

# **Analysis of Management Options for the Area 2C and 3A Charter Halibut Fisheries for 2018**



**For the North Pacific Fishery Management Council  
December 2017**

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Alaska Department of Fish and Game

# Overview

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- ▶ Fishery review through 2017
- ▶ Analysis of management measures for 2018
  - ▶ Area 2C
  - ▶ Area 3A

# Fishery review through 2017

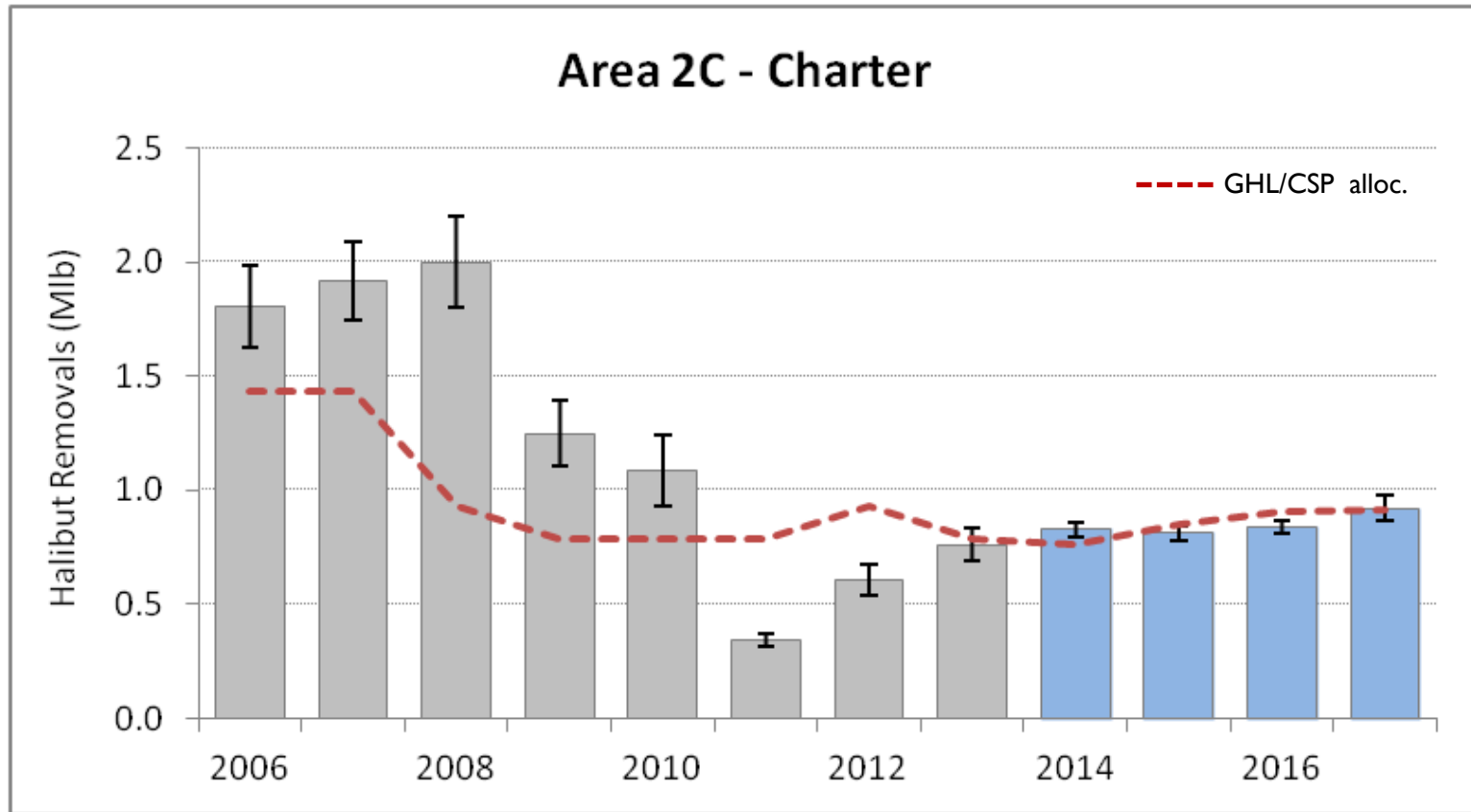


# Preliminary charter estimates for 2017

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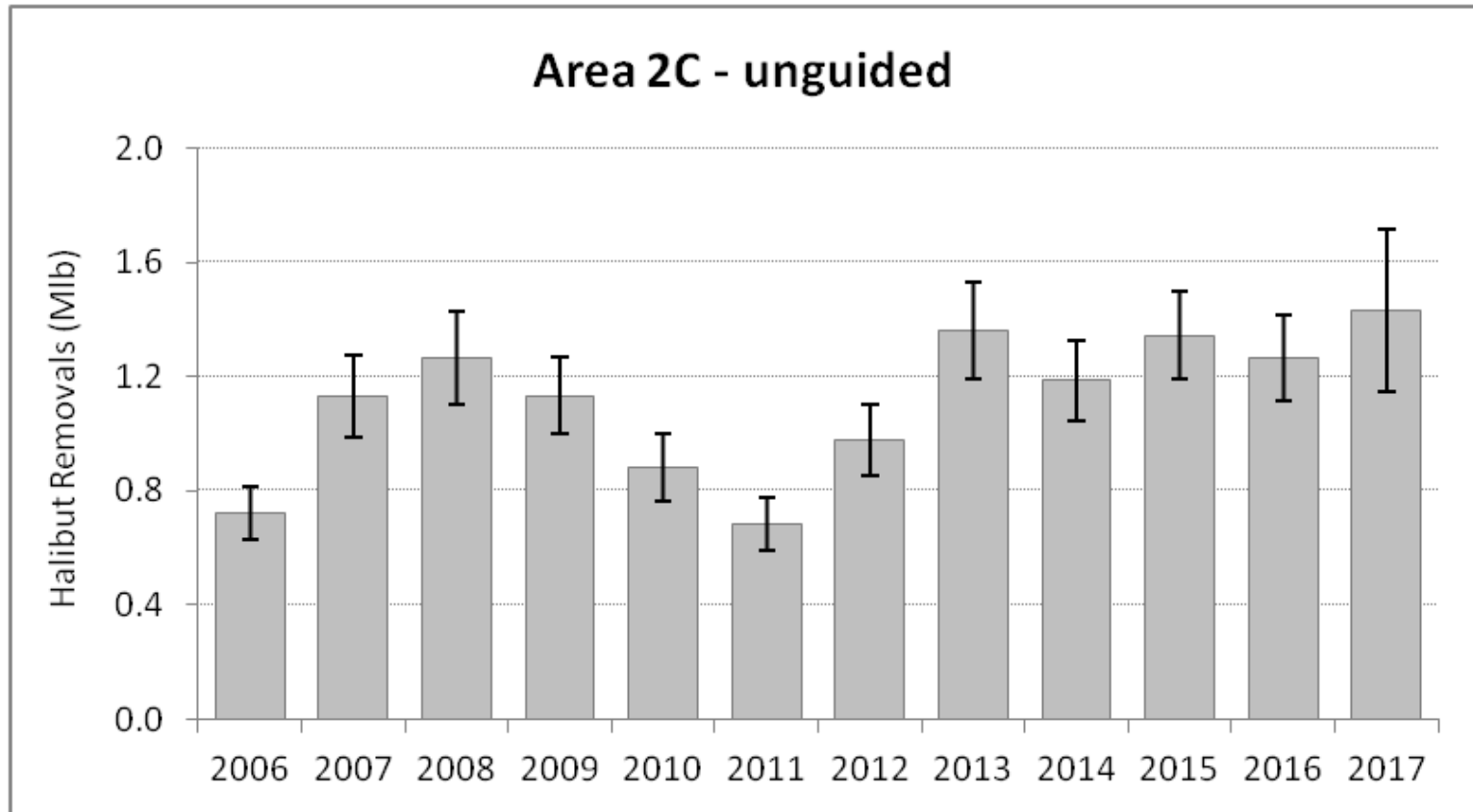
Area	Mean wt	Logbook	Yield (lb)	O26	Total	Allocation (lb)	Overage (lb)	Overage %
	(lb)	Harvest (no. fish)		RelMort (lb)	Removals (lb)			
2C	12.31	71,711	882,451	38,925	921,376	915,000	6,376	0.7%
3A	14.48	143,654	2,079,405	13,620	2,093,025	1,890,000	203,025	10.7%

# Area 2C charter

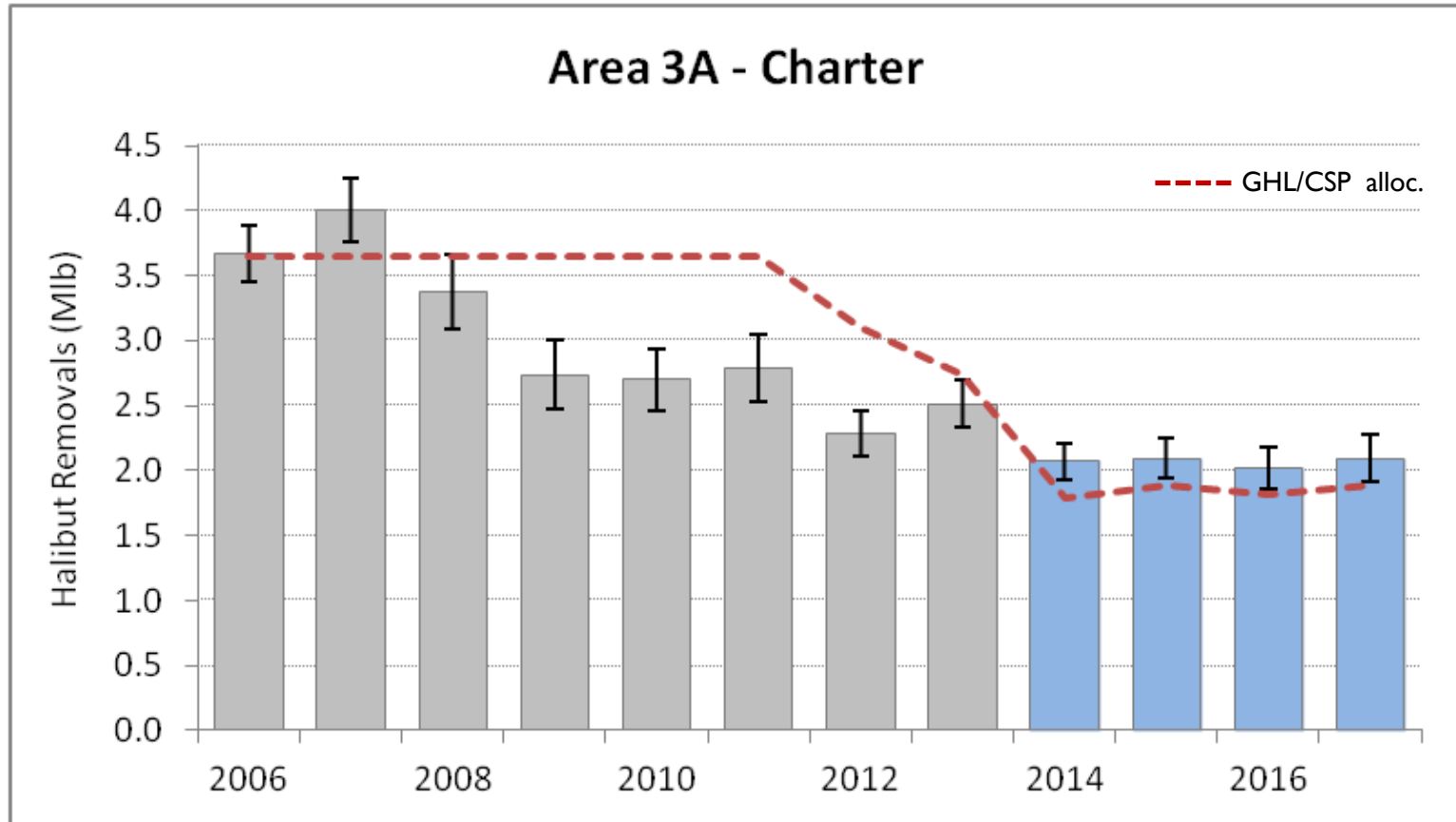


# Area 2C unguided

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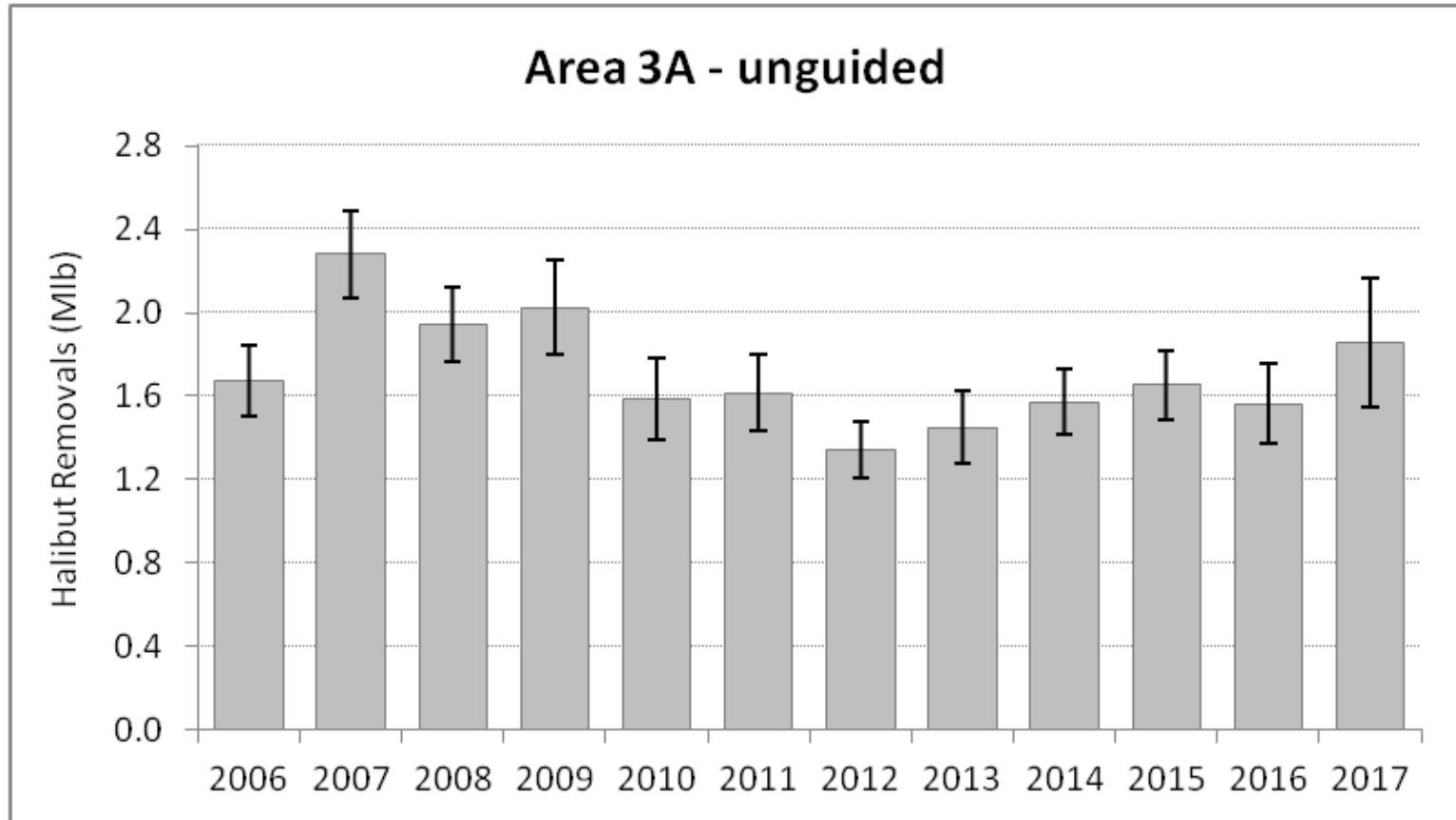


# Area 3A charter



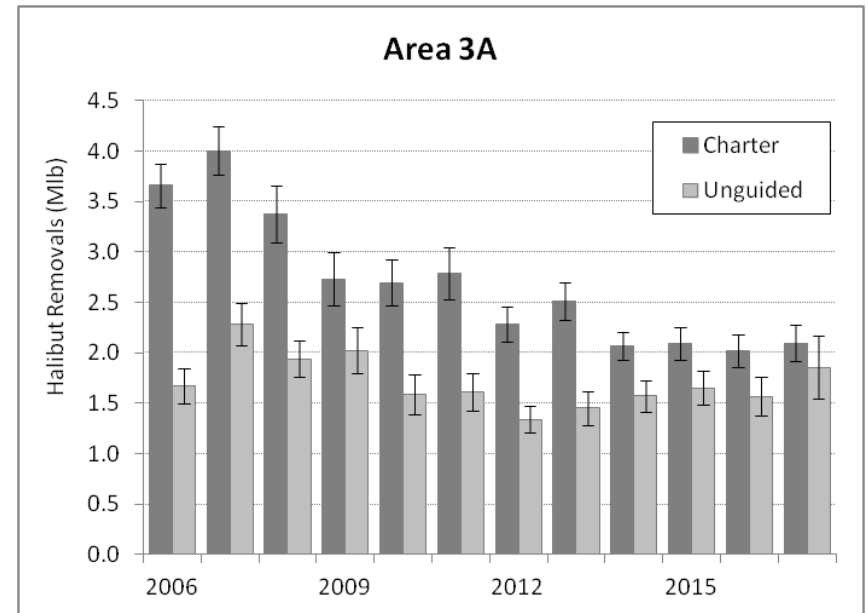
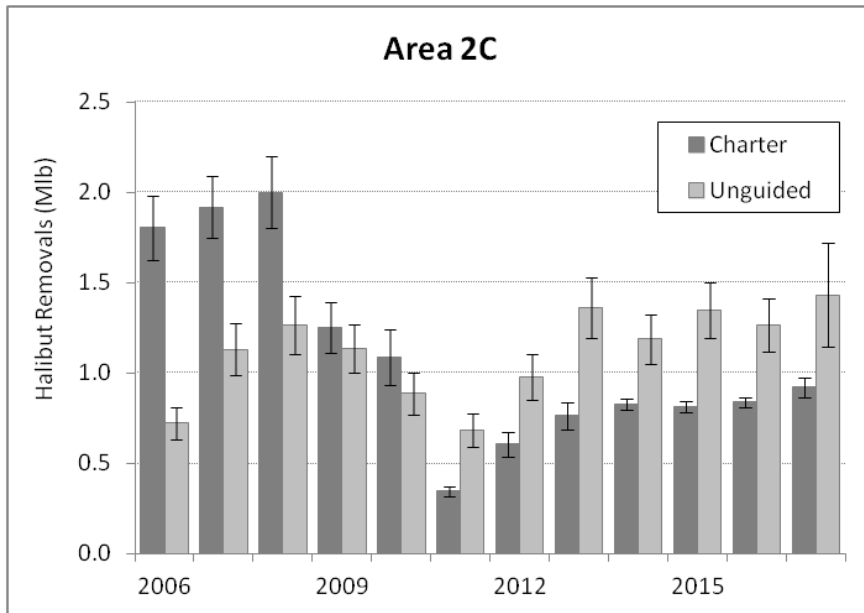
# Area 3A unguided

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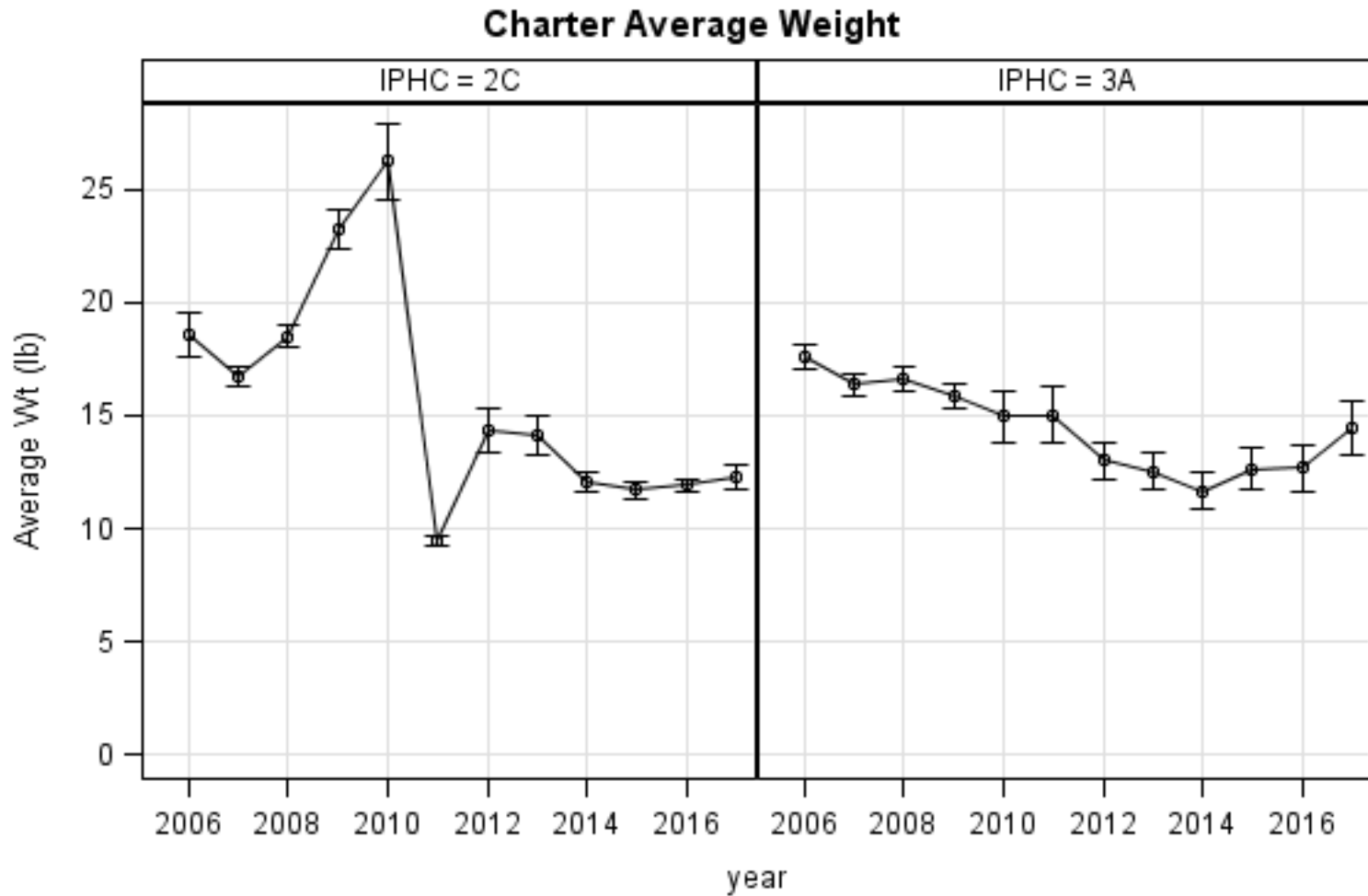




# Charter and unguided

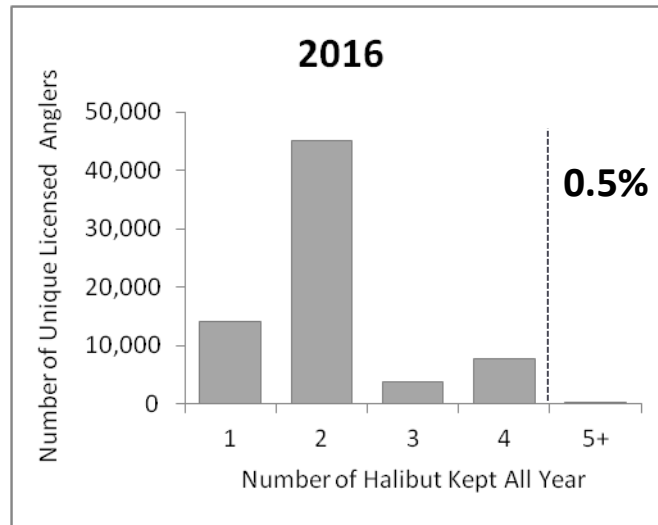
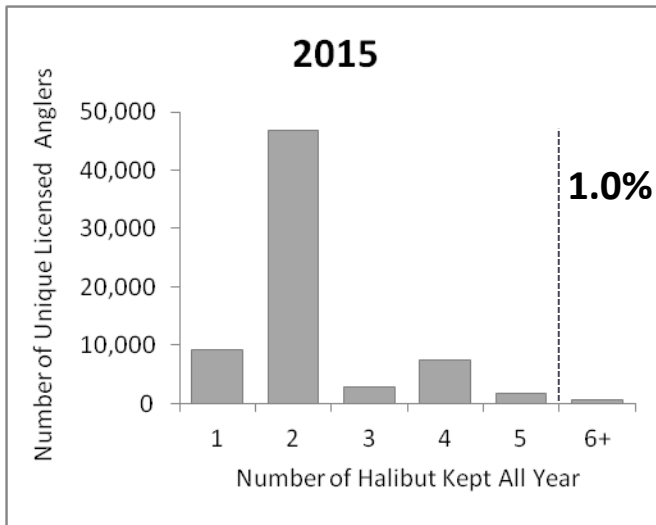


# Average weight trends



# Compliance with annual limits in Area 3A

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# Analysis of management measures for 2017



*Photo: Kenai Riverfront Lodge*

# Reference SPR allocations for 2018

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- ▶ Based on reference SPR (SPR<sub>46%</sub>)

Area	Combined Catch Limit (Mlb)	CSP Allocation Percentage	2018 Charter Allocation (Mlb)	2017 Charter Allocation (Mlb)	Change
2C	3.76	18.3%	0.69	0.915	-24.8%
3A	9.01	18.9%	1.70	1.890	-9.9%

# General methods

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$$\text{Effort} \times \text{HPUE} = \text{Harvest}$$

$$\text{Harvest} \times \text{Average weight} = \text{Yield}$$

$$\text{Yield} + \text{Release Mortality} = \text{Removals}$$

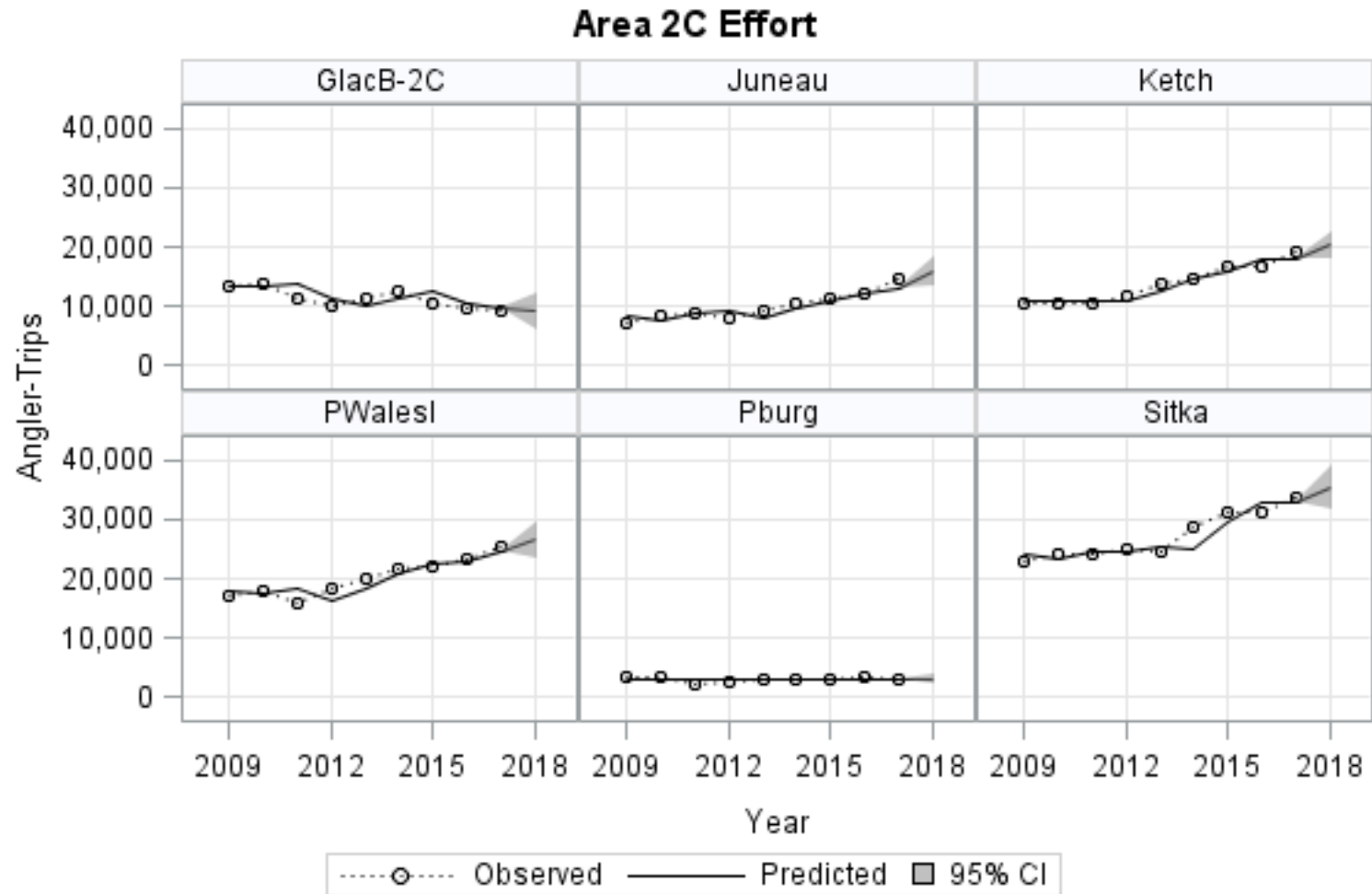
## Area 2C - Measures for 2018

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- ▶ Status quo: One fish bag limit, U44O80 reverse slot size limit
- ▶ Reverse (protected) slot limit (U35-50, O50-80)

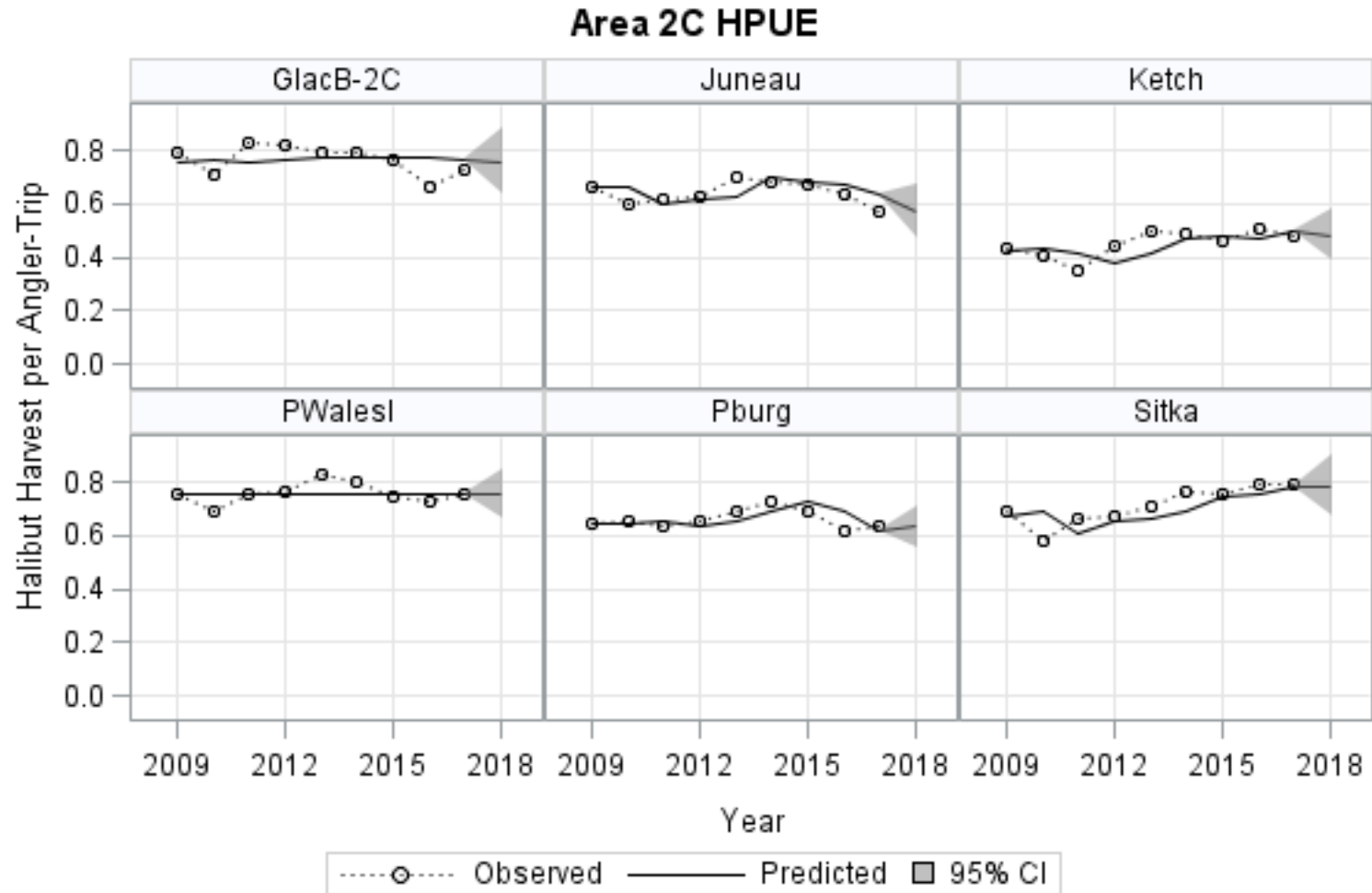


# Area 2C Effort Forecasts





# Area 2C HPUE Forecasts



# Area 2C – reverse slot limit

► Harvest forecast = 75,430

No annual limit, harvest = 75,430 halibut																
Lower Limit (in)	Upper Length Limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	1.348	1.259	1.191	1.114	1.059	1.010	0.941	0.874	0.836	0.806	0.777	0.756	0.728	0.712	0.711	0.698
36	1.385	1.298	1.231	1.155	1.100	1.052	0.983	0.917	0.879	0.850	0.820	0.800	0.772	0.756	0.754	0.742
37	1.407	1.321	1.255	1.180	1.126	1.077	1.009	0.943	0.905	0.876	0.847	0.826	0.799	0.783	0.781	0.769
38	1.441	1.356	1.291	1.217	1.163	1.115	1.047	0.982	0.945	0.916	0.886	0.866	0.839	0.823	0.821	0.809
39	1.466	1.383	1.318	1.244	1.191	1.144	1.076	1.012	0.974	0.945	0.916	0.896	0.868	0.853	0.851	0.839
40	1.487	1.404	1.340	1.267	1.215	1.167	1.100	1.036	0.999	0.970	0.941	0.921	0.894	0.878	0.876	0.864
41	1.512	1.431	1.368	1.295	1.243	1.196	1.130	1.066	1.029	1.000	0.971	0.951	0.924	0.908	0.907	0.895
42	1.528	1.448	1.386	1.314	1.262	1.216	1.150	1.086	1.049	1.021	0.992	0.972	0.945	0.929	0.928	0.916
43	1.547	1.468	1.406	1.335	1.284	1.238	1.172	1.109	1.072	1.044	1.015	0.995	0.968	0.952	0.951	0.939
44	1.574	1.496	1.435	1.365	1.314	1.268	1.203	1.140	1.103	1.075	1.047	1.027	1.000	0.984	0.983	0.971
45	1.602	1.526	1.466	1.397	1.346	1.301	1.236	1.174	1.138	1.110	1.081	1.061	1.035	1.019	1.017	1.005
46	1.621	1.546	1.487	1.418	1.368	1.323	1.259	1.197	1.161	1.133	1.105	1.085	1.058	1.043	1.041	1.029
47	1.647	1.573	1.515	1.447	1.398	1.353	1.289	1.228	1.192	1.164	1.136	1.116	1.090	1.074	1.073	1.061
48	1.666	1.593	1.535	1.468	1.419	1.375	1.311	1.250	1.214	1.187	1.158	1.139	1.112	1.097	1.095	1.083
49	1.697	1.625	1.568	1.502	1.453	1.410	1.346	1.286	1.250	1.223	1.195	1.176	1.149	1.134	1.132	1.120
50	1.718	1.647	1.592	1.526	1.478	1.435	1.372	1.312	1.277	1.250	1.222	1.202	1.176	1.161	1.159	1.147

# Area 2C – effect of annual limits

Annual-Limit	Subarea						Area-2C
	Ketchikan	PWIK	Pburg	Sitka	Juneau	Glac Bay	
	<b>Estimated-percent-of-anglers-affected-by-the-annual-limit:</b>						
1	26.4%	69.6%	55.3%	71.6%	43.2%	46.1%	56.6%
2	11.1%	41.2%	27.4%	41.0%	27.7%	27.2%	32.3%
3	1.8%	9.6%	10.7%	10.4%	13.4%	14.0%	9.4%
4	0.6%	1.3%	2.9%	1.7%	3.8%	5.6%	2.1%
5	0.2%	0.5%	0.4%	0.4%	1.6%	0.6%	0.5%
	<b>Estimated-percent-change-in-harvest-relative-to-no-annual-limit:</b>						
1	-28.6%	-55.0%	-49.2%	-55.6%	-47.6%	-48.5%	-50.2%
2	-9.7%	-23.7%	-21.0%	-23.8%	-25.0%	-24.7%	-22.1%
3	-1.8%	-5.2%	-7.1%	-5.6%	-10.4%	-10.7%	-6.1%
4	-0.6%	-0.9%	-1.7%	-1.0%	-3.4%	-3.5%	-1.4%
5	-0.2%	-0.3%	-0.2%	-0.2%	-1.4%	-0.6%	-0.4%
	<b>Projected-harvest-(number-of-halibut):</b>						
1	6,985	8,989	981	12,366	4,738	3,520	37,578
2	8,831	15,248	1,523	21,222	6,783	5,143	58,750
3	9,603	18,952	1,792	26,294	8,097	6,101	70,839
4	9,727	19,815	1,897	27,582	8,733	6,592	74,345
5	9,766	19,934	1,925	27,790	8,913	6,789	75,117
No-Limit	9,782	19,997	1,929	27,853	9,038	6,831	75,430



# Area 2C – reverse slot limit

- ▶ Harvest forecast = 58,750

2-fish-annual-limit, harvest=58,750

Lower-Limit-(in)	Upper-Length-Limit-(in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	1.047	0.977	0.924	0.865	0.823	0.785	0.731	0.679	0.649	0.627	0.604	0.588	0.567	0.554	0.553	0.544
36	1.076	1.008	0.956	0.897	0.855	0.818	0.764	0.713	0.683	0.661	0.638	0.623	0.601	0.589	0.587	0.578
37	1.094	1.026	0.974	0.916	0.875	0.838	0.784	0.733	0.704	0.681	0.659	0.643	0.622	0.610	0.608	0.599
38	1.120	1.053	1.003	0.945	0.904	0.867	0.814	0.764	0.735	0.712	0.690	0.674	0.653	0.641	0.639	0.630
39	1.140	1.074	1.024	0.967	0.926	0.889	0.837	0.787	0.758	0.735	0.713	0.698	0.676	0.664	0.663	0.654
40	1.156	1.091	1.041	0.985	0.945	0.908	0.856	0.806	0.777	0.755	0.733	0.717	0.696	0.684	0.683	0.673
41	1.175	1.112	1.063	1.007	0.967	0.931	0.879	0.829	0.801	0.778	0.756	0.741	0.720	0.708	0.707	0.697
42	1.188	1.125	1.077	1.021	0.982	0.946	0.894	0.845	0.816	0.794	0.772	0.757	0.736	0.724	0.723	0.714
43	1.203	1.141	1.093	1.038	0.999	0.963	0.911	0.862	0.834	0.812	0.790	0.775	0.754	0.742	0.740	0.731
44	1.224	1.162	1.115	1.061	1.022	0.987	0.936	0.887	0.859	0.837	0.815	0.800	0.779	0.767	0.766	0.757
45	1.246	1.186	1.139	1.086	1.047	1.012	0.962	0.913	0.885	0.863	0.842	0.827	0.806	0.794	0.793	0.784
46	1.261	1.202	1.156	1.103	1.065	1.030	0.980	0.931	0.903	0.882	0.860	0.845	0.824	0.813	0.811	0.802
47	1.281	1.223	1.178	1.125	1.088	1.053	1.003	0.956	0.928	0.906	0.885	0.870	0.849	0.837	0.836	0.827
48	1.296	1.239	1.194	1.142	1.105	1.070	1.021	0.973	0.946	0.924	0.903	0.888	0.867	0.855	0.854	0.845
49	1.320	1.264	1.219	1.168	1.131	1.097	1.048	1.001	0.973	0.952	0.931	0.916	0.895	0.884	0.882	0.874
50	1.336	1.281	1.238	1.187	1.150	1.117	1.068	1.021	0.994	0.973	0.951	0.937	0.916	0.904	0.903	0.894

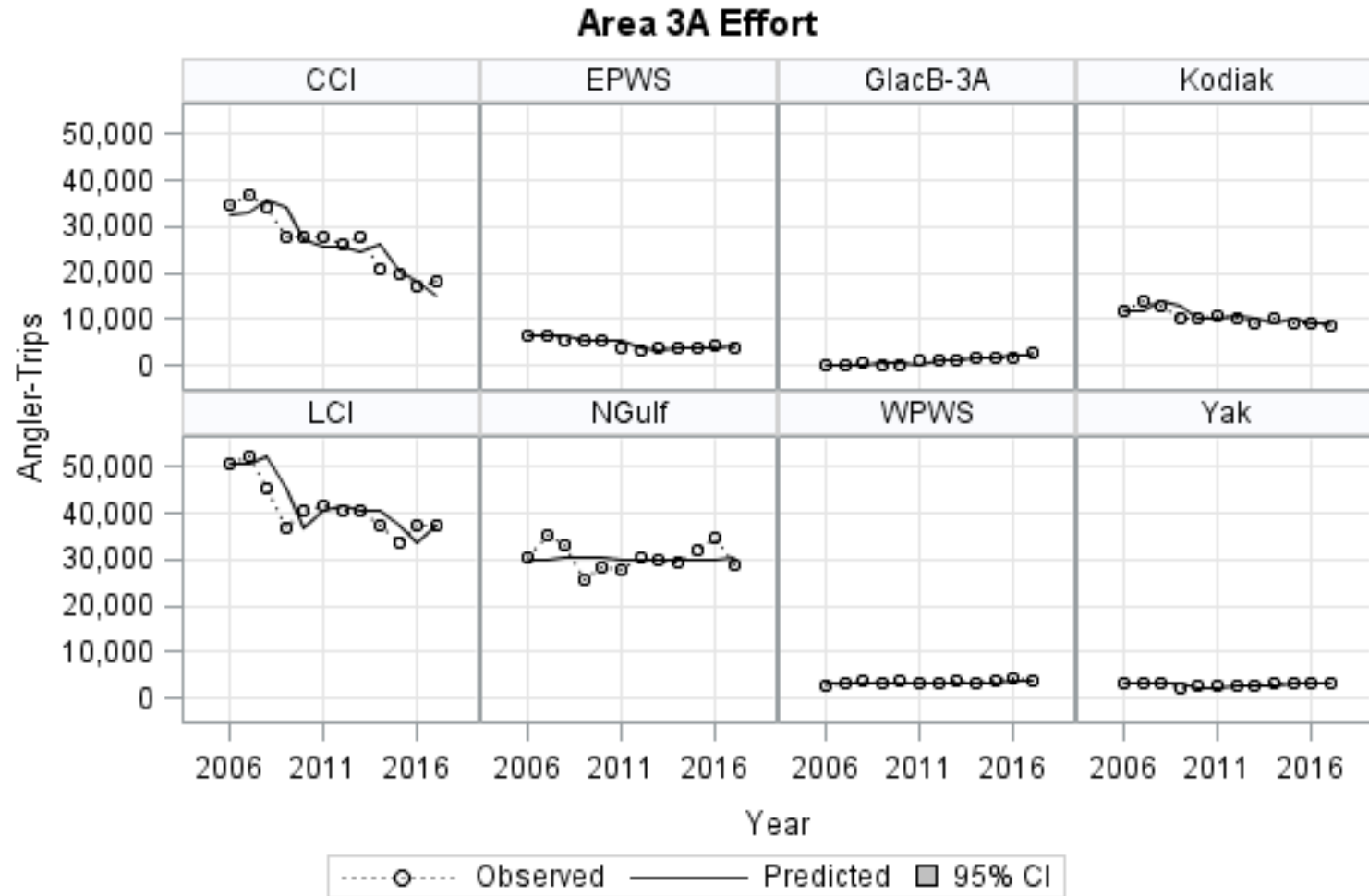
# Area 3A Measures for 2017

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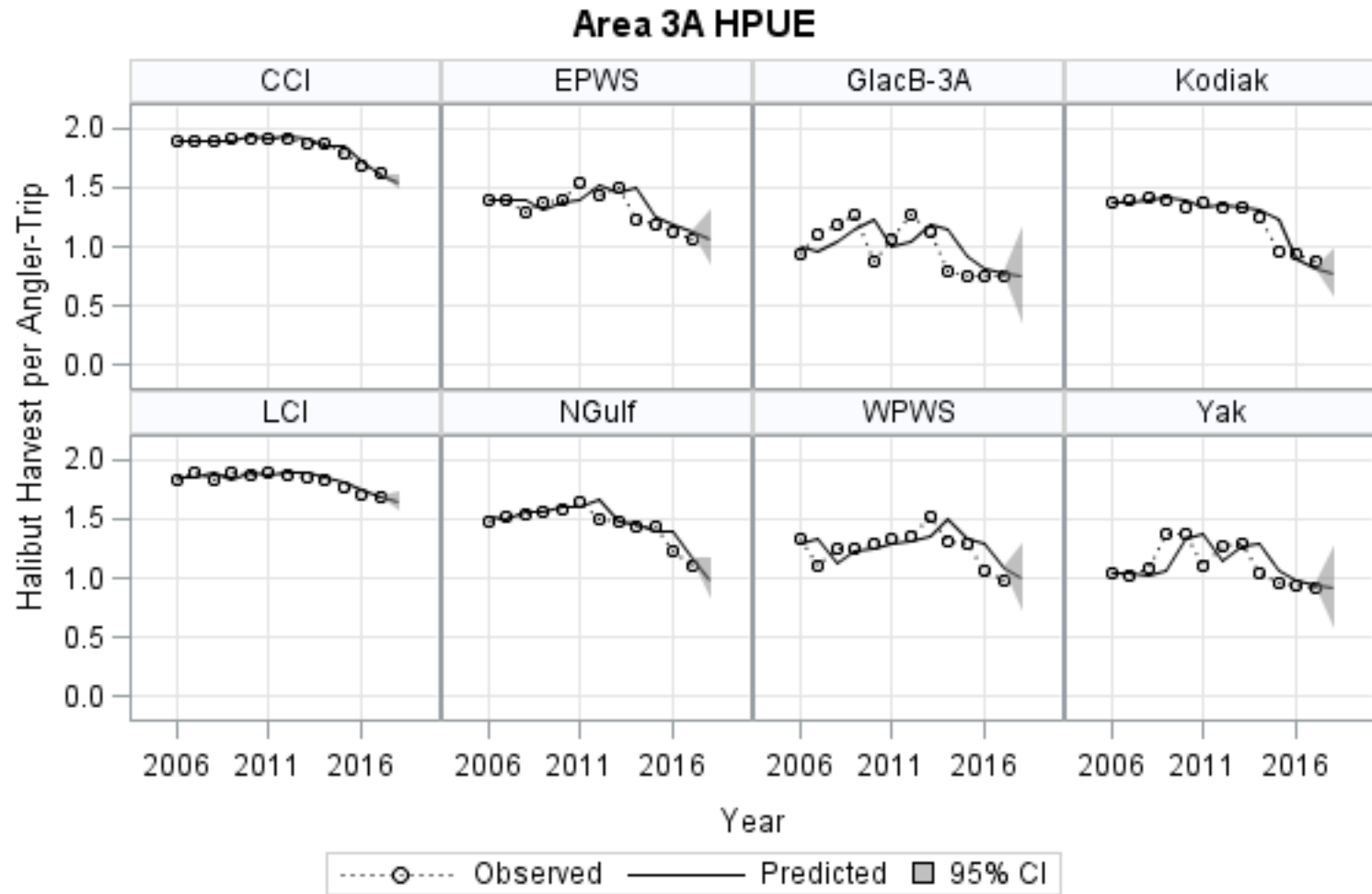
- ▶ **Status quo**
  - ▶ 2-fish bag limit/ one any size, one < 28 inches
  - ▶ Annual limit 4 fish
  - ▶ One trip per vessel per day
  - ▶ One trip per CHP per day
  - ▶ Wednesdays closed all year, three Tuesdays closed
- ▶ **Status quo plus additional closed Tuesdays June-August**
- ▶ **Status quo with reverse slot limit on one fish (+28-inch max)**
- ▶ **One fish any size**



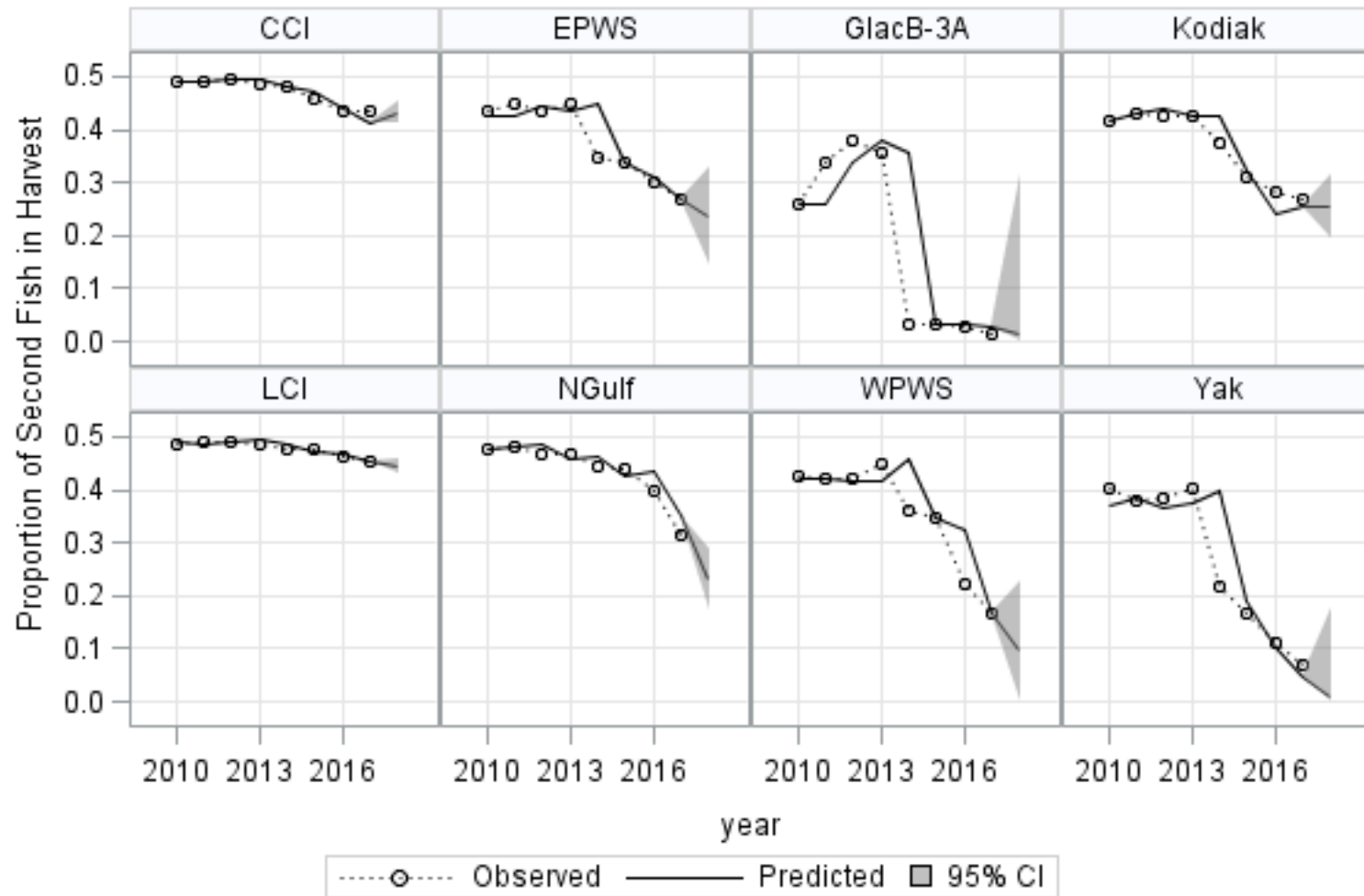
# Area 3A effort



# Area 3A HPUE



# Area 3A – Proportions of second fish





# Area 3A status quo forecast

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- ▶ Harvest forecast = 136,734

**Projected Charter Removals (Mlb)**

Size Limit (in)	Annual Limit (number of halibut)					
	2	3	4 (status quo)	5	6	No Limit
26	1.538	1.682	1.792	1.825	1.850	1.876
27	1.559	1.705	1.817	1.851	1.876	1.903
28	1.592	1.740	1.855	1.890	1.915	1.943
29	1.612	1.763	1.879	1.914	1.940	1.968
30	1.644	1.797	1.916	1.952	1.979	2.008

# Area 3A – close additional Tuesdays June-August

Number of Closed Tuesdays	Beginning and Ending Dates	Percentage reduction in harvest relative to status quo	Projected Harvest (no. Fish)	Projected Removals (Mlb)
3 (Status quo)	Jul 24 - Aug 07	0.0%	136,734	1.855
4	Jul 17 - Aug 07	-1.3%	134,986	1.830
5	Jul 17 - Aug 14	-2.5%	133,298	1.808
6	Jul 10 - Aug 14	-4.1%	131,068	1.777
7	Jul 03 - Aug 14	-5.5%	129,257	1.752
8	Jul 03 - Aug 21	-6.4%	127,977	1.736
9	Jun 26 - Aug 21	-7.6%	126,313	1.712
10	Jun 19 - Aug 21	-8.8%	124,686	1.689
11	Jun 19 - Aug 28	-9.5%	123,794	1.677
12	Jun 12 - Aug 28	-10.4%	122,449	1.659
13	Jun 05 - Aug 28	-11.2%	121,391	1.645
47 (all season)	Feb 01 - Dec 31	-13.2%	118,749	1.608

## Area 3A – close additional Tuesdays June-August

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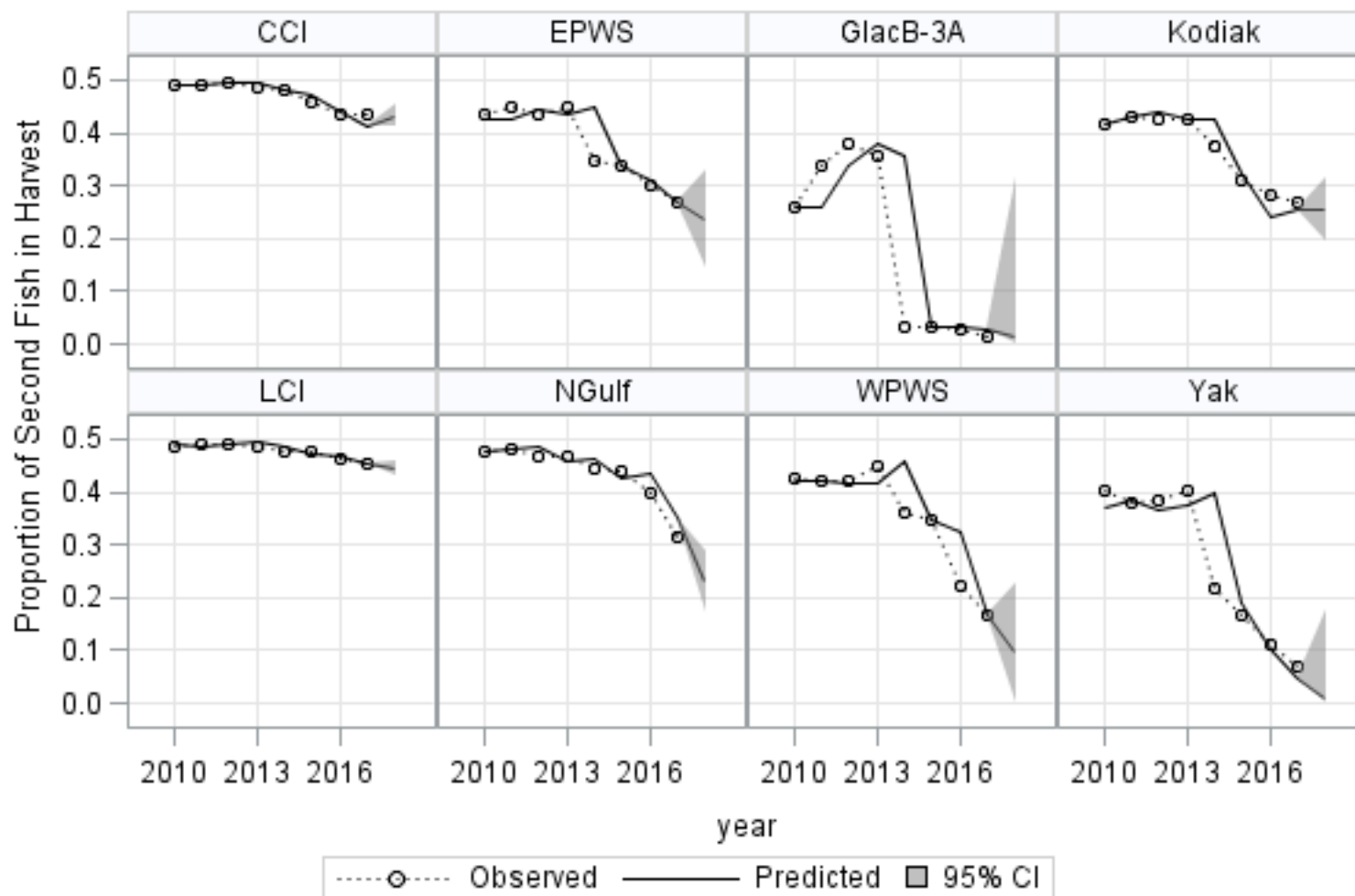
- ▶ Projected removals assume daily closures will have maximum effect, no diversion of effort to other days
- ▶ Overall effect is about 1.3-1.4% per closed day
- ▶ Preferred dates provided to maintain recent seasonal distribution of harvest

## Area 3A – Status quo + reverse slot limit

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- ▶ Equivalent to different max size limits on both fish, but opportunity to harvest exceptional fish
- ▶ Size limit on first fish could increase retention of second fish
- ▶ No experience, no way to predict harvest with confidence
- ▶ Two harvest scenarios bracket likely range of harvest
  - ▶ Low harvest scenario – same HPUE as status quo, assumes no increase in harvest of second fish
  - ▶ High harvest scenario – assumes HPUE and harvest of second fish similar to 2013.

# Area 3A – Status quo + reverse slot limit



## Area 3A – Status quo + reverse slot limit

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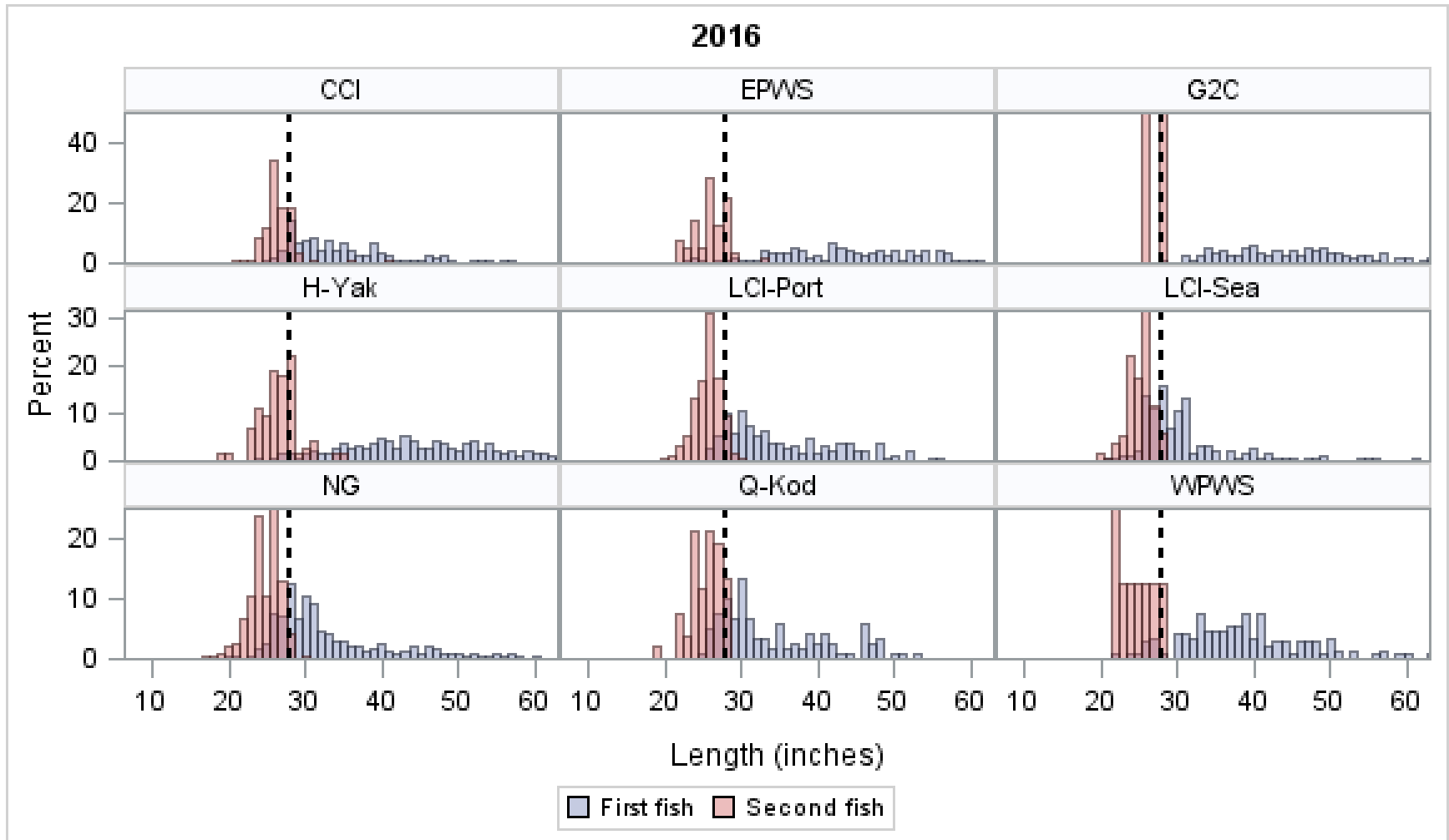
- ▶ Low harvest scenario: 136,734 fish
  - ▶ Workable lower limits from U44-O60 to U50-O80
- ▶ High harvest scenario: 176,083 fish
  - ▶ No workable size limits (lowest projection is 1.749 Mlb)

## Area 3A – One-fish bag limit (no size limit)

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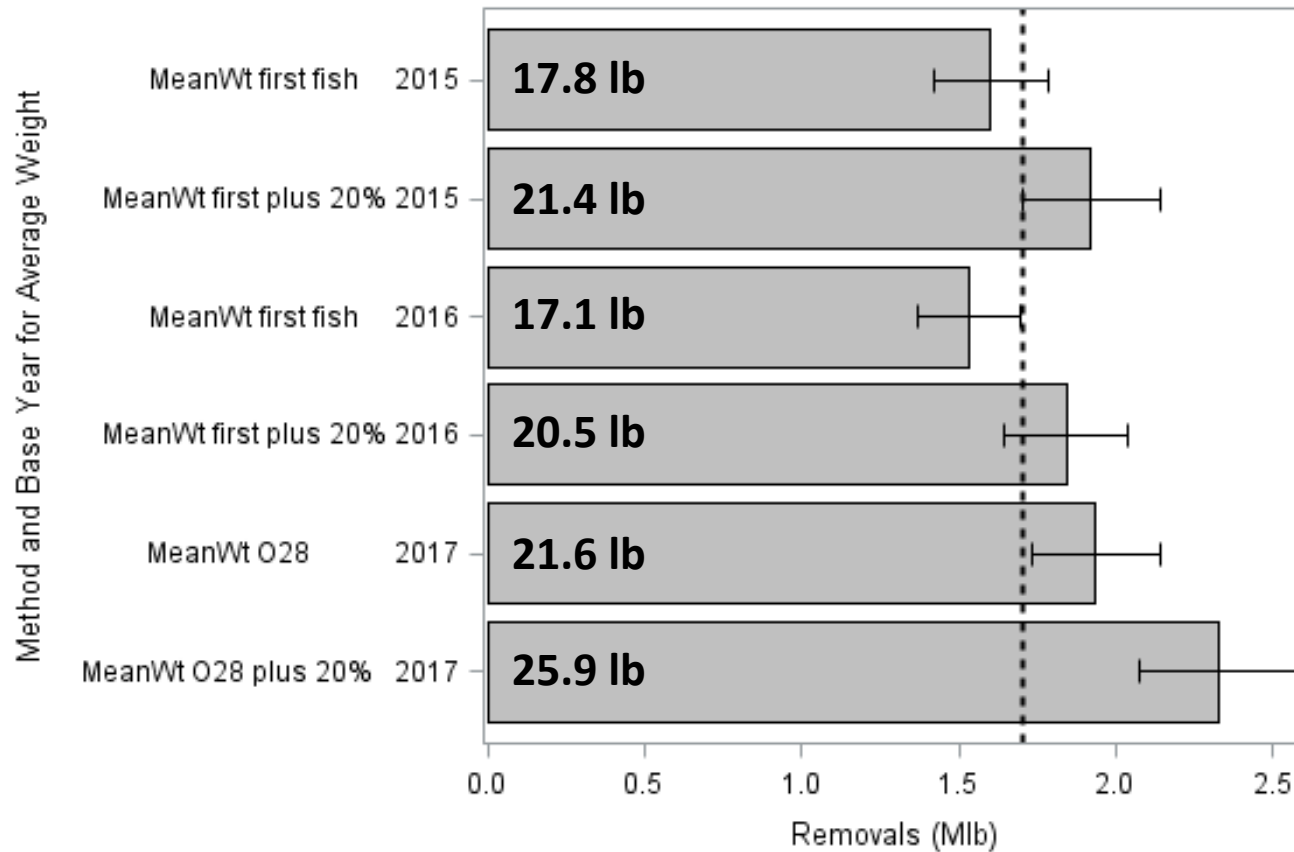
- ▶ Harvest forecast: 88,013 fish (64% of status quo)
- ▶ Not possible to estimate average weight with certainty (unknown degree of high-grading)
- ▶ Explored several options
  - ▶ Average weight of first fish in 2015
  - ▶ Average weight of first fish in 2015 + 20%
  - ▶ Average weight of first fish in 2016
  - ▶ Average weight of first fish in 2016 + 20%
  - ▶ Average weight of fish over 28 inches in 2017
  - ▶ Average weight of fish over 28 inches in 2017 + 20%

# Area 3A – One-fish bag limit (no size limit)





# Area 3A – One-fish bag limit (no size limit)



# Acknowledgements

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- ▶ Bob Powers – logbook data summaries
  - ▶ Diana Tersteeg and Mike Jaenicke – Southeast data
  - ▶ Martin Schuster – Southcentral data
  - ▶ Countless technicians – halibut measurements and angler interviews
  - ▶ Charter operators, crews, clients
- 
- ▶ Funding:
    - State of Alaska General Funds
    - DJ-WB Federal Aid in Fish Restoration
    - Fish and Game Fund

