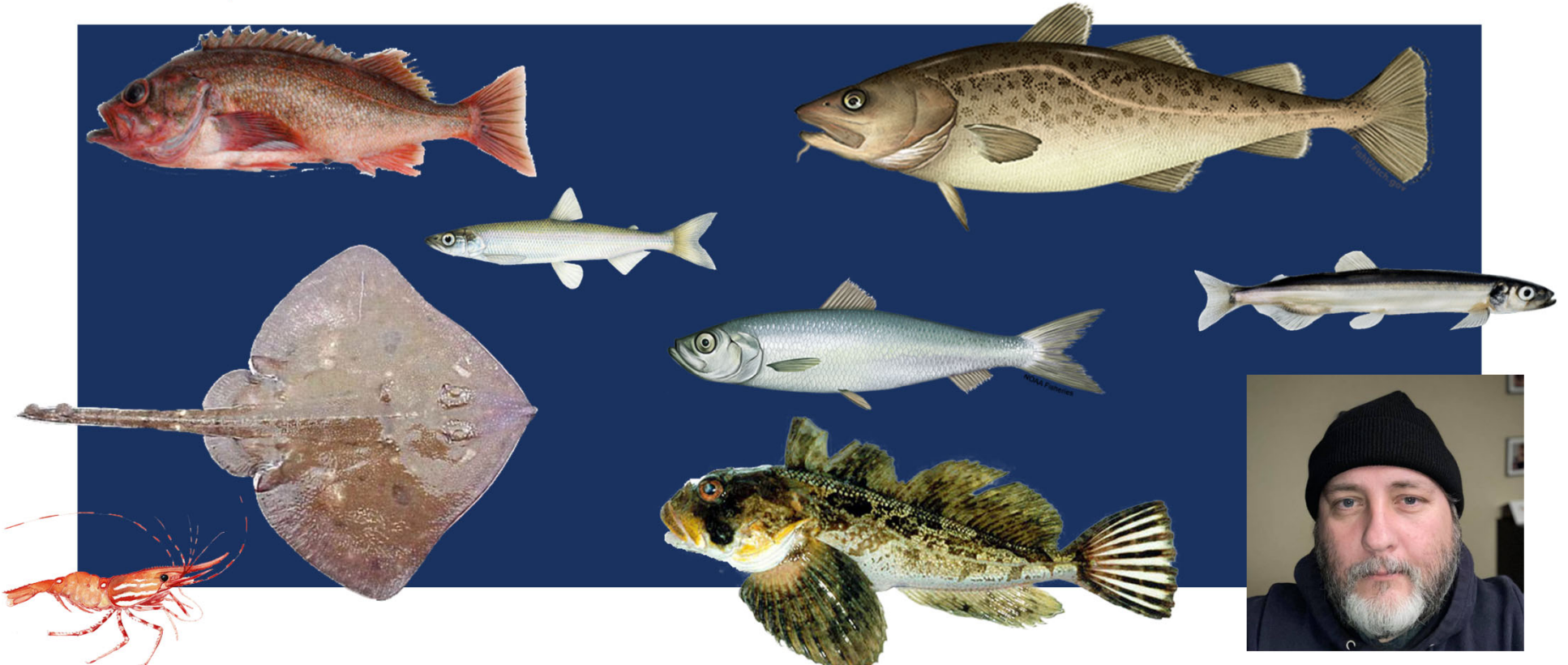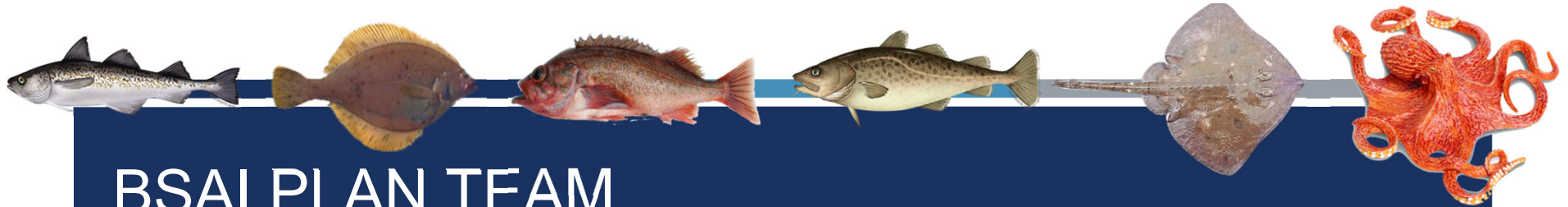# REPORT OF THE NOVEMBER 2023 BSAI GROUNDFISH PLAN TEAM MEETING

STEVE BARBEAUX (CO-CHAIR), KALEI SHOTWELL (CO-CHAIR), CINDY TRIBUZIO (VICE-CHAIR). DIANA STRAM (COORDINATOR)

DECEMBER 4, 2023

BSAI PLAN TEAM MEETING OVERVIEW

- Dates: November 13-17

- Place: AFSC Seattle

- Leaders: Steve Barbeaux, Kalei Shotwell (co-chairs); Cindy Tribuzio (vice-chair); Diana Stram (coordinator)

- Participation:

  - Steven Whitney (NMFS AKRO)

  - Allan Hicks (IPHC)

  - Lisa Hillier (WDFW)

  - Kirstin Holsman (AFSC REFM)

  - Phil Joy (ADF&G)

  - Andy Kingham (AFSC FMA)

  - Beth Matta (AFSC REFM)

  - Andy Seitz (UAF)

  - Jane Sullivan (AFSC)

  - Lucas De Filippo (AFSC ABL)

  - AFSC and AKRO staff and members of the public

2

BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE

- Assessments of 26 stocks/complexes – (3 **Full**, 5 Update; 10 Harvest projection; 5 Catch report; 2 Ecosystem report; 1 "none")

- Total of 23 models, including Tier 5/6 methods:
  - 8 base models/methods
  - 15 additional models/methods

- The Team agreed with authors' recommendations regarding preferred models/methods and harvest specifications in all but one stock (AI Pacific cod)

- 2 new reductions from maximum permissible ABC recommended (5 total)

- Of the 15 stocks/complexes in Tiers 1 or 3, only 1 is in sub-tier "b"

- No stocks/complexes were subjected to overfishing in 2022, and no Tier 1 or 3 stocks/complexes are overfished/approaching as of 2023

- 19 Team recommendations

3
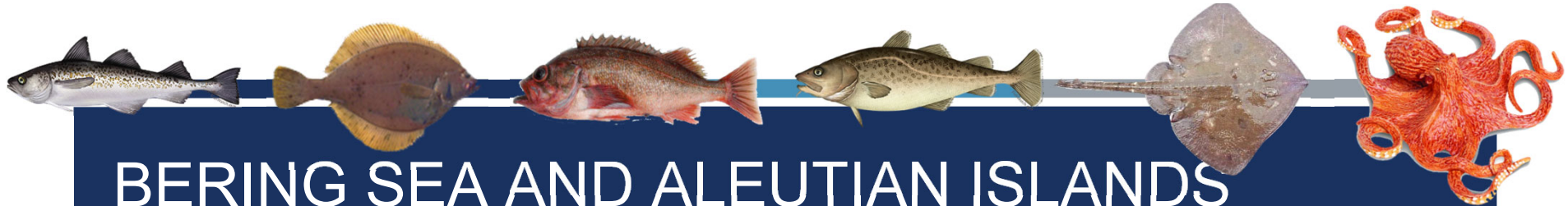
BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE (TINY FONT)

| Chapter	Assessment	Author	Tier	Type	Risk*	% Reduction
1	Eastern Bering Sea pollock	Ianelli	1a	Full	1,1,2,1	18%
1A	Aleutian Islands pollock	Barbeaux	3a	H-Proj		
1B	Bogoslof Island pollock	Ianelli	5	C-Rep		
2	Eastern Bering Sea Pacific cod	Barbeaux	3b	Full	1,1,1,1	
2A	Aleutian Islands Pacific cod	Spies	5	Full	1,2,2,1	8%
3	Sablefish	Goethel	3a	Update	1,1,1,1	
4	Yellowfin sole	Spies/Bryan	1a	Update	1,2,2,1	
5	Greenland turbot	Bryan	3a	H-Proj		
6	Arrowtooth flounder	Shotwell	3a	H-Proj		
7	Kamchatka flounder	Bryan	3a	H-Proj		
8	Northern rock sole	McGilliard	1a	H-Proj		36%
9	Flathead sole	Kapur	3a	H-Proj		
10	Alaska plaice	Cronin-Fine	3a	C-Rep		
11	Other flatfish	Monnahan	5	H-Proj		
12	Pacific ocean perch	Spencer	3a	H-Proj		
13	Northern rockfish	Spencer	3a	Update	2,2,1,1	
14	Rougheye & blackspotted rockfish	Spencer	3a/5	H-Proj		12%
15	Shortraker rockfish	Shotwell	5	C-Rep		
16	Other rockfish	Sullivan	5	C-Rep		
17	Atka mackerel	Sullivan/Lowe	3a	H-Proj		
18	Skates	Tribuzio	3a/5	Update	(2,1),1,1,1	
19	Sharks	Tribuzio	6	C-Rep		13%
22	Octopus	Cronin-Fine	6	Update	1,1,1,1	
Appendix 1	Forage Species (including Squid)	Szulwaski	eco	E-Rep		
Appendix 2	Sculpins	Spies	eco	E-Rep		

* Assessment, Pop Dy., Environment, Fishery

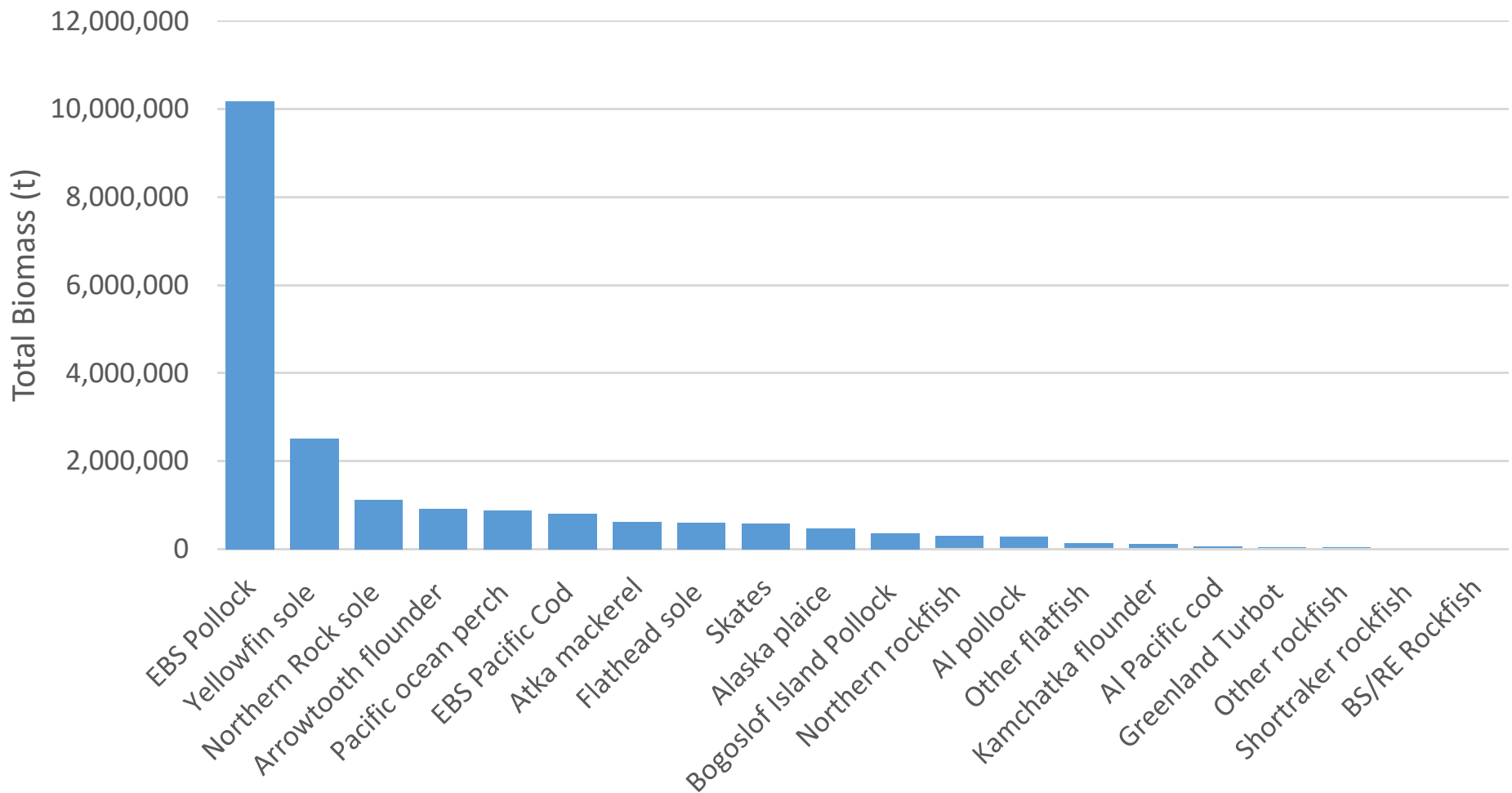# BERING SEA AND ALEUTIAN ISLANDS RISK TABLE AND REDUCTIONS

- New three level rating system with no categories or stocks with extreme concern

- Two of the five recommendations for reduction from maximum permissible ABC were from this year's deliberations.

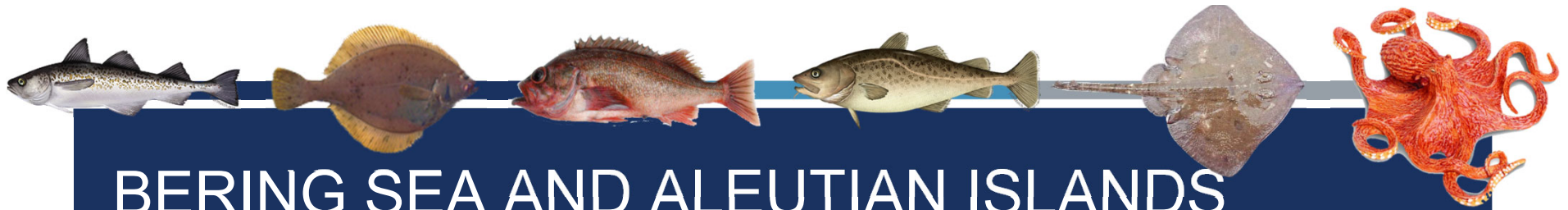- Three of the five reductions were carried over from 2022 determinations.

Risk Table Scoring (8 Stocks)

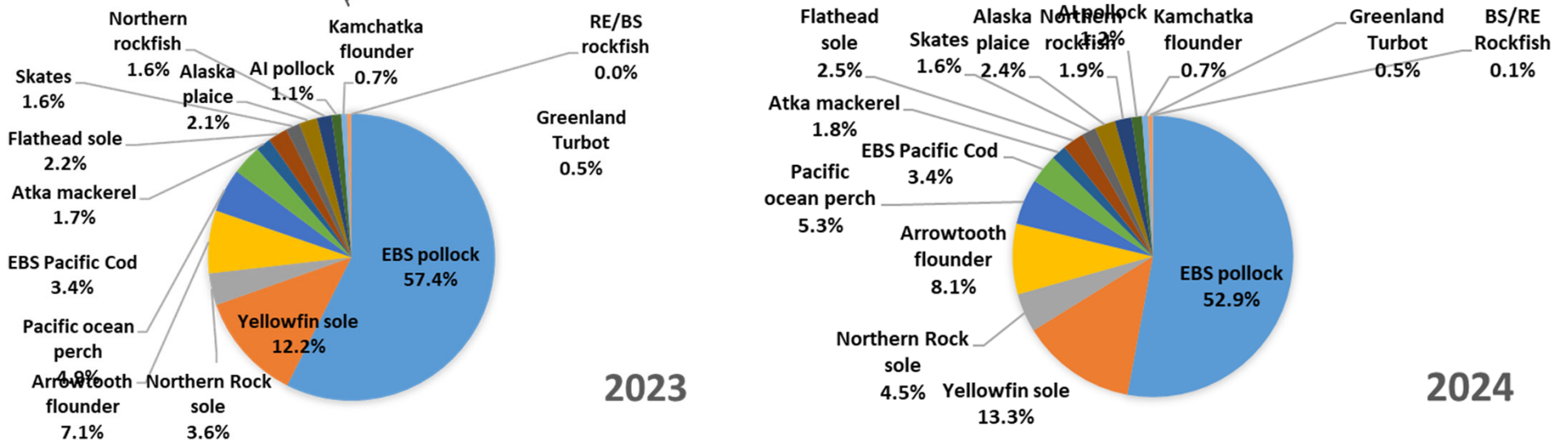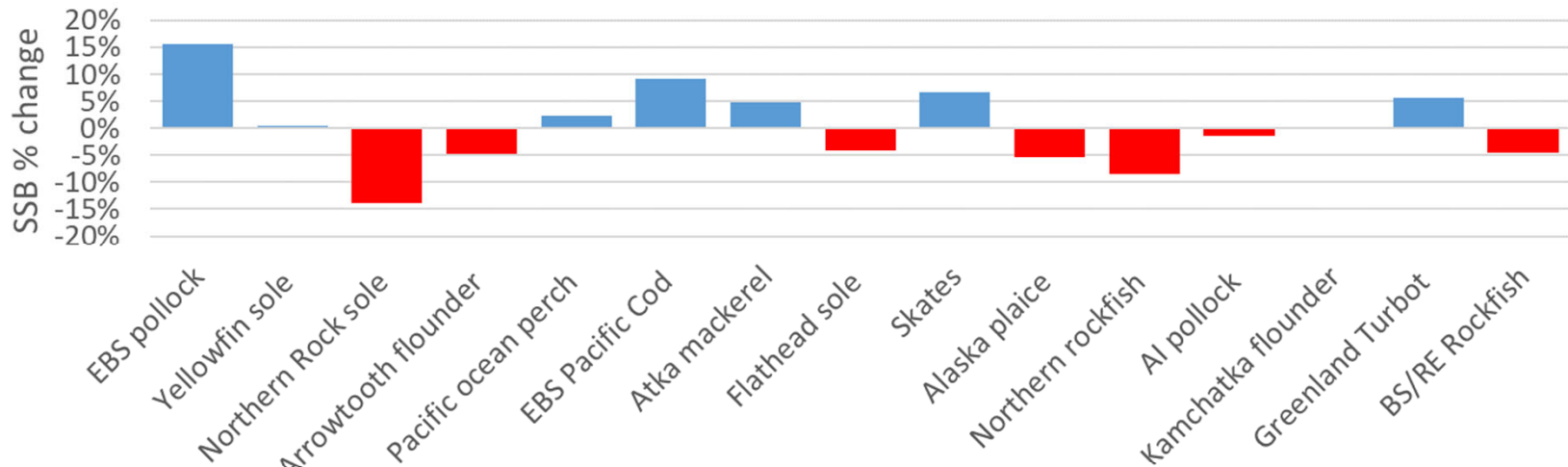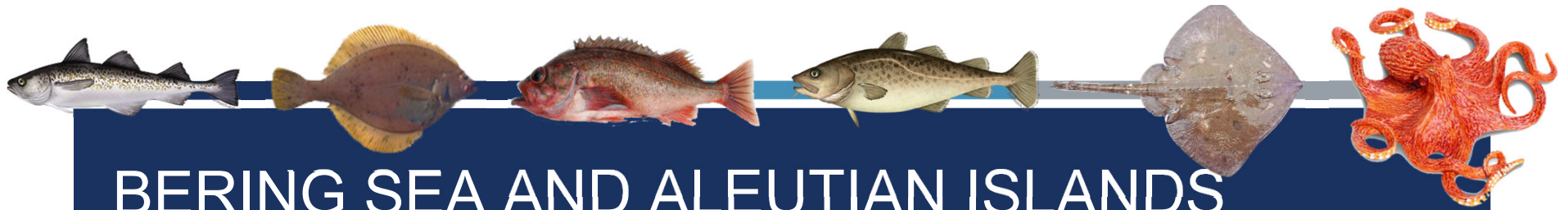Legend: 1 - No Concern, 2 - Major Concern, 3 - Extreme Concern
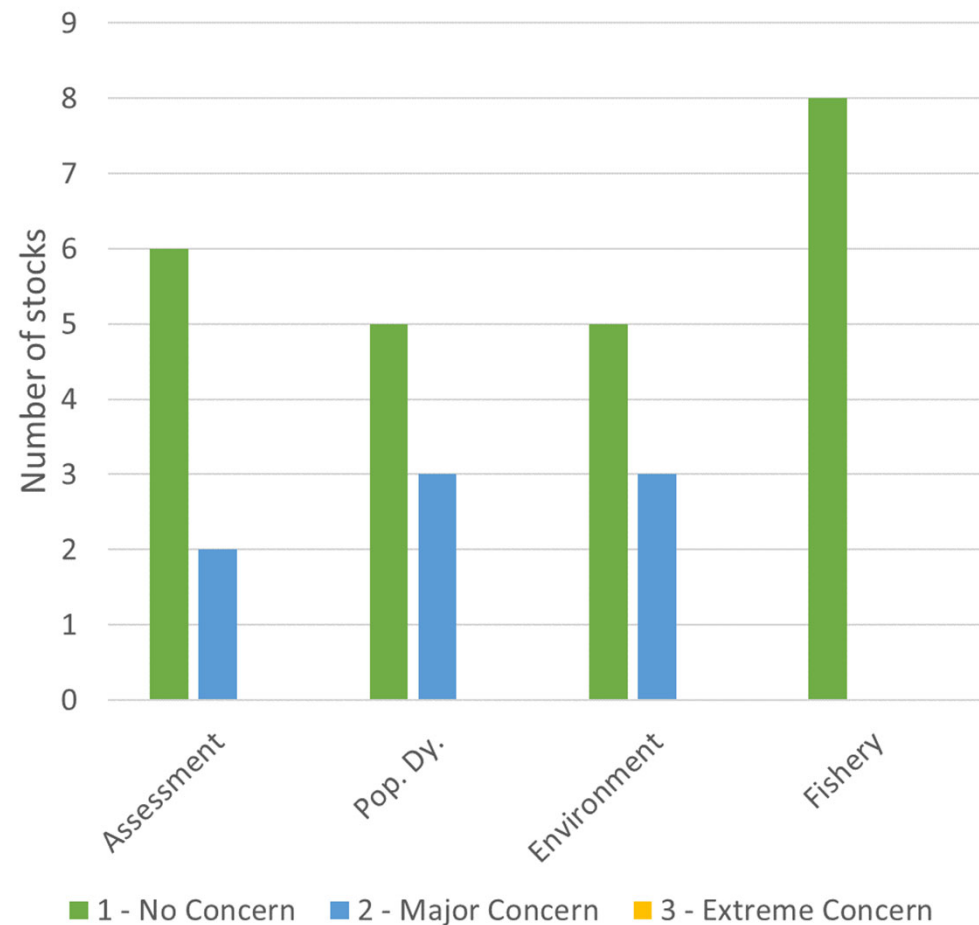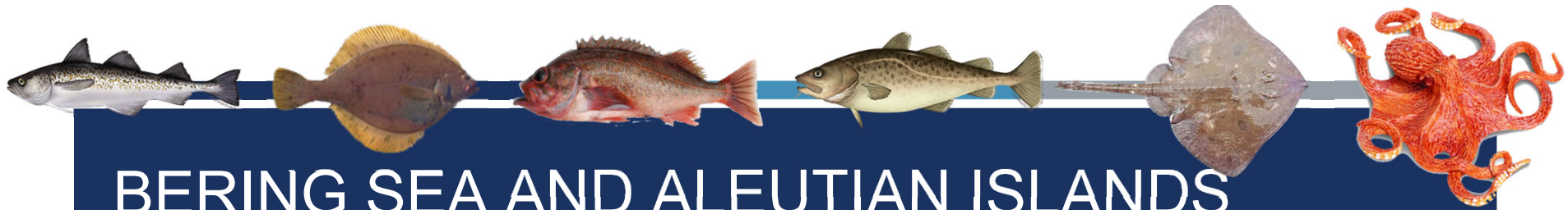
BERING SEA AND ALEUTIAN ISLANDS TOTAL BIOMASS (TIER 1, 3, AND 5)
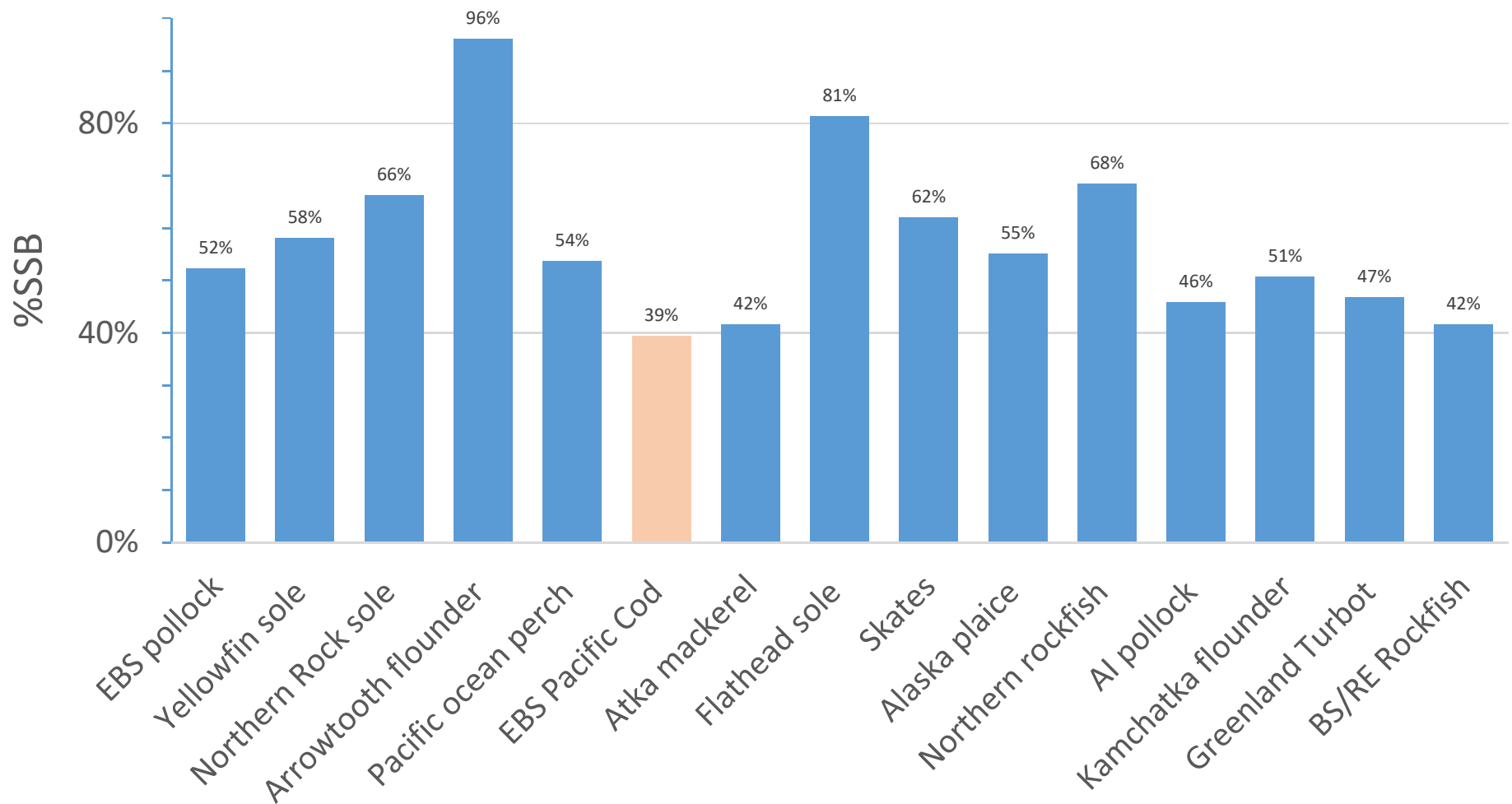
BERING SEA AND ALEUTIAN ISLANDS SPAWNING BIOMASS (TIERS 1 AND 3)
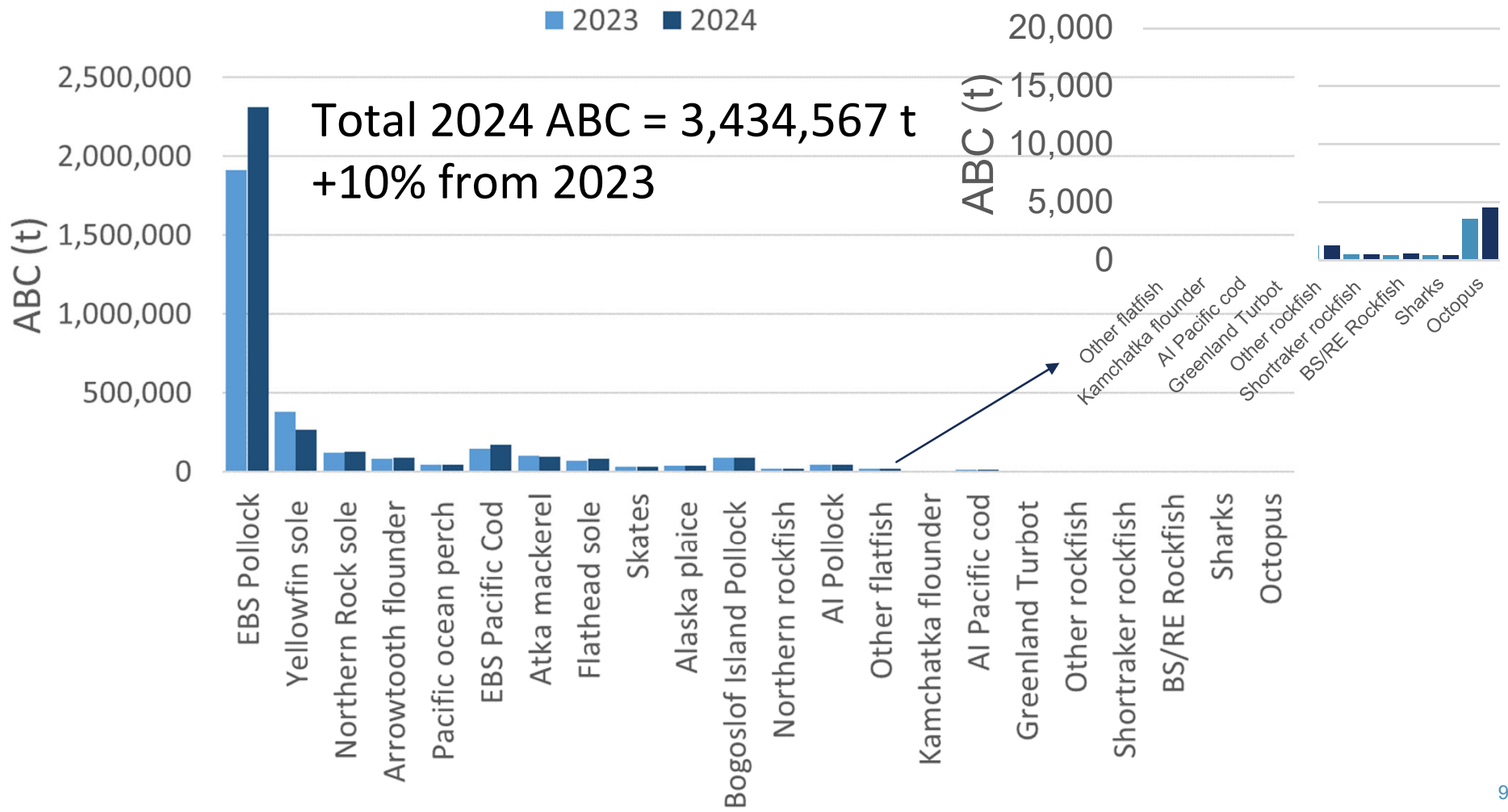
BERING SEA AND ALEUTIAN ISLANDS SPAWNING BIOMASS (TIERS 1 AND 3)

BERING SEA AND ALEUTIAN ISLANDS ALLOWABLE BIOLOGICAL CATCH (ABC)

Total 2024 ABC = 3,434,567 t +10% from 2023
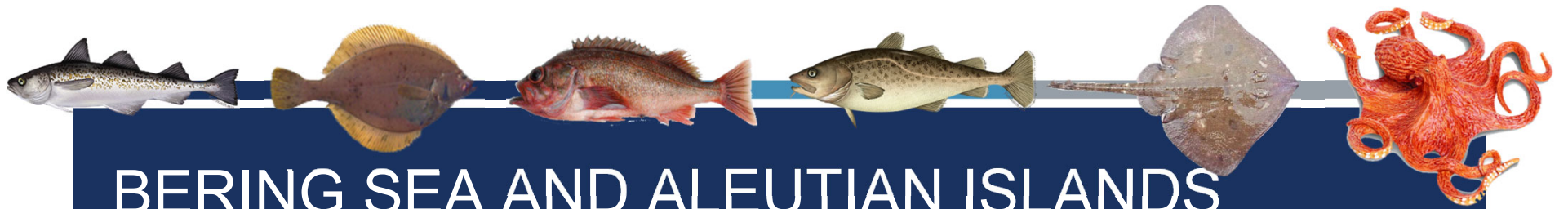
BERING SEA AND ALEUTIAN ISLANDS CHANGE IN 2023 ABC *PROJECTION*
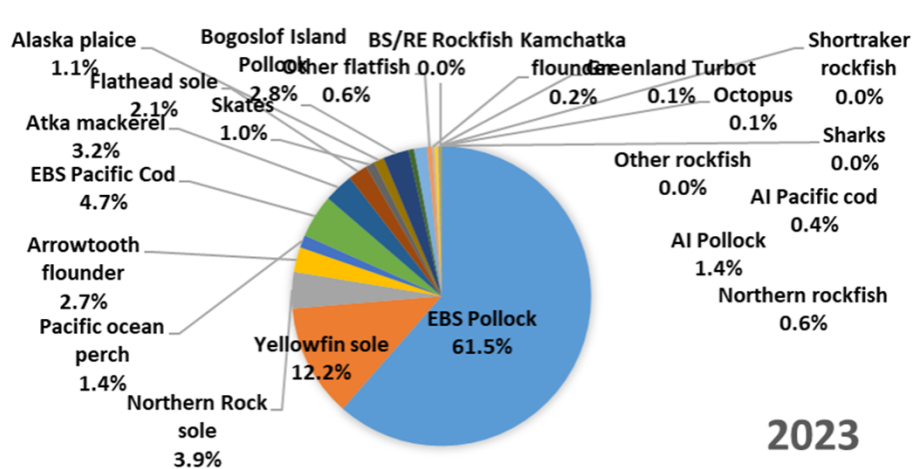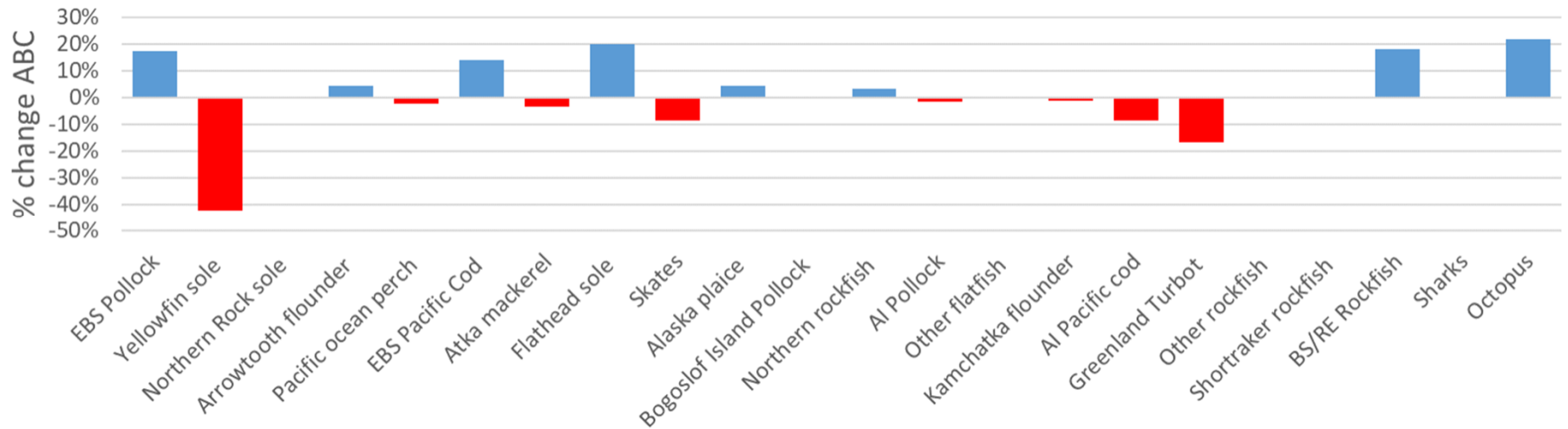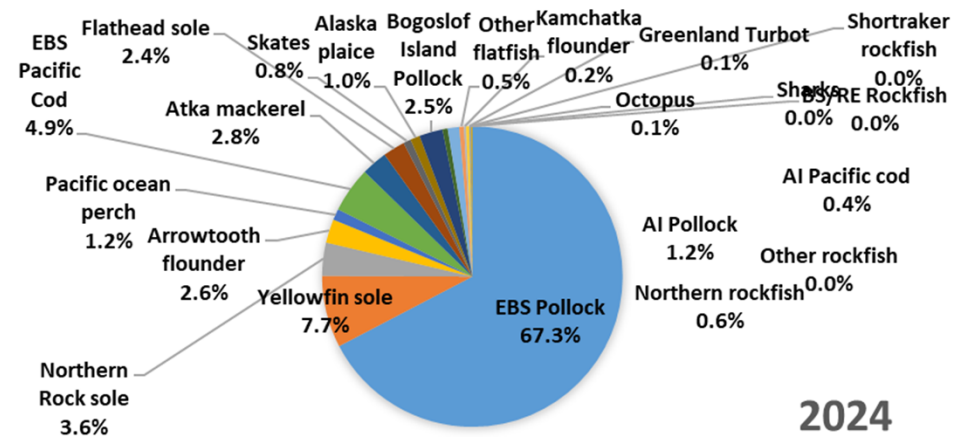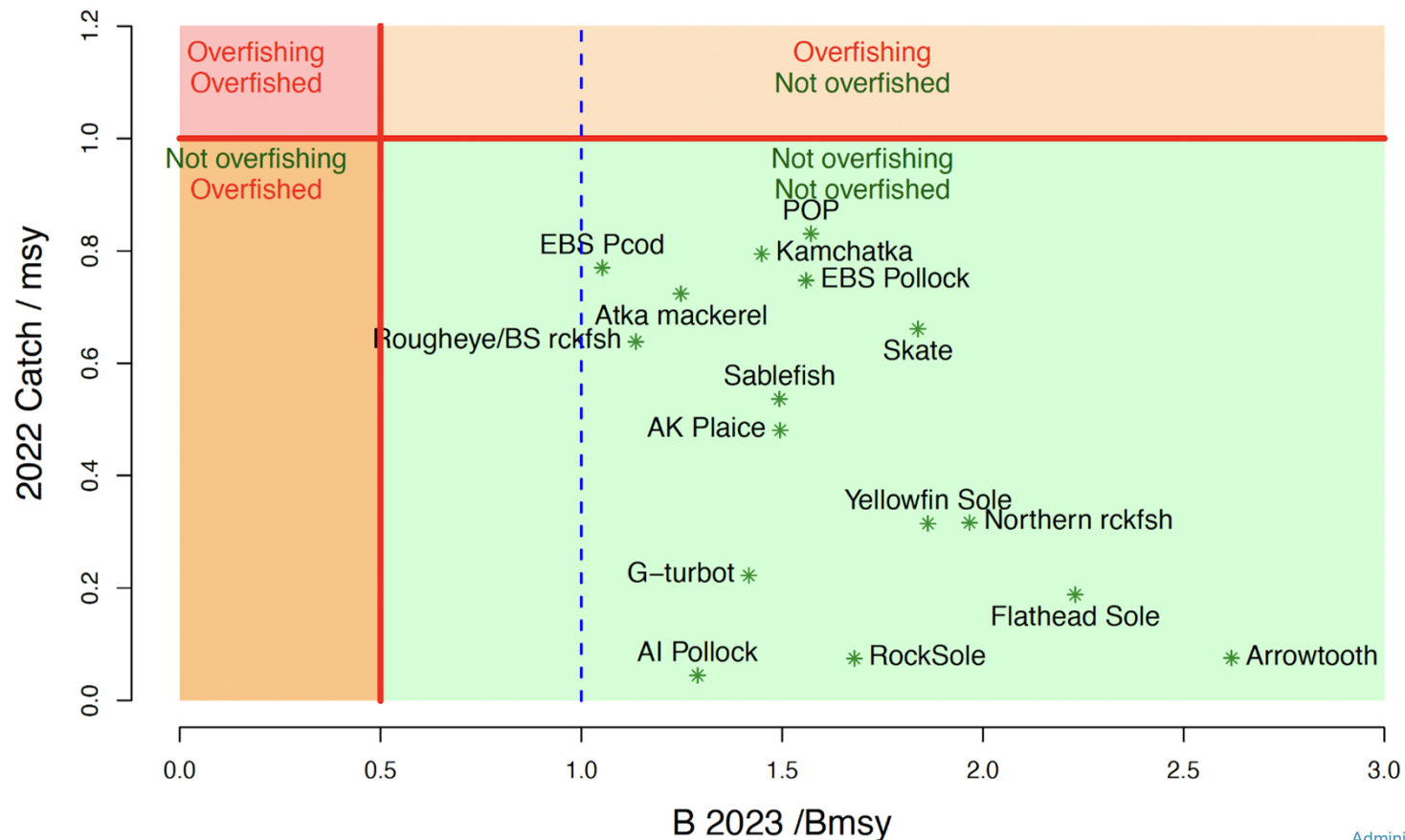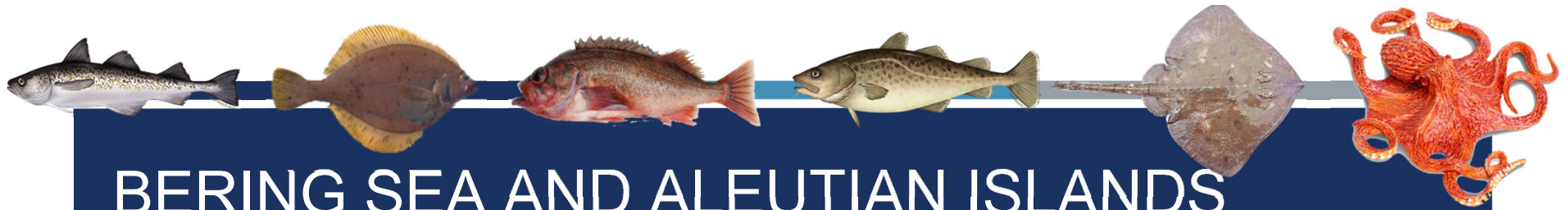
BERING SEA AND ALEUTIAN ISLANDS BIG PICTURE – STOCK STATUS

Bering Sea and Aleutian Islands

Bering Sea and Aleutian Islands

BERING SEA AND ALEUTIAN ISLANDS
BIG PICTURE – ECONOMICS
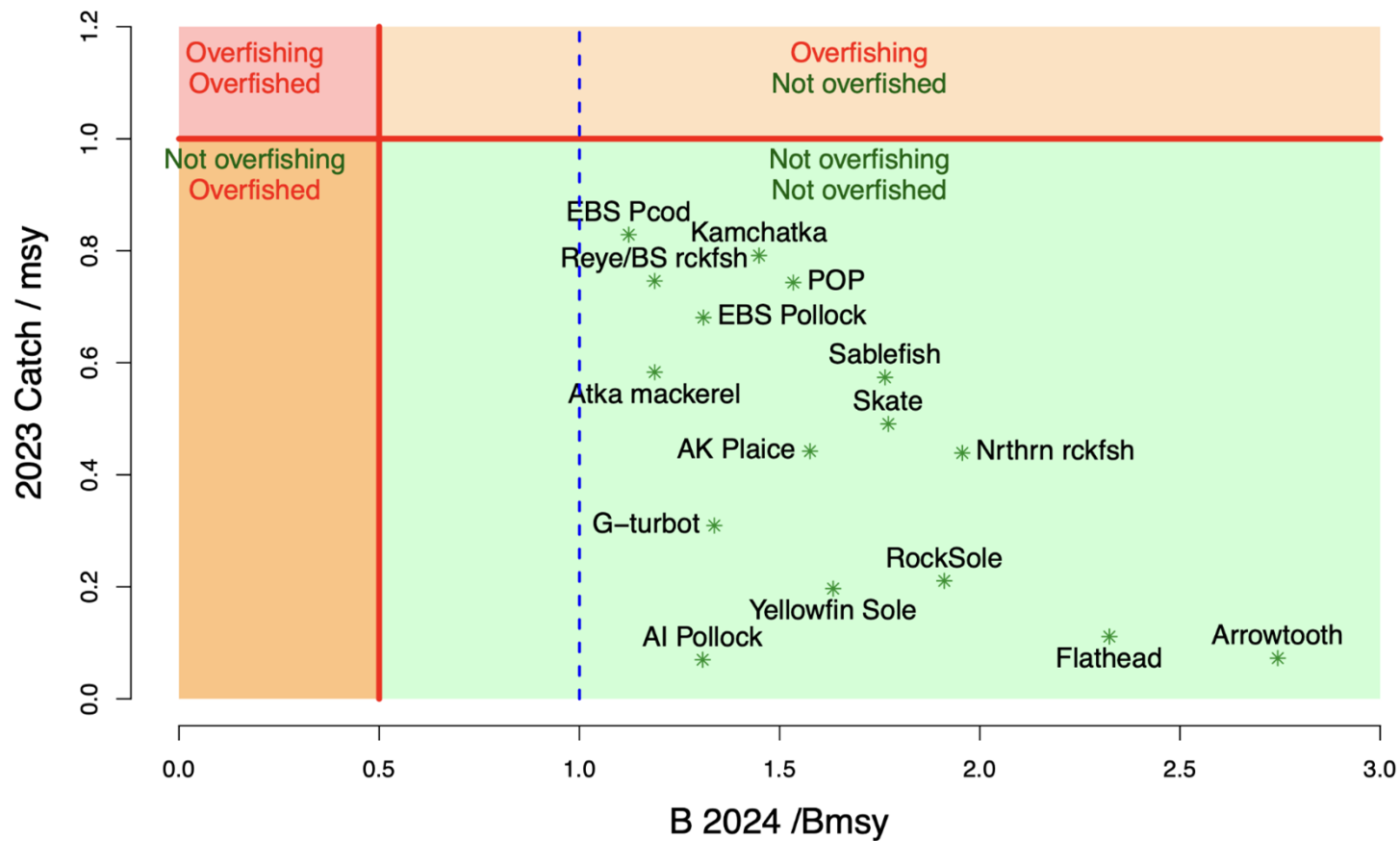
▪ Increase in value of BSAI harvested species from 2021 to 2022

Real ex-vessel value
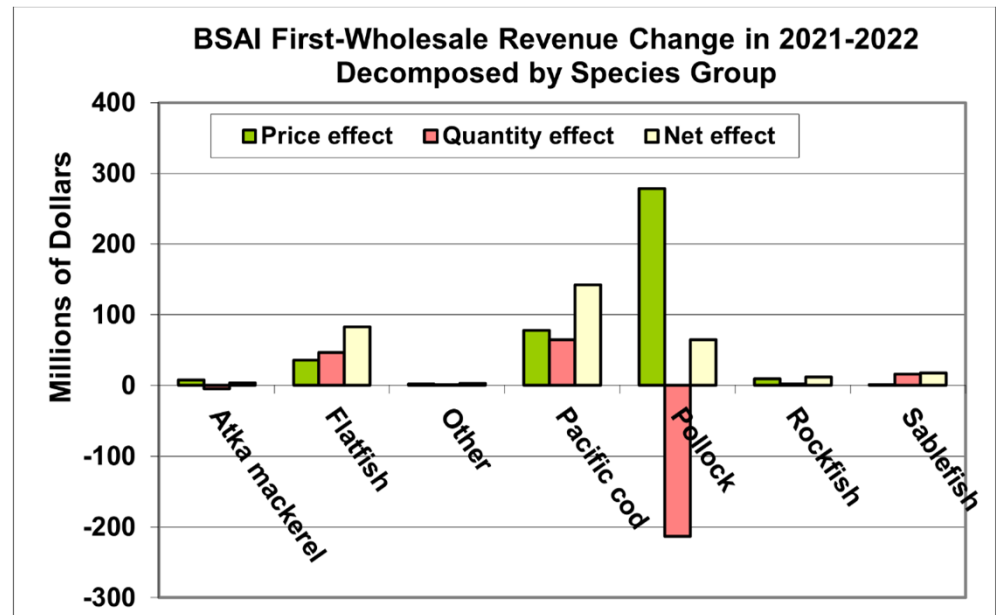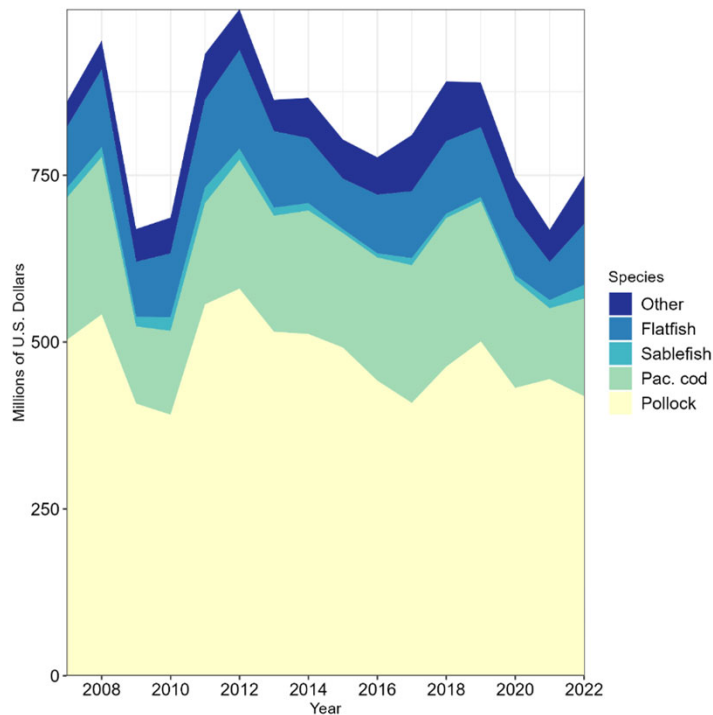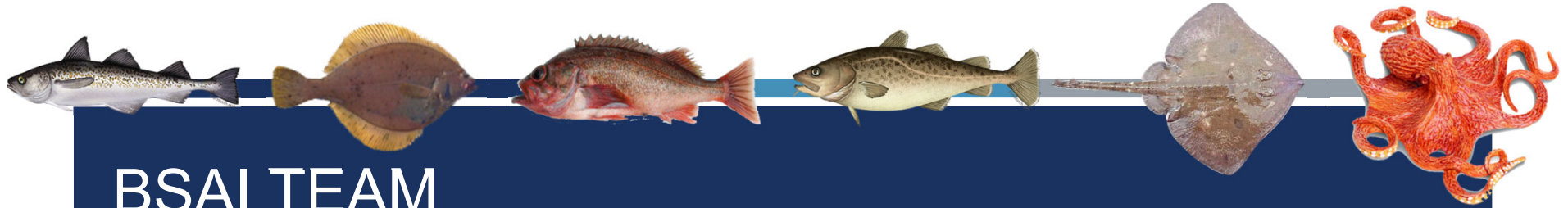
BSAI First-Wholesale Revenue Change in 2021-2022
Decomposed by Species Group

BSAI TEAM
GENERAL RECOMMENDATIONS

- The Team recommended that a bullet point be added in harvest projection presentations to explain reductions or changes in max ABC when it occurs.

- The Team recommended that as a best practice that appendices be linked in the front of the document (as with the sablefish assessment) to allow for an easier review of the appendices.

POLLOCK AND PACIFIC COD SUMMARY
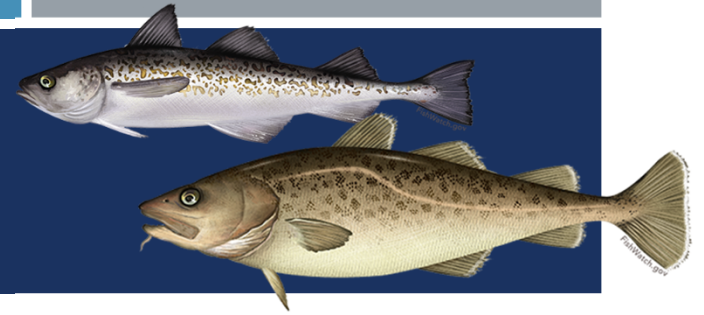
Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
EBS Pollock (Full)	1a	**2,313,000*(18%)**	3,162,000	21%
AI Pollock (H-Proj)	3a	42,654	51,516	-2%
Bogoslof Poll. (C-Rep)	5	86,360	115,146	0%
EBS Pacific cod (Full)	3b	167,952	200,995	16%
AI Pacific cod (Full)	5	**12,732*(8%)**	18,416	-8%

*xx% Reduced from maximum permissible ABC

CHAPTER 1
EBS WALLEYE POLLOCK

- Full Assessment; 1 new model presented; risk table (1,1,2,1)

- Switch to authors' presentation (Team comments will follow)

CHAPTER 1
EBS WALLEYE POLLOCK

- Full Assessment; 1 new model presented; risk table (1,1,2,1)

- Team agreed with author's recommendation on assessment model and reduction from maximum permissible ABC

- ABCs to be reduced by 18% from Tier 1 maximum permissible ABC based on risk table assessment
  - Multiple indicators of primary and secondary productivity show adverse signals borne out in continued declining trends in juvenile and adult fish condition.

Quantity	Last asmt.	This asmt.	Change
M	0.3	0.3	0%
2023 Tier	1a		
2024 Tier	1a	1a	
2023 age+ biomass	12,389,000		-22%
2024 age+ biomass	11,445,000	10,184,000	-12%
2023 spawning biomass	4,171,000		-19%
2024 spawning biomass	3,944,000	3,518,000	12%
B_0	6,653,000	6,728,000	1%
B_{msy}	2,674,000	2,689,000	1%
2024 F_{OFL}	0.491	0.422	16%
2024 F_{ABC}	0.365	0.365	0%
2023 OFL	3,381,000		-7%
2024 OFL	4,639,000	3,162,000	-32%
2023 ABC	1,910,000		17%
2024 ABC	2,275,000	2,313,000	2%

CHAPTER 1
EBS POLLOCK RECOMMENDATIONS

- **EBS Pollock**

    - The Team recommended continuing to evaluate projection bias due to selectivity assumptions, and the examination of new methods that may reduce that bias.

    - The Team recommended that the authors clearly state where MLE estimates are being used and where MCMC estimates are being used.

    - The Team recommended using posterior distributions from the MCMC to determine probabilities in the risk table and expanding the risk table to at least include the recommended ABC.

- **EBS Multi-species Model**

    - Kirstin intends to communicate with the individual species stock assessment authors earlier in next year's assessment cycle to help facilitate risk assessment, which is further recommended by the Team.

CHAPTER 2
EBS PACIFIC COD
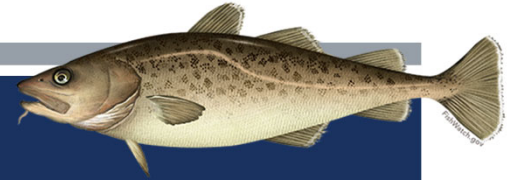
- Full Assessment; 3 new models presented; risk table (1,1,1,1)

- Switch to authors' presentation (Team comments will follow)
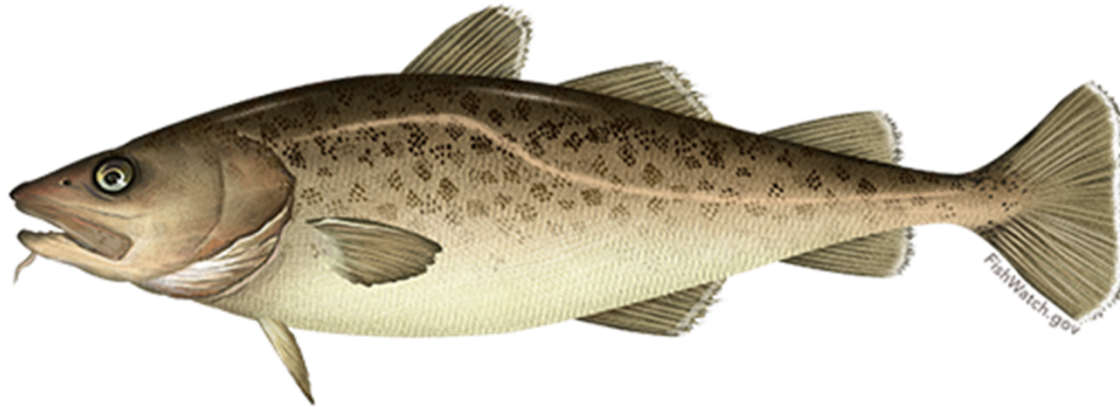
ECOSYSTEM AND SOCIOECONOMIC PROFILE (ESP)

- Management Summary:
  - Sea ice advance and retreat below average, surface temperatures average and bottom temperature below average, calmer cooler conditions
  - Spring bloom timing average but match depends on spawning and movement of Pacific cod
  - Condition of juveniles above average, adult below average, suggesting sufficient prey, population continues to move southeast, and more spread out
  - Arrowtooth biomass has steadily increased over time, near time series peak
  - Ex-vessel value increased but still below average, price and revenue/effort increased to average in 2022
- Modeling Summary:
  - One potential covariate for recruitment, summer bottom temperature from ROMS-NPZ model, 1985-2019 year class
  - CEATTLE model update: age-1 M decreased and remains below mean, total biomass consumed above average, ration decreased but still above average

Overall Stage 1 Score for Eastern Bering Sea EBS Pacific Cod
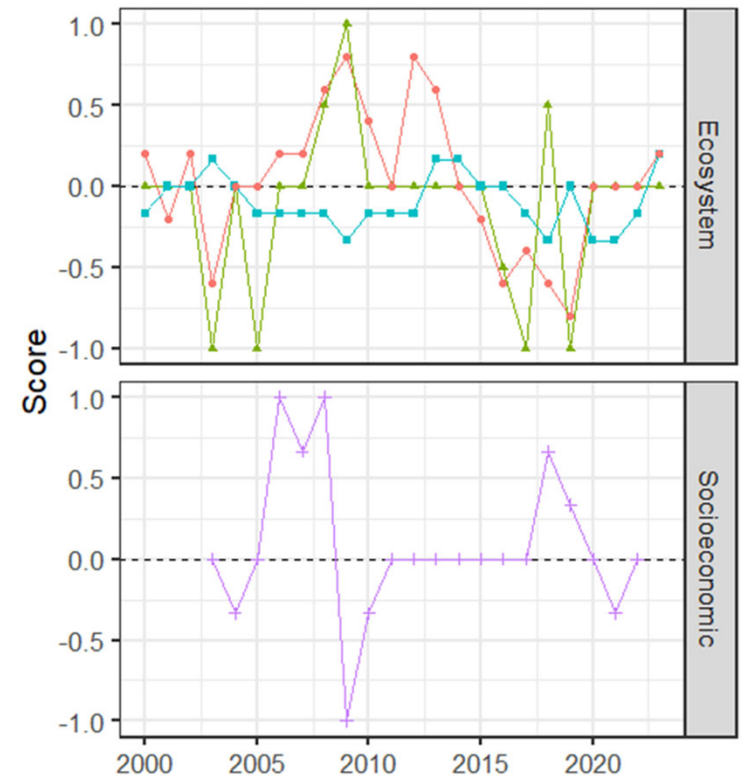
CHAPTER 2
EBS PACIFIC COD

- Full Assessment; 3 new models presented; risk table (1,1,1,1)

- Move from ensemble to single model approach

- Team agreed with author's recommendation of using Model 23.1.0.d

- No reduction from maxABC

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.3866	12%
2023 Tier	3b		
2024 Tier	3b	3b	
2023 age+ biomass	844,578		-5%
2024 age+ biomass	831,566	808,203	-3%
2023 spawning biomass	245,594		-10%
2024 spawning biomass	242,911	223,107	-9%
B_0	668,477	567,465	-18%
2024 F_{OFL}	0.35	0.46	24%
2024 F_{ABC}	0.29	0.37	22%
2023 OFL	172,495		14%
2024 OFL	166,814	200,995	17%
2023 ABC	144,834		14%
2024 ABC	140,159	167,952	17%

U.S. Department of Commerce | National Oceanic and Atmospheric Administration | NOAA Fisheries
This information is distributed solely for the purpose of pre-dissemination peer review under applicable information quality guidelines.
It has not been formally disseminated by the National Marine Fisheries Service and should not be construed to represent any agency determination of policy.

CHAPTER 2
EBS PACIFIC COD RECOMMENDATIONS

Pacific cod- EBS

- The Team recommended expanding the discussion of uncertainty around M in the risk table. For example, the interplay between M and q, and what may elevate the risk to a level 2 categorization.

CHAPTER 2A
ALEUTIAN ISLANDS PACIFIC COD

- Full Assessment; 3 new models presented; risk table (1,2,2,1)

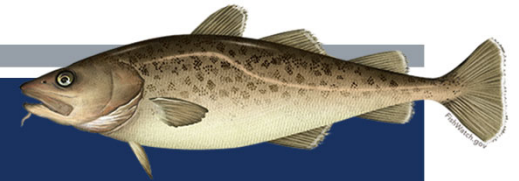- Switch to authors' presentation (Team comments will follow)
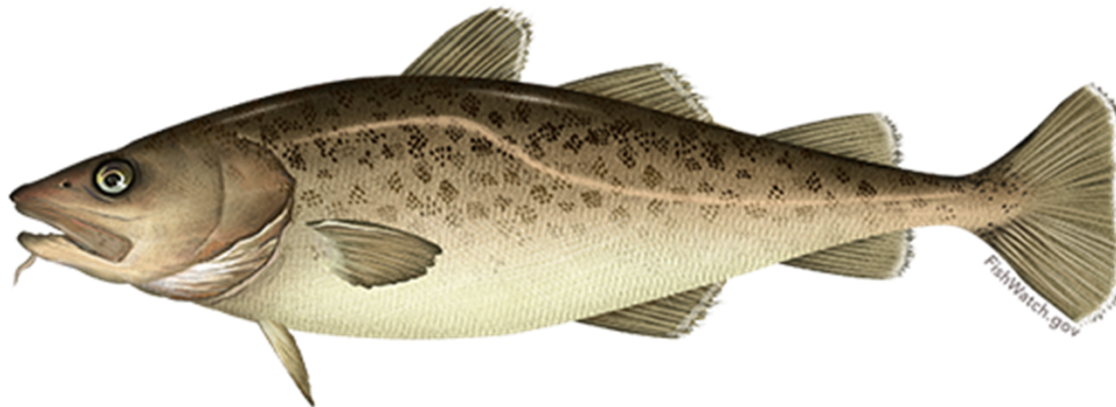
CHAPTER 2A: AI PACIFIC COD

- Tier 5; Full Assessment, 3 new models; risk table (1,2,2,1)

- The Team determined that Model 23.2 was sufficiently divergent from models presented in September 2023 and had sufficient questions to require additional review before it could be accepted for management.

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.34	0
2023 tier	5		
2024 tier	5	5	0
Biomass	54,165	54,165	0%
2024 F_{OFL}	0.34	0.34	0%
2024 F_{ABC}	0.255	0.255	0%
2023 OFL	18,416		0%
2024 OFL	18,416	18,416	0%
2023 ABC	13,812		-8%
2024 ABC	13,812	12,732	-8%

CHAPTER 2A:
AI PACIFIC COD

- Tier 5; Full Assessment, 3 new models; risk table (1,2,2,1)

- The Team was unprepared to make a final decision and set precedence on the alternative projections because it was not provided to the Team prior to the authors presentation, nor documented.

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.34	0
2023 tier	5		
2024 tier	5	5	0
Biomass	54,165	54,165	0%
2024 F_{OFL}	0.34	0.34	0%
2024 F_{ABC}	0.255	0.255	0%
2023 OFL	18,416		0%
2024 OFL	18,416	18,416	0%
2023 ABC	13,812		-8%
2024 ABC	13,812	12,732	-8%

CHAPTER 2A:
AI PACIFIC COD

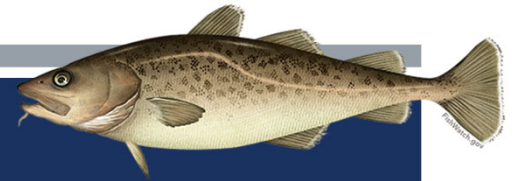- Tier 5; Full Assessment, 3 new models; risk table (1,2,2,1)

- The Team recommended continued use of the base Tier 5 model with a reduction from maximum ABC due to the Level 2 - Major Concerns in the risk table for the population dynamics and ecosystem considerations sections.

- The reduction from the Tier 5 maximum ABC was set equal to that which would match the ABC to the 2024 OFL from the author recommended model projected using the mean M and growth values for 2004-2023.

- This reduction was intended to reduce the probability that the ABC exceeds the true but unknown OFL, per SSC recommendation.

- The reasoning behind this decision mirrors that employed in 2022 in reducing the ABC from the maximum for BSAI northern rock sole when the Team was faced with a compelling, but not adequately reviewed, new model and indications from the risk table of potential cause for concern.

Quantity	Last asmt.	This asmt.	Change
M	0.34	0.34	0
2023 tier	5		
2024 tier	5	5	0
Biomass	54,165	54,165	0%
2024 F_{OFL}	0.34	0.34	0%
2024 F_{ABC}	0.255	0.255	0%
2023 OFL	18,416		0%
2024 OFL	18,416	18,416	0%
2023 ABC	13,812		-8%
2024 ABC	13,812	12,732	-8%

CHAPTER 2A
AI PACIFIC COD RECOMMENDATIONS

- The Team recommended that authors refrain from reusing model names previously reviewed and provide unique model names for any new model configurations up for review by the Team.

- The Team recommended that the authors investigate length-weight data and look for changes over time.

- The Team also recommended that a sensitivity analysis on M similar to what was provided in the eastern Bering sea Pacific cod assessment be presented given the high uncertainty in that value.

- The Team recommended that the authors conduct a sensitivity analysis and provide the probability of being under $B_{20\%}$ given the three projection scenarios similar to what was provided in the Bering Sea Pacific cod stock assessment.

FLATFISH SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Yellowfin sole (Update)	1a	265,913	305,298	-74%
Greenland turb. (H-Proj)*	3a	3,188	3,705	-19%
Arrowtooth fl (H-Proj)	3a	87,690	103,280	5%
Kamchatka fl. (H-Proj)	3a	7,498	8,850	-1%
Northern rsole (H-Proj)	1a	122,091*(36%)	197,828	<1%
Flathead sole (H-Proj)	3a	67,289	81,605	3%
Alaska plaice (H-Proj)	3a	35,494	42,695	5%
Other flatfish (C-Rep)	5	17,189	22,919	0%

* Team recommendation made even though it was a harvest projection year

CHAPTER 4
YELLOWFIN SOLE

- Tier 1a; Update Assessment, 2 new models; risk table (1,2,2,1)

- Large decrease (-46%) in 2023 bottom trawl survey biomass estimate
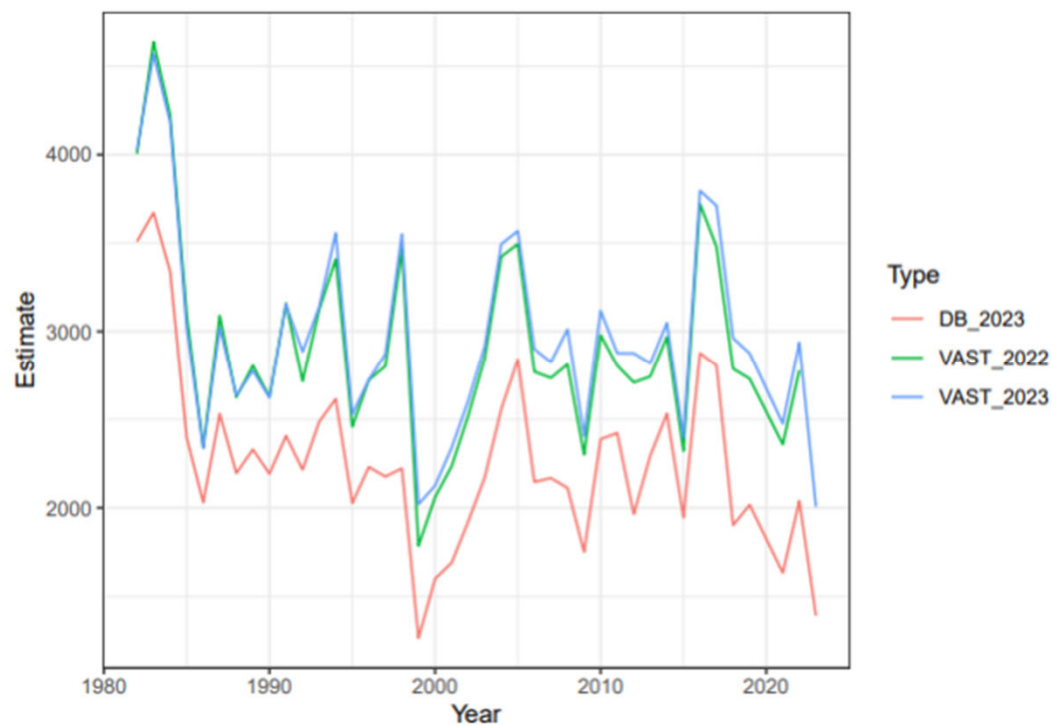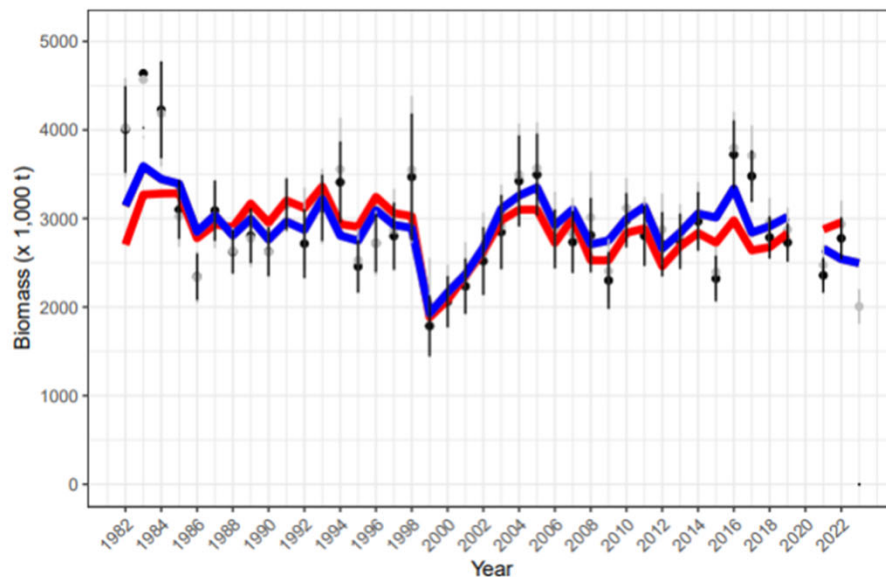
CHAPTER 4
YELLOWFIN SOLE

- Tier 1a; Update Assessment, 2 new models; risk table (1,2,2,1)

- Large reduction in catch earlier in the year, now rapidly catching up.

  - Due to the out of the ordinary fishing behavior in 2023 the projected catch used in the model was a substantial underestimate of where the catch is now.

  - Tables 1 and 2 in the document differ by nearly 20k tons because they were generated 10 days apart in October.

- Change in fishing was due to market conditions as domestic and global demand for yellowfin sole is down early in the year.
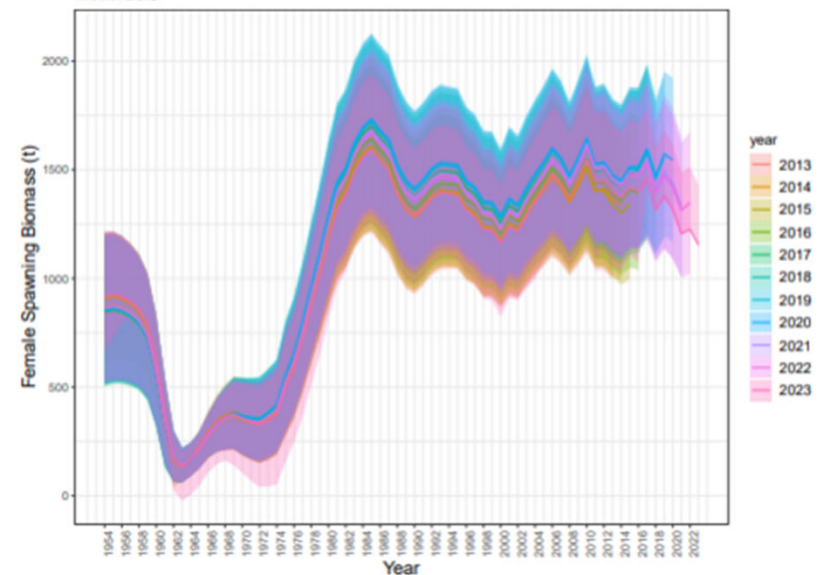
CHAPTER 4
YELLOWFIN SOLE

- Tier 1a; Update Assessment, 2 new models; risk table (1,2,2,1)

- Update Assessment; risk table (1,2,2,1)

  - **23.0** Single sex selectivity (nearly identical to 22.1)

    - Good fit to all data

    - Decent retrospective pattern (Mohn's rho = 0.06)

CHAPTER 4
YELLOWFIN SOLE

- Tier 1a; Update Assessment, 2 new models; risk table (1,2,2,1)

- Substantial reduction in 2017 and surrounding year classed from previous assessment
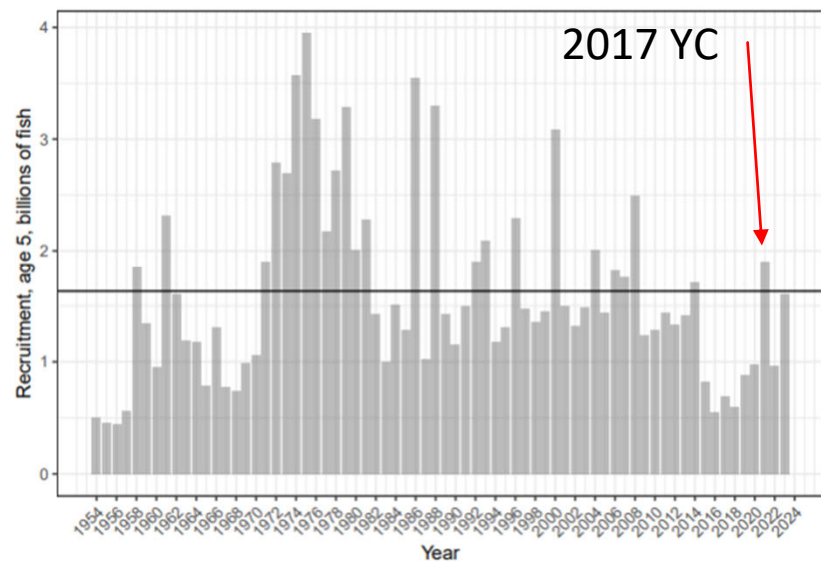
Age 5 recruitment for Model 22.1 in 2022
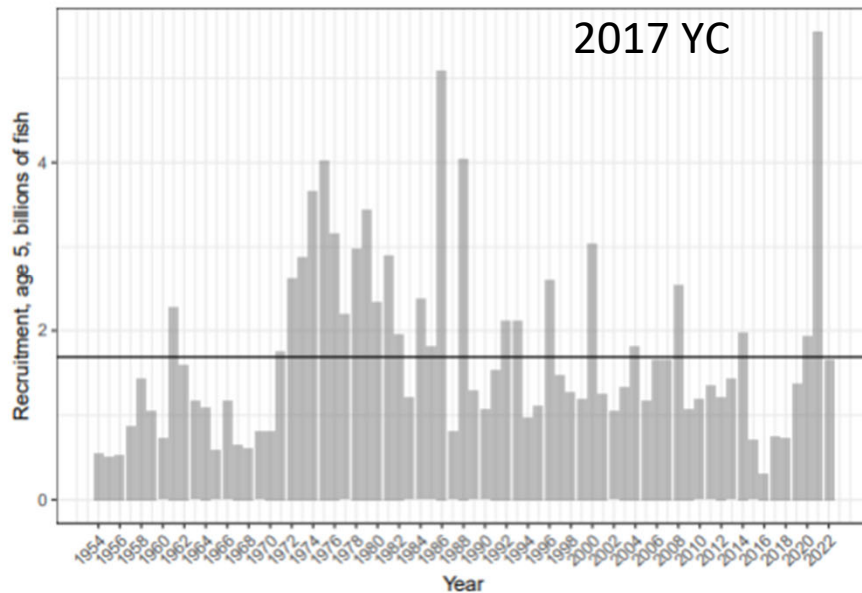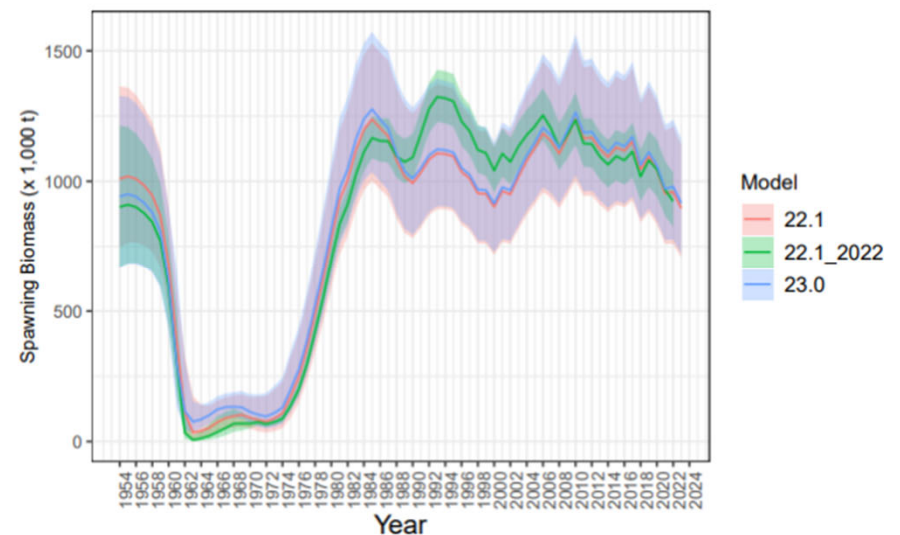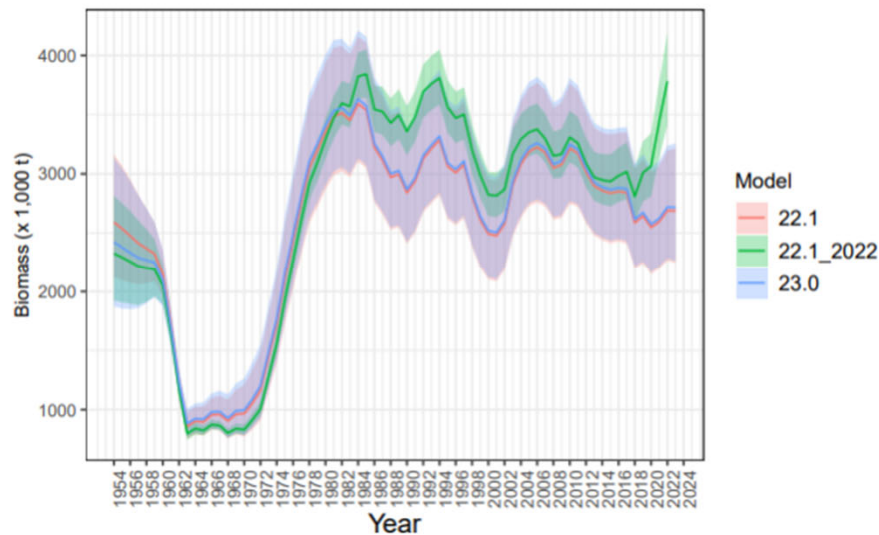
Age 5 recruitment for Model 23.0 in 2023

CHAPTER 4
YELLOWFIN SOLE

- Tier 1a; Update Assessment, 2 new models; risk table (1,2,2,1)

  - Large reduction in total biomass (-62%) from 2022

  - Similar female spawning biomass (-2%)

CHAPTER 4
YELLOWFIN SOLE

- Tier 1a; Update Assessment, 2 new models; risk table (1,2,2,1)

- Fishery catches a large portion of younger/immature fish.

- Yellowfin sole females are 82% selected to the fishery by age 10 whereas they have been found to be only 40% mature at this age

- Large reduction in OFL and ABC, but still well above catch.

Quantity	Last asmt.	This asmt.	Change
M	0.12/0.125	0.12/0.137	
2023 Tier	1a		
2024 Tier	1a	1a	
2023 age 6+ biomass	3,321,640		-32%
2024 age 6+ biomass	4,062,230	2,512,810	62%
2023 spawning biomass	885,444		0%
2024 spawning biomass	897,062	881,640	-2%
B_0	1,407,000	1,516,980	7%
B_{msy}	475,199	539,657	12%
2024 F_{OFL}	0.122	0.121	-1%
2024 F_{ABC}	0.114	0.106	-8%
2023 OFL	404,882		-33%
2024 OFL	495,155	305,298	-62%
2023 ABC	378,499		-42%
2024 ABC	462,890	265,913	-74%

CHAPTER 4
YELLOWFIN SOLE RECOMMENDATIONS

- The Team recommended that the author conduct a model sensitivity analysis to evaluate the current approach used for natural mortality and the effect it has on model performance and results. Including estimating female natural mortality of the current approach to using natural mortality that is estimated for males and fixed for females.

CHAPTER 4
GREENLAND TURBOT RECOMMENDATIONS

- **Greenland Turbot (Harvest Projection)**

  - The Team was concerned about the status of Greenland turbot and recommended an operational full assessment due to concerns with continued long term declines in survey indices as well as the inability of the model to fit the indices.
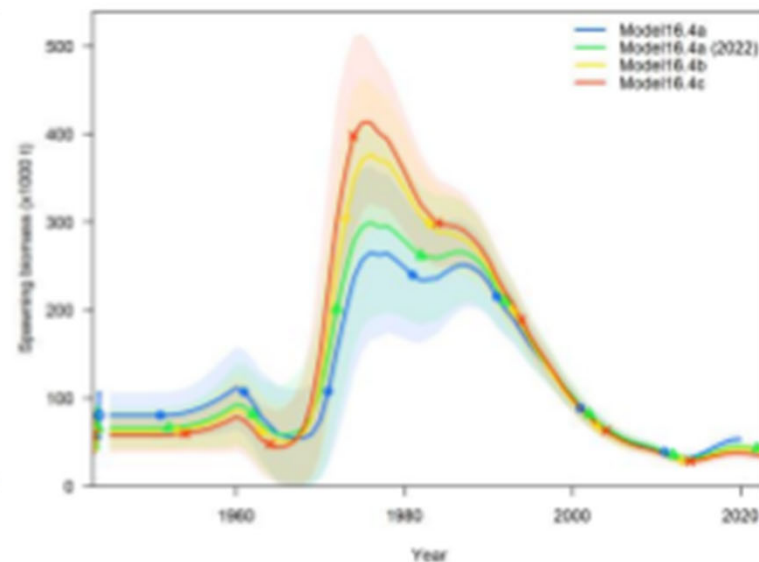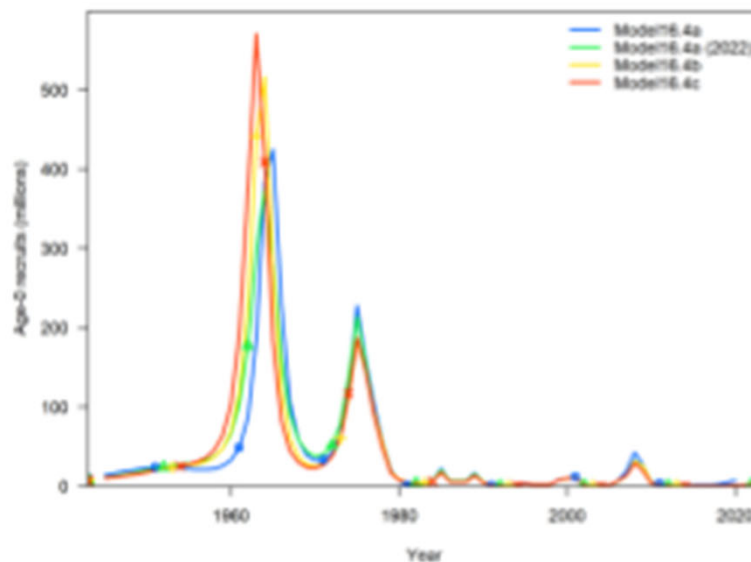
ROCKFISH SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Pacific ocean perch (H-Proj)	3a	41,096	49,010	-2%
Northern rockfish (Update)	3a	19,274	23,556	3%
Blackspotted/rougheye (H-Proj)	3b/5	511*(12%)	684	9%
Shortraker rockfish (C-Rep)	5	530	706	0%
Other rockfish (C-Rep)	5	1,260	1,680	0%

*xx% Reduced from maximum permissible ABC

CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; Risk (2,2,1,1)
  - Same model, data update
    - Negative retrospective pattern (Mohn's rho = -0.16)
  - Fishery
    - Continued development of target fishery
    - Rapidly increasing catches
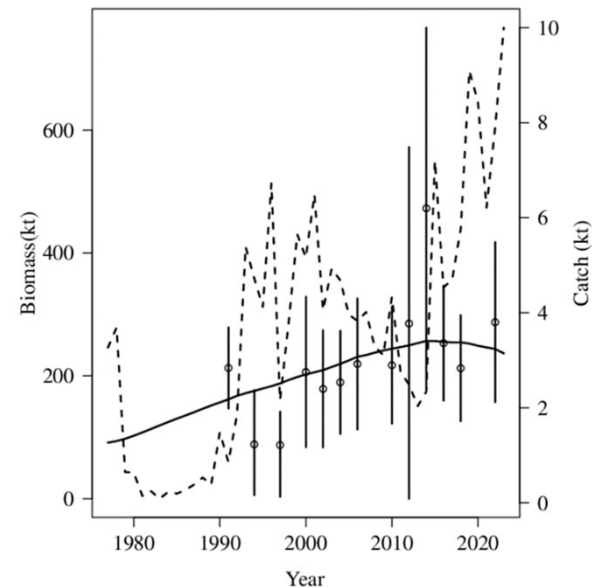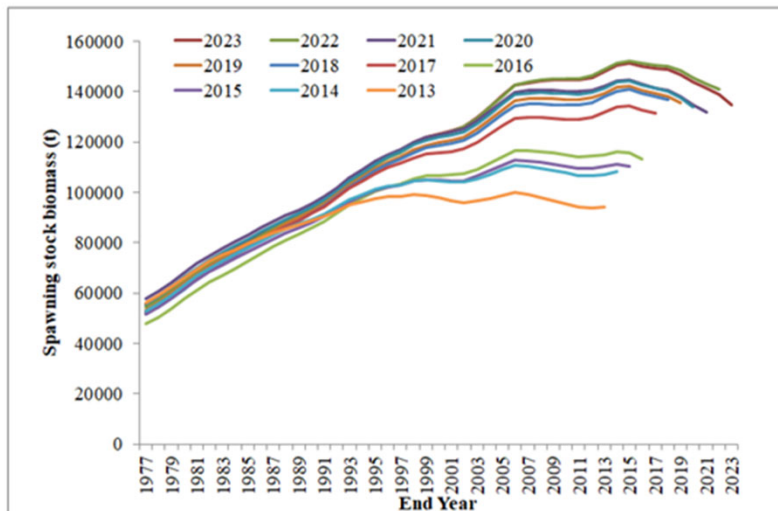
CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; Risk (2,2,1,1)

  - Same model, data update

    - Negative retrospective pattern (Mohn's rho = -0.16)

  - Fishery

    - Continued development of target fishery
    - Rapidly increasing catches
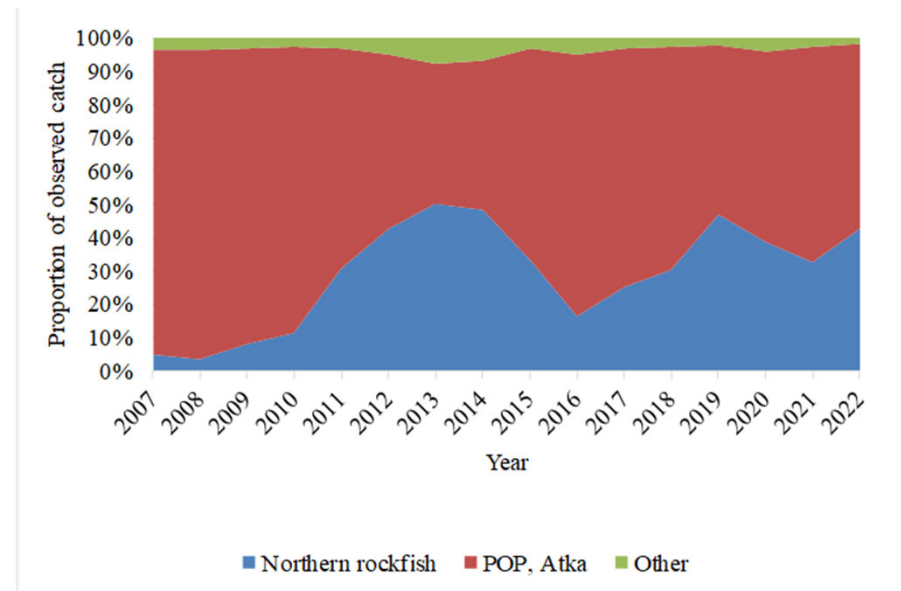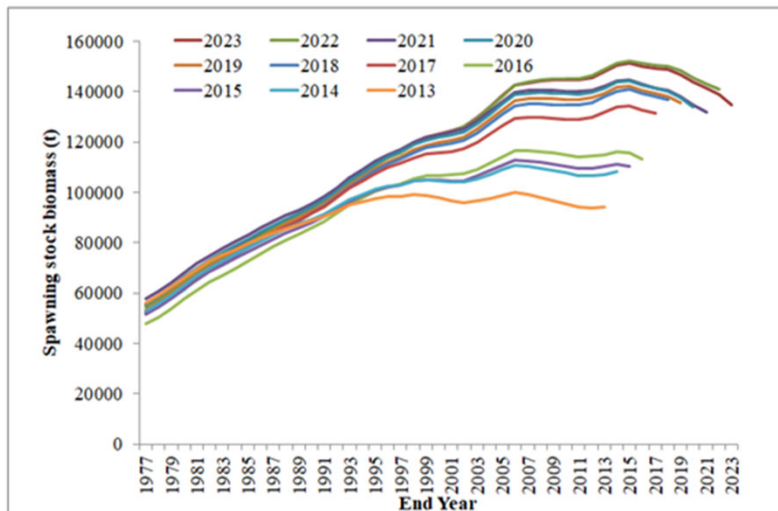
CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; Risk (2,2,1,1)

- Stock Structure
  - Update of stock structure information requested by SSC
  - Spatial patterns in growth, and spatial genetic structure (Larson September PT presentation)
- Management
  - Mismatch between spatial scale of management and spatial population structure
- Risk table
  - Catch << ABC. Do not recommend reductions from maxABC, but monitor stock and fishery
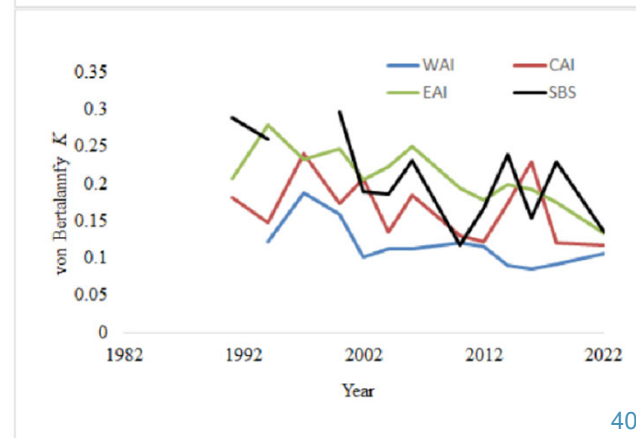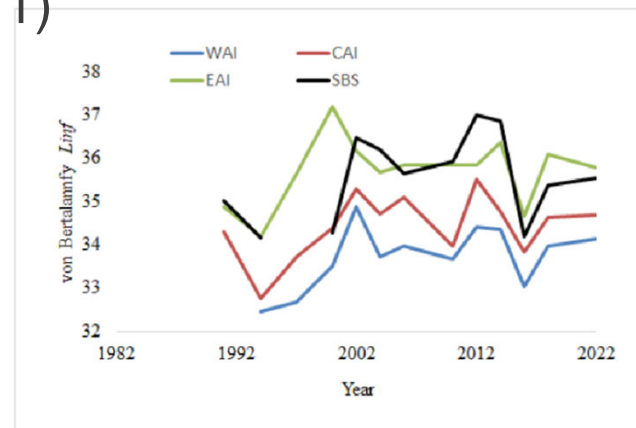
40

CHAPTER 13
NORTHERN ROCKFISH

- Tier 3a; Update Assessment; Risk (2,2,1,1)

- Team agreed with author's recommendation and stayed with base model

- No additional recommendations

Quantity	Last asmt.	This asmt.	Change
M	0.054	0.052	-4%
2023 Tier	3a		
2024 Tier	3a	3a	
2023 age+ biomass	277,133		7%
2024 age+ biomass	273,414	297,189	8%
2023 spawning biomass	118,251		8%
2024 spawning biomass	115,209	128,229	10%
B_0	171,768	187,268	8%
2024 F_{OFL}	0.085	0.086	1%
2024 F_{ABC}	0.069	0.070	1%
2023 OFL	22,776		3%
2024 OFL	22,105	23,556	6%
2023 ABC	18,687		3%
2024 ABC	18,135	19,274	6%

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OTHER SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Atka mackerel (H-Rep)	3a	95,358	111,684	-3%
Skates (Update)	3a/5	37,808	45,574	-4%
Sharks (C-Rep)	6	450*(13%)	689	0%
Octopus (Update)	6	4,560	6,080	22%

*xx% Reduced from maximum permissible ABC
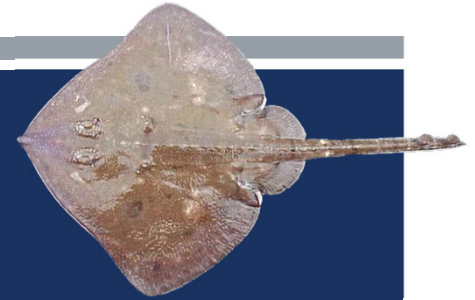
- Tier 3a and 5; Update Assessment, risk table ((2,1),1,1,1)

- Alaska Skate Tier 3a

  - Update to catch and survey data

  - Migration from older version of stock synthesis

EBS_SHELF / Alaska skate
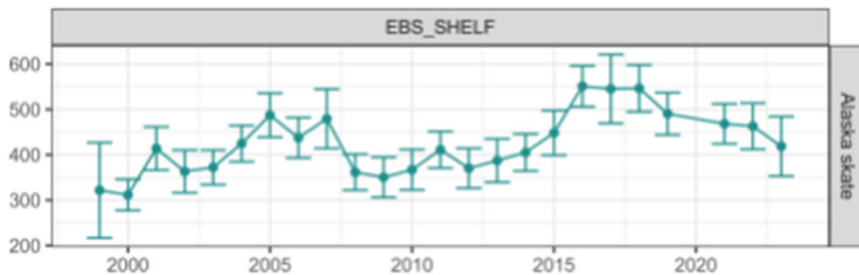
Quantity	Last asmt.	This asmt.	Change
M	0.13	0.13	0%
2023 Tier	3a		
2024 Tier	3a	3a	
2023 age+ biomass	473,527		-4%
2024 age+ biomass	450,679	455,367	1%
2023 spawning biomass	114,804		-7%
2024 spawning biomass	105,595	107,197	1%
B_0	178,425	172,881	-3%
2024 F_{OFL}	0.092	0.093	1%
2024 F_{ABC}	0.079	0.080	1%
2023 OFL	35,503		-9%
2024 OFL	33,451	32,429	-3%
2023 ABC	30,567		-9%
2024 ABC	28,799	27,950	-3%

CHAPTER 18
SKATES
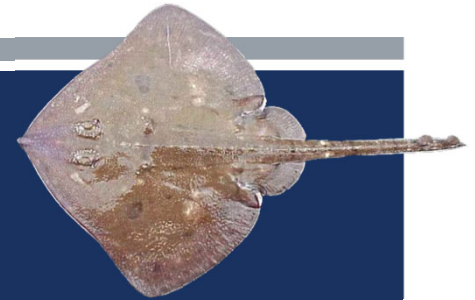
- Tier 3a and 5; Update Assessment, risk table ((2,1),1,1,1)

- Other Skates Tier 5

  - Update to survey biomass estimates

  - New REMA model run

Quantity	Last asmt.	This asmt.	Change
M	0.1	0.1	0%
2023 Tier	5		
2024 Tier	5	5	
2023 age+ biomass	107,174		18%
2024 age+ biomass	107,174	131,446	18%
2024 F_{OFL}	0.1	0.1	0%
2024 F_{ABC}	0.075	0.075	0%
2023 OFL	10,717		18%
2024 OFL	10,717	13,145	18%
2023 ABC	8,038		18%
2024 ABC	8,038	9,858	18%

44
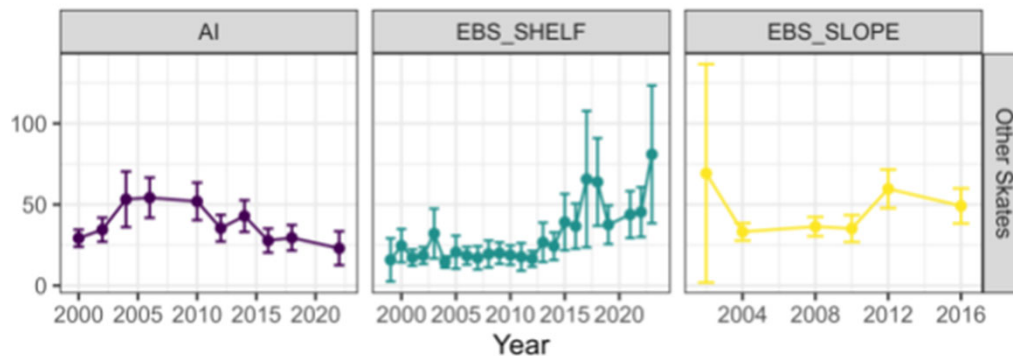
CHAPTER 18
SKATES

- Recommendations
  - The Team recommended the authors examine using a catchability that is tuned to temperature.
  - The Team applauded the authors' approach to not change the methodology for this first assessment cycle after the change in authorship, and gave the authors leeway to explore the data and assessment methodology in more detail to come up with the improvements that should be incorporated into the model for the next assessment cycle. The Team recommended this careful and considered approach be used as the model for how authorship transfers be conducted going forward.

CHAPTER 22 OCTOPUS

- Tier 6; Update assessment; risk table (1,1,1,1)

- Tier 6 based on Consumption model

  - Updated Pacific cod stomach samples

  - No model changes

Quantity	Last asmt.	This asmt.	Change
2023 Tier	6		
2024 Tier	6	6	
2023 OFL	4,769		22%
2024 OFL	4,769	6,080	22%
2023 ABC	3,576		22%
2024 ABC	3,576	4,560	22%

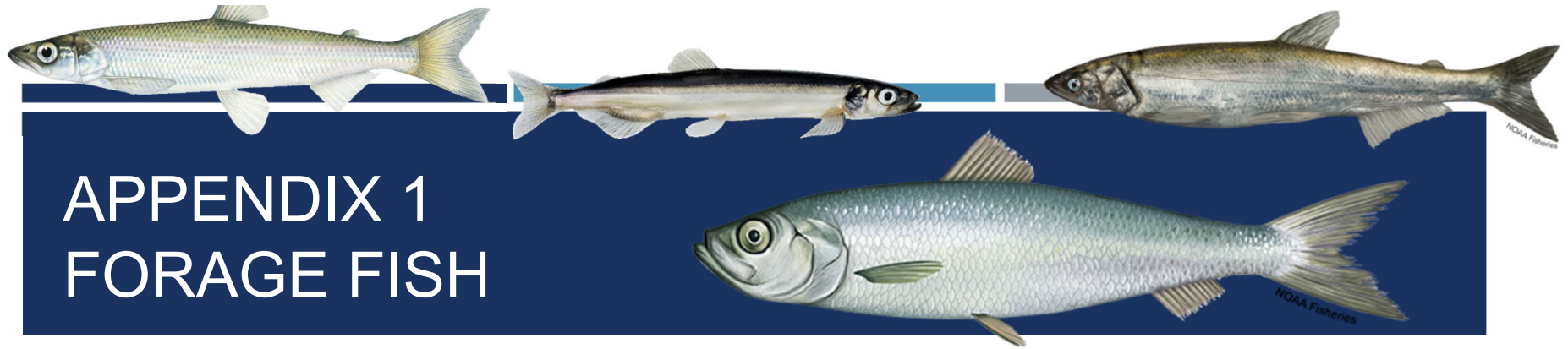# CHAPTER 22 OCTOPUS

- Recommendations
  - The Team recommends that the next assessment contain a link to the original consumption methodology employed in the 2012 analysis.

APPENDIX 1
FORAGE FISH

- Ecosystem component, biennial report

  - Highest density and prevalence of herring in the time series of the survey with fishery catches of squid and herring very high compared to historic levels.

APPENDIX 1
FORAGE FISH

scaled(Numbers/km^2)
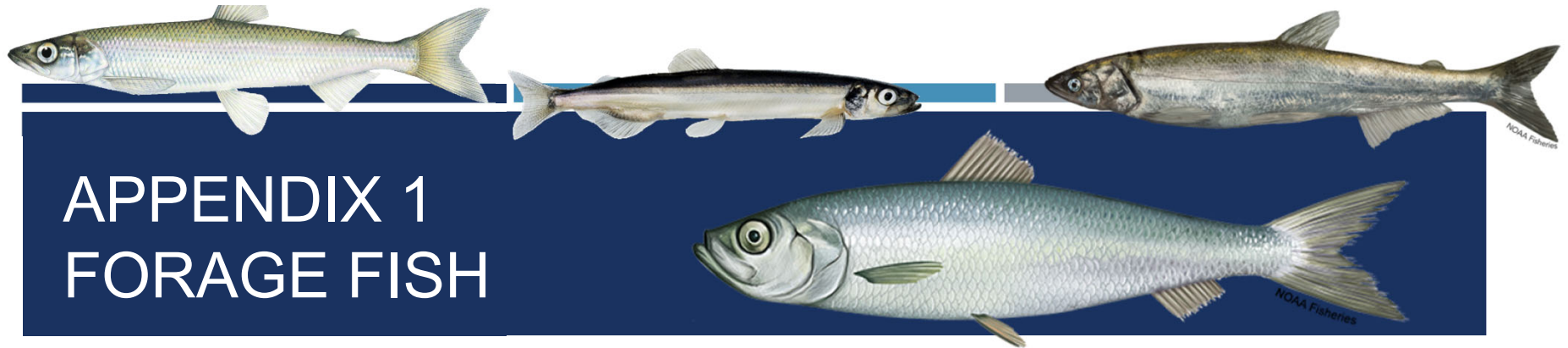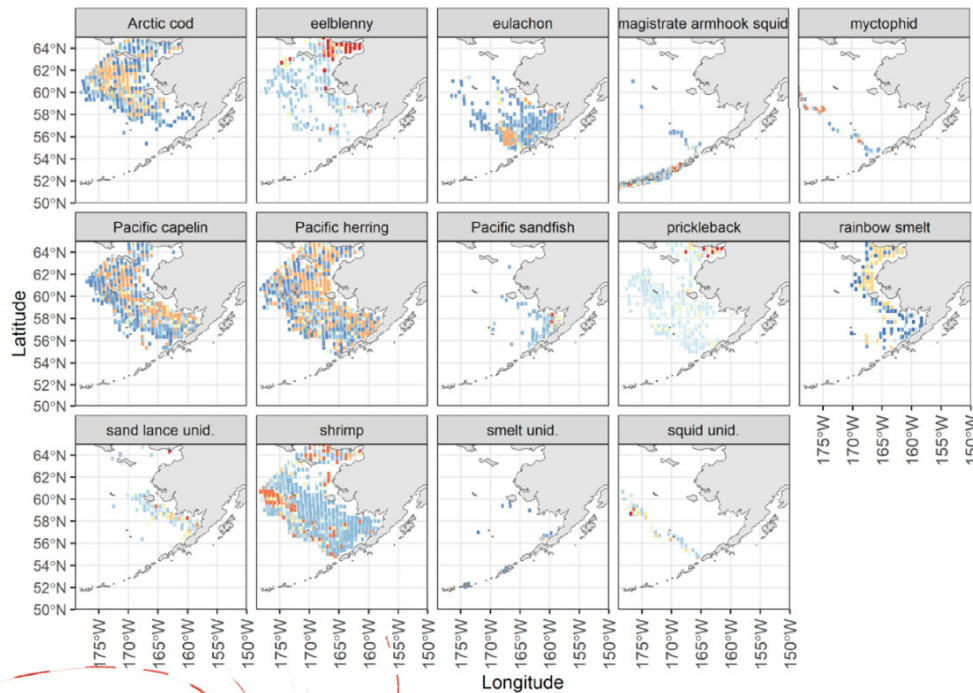
Bottom trawl survey
- Capelin and eulachon **down**.
- Herring and shrimp **up**.
- BASIS survey **down**.

Fisheries
- Squid and herring catches **up**.
- All other catches **down**.

Future
- Spatiotemporal models + environmental linkages
- Synthetic indices of forage
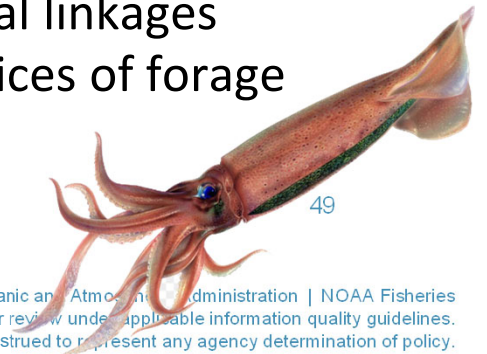
APPENDIX 1
FORAGE FISH

- Capelin
    - Low recent prevalence in previous 5 surveys
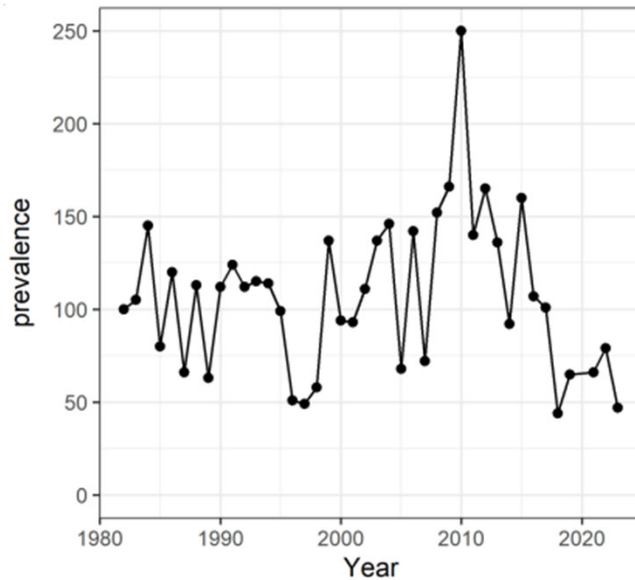
- Eulachon
    - Low prevalence in previous three surveys
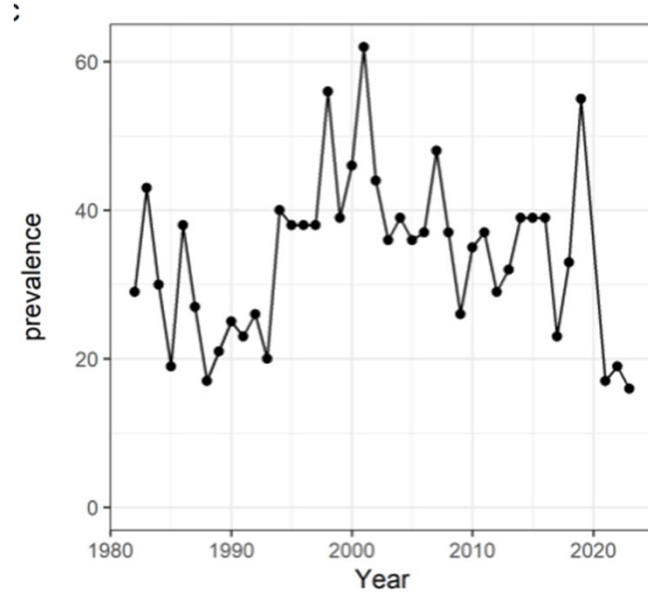
APPENDIX 1
FORAGE FISH

■ Rainbow smelt

- ■ High prevalence in recent surveys
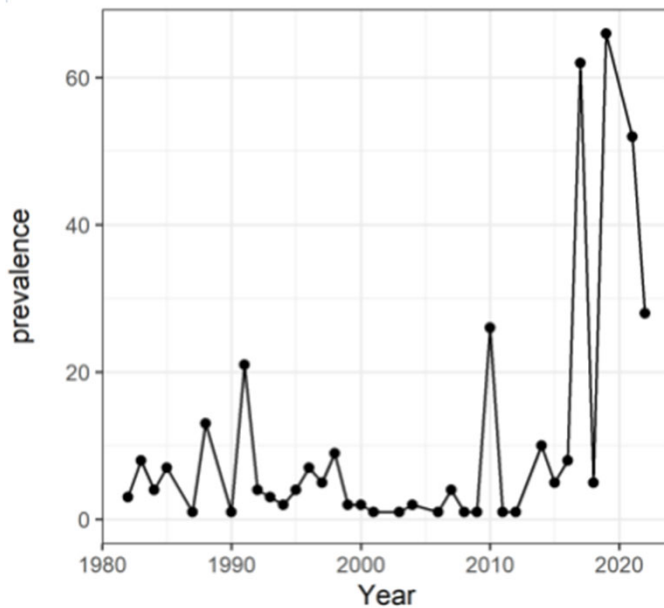
■ Pacific herring

- ■ Increasing trend with recent high values

- ■ High catch in fisheries
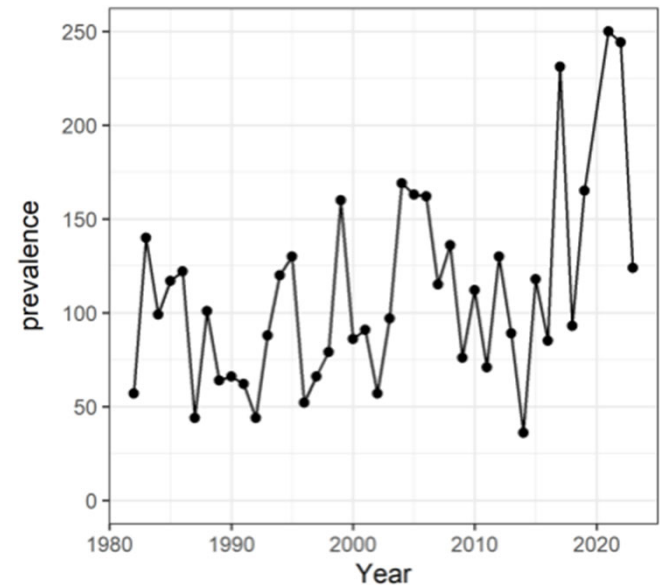
APPENDIX 1
FORAGE FISH

- Squid
  - Highly variable in surveys, no apparent trend
  - More prevalent in the Aleutian Islands
  - High fishery Catch
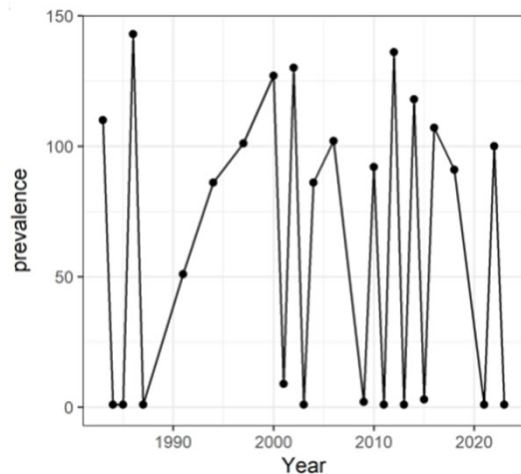
- Shrimp
  - Increase in last 20 years, but slow decline since 2010 high
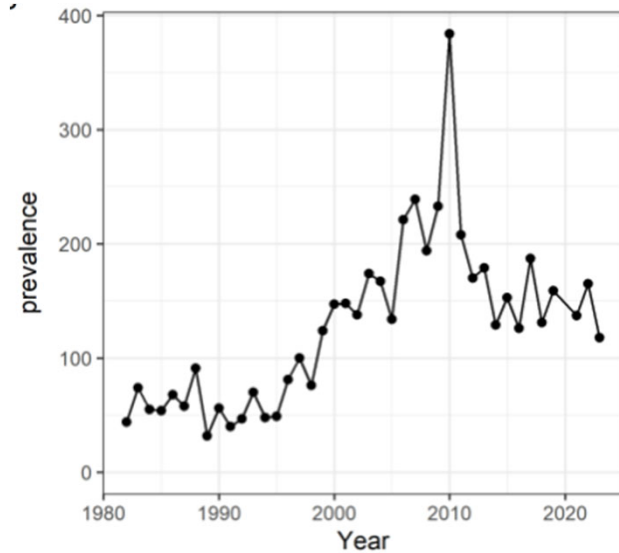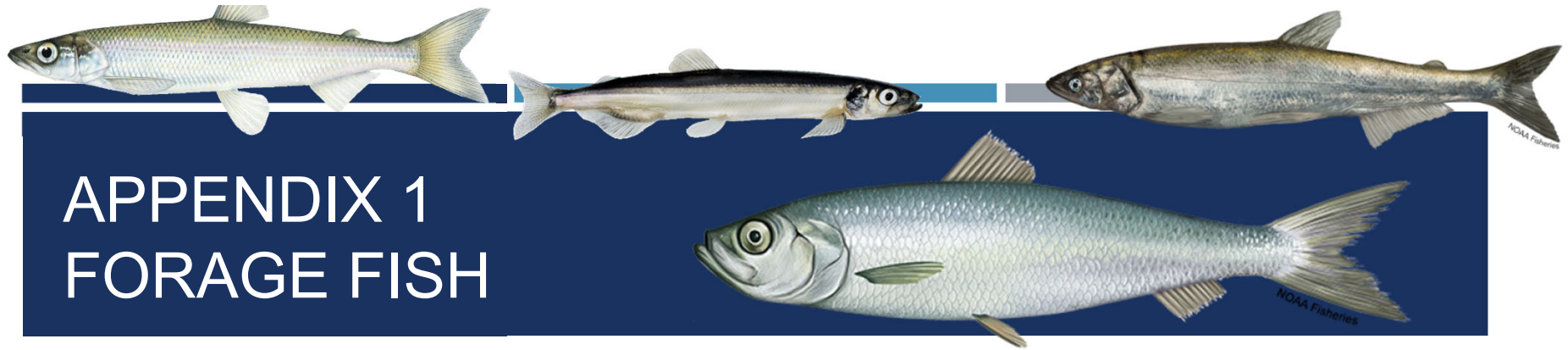
APPENDIX 1
FORAGE FISH

- **Forage Species Recommendations**

  - The Team recommended providing some indication on future plots of reference levels across years to show consistent comparative information across years and trends.

  - The Team recommended working in collaboration with the ESR team and to consider how to contribute forage information to other initiatives such as ESP and ESR as time allows including the consideration of what is the best index of forage and how and where it can be reported on an annual basis.

HARVEST PROJECTION SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
AI pollock (H-Proj)	3a	42,654	51,516	-2%
Greenland turb. (H-Proj)*	3a	3,188	3,705	-19%
Arrowtooth fl (H-Proj)	3a	87,690	103,280	5%
Kamchatka fl. (H-Proj)	3a	7,498	8,850	-1%
Northern rsole (H-Proj)	1a	122,091*(36%)	197,828	<1%
Flathead sole (H-Proj)	3a	67,289	81,605	3%
Alaska plaice (H-Proj)	3a	35,494	42,695	5%
Pacific ocean perch (H-Proj)	3a	41,096	49,010	-2%
Blackspotted/rougheye (H-Proj)	3b/5	511*(12%)	684	9%
Atka mackerel (H-Proj)	3a	95,358	111,684	-3%

* Team recommendation made even though it was a harvest projection year

Greenland Turbot (Harvest Projection)

- The Team was concerned about the status of Greenland turbot and recommended an operational full assessment due to concerns with continued long term declines in survey indices as well as the inability of the model to fit the indices.
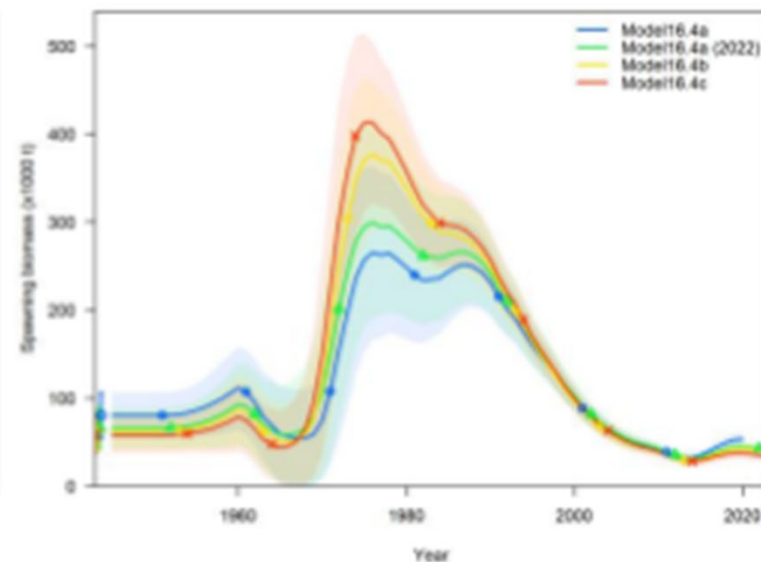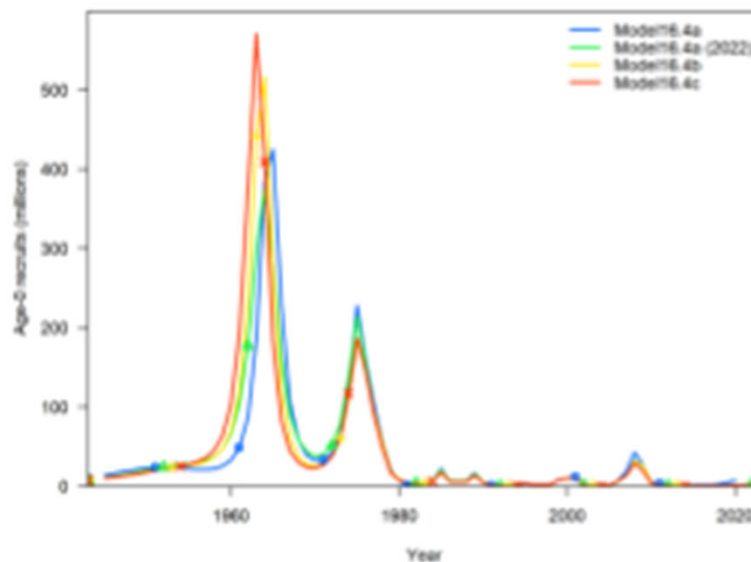
CATCH REPORT SUMMARY

Stock	Tier	2024 ABC (t)	2024 OFL (t)	Change from 2023 ABC
Bogoslof poll. (C-Rep)	5	86,360	115,1460	0%
Other flatfish (C-Rep)	5	17,189	22,919	0%
Shortraker rockfish (C-Rep)	5	530	706	0%
Other rockfish (C-Rep)	5	1,260	1,680	0%
Sharks (C-Rep)	6	450*(13%)	689	0%

*xx% Reduced from maximum permissible ABC
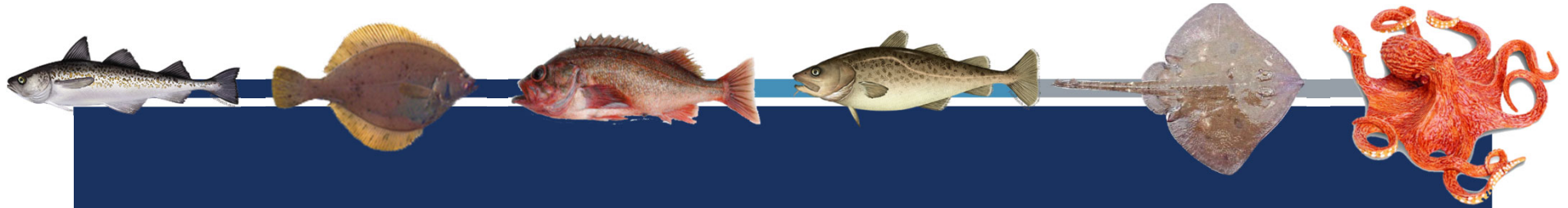
RECOMMENDED HARVEST SPECIFICATIONS

Species	Area	2023 OFL	2023 ABC	2023 TAC	Catch as of 11/5/2023	2024 OFL	2024 ABC	2025 OFL	2025 ABC
Pollock	EBS	3,381,000	1,910,000	1,314,500	1,307,997	3,162,000	2,313,000	3,449,000	2,401,000
	AI	52,383	43,413	4,500	3,665	51,516	42,654	53,030	43,863
	Bogoslof	115,146	86,360	300	118	115,146	86,360	115,146	86,360
Pacific cod	BS	172,495	144,834	127,409	112,963	200,995	167,952	180,798	150,876
	AI	18,416	13,812	8,425	3,750	18,416	12,732	18,416	12,732
	BSAI/GOA	47,390				55,084	47,146	55,317	47,350
Sablefish	BS		8,417	7,996	5,164		11,450		11,499
	AI		8,884	8,440	2,319		13,100		13,156
Yellowfin sole	BSAI	404,882	378,499	230,000	105,682	305,298	265,913	317,932	276,917
Greenland turbot	BSAI	4,645	3,960	3,722	1,272	3,705	3,188	3,185	2,740
	BS		3,338	3,180	793		2,687		2,310
	AI		622	592	479		501		430
Arrowtooth flounder	BSAI	98,787	83,852	15,000	6,948	103,280	87,690	104,270	88,548
Kamchatka flounder	BSAI	8,946	7,579	7,579	6,926	8,850	7,498	8,687	7,360
Northern rock sole	BSAI	166,034	121,719	66,400	26,907	197,828	122,091	264,789	122,535
Flathead sole	BSAI	79,256	65,344	35,100	8,759	81,605	67,289	82,699	68,203
Alaska plaice	BSAI	40,823	33,946	17,875	15,018	42,695	35,494	45,182	37,560
Other flatfish	BSAI	22,919	17,189	4,500	2,994	22,919	17,189	22,919	17,189
Pacific Ocean perch	BSAI	50,133	42,038	37,703	34,720	49,010	41,096	48,139	40,366
	BS		11,903	11,903	10,196		11,636		11,430
	EAI		8,152	8,152	7,255		7,969		7,828
	CAI		5,648	5,648	5,461		5,521		5,423
	WAI		16,335	12,000	11,807		15,970		15,685
Northern rockfish	BSAI	22,776	18,687	11,000	10,308	23,556	19,274	22,838	18,685
Blackspotted/Rougheye Rockfish	BSAI	703	525	525	523	761	569	813	607
	EBS/EAI		359	359	207		388		412
	CAI/WAI		166	166	316		181		195
Shortraker rockfish	BSAI	706	530	530	224	706	530	706	530
Other rockfish	BSAI	1,680	1,260	1,260	1,179	1,680	1,260	1,680	1,260
	BS		880	880	618		880		880
	AI		380	380	560		380		380
Atka mackerel	BSAI	118,787	98,588	69,282	65,527	111,684	95,358	99,723	84,676
	EAI/BS		43,281	27,260	23,776		41,723		37,049
	CAI		17,351	17,351	17,210		16,754		14,877
	WAI		37,956	24,671	24,541		36,882		32,750
Skates	BSAI	46,220	38,605	27,441	24,605	45,574	37,808	44,203	36,625
Sharks	BSAI	689	450	333	320	689	450	689	450
Octopuses	BSAI	4,769	3,576	400	151	6,080	4,560	6,080	4,560
Total	BSAI	4,859,585	3,132,067	2,000,270	1,748,036	4,609,077	3,454,506	4,946,241	3,528,297

Sources: 2022 OFLs, ABCs, and TACs and 2023 OFLs and ABCs are from harvest specifications adopted by the Council in December 2021 and December 2022 respectively as well as inseason actions; 2022 catches through

THANK YOU
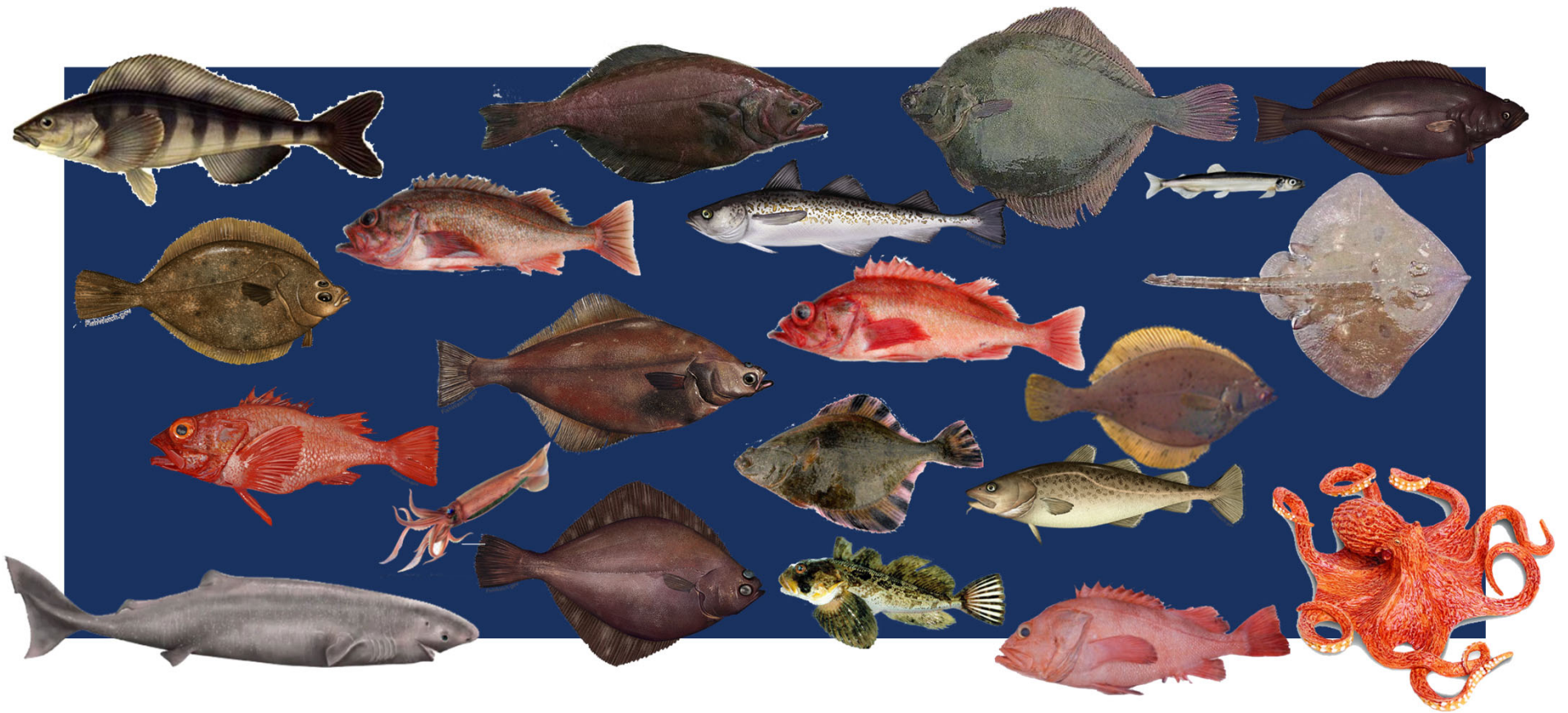
BSAI TEAM GENERAL RECOMMENDATIONS

- The Team recommended that a bullet point be added in harvest projection presentations to explain reductions or changes in max ABC when it occurs.

- The Team recommended that as a best practice that appendices be linked in the front of the document (as with the sablefish assessment) to allow for an easier review of the appendices.

BSAI TEAM POLLOCK RECOMMENDATIONS

- **EBS Pollock**

  - The Team recommended continuing to evaluate projection bias due to selectivity assumptions, and the examination of new methods that may reduce that bias.

  - The Team recommended that the authors clearly state where MLE estimates are being used and where MCMC estimates are being used.

  - The Team recommended using posterior distributions from the MCMC to determine probabilities in the risk table and expanding the risk table to at least include the recommended ABC.

- **EBS Multi-species Model**

  - Kirstin intends to communicate with authors earlier in next year's assessment cycle to help facilitate risk assessment, which is further recommended by the Team.

BSAI TEAM
PACIFIC COD RECOMMENDATIONS

- **Pacific cod - EBS**

  - The Team recommended expanding the discussion of uncertainty around M in the risk table. For example, the interplay between M and q, and what may elevate the risk to a level 2 categorization.

- **Pacific cod - Aleutian Islands**

  - The Team recommended that authors refrain from reusing model names previously reviewed and provide unique model names for any new model configurations up for review by the Team.

  - The Team recommended that the authors investigate length-weight data and look for changes over time.

  - The Team also recommended that a sensitivity analysis on M similar to what was provided in the eastern Bering sea Pacific cod assessment be presented given the high uncertainty in that value.

  - The Team recommended that the authors conduct a sensitivity analysis and provide the probability of being under $B_{20\%}$ given the three projection scenarios similar to what was provided in the Bering Sea Pacific cod stock assessment.

BSAI TEAM FLATFISH RECOMMENDATIONS

- **Yellowfin sole**

  - The Team recommended that the author conduct a model sensitivity analysis to evaluate the current approach used for natural mortality and the effect it has on model performance and results. including estimating female natural mortality of the current approach to using natural mortality that is estimated for males and fixed for females.

- **Greenland Turbot**

  - The Team was concerned about the status of Greenland turbot and recommended an operational full assessment due to concerns with continued long term declines in survey indices as well as the inability of the model to fit the indices.

BSAI TEAM
OTHER FISHES RECOMMENDATIONS

- **Skates**

    - The Team recommends the authors examine using a catchability that is tuned to temperature.

    - The Team applauded the authors' approach to not change the methodology for this first assessment cycle after the change in authorship, and gave the authors leeway to explore the data and assessment methodology in more detail to come up with the improvements that should be incorporated into the model for the next assessment cycle. The Team recommended this approach be used as the model for how authorship transfers be conducted going forward.

- **Octopus**

    - The Team recommends that the next assessment contain a link to the original consumption methodology employed in the 2012 analysis.

BSAI TEAM ECOSYSTEM COMPONENTS

- **Forage Species**

  - The Team recommended providing some indication on future plots of reference levels across years to show consistent comparative information across years and trends.

  - The Team recommended working in collaboration with the ESR team and to consider how to contribute forage information to other initiatives such as ESP and ESR as time allows including the consideration of what is the best index of forage and how and where it can be reported on an annual basis.