

Analysis of Management Options for the Area 2C and 3A Charter Halibut Fisheries for 2014

For the North Pacific Fishery Management Council
December 2013



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Alaska Department of Fish and Game

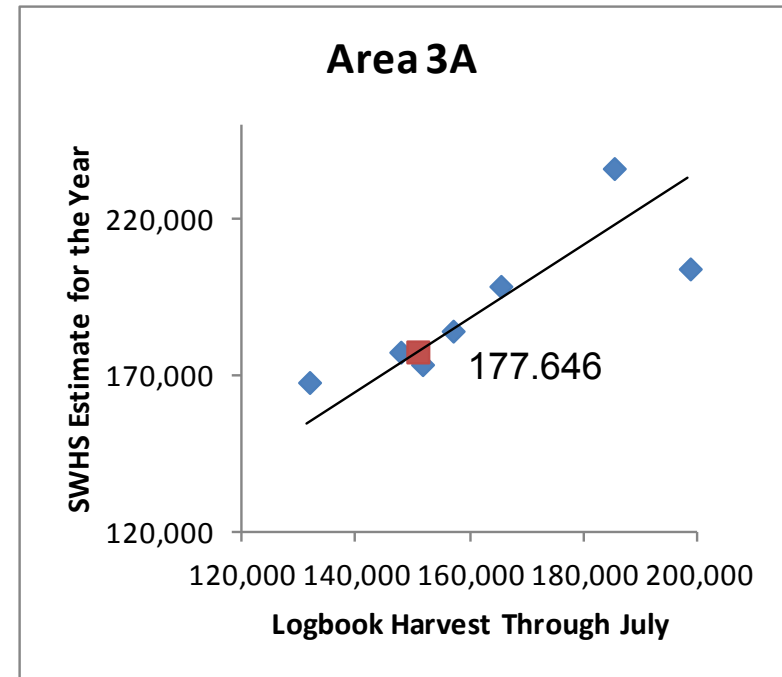
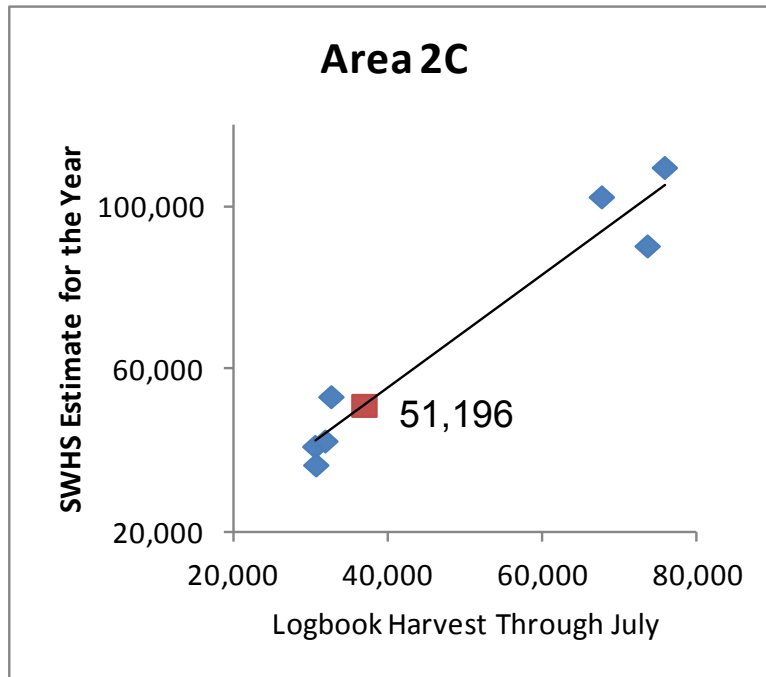
Overview

- ▶ Sport Harvest Summary through 2013
 - ▶ Numbers, average wt, yield
 - ▶ Compare logbook and SWHS estimates
- ▶ Analysis of Management Measures Under CSP
 - ▶ Area 2C
 - ▶ Area 3A

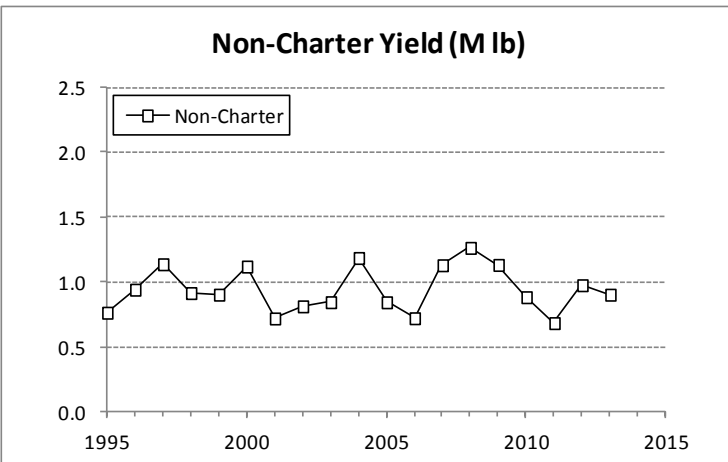
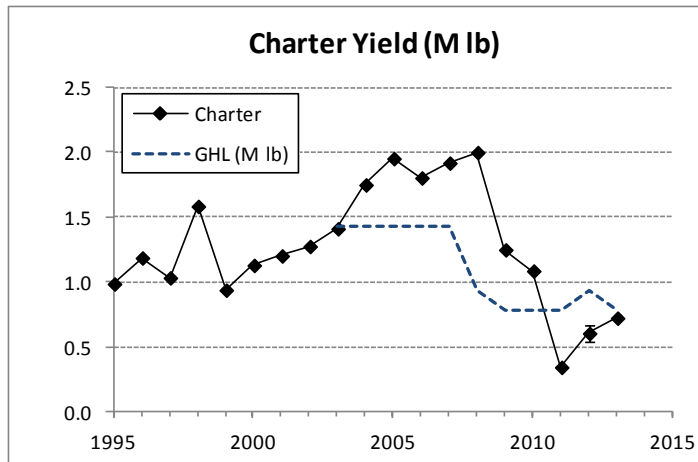
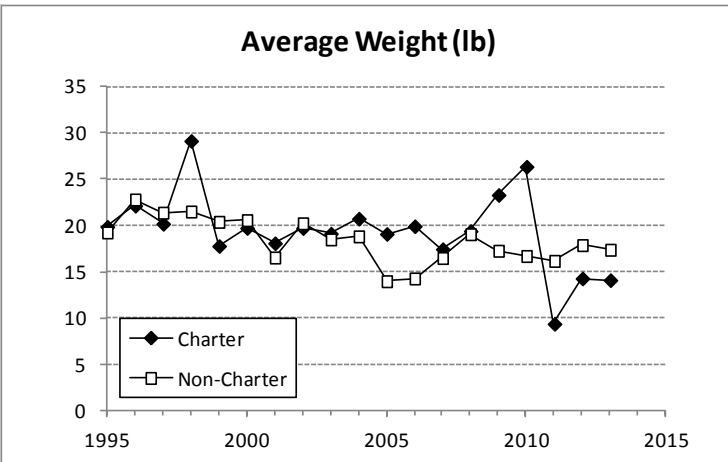
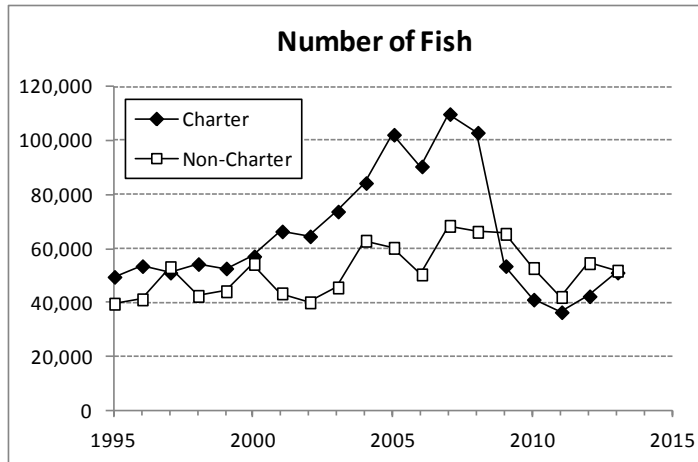
Sport Harvest Summary Through 2013

2013 Charter Projections

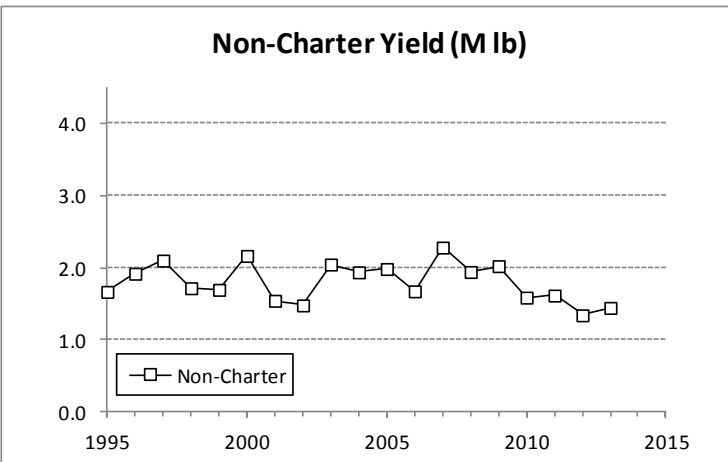
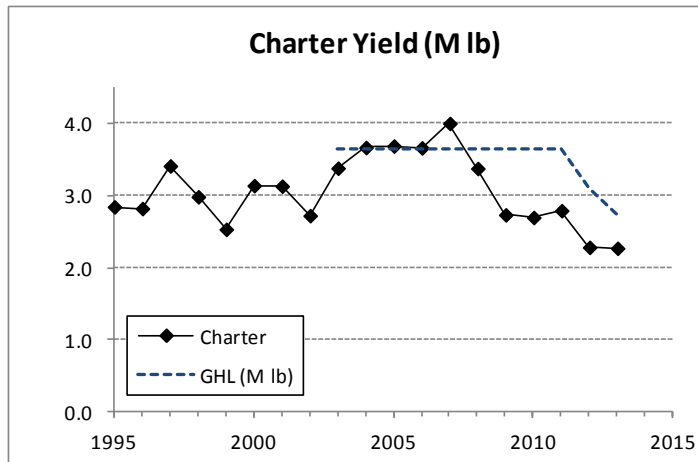
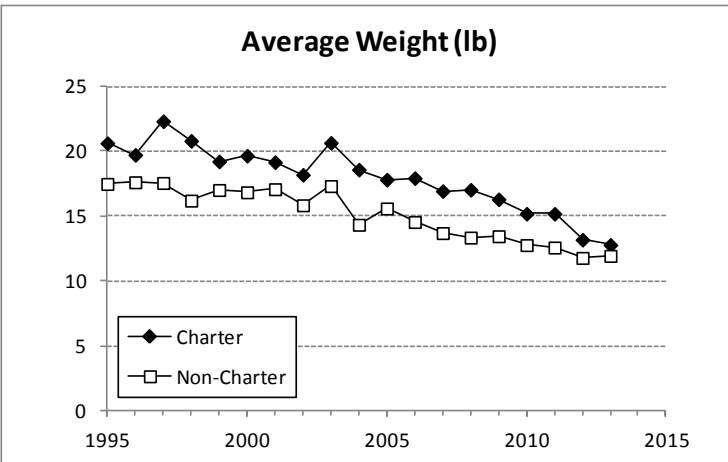
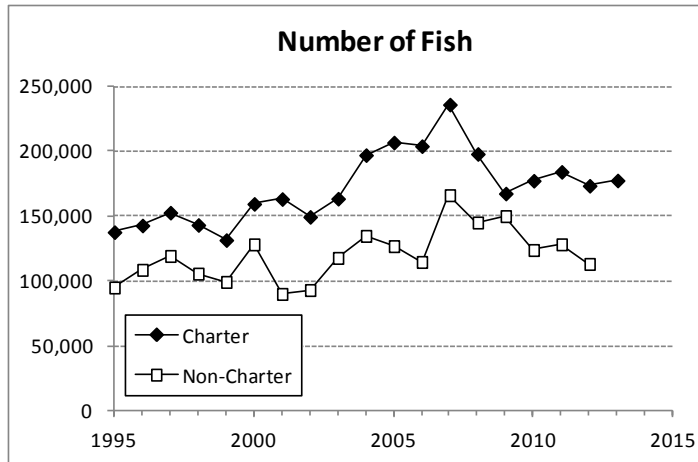
- ▶ Logbook data through July vs. SWHS estimates



Area 2C Summary



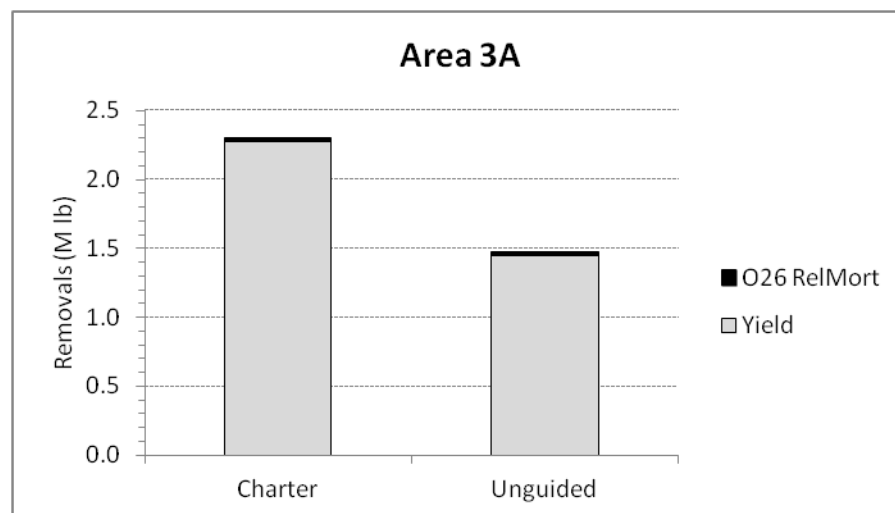
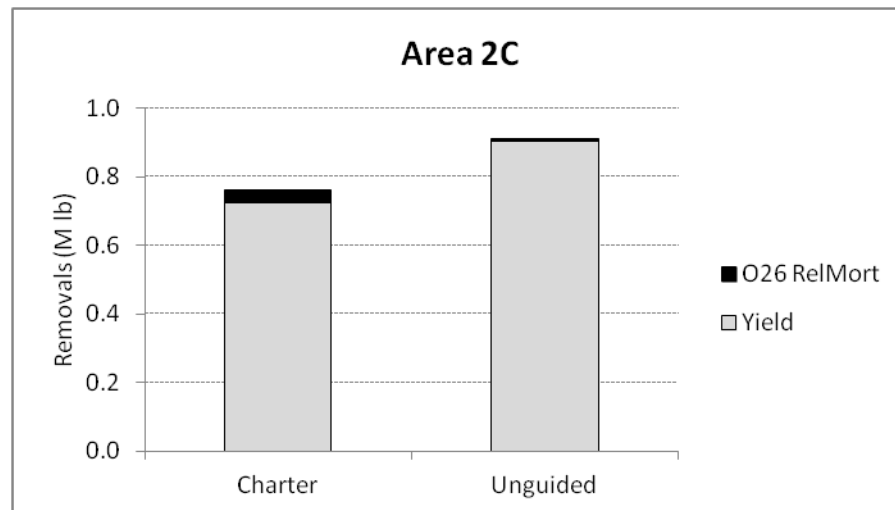
Area 3A Summary



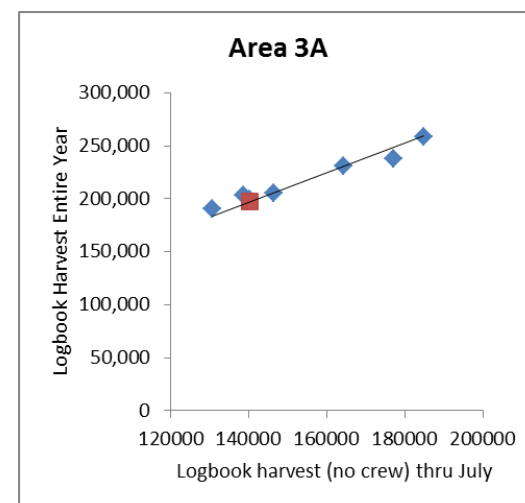
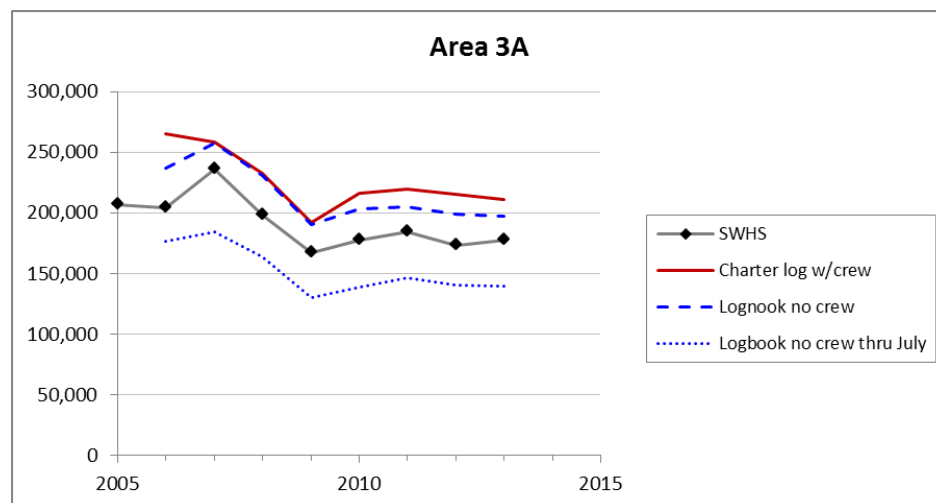
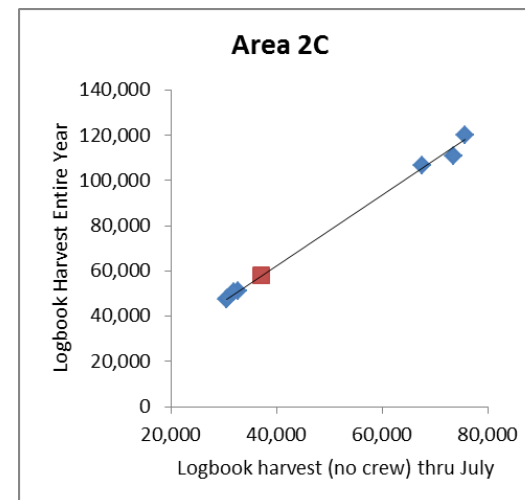
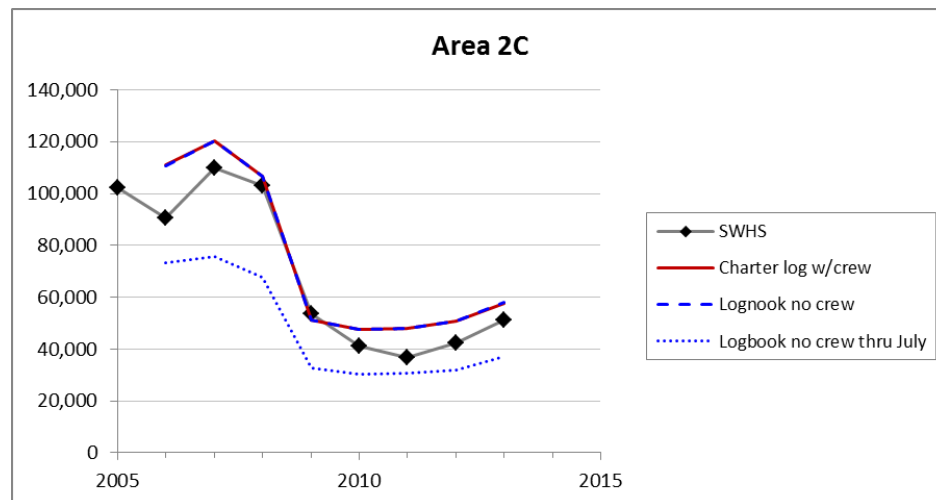
Release Mortality 2013

- Assumed mortality rates based on hook type use:

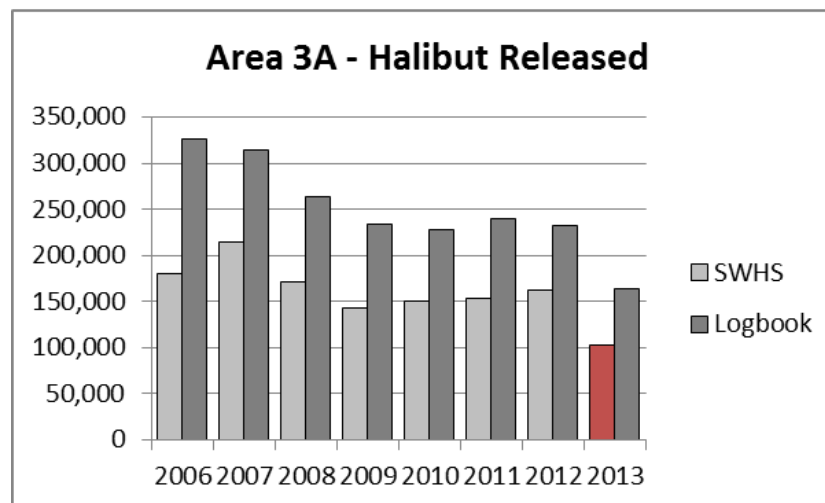
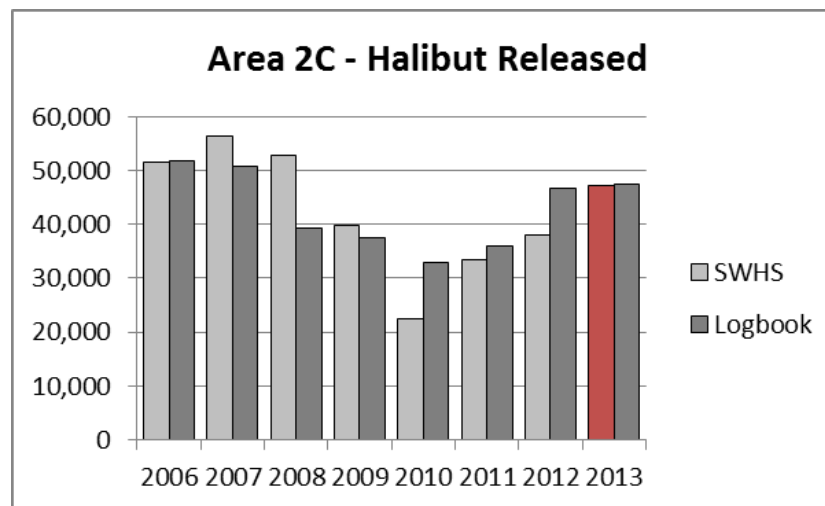
Sector	Area 2C	Area 3A
Charter	6%	5%
Unguided	7%	6%



Logbook-SWHS Comparison: Harvest



Logbook-SWHS Comparison - Releases



Analysis of Management Measures 2014

- ▶ Switch from SWHS to logbooks
- ▶ Crew harvest prohibited in Areas 2C and 3A
- ▶ Release mortality included in charter allocation

Area 2C alternatives for analysis

- ▶ U45O68 reverse slot (status quo)
- ▶ Maximum size limits
- ▶ Annual limit + maximum size limit
- ▶ Annual limit + reverse slot limit

Goal

- Identify possible charter allocations for 2014:

Area	Scenario	Combined FCEY	Possible Charter Allocation (incl.waste)
2C	Comm catch limit up 1/3 from 2013	3.87	0.71
	Blue Line	4.16	0.76
3A	Blue Line	9.43	1.78
	FCEY in intermediate range	10.0-10.8	1.89
	Comm catch limit down 1/2 from 2013	11.62	2.03

Area 2C – Status quo projection

Subarea	Harvest Forecast	Average Wt (lb)	Yield (M lb)	Release Mortality (5%)	Total Removals (M lb)
Ket	6,872	13.90	0.096	0.005	0.100
PWI	17,282	11.36	0.196	0.010	0.206
Pburg	1,927	20.85	0.040	0.002	0.042
Sitka	17,112	12.91	0.221	0.011	0.232
Jun	6,684	13.09	0.087	0.004	0.092
G2C	8,128	21.51	0.175	0.009	0.184
Area 2C	58,005	14.05	0.815	0.041	0.856

Table 3, Figure 4

Area 2C – Annual limit effect of harvest

Annual Limit	Subarea						Area 2C
	Ket	PWI	Pburg	Sitka	Jun	G2C	
	Estimated percent change in harvest:						
1	-30.2%	-57.0%	-49.6%	-50.3%	-48.4%	-61.6%	-51.2%
2	-10.0%	-26.9%	-22.8%	-18.8%	-24.6%	-39.5%	-23.9%
3	-2.0%	-7.7%	-7.8%	-3.6%	-10.9%	-24.1%	-8.5%
4	-0.6%	-1.6%	-2.4%	-0.5%	-3.8%	-13.8%	-3.2%
5	-0.1%	-0.5%	-0.3%	-0.1%	-1.2%	-8.4%	-1.5%
	Projected harvest:						
1	4,799	7,429	972	8,505	3,450	3,124	28,279
2	6,184	12,638	1,488	13,895	5,042	4,917	44,165
3	6,733	15,955	1,777	16,496	5,958	6,172	53,092
4	6,833	17,000	1,881	17,025	6,429	7,006	56,173
5	6,862	17,203	1,921	17,092	6,601	7,449	57,128
None	6,872	17,282	1,927	17,112	6,684	8,128	58,005

Table 4

Area 2C – Max size limit evaluation

- ▶ Based on average weight of fish below size limit in 2010
- ▶ Comparison of projections to empirical estimates:

Year	Limit	Predicted	“Observed”	Difference
2011	U37	9.94	9.40	5.7%
2012	U45	13.55	12.88	5.2%
2013	U45	13.57	12.93	5.0%

- ▶ Predictions have been high by at least 5%
- ▶ Look for measures corresponding to removals = 0.798 M lb

Table 5

Area 2C – Max size limit + annual limit

	A. Projected Total Removals incl. release mortality (M lb)					
Size Limit (inches)	Annual Limit					
	1	2	3	4	5	None
30	0.193	0.302	0.363	0.384	0.390	0.396
31	0.208	0.324	0.389	0.412	0.419	0.425
32	0.226	0.352	0.423	0.447	0.455	0.463
33	0.239	0.371	0.445	0.471	0.479	0.487
34	0.253	0.393	0.472	0.499	0.508	0.516
35	0.264	0.410	0.492	0.521	0.530	0.539
36	0.282	0.438	0.525	0.556	0.565	0.575
37	0.293	0.455	0.546	0.578	0.588	0.598
38	0.311	0.482	0.577	0.611	0.622	0.633
39	0.323	0.500	0.599	0.635	0.646	0.658
40	0.334	0.517	0.620	0.656	0.668	0.680
41	0.348	0.538	0.644	0.683	0.695	0.708
42	0.357	0.552	0.662	0.701	0.714	0.728
43	0.367	0.568	0.680	0.721	0.735	0.750
44	0.380	0.589	0.705	0.747	0.762	0.776
45	0.394	0.611	0.731	0.775	0.790	0.806
46	0.404	0.626	0.749	0.794	0.810	0.826
47	0.418	0.647	0.775	0.821	0.838	0.854
48	0.428	0.662	0.792	0.840	0.856	0.874
49	0.443	0.686	0.822	0.872	0.889	0.908
50	0.455	0.705	0.844	0.896	0.914	0.934
51	0.467	0.723	0.866	0.919	0.938	0.958
52	0.484	0.750	0.898	0.953	0.973	0.994
53	0.495	0.766	0.918	0.974	0.994	1.016
54	0.509	0.788	0.944	1.002	1.022	1.045
55	0.521	0.807	0.966	1.025	1.046	1.069

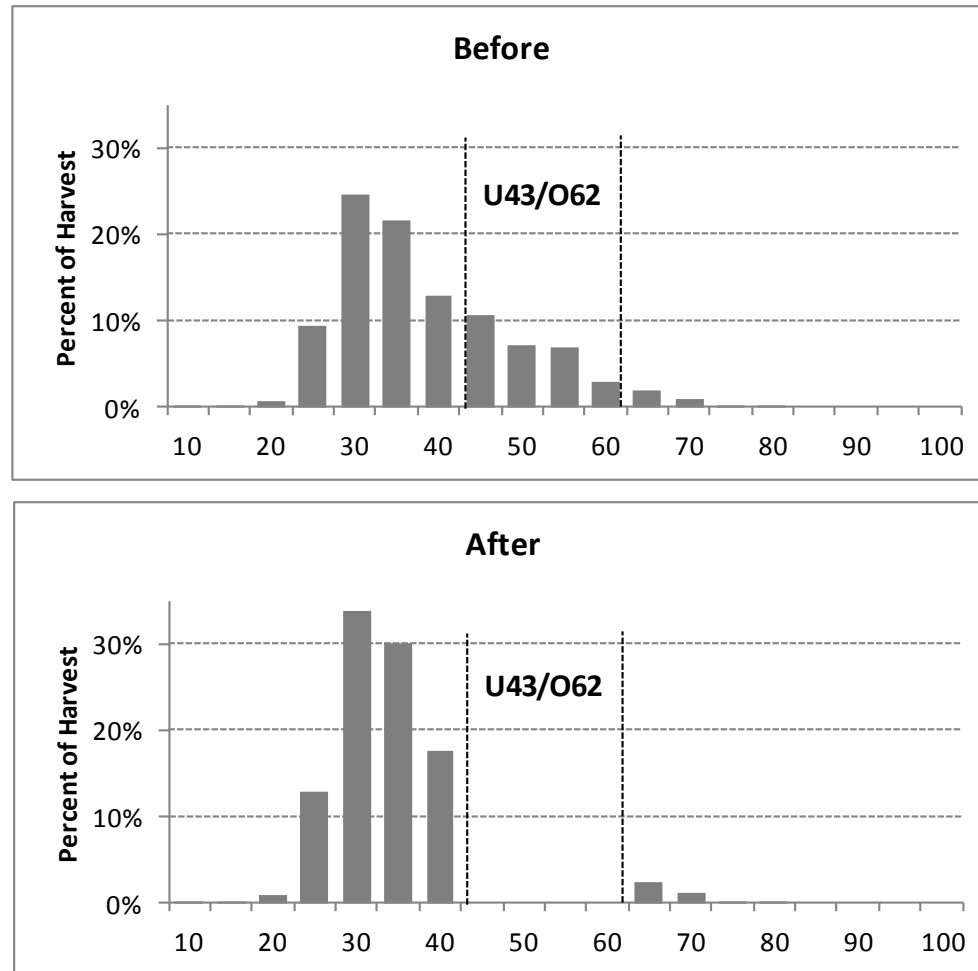
Table 5

Area 2C – Max size limit + annual limit

	A. Projected Total Removals incl. release mortality (M lb)					
Size Limit (inches)	Annual Limit					
	1	2	3	4	5	None
30	0.193	0.302	0.363	0.384	0.390	0.396
31	0.208	0.324	0.389	0.412	0.419	0.425
32	0.226	0.352	0.423	0.447	0.455	0.463
33	0.239	0.371	0.445	0.471	0.479	0.487
34	0.253	0.393	0.472	0.499	0.508	0.516
35	0.264	0.410	0.492	0.521	0.530	0.539
36	0.282	0.438	0.525	0.556	0.565	0.575
37	0.293	0.455	0.546	0.578	0.588	0.598
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42	0.357	0.552	0.662	0.701	0.714	0.728
43	0.367	0.568	0.680	0.721	0.735	0.750
44	0.380	0.589	0.705	0.747	0.762	0.776
45	0.394	0.611	0.731	0.775	0.790	0.806
46	0.404	0.626	0.749	0.794	0.810	0.826
47	0.418	0.647	0.775	0.821	0.838	0.854
48	0.428	0.662	0.792	0.840	0.856	0.874
49	0.443	0.686	0.822	0.872	0.889	0.908
50	0.455	0.705	0.844	0.896	0.914	0.934
51	0.467	0.723	0.866	0.919	0.938	0.958
52	0.484	0.750	0.898	0.953	0.973	0.994
53	0.495	0.766	0.918	0.974	0.994	1.016
54	0.509	0.788	0.944	1.002	1.022	1.045
55	0.521	0.807	0.966	1.025	1.046	1.069

Table 5

Area 2C – Reverse slot limit, no annual limit



Area 2C – Reverse Slot Limit

- ▶ Based on average weight of fish below size limit in 2010
- ▶ Comparison of projections to empirical estimates:

Method	Annual Limit					
	1	2	3	4	5	None
Projection method based on 2010 data	0.457	0.710	0.854	0.910	0.930	0.953
Empirical – mean of 2012-2013 average weights	0.413	0.642	0.772	0.821	0.838	0.856
Percent difference	10.6%	10.5%	10.6%	10.8%	11.0%	11.3%

- ▶ Predictions have been high by at least 11%
- ▶ Look for measures corresponding to removals = 0.844 M lb

Table 6

Area 2C – Reverse Slot Limit

No annual limit, harvest = 58,005 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	1.155	1.091	1.034	0.971	0.922	0.874	0.813	0.753	0.722	0.692	0.661	0.644	0.621	0.604	0.601	0.587
36	1.185	1.122	1.066	1.004	0.955	0.908	0.848	0.788	0.757	0.727	0.697	0.680	0.656	0.640	0.637	0.623
37	1.204	1.142	1.086	1.025	0.976	0.930	0.870	0.810	0.779	0.750	0.719	0.702	0.679	0.663	0.660	0.646
38	1.233	1.172	1.117	1.057	1.008	0.963	0.903	0.844	0.813	0.784	0.754	0.737	0.714	0.697	0.695	0.681
39	1.254	1.193	1.139	1.079	1.031	0.986	0.927	0.868	0.837	0.808	0.778	0.761	0.738	0.722	0.719	0.705
40	1.272	1.212	1.158	1.099	1.052	1.007	0.948	0.890	0.859	0.831	0.801	0.784	0.761	0.745	0.742	0.728
41	1.294	1.235	1.183	1.124	1.078	1.033	0.974	0.917	0.886	0.858	0.828	0.811	0.789	0.772	0.770	0.756
42	1.309	1.251	1.199	1.141	1.095	1.051	0.993	0.936	0.905	0.877	0.847	0.831	0.808	0.791	0.789	0.775
43	1.326	1.269	1.217	1.160	1.114	1.070	1.013	0.956	0.926	0.898	0.868	0.851	0.829	0.812	0.810	0.796
44	1.348	1.291	1.241	1.184	1.139	1.096	1.038	0.982	0.952	0.924	0.895	0.878	0.856	0.839	0.837	0.823
45	1.371	1.316	1.266	1.210	1.166	1.123	1.066	1.010	0.981	0.953	0.923	0.907	0.885	0.868	0.866	0.852
46	1.387	1.333	1.284	1.228	1.184	1.142	1.085	1.030	1.000	0.972	0.943	0.927	0.905	0.889	0.886	0.872
47	1.410	1.357	1.308	1.254	1.210	1.168	1.112	1.057	1.028	1.000	0.971	0.955	0.933	0.917	0.914	0.901
48	1.425	1.372	1.325	1.270	1.227	1.185	1.130	1.075	1.046	1.019	0.990	0.974	0.951	0.935	0.933	0.919
49	1.452	1.401	1.354	1.301	1.258	1.217	1.162	1.108	1.079	1.052	1.023	1.007	0.985	0.969	0.967	0.953
50	1.472	1.422	1.376	1.323	1.282	1.241	1.187	1.133	1.104	1.077	1.049	1.033	1.011	0.995	0.993	0.979

Table 6

Area 3A alternatives for analysis

- ▶ Two fish no size limit (status quo)
- ▶ Annual limit
- ▶ Maximum size limits on second fish
- ▶ (Annual limit + maximum size limit on second fish)
- ▶ Vessel Trip Limit

Area 3A – Status quo projection

Subarea	Harvest Forecast	Mean Wt (lb)	Yield (M lb)	Release Mortality (2%)	Total Removals (M lb)
G3A	1,684	42.25	0.071	0.001	0.073
Yak	3,422	27.90	0.095	0.002	0.097
EPWS	5,544	20.59	0.114	0.002	0.116
WPWS	6,134	16.35	0.100	0.002	0.102
NG	45,380	12.27	0.557	0.011	0.568
LCI	72,636	10.73	0.779	0.016	0.795
CCI	50,833	12.60	0.641	0.013	0.653
Kod	11,867	11.38	0.135	0.003	0.138
Area 3A	197,500	12.62	2.493	0.050	2.543

Table 8

Area 3A – Annual Limit (projected harvest)

Annual Limit	Subarea								Area 3A
	Kod	CCI	LCI	NG	WPWS	EPWS	Yak	G3A	
	Estimated percent change in harvest:								
1	-70.3%	-60.0%	-59.8%	-54.7%	-50.3%	-49.3%	-56.8%	-59.1%	-58.7%
2	-44.0%	-20.7%	-20.6%	-14.0%	-11.0%	-9.1%	-25.8%	-29.1%	-20.0%
3	-30.1%	-13.6%	-12.7%	-8.4%	-4.7%	-5.1%	-14.5%	-15.6%	-12.6%
4	-18.8%	-6.7%	-5.1%	-3.7%	-0.7%	-2.0%	-7.0%	-5.9%	-5.8%
5	-11.7%	-4.6%	-3.3%	-2.3%	-0.4%	-1.3%	-3.7%	-2.3%	-3.8%
6	-6.5%	-2.7%	-1.7%	-1.2%	-0.2%	-0.8%	-1.9%	-0.6%	-2.1%
7	-3.8%	-2.0%	-1.1%	-0.8%	-0.1%	-0.5%	-1.0%	-0.1%	-1.4%
8	-2.0%	-1.3%	-0.6%	-0.5%	-0.1%	-0.3%	-0.4%	0.0%	-0.8%
9	-1.2%	-1.1%	-0.5%	-0.4%	-0.1%	-0.2%	0.0%	0.0%	-0.6%
10	-0.7%	-0.8%	-0.3%	-0.3%	0.0%	-0.1%	0.0%	0.0%	-0.4%
	Projected harvest:								
1	3,524	20,357	29,180	20,572	3,049	2,809	1,477	688	81,656
2	6,642	40,323	57,676	39,040	5,462	5,041	2,538	1,193	157,916
3	8,296	43,941	63,424	41,562	5,843	5,259	2,926	1,421	172,672
4	9,638	47,447	68,907	43,705	6,093	5,431	3,184	1,585	185,991
5	10,476	48,476	70,211	44,328	6,108	5,469	3,294	1,645	190,007
6	11,098	49,445	71,406	44,829	6,123	5,501	3,358	1,675	193,436
7	11,417	49,811	71,807	45,001	6,126	5,517	3,389	1,683	194,750
8	11,631	50,152	72,172	45,145	6,129	5,529	3,410	1,684	195,850
9	11,728	50,297	72,291	45,206	6,130	5,535	3,421	1,684	196,291
10	11,784	50,426	72,400	45,258	6,131	5,539	3,422	1,684	196,645
None	11,867	50,833	72,636	45,380	6,134	5,544	3,422	1,684	197,500

Table 9

Area 3A – Annual Limit (projected removals)

Annual Limit	Subarea								Area 3A
	Kod	CCI	LCI	NG	WPWS	EPWS	Yak	G3A	
1	0.041	0.262	0.319	0.257	0.051	0.059	0.042	0.030	1.061
2	0.077	0.518	0.631	0.488	0.091	0.106	0.072	0.051	2.036
3	0.096	0.565	0.694	0.520	0.097	0.110	0.083	0.061	2.228
4	0.112	0.610	0.754	0.547	0.102	0.114	0.091	0.068	2.397
5	0.122	0.623	0.769	0.555	0.102	0.115	0.094	0.071	2.449
6	0.129	0.636	0.782	0.561	0.102	0.116	0.096	0.072	2.492
7	0.133	0.640	0.786	0.563	0.102	0.116	0.096	0.073	2.509
8	0.135	0.645	0.790	0.565	0.102	0.116	0.097	0.073	2.522
9	0.136	0.647	0.791	0.566	0.102	0.116	0.097	0.073	2.528
10	0.137	0.648	0.792	0.566	0.102	0.116	0.097	0.073	2.532
None	0.138	0.653	0.795	0.568	0.102	0.116	0.097	0.073	2.543

Table 10

Area 3A – Max Size Limit (2nd Fish) + Annual limit

	A. 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	0.769	1.477	1.617	1.741	1.779	1.811	1.823	1.833	1.837	1.840	1.848
27	0.786	1.510	1.653	1.780	1.819	1.851	1.864	1.874	1.878	1.881	1.889
28	0.812	1.559	1.707	1.838	1.878	1.912	1.924	1.935	1.939	1.943	1.951
29	0.828	1.592	1.742	1.876	1.917	1.951	1.964	1.975	1.979	1.982	1.991
30	0.854	1.642	1.797	1.935	1.977	2.012	2.025	2.036	2.041	2.045	2.053
31	0.872	1.675	1.834	1.974	2.017	2.053	2.067	2.078	2.083	2.086	2.095
32	0.894	1.718	1.880	2.025	2.069	2.105	2.120	2.131	2.136	2.140	2.149
33	0.908	1.745	1.910	2.056	2.101	2.138	2.153	2.164	2.169	2.173	2.182
34	0.923	1.774	1.942	2.091	2.136	2.174	2.189	2.201	2.206	2.210	2.219
35	0.933	1.793	1.963	2.113	2.159	2.198	2.212	2.225	2.230	2.233	2.243
36	0.946	1.818	1.990	2.142	2.189	2.228	2.243	2.255	2.260	2.264	2.274
37	0.952	1.830	2.003	2.156	2.203	2.243	2.258	2.270	2.275	2.279	2.289
38	0.960	1.847	2.021	2.176	2.224	2.263	2.278	2.291	2.296	2.300	2.310
39	0.968	1.861	2.037	2.193	2.241	2.281	2.296	2.309	2.314	2.318	2.328
40	0.974	1.872	2.049	2.206	2.254	2.294	2.309	2.322	2.327	2.331	2.341

Table 12

Area 3A – Trip Limits

- ▶ Lots of businesses make multiple trips per day
- ▶ Few businesses do it more than 20 days per year

Number of Days Made Multiple Trips	Number of Businesses					
	2007	2008	2009	2010	2011	2012
1 to 5 days	153	130	120	83	88	78
6 to 20 days	25	19	16	17	17	13
>20 days	11	15	7	9	15	21
Total	189	164	143	109	120	112
Percent > 20 days	5.8%	9.1%	4.9%	8.3%	12.5%	18.8%

Table 14

Area 3A – Harvest by trip

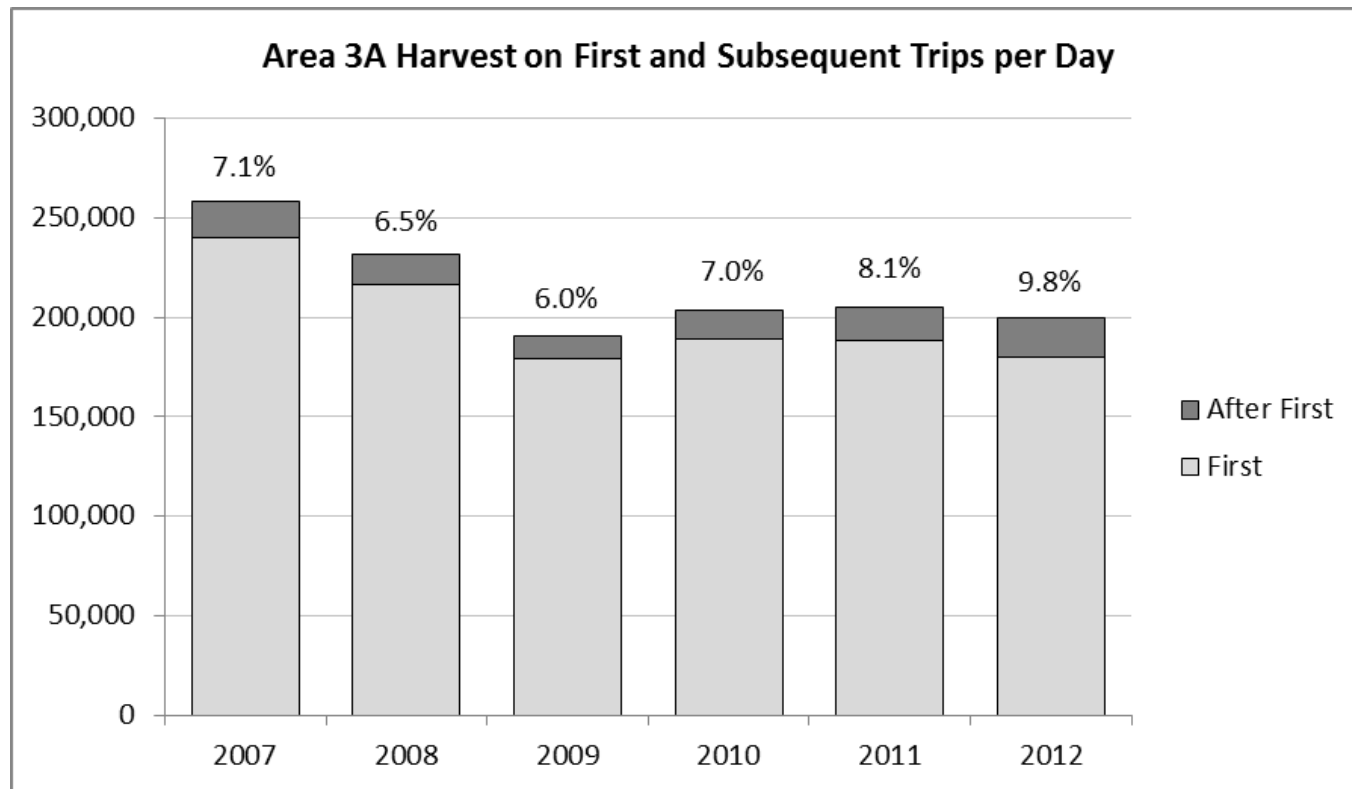


Table 15

Area 3A – Trip Limits

► Maximum angler excess capacity

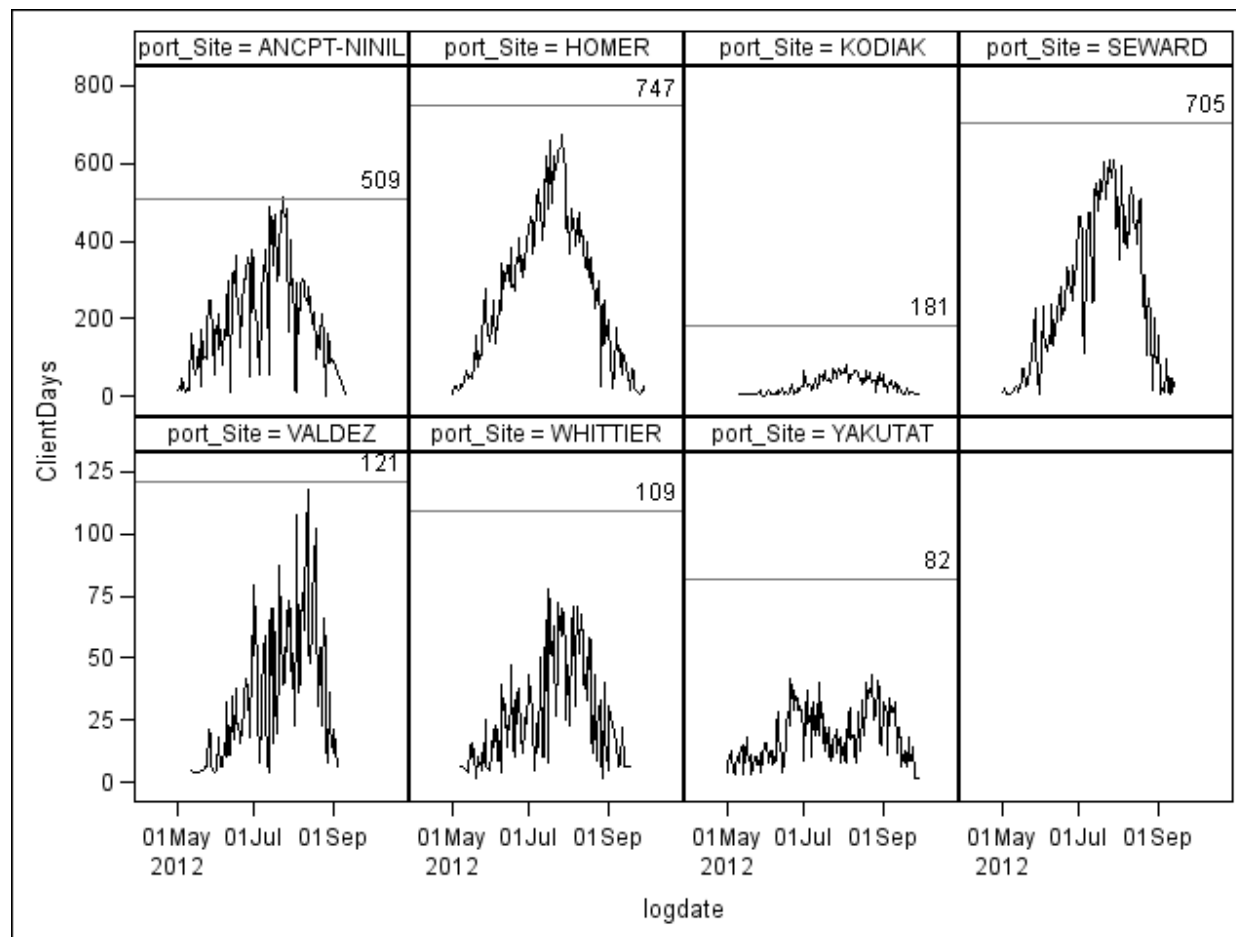


Figure 6

Questions?

