

Analysis of Management Options for the Area 2C and 3A Charter Halibut Fisheries for 2015



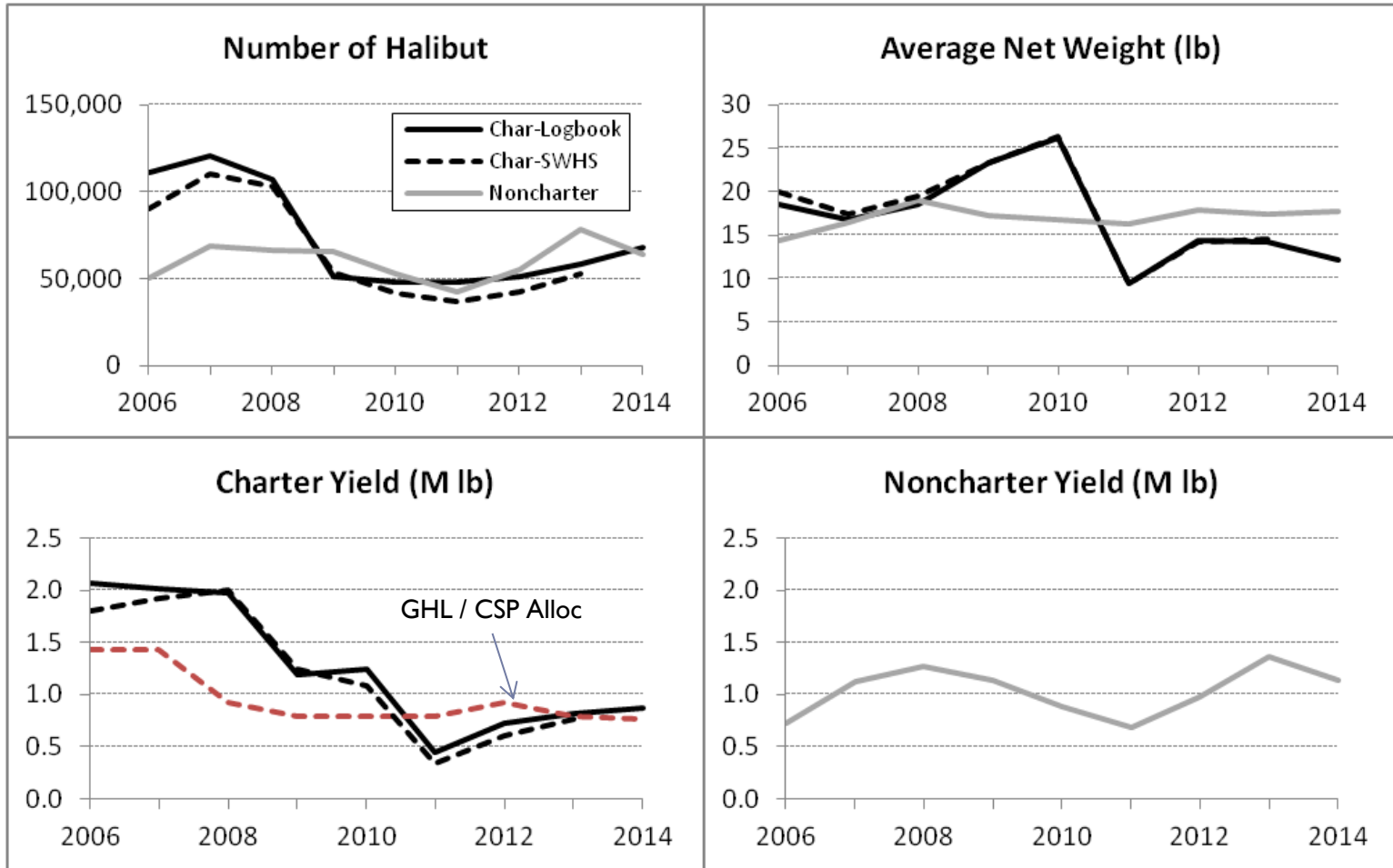
**For the North Pacific Fishery Management Council
December 2014**

Scott Meyer, Bob Powers
Alaska Department of Fish and Game

Overview

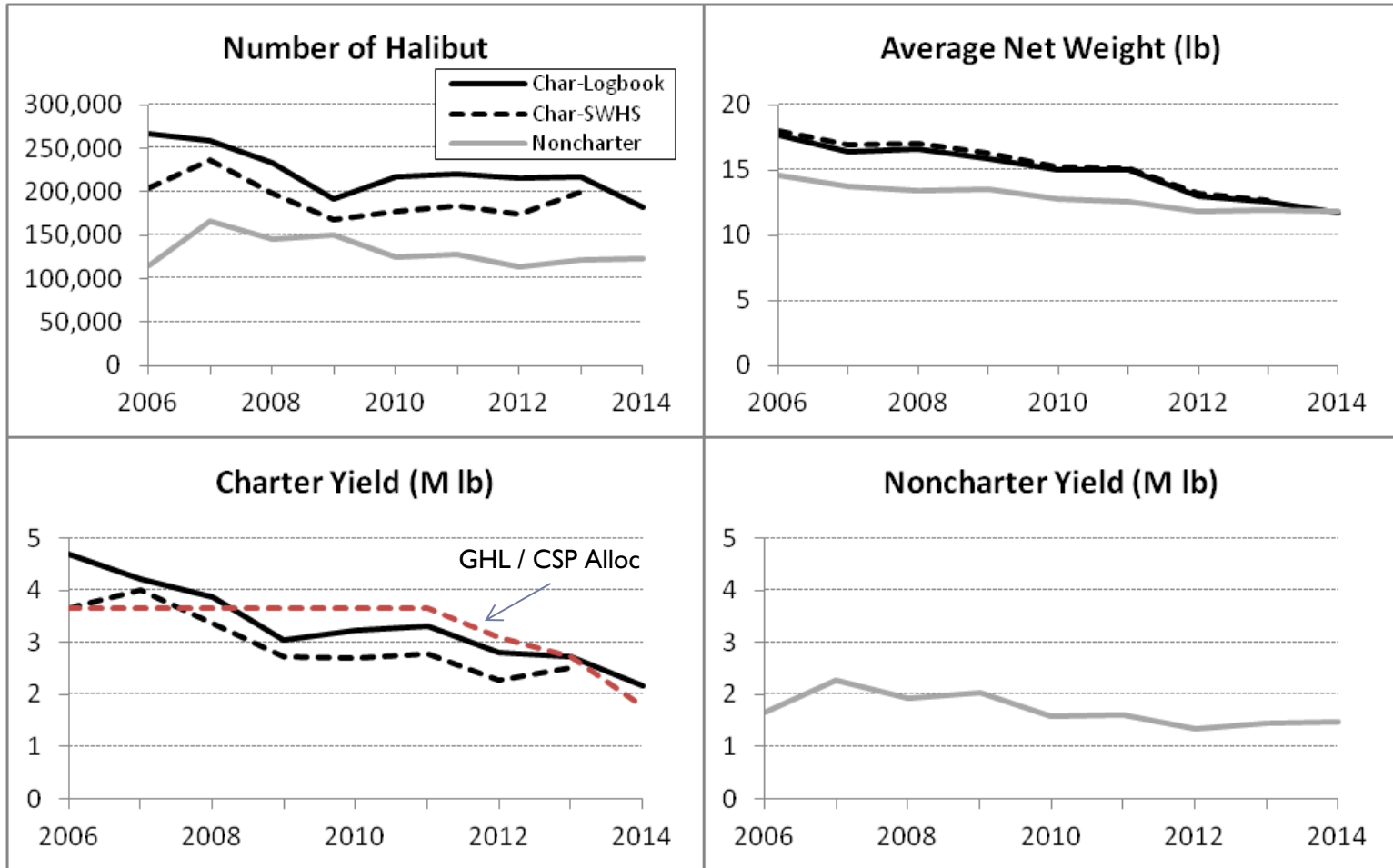
- ▶ Harvest review through 2014
- ▶ Analysis of management measures for 2015
 - ▶ Area 2C
 - ▶ Area 3A

Area 2C Sport Fishery



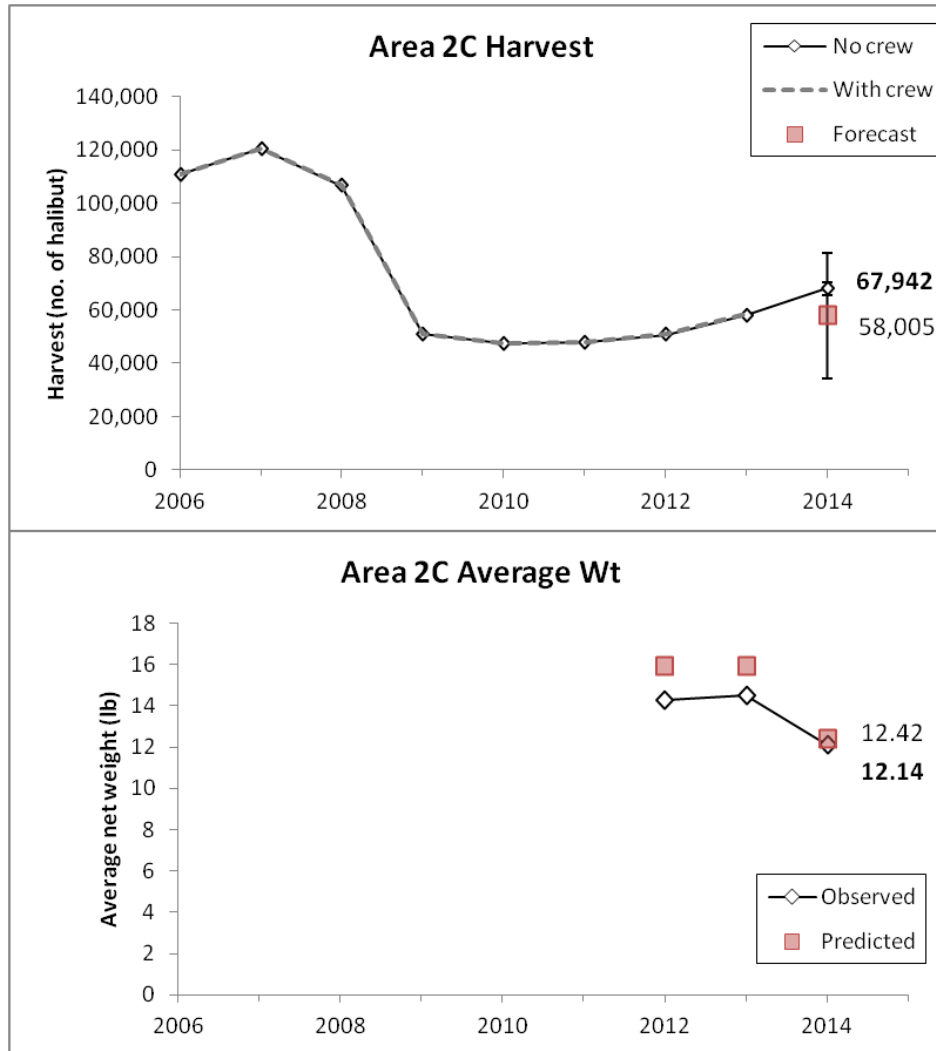
2014 charter and noncharter estimates are preliminary

Area 3A Sport Fishery

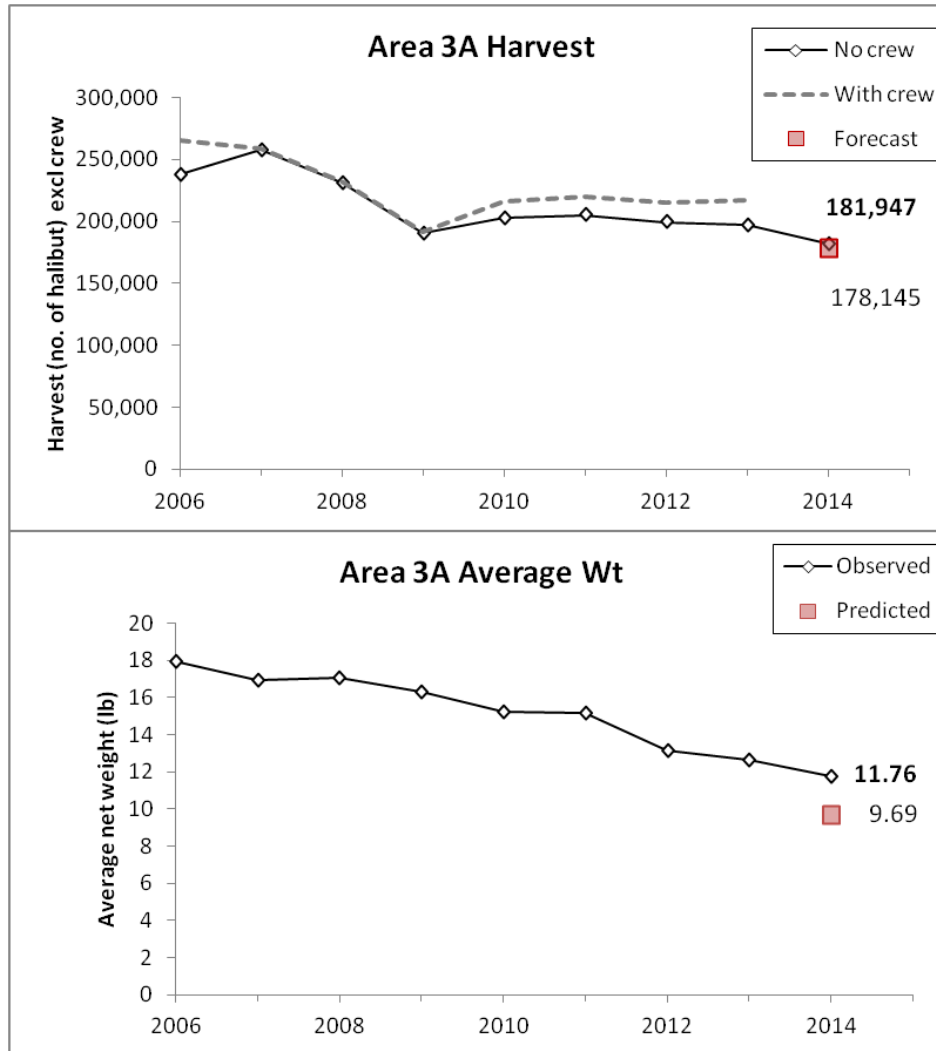


2014 charter and noncharter estimates are preliminary

Area 2C – 2014 projections and outcomes



Area 3A – 2014 projections and outcomes



+2%

+21%



Performance of Council-recommended management measures

Area	Year	Management measure	Mgmt Type	Allocation ^a (M lb)	Removals ^a (M lb)	Overage (M lb)	% Overage
2C	2012	One fish, U45-O68 rev. slot	GHL	0.931	0.605	-0.326	-35%
	2013	One fish, U45-O68 rev. slot	GHL	0.788	0.762	-0.026	-3%
	2014	One fish, U44-O76 rev. slot	CSP	0.761	0.871	0.110	14%
3A	2012	Two fish any size	GHL	3.103	2.284	-0.819	-26%
	2013	Two fish any size	GHL	2.734	2.514	-0.220	-8%
	2014	Two fish, one < 29", trip limit	CSP	1.780	2.173	0.413	23%

^a - Allocations and harvest include O26 release mortality beginning with the CSP in 2014.

Area 2C Measures for 2015 (1-fish bag limit)

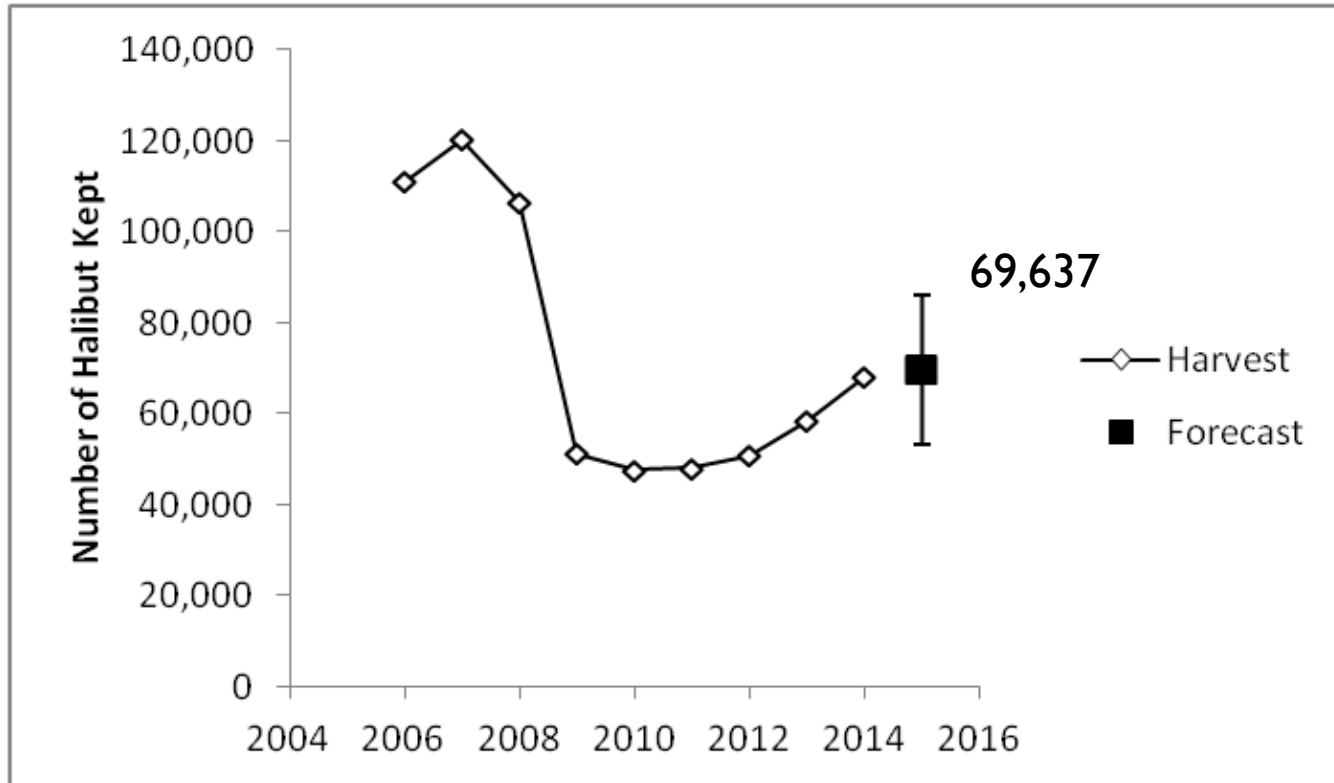
- ▶ Maximum size limit, annual limit
- ▶ Reverse (protected) slot limit, annual limit
- ▶ Day of the week closure (low priority, not analyzed)

- ▶ IPHC 'Blue Line' allocation is 0.79 Mlb

Area 2C – harvest forecast

- ▶ Forecasts based on logbook data excluding crew harvest
- ▶ Best exponentially-weighted (simple or double) smoother
 - ▶ Forecast from harvest time series
 - ▶ Forecast from effort and HPUE time series (preferred)

Area 2C – harvest forecast



Area 2C – effect of annual limits

Annual Limit	Subarea						Area 2C
	Ketch	PWI	Pburg	Sitka	Jun	GlacB	
Estimated percent of anglers affected by the annual limit:							
1	26.9%	75.0%	58.0%	67.2%	40.9%	64.0%	58.7%
2	11.6%	54.6%	34.2%	36.6%	25.0%	44.8%	36.7%
3	2.6%	20.3%	16.8%	9.0%	12.4%	29.0%	14.2%
4	0.7%	4.3%	6.9%	1.2%	4.8%	16.5%	4.6%
5	0.4%	1.4%	0.6%	0.3%	1.2%	7.6%	1.7%
Estimated percent change in harvest:							
1	-29.7%	-61.0%	-54.2%	-53.4%	-45.9%	-63.4%	-53.7%
2	-10.8%	-31.8%	-27.7%	-22.1%	-23.8%	-40.1%	-26.6%
3	-2.7%	-10.5%	-12.0%	-5.0%	-10.2%	-23.7%	-9.9%
4	-0.9%	-2.7%	-4.3%	-0.8%	-3.5%	-13.1%	-3.6%
5	-0.3%	-1.0%	-1.2%	-0.2%	-0.9%	-7.0%	-1.6%
Projected harvest (number of halibut):							
1	4,958	7,013	889	11,137	4,272	3,968	32,237
2	6,290	12,269	1,405	18,622	6,020	6,506	51,113
3	6,865	16,098	1,709	22,701	7,088	8,285	62,744
4	6,992	17,519	1,858	23,708	7,619	9,436	67,133
5	7,028	17,817	1,920	23,843	7,823	10,093	68,523
None	7,052	17,996	1,943	23,896	7,896	10,855	69,637

Area 2C – maximum size limit

Prediction error (predicted relative to observed):

Subarea	2011	2012	2013	2014
Ketch	1.7%	5.7%	2.6%	0.7%
PWI	-4.8%	-7.1%	-22.7%	-4.0%
Pburg	-19.7%	8.7%	10.9%	12.5%
Sitka	15.4%	10.6%	14.9%	13.2%
Jun	5.7%	-1.4%	3.2%	11.4%
GlacB	9.4%	6.7%	16.9%	17.3%
Area 2C	5.5%	4.3%	2.5%	8.8%

Area 2C – maximum size limit

A. Projected total removals including release mortality (M lb).

Size limit (inches)	Annual Limit					
	1	2	3	4	5	None
30	0.222	0.351	0.431	0.461	0.470	0.478
31	0.239	0.377	0.463	0.495	0.505	0.513
32	0.260	0.411	0.504	0.539	0.550	0.560
33	0.274	0.433	0.530	0.567	0.579	0.589
34	0.291	0.459	0.562	0.601	0.614	0.625
35	0.304	0.480	0.588	0.629	0.642	0.653
36	0.325	0.513	0.627	0.671	0.686	0.697
37	0.339	0.534	0.653	0.699	0.714	0.726
38	0.359	0.565	0.691	0.740	0.756	0.769
39	0.373	0.588	0.718	0.769	0.786	0.800
40	0.386	0.608	0.744	0.796	0.814	0.829
41	0.402	0.633	0.774	0.829	0.848	0.863
42	0.414	0.651	0.796	0.853	0.872	0.889
43	0.426	0.671	0.820	0.878	0.899	0.916
44	0.441	0.695	0.850	0.911	0.932	0.950
45	0.459	0.722	0.883	0.946	0.968	0.987
46	0.471	0.742	0.906	0.971	0.994	1.014
47	0.487	0.767	0.938	1.005	1.029	1.049
48	0.498	0.785	0.959	1.028	1.052	1.073
49	0.517	0.814	0.996	1.067	1.093	1.116
50	0.531	0.837	1.024	1.098	1.125	1.149
51	0.546	0.861	1.052	1.128	1.156	1.180
52	0.565	0.892	1.090	1.170	1.199	1.224
53	0.578	0.912	1.115	1.196	1.226	1.252
54	0.595	0.940	1.149	1.232	1.263	1.290
55	0.610	0.964	1.178	1.263	1.295	1.322



Area 2C – reverse slot limit

Average Weight Under Reverse Slot Limits (lb)							Prediction Error in Average Weight (predicted relative to observed)		
Subarea	2012 (U45068)		2013 (U45068)		2014 (U44076)		2012	2013	2014
	Predicted	Observed	Predicted	Observed	Predicted	Observed			
Ketch	14.66	13.78	14.66	14.02	13.69	13.59	6.4%	4.6%	0.7%
PWI	10.55	10.56	10.55	12.17	9.30	9.42	0.0%	-13.2%	-1.2%
Pburg	22.67	21.57	22.67	20.29	20.29	18.03	5.1%	11.7%	12.5%
Sitka	15.23	13.25	15.23	12.56	13.50	11.61	14.9%	21.2%	16.2%
Jun	13.71	13.68	13.71	12.48	12.53	11.25	0.2%	9.8%	11.4%
GlacB	28.09	22.22	28.09	20.86	23.46	16.36	26.4%	34.7%	43.4%
Area 2C	16.06	14.27	15.87	14.47	14.10	12.14	12.6%	9.7%	16.1%

Area 2C – reverse slot limit

Method	Total Charter Removals Under Annual Limits					
	1	2	3	4	5	None
Standard method based on 2010 data	0.473	0.747	0.916	0.985	1.010	1.033
Empirical – uses average weight from 2014	0.413	0.651	0.796	0.853	0.873	0.891
Percent difference relative to empirical	14.5%	14.8%	15.1%	15.4%	15.6%	16.0%



Area 2C – reverse slot limit

No annual limit, harvest = 69,637 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	1.439	1.358	1.285	1.204	1.139	1.080	1.004	0.927	0.886	0.849	0.811	0.789	0.759	0.739	0.736	0.718
36	1.476	1.396	1.324	1.245	1.180	1.122	1.046	0.969	0.929	0.893	0.854	0.832	0.803	0.783	0.780	0.762
37	1.499	1.421	1.349	1.271	1.207	1.149	1.073	0.997	0.957	0.921	0.883	0.861	0.832	0.812	0.808	0.791
38	1.534	1.457	1.387	1.309	1.247	1.189	1.114	1.039	0.999	0.963	0.925	0.904	0.875	0.855	0.851	0.834
39	1.560	1.484	1.414	1.337	1.275	1.218	1.144	1.069	1.029	0.993	0.955	0.934	0.905	0.885	0.882	0.864
40	1.582	1.507	1.439	1.363	1.301	1.244	1.171	1.096	1.057	1.021	0.984	0.962	0.933	0.914	0.910	0.893
41	1.610	1.536	1.469	1.393	1.333	1.277	1.203	1.130	1.090	1.055	1.018	0.996	0.968	0.948	0.945	0.928
42	1.629	1.557	1.490	1.415	1.355	1.300	1.227	1.154	1.115	1.080	1.043	1.021	0.993	0.973	0.970	0.953
43	1.650	1.579	1.513	1.439	1.380	1.325	1.252	1.180	1.141	1.106	1.069	1.048	1.019	1.000	0.996	0.980
44	1.677	1.607	1.542	1.469	1.410	1.356	1.284	1.212	1.174	1.139	1.102	1.081	1.053	1.033	1.030	1.013
45	1.707	1.638	1.575	1.503	1.445	1.391	1.320	1.248	1.210	1.176	1.139	1.118	1.090	1.070	1.067	1.050
46	1.728	1.660	1.597	1.526	1.469	1.415	1.345	1.274	1.236	1.202	1.165	1.144	1.116	1.097	1.093	1.077
47	1.756	1.690	1.628	1.557	1.501	1.448	1.378	1.308	1.270	1.236	1.200	1.179	1.151	1.132	1.129	1.112
48	1.775	1.709	1.648	1.578	1.522	1.470	1.400	1.331	1.293	1.259	1.223	1.202	1.174	1.155	1.152	1.135
49	1.808	1.744	1.684	1.616	1.561	1.509	1.441	1.371	1.334	1.301	1.265	1.244	1.216	1.197	1.194	1.178
50	1.834	1.771	1.712	1.645	1.590	1.539	1.472	1.403	1.366	1.333	1.297	1.277	1.249	1.230	1.227	1.211

Area 2C – reverse slot limit

No annual limit, harvest = 69,637 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	1.439	1.358	1.285	1.204	1.139	1.080	1.004	0.927	0.886	0.849	0.811	0.789	0.759	0.739	0.736	0.718
36	1.476	1.396	1.324	1.245	1.180	1.122	1.046	0.969	0.929	0.893	0.854	0.832	0.803	0.783	0.780	0.762
37	1.499	1.421	1.349	1.271	1.207	1.149	1.073	0.997	0.957	0.921	0.883	0.861	0.832	0.812	0.808	0.791
38	1.534	1.457	1.387	1.309	1.247	1.189	1.114	1.039	0.999	0.963	0.925	0.904	0.875	0.855	0.851	0.834
39	1.560	1.484	1.414	1.337	1.275	1.218	1.144	1.069	1.029	0.993	0.955	0.934	0.905	0.885	0.882	0.864
40	1.582	1.507	1.439	1.363	1.301	1.244	1.171	1.096	1.057	1.021	0.984	0.962	0.933	0.914	0.910	0.893
41	1.610	1.536	1.469	1.393	1.333	1.277	1.203	1.130	1.090	1.055	1.018	0.996	0.968	0.948	0.945	0.928
42	1.629	1.557	1.490	1.415	1.355	1.300	1.227	1.154	1.115	1.080	1.043	1.021	0.993	0.973	0.970	0.953
43	1.650	1.579	1.513	1.439	1.380	1.325	1.252	1.180	1.141	1.106	1.069	1.048	1.019	1.000	0.996	0.980
44	1.677	1.607	1.542	1.469	1.410	1.356	1.284	1.212	1.174	1.139	1.102	1.081	1.053	1.033	1.030	1.013
45	1.707	1.638	1.575	1.503	1.445	1.391	1.320	1.248	1.210	1.176	1.139	1.118	1.090	1.070	1.067	1.050
46	1.728	1.660	1.597	1.526	1.469	1.415	1.345	1.274	1.236	1.202	1.165	1.144	1.116	1.097	1.093	1.077
47	1.756	1.690	1.628	1.557	1.501	1.448	1.378	1.308	1.270	1.236	1.200	1.179	1.151	1.132	1.129	1.112
48	1.775	1.709	1.648	1.578	1.522	1.470	1.400	1.331	1.293	1.259	1.223	1.202	1.174	1.155	1.152	1.135
49	1.808	1.744	1.684	1.616	1.561	1.509	1.441	1.371	1.334	1.301	1.265	1.244	1.216	1.197	1.194	1.178
50	1.834	1.771	1.712	1.645	1.590	1.539	1.472	1.403	1.366	1.333	1.297	1.277	1.249	1.230	1.227	1.211



Area 2C – reverse slot limit

5-fish annual limit, harvest = 68,523 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	1.402	1.324	1.252	1.173	1.110	1.053	0.979	0.904	0.864	0.829	0.792	0.771	0.742	0.723	0.720	0.703
36	1.439	1.361	1.291	1.213	1.151	1.094	1.021	0.946	0.907	0.872	0.835	0.814	0.785	0.766	0.763	0.747
37	1.462	1.385	1.316	1.238	1.177	1.121	1.048	0.974	0.934	0.900	0.863	0.842	0.813	0.794	0.791	0.775
38	1.496	1.421	1.352	1.276	1.216	1.160	1.088	1.015	0.975	0.941	0.905	0.883	0.855	0.836	0.833	0.817
39	1.521	1.447	1.379	1.304	1.243	1.188	1.116	1.044	1.005	0.971	0.934	0.913	0.885	0.866	0.863	0.846
40	1.543	1.470	1.403	1.328	1.269	1.214	1.143	1.071	1.032	0.998	0.962	0.941	0.913	0.894	0.891	0.874
41	1.570	1.498	1.432	1.358	1.299	1.246	1.174	1.103	1.065	1.031	0.995	0.974	0.946	0.927	0.924	0.908
42	1.589	1.518	1.453	1.380	1.321	1.268	1.197	1.126	1.088	1.055	1.019	0.998	0.970	0.952	0.948	0.932
43	1.609	1.540	1.475	1.403	1.345	1.292	1.222	1.152	1.114	1.080	1.045	1.024	0.996	0.978	0.974	0.958
44	1.636	1.567	1.504	1.432	1.375	1.323	1.253	1.184	1.146	1.113	1.077	1.056	1.029	1.010	1.007	0.991
45	1.665	1.598	1.536	1.465	1.409	1.357	1.288	1.219	1.181	1.148	1.113	1.092	1.065	1.046	1.043	1.027
46	1.686	1.619	1.558	1.488	1.432	1.381	1.312	1.244	1.206	1.173	1.138	1.118	1.091	1.072	1.069	1.053
47	1.713	1.648	1.587	1.519	1.464	1.413	1.345	1.277	1.240	1.207	1.172	1.152	1.125	1.106	1.103	1.087
48	1.731	1.667	1.607	1.539	1.485	1.434	1.367	1.299	1.262	1.230	1.195	1.175	1.147	1.129	1.126	1.110
49	1.764	1.702	1.643	1.576	1.522	1.472	1.406	1.339	1.302	1.270	1.236	1.215	1.188	1.170	1.167	1.151
50	1.789	1.727	1.670	1.604	1.551	1.502	1.436	1.369	1.333	1.301	1.267	1.247	1.220	1.202	1.199	1.183

4-fish annual limit, harvest = 67,133 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	1.364	1.288	1.218	1.141	1.080	1.025	0.953	0.880	0.841	0.808	0.772	0.751	0.723	0.705	0.702	0.686
36	1.400	1.324	1.256	1.180	1.119	1.065	0.993	0.922	0.883	0.850	0.814	0.793	0.766	0.747	0.744	0.729
37	1.422	1.348	1.280	1.205	1.145	1.091	1.020	0.948	0.910	0.877	0.841	0.821	0.793	0.775	0.772	0.756
38	1.456	1.383	1.316	1.241	1.183	1.129	1.059	0.988	0.950	0.917	0.882	0.861	0.834	0.815	0.812	0.797
39	1.480	1.408	1.342	1.268	1.210	1.157	1.087	1.016	0.978	0.946	0.911	0.890	0.863	0.845	0.842	0.826
40	1.502	1.431	1.365	1.292	1.235	1.182	1.112	1.043	1.005	0.972	0.938	0.917	0.890	0.872	0.869	0.853
41	1.528	1.458	1.394	1.321	1.264	1.212	1.143	1.074	1.037	1.004	0.970	0.949	0.922	0.904	0.901	0.886
42	1.546	1.477	1.414	1.342	1.286	1.234	1.166	1.097	1.059	1.027	0.993	0.973	0.945	0.928	0.924	0.909
43	1.566	1.498	1.435	1.365	1.309	1.258	1.189	1.121	1.084	1.052	1.018	0.998	0.970	0.953	0.950	0.934
44	1.592	1.525	1.463	1.394	1.338	1.288	1.220	1.152	1.115	1.083	1.050	1.029	1.002	0.985	0.982	0.966
45	1.621	1.555	1.495	1.426	1.371	1.321	1.254	1.187	1.150	1.118	1.085	1.065	1.038	1.020	1.017	1.002
46	1.641	1.576	1.516	1.448	1.394	1.344	1.278	1.211	1.174	1.143	1.109	1.089	1.063	1.045	1.042	1.027
47	1.667	1.604	1.545	1.478	1.424	1.375	1.309	1.243	1.207	1.176	1.142	1.122	1.096	1.078	1.075	1.060
48	1.685	1.623	1.564	1.498	1.445	1.396	1.330	1.265	1.229	1.198	1.164	1.144	1.118	1.100	1.097	1.082
49	1.717	1.656	1.599	1.533	1.481	1.433	1.368	1.303	1.267	1.237	1.204	1.184	1.157	1.140	1.137	1.122
50	1.741	1.681	1.625	1.560	1.509	1.461	1.397	1.333	1.297	1.267	1.234	1.214	1.188	1.171	1.168	1.153

Area 2C – reverse slot limit

3-fish annual limit, harvest = 62,744 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	1.265	1.194	1.129	1.057	1.001	0.950	0.883	0.817	0.780	0.750	0.717	0.698	0.672	0.656	0.653	0.639
36	1.298	1.228	1.164	1.093	1.038	0.988	0.922	0.855	0.819	0.789	0.757	0.737	0.712	0.695	0.692	0.679
37	1.320	1.250	1.187	1.116	1.062	1.012	0.946	0.880	0.844	0.814	0.782	0.763	0.737	0.721	0.718	0.704
38	1.351	1.283	1.220	1.151	1.097	1.048	0.982	0.917	0.882	0.851	0.820	0.801	0.775	0.759	0.756	0.742
39	1.374	1.307	1.245	1.176	1.122	1.074	1.009	0.944	0.908	0.878	0.847	0.828	0.802	0.786	0.783	0.769
40	1.394	1.328	1.267	1.198	1.145	1.097	1.033	0.968	0.933	0.903	0.872	0.853	0.827	0.811	0.808	0.795
41	1.418	1.353	1.293	1.226	1.173	1.125	1.061	0.997	0.962	0.933	0.902	0.883	0.857	0.841	0.838	0.825
42	1.435	1.371	1.311	1.245	1.193	1.145	1.082	1.018	0.983	0.954	0.923	0.904	0.879	0.863	0.860	0.846
43	1.454	1.390	1.332	1.265	1.214	1.167	1.104	1.041	1.006	0.977	0.946	0.927	0.902	0.886	0.883	0.870
44	1.478	1.416	1.358	1.293	1.242	1.195	1.133	1.070	1.035	1.006	0.976	0.957	0.932	0.916	0.913	0.900
45	1.505	1.444	1.387	1.323	1.272	1.226	1.164	1.102	1.068	1.039	1.008	0.990	0.965	0.949	0.946	0.933
46	1.523	1.463	1.407	1.343	1.294	1.248	1.186	1.125	1.091	1.062	1.031	1.013	0.988	0.972	0.970	0.956
47	1.548	1.489	1.434	1.371	1.322	1.277	1.216	1.155	1.121	1.092	1.062	1.044	1.019	1.003	1.000	0.987
48	1.565	1.507	1.452	1.390	1.341	1.297	1.236	1.175	1.141	1.113	1.083	1.064	1.040	1.024	1.021	1.008
49	1.595	1.538	1.484	1.423	1.375	1.331	1.270	1.210	1.177	1.149	1.119	1.101	1.076	1.060	1.058	1.044
50	1.617	1.561	1.508	1.447	1.400	1.357	1.297	1.238	1.204	1.176	1.147	1.128	1.104	1.088	1.086	1.073

2-fish annual limit, harvest = 51,113 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	1.027	0.969	0.915	0.857	0.812	0.771	0.717	0.663	0.634	0.609	0.583	0.567	0.546	0.533	0.531	0.520
36	1.055	0.997	0.945	0.887	0.842	0.803	0.749	0.695	0.666	0.641	0.616	0.600	0.579	0.566	0.564	0.553
37	1.072	1.015	0.963	0.906	0.862	0.823	0.769	0.716	0.686	0.662	0.636	0.621	0.600	0.587	0.585	0.574
38	1.098	1.042	0.991	0.935	0.891	0.852	0.799	0.746	0.717	0.693	0.667	0.652	0.631	0.618	0.616	0.605
39	1.117	1.062	1.011	0.955	0.912	0.873	0.821	0.768	0.739	0.715	0.690	0.674	0.653	0.641	0.639	0.628
40	1.133	1.079	1.029	0.974	0.931	0.892	0.840	0.788	0.759	0.735	0.710	0.695	0.674	0.661	0.659	0.649
41	1.153	1.100	1.051	0.996	0.954	0.916	0.864	0.812	0.783	0.760	0.735	0.719	0.699	0.686	0.684	0.673
42	1.167	1.115	1.066	1.012	0.970	0.932	0.880	0.829	0.801	0.777	0.752	0.737	0.716	0.704	0.702	0.691
43	1.182	1.131	1.082	1.029	0.987	0.950	0.898	0.847	0.819	0.796	0.771	0.756	0.735	0.723	0.721	0.710
44	1.202	1.151	1.104	1.051	1.010	0.973	0.922	0.871	0.843	0.820	0.795	0.780	0.759	0.747	0.745	0.735
45	1.225	1.175	1.128	1.076	1.035	0.998	0.948	0.898	0.870	0.847	0.822	0.807	0.787	0.774	0.772	0.762
46	1.240	1.191	1.145	1.093	1.053	1.016	0.966	0.916	0.889	0.865	0.841	0.826	0.806	0.794	0.791	0.781
47	1.260	1.212	1.167	1.115	1.076	1.040	0.990	0.941	0.913	0.890	0.866	0.851	0.831	0.819	0.817	0.806
48	1.274	1.227	1.182	1.131	1.092	1.056	1.007	0.958	0.930	0.907	0.883	0.868	0.848	0.836	0.834	0.824
49	1.298	1.251	1.208	1.157	1.119	1.084	1.035	0.986	0.959	0.936	0.912	0.898	0.877	0.865	0.863	0.853
50	1.316	1.270	1.227	1.178	1.140	1.105	1.057	1.008	0.981	0.959	0.935	0.920	0.900	0.888	0.886	0.876

Area 3A Measures for 2015 (2-fish bag limit)

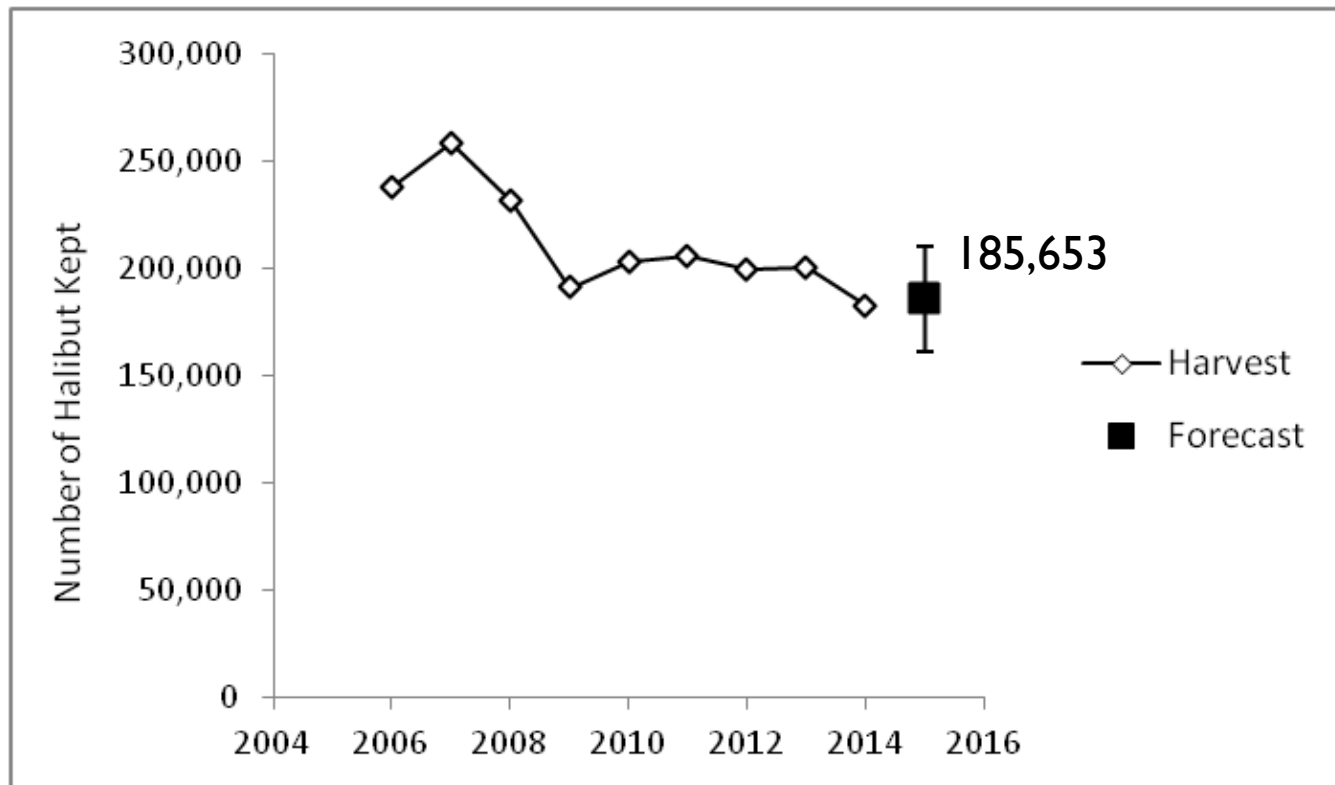
- ▶ Maximum size limit on one fish, annual limit
- ▶ Day of the week closure
- ▶ Reverse (protected) slot limit on both fish, annual limit
- ▶ Max size limit & reverse slot (low priority, not analyzed)

- ▶ IPHC 'Blue Line' allocation is 1.89 Mlb

Area 3A – harvest forecast

- ▶ Forecasts based on logbook data excluding crew harvest
- ▶ Best exponentially-weighted (simple or double) smoother
 - ▶ Forecast from harvest time series
 - ▶ Forecast effort and HPUE
 - ▶ Include 2014 HPUE for status quo (29” size limit)
 - ▶ Exclude 2014 HPUE for considering other size limits

Area 3A – harvest forecast



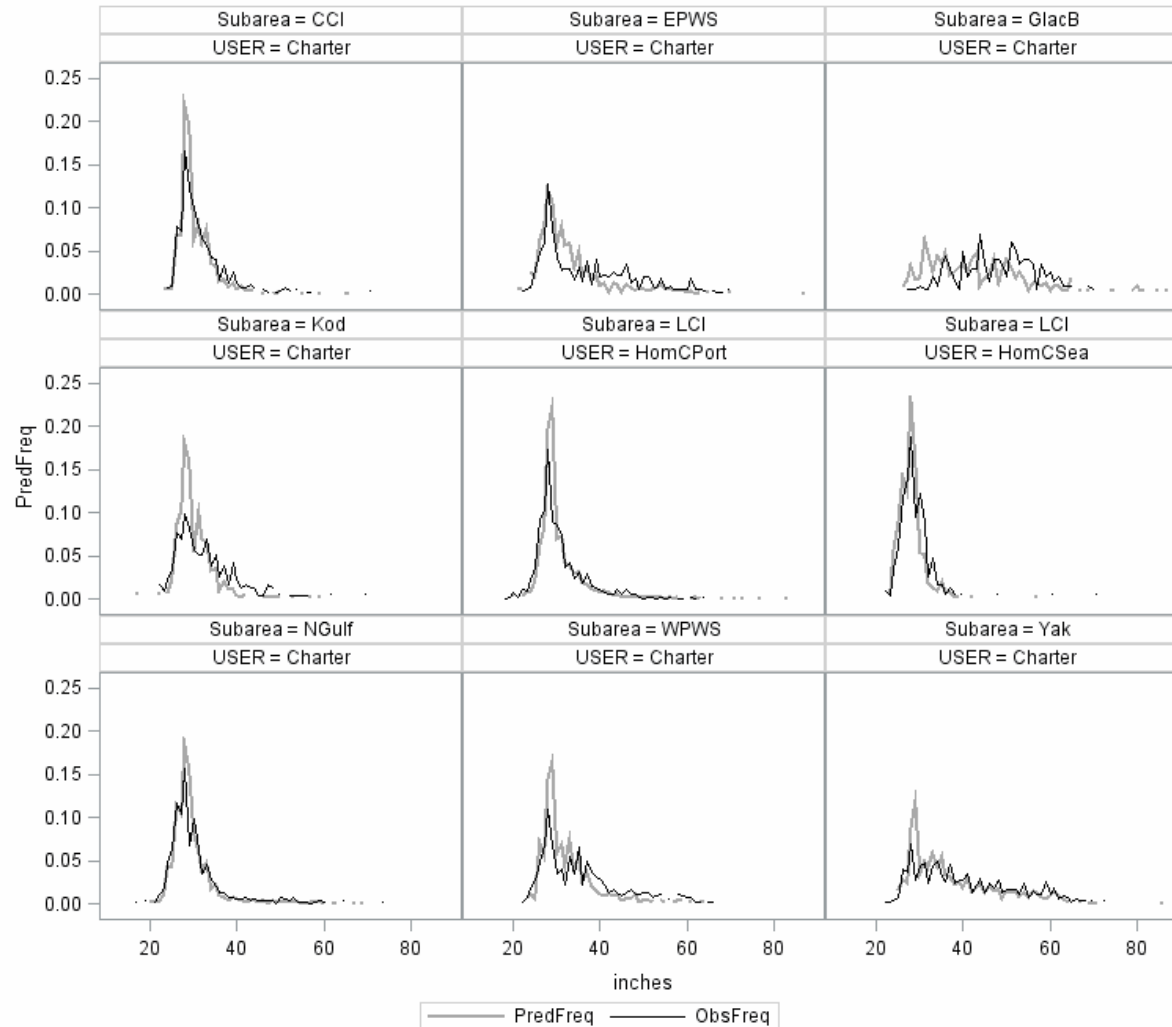
Area 3A – effect of annual limits

Annual Limit	Subarea								
	CCI	EPWS	GlacBay	Yak	LCI	NGulf	Kod	WPWS	Area 3A
Estimated percent change in harvest:									
1	-59.3%	-51.7%	-59.2%	-58.8%	-59.7%	-54.7%	-69.0%	-51.8%	-58.6%
2	-20.1%	-11.3%	-30.8%	-26.8%	-21.0%	-14.3%	-42.3%	-10.0%	-20.4%
3	-12.9%	-6.1%	-16.3%	-13.9%	-12.9%	-8.5%	-29.1%	-4.5%	-12.6%
4	-6.2%	-2.1%	-6.0%	-5.4%	-5.4%	-3.6%	-18.1%	-0.6%	-5.8%
5	-4.2%	-1.3%	-2.6%	-2.5%	-3.6%	-2.2%	-11.6%	-0.3%	-3.8%
6	-2.5%	-0.6%	-0.6%	-1.1%	-2.0%	-1.2%	-6.4%	-0.1%	-2.1%
7	-1.8%	-0.3%	-0.3%	-0.4%	-1.4%	-0.8%	-3.7%	0.0%	-1.4%
8	-1.2%	-0.1%	-0.1%	-0.1%	-0.9%	-0.5%	-2.0%	0.0%	-0.9%
9	-1.0%	-0.1%	0.0%	-0.1%	-0.7%	-0.4%	-1.2%	0.0%	-0.6%
10	-0.8%	0.0%	0.0%	0.0%	-0.5%	-0.3%	-0.6%	0.0%	-0.5%
Projected harvest (with trip limit and 29-inch maximum size limit on one fish (status quo):									
1	15,521	2,526	708	1,961	27,343	20,530	4,134	2,334	75,113
2	30,497	4,634	1,200	3,482	53,568	38,829	7,702	4,364	144,292
3	33,241	4,906	1,452	4,093	59,052	41,460	9,468	4,630	158,321
4	35,819	5,114	1,629	4,496	64,195	43,698	10,934	4,815	170,696
5	36,553	5,158	1,690	4,634	65,403	44,316	11,813	4,832	174,404
6	37,230	5,196	1,724	4,705	66,504	44,786	12,505	4,842	177,498
7	37,487	5,212	1,729	4,738	66,881	44,948	12,858	4,845	178,709
8	37,713	5,219	1,733	4,751	67,223	45,075	13,095	4,846	179,665
9	37,803	5,224	1,734	4,752	67,373	45,130	13,202	4,846	180,073
10	37,883	5,226	1,734	4,754	67,508	45,173	13,275	4,846	180,406
None	38,172	5,227	1,734	4,755	67,833	45,314	13,357	4,846	181,238
Projected harvest (with trip limit, no size limits):									
1	15,577	2,685	763	2,067	27,411	21,460	4,371	2,610	76,943
2	30,608	4,926	1,294	3,668	53,703	40,587	8,142	4,879	147,807
3	33,362	5,215	1,565	4,312	59,201	43,337	10,009	5,177	162,177
4	35,949	5,437	1,756	4,737	64,356	45,676	11,559	5,383	174,854
5	36,686	5,484	1,822	4,882	65,568	46,322	12,488	5,402	178,653
6	37,365	5,524	1,859	4,957	66,671	46,813	13,219	5,413	181,822
7	37,624	5,541	1,864	4,992	67,050	46,983	13,592	5,417	183,063
8	37,850	5,549	1,868	5,006	67,392	47,116	13,843	5,418	184,042
9	37,941	5,553	1,869	5,007	67,543	47,173	13,956	5,418	184,460
10	38,021	5,555	1,869	5,009	67,678	47,217	14,033	5,418	184,801
None	38,311	5,556	1,869	5,010	68,003	47,365	14,120	5,418	185,653



1	-58.6%
2	-20.4%
3	-12.6%
4	-5.8%
5	-3.8%
6	-2.1%
7	-1.4%
8	-0.9%
9	-0.6%
10	-0.5%

Area 3A – maximum size limit on one fish

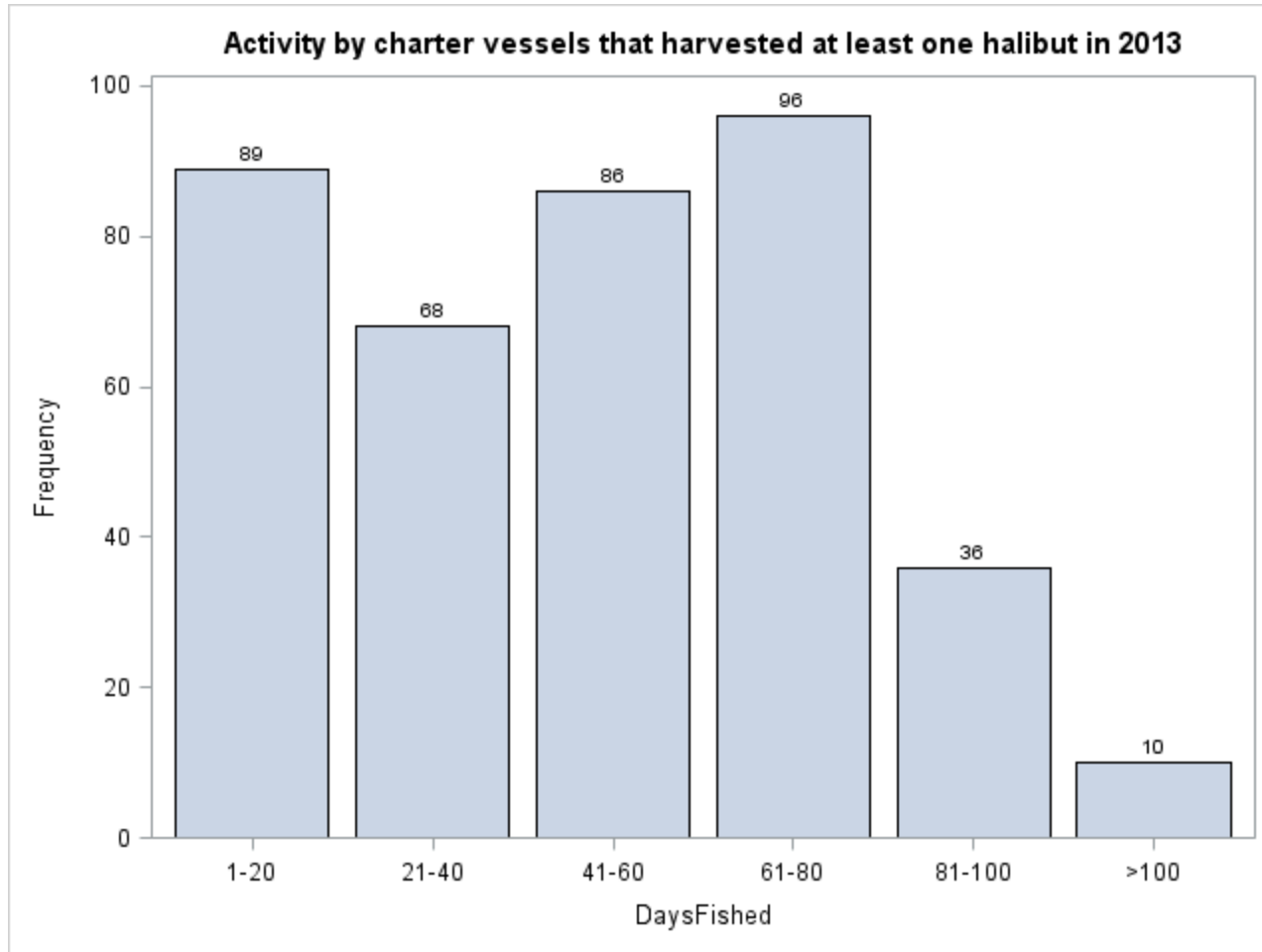


Area 3A – maximum size limit on one fish

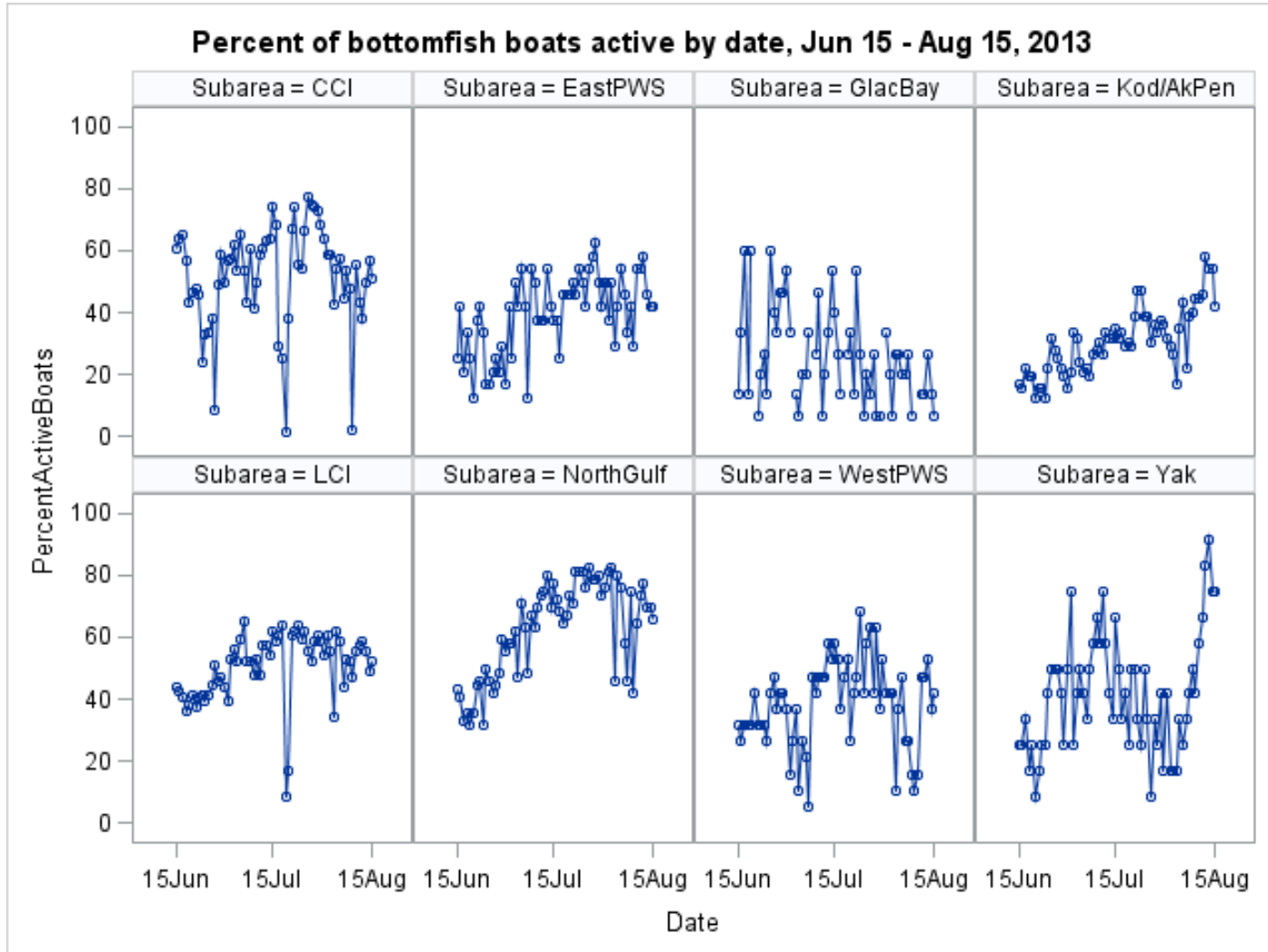
Projected Total Removals including release mortality (Mlb)

Size Limit on 2nd fish (in)	Annual Limit										
	1	2	3	4	5	6	7	8	9	10	None
26	0.728	1.388	1.528	1.648	1.684	1.714	1.725	1.734	1.737	1.740	1.748
27	0.743	1.416	1.559	1.682	1.719	1.749	1.760	1.769	1.773	1.776	1.783
28	0.766	1.459	1.607	1.733	1.771	1.802	1.814	1.823	1.827	1.830	1.838
29	0.780	1.487	1.637	1.766	1.805	1.836	1.848	1.858	1.862	1.865	1.873
30	0.802	1.530	1.684	1.816	1.856	1.889	1.901	1.911	1.915	1.918	1.926
31	0.817	1.559	1.716	1.850	1.891	1.924	1.937	1.947	1.951	1.954	1.962
32	0.836	1.596	1.756	1.894	1.936	1.969	1.983	1.993	1.997	2.000	2.009
33	0.848	1.619	1.781	1.921	1.963	1.997	2.011	2.021	2.025	2.029	2.037
34	0.861	1.643	1.808	1.950	1.993	2.028	2.041	2.052	2.056	2.060	2.068
35	0.870	1.660	1.826	1.969	2.013	2.048	2.062	2.072	2.077	2.080	2.089
36	0.881	1.681	1.850	1.995	2.039	2.074	2.088	2.099	2.103	2.107	2.116
37	0.886	1.692	1.861	2.007	2.051	2.087	2.101	2.112	2.116	2.120	2.129
38	0.894	1.706	1.877	2.024	2.069	2.105	2.119	2.130	2.134	2.138	2.147
39	0.900	1.718	1.890	2.038	2.083	2.120	2.134	2.145	2.149	2.153	2.162
40	0.905	1.727	1.900	2.049	2.094	2.131	2.145	2.156	2.160	2.164	2.173
41	0.909	1.735	1.909	2.059	2.104	2.141	2.155	2.166	2.171	2.174	2.184
42	0.913	1.742	1.917	2.067	2.112	2.149	2.163	2.174	2.179	2.183	2.192
43	0.918	1.752	1.927	2.078	2.124	2.161	2.175	2.187	2.191	2.195	2.204
44	0.921	1.757	1.933	2.084	2.130	2.167	2.182	2.193	2.197	2.201	2.211
45	0.924	1.764	1.941	2.092	2.138	2.176	2.190	2.201	2.206	2.210	2.219
46	0.927	1.769	1.945	2.098	2.144	2.181	2.196	2.207	2.211	2.215	2.225
47	0.930	1.775	1.953	2.106	2.152	2.189	2.204	2.215	2.220	2.224	2.233
48	0.932	1.779	1.957	2.110	2.156	2.194	2.208	2.220	2.224	2.228	2.238
49	0.937	1.789	1.968	2.121	2.168	2.206	2.220	2.232	2.236	2.240	2.250
50	0.941	1.796	1.975	2.130	2.177	2.214	2.229	2.240	2.245	2.249	2.259

Area 3A – closure of one day per week



Area 3A – closure of one day per week



Area 3A – closure of one day per week

Day of the Week	Maximum Expected Reduction in Harvest (in numbers of halibut)
Sun	9.9%
Mon	10.4%
Tue	10.0%
Wed	11.0%
Thu	12.3%
Fri	9.0%
Sat	9.0%



Area 3A – reverse slot limit on both fish

No annual limit, harvest = 185,653 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	2.098	2.052	2.009	1.974	1.925	1.877	1.856	1.826	1.801	1.786	1.779	1.773	1.769	1.766	1.761	1.756
36	2.158	2.112	2.070	2.035	1.987	1.938	1.918	1.888	1.863	1.849	1.841	1.835	1.831	1.828	1.823	1.818
37	2.187	2.142	2.100	2.065	2.017	1.969	1.948	1.918	1.894	1.879	1.871	1.865	1.861	1.859	1.854	1.849
38	2.227	2.182	2.140	2.106	2.058	2.010	1.989	1.960	1.935	1.921	1.913	1.907	1.903	1.900	1.895	1.890
39	2.261	2.217	2.175	2.141	2.093	2.045	2.025	1.995	1.971	1.956	1.949	1.943	1.939	1.936	1.931	1.926
40	2.286	2.242	2.201	2.167	2.119	2.071	2.051	2.022	1.997	1.983	1.975	1.969	1.965	1.962	1.958	1.953
41	2.310	2.266	2.225	2.191	2.144	2.096	2.076	2.046	2.022	2.008	2.000	1.994	1.990	1.987	1.983	1.978
42	2.329	2.285	2.244	2.210	2.163	2.116	2.095	2.066	2.042	2.028	2.020	2.014	2.010	2.007	2.003	1.997
43	2.357	2.314	2.273	2.240	2.193	2.145	2.125	2.096	2.072	2.058	2.050	2.044	2.040	2.037	2.033	2.028
44	2.371	2.328	2.288	2.255	2.208	2.160	2.140	2.111	2.087	2.073	2.066	2.060	2.056	2.053	2.048	2.043
45	2.391	2.348	2.307	2.274	2.227	2.180	2.160	2.132	2.108	2.093	2.086	2.080	2.076	2.073	2.068	2.063
46	2.403	2.361	2.320	2.287	2.241	2.194	2.174	2.145	2.121	2.107	2.099	2.093	2.089	2.087	2.082	2.077
47	2.424	2.381	2.342	2.309	2.262	2.216	2.196	2.167	2.143	2.129	2.122	2.116	2.112	2.109	2.104	2.099
48	2.435	2.393	2.353	2.321	2.274	2.228	2.208	2.180	2.156	2.142	2.134	2.128	2.124	2.122	2.117	2.112
49	2.462	2.421	2.381	2.349	2.303	2.257	2.237	2.209	2.185	2.171	2.163	2.157	2.153	2.151	2.146	2.141
50	2.483	2.442	2.403	2.371	2.325	2.279	2.259	2.231	2.207	2.193	2.186	2.180	2.176	2.173	2.169	2.164

Area 3A – reverse slot limit on both fish

5-fish annual limit, harvest = 178,653 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	2.022	1.977	1.935	1.901	1.854	1.807	1.786	1.757	1.733	1.719	1.711	1.706	1.702	1.699	1.694	1.689
36	2.080	2.035	1.994	1.960	1.913	1.866	1.846	1.817	1.793	1.779	1.771	1.766	1.762	1.759	1.754	1.749
37	2.108	2.064	2.023	1.989	1.942	1.895	1.875	1.846	1.822	1.808	1.801	1.795	1.791	1.788	1.784	1.779
38	2.146	2.103	2.062	2.028	1.982	1.935	1.915	1.886	1.862	1.848	1.841	1.835	1.831	1.828	1.824	1.819
39	2.179	2.136	2.095	2.062	2.016	1.969	1.949	1.920	1.897	1.883	1.875	1.869	1.866	1.863	1.858	1.853
40	2.203	2.160	2.120	2.087	2.041	1.994	1.974	1.946	1.922	1.908	1.901	1.895	1.891	1.888	1.884	1.879
41	2.226	2.183	2.143	2.110	2.064	2.018	1.998	1.970	1.946	1.932	1.925	1.919	1.915	1.913	1.908	1.903
42	2.244	2.202	2.162	2.129	2.083	2.037	2.017	1.989	1.965	1.951	1.944	1.938	1.934	1.932	1.927	1.922
43	2.272	2.230	2.190	2.157	2.112	2.066	2.046	2.018	1.994	1.980	1.973	1.967	1.964	1.961	1.956	1.951
44	2.286	2.244	2.204	2.172	2.126	2.081	2.061	2.033	2.009	1.995	1.988	1.982	1.979	1.976	1.971	1.966
45	2.304	2.263	2.223	2.191	2.146	2.100	2.080	2.052	2.029	2.015	2.008	2.002	1.998	1.996	1.991	1.986
46	2.316	2.275	2.236	2.204	2.158	2.113	2.093	2.065	2.042	2.028	2.021	2.015	2.011	2.009	2.004	1.999
47	2.336	2.295	2.256	2.224	2.179	2.134	2.115	2.087	2.064	2.050	2.043	2.037	2.033	2.030	2.026	2.021
48	2.347	2.307	2.268	2.236	2.191	2.146	2.127	2.099	2.076	2.062	2.055	2.049	2.045	2.043	2.038	2.033
49	2.374	2.333	2.295	2.264	2.219	2.174	2.155	2.127	2.104	2.090	2.083	2.077	2.074	2.071	2.066	2.062
50	2.394	2.354	2.316	2.285	2.240	2.195	2.177	2.149	2.126	2.112	2.105	2.099	2.096	2.093	2.088	2.084

4-fish annual limit, harvest = 174,854 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	1.978	1.935	1.894	1.860	1.814	1.768	1.748	1.719	1.696	1.682	1.674	1.669	1.665	1.662	1.658	1.653
36	2.035	1.992	1.951	1.918	1.872	1.826	1.806	1.778	1.754	1.740	1.733	1.727	1.724	1.721	1.716	1.712
37	2.062	2.019	1.979	1.946	1.900	1.854	1.835	1.806	1.783	1.769	1.762	1.756	1.752	1.750	1.745	1.740
38	2.100	2.057	2.017	1.985	1.939	1.893	1.874	1.845	1.822	1.808	1.801	1.795	1.791	1.789	1.784	1.779
39	2.132	2.090	2.050	2.018	1.972	1.927	1.907	1.879	1.856	1.842	1.835	1.829	1.825	1.823	1.818	1.813
40	2.156	2.114	2.074	2.042	1.997	1.951	1.932	1.904	1.881	1.867	1.860	1.854	1.850	1.848	1.843	1.838
41	2.178	2.136	2.097	2.065	2.020	1.975	1.955	1.927	1.904	1.890	1.883	1.878	1.874	1.871	1.867	1.862
42	2.196	2.155	2.115	2.083	2.038	1.993	1.974	1.946	1.923	1.909	1.902	1.896	1.893	1.890	1.885	1.881
43	2.223	2.182	2.143	2.111	2.066	2.021	2.002	1.974	1.951	1.938	1.930	1.925	1.921	1.918	1.914	1.909
44	2.237	2.196	2.157	2.125	2.081	2.036	2.017	1.989	1.966	1.952	1.945	1.939	1.936	1.933	1.929	1.924
45	2.255	2.214	2.176	2.144	2.100	2.055	2.036	2.008	1.985	1.972	1.965	1.959	1.955	1.953	1.948	1.943
46	2.267	2.226	2.188	2.156	2.112	2.067	2.049	2.021	1.998	1.985	1.977	1.972	1.968	1.966	1.961	1.956
47	2.286	2.246	2.208	2.177	2.133	2.088	2.069	2.042	2.019	2.006	1.999	1.993	1.989	1.987	1.982	1.977
48	2.297	2.257	2.219	2.188	2.144	2.100	2.081	2.054	2.031	2.018	2.011	2.005	2.001	1.999	1.994	1.990
49	2.323	2.284	2.246	2.215	2.171	2.127	2.109	2.081	2.059	2.045	2.038	2.033	2.029	2.026	2.022	2.017
50	2.343	2.304	2.266	2.236	2.192	2.148	2.130	2.103	2.080	2.067	2.060	2.054	2.050	2.048	2.043	2.039

Area 3A – reverse slot limit on both fish

3-fish annual limit, harvest = 162,177 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	1.835	1.794	1.756	1.725	1.682	1.639	1.620	1.594	1.572	1.559	1.552	1.547	1.543	1.541	1.537	1.532
36	1.887	1.847	1.809	1.778	1.736	1.693	1.675	1.648	1.626	1.614	1.607	1.601	1.598	1.595	1.591	1.587
37	1.913	1.873	1.835	1.804	1.762	1.719	1.701	1.674	1.653	1.640	1.633	1.628	1.624	1.622	1.618	1.613
38	1.948	1.908	1.871	1.840	1.798	1.755	1.737	1.711	1.689	1.676	1.669	1.664	1.661	1.658	1.654	1.650
39	1.978	1.938	1.901	1.871	1.829	1.786	1.768	1.742	1.720	1.708	1.701	1.695	1.692	1.690	1.685	1.681
40	2.000	1.961	1.924	1.893	1.852	1.809	1.791	1.765	1.743	1.731	1.724	1.718	1.715	1.713	1.709	1.704
41	2.020	1.982	1.945	1.915	1.873	1.831	1.813	1.787	1.765	1.753	1.746	1.741	1.737	1.735	1.731	1.726
42	2.037	1.998	1.962	1.932	1.890	1.848	1.830	1.804	1.783	1.770	1.763	1.758	1.754	1.752	1.748	1.744
43	2.062	2.023	1.987	1.957	1.916	1.874	1.856	1.830	1.809	1.796	1.789	1.784	1.781	1.779	1.774	1.770
44	2.075	2.036	2.000	1.971	1.929	1.887	1.870	1.844	1.823	1.810	1.803	1.798	1.795	1.792	1.788	1.784
45	2.092	2.054	2.018	1.988	1.947	1.905	1.888	1.862	1.841	1.828	1.821	1.816	1.813	1.810	1.806	1.802
46	2.103	2.065	2.029	2.000	1.959	1.917	1.900	1.874	1.853	1.840	1.833	1.828	1.825	1.823	1.818	1.814
47	2.121	2.083	2.048	2.019	1.978	1.936	1.919	1.893	1.872	1.860	1.853	1.848	1.844	1.842	1.838	1.834
48	2.131	2.094	2.058	2.029	1.989	1.947	1.930	1.904	1.884	1.871	1.864	1.859	1.856	1.853	1.849	1.845
49	2.155	2.118	2.083	2.054	2.014	1.973	1.956	1.930	1.909	1.897	1.890	1.885	1.881	1.879	1.875	1.871
50	2.174	2.137	2.102	2.074	2.033	1.992	1.975	1.950	1.929	1.917	1.910	1.905	1.901	1.899	1.895	1.891

2-fish annual limit, harvest = 147,807 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	1.668	1.632	1.597	1.568	1.530	1.491	1.474	1.450	1.431	1.419	1.412	1.407	1.404	1.402	1.399	1.395
36	1.716	1.680	1.645	1.617	1.579	1.540	1.523	1.499	1.480	1.468	1.462	1.457	1.454	1.452	1.448	1.445
37	1.739	1.703	1.669	1.640	1.602	1.563	1.547	1.523	1.504	1.492	1.486	1.481	1.478	1.476	1.472	1.468
38	1.771	1.735	1.701	1.673	1.635	1.596	1.580	1.556	1.537	1.525	1.519	1.514	1.511	1.509	1.505	1.502
39	1.798	1.762	1.729	1.701	1.663	1.624	1.608	1.584	1.565	1.554	1.547	1.542	1.539	1.537	1.534	1.530
40	1.818	1.783	1.749	1.721	1.684	1.645	1.629	1.605	1.586	1.575	1.568	1.563	1.560	1.558	1.555	1.551
41	1.837	1.802	1.768	1.741	1.703	1.665	1.649	1.625	1.606	1.595	1.588	1.584	1.580	1.578	1.575	1.571
42	1.852	1.817	1.784	1.756	1.719	1.680	1.665	1.641	1.622	1.610	1.604	1.599	1.596	1.594	1.590	1.587
43	1.874	1.840	1.807	1.779	1.742	1.704	1.688	1.665	1.646	1.634	1.628	1.623	1.620	1.618	1.614	1.611
44	1.886	1.852	1.819	1.791	1.754	1.716	1.701	1.677	1.658	1.647	1.640	1.636	1.633	1.631	1.627	1.623
45	1.902	1.867	1.835	1.808	1.771	1.733	1.717	1.694	1.675	1.663	1.657	1.652	1.649	1.647	1.643	1.640
46	1.912	1.878	1.845	1.818	1.782	1.744	1.728	1.705	1.686	1.674	1.668	1.663	1.660	1.658	1.655	1.651
47	1.928	1.894	1.862	1.835	1.799	1.761	1.745	1.722	1.703	1.692	1.686	1.681	1.678	1.676	1.672	1.669
48	1.937	1.904	1.871	1.845	1.808	1.771	1.755	1.732	1.713	1.702	1.696	1.691	1.688	1.686	1.682	1.679
49	1.960	1.926	1.894	1.868	1.831	1.794	1.779	1.756	1.737	1.725	1.719	1.715	1.711	1.710	1.706	1.702
50	1.976	1.943	1.911	1.885	1.849	1.812	1.796	1.773	1.755	1.743	1.737	1.733	1.729	1.728	1.724	1.720

Determining the effect of measures

- ▶ Not possible to precisely discern effects of measures after the fact
- ▶ Makes it hard to determine effects going forward

Acknowledgements

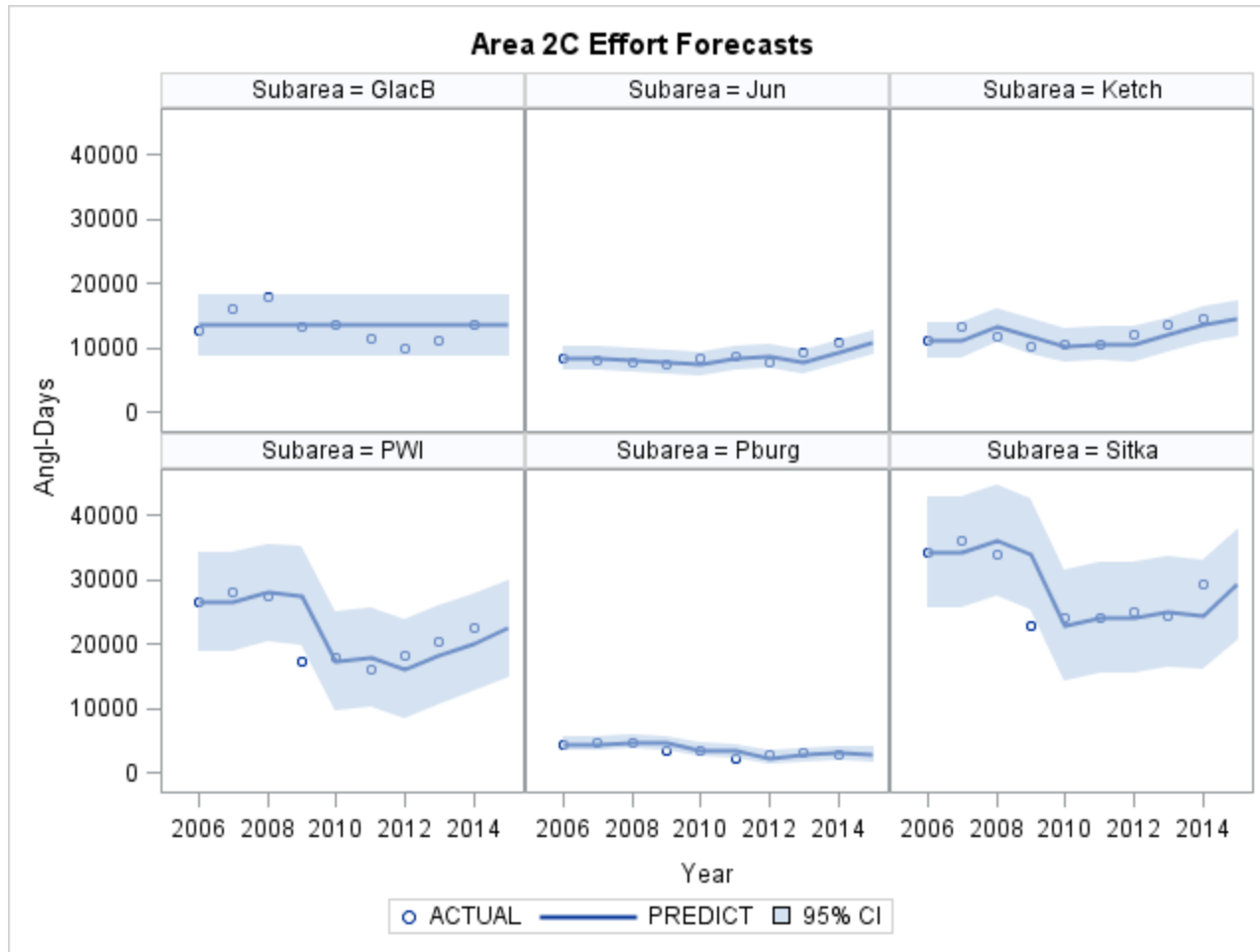
- ▶ Bob Powers – logbook data
- ▶ Diana Tersteeg, Mike Jaenicke – Southeast data
- ▶ Barbi Failor – Southcentral data
- ▶ Countless technicians – halibut measurements and angler interviews

- ▶ Funding:
State of Alaska General Funds
DJ-VWB Federal Aid in Fish Restoration

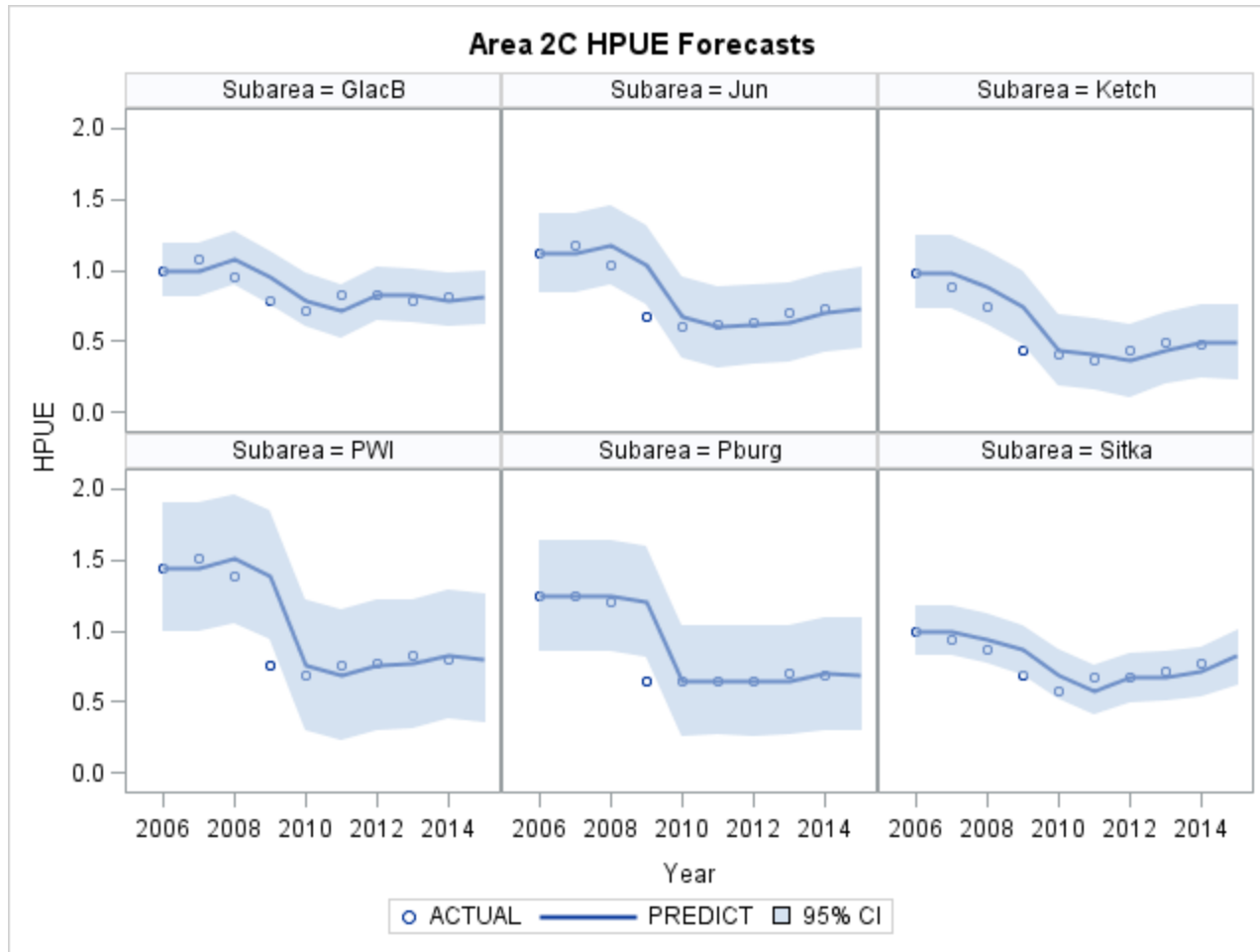


Extra slides

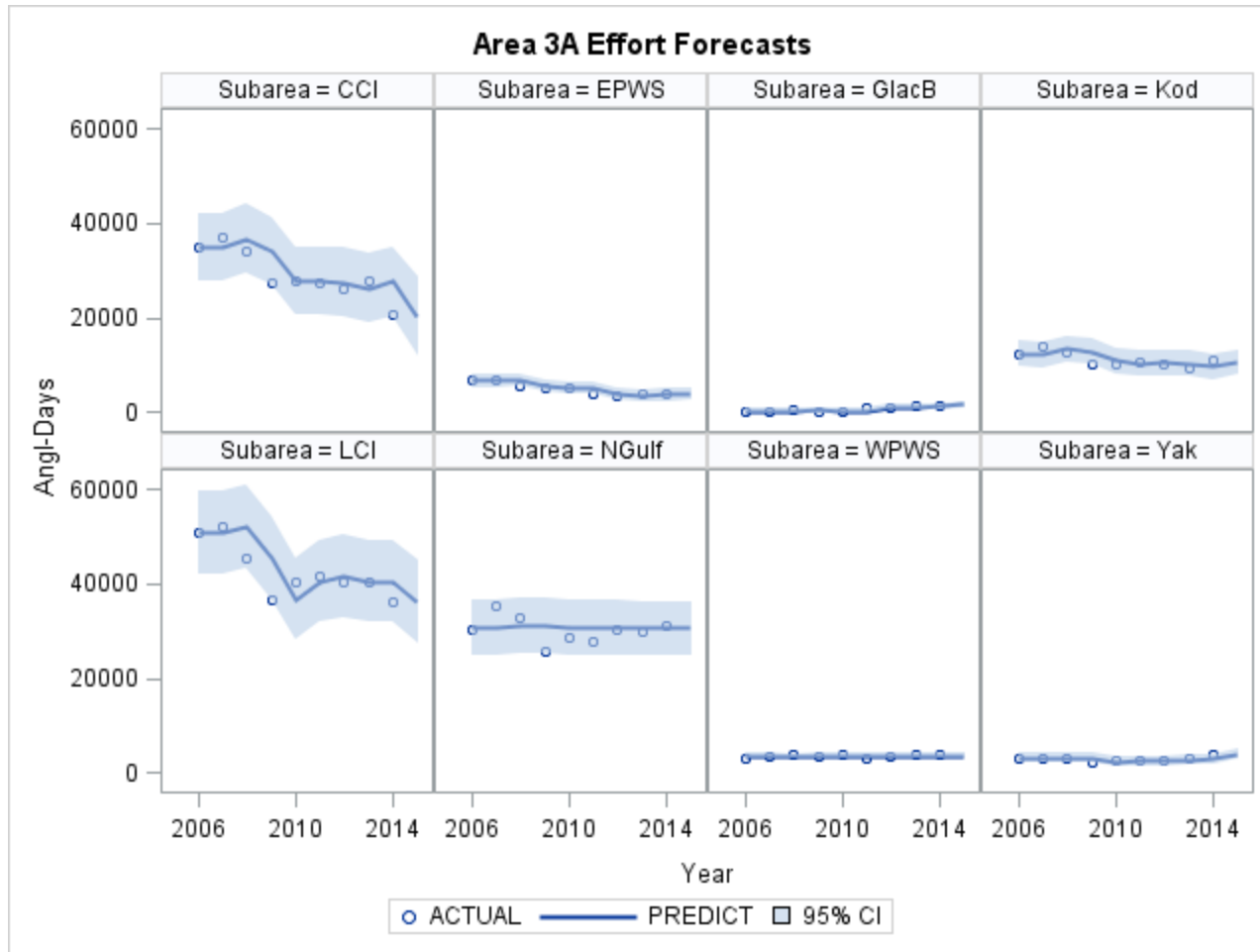
2015 forecasts of effort and HPUE, Area 2C



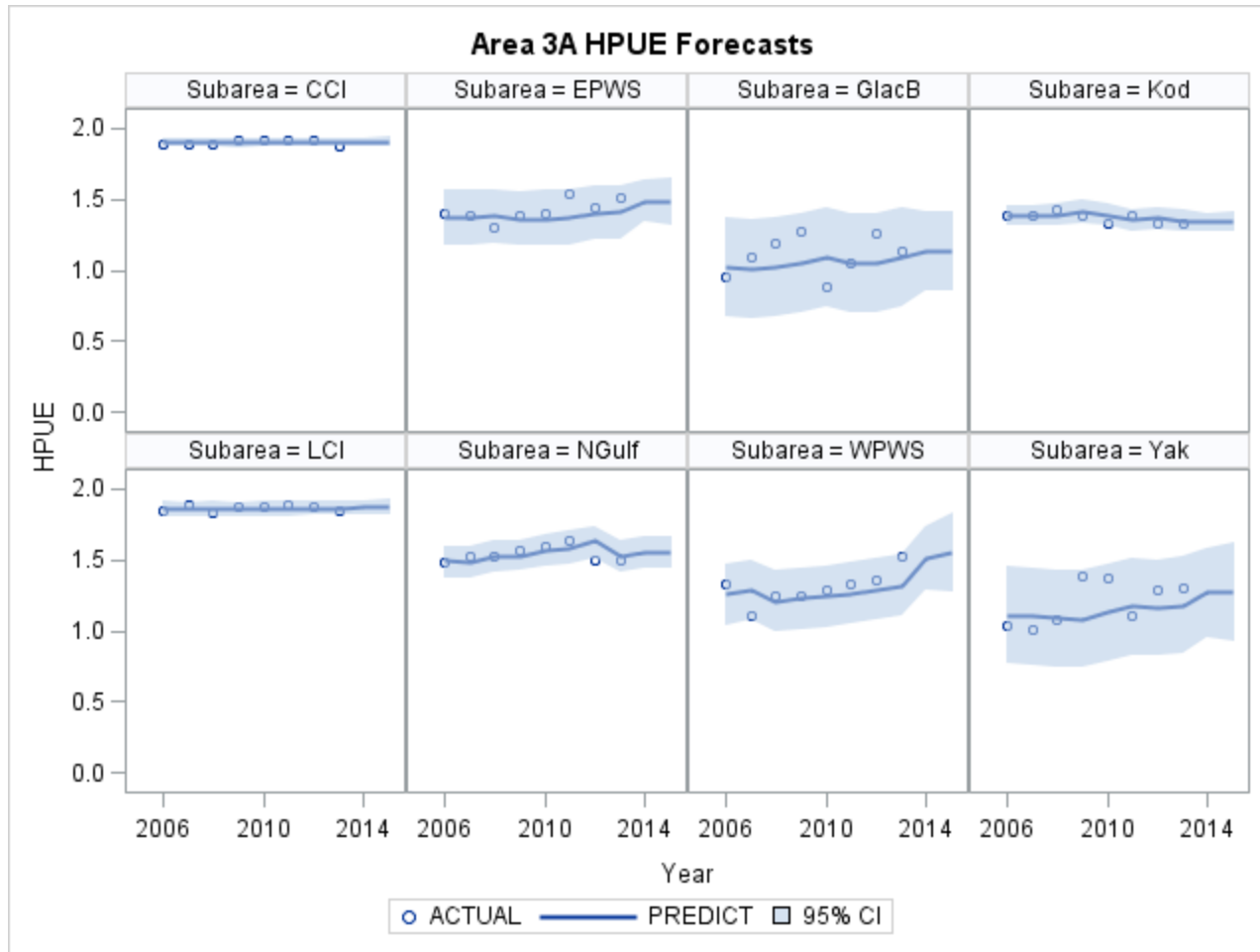
2015 forecasts of effort and HPUE, Area 2C



2015 forecasts of effort and HPUE, Area 3A



2015 forecasts of effort and HPUE, Area 3A



Alternate Table 17 (10% reduction from daily closure)

Table 17-Alternate Projection. Area 3A projected charter removals for 2015 including release mortality under a range of maximum size limits and annual limits (including no annual limit). This revised table assumes a 10% reduction in harvest (numbers of fish) from the closure of one day per week. Shaded values represent candidate measures assuming the prediction algorithm is correct. Boxed values represent candidate measures to stay below 1.89 M lb assuming that the values in the table underestimate the charter removals by 15% (adjusted allocation is 1.607 M lb).

Projected Total Removals including release mortality (Mlb)											
Annual Limit											
Size Limit on 2nd fish (in)	1	2	3	4	5	6	7	8	9	10	None
26	0.655	1.249	1.375	1.483	1.515	1.542	1.552	1.560	1.563	1.566	1.572
27	0.668	1.274	1.403	1.513	1.546	1.573	1.584	1.592	1.595	1.598	1.605
28	0.689	1.313	1.446	1.559	1.594	1.621	1.632	1.640	1.644	1.647	1.653
29	0.702	1.338	1.473	1.589	1.624	1.652	1.663	1.671	1.675	1.678	1.685
30	0.722	1.377	1.515	1.634	1.670	1.699	1.711	1.719	1.723	1.726	1.733
31	0.735	1.403	1.544	1.665	1.701	1.731	1.743	1.751	1.755	1.758	1.766
32	0.753	1.436	1.580	1.704	1.742	1.772	1.784	1.793	1.797	1.800	1.808
33	0.763	1.456	1.603	1.728	1.766	1.797	1.809	1.818	1.822	1.825	1.833
34	0.775	1.479	1.627	1.754	1.793	1.825	1.837	1.846	1.850	1.853	1.861
35	0.783	1.494	1.643	1.772	1.811	1.843	1.855	1.865	1.869	1.872	1.880
36	0.793	1.513	1.665	1.795	1.835	1.867	1.879	1.889	1.893	1.896	1.904
37	0.797	1.522	1.675	1.806	1.846	1.878	1.891	1.900	1.904	1.908	1.916
38	0.804	1.535	1.689	1.821	1.861	1.894	1.907	1.916	1.920	1.924	1.932
39	0.810	1.546	1.701	1.834	1.875	1.907	1.920	1.930	1.934	1.937	1.946
40	0.814	1.554	1.710	1.844	1.884	1.917	1.930	1.940	1.944	1.947	1.956
41	0.818	1.562	1.718	1.852	1.893	1.926	1.939	1.949	1.953	1.957	1.965
42	0.821	1.568	1.725	1.860	1.901	1.934	1.947	1.957	1.961	1.964	1.973
43	0.826	1.576	1.734	1.870	1.911	1.945	1.958	1.968	1.972	1.975	1.984
44	0.828	1.581	1.739	1.876	1.917	1.950	1.963	1.973	1.977	1.981	1.989
45	0.832	1.587	1.746	1.883	1.924	1.958	1.971	1.981	1.985	1.989	1.997
46	0.834	1.592	1.751	1.888	1.929	1.963	1.976	1.986	1.990	1.993	2.002
47	0.837	1.598	1.757	1.895	1.936	1.970	1.983	1.993	1.998	2.001	2.010
48	0.839	1.601	1.761	1.899	1.940	1.974	1.987	1.997	2.002	2.005	2.014
49	0.844	1.610	1.771	1.909	1.951	1.985	1.998	2.008	2.012	2.016	2.024
50	0.847	1.616	1.778	1.917	1.959	1.993	2.006	2.016	2.020	2.024	2.032

Annual limit audit

- ▶ 2012 nonresident Chinook, Southeast Alaska
- ▶ 13,187 nonres that harvested at least 1 king bought 13,293 licenses.
- ▶ 76 anglers harvested in excess of annual limit (0.6%)
- ▶ 102 kings harvested in excess of limit (1.3 per angler)
- ▶ Reported harvest in excess represented 0.4% of total harvest.

Annual limit audit

