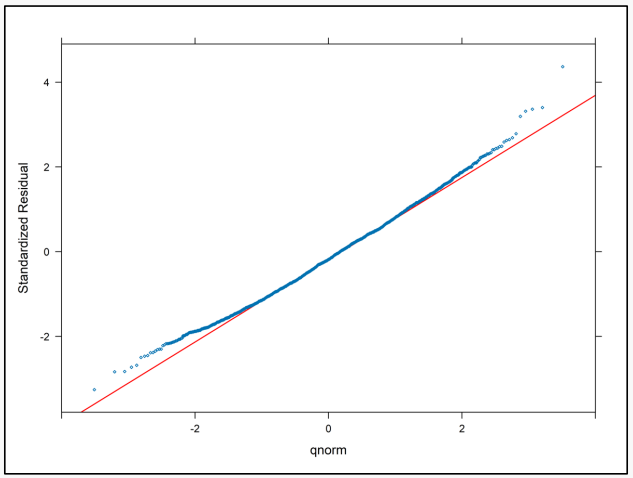
- Length-at-age data (n = 2,226)
  - Fishery-independent
    - Predominantly Spear and Trawl
  - Fishery-dependent Spear
    - Assumed flat-topped selectivity and offshore targeting
- Growth model
  - Size truncated von Bertalanffy growth model (Diaz et al. 2004)
    - Gulf minimum size limits
    - Inverse weighting on ages
  - CV changes linearly with age
    - 0.20 – 0.07
  - **L_∞ = 823 mm FL**
  - **k = 0.112**
  - t_0 = -0.954
  - Parameters used as initial values in assessment model
- No sexual dimorphism
  - Females first then males follow same growth curve after transition

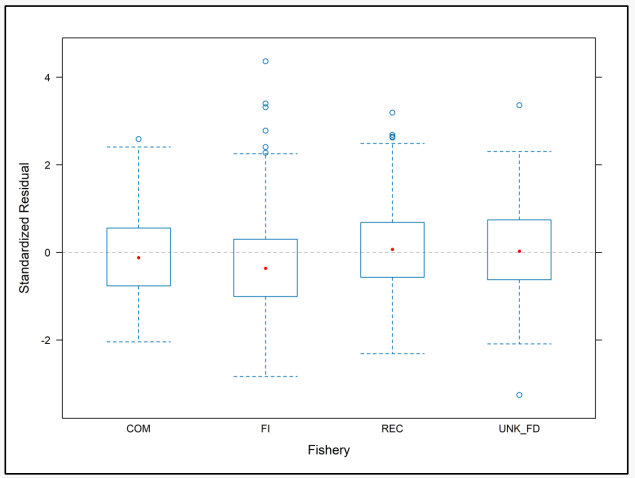


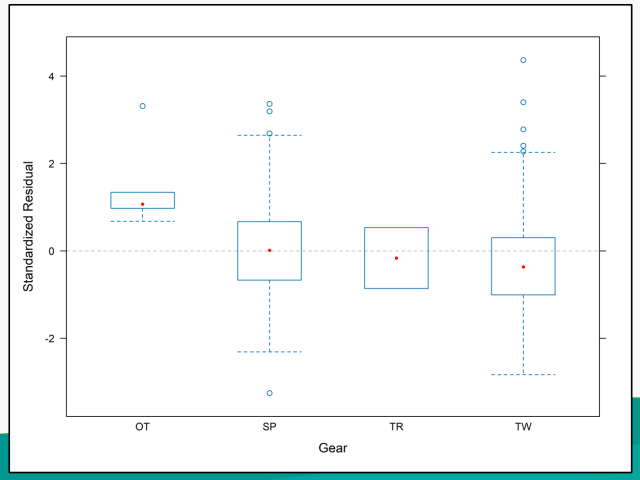


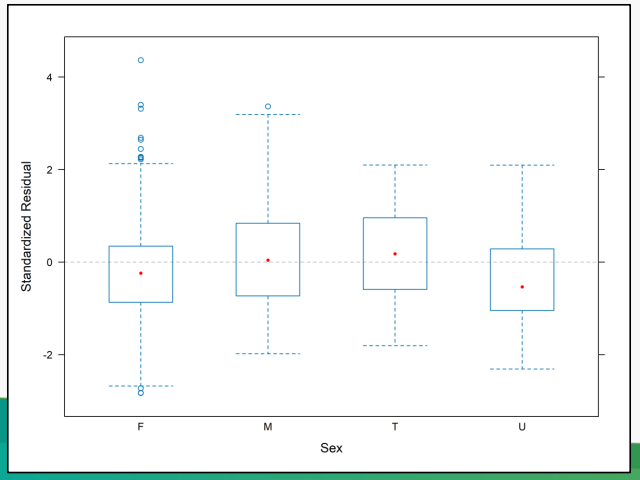
External Growth Model

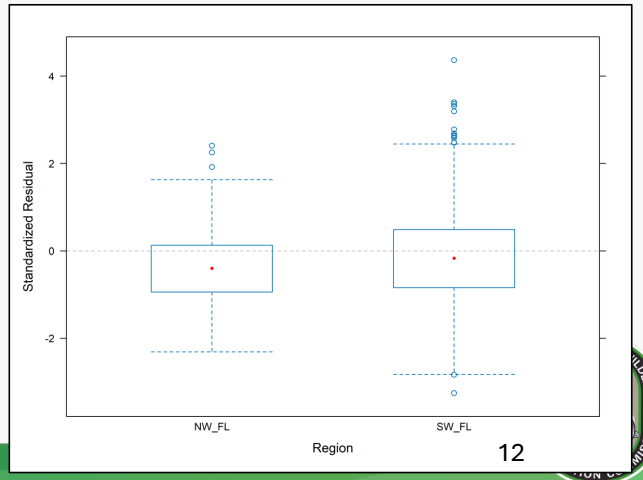








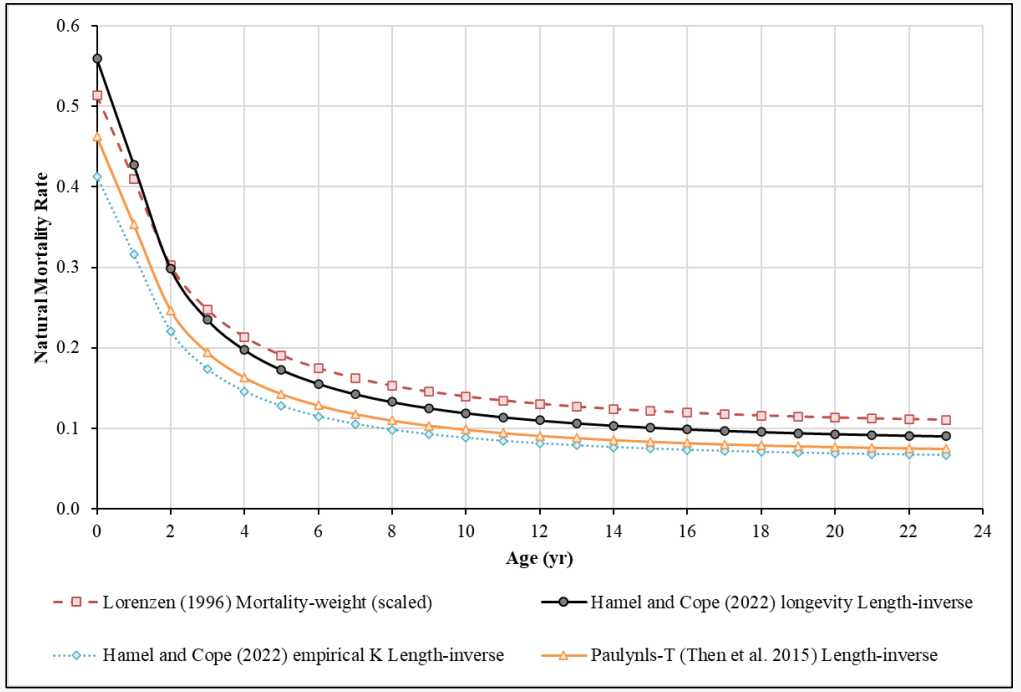




Natural Mortality

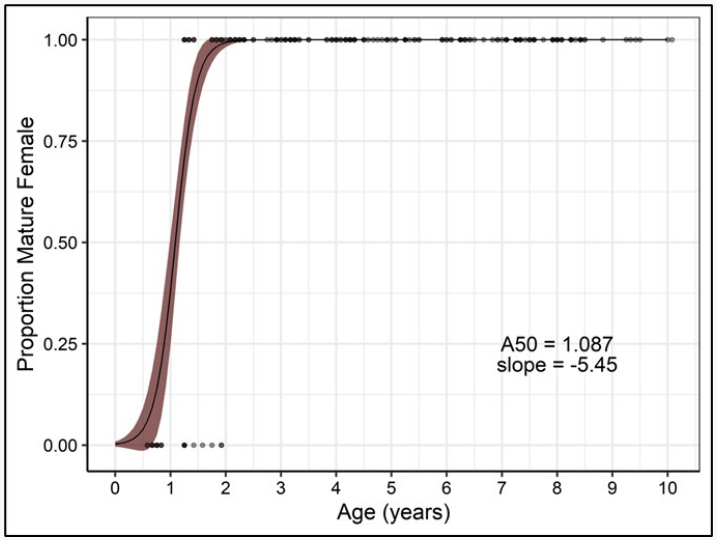
- Natural mortality inversely related to fish length
- M(a): Lorenzen (2022) with reference age-3
  - **Longevity (23)**
    - Hamel and Cope (2022) = 0.235 yr^{-1}
    - cum. surv. 2.3%
  - Lorenzen (1996)
    - Length-weight relationship
    - cum. surv. 1.7%
    - Explored as a sensitivity run in assessment model
- Converted to mortality-at-age via external growth model
  - Fixed parameter in assessment model

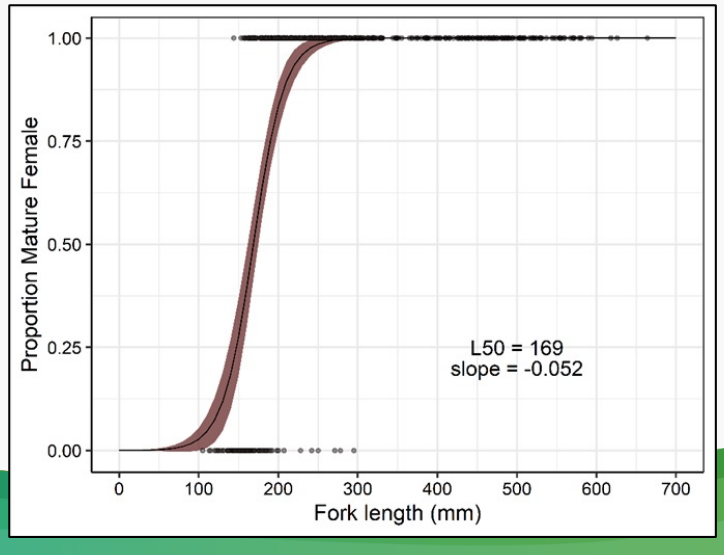
DW Report
Figure 2.13.39



Female Maturity

- Female maturity
  - McBride and Johnson (2007); Collins and McBride (2015)
    - Female classes 1 – 4
- Analytical methods
  - Lowerre-Barbieri (2022)
  - Lowerre-Barbieri and Friess (2023)
- Data
  - Histological samples only
  - Repro classes 1 and 3
    - Immature (1)
    - Active spawning (3)
- Logistic regression model
  - **A50 = 1.09 years (n = 385)**
  - L50 = 169 mm FL (n = 533)

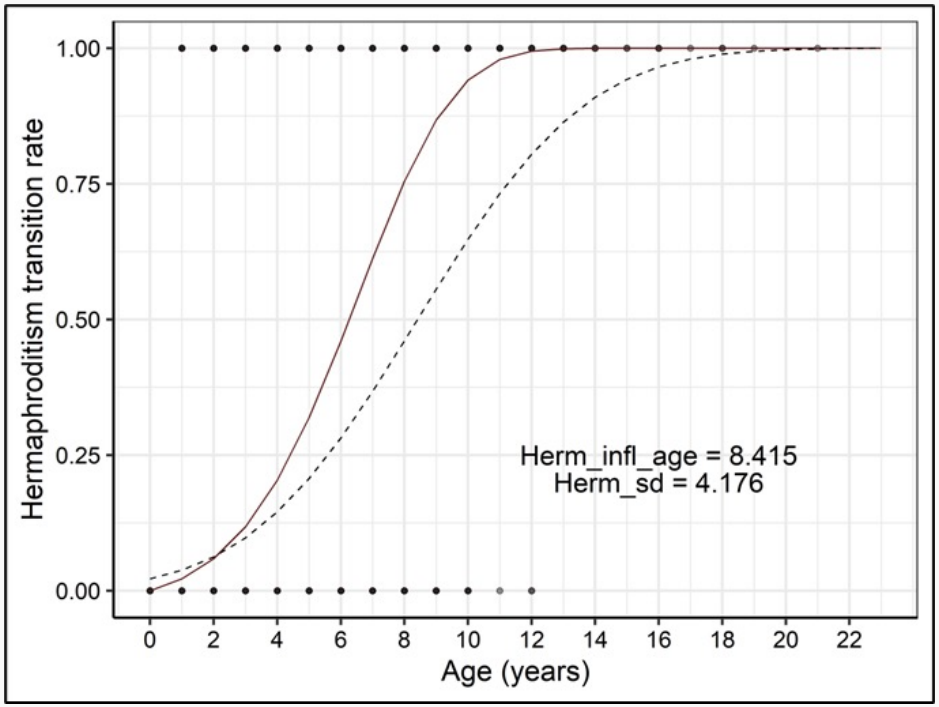




DW Report
Figure 2.13.43a-b

Male Transition

- Hermaphroditism
  - Differs by nearshore/offshore strata (Collins and McBride 2011)
    - Younger nearshore than offshore
      - Wider variability when aggregated
  - Repro classes (n = 942)
    - 1 – 4 (imm./mature females)
    - 5 – 10 (transitionals, imm./mature males)
- Transition probabilities
  - Cumulative normal distribution
    - Defines proportion that *change* sex in a time step, not proportion that *are* each sex
  - First fully male age was 13 years.
  - **Herm. infl. age = 8.42 years**



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Data: Landings and Releases



Landings

Commercial by gear (mt)

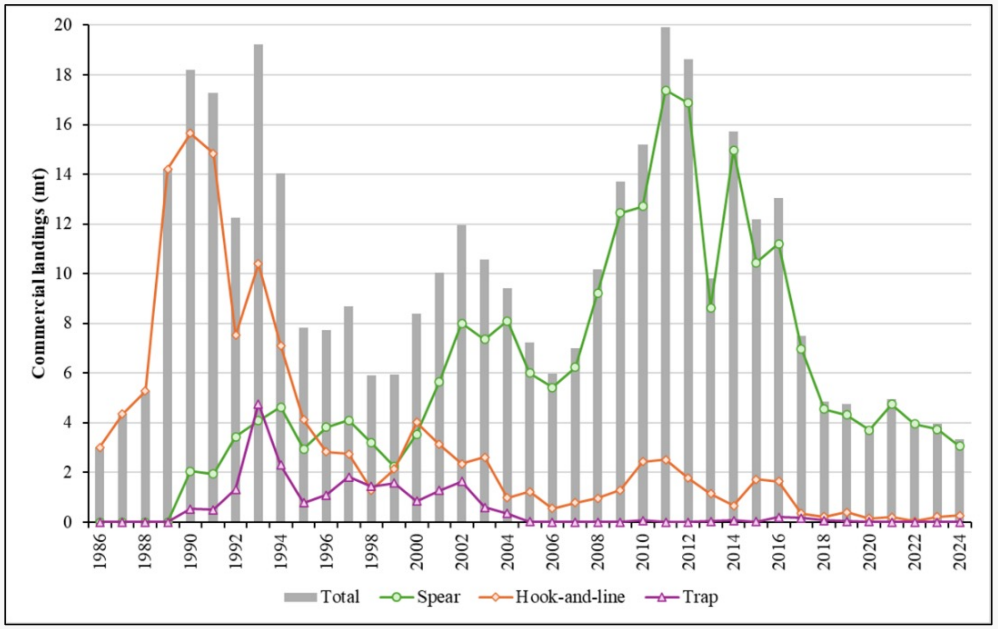


Figure 4.2

Commercial by gear (num, 000s)

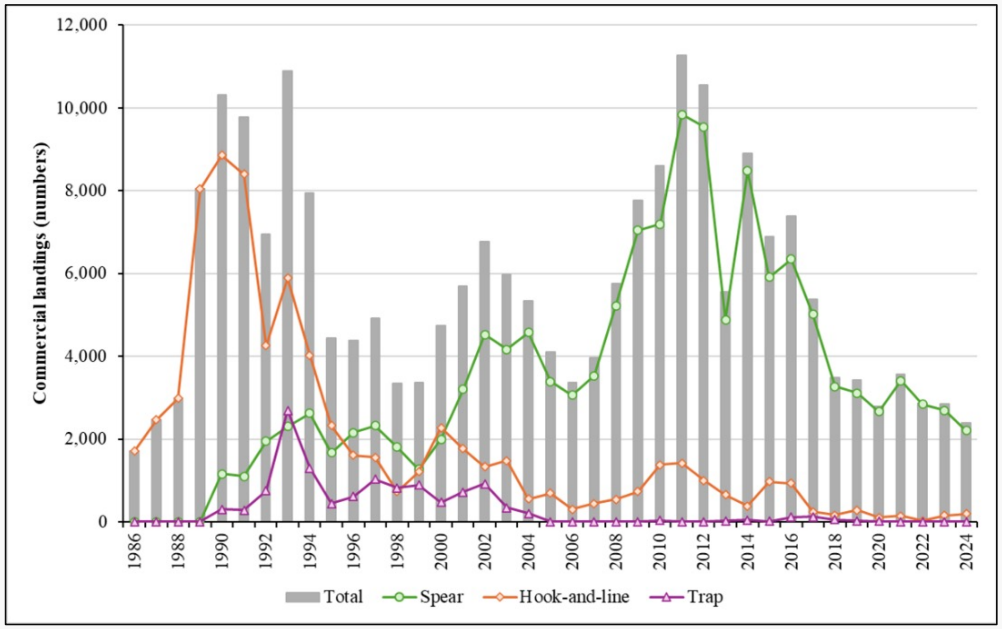


Figure 4.3

AW panel decision points:

- Given the relatively small contribution of the commercial sector and the sparse, noisy sampling data, the AW panel determined that, for each stock, aggregating all commercial gears into a single fleet was the most parsimonious modeling approach.

Landings

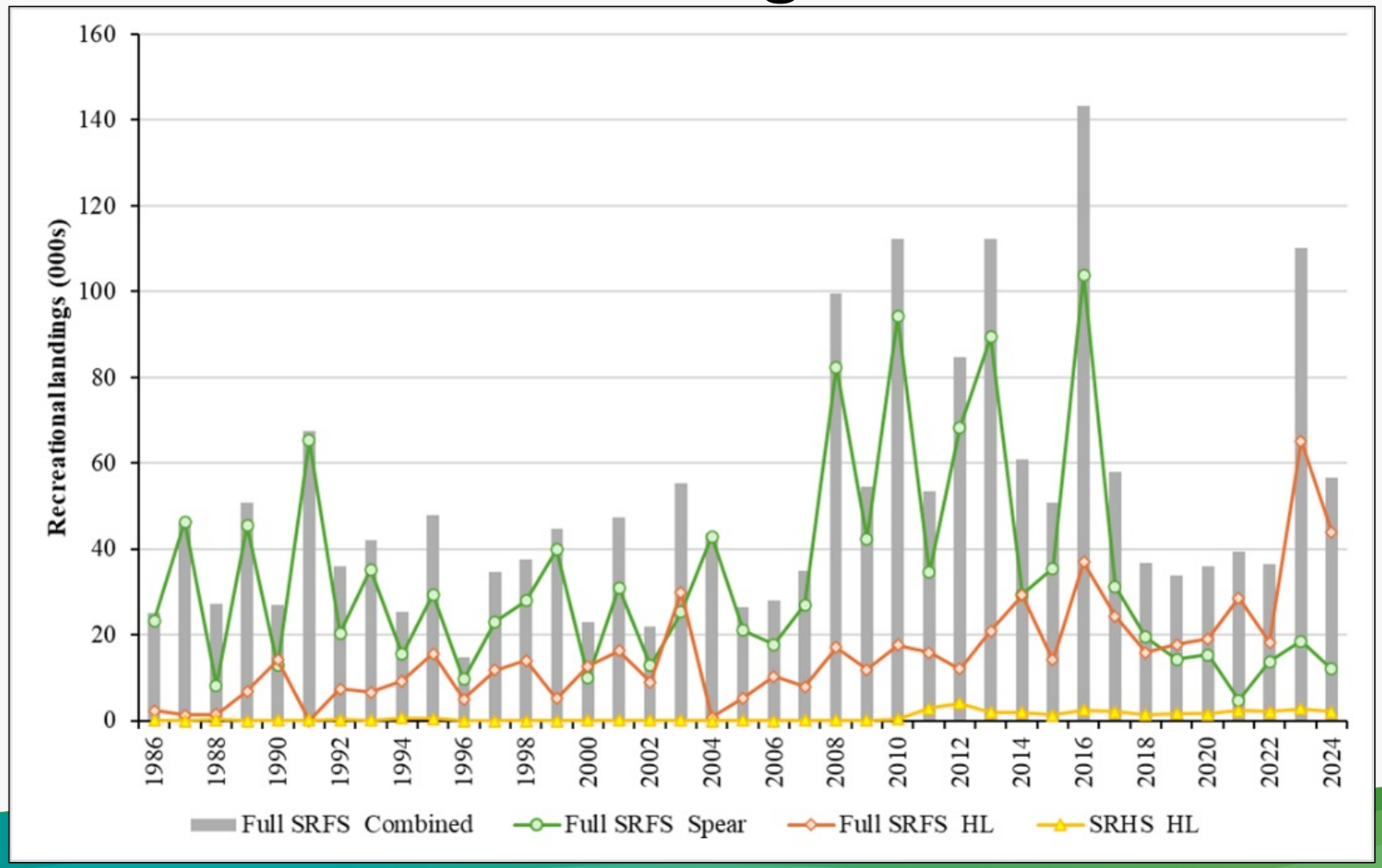


Figure 4.4

Recreational Discards

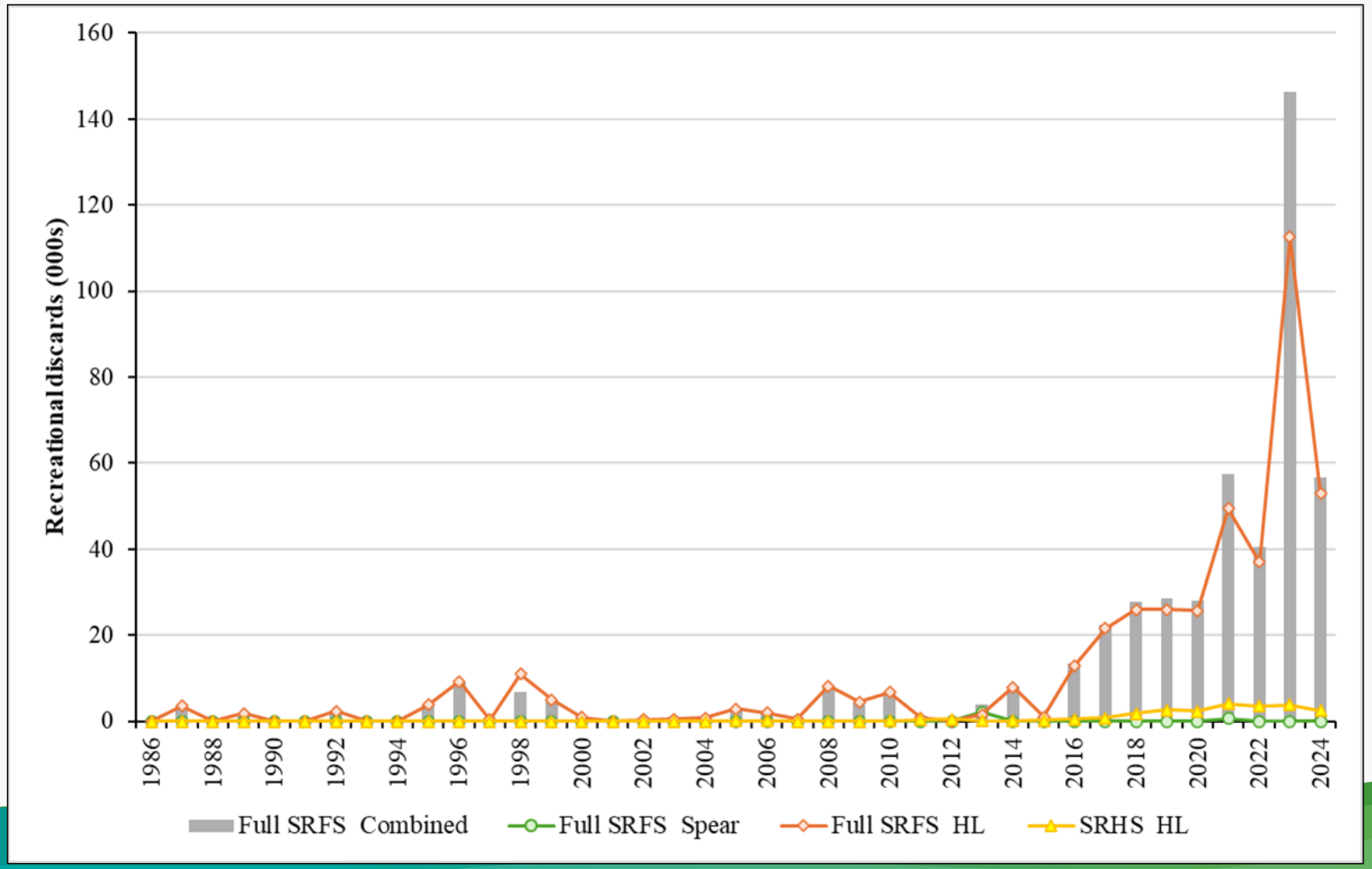
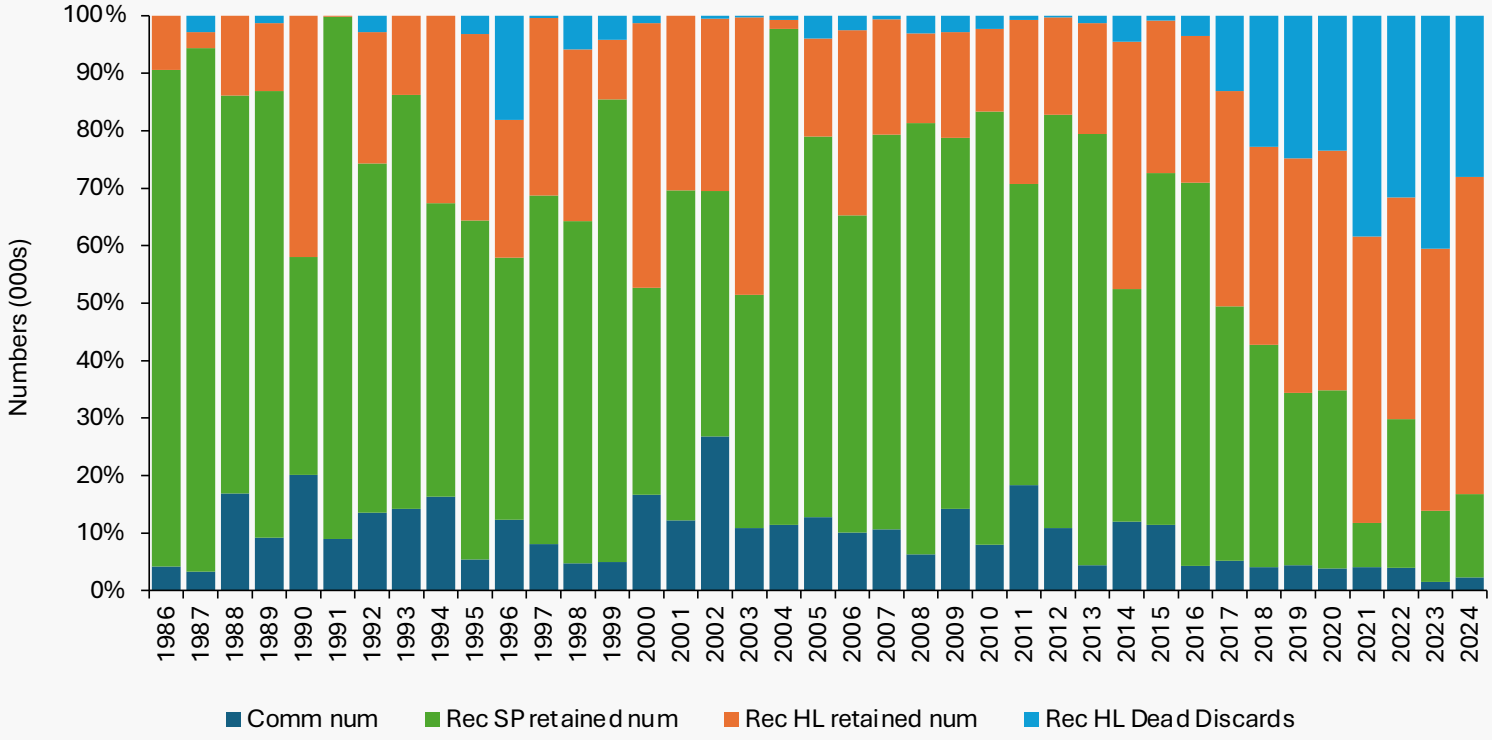


Figure 4.5

Total Removals



SEDAR 94: Florida Hogfish

Data: Indices of Abundance



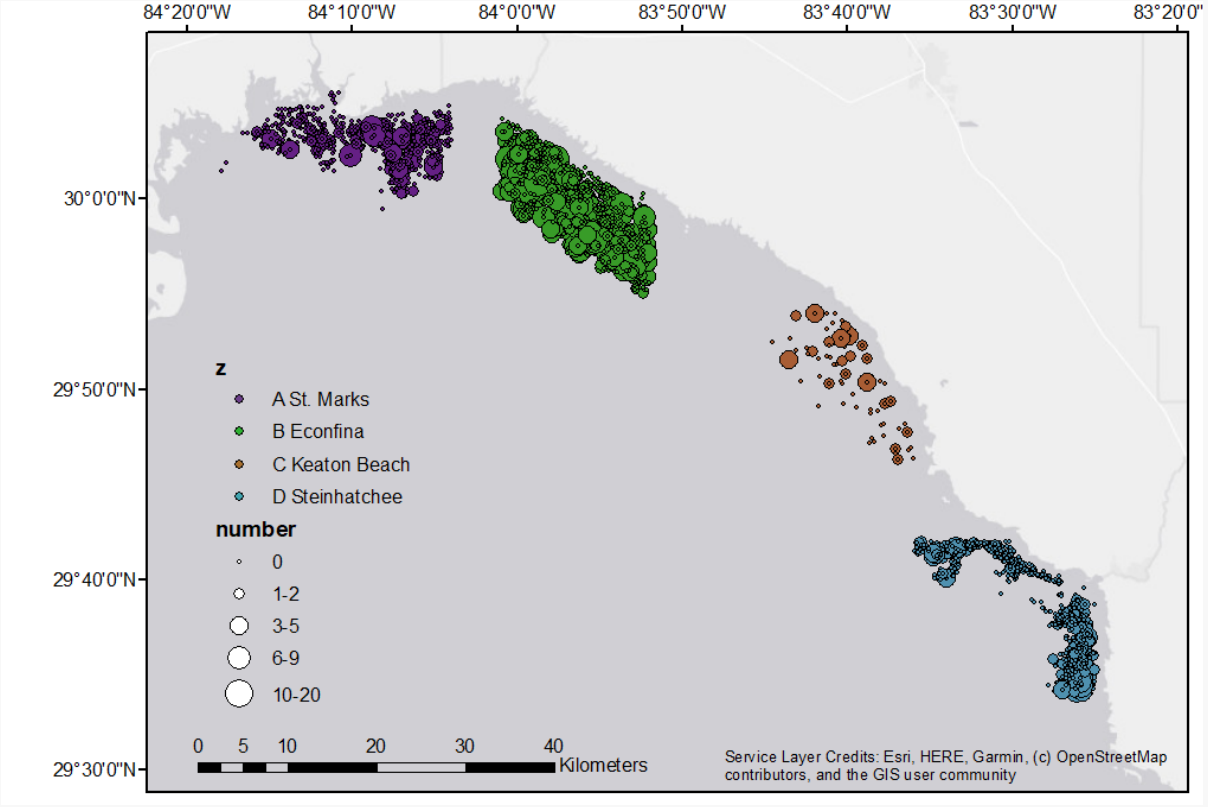
Seagrass Trawl

SEDAR 94 DW-14: Young of Year Hogfish Index of Abundance from Seagrass Trawl Surveys of the Florida Big Bend

- Sampling Design: Fishery independent stratified random sampling
- Gear: 6.1 m otter trawl
- Spatial Coverage: Big Bend, Florida
- Years: 2008 - 2024
- Months: June – October
- Lengths- < 165 mm SL; median: 77 mm SL; stage: Age 0

Data | Config | Results

Seagrass Trawl



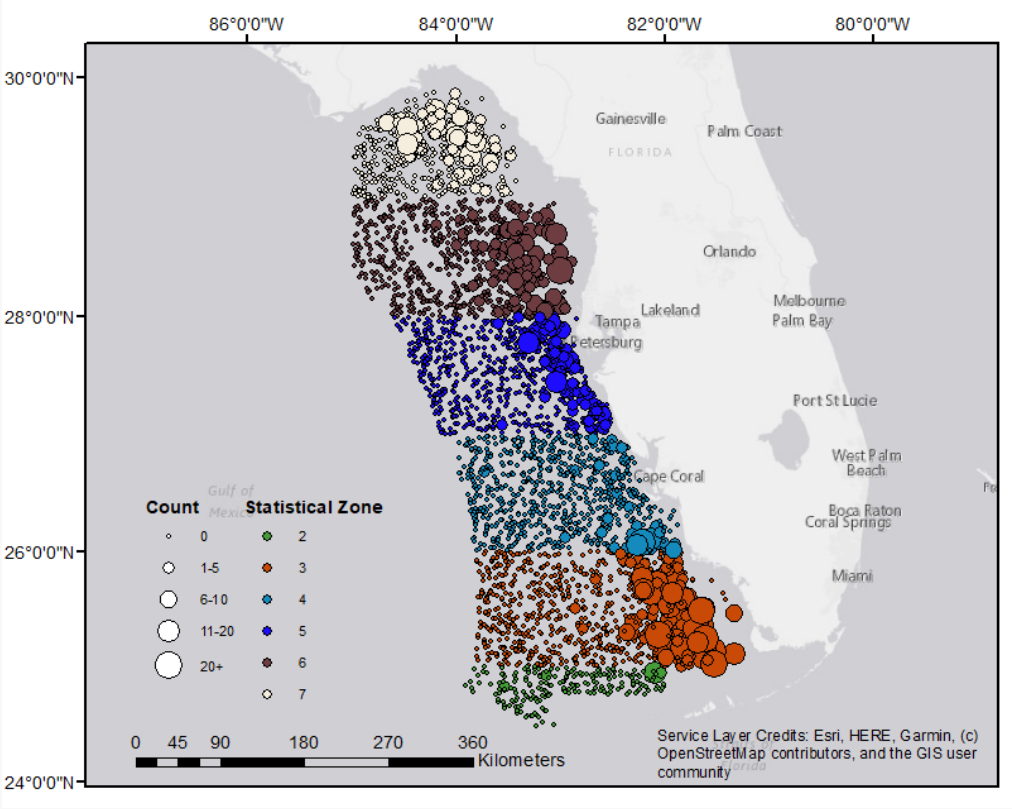
SEAMAP Trawl

SEDAR 94 DW-13: Hogfish Index of Abundance form the Annual FWRI-SEAMAP Trawl Survey along the West Florida Shelf

- Sampling Design: Fishery independent stratified random sampling
- Gear: 12.8m shrimp trawl
- Spatial Coverage: Statistical zones 3 - 7
- Years: 2010 - 2024
- Months: June, July, October, November
- Lengths: 25- 800 mm FL; mode 150 mm

Data | Config | Results

SEAMAP Trawl



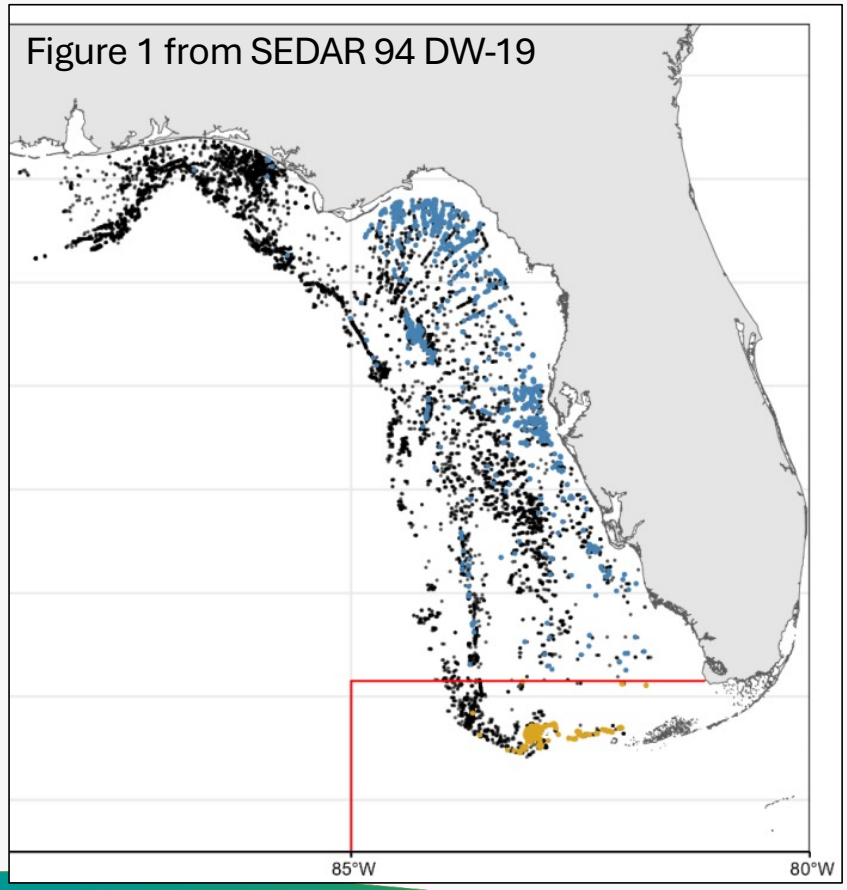
Combined Video Survey

SEDAR 94 DW-19: Indices of abundance for Gulf and Atlantic Hogfish (Lachnolaimus maximus) using data from multiple video surveys

- Stationary video surveys with SRS design
  - NMFS SEAMAP reef fish video survey (SRFV)
  - NMFS Panama City Lab
  - Florida Fish and Wildlife Research Institute survey (FWRI, starting year 2008)
  - After 2020, unified survey design under G-FISHER
- Gear
  - Paired stereo-imaging cameras
    - Sites selected at random from known reef areas identified through habitat mapping (multi-beam and side-scan sonar) and were deployed.
- Spatial Coverage
  - Stat Zones 3-7
  - Depths from 10 – 180m
- Years
  - SRFV: 2006– 2019
  - PC: 2006 – 2019
  - FWRI: 2008 – 2019
  - G-FISHER: 2020-2024
- Months
  - Daylight hours between April through September

- Length composition data only (subadult, adult)

Combined Video Survey



Indices

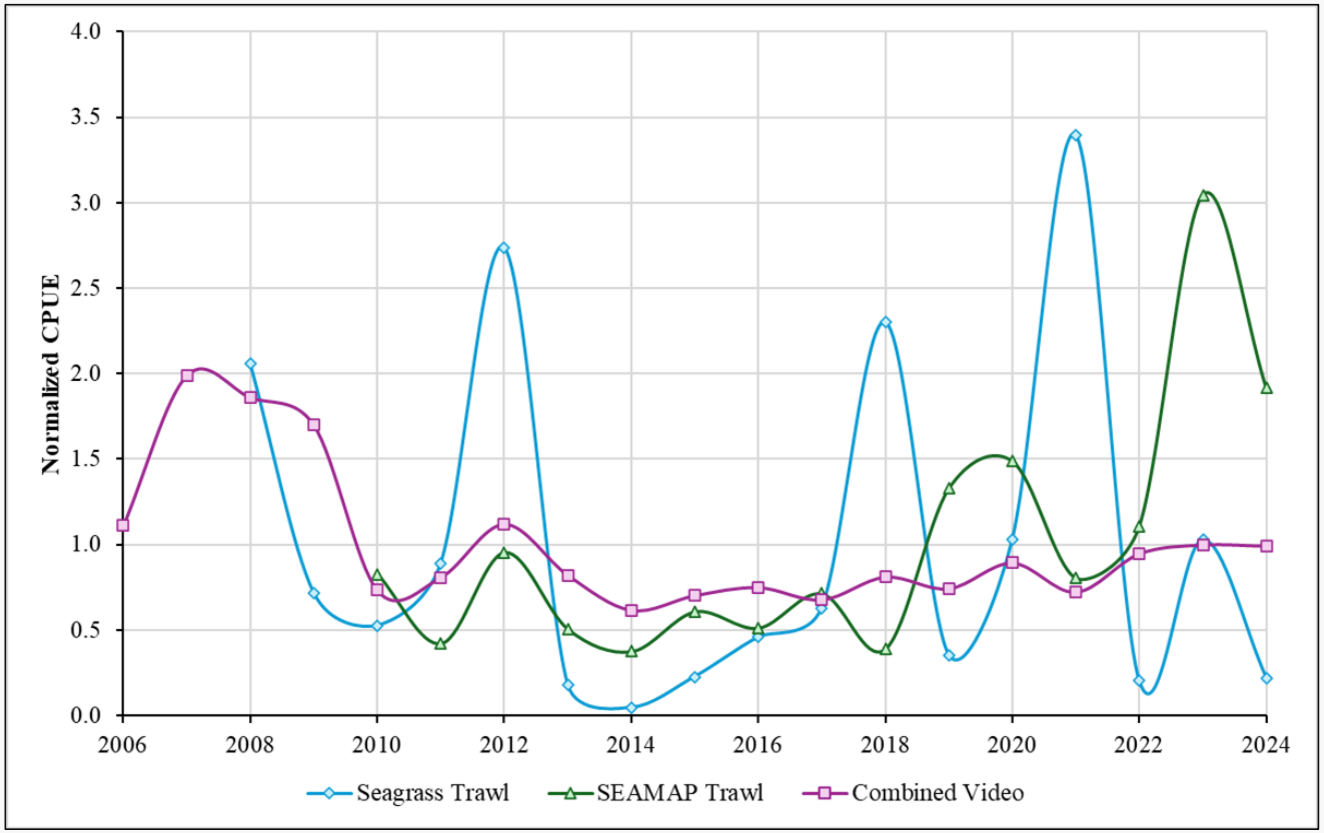


Figure 4.7

SEDAR 94: Florida Hogfish

Data: Length and Age compositions



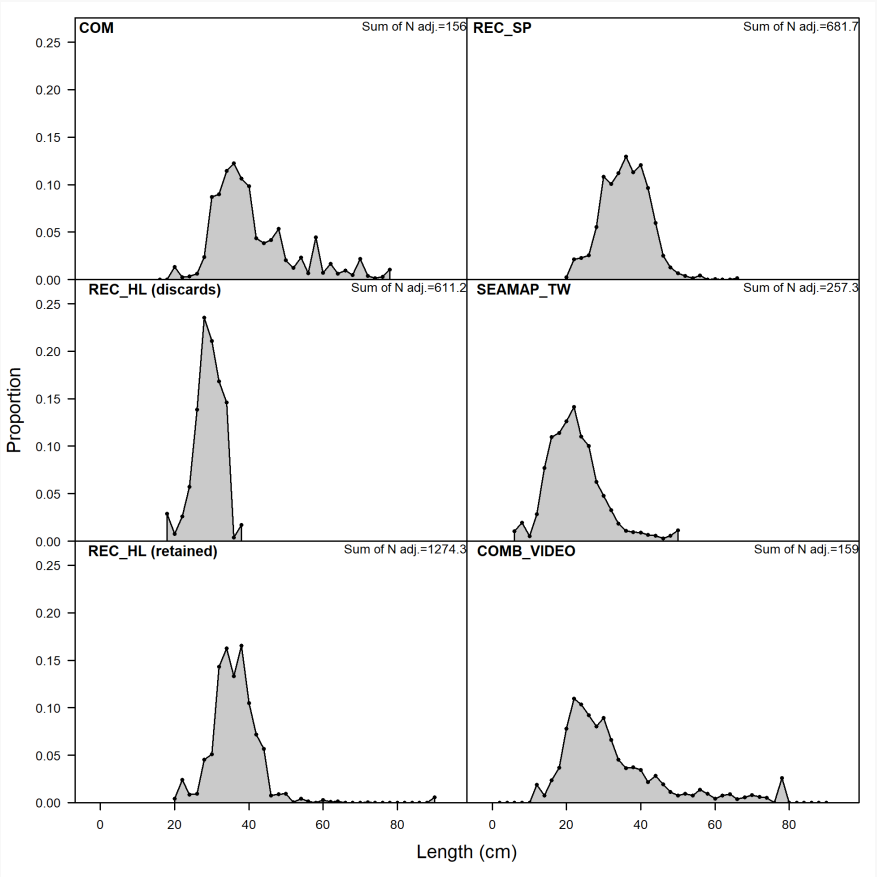
Fishery Length Compositions

Fleet	Partition	Years	Number of Positive Annual Trips	Super-periods (pos. trips)
Commercial	Landings	1991– 2024	avg. = 7 (q1 = 3, median = 5, q3 = 9)	1991 – 1999 (43), 2000 – 2017 (141), 2018 – 2024 (43)
Recreational	Landings (H&L)	1986 – 2024	avg. = 13 (q1 = 6, median = 9, q3 = 20)	1986 – 1999 (85), 2000 – 2004 (42), 2005 – 2017 (171), 2018 – 2024 (217)
Recreational	Landings (SP)	1986-2024	avg. = 13 (q1 = 7, median = 11, q3 = 20)	1986 – 1999 (151), 2000 – 2017 (331), 2018 – 2024 (52)
Recreational	Live Releases	2005, 2009, 2013, 2015 – 2024	avg. = 19 (q1 = 4, median = 15, q3 = 28)	2005 – 2017 (35), 2018 – 2024 (212)

Index Length Compositions

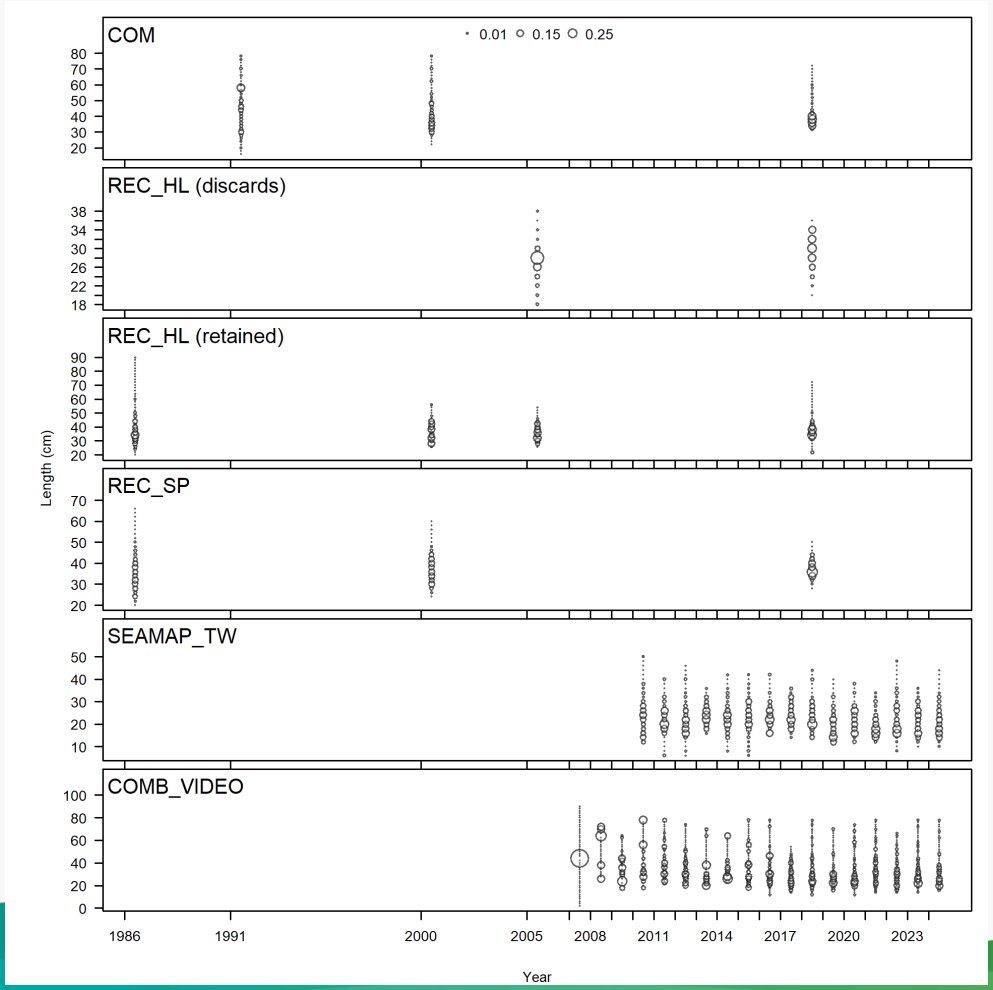
Fleet	Partition	Years	Number of Positive Annual Sets
Combined Video	Index	2007-2024	avg. = 37 (q1 = 14, median = 40, q3 = 61) Total= 661
SEAMAP Trawl	Index	2010 – 2024	avg. = 21 (q1 = 16, median = 22, q3 = 27) Total=317

Length Composition

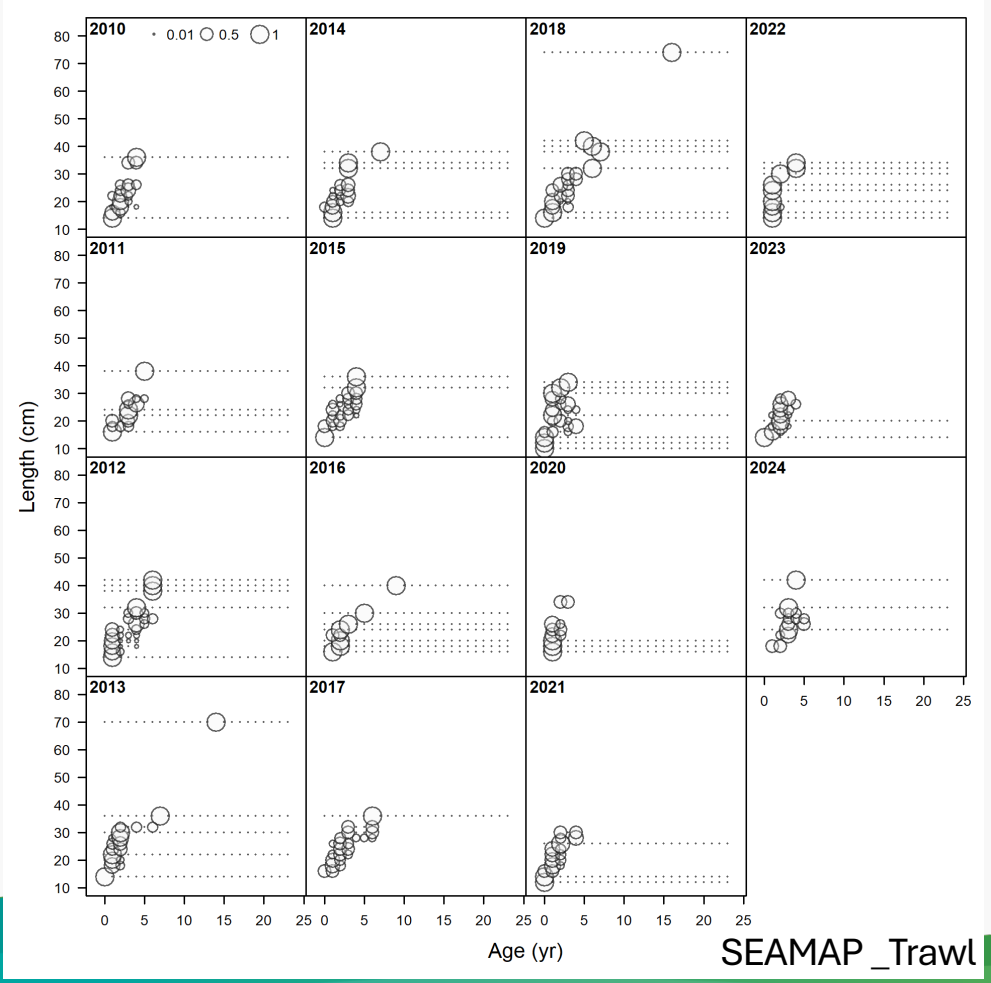


- Fork length (2 cm bins)
  - 2 – 90 cm
  - Largely unimodal distributions
- Fishery length comps weighted by catch or live releases
  - Distributions heavily dome-shaped with more larger individuals captured by the commercial fishery
  - Retained lengths generally followed changes to minimum size limits
  - Discards were largely below minimum size limits
- Combined video lengths weighted by index value

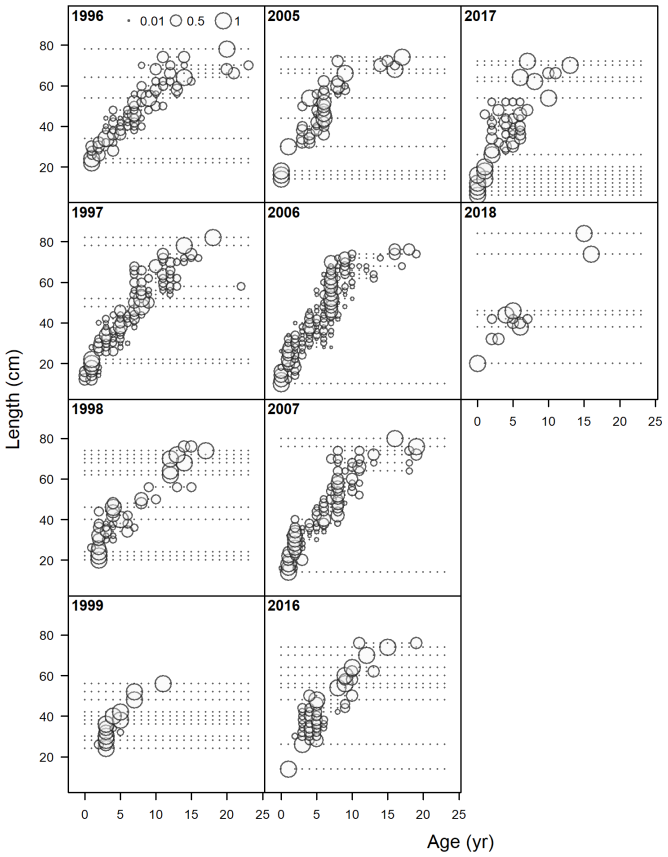
Length Composition



Conditional Age at Length Composition



Conditional Age at Length Composition



FI_LHR_SP

- Fishery-independent research
  - McBride and Richardson (1996-1999)
  - Collins and McBride (2005-2007)
  - Faletti and Stallings (2016-2018)
  - 2 cm FL bins
- Purpose to better inform internal estimation of growth
  - Not linked to any fleet