SEO Demersal Shelf Rockfish Stock Assessment for 2019

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Stock Assessment

DSR Complex:

Yelloweye (*S. ruberrimus*)

Quillback (*S. maliger*)

Tiger (*S. nigrocinctus*)

China (*S. nebulosus*)

Canary (*S. pinniger*)

Copper (*S. caurinus*)

Rosethorn (*S. helvomaculatus*)

Images: Google Images

Stock Assessment

EYKT
1995, 1997, 1999,
2003, 2009, 2015,
2017

NSEO
1994, 2016,
2018

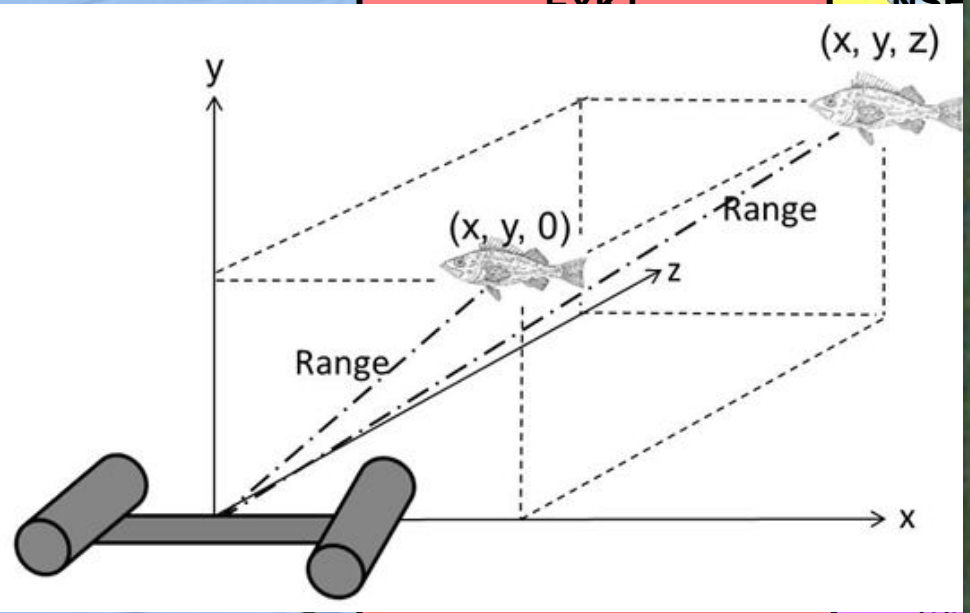
Juneau

CSEO
1994, 1995, 1997, 2003,
2007, 2012, 2016, **2018**

SSEO
1994, 1999, 2005,
2013, **2018**

Esri, DeLorme, GEBCO, NOAA NGDC, and other contributors, Sources: Esri, Geonames.org, and other contributors

Stock Assessment



Stock Assessment

Tier 4 Stock Assessment–based on the total of biomass of yelloweye rockfish:

- Density of yelloweye by mgmt area
- Avg. weight of yelloweye by mgmt area
- Area of rocky habitat by mgmt area

$$YE\ Biomass_{a,y_1} = Avg\ Wt_{y_1} * Habitat(km^2)_a * Density\ YE(n/km^2)_{a,y_2}$$

$$where\ a = area(EYKT, NSEO, CSEO, SSEO), y_1 = current\ year, and\ y_2 = year\ of\ last\ ROV\ survey$$

$$Total\ YE\ Biomass = \sum_{a_i}^{4} YE\ Biomass_i$$

Stock Assessment

Tier 6 Stock Assessment–Other DSR (Quillback, Tiger, China, Canary, Copper, & Rosethorn):

- Derive OFL & ABC from estimates from commercial, sport, and subsistence (2010–2014)

Quantity (Other DSR only)	**As estimated or *specified last year* for: 2018**	**As estimated or *recommended this* year for: 2019**
ABC (t) Tier 6	20	20
OFL (t) Tier 6	26	26

Area	Year	# transects	# YE[b]	Meters surveyed	Encounter rate (YE/m)	Density (YE/km²)	Lower CI (YE/km²)	Upper CI (YE/km²)	CV
EYKT[a]	1995	17	330	22,896	0.014	2,711	1,776	4,141	0.20
	1997	20	350	19,240	0.018	2,576	1,459	4,549	0.28
	1999	20	236	25,198	0.009	1,584	1,092	2,298	0.18
	2003	20	335	17,878	0.019	3,825	2,702	5,415	0.17
	2009	37	215	29,890	0.007	1,930	1,389	2,682	0.17
	2015	33	251	22,896	0.008	1,755	1,065	2,891	0.25
	2017	**35**	**134**	**33,960**	**0.004**	**1,072**	**703**	**1,635**	**0.21**
CSEO	1994[c]					1,683			0.10
	1995	24	235	39,368	0.006	2,929			0.19
	1997	32	260	29,273	0.009	1,631	1,224	2,173	0.14
	2003	101	726	91,285	0.008	1,853	1,516	2,264	0.10
	2007	60	301	55,640	0.005	1,050	830	1,327	0.12
	2012	46	118	38,590	0.003	752	586	966	0.13
	2016	**32**	**160**	**30,726**	**0.005**	**1,101**	**833**	**1,454**	**0.14**
NSEO	1994[c]	13	62	17,622	0.004	765	383	1,527	0.33
	2016	**36**	**125**	**34,435**	**0.004**	**701**	**476**	**1,033**	**0.20**
SSEO	1994[c]	13	99	18,991	0.005	1,173			0.29
	1999	41	360	41,333	0.009	2,376	1,615	3,494	0.20
	2005	32	276	28,931	0.010	2,357	1,634	3,401	0.18
	2013	**31**	**118**	**30,439**	**0.004**	**986**	**641**	**1,517**	**0.22**

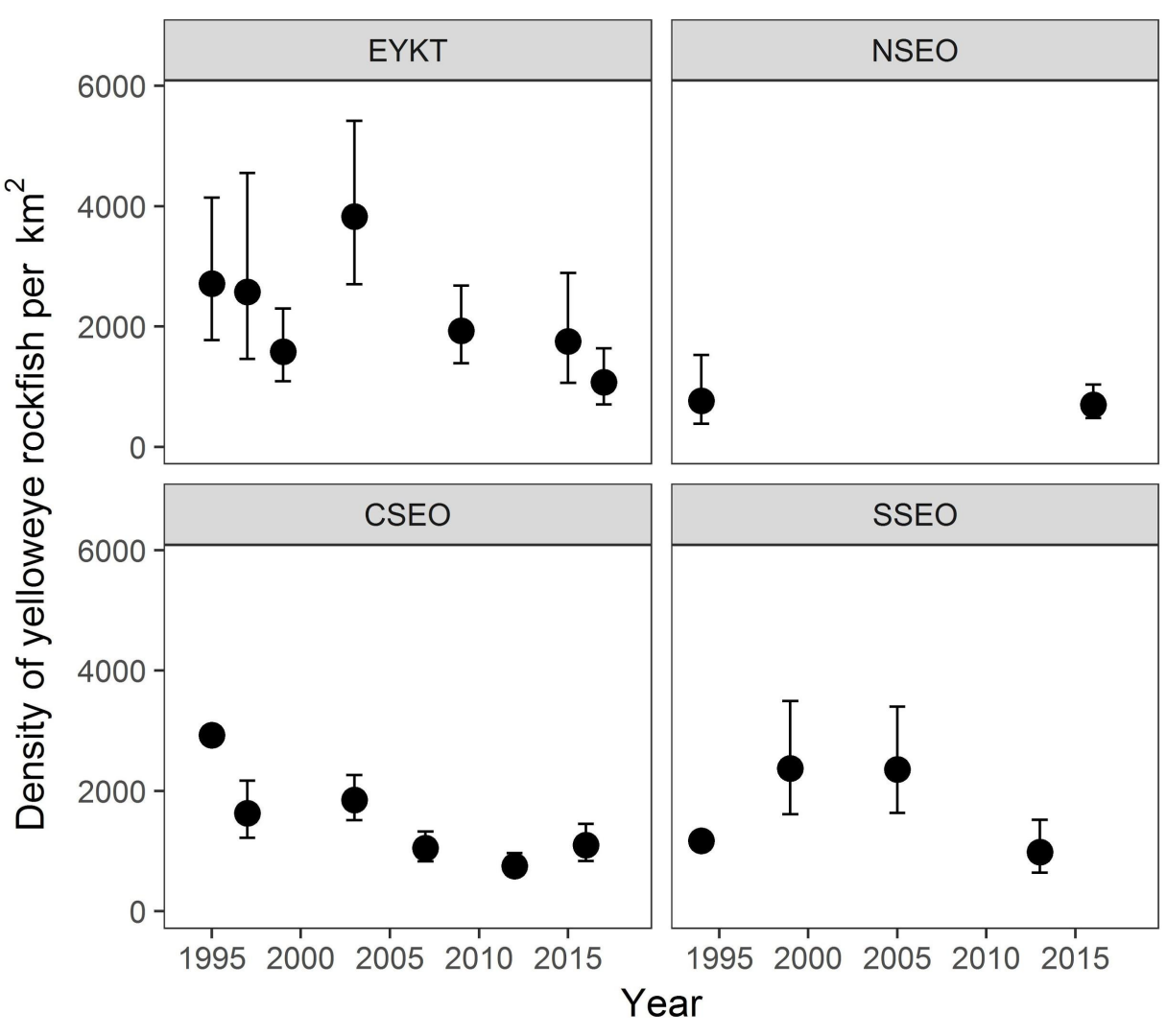
Updates to Model Input Data and Methods

Input Data: new avg wts from port sampling

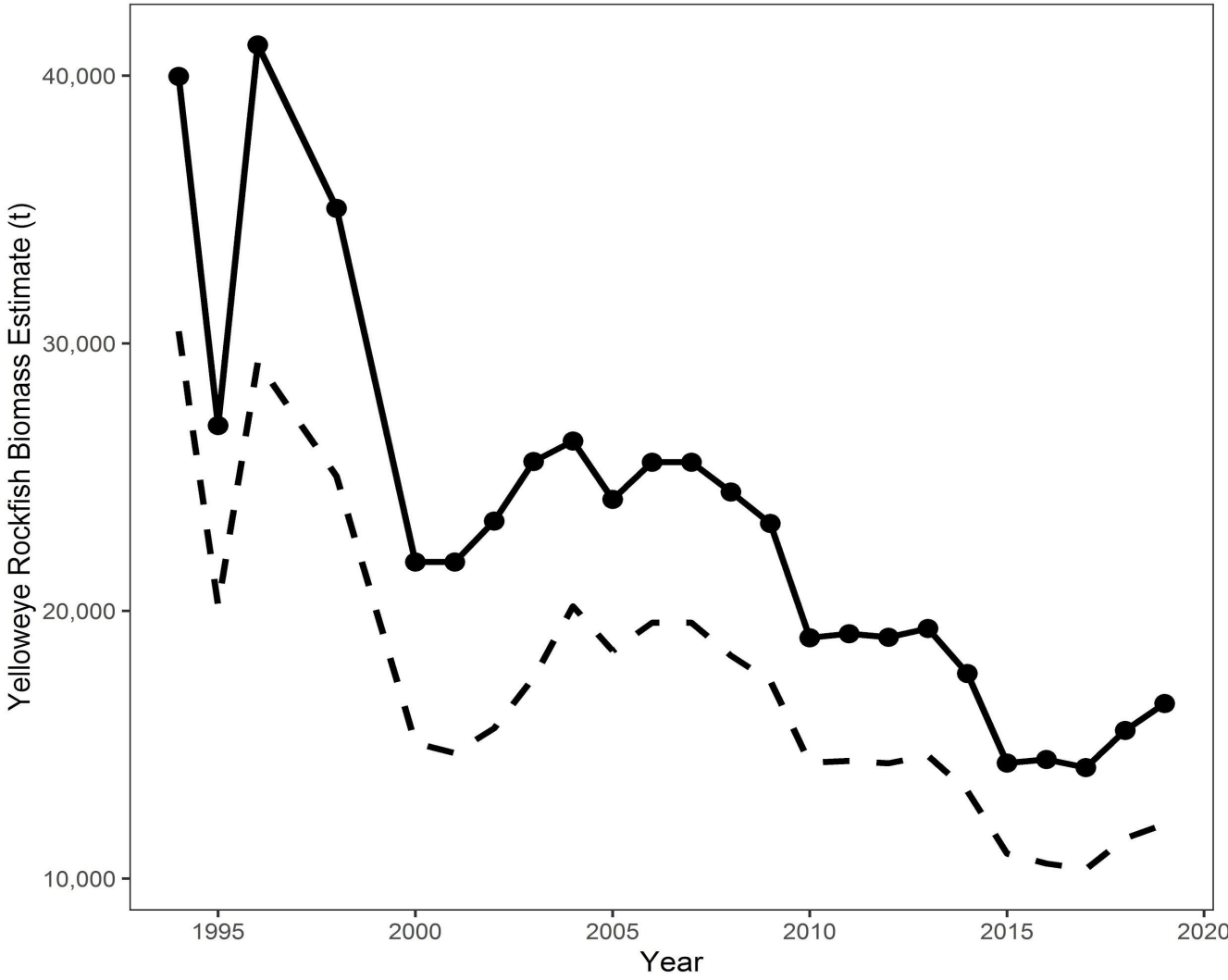
Methodology: Tier 4 Yelloweye + Tier 6 calculations for other DSR

	As estimated or *specified last* year for:		As estimated or *recommended this* year for:	
Quantity	2018	2019	2019	2020
M (natural mortality rate)	0.02	0.02	0.02	0.02
Tier	4	4	4	4
Yelloweye Biomass (t)	11,508		12,029	
$F_{OFL}=F_{35\%}$	0.032	0.032	0.032	0.032
$maxF_{ABC}$	0.026	0.026	0.026	0.026
F_{ABC}	0.020	0.020	0.020	0.020
DSR OFL (t)	394	394	411	411
DSR max ABC (t)	319	319	333	333
ABC (t)	250	250	261	261
Status	As determined last year for:		As determined this year for:	
	2016	2017	2017	2018
Overfishing	No	n/a	No	n/a

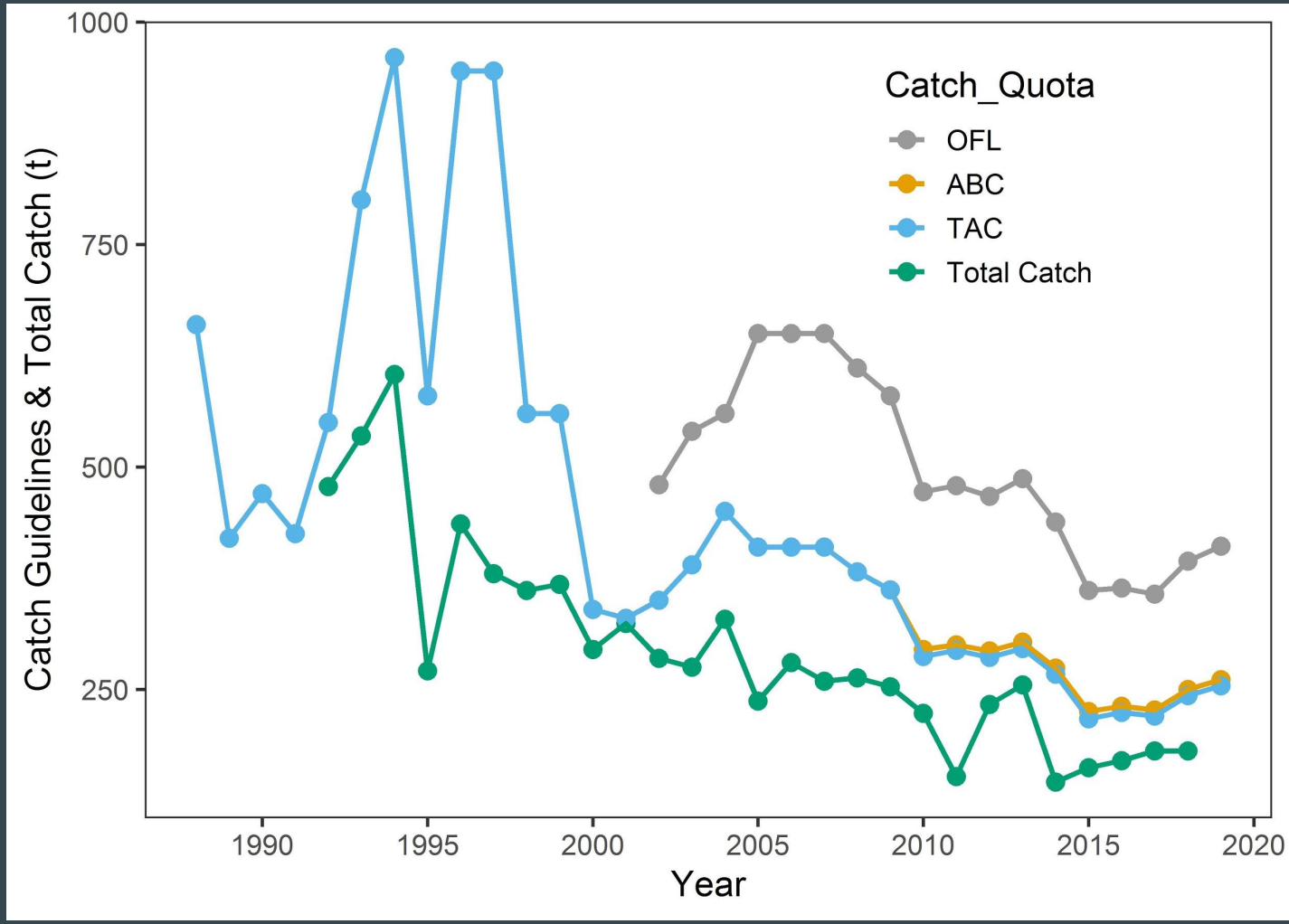
Sub & ROV Density Estimates (95% CI)



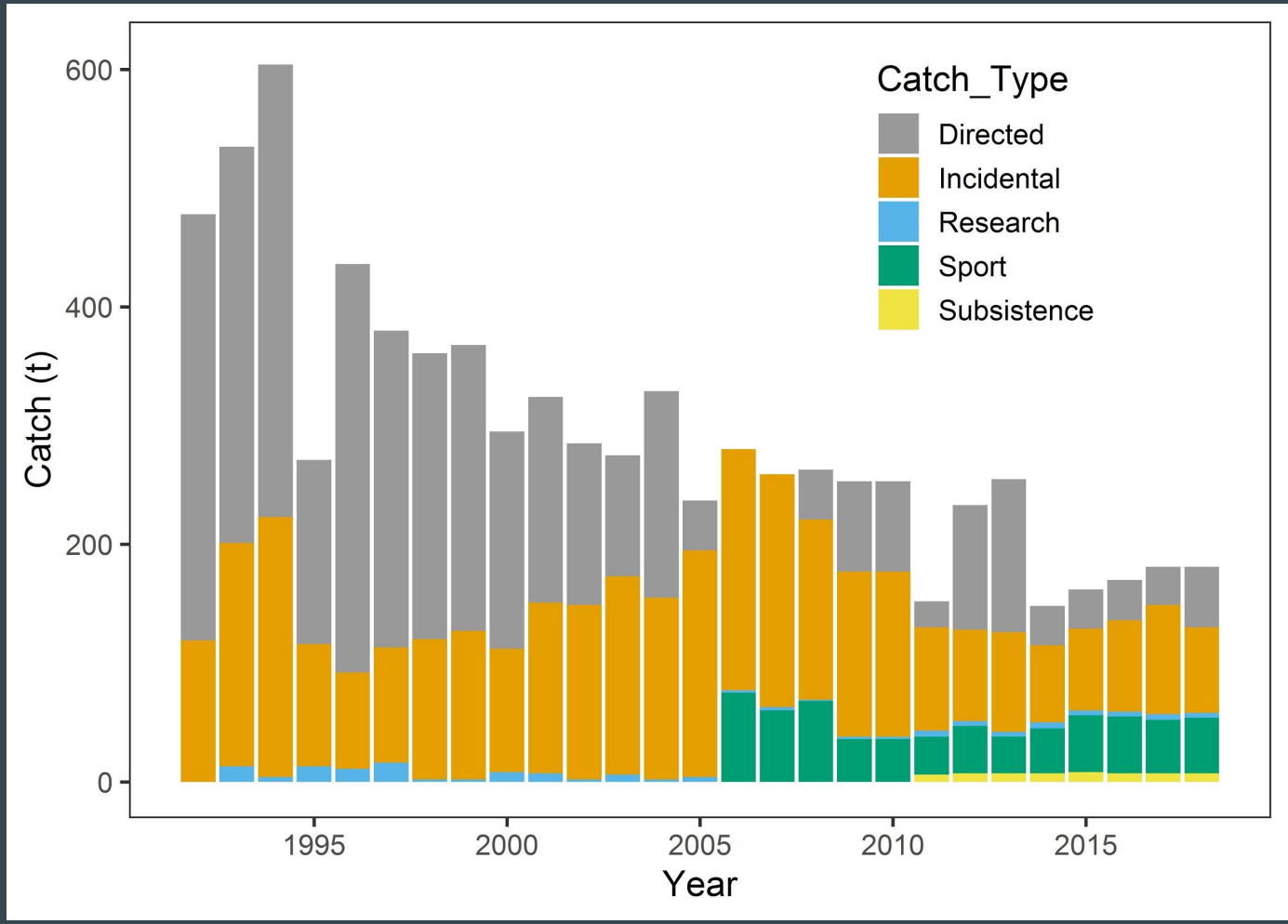
YE Biomass w/ Lower 90% CI



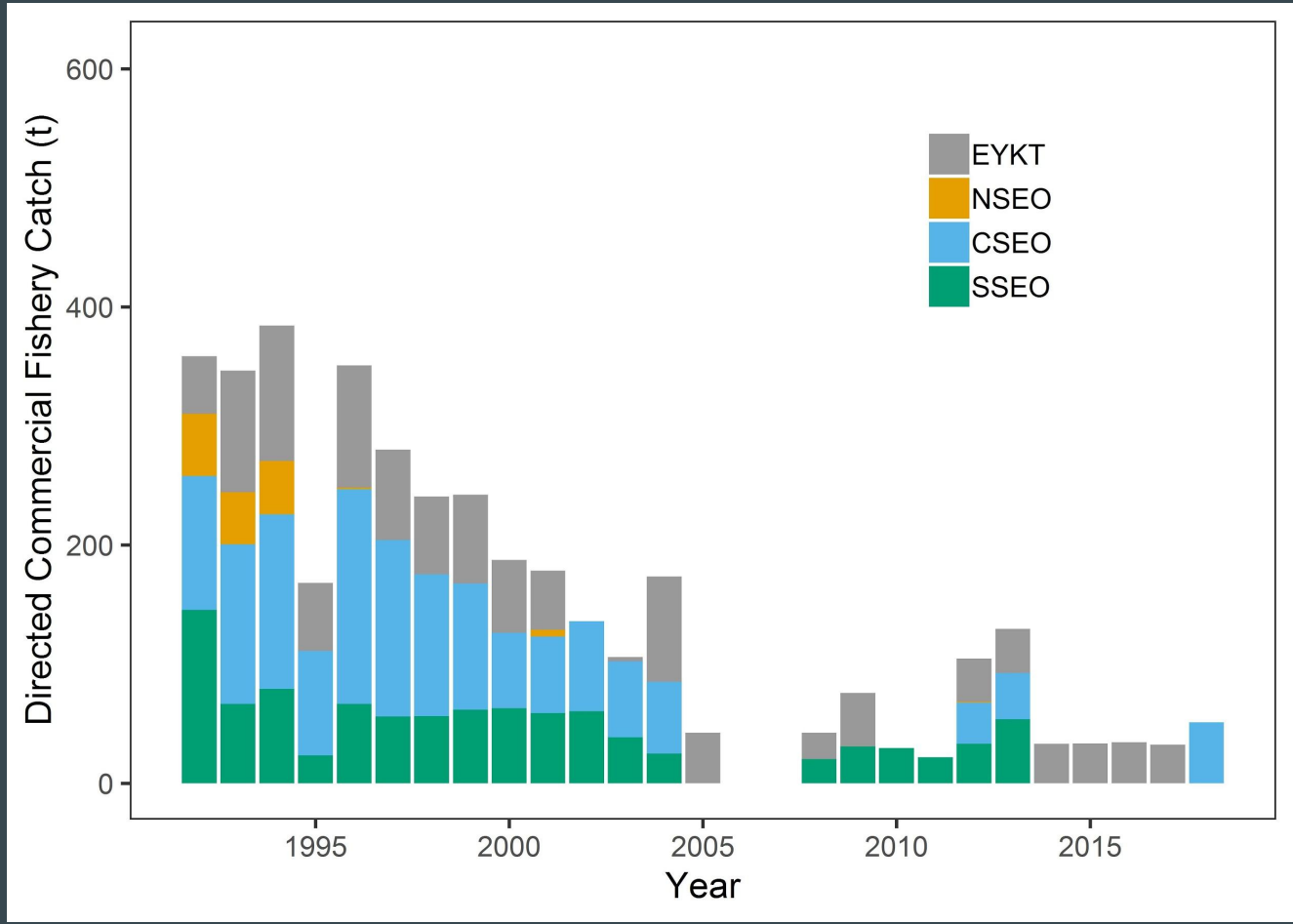
Catch Guidelines vs Total Catch



SEO DSR Catch by Sector

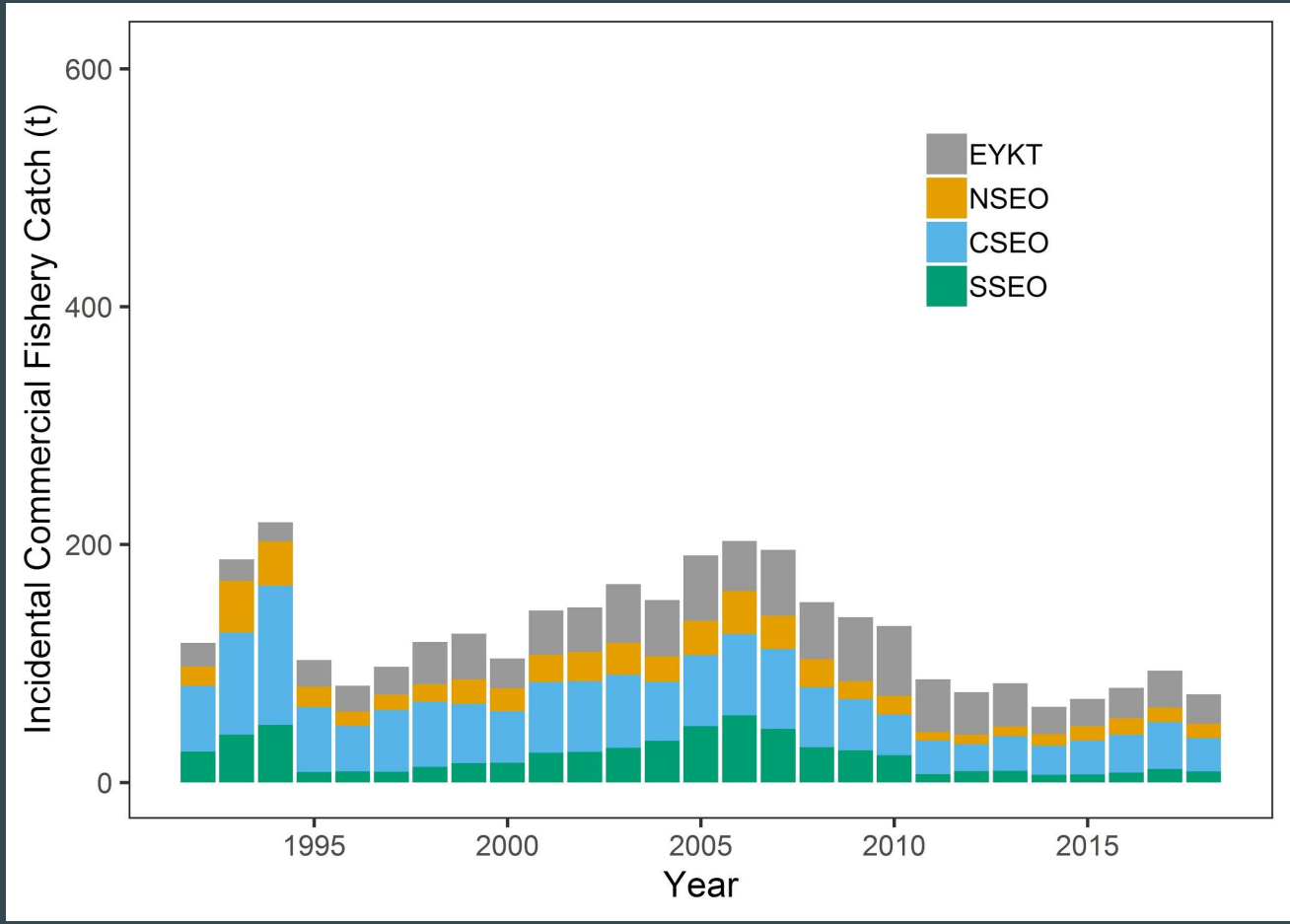


Directed Commercial DSR Catch



Incidental Commercial DSR Catch

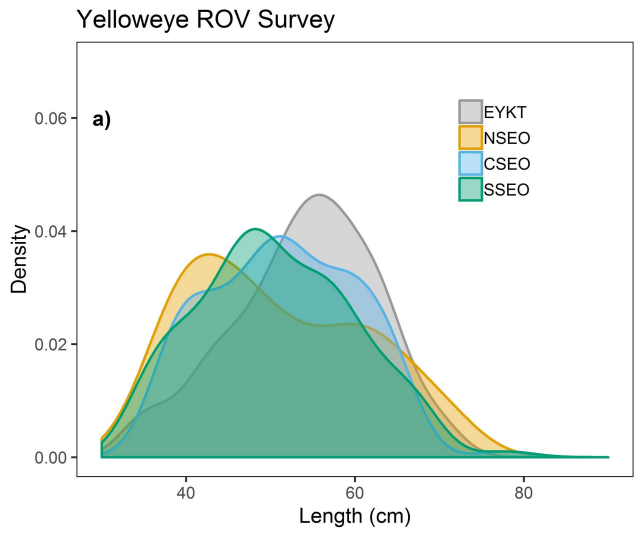
(halibut, lingcod, sablefish, P. cod, & salmon troll (2015-present))

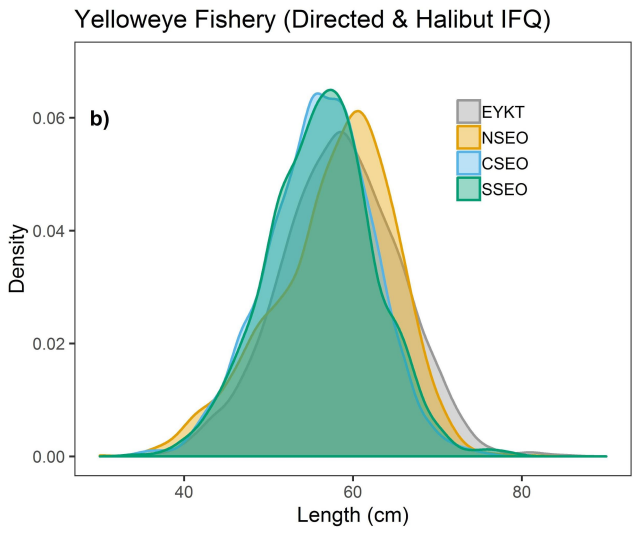


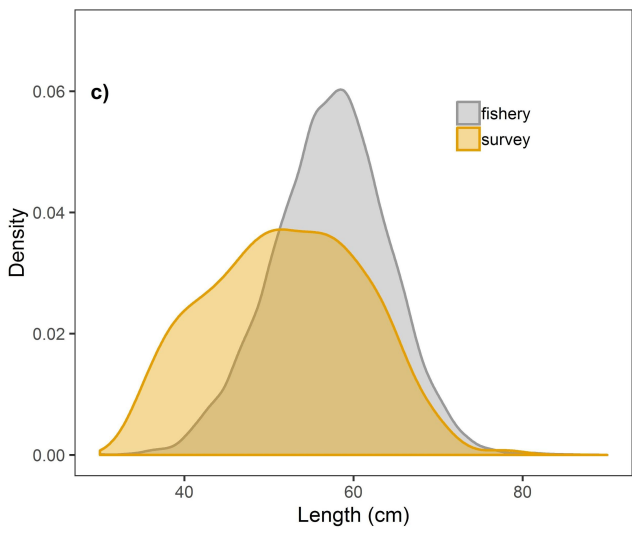
Reponse to Plan Team Comments

The Plan Team recommended an examination of converting ROV determined lengths to weights in order to examine the similarities/differences between surveyed and harvested populations

Data: 2012–2018







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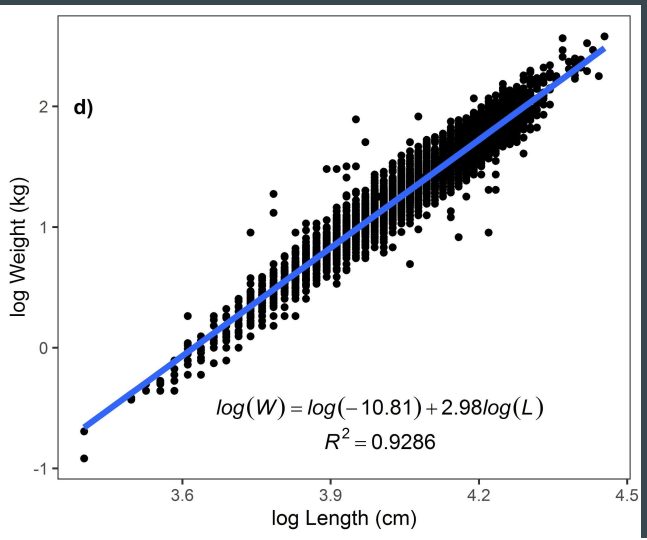
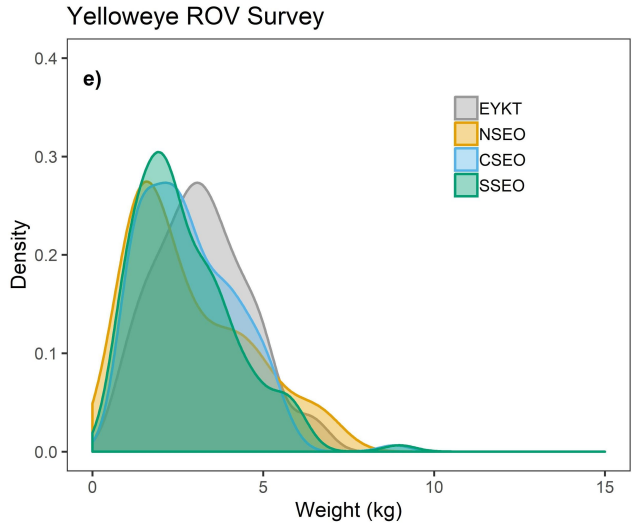
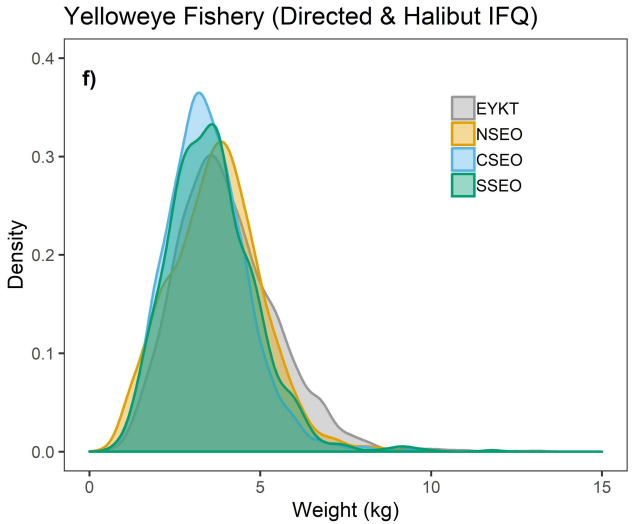
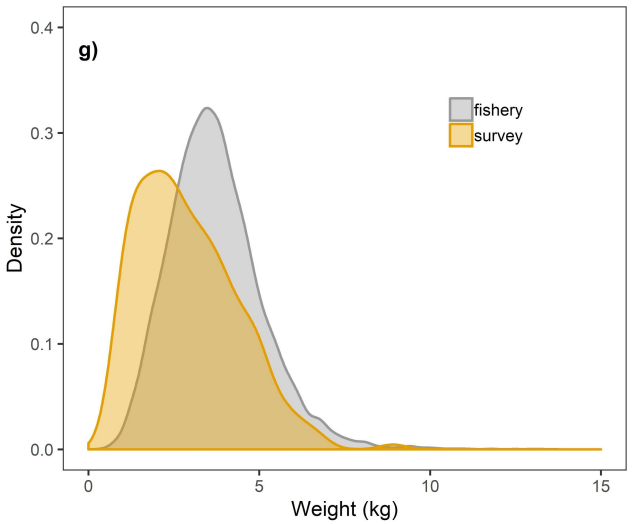








Recommended Allocation

2019 recommended ABC =261 mt

261 t– 7 t (subsistence catch) = 254 t

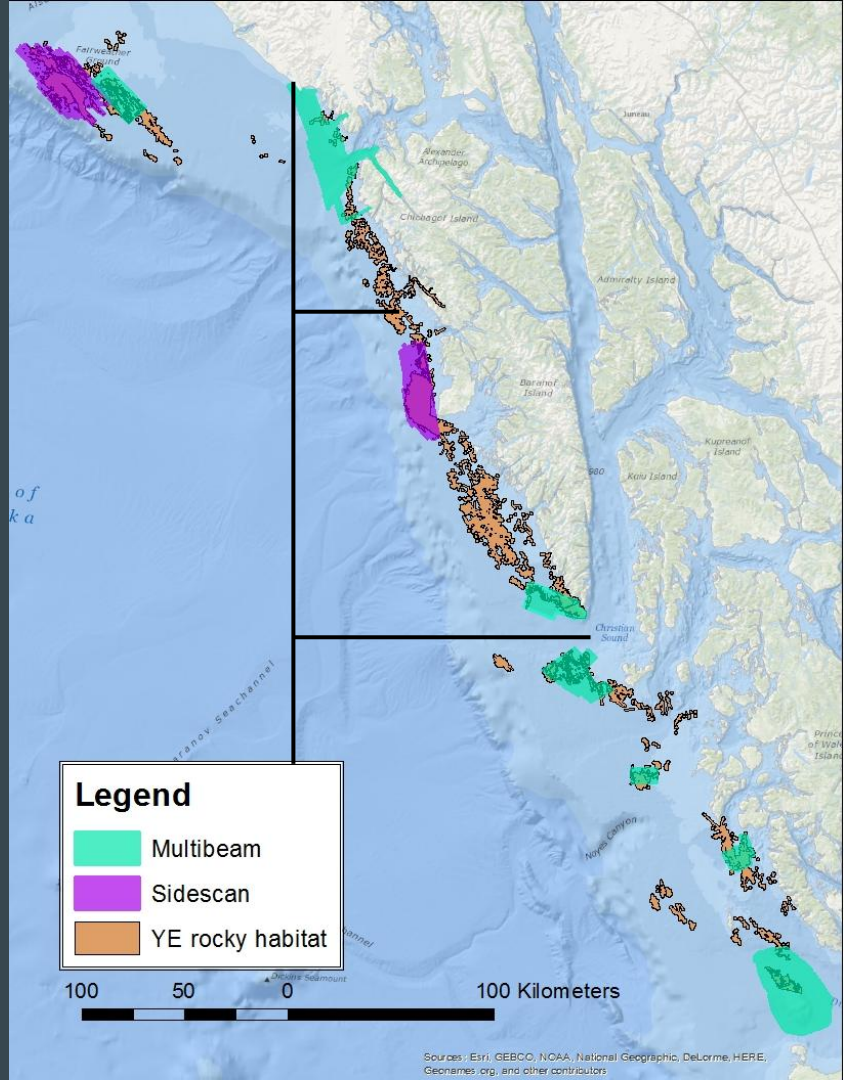
Allocation: 84% Commercial / 16% Sport

213 t to Commercial / 41 t to Sport

Image: tanakulodge.com

Future Research

- Age Structured Assessment in 2020
- Increase survey consistency for mgt areas
- Density estimates in 2019
    - SSEO, NSEO, & CSEO
- Survey EYKT in 2019
- Updating habitat maps using available information from NOAA, USGS, and Alaska Longliners Fisheries Association (ALFA)
- Develop YE habitat suitability model for survey area stratification



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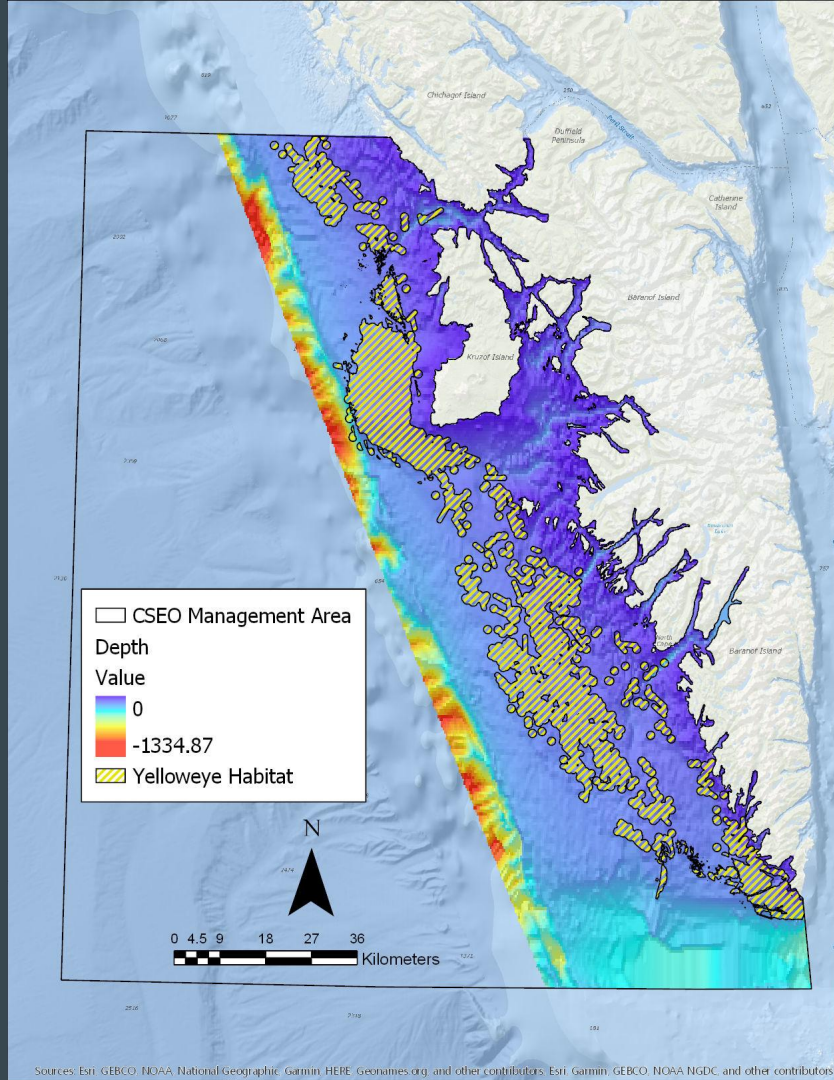

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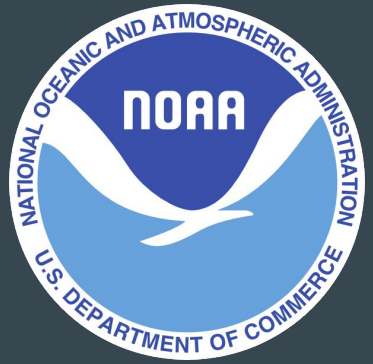

Questions?

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