

# SEO Demersal Shelf Rockfish Stock Assessment for 2018



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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*)

# Stock Assessment

## EYKT

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

## NSEO

1994, **2016**

## CSEO

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

## SSEO

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

Juneau



# 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, recreational, and subsistence (2010–2014)

<b>Quantity (Other DSR only)</b>	<b><i>As estimated or specified last year for:</i> 2017</b>	<b><i>As estimated or recommended this year for:</i> 2018</b>
ABC (t) Tier 6	20	20
OFL (t) Tier 6	26	26

Area	Year	# transects	# <u>YE<sup>b</sup></u>	Meters surveyed	Encounter rate (YE/m)	Density (YE/km <sup>2</sup> )	Lower CI (YE/km <sup>2</sup> )	Upper CI (YE/km <sup>2</sup> )	CV
<u>EYKT<sup>a</sup></u>	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
	<b>2015</b>	<b>33</b>	<b>251</b>	<b>22,896</b>	<b>0.008</b>	<b>1,755</b>	<b>1,065</b>	<b>2,891</b>	<b>0.25</b>
CSEO	1994 <sup>c</sup>					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
	<b>2016</b>	<b>32</b>	<b>160</b>	<b>30,726</b>	<b>0.005</b>	<b>1,101</b>	<b>833</b>	<b>1,454</b>	<b>0.14</b>
NSEO	1994 <sup>c</sup>	13	62	17,622	0.004	765	383	1,527	0.33
	<b>2016</b>	<b>36</b>	<b>125</b>	<b>34,435</b>	<b>0.004</b>	<b>701</b>	<b>476</b>	<b>1,033</b>	<b>0.20</b>
SSEO	1994 <sup>c</sup>	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
	<b>2013</b>	<b>31</b>	<b>118</b>	<b>30,439</b>	<b>0.004</b>	<b>986</b>	<b>641</b>	<b>1,517</b>	<b>0.22</b>



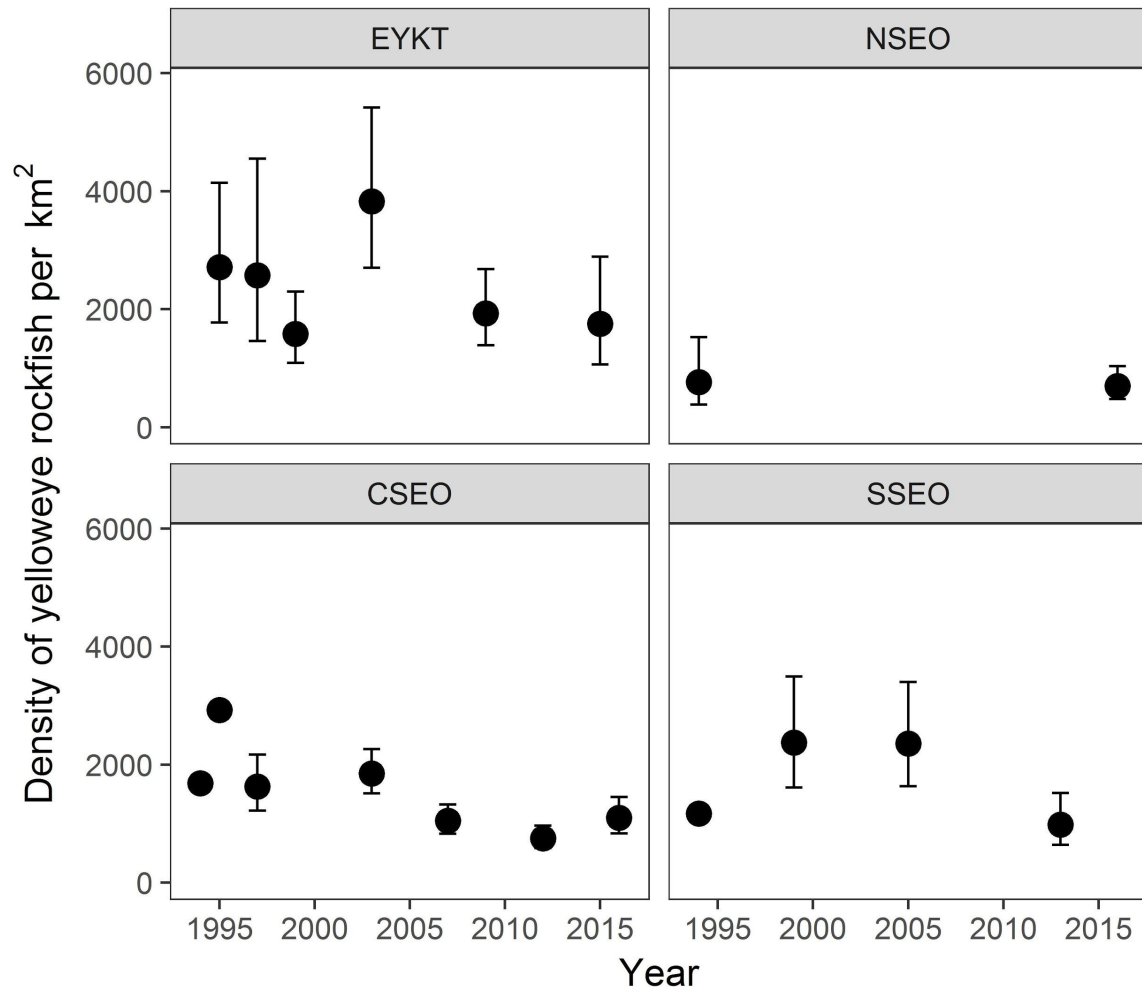
# Updates to Model Input Data and Methods

**Input Data:** new avg wts & NSEO and CSEO density estimates

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

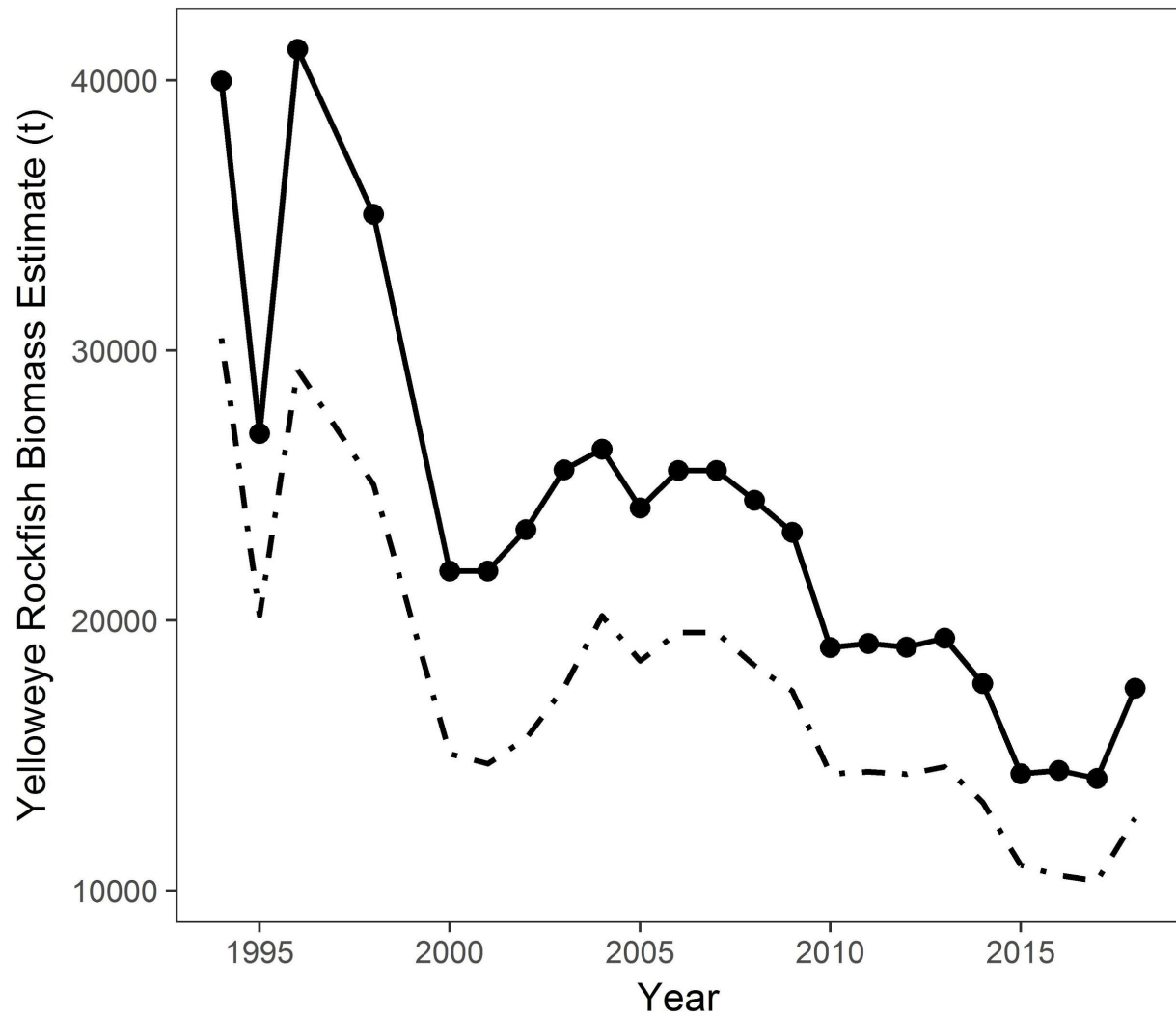
<b>Quantity</b>	As estimated or <i>specified last year for:</i>		As estimated or <i>recommended this year for:</i>	
	2017	2018	2018	2019
$M$ (natural mortality rate)	0.02	0.02	0.02	0.02
Tier	4	4	4	4
<u>Yelloweye</u> Biomass (t)	10,347		12,678	
$F_{OFL} = F_{35\%}$	0.032	0.032	0.032	0.032
$\max F_{ABC}$	0.026	0.026	0.026	0.026
$F_{ABC}$	0.020	0.020	0.020	0.020
DSR OFL (t)	357	357	432	432
DSR max ABC (t)	289	289	350	350
ABC (t)	227	227	274	274
<b>Status</b>	As determined last year for:		As determined this year for:	
	2015	2016	2016	2017
Overfishing	No	n/a	No	n/a

# Sub & ROV Density Estimates (95% CI)

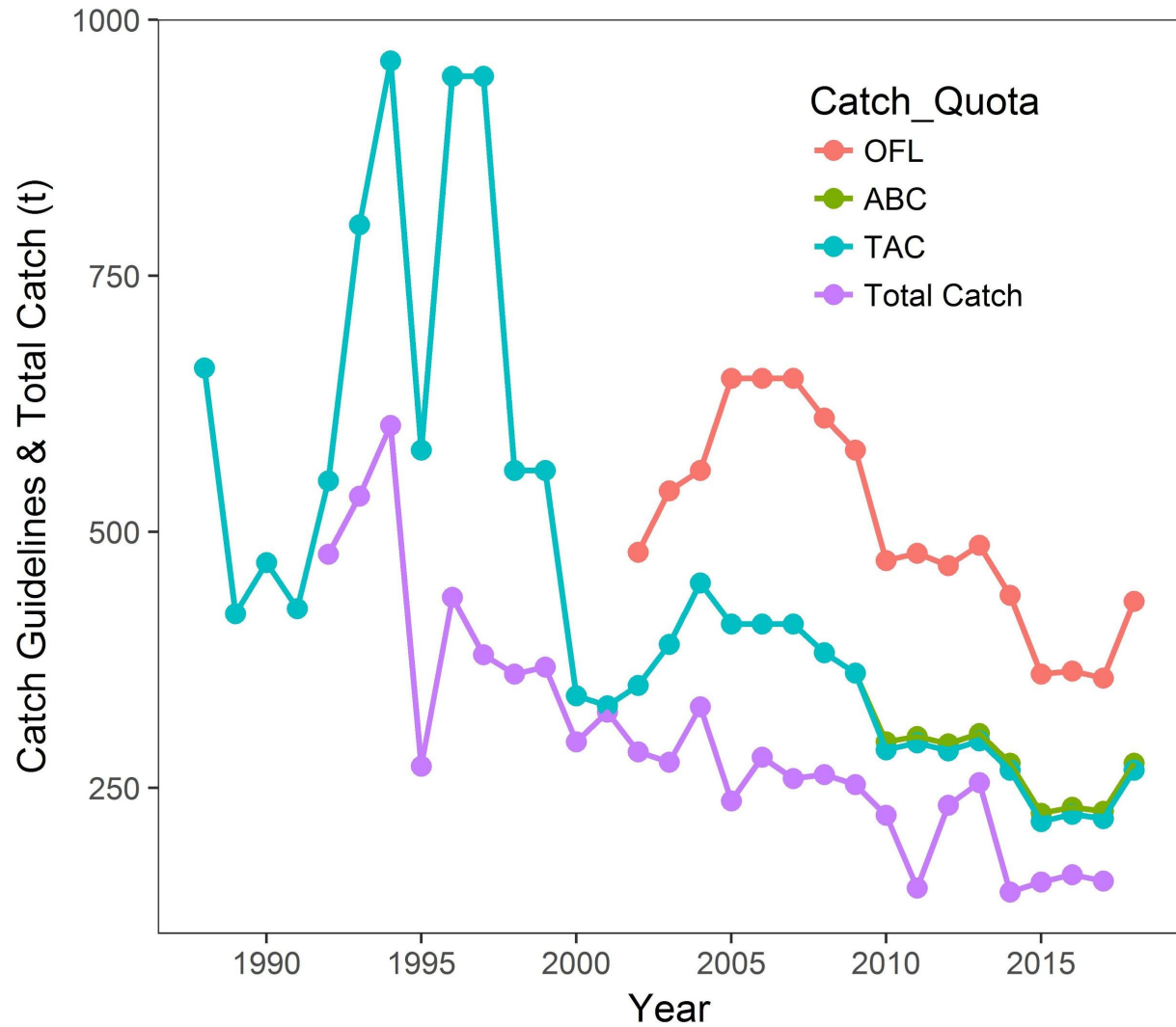




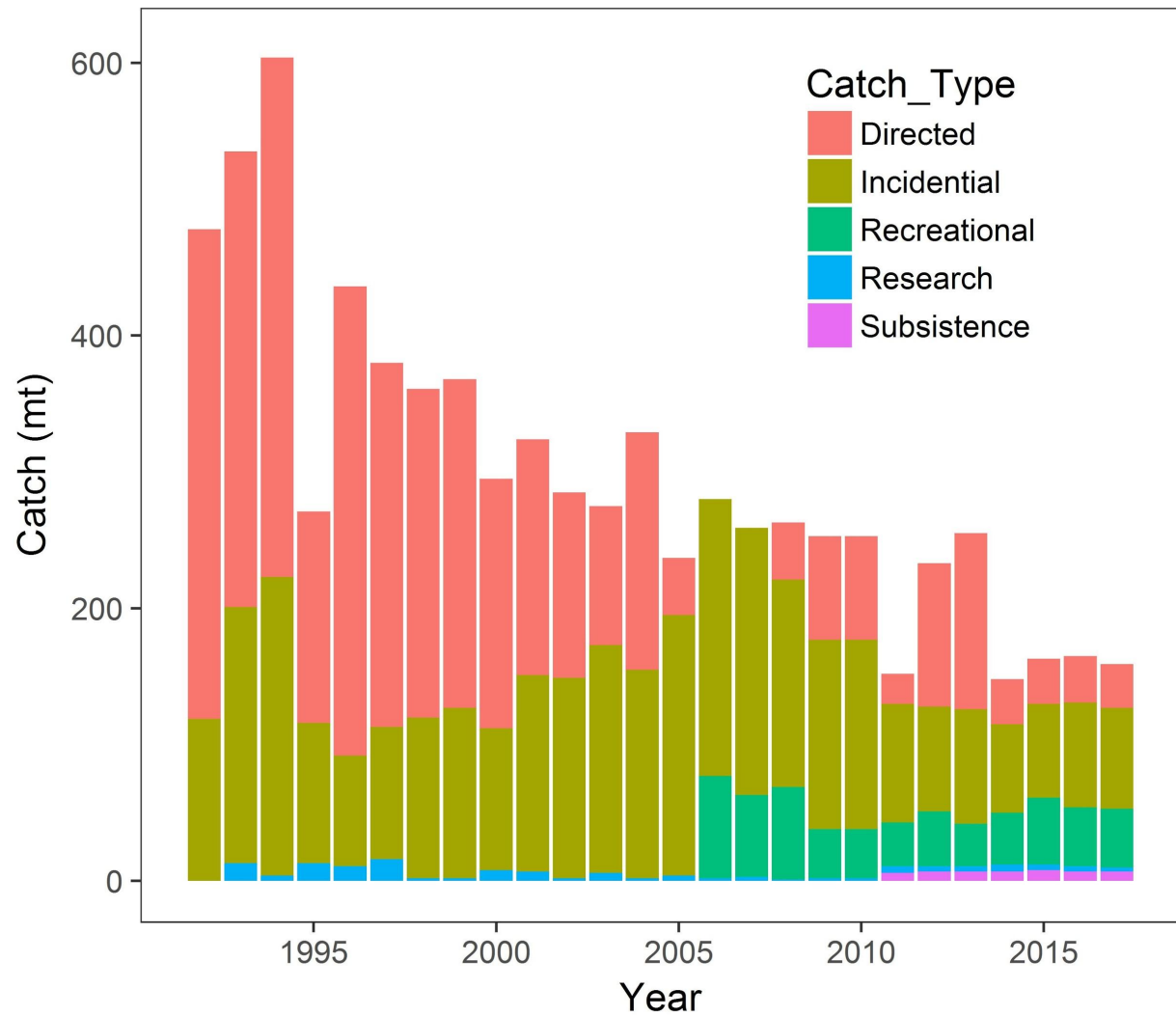
# YE Biomass w/ Lower 90% CI



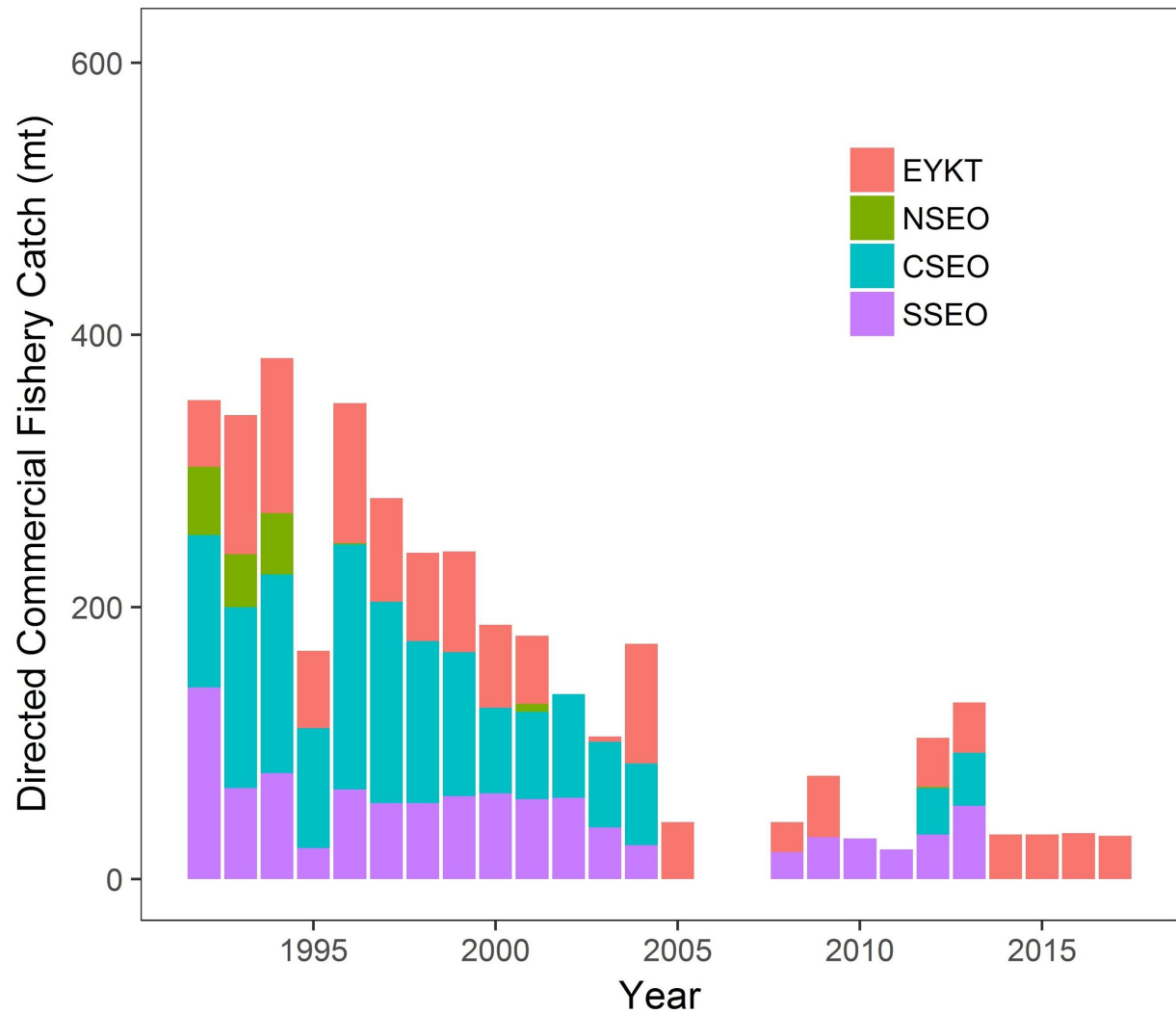
# Catch Guidelines vs Total Catch



# SEO DSR Catch by Sector

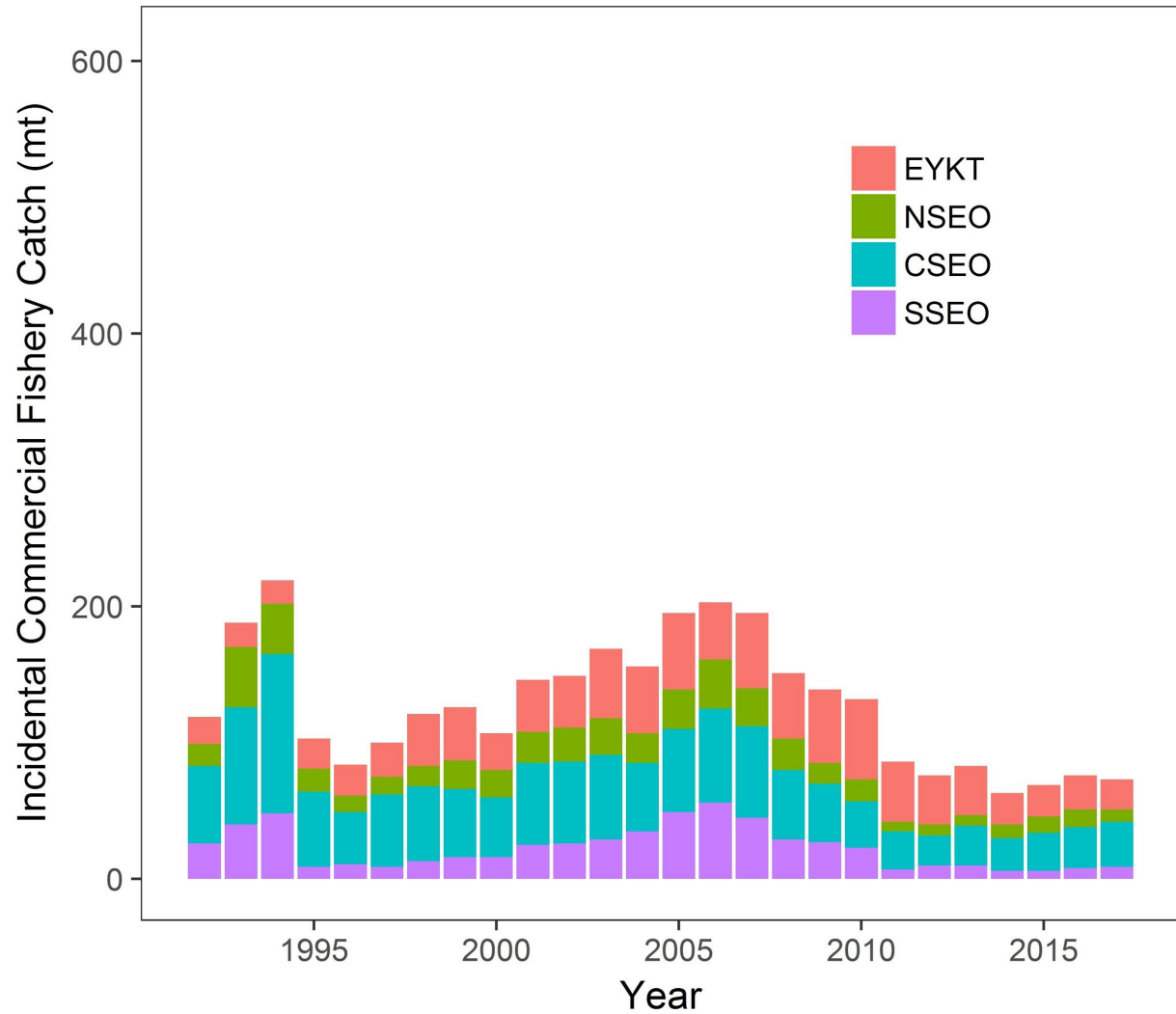


# Directed Commercial YE Catch



# Incidental Commercial YE Catch

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



# Recommended Allocation

2018 recommended ABC = 267 mt

274 t – 7 t (subsistence catch) = 267 t

Allocation: 84% Commercial / 16% Sport

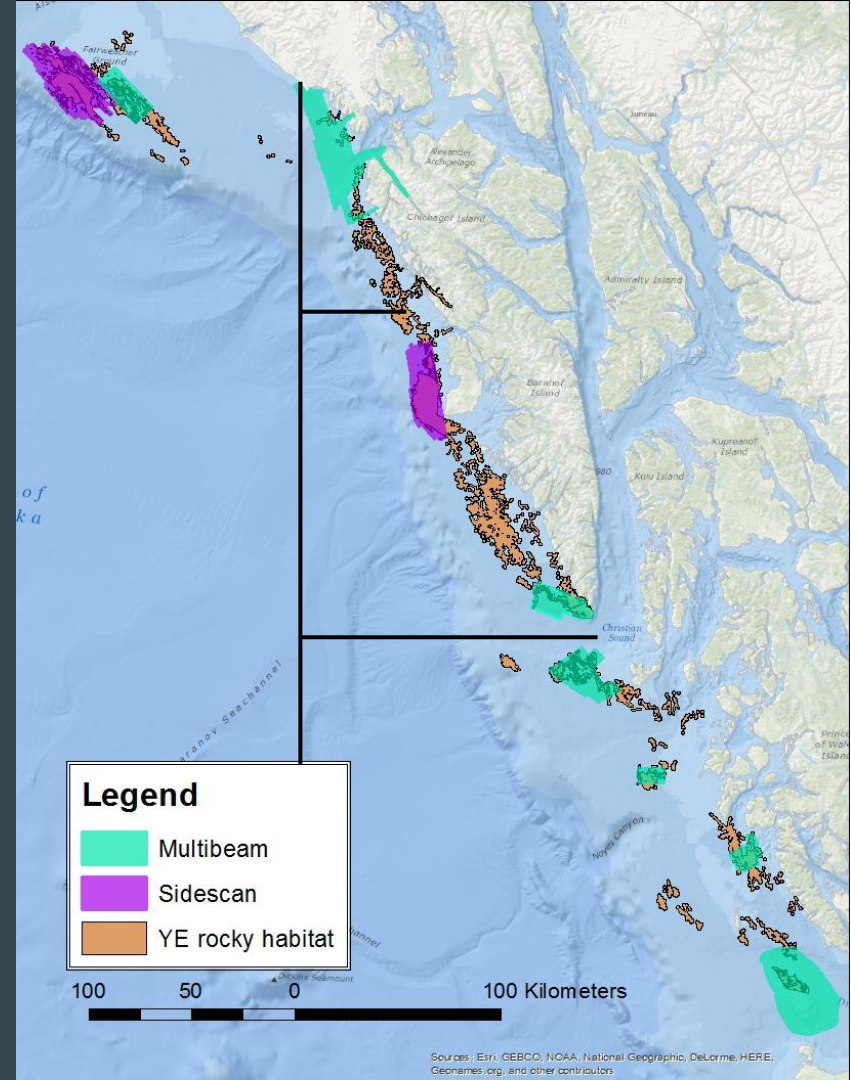
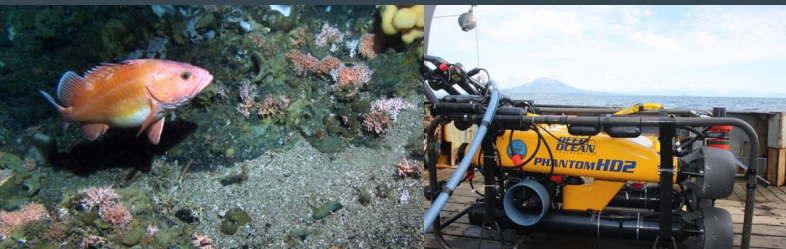
224 t to Commercial / 43 t to Sport



Image: [tanakulodge.com](http://tanakulodge.com)

# Future Research

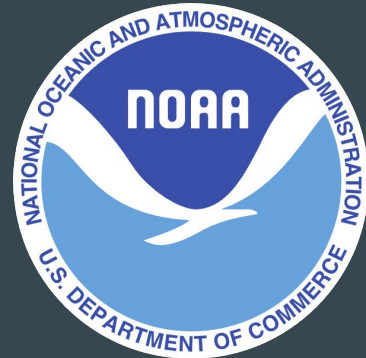
- Continue development of ASA model
  - Update in 2018
- 2017 EYKT density estimate ~mid-Oct.
- Investigate juvenile biomass
- 2018 ROV survey in:
  - SSEO (May/June)
  - NSEO/CSEO (August)





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Questions?

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