amount the RQE could purchase under annual transfer limits with the value of the one percent limit falling to between 0.018 Mlb and 0.028 Mlb under 2011 to 2015 conditions (see Table 4-45).

Table 4-45 Comparison of Sub-Option Effects on Annual Transfer Limits, Area 2C

Year	Available QS Units	QS/IFQ Ratio	Pounds of Annual Transfer Allowance (by Percent)				
			1	2	3	4	5
No Exclusions							
2011	59,477,396	25.56	0.023	0.047	0.070	0.093	0.116
2012	59,477,396	22.70	0.026	0.052	0.079	0.105	0.131
2013	59,477,396	20.05	0.030	0.059	0.089	0.119	0.148
2014	59,477,396	17.94	0.033	0.066	0.099	0.133	0.166
2015	59,477,396	16.17	0.037	0.074	0.110	0.147	0.184
Excluding D-Class							
2011	50,581,920	25.56	0.020	0.040	0.059	0.079	0.099
2012	50,581,920	22.70	0.022	0.045	0.067	0.089	0.111
2013	50,581,920	20.05	0.025	0.050	0.076	0.101	0.126
2014	50,581,920	17.94	0.028	0.056	0.085	0.113	0.141
2015	50,581,920	16.17	0.031	0.063	0.094	0.125	0.156
Excluding ≥1500 lb Blocks							
2011	51,298,804	25.56	0.020	0.040	0.060	0.080	0.100
2012	51,298,804	22.70	0.023	0.045	0.068	0.090	0.113
2013	51,298,804	20.05	0.026	0.051	0.077	0.102	0.128
2014	51,298,804	17.94	0.029	0.057	0.086	0.114	0.143
2015	51,298,804	16.17	0.032	0.063	0.095	0.127	0.159
Excluding ≥2000 lb Blocks							
2011	45,575,160	25.56	0.018	0.036	0.053	0.071	0.089
2012	45,575,160	22.70	0.020	0.040	0.060	0.080	0.100
2013	45,575,160	20.05	0.023	0.045	0.068	0.091	0.114
2014	45,575,160	17.94	0.025	0.051	0.076	0.102	0.127
2015	45,575,160	16.17	0.028	0.056	0.085	0.113	0.141

Source: Northern Economics, Inc. estimates from NOAA (2015a).

The same effect can be seen in Area 3A with the ≤1,500 pound blocks reducing the value to the RQE of a one percent annual transfer limit from 0.70 to 0.144 Mlb to 0.065 to 0.133 Mlb. This effect is again substantially similar to the effect of banning the RQE from holding D-class shares, which during the same time period would have resulted in annual limits ranging from 0.066 Mlb to 0.134 Mlb. A ≤2,000 pound block restriction reduces the RQE's allowed purchases slightly, moving the 2011-2015 historical range to 0.061 to 0.125 Mlb (see Table 4-46).

Table 4-46 Comparison of Sub-Option Effects on Annual Transfer Limits, Area 2C

Year	Available QS Units	QS/IFQ Ratio	Pounds of Annual Transfer Allowance (by Percent)				
			1	2	3	4	5
No Exclusions							
2011	184,893,008	12.88	0.144	0.287	0.431	0.574	0.718
2012	184,893,008	15.52	0.119	0.238	0.357	0.477	0.596
2013	184,893,008	16.76	0.110	0.221	0.331	0.441	0.552
2014	184,893,008	26.27	0.070	0.141	0.211	0.282	0.352
2015	184,893,008	23.73	0.078	0.156	0.234	0.312	0.389
Excluding D-Class							
2011	172,219,382	12.88	0.134	0.267	0.401	0.535	0.669
2012	172,219,382	15.52	0.111	0.222	0.333	0.444	0.555
2013	172,219,382	16.76	0.103	0.206	0.308	0.411	0.514
2014	172,219,382	26.27	0.066	0.131	0.197	0.262	0.328
2015	172,219,382	23.73	0.073	0.145	0.218	0.290	0.363
Excluding ≥1500 lb Blocks							
2,011	171,537,369	12.88	0.133	0.266	0.400	0.533	0.666
2,012	171,537,369	15.52	0.111	0.221	0.332	0.442	0.553
2,013	171,537,369	16.76	0.102	0.205	0.307	0.409	0.512
2,014	171,537,369	26.27	0.065	0.131	0.196	0.261	0.326
2,015	171,537,369	23.73	0.072	0.145	0.217	0.289	0.361
Excluding ≥2000 lb Blocks							
2011	160,533,112	12.88	0.125	0.249	0.374	0.499	0.623
2012	160,533,112	15.52	0.103	0.207	0.310	0.414	0.517
2013	160,533,112	16.76	0.096	0.192	0.287	0.383	0.479
2014	160,533,112	26.27	0.061	0.122	0.183	0.244	0.306
2015	160,533,112	23.73	0.068	0.135	0.203	0.271	0.338

Source: Northern Economics, Inc. estimates from NOAA (2015a).

4.8.1.2.7 Effects of Element 2, Option 3 on Total Cumulative Limits

Block restrictions would trickle through from annual transfer limits to total cumulative limits. Table 4-47 and Table 4-48 show the effect of QS/IFQ ratio and block size restrictions on the total cumulative limits in Area 2C. As expected, both restrictions results in smaller cumulative limits relative to the unrestricted scenario.

Table 4-47 Qs/IFQ Ratio Effect on Total Cumulative Limits, Area 2C with ≤1,500 pound block restrictions

Cumulative Cap (Percent)	Maximum QS units Allowed	Scenario/QS Ratio					
		Historical Abundance (1995-2007)	2011	2012	2013	2014	2015
5	2,564,940	0.406	0.100	0.113	0.128	0.143	0.159
6	3,077,928	0.487	0.120	0.136	0.154	0.172	0.190
7	3,590,916	0.568	0.140	0.158	0.179	0.200	0.222
8	4,103,904	0.649	0.161	0.181	0.205	0.229	0.254
9	4,616,892	0.730	0.181	0.203	0.230	0.257	0.286
10	5,129,880	0.811	0.201	0.226	0.256	0.286	0.317
11	5,642,868	0.892	0.221	0.249	0.281	0.315	0.349
12	6,155,856	0.973	0.241	0.271	0.307	0.343	0.381
13	6,668,845	1.055	0.261	0.294	0.333	0.372	0.413
14	7,181,833	1.136	0.281	0.316	0.358	0.400	0.444
15	7,694,821	1.217	0.301	0.339	0.384	0.429	0.476
16	8,207,809	1.298	0.321	0.362	0.409	0.458	0.508
17	8,720,797	1.379	0.341	0.384	0.435	0.486	0.539
18	9,233,785	1.460	0.361	0.407	0.461	0.515	0.571
19	9,746,773	1.541	0.381	0.429	0.486	0.543	0.603
20	10,259,761	1.622	0.401	0.452	0.512	0.572	0.635
QS/IFQ Ratio		6.32	25.56	22.70	20.05	17.94	16.17

Source: Northern Economics, Inc. estimates from NOAA (2015a).

Table 4-48 Qs/IFQ Ratio Effect on Total Cumulative Limits, Area 2C with ≤2,000 pound block restrictions

Cumulative Cap (Percent)	Maximum QS units Allowed	Scenario/QS Ratio					
		Historical Abundance (1995-2007)	2011	2012	2013	2014	2015
5	2,278,758	0.360	0.089	0.100	0.114	0.127	0.141
6	2,734,510	0.432	0.107	0.120	0.136	0.152	0.169
7	3,190,261	0.504	0.125	0.141	0.159	0.178	0.197
8	3,646,013	0.577	0.143	0.161	0.182	0.203	0.226
9	4,101,764	0.649	0.160	0.181	0.205	0.229	0.254
10	4,557,516	0.721	0.178	0.201	0.227	0.254	0.282
11	5,013,268	0.793	0.196	0.221	0.250	0.279	0.310
12	5,469,019	0.865	0.214	0.241	0.273	0.305	0.338
13	5,924,771	0.937	0.232	0.261	0.295	0.330	0.366
14	6,380,522	1.009	0.250	0.281	0.318	0.356	0.395
15	6,836,274	1.081	0.267	0.301	0.341	0.381	0.423
16	7,292,026	1.153	0.285	0.321	0.364	0.406	0.451
17	7,747,777	1.225	0.303	0.341	0.386	0.432	0.479
18	8,203,529	1.297	0.321	0.361	0.409	0.457	0.507
19	8,659,280	1.369	0.339	0.381	0.432	0.483	0.536
20	9,115,032	1.441	0.357	0.402	0.455	0.508	0.564
QS/IFQ Ratio			0.360	0.089	0.100	0.114	0.127

Source: Northern Economics, Inc. estimates from NOAA (2015a).

While the block restrictions reduce the total cumulative limits, within a certain range the Council could adjust for the block restrictions with higher total cumulative limits. For example, presume the Council wanted to ban RQE ownership of the ≤2,000 pound blocks, but wanted the Area 2C fishery to have access to an additional 0.250 Mlb of quota while operating under 2015 conditions. In a no restriction scenario the Council would need to select a 7 percent total cumulative limit. However, in a scenario where the Council restricted the ownership of ≤2,000 pound blocks, the Council would need to select a roughly nine percent total cumulative limit (see Table 4-49).[27]

Table 4-49 Comparison of Sub-Option Effects on Total Cumulative Limits, Area 2C and 2015 QS/IFQ Ratios

Cumulative Cap (Percent)	Maximum QS units Allowed	Scenario/QS Ratio			
		No Restrictions	No D-Class	No 1,500 lb Blocks	No 2,000 lb Blocks
5	2,564,940	0.184	0.156	0.159	0.141
6	3,077,928	0.221	0.188	0.190	0.169
7	3,590,916	0.258	0.219	0.222	0.197
8	4,103,904	0.294	0.250	0.254	0.226
9	4,616,892	0.331	0.282	0.286	0.254
10	5,129,880	0.368	0.313	0.317	0.282
11	5,642,868	0.405	0.344	0.349	0.310
12	6,155,856	0.441	0.375	0.381	0.338
13	6,668,845	0.478	0.407	0.413	0.366
14	7,181,833	0.515	0.438	0.444	0.395
15	7,694,821	0.552	0.469	0.476	0.423
16	8,207,809	0.589	0.501	0.508	0.451
17	8,720,797	0.625	0.532	0.539	0.479
18	9,233,785	0.662	0.563	0.571	0.507
19	9,746,773	0.699	0.594	0.603	0.536
20	10,259,761	0.736	0.626	0.635	0.564
QS/IFQ Ratio		16.17	16.17	16.17	16.17

Source: Northern Economics, Inc. estimates from NOAA (2015a).

Figure 4-21 and Figure 4-22 show the regulatory options that would have been available to an RQE in 2015 if an RQE existed and it had held between 5 and 20 percent of all Area 2C QS. As with the unrestricted and D-Class analysis, under 2015 conditions the RQE would have been able to liberalize the reverse slot limits. The authors note that at single digit cumulative limits, all of the scenarios are somewhat similar and really only differ once the reader begins comparing what higher cumulative limits could provide.

[27] The authors note that selecting the ≤2,000 block limit also has the effect of protecting 60.5 percent of the Area 2C D-Class share from being purchased by the RQE.

Figure 4-21 Area 2C Charter regulations achievable by cumulative limit based on 2015 estimates of harvest and average fish size and QS/IFQ Ratio, No ≤1,500 lb Blocks

Lower Limit (in)	Upper length limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	13	11	9	7	5	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5
36	14	12	10	8	6	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5
37	15	13	11	9	7	5	5	5	<5	<5	<5	<5	<5	<5	<5	<5
38	16	14	12	10	8	6	5	5	5	<5	<5	<5	<5	<5	<5	<5
39	16	14	12	10	9	7	5	5	5	5	<5	<5	<5	<5	<5	<5
40	17	15	13	11	9	8	6	5	5	5	5	<5	<5	<5	<5	<5
41	18	16	14	12	10	9	7	5	5	5	5	5	<5	<5	<5	<5
42	18	16	15	12	11	9	7	5	5	5	5	5	5	<5	<5	<5
43	19	17	15	13	11	10	8	6	5	5	5	5	5	5	5	5
44	20	18	16	14	12	11	9	7	6	5	5	5	5	5	5	5
45	20	19	17	15	13	12	10	8	7	6	5	5	5	5	5	5
46	N/A	19	17	15	14	12	11	9	8	7	6	5	5	5	5	5
47	N/A	20	18	16	15	13	11	10	8	8	7	6	5	5	5	5
48	N/A	N/A	19	17	15	14	12	10	9	8	7	7	6	5	5	5
49	N/A	N/A	20	18	16	15	13	11	10	9	8	8	7	6	6	6
50	N/A	N/A	N/A	19	17	16	14	12	11	10	9	9	8	7	7	7

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Figure 4-22 Area 2C Charter regulations achievable by cumulative limit based on 2015 estimates of harvest and average fish size and QS/IFQ Ratio, No ≤2,000 lb Blocks

Lower Limit (in)	Upper length limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	15	12	10	7	5	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5
36	16	13	11	9	7	5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5
37	17	14	12	10	8	6	5	5	<5	<5	<5	<5	<5	<5	<5	<5
38	18	15	13	11	9	7	5	5	5	<5	<5	<5	<5	<5	<5	<5
39	18	16	14	12	10	8	6	5	5	5	<5	<5	<5	<5	<5	<5
40	19	17	15	12	10	9	6	5	5	5	5	<5	<5	<5	<5	<5
41	20	18	16	13	11	10	7	5	5	5	5	5	<5	<5	<5	<5
42	N/A	18	16	14	12	10	8	6	5	5	5	5	5	<5	<5	<5
43	N/A	19	17	15	13	11	9	7	6	5	5	5	5	5	5	5
44	N/A	20	18	16	14	12	10	8	7	5	5	5	5	5	5	5
45	N/A	N/A	19	17	15	13	11	9	8	7	5	5	5	5	5	5
46	N/A	N/A	20	17	16	14	12	10	8	7	6	6	5	5	5	5
47	N/A	N/A	N/A	18	17	15	13	11	9	8	7	7	6	5	5	5
48	N/A	N/A	N/A	19	17	16	13	11	10	9	8	7	7	6	6	5
49	N/A	N/A	N/A	20	18	17	15	13	11	10	9	9	8	7	7	7
50	N/A	N/A	N/A	N/A	19	18	16	14	12	11	10	10	9	8	8	8

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Under 2011 lower stock conditions, the effects of block restrictions are much more noticeable at both of the considered levels. For the Area 2C fishery to reach one fish measuring less than 48 inches or more than 80 inches requires a five percent cumulative allowance under 2015 stock conditions, but would require a 10 percent allowance with the ≤1,500 pound block restriction (see Figure 4-23) and 12 percent under the ≤2,000 pound block restriction (see Figure 4-24). The smallest reverse slot gap that the RQE could reach with a 20 percent cumulative limit would be an U50/O66 regime with the ≤1,500 pound block restriction and U50/O70 regime with the ≤2,000 pound block restriction.

Figure 4-23 Area 2C Charter regulations achievable by cumulative limit based on 2015 estimates of harvest and average fish size and 2011 QS/IFQ ratio, No ≤1,500 lb Blocks

Lower Limit (in)	Upper length limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	N/A	20	17	13	11	8	5	5	<5	<5	<5	<5	<5	<5	<5	<5
36	N/A	N/A	19	15	12	10	7	5	5	<5	<5	<5	<5	<5	<5	<5
37	N/A	N/A	20	16	14	11	8	5	5	5	<5	<5	<5	<5	<5	<5
38	N/A	N/A	N/A	18	15	13	10	6	5	5	5	<5	<5	<5	<5	<5
39	N/A	N/A	N/A	19	16	14	11	8	6	5	5	5	<5	<5	<5	<5
40	N/A	N/A	N/A	20	18	15	12	9	7	5	5	5	5	5	5	<5
41	N/A	N/A	N/A	N/A	19	17	13	10	8	7	5	5	5	5	5	5
42	N/A	N/A	N/A	N/A	20	18	14	11	10	8	6	5	5	5	5	5
43	N/A	N/A	N/A	N/A	N/A	19	15	12	11	9	8	7	5	5	5	5
44	N/A	N/A	N/A	N/A	N/A	20	17	14	12	11	9	8	7	6	6	5
45	N/A	N/A	N/A	N/A	N/A	N/A	18	15	14	12	11	10	8	8	7	7
46	N/A	N/A	N/A	N/A	N/A	N/A	20	16	15	13	12	11	10	9	9	8
47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18	16	15	13	12	11	10	10	9
48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	17	16	14	13	12	11	11	10
49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	18	16	15	14	13	13	12
50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	19	17	17	15	15	14	14

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Figure 4-24 Area 2C Charter regulations achievable by cumulative limit based on 2015 estimates of harvest and average fish size and 2011 QS/IFQ ratio, No ≤2,000 lb Blocks

Lower Limit (in)	Upper length limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	N/A	N/A	19	15	12	9	5	5	<5	<5	<5	<5	<5	<5	<5	<5
36	N/A	N/A	N/A	17	14	11	7	5	5	<5	<5	<5	<5	<5	<5	<5
37	N/A	N/A	N/A	18	15	12	9	5	5	5	<5	<5	<5	<5	<5	<5
38	N/A	N/A	N/A	20	17	14	11	7	5	5	5	<5	<5	<5	<5	<5
39	N/A	N/A	N/A	N/A	18	16	12	8	6	5	5	5	<5	<5	<5	<5
40	N/A	N/A	N/A	N/A	20	17	13	10	8	6	5	5	5	5	5	<5
41	N/A	N/A	N/A	N/A	N/A	19	15	11	9	8	6	5	5	5	5	5
42	N/A	N/A	N/A	N/A	N/A	20	16	13	11	9	7	6	5	5	5	5
43	N/A	N/A	N/A	N/A	N/A	N/A	17	14	12	10	8	7	6	5	5	5
44	N/A	N/A	N/A	N/A	N/A	N/A	19	15	14	12	10	9	8	7	7	6
45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17	15	14	12	11	9	8	8	8
46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18	17	15	13	12	11	10	10	9
47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	18	17	15	14	12	12	11	11
48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	19	18	16	15	14	13	12	12
49	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	18	17	16	15	15	14
50	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20	19	17	16	16	15

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Within Area 3A, the block restrictions would also trickle through from annual transfer limits to total cumulative limits. Table 4-50 and Table 4-52 show the effect of QS/IFQ ratio and block size restrictions on the total cumulative limits in Area 2C. As expected, both restrictions results in smaller cumulative limits relative to the unrestricted scenario.

Table 4-50 QS/IFQ Ratio Effect on Total Cumulative Limits with ≤ 1,500 Pound Block Restrictions, Area 3A

Cumulative Cap (Percent)	Maximum QS units Allowed	Scenario/QS Ratio					
		Historical Abundance (1995-2007)	2011	2012	2013	2014	2015
5	8,576,868	1.067	0.666	0.553	0.512	0.326	0.361
6	10,292,242	1.280	0.799	0.663	0.614	0.392	0.434
7	12,007,616	1.493	0.932	0.774	0.716	0.457	0.506
8	13,722,990	1.707	1.065	0.884	0.819	0.522	0.578
9	15,438,363	1.920	1.199	0.995	0.921	0.588	0.650
10	17,153,737	2.134	1.332	1.105	1.023	0.653	0.723
11	18,869,111	2.347	1.465	1.216	1.126	0.718	0.795
12	20,584,484	2.560	1.598	1.326	1.228	0.784	0.867
13	22,299,858	2.774	1.731	1.437	1.331	0.849	0.940
14	24,015,232	2.987	1.865	1.547	1.433	0.914	1.012
15	25,730,605	3.200	1.998	1.658	1.535	0.979	1.084
16	27,445,979	3.414	2.131	1.768	1.638	1.045	1.156
17	29,161,353	3.627	2.264	1.879	1.740	1.110	1.229
18	30,876,726	3.840	2.397	1.989	1.842	1.175	1.301
19	32,592,100	4.054	2.530	2.100	1.945	1.241	1.373
20	34,307,474	4.267	2.664	2.211	2.047	1.306	1.445
QS/IFQ Ratio		8.04	12.88	15.52	16.76	26.27	23.73

Source: Northern Economics, Inc. estimates from NOAA (2015a).

Table 4-51 QS/IFQ Ratio Effect on Total Cumulative Limits with ≤ 2,000 Pound Block Restrictions, Area 3A

Cumulative Cap (Percent)	Maximum QS units Allowed	Scenario/QS Ratio					
		Historical Abundance (1995-2007)	2011	2012	2013	2014	2015
5	8,026,656	0.998	0.623	0.517	0.479	0.306	0.338
6	9,631,987	1.198	0.748	0.621	0.575	0.367	0.406
7	11,237,318	1.398	0.872	0.724	0.670	0.428	0.473
8	12,842,649	1.597	0.997	0.827	0.766	0.489	0.541
9	14,447,980	1.797	1.122	0.931	0.862	0.550	0.609
10	16,053,311	1.997	1.246	1.034	0.958	0.611	0.676
11	17,658,642	2.196	1.371	1.138	1.054	0.672	0.744
12	19,263,973	2.396	1.496	1.241	1.149	0.733	0.812
13	20,869,305	2.596	1.620	1.345	1.245	0.794	0.879
14	22,474,636	2.795	1.745	1.448	1.341	0.856	0.947
15	24,079,967	2.995	1.870	1.552	1.437	0.917	1.015
16	25,685,298	3.195	1.994	1.655	1.533	0.978	1.082
17	27,290,629	3.394	2.119	1.758	1.628	1.039	1.150
18	28,895,960	3.594	2.243	1.862	1.724	1.100	1.217
19	30,501,291	3.794	2.368	1.965	1.820	1.161	1.285
20	32,106,622	3.993	2.493	2.069	1.916	1.222	1.353
QS/IFQ Ratio		8.04	12.88	15.52	16.76	26.27	23.73

Source: Northern Economics, Inc. estimates from NOAA (2015a).

As noted in the Area 2C discussion, while block restrictions reduce the total cumulative limits, within a certain range the Council could adjust for the block restrictions with higher total cumulative limits. For example, presume the Council wanted to ban RQE ownership of the ≤2,000 pound blocks, but wanted the Area 3A fishery to have access to an additional 0.500 Mlb of quota while operating under 2015 conditions. In a no restriction scenario the Council would need to select a six to seven percent total cumulative limit. However, in a scenario where the Council restricted the ownership of ≤2,000 pound blocks, the Council would need to select a roughly seven to eight percent total cumulative limit (see Table 4-49).[28]

[28] The authors' note that selecting the ≤2,000 block limit also has the effect of protecting 62.5 percent of the Area 3A D-Class share from being purchased by the RQE.

Table 4-52 Comparison of Sub-Option Effects on Total Cumulative Limits, Area 3A

Cumulative Cap (Percent)	Maximum QS units Allowed	Scenario/QS Ratio			
		No Restrictions	No D-Class	No 1,500 Blocks	No 2,000 Blocks
5	8,576,868	0.389	0.363	0.361	0.338
6	10,292,242	0.467	0.435	0.434	0.406
7	12,007,616	0.545	0.508	0.506	0.473
8	13,722,990	0.623	0.580	0.578	0.541
9	15,438,363	0.701	0.653	0.650	0.609
10	17,153,737	0.779	0.726	0.723	0.676
11	18,869,111	0.857	0.798	0.795	0.744
12	20,584,484	0.935	0.871	0.867	0.812
13	22,299,858	1.013	0.943	0.940	0.879
14	24,015,232	1.091	1.016	1.012	0.947
15	25,730,605	1.168	1.088	1.084	1.015
16	27,445,979	1.246	1.161	1.156	1.082
17	29,161,353	1.324	1.234	1.229	1.150
18	30,876,726	1.402	1.306	1.301	1.217
19	32,592,100	1.480	1.379	1.373	1.285
20	34,307,474	1.558	1.451	1.445	1.353
QS/IFQ Ratio		23.735	23.735	23.735	23.735

Source: Northern Economics, Inc. estimates from NOAA (2015a).

The analysis only shows figures of the effect of block restrictions for lower stock conditions similar to 2015. The analytical results for 2011 higher stock conditions indicate that the Area 3A fishery could reach any of the regulatory options in the figures, including no annual limit and a second fish under 50 inches, with 5 percent or less of the Area 3A QS (minus the restricted blocks). Under both the $\leq$1,500 pound and $\leq$2,000 pound restrictions, the Area 3A fishery is able to reach substantially larger second fish length maximums with 7 to 10 percent of the QS in Area 3A. Under 2015 stock conditions, the sector needs the five percent cumulative limit just to reach the status quo. This situation is whether the analysis is talking about the no restriction scenario, the D-Class scenario, or the block restrictions scenarios. The results of the analysis seems to suggest that in Area 3A, a five percent cumulative limit would leave the sector very well supplied in times of higher abundance (i.e., 2011 conditions), but would not significantly liberalize regulations under current conditions. At the same time, a 9 to 10 percent limit would give the fishery significant flexibility in lean times, but would result in significant return to the commercial sector in better times.

Figure 4-25 Area 3A Charter regulations achievable by cumulative limit based on 2015 estimates of harvest and average fish size and QS/IFQ Ratio, No ≤1,500 lb Blocks

Size Limit on 2nd fish (in)	Annual Limit										
	1	2	3	4	5	6	7	8	9	10	None
26	<5	<5	<5	5	5	5	5	5	5	5	5
27	<5	<5	<5	5	5	5	5	5	5	5	5
28	<5	<5	5	5	5	5	5	5	5	5	5
29	<5	<5	5	5	5	5	5	5	5	5	5
30	<5	<5	5	5	5	5	5	5	6	6	6
31	<5	<5	5	5	5	6	6	6	6	6	6
32	<5	<5	5	5	6	6	7	7	7	7	7
33	<5	5	5	6	6	7	7	7	7	7	8
34	<5	5	5	6	7	7	8	8	8	8	8
35	<5	5	5	6	7	8	8	8	8	8	8
36	<5	5	5	7	8	8	8	9	9	9	9
37	<5	5	5	7	8	8	9	9	9	9	9
38	<5	5	5	7	8	9	9	9	9	9	9
39	<5	5	5	8	8	9	9	9	9	9	10
40	<5	5	5	8	8	9	9	9	10	10	10
41	<5	5	5	8	9	9	9	10	10	10	10
42	<5	5	6	8	9	9	10	10	10	10	10
43	<5	5	6	8	9	10	10	10	10	10	10
44	<5	5	6	8	9	10	10	10	10	10	10
45	<5	5	6	8	9	10	10	10	10	10	10
46	<5	5	6	9	9	10	10	10	10	10	11
47	<5	5	6	9	9	10	10	10	10	11	11
48	<5	5	6	9	9	10	10	10	11	11	11
49	<5	5	6	9	10	10	10	11	11	11	11
50	<5	5	6	9	10	10	11	11	11	11	11

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Figure 4-26 Area 3A Charter regulations achievable by cumulative limit based on 2015 estimates of harvest and average fish size and QS/IFQ ratio, No ≤2,000 lb Blocks

Size Limit on 2nd fish (in)	Annual Limit										
	1	2	3	4	5	6	7	8	9	10	None
26	<5	<5	<5	5	5	5	5	5	5	5	5
27	<5	<5	<5	5	5	5	5	5	5	5	5
28	<5	<5	5	5	5	5	5	5	5	5	5
29	<5	<5	5	5	5	5	5	5	5	5	5
30	<5	<5	5	5	5	5	6	6	6	6	6
31	<5	<5	5	5	5	6	6	6	6	7	7
32	<5	<5	5	6	6	7	7	7	7	7	8
33	<5	5	5	6	7	7	8	8	8	8	8
34	<5	5	5	6	7	8	8	8	8	8	9
35	<5	5	5	7	8	8	8	9	9	9	9
36	<5	5	5	7	8	9	9	9	9	9	9
37	<5	5	5	7	8	9	9	9	9	9	10
38	<5	5	5	8	9	9	9	10	10	10	10
39	<5	5	5	8	9	9	10	10	10	10	10
40	<5	5	6	8	9	10	10	10	10	10	10
41	<5	5	6	8	9	10	10	10	10	10	11
42	<5	5	6	9	9	10	10	10	10	11	11
43	<5	5	6	9	10	10	10	11	11	11	11
44	<5	5	6	9	10	10	11	11	11	11	11
45	<5	5	6	9	10	10	11	11	11	11	11
46	<5	5	6	9	10	10	11	11	11	11	11
47	<5	5	7	9	10	11	11	11	11	11	11
48	<5	5	7	9	10	11	11	11	11	11	11
49	<5	5	7	9	10	11	11	11	11	12	12
50	<5	5	7	10	10	11	11	12	12	12	12

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

4.8.1.2.8 Comparison of Element 2 Options and Combinations

The number of options and sub-options combined with the innate variability of charter harvests makes comparing the effect of options challenging. The following tables attempt to compare the effect of the sub-options under specific conditions on the "best" regulatory option achievable with different cumulative caps.[29] Table 4-53 compares the effect of the option sand sub-options of **Element 2** in Area 2C under 2015 stock conditions and projected angler demand. Under a five percent cumulative allowance cap, the RQE could have achieve a 1 fish under 49 inches or above 80 inches (U49-O80). This compares to the actual regulation of U42-O80. If the RQE were banned from buying D-Class shares or blocks with 1,500 pounds or less, the RQE could have managed a U48-O76 scenario. Combining these two restrictions would lead to a U48-O80 scenario. This U48-O80 scenario would also have been achievable with the restriction on 2,000 pounds or smaller blocks, but the combination of this block restriction with the D-Class restriction would have reduced the best available option to U47-O80. In essence, the modeling shows that while the restrictions have effects, the RQE would still be able to make substantial progress, in a recovering stock scenario, in liberalizing daily bag limits.

Table 4-53 Comparison of Element 2 Options and Sub-Options, Area 2C 2015 Stock Conditions/2015 Demand

Cumulative Cap (Percent)	No Restrictions	No D-Class	≤1,500 lb Blocks		≤2,000 lb Blocks	
			No Blocks	No Blocks and D-Class	No Blocks	No Blocks and D-Class
5	U49-O80	U48-O76	U48-O76	U48-O80	U48-O80	U47-O80
6	U50-O76	U49-O78	U49-O76	U48-O74	U48-O76	U48-O76
7	U50-O74	U50-O76	U50-O76	U49-O76	U49-O76	U49-O80
8	U50-O70	U50-O74	U50-O74	U50-O76	U50-O76	U50-O80
9	U50-O68	U50-O72	U50-O70	U50-O74	U50-O74	U50-O76
10	U50-O66	U50-O68	U50-O68	U50-O70	U50-O70	U50-O74
11	U50-O64	U50-O66	U50-O66	U50-O68	U50-O68	U50-O70
12	U50-O62	U50-O64	U50-O64	U50-O66	U50-O66	U50-O68
13	U49-O60	U49-O62	U49-O62	U50-O64	U49-O64	U50-O66
14	U50-O60	U50-O62	U50-O62	U46-O60	U50-O64	U49-O64
15	U50-O58	U49-O60	U49-O60	U49-O62	U49-O62	U50-O64
16	U50-O56	U50-O60	U50-O60	U50-O62	U50-O62	U49-O62
17	U49-O54	U50-O58	U50-O58	U49-O60	U49-O60	U50-O62
18	U50-O54	U49-O56	U49-O56	U50-O60	U50-O60	U49-O60
19	U50-O52	U50-O56	U50-O56	U50-O58	U50-O58	U50-O60
20	U49-O50	U49-O54	U49-O54	U49-O56	U49-O56	U49-O58

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Table 4-54 provides the same comparison as Table 4-53 for Area 2C, but under 2011 stock conditions. With no restrictions the best option would a U55-O76 regulation with a five percent allowance. As the restrictions on RQE purchases increase this slips to a U44-O80 regulation and then to a U43-O76 regulation. The effect of the restrictions are more visible at higher allowances. Under a 20 percent allowance the restrictions cause the best option to fall from a U49-O62 to a U50-O70 option.

[29] At times it is unclear which regulatory option would be preferred by the charter sector and fishery managers. In the case of these tables the authors have prioritized raising the maximum size (i.e., the lower length limit) over lowering the minimum size of trophy fish (i.e., the upper length limit) or raising the annual limit. The authors made this assumption as raising the minimum length gives the most anglers access to the most fish.

Table 4-54 Comparison of Element 2 Options and Sub-Options, Area 2C 2011 Stock Conditions/2015 Demand

Cumulative Cap (Percent)	No Restrictions	No D-Class	≤1,500 lb Blocks		≤2,000 lb Blocks	
			No Blocks	No Blocks and D-Class	No Blocks	No Blocks and D-Class
5	U44-O76	U44-U80	U44-O80	U43-O76	U43-O76	U43-O76
6	U44-O74	U44-U76	U44-O76	U44-O78	U44-O80	U44-O80
7	U46-O78	U45-O80	U45-O78	U45-O80	U44-O76	U44-O76
8	U47-O80	U46-O80	U46-O80	U45-O76	U45-O76	U45-O80
9	U48-O80	U46-O76	U47-O80	U46-O80	U46-O80	U45-O76
10	U48-O76	U47-O76	U48-O80	U47-O80	U46-O76	U46-O78
11	U49-O76	U48-O76	U48-O76	U47-O76	U47-O78	U47-O80
12	U50-O78	U49-O80	U49-O80	U48-O80	U48-O78	U47-O76
13	U50-O74	U49-O76	U49-O76	U48-O74	U48-O76	U48-O78
14	U50-O72	U50-O80	U50-O80	U49-O78	U49-O80	U48-O76
15	U50-O70	U50-O76	U50-O74	U50-O80	U50-O80	U49-O80
16	U50-O68	U50-O74	U49-O70	U50-O76	U50-O76	U49-O76
17	U46-O62	U50-O72	U50-O70	U50-O74	U50-O74	U50-O78
18	U50-O66	U50-O70	U49-O68	U50-O72	U49-O70	U50-O76
19	U50-O64	U50-O68	U50-O68	U50-O70	U50-O72	U50-O74
20	U49-O62	U46-O62	U50-O66	U49-O68	U50-O70	U50-O72

Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

For Area 3A, the analysis shows low stock conditions of 2015. Under higher stocks and similar demand conditions the sector would need less than the 5 percent minimum allowance under consideration by the Council. Under 2015 conditions, an unrestricted 5 percent allowance would allow the sector to have a 32-inch maximum size limit on the second fish while the most restrictive option would only allow a 30-inch maximum size limit. Another way of looking at the sub-options is the minimum allocation needed to reach a selected size limit. For example, a U50 size limit would require a 9 percent cumulative allowance in a no restrictions scenario, but an 11 percent allowance when the RQE is restricted from purchasing blocks of 2,000 pounds or less and D-Class.

Table 4-55 Comparison of Element 2 Options and Sub-Options, Area 3A 2015 Stock Conditions/2015 Demand

Cumulative Cap (Percent)	No Restrictions	No D-Class	≤1,500 lb Blocks		≤2,000 lb Blocks	
			Only Blocks	Blocks and D-Class	Only Blocks	Blocks and D-Class
5	U32	U31	U31	U31	U31	U30
6	U34	U33	U33	U32	U32	U32
7	U38	U35	U35	U35	U34	U34
8	U44	U40	U40	U38	U37	U37
9	U50	U48	U48	U44	U42	U41
10		U50	U50	U50	U50	U48
11						U50
12						
13						
14						
15						
16						
17						
18						
19						
20						

This blue shaded area indicated allowances that would allow managers to select a maximum size on the second fish larger than 50" in length or relax the 5-fish annual limit or eliminate the day of the week closure.

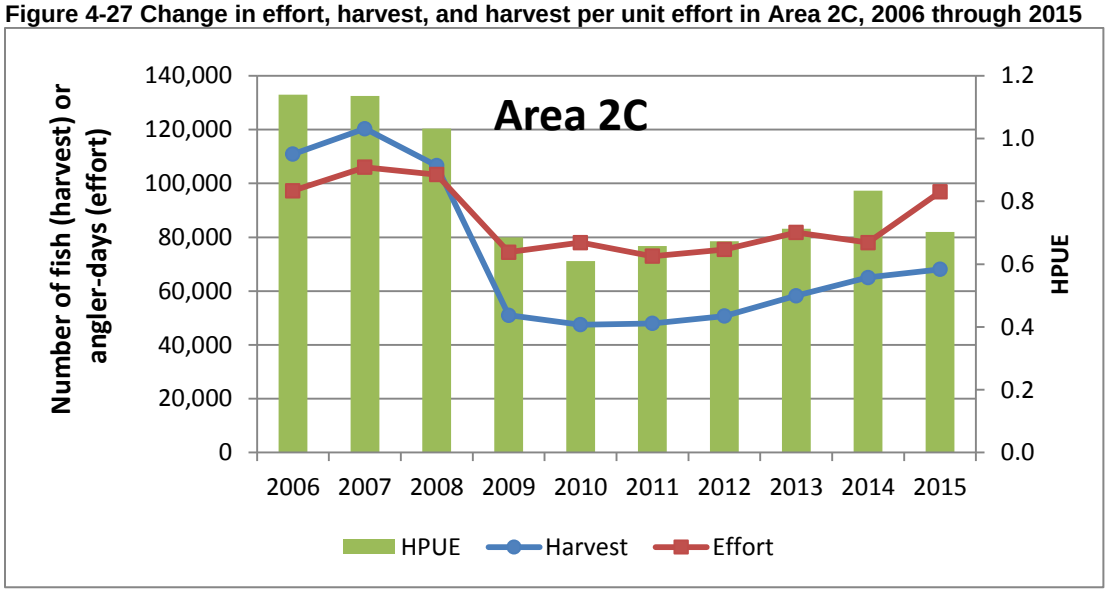
Source: Northern Economics, Inc. estimates from ADF&G (2015) and NOAA (2015a).

Angler demand is held constant at 2015 levels in Table 4-53 through Table 4-55 in order to isolate the impact of stock conditions. However, changes in angler effort could greatly affect an RQE's demand for halibut QS in a way that is difficult to predict. While new entry into the halibut charter business is capped in the fishery with a limited number of CHPs in circulation, without additional harvest restrictions this does not directly cap angler effort.[30] Variability in angler effort itself depends on a suite of other exogenous factors, for example changes in angler demand, ocean and weather conditions, the management measures chosen (e.g. day of the week closure). In addition, as further analyzed under **Alternative 3** in Section 4.9, there is significant unused and underutilized capacity under the existing CHPs, although it is unlikely that capacity will ever be fully realized due to seasonal trends.

Change in effort has often been considered in terms of a change in angler-trips. This change is shown for Area 2C in Figure 4-27. Both Area 2C and Area 3A demonstrates a noteworthy decline in effort (as well as harvest) between 2008 and 2009. One likely culprit was the declining state of the U.S. economy in after 2008, which could particularly impact non-Alaskan charter anglers. Area 3A had the same management measures for 2008 and 2009; however, another likely factor for Area 2C could have been the shift in regulations from a two fish bag-limit (1 U32) to a one fish of any size management regime. This may have contributed to the reduced harvest, and potentially effort due to an aversion to the lower bag limit. Section 4.8.2.1.1 continues the discussion of impacts on charter anglers and angler effort.

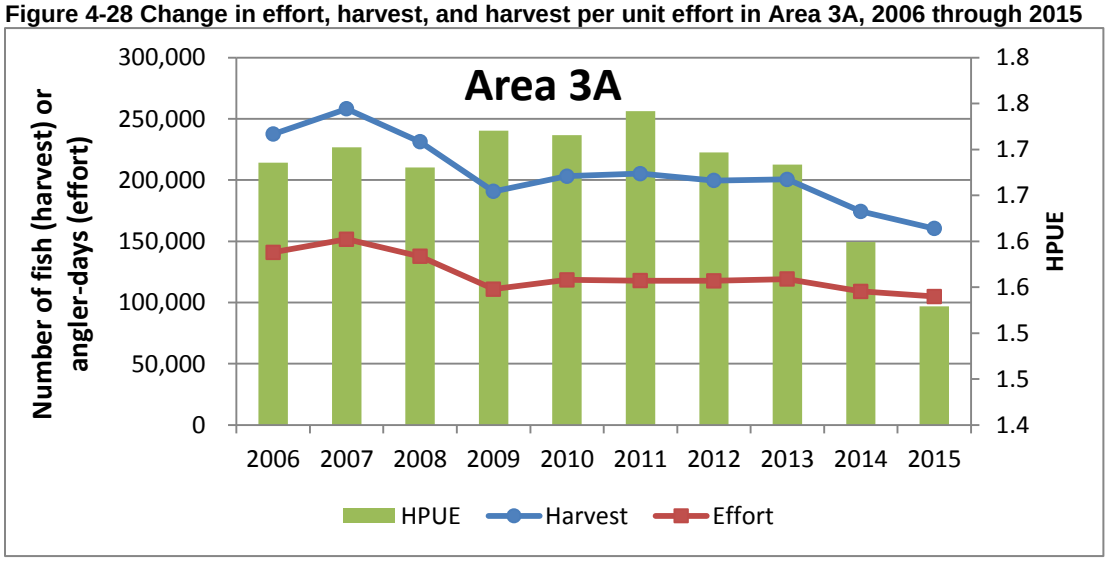
[30] CHPs do have a designated number of anglers that are endorsed to fish halibut on their vessel in a given trip. However, absent other management measure, theoretically, this would not preclude an angler from taking multiple trips in a day.

Figure 4-27 Change in effort, harvest, and harvest per unit effort in Area 2C, 2006 through 2015



Source: Logbook sourced through ADF&G
Figure notes: Harvest is measured in number of fish. Effort is number of bottomfish angler-trips with halibut harvest. 2015 values are preliminary.

Figure 4-28 Change in effort, harvest, and harvest per unit effort in Area 3A, 2006 through 2015



Source: Logbook sourced through ADF&G
Figure notes: Harvest is measured in number of fish. Effort is number of bottomfish angler-trips with halibut harvest. 2015 values are preliminary.

4.8.1.3 Element 3: Annual Reversion in Times of High Abundance

Element 3 of **Alternative 2** sets the timing of the use of RQE shares plus conditions for the temporary redistribution of RQE holdings back to the commercial sector when an RQE has holdings in excess of the amount of QS needed to provide charter clients with harvest opportunities greater than the unguided recreational bag limit in either area. As stated in the Council's December 2015 motion:

> *Setting of annual charter management measures. Use RQE quota share holdings as of October 1 each year as the basis to estimate IFQ pounds to add to the estimated guided recreational allocation under the catch sharing plan for the upcoming year. This amount must be maintained*

for the following fishing year. This estimated combined allocation would be used to recommend the guided recreational harvest measures for the following year. The procedural process steps and timeline would remain unchanged.

If the RQE holdings provide a charter harvest opportunity greater than the unguided recreational bag limit in either area, NMFS would not issues annual IFQ in excess of the amount needed for the charter sector to obtain the unguided recreational bag limit to the RQE for that area. Unallocated RQE IFQ would be reallocated as follows:

- ***Sub-option 1****-Equally to all catcher vessel QS holders which hold not more than 1,500 to 3,000 pounds in 2016 pounds (by area, proportional to QS holdings)*[31]
- ***Sub-option 2****-Equally to all catcher vessel QS holders (by area, proportional to QS holdings)*
- ***Sub-option 3****-CQEs actively participating in Area 2C/Area 3A*
- ***Sub-option 4****-Unallocated RQE IFQ would not be allocated (left in the water)*

As specified by the option, the analysis focus on the reallocation when halibut are abundant including under what conditions a reallocation would be triggered. Under recent stock conditions, none of the considered allocations in Area 2C would result in a bag limit of two fish of unrestricted size. The ability to reach this type of daily bag limit in Area 3A could likely occur with a high allocation and low annual limit.

Sub-option 1 would reallocate excess QS to all catcher vessel QS holders holding not more than 1,500 pounds to 3,000 pounds while **Sub-option 2** would reallocate the QS to all catcher vessel QS holders. As these two options are very similar, the analysis presents them together. Table 4-56 depicts the number of 2015 QS holders in Area 2C, the portion of all QS holders represented by each sub-group, their relative portion of all QS held, and the average and median pounds of IFQ in 2015. In 2015, there were 993 QS holders averaging 3,704 pounds of IFQ each. However, the median IFQ holder held just 2,561 pounds of IFQ, indicating the presence of relatively few large QS owners and many owners of smaller amounts (see Table 4-56). For the other groups:

- There were just over 376 QS owners who held 1,500 pounds or less in 2015. This group represented 37.9 percent of all QS owners by held just 5.5 percent of all QS units. Their average 2015 poundage was 537 pounds while their median poundage was 417 pounds.
- QS owners with the 2015 equivalent of 2,000 pounds or less of IFQ numbered 436, representing 43.9 percent of all owners and holding 8.3 percent of QS. On average, they held 703 pounds of QS with a median holding of 544 pounds.
- The 2,500 pounds or less group represents 49.6 percent (493 owners) of all QS owners, and they held 11.8 percent of all QS units. On average those units were worth 882 pounds in 2015, while the median holding was 717 pounds.
- Owners with 3,000 pounds or less represent 55.4 percent of all holders and they hold 16.8 percent of all QS. Average holdings were 1,077 pounds while median holding 856 pounds.

[31] The analysis uses 2015 data from NMFS.

Table 4-56 2015 QS and IFQ Holders in Area 2C, 2015 data[32]

Group	Holders (N)	Holders (%)	QS (%)	Average IFQ (Pounds)	Median IFQ (Pounds)
All QS Holders	993	100.0	100	3,704	2,551
≤1,500 Pounds	376	37.9	5.5	537	417
≤2,000 Pounds	436	43.9	8.3	703	544
≤2,500 Pounds	493	49.6	11.8	882	717
≤3,000 Pounds	550	55.4	16.1	1077	856

Source: NMFS 2015(a)

It is difficult at this stage to determine how much, if any, QS would be reallocated back to the commercial sector. Under 2015 conditions, ADF&G estimated that a one-fish bag limit with unrestricted size would require a 1.5 Mlb allocation to the 2C charter sector. Assuming that roughly 60 percent of anglers kept a second fish, a two-fish allocation would require 2.4 Mlb. Without the RQE, this poundage could only be reached if total combined catch limit reached 15 Mlb (see Table 4-56). The Area 2C charter fishery's ability to reach the equivalent of 2.4 Mlb to allow for a two fish of any size daily bag limit will depend on abundance and the cumulative allowance set by the Council. Table 4-56 shows the base charter allocation by Annual Combined Catch Limit level and the RQE catch limit (base allocation plus value of QS holdings) by allowance scenario. For example, if the Council allowed the RQE to purchase up to 20 percent of all QS (unrestricted) then, assuming current demand and average weights, we could expect overage allocations to start occuring around the 7.5 Mlb ACCL. The shaded cells indicate when the RQE's catch limit would exceed 2.4 Mlb. The dotted box represents the equivalent of the ACCL during the years the GHL was in place and halibut were more abundant. The table shows that a 20 percent allowance (and ownership) would likely result in reallocations before abundance reaches historical levels. A 15 percent allowance or a 10 percent allowance would likely result in some reallocations at historical levels, while a 5 percent allowance and owership means that reallocations would likely only occur at very high abundance levels.

[32] Unique holders are identified by NMFS ID. The authors acknowledge that some partnerships/spousal arrangements might be considered individual small holders for the purposes of this discussion but may actually function like a larger entity in practice.

Table 4-57 Conditions for Triggering a Reallocation, Area 2C

Annual Combined Catch Limit (Mlb)	Base Charter Allocation (Mlb)	Commercial Catch Limit Ex Incidental Mortality (Mlb)	Est QS/IFQ Ratio	RQE CL at 20 Percent RQE Allowance	RQE CL at 15 Percent RQE Allowance	RQE CL at 10 Percent RQE Allowance	RQE CL at 5 Percent RQE Allowance
1.5	0.275	1.19	50.0	0.512	0.453	0.39	0.334
2.0	0.366	1.59	37.5	0.683	0.604	0.52	0.445
2.5	0.458	1.98	30.0	0.854	0.755	0.66	0.557
3.0	0.549	2.38	25.0	1.025	0.906	0.79	0.668
3.5	0.641	2.77	21.4	1.195	1.057	0.92	0.779
4.0	0.732	3.17	18.8	1.366	1.208	1.05	0.891
4.5	0.824	3.57	16.7	1.537	1.359	1.18	1.002
5.0	0.915	3.96	15.0	1.708	1.510	1.31	1.113
5.5	0.915	4.45	13.4	1.805	1.582	1.36	1.137
6.0	0.954	4.90	12.1	1.933	1.688	1.44	1.199
6.5	1.034	5.30	11.2	2.094	1.829	1.56	1.299
7.0	1.113	5.71	10.4	2.255	1.970	1.68	1.399
7.5	1.193	6.12	9.7	2.417	2.111	1.80	1.499
8.0	1.272	6.53	9.1	2.578	2.251	1.92	1.598
8.5	1.352	6.94	8.6	2.739	2.392	2.05	1.698
9.0	1.431	7.34	8.1	2.900	2.533	2.17	1.798
9.5	1.511	7.75	7.7	3.061	2.673	2.29	1.898
10.0	1.590	8.16	7.3	3.222	2.814	2.41	1.998
10.5	1.670	8.57	6.9	3.383	2.955	2.53	2.098
11.0	1.749	8.98	6.6	3.544	3.095	2.65	2.198
11.5	1.829	9.38	6.3	3.705	3.236	2.77	2.298
12.0	1.908	9.79	6.1	3.867	3.377	2.89	2.398
12.5	1.988	10.20	5.8	4.028	3.518	3.01	2.498
13.0	2.067	10.61	5.6	4.189	3.658	3.13	2.597
13.5	2.147	11.02	5.4	4.350	3.799	3.25	2.697
14.0	2.226	11.42	5.2	4.511	3.940	3.37	2.797
14.5	2.306	11.83	5.0	4.672	4.080	3.49	2.897
15.0	2.385	12.24	4.9	4.833	4.221	3.61	2.997

Apparent from Table 4-56 is that reallocations will likely only be reached under certain specific stock, RQE QS ownership, and angler demand conditions. Additionally, reallocations could range from less than 50,000 pounds to several hundred thousand pounds or millions of pounds in the right (albeit very rare) conditions. It is impossible to predict from whom and from how many the RQE will purchase QS or how those purchases will change median or average holdings. However, it is most likely that there will be fewer commercial QS owners. For discussion purchases, Table 4-58 shows the effect of redistributing a range of additional poundage across the *existing* QS owners. The table shows that even modest reallocations could be a potential boon to the small QS holders. For example, redistributing 100,000 pounds across the 266 holders of 1,500 pounds or less would increase holdings by 266 pounds each or a 64 percent increase for the median holder. The authors note that included in this group of 376 QS owners are 100 owners who held less than 100 pounds of QS in 2015. For these individuals, the addition of 266 pounds would more than treble their holdings and might raise question about whether the QS is being distributed to individuals who actually invest significantly in the fishery.

Table 4-58 Effect of High Abundance Re-allocation on QS Holders, Area 2C

	Pounds Reallocated			
Distribution Group	**100,000**	**250,000**	**500,000**	**1,000,000**
Pounds of Additional Quota				
All QS Holders	101	252	504	1,007
≤1,500 Pounds	266	665	1,330	2,660
≤2,000 Pounds	229	573	1,147	2,294
≤2,500 Pounds	203	507	1,014	2,028
≤3,000 Pounds	182	455	909	1,818
Percent Increase in Median Quota				
All QS Holders	4	10	20	39
≤1,500 Pounds	64	159	319	638
≤2,000 Pounds	42	105	211	422
≤2,500 Pounds	28	71	141	283
≤3,000 Pounds	21	53	106	212

Source: Northern Economics, Inc. estimates from NMFS 2015(a).

In Area 3A in 2015, there were 1,257 QS holders averaging 6,198 pounds of IFQ each. However, the median IFQ holder held just 3,399 pounds of IFQ, indicating the presence of relatively few large QS owners and many owners of smaller amounts (see Table 4-56). For the other groups:

- There were just over 370 QS owners who held 1,500 pounds or less in 2015. This group represented 29.6 percent of all QS owners, but held just 2.3 percent of all QS units. Their average 2015 poundage was 477 pounds while their median poundage was 279 pounds.
- QS owners with the 2015 equivalent of 2,000 pounds or less of IFQ numbered 448 representing 35.6 percent of all owners and holding 4.0 percent of QS. On average, they held 658 pounds of QS with a median holding of 445 pounds.
- The 2,500 pounds or less group represents 41.9 percent (527 owners) of all QS owners and they held 6.2 percent of all QS units. On average, those units were worth 919 pounds in 2015 while the median holding was 794 pounds.
- Owners with 3,000 pounds or less represent 45.6 percent of all holders and they hold 7.8 percent of all QS. Average holdings were 1,064 pounds while median holding 938 pounds.

Table 4-59 2015 QS and IFQ Holders in Area 3A

Group	Holders (N)	Holders (%)	QS (%)	Average IFQ	Median IFQ
All QS Holders	1,257	100.0		6,198	3,399
<1,500 Pounds	372	29.6	2.3	477	279
<2,000 Pounds	448	35.6	4.0	658	445
<2,500 Pounds	527	41.9	6.2	919	794
<3,000 Pounds	573	45.6	7.8	1064	938

Source: NMFS 2015(a).

Under current conditions in Area 3A, we expect that a two fish of any size daily bag limit could be reached somewhere between 2.8 Mlb and 3.4 Mlb depending on demand and average fish size. The Area 3A charter sector used to regularly take an amount of halibut near the GHL, but a combination of economic factors (i.e., strength of the economy, cost of charters, etc.), smaller fish sizes, and regulatory pressures have lowered overall demand potential. Table 4-60 shows that reallocations are more likely in

Area 3A and are likely to occur even at ACCL levels below historical combined catch levels (as displayed by the dotted box. Even under 5 to 10 percent allowances, reallocations could occur between ACCLs of 11 to 15 Mlb.

Table 4-60 Conditions for Triggering a Reallocation, Area 3A

Annual Combined Catch Limit (Mlb)	Base Charter Allocation (Mlb)	Commercial Catch Limit Ex Incidental Mortality (Mlb)	Est QS/IFQ Ratio	RQE CL at 20 Percent RQE Allowance	RQE CL at 15 Percent RQE Allowance	RQE CL at 10 Percent RQE Allowance	RQE CL at 5 Percent RQE Allowance
1.0	0.189	0.79	235.0	0.346	0.307	0.268	0.228
2.0	0.378	1.57	117.5	0.693	0.614	0.535	0.457
3.0	0.567	2.36	78.3	1.039	0.921	0.803	0.685
4.0	0.756	3.15	58.7	1.386	1.228	1.071	0.913
5.0	0.945	3.93	47.0	1.732	1.535	1.338	1.142
6.0	1.134	4.72	39.2	2.078	1.842	1.606	1.370
7.0	1.323	5.51	33.6	2.425	2.149	1.874	1.598
8.0	1.512	6.30	29.4	2.771	2.456	2.142	1.827
9.0	1.701	7.08	26.1	3.117	2.763	2.409	2.055
10.0	1.890	7.87	23.5	3.464	3.070	2.677	2.283
11.0	1.925	8.81	21.0	3.686	3.246	2.806	2.365
12.0	2.100	9.61	19.2	4.021	3.541	3.061	2.580
13.0	2.275	10.41	17.8	4.356	3.836	3.316	2.795
14.0	2.450	11.21	16.5	4.691	4.131	3.571	3.010
15.0	2.625	12.01	15.4	5.027	4.426	3.826	3.225
16.0	2.800	12.81	14.4	5.362	4.721	4.081	3.440
17.0	2.975	13.61	13.6	5.697	5.016	4.336	3.655
18.0	3.150	14.41	12.8	6.032	5.311	4.591	3.870
19.0	3.325	15.21	12.2	6.367	5.606	4.846	4.085
20.0	3.500	16.01	11.5	6.702	5.902	5.101	4.301
21.0	3.500	16.98	10.9	6.896	6.047	5.198	4.349
22.0	3.500	17.95	10.3	7.090	6.193	5.295	4.398
23.0	3.500	18.92	9.8	7.284	6.338	5.392	4.446
24.0	3.500	19.89	9.3	7.478	6.484	5.489	4.495
25.0	3.500	20.86	8.9	7.672	6.629	5.586	4.543
26.0	3.640	21.70	8.5	7.979	6.894	5.810	4.725
27.0	3.780	22.53	8.2	8.286	7.160	6.033	4.907
28.0	3.920	23.37	7.9	8.593	7.425	6.257	5.088

As in Area 2C, reallocations could range from less than 50,000 pounds to several hundred thousand pounds or millions of pounds in the right conditions. It is impossible to know from whom and from how many the RQE will purchase QS or how those purchases will change median or average holdings. However, it is most likely that there will be fewer commercial QS owners. For discussion purchases, Table 4-58 shows the effect of redistributing a range of additional poundage across the *existing* QS owners. The table shows that, as in Area 2C, even modest reallocations could be a potential boon to the small QS holders.

Table 4-61 Effect of High Abundance Re-allocation on QS Holders, Area 3A

	Pounds Reallocated			
Distribution Group	**50,000**	**100,000**	**150,000**	**200,000**
Pounds of Additional Quota				
All QS Holders	101	252	504	1,007
<1,500 Pounds	266	665	1,330	2,660
<2,000 Pounds	229	573	1,147	2,294
<2,500 Pounds	203	507	1,014	2,028
<3,000 Pounds	182	455	909	1,818
Percent Increase in Median Quota				
All QS Holders	4	10	20	39
<1,500 Pounds	64	159	319	638
<2,000 Pounds	42	105	211	422
<2,500 Pounds	28	71	141	283
<3,000 Pounds	21	53	106	212

Source: Northern Economics, Inc. estimates from NMFS 2015(a).

Under **Sub-option 3**, reallocated halibut would flow to CQEs operating in Area 2C/Area 3A. As of December 31, 2015, NMFS data indicate that there were no CQEs operating with QS holdings in Area 2C and two CQEs operating with QS holdings in Area 3A. These CQEs fished less held less than 20,000 pounds of halibut IFQ in 2015 (see Table 4-17). As shown above, overages in Area 3A could be many times the current holdings of these CQEs and might exceed their ability to fish the reallocation in the space of one season.

Under **Sub-option 4**, NMFS would not issue any IFQ related to QS above the amount required for the charter sector to provide the same daily bag limit as unguided anglers. Thus, the associated halibut stock would remain in the water. As shown above, the amount of catchable halibut that could be left in the water could be as low as several thousand pounds or it could be as high as several million pounds. Leaving halibut biomass in the water could balance years when the charter fishery inadvertently exceeds its allocation. However, the unfished halibut are economically valuable and would represent "foregone revenues" for the commercial sector and associated support sector.

4.8.1.4 Element 4: Limit on use of the RQE Funds

Element 4 would limit the use of RQE funds to the acquisition of commercial halibut quota; acquisition of charter halibut permits; halibut conservation/research; promotion of the halibut resource, and administrative costs. The RQE could not use funds to market the charter halibut sector or angler participation in the charter halibut sector. The analysis does not see significant implication of this element with the exception that the Council may wish to make clear that whether angler education, a potentially important part of long-term conservation, is expressly allowed under these limits.

4.8.1.5 Element 5: RQE Board Composition

Element 5 suggests the Council's desire for the RQE's Board to consist of a diversified group of stakeholders and individuals who can provide the organization with professional guidance, to hold regular board meetings, and to file regular annual reports. This element states:

> *RQE Organizational Structure. The RQE shall consist of a board of seven people and shall include the following: 4 CHP holders, 1 commercial halibut quota share holder, 1 community*

representative (not a holder of a CHP or commercial QS), and Commissioner of Alaska Department of Fish and Game, or designee.

Option 1. *A representative of the Alaska Department of Revenue shall sit as an ex-officio member of the RQE board.*

Option 2. *RQE board terms shall be for [Options: 3 or 5 years].*

Option 3. *The RQE shall hold no less than two board meetings annually.*

Option 4. *The RQE shall file an annual report detailing RQE activities during the prior year.*

NMFS staff early review of this provision indicates that the Council is within its authority to define the organizational structure. However, staff noted that the current wording goes beyond the specificity provided for under other programs. For example, the CQE program regulations state:

> *Regulations at § 679.41(l) specify that CQE applications must include articles of incorporation and management organization information, including 1) bylaws and 2) a list of key personnel including, but not limited to, the board of directors, officers, representatives, and any managers.*

If the Council is as specific about the structure of the organization as outlined in the current motion, NMFS would likely 'enforce' the language by requiring the RQE to submit an annual report specifying their organizational structure. NMFS would then verify that the listed members are consistent with the requirements. In effect, the annual report would serve as the RQE's attestation that it meets the Council's requirements.

4.8.1.6 Additional IFQ and CQE Program Elements and Restrictions

The following sub-sections go into more detail on issues that are not explicitly addressed in previous Council motions, yet are still relevant to a potential RQE program. Specifically, these sub-sections include discussions of the overage-underage provisions in the commercial sector, cost recovery for the development, management and monitoring of an RQE, and a short discussion on the funding avenues that may be considered by the charter sector.

4.8.1.6.1 Overage-underage provision

Section 4.5.1 describes the overage-underage program that exists in in the commercial halibut fishing for IFQ participants. The Council has not created alternatives or options around this potential aspect of the program. However, the CATCH proposal recommended that this flexibility also apply in the case of an RQE (Yamada & Flumerflet 2014). In Feb 2014, Gregg Williams (former staff) of the IPHC weighed in on the challenges of applying the overage-underage provision that exists in the commercial halibut IFQ fishery to the charter sector as recommended in the CATCH proposal. He emphasized the difference in pounds between a ten percent overage of an individual IFQ holder and a whole halibut charter sector for one regulatory area.

4.8.1.6.2 Cost Recovery

Statutory provisions set forth by section 304(d)(2) of the Magnuson-Stevens Act give the Secretary of Commerce authority to collect fees to recover the actual costs directly related to the management, data collection, and enforcement of any limited access privilege programs. This section of Magnuson-Stevens Act also dictates that this fee is not to exceed three percent of the ex-vessel value of the fish harvested under any such program. Therefore, as participants in a limited access privilege program, IFQ participants pay a fee that is three percent or less of the ex-vessel value of the halibut harvested to recover IFQ program costs. In the GAF program, the commercial QS holder is responsible for paying cost recovery

fees on the IFQ that he or she leases to a charter operator as GAF. It is assumed that some or all of that cost is passed onto the GAF user.

NMFS anticipates increased costs associated with managing IFQ accounts for an RQE. Specifically, there would be costs involved with restructuring the IFQ transfer database to allow for QS transfers to an RQE, particularly the more complex any transfer restrictions become. Potential cost recovery for the proposed RQE is an area in need of further investigation.

If QS is transferred to an RQE, there is no current mechanism for costs associated with that IFQ to be passed on to the entity. It is unclear if NMFS has authority for cost recovery in the charter sector and there are no ex-vessel fees with which base costs. Moreover, if an RQE is unable to obtain funding, administrative costs will be incurred with no outlet for revenue. This area is currently under further consideration.

4.8.1.7 Funding Considered by Charter Groups

As previously mentioned, Alternative 2 and the current analysis does not propose or analyze funding sources for a potential RQE to use in order to permanently transfer quota for use in the charter sector. This scoping decision was a deliberate choice by the Council in order to focus analytical effort toward how an RQE may be structured, and impacts under the assumption that an RQE would have the means to acquire QS. Similar to the CQE, the Council does not have jurisdiction over the potential avenues considered for funding sources by charter stakeholders. Moreover, the source of funding and practical ability to acquire quota will likely depend on the type of management provisions set up by the Council and NMFS. In light of this inter-connected relationship between program structure and funding, the Council has requested this analytical scope, acknowledging that source and ability of an RQE to generate funding are important components to monitor throughout the analytical process. If the draft analysis moves forward and regulatory issues are identified pertaining to the type of funding that may be employed, the Council might identify issues to engage in the analysis.

Therefore, while the Council has not established alternatives or options specific to a funding mechanism, this section briefly describes the top two funding options analyzed in the CATCH proposal (Yamada & Flumerflet 2014). Overall, the CATCH proposal states that an RQE would seek out a variety of funding sources. Among these sources would include grants, loans, and a source that could provide a long-term revenue stream.

The CATCH proposals states the non-profit entity should give priority to creating a new type of recreational fishing stamp through the state, similar to the state of Alaska run king salmon stamp. This stamp would be specific for those intending to target halibut on a guided trip, and would be paid for by this specific sub-group of recreational anglers. The proposal notes that this plan would not require Congressional Action but would likely require legislative action (Davis, Sylvia, & Cusack 2013; Yamada & Flumerflet 2014).

The second choice for a long-term funding mechanism was stated to be a charter halibut tax. This plan may be a might more complex to establish because the non-profit would need to be established in such a way that it could self-tax, i.e. it would need to be formed as a Regional Non-profit Association. This method would also require legislative action in order for these funds to be collected and paid to the Alaska Department of Revenue. The proposal also discusses what this tax would be based off of. It would likely be a proportion of gross revenue or number of fish harvested rather than just a lump sum transfer in order to not disadvantage smaller operations. For more information on financing option for an non-profit charter entity see Yamada & Flumerflet (2014) and Davis, Sylvia, & Cusack (2013).

4.8.2 Economic and Social Effects of the Proposed Program

The following sub-sections examine expected social and economic impacts from **Alternative 2,** allowing for the development of an RQE.[33] This section does not address social and economic impacts by each element of the Council's motion as these technical discussions can be found in the previous Section 4.8.1. The following sub-sections include expected effect on the halibut charter fishery, including guided anglers and charter operators. It also includes expected effect on the commercial halibut fishery in Area 2C and 3A, including QS holders, commercial skippers and crew, CQEs, processors, the commercial QS market, and consumers of halibut. This section also considers potential impacts on non-guided halibut anglers and on subsistence fishing and communities. Finally this section considers potential changes to vessel and crew safety based on the action alternative.

One of the primary considerations about the proposed **Alternative 2**, centers around the concept of economic efficiency. Economic efficiency is promoted in National Standard 1 and National Standard 5 as one of the goals that the Council balances amongst a suite of others. A market is considered "economically efficient" if resources are allocated to the place in which they generate the greatest economic value. Economic values include more than just accounting costs; they can represent both use value (such as the productive capacity of QS) and non-use values (for example, the benefits someone in Minnesota may derive from knowing there is a healthy halibut charter fishing sector in Alaska), as well as opportunity costs (the value of the next highest valued alternative use of a resource). In theory, the greatest economic value represents the greatest net economic benefit.

For purposes of this initial review analysis, economic efficiency is discuss qualitatively, at three different levels of scope: 1) at an individual transaction level, between a commercial QS holder and an RQE; 2) at a sector level, between the commercial halibut sector and the halibut charter sector; and 3) at a National level, when more social and non-market considerations are included in a broader perspective. Discussing economic values at these different levels can highlight some of the distributional effects that may not be revealed when just considering an action's net benefits to the Nation. The following sections consider economic values and effects at this first and second level of scope. Net benefits to the Nation are further discussed in Section 4.10.

4.8.2.1 Effects on the Halibut Charter Fishery

An analysis of the effects on the charter fishery begins by discussing the first scope of economic efficiency. One of the advantages of the pursuit of economic efficiency at the individual transaction level, is that it does not require the Council or any other governmental agency determine where the greatest net economic benefit lies, but would allow the players to determine this equimarginal point by identifying their own opportunities to gain in the market place. This "natural calculation" exists every day in an open market place. When a willing seller and a willing buyer come to terms on a price for the exchange or goods or services, the economic value of that good is represented in the willingness-to-pay of the buyer. Some social values may be represented in that transaction price. For example an individual in either sector may be willing to pay more than the productive capacity of that QS because they understand it to have a positive effect on the community they live in. Another example could be the increased price that a commercial halibut QS holder is willing to accept, due to the social stigma attached to doing business with participants in another halibut sector. These values could be represented in the transaction price. Economists have techniques to estimate where the greatest economic value could manifest.[34]

[33] Note: This section has not been substantially edited from the December 2015 analysis. If the analysis moves forward for further action, the authors intend to update this section after the SSC, AP, the Council, and the public have a chance to comment on the preceding sections.

[34] Some examples include the travel cost model, which evaluates marginal willingness-to-pay (WTP) based on how much it cost a person in order to travel and participate in an activity (including the opportunity cost of their time),

Allowing for this willing seller, willing buyer opportunity is something that the Council has considered to be a "long-term solution" to the tension between commercial and charter halibut allocation discussion since before the CSP was implemented (NPFMC 2007). It was noted in the analysis for the CSP, during the consideration of sector allocations, that in order to maintain an optimal allocation, managers would need to adjust that allocation whenever economic or biological conditions changed (NPFMC 2013; Criddle 2008). While it is unreasonable to assume that the optimal net economic benefits could be sustained over time by a management agency altering the allocation, the ability to transfer QS freely between sectors could allow the market to contribute to a determination of an economically efficient point for optimal allocation (from the perspective of this first scope of economic efficiency).

In a world of perfect information, the option of compensated reallocation would be expected to increase economic efficiency between the commercial QS holder and the charter halibut sector. Overall, between these two halibut user groups, entities would be expected to act in their own best interest and net benefits would be maximized. With a mechanism to authorize transfer, and with limited transaction costs, economic efficiency would be expected to promote reallocation to the sector (or individual) with the greater marginal willingness-to-pay,[35] until the marginal willingness-to-pay was equal across sectors (or individuals) and the net economic benefits are maximized for those entities. Some of the economic literature has pointed out the gains in economic efficiency that may be realized given more open and perpetual transferability of fishing privileges (Call & Lew 2015; Davis, Sylvia & Cusak 2013; Kroetz, Sanchirico, & Lew 2015).

If it is discovered that the funds are not available to purchase QS, or that while some funds are available, the amount of money it would take to make a meaningful positive impact on the charter sector exceeds additional compensation they would receive from the existing angler pool or new angler demand, the sector still has that opportunity to purchase QS should willingness-to-pay change in future conditions. The benefits of opportunity should not be overlooked.

Economic efficiency at the individual level could potentially be gained through a compensated reallocation using common pool or by from compensation by individual operators, as discussed in Section 4.8.1.1. So far in the developmental process, the idea of seeking compensated reallocation for a common pool of anglers appears to be the most supported method among the charter sector.[36] However, opposition from members of the charter sector could be a large hurdle in implementation of such a program. Under Alternative 2, all guided anglers would have equal access to the sport halibut fishery the same management measures established for that area. The current proposal does not provide for a situation in which some guided anglers could take advantage of the increase in the charter allocation and the correspondingly less strict management measures, while other in the fishery were restricted by the annual charter allocation amount without access to pounds of IFQ acquired under a guided angler pool of QS. If such a situation were permitted, it would create serious implementation, accounting, and enforcement challenges in the halibut charter fishery.

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hedonic models which evaluates marginal WTP for different attributes of a good, based on the different prices paid in an aggregated number of market transaction for that good, and choice experiments (CE) in which a person indicates their preference for one good over another (or series of options), given different price levels. Aggregated among other individuals' preferences, the CE is able to estimate a marginal WTP for each attribute of a good. For the commercial sector, WTP could be estimated more easily using price per pound of QS and understanding that there may be some additional transactions costs associated with selling QS across sectors. While estimating equilibrium point is outside of the current analytical scope, it could be an area for future discussion.

[35] Marginal willingness-to-pay is the additional amount consumers are willing to pay for one more unit of a particular good.

[36] A study is currently underway by the Alaska Fisheries Science Center on attitudes towards an RQE program (Dan Lew, 11/10/2015, personal communications) and is expected to have preliminary results by January 2016.

Thus, while the RQE would be seeking to maximize net benefits for the sector, there may be some specific individuals related to the charter sector that are not benefited. Even if in aggregate, charter anglers are willing to pay the amount it requires to purchase QS and relax annual management measures (in a scenario where costs are passed on to the angler), there will most likely be some anglers that will not meet that threshold. Even if in aggregate, charter operators benefit from increased angler demand or increased prices from relaxed management measures, there will most likely some charter operators whose clients are too sensitive to changes in prices, or who operate too close to the margin, to remain in business. These represent distributional effects. In terms of strict economic efficiency, the cost associated with these losses would be balanced by the greater amount of benefits realized through the transfers.

4.8.2.1.1 Halibut Charter Anglers

To the extent that an RQE was able to obtain funding outlets and identify QS for transfer, Alternative 2 would be expected to have an effect on charter halibut anglers. Regardless of the funding source there is a high likelihood that some or all of the additional cost will be passed on to the charter anglers. The magnitude of where the increased cost would be absorbed depends on the funding mechanism (i.e., a charter halibut stamp would be a direct costs to the angler, but a grant may not) and how much the charter operation is financially able and willing to absorb.

The economic effects to the charter anglers under an RQE program would be an increased price associated with a charter halibut fishing trip. If angler demand (as well as effort and harvest) is assumed to be held constant, this increased price would be in exchange for a relaxation of management measures. For instance, it could provide anglers the ability to retain more halibut on a trip (relaxing bag limit), during a year (relaxation of annual limit), in more varied sizes (relaxation of reverse slot limit), and/ or on all the days of the week (no day or the week closure).

If angler demand changes, as is very likely given the many factors that impact angler demand, the relationship can become much more complex. Including a multitude of exogenous factors, angler demand may respond to price increases on a trip and it may also respond to any relaxation of annual management measures.[37] In this case there could be both movement along the demand curve (by changing price) as a shift in the demand curve (by changing the underlying product being sold). For example, assume halibut abundance remains at status quo, and halibut charter prices increase (in some form, depending on the funding mechanism) to compensate a QS purchase for the RQE. Particularly under the same management regime, this may prompt a decrease in angler demand. The increase in trip price would have to be enough to compensate charter operators for this loss in clients,[38] or charter operators would have to trust in the future benefits associated with relaxation of annual management measures.

If the price increase occurred at the same time as a relaxation of annual management measures, (if an RQE was able to initiate QS purchase using loans, but needed a long-term revenue stream in order to retire loans) it is difficult to predict direction of effects for charter anglers and operators. Some anglers may be responding to the increase in price by exiting the market, other anglers may be enticed into the market by the increased opportunity for halibut fishing.

Angler demand in for charter halibut fishing in Alaska has been the subject of a number of economic analyses (e.g. Criddle, Hermann, Lee & Hamel 2003; Lew & Larson 2015; Lew & Larson 2012). In one example, a 2015 stated preference study evaluated the impact of size and bag limits on the willingness-to-pay of charter anglers in Alaska provided further explanation for this low harvest season in Area 2C.

[37] If there is significant consumer surplus associated with halibut charter fishing and charter halibut anglers have a very high WTP, there may a very slow response to either of these factors.
[38] This would be an increase in price in addition to the costs set aside for purchasing halibut QS.

Based on responses to a series of choice questions, the study determined that the opportunity to catch at least one large fish (i.e., a "trophy fish") is very valuable to non-resident charter anglers. Without that possibility, the willingness-to-pay for a halibut charter trip by an average non-resident angler was indistinguishable from zero. This result is particularly relevant for Area 2C, in which a large proportion of the demand is made up of non-resident anglers (Lew & Larson 2015).

While holding other charter trip characteristics constant (e.g., location of trip, number of fishing days, salmon harvested), Lew and Larson's stated preference study observed no statistical significance in non-resident anglers' willingness-to-pay estimates for stricter reverse slot limits in Area 2C (2015). They tested varying the lower limit in Southeast Alaska on a one fish bag limit between 35, 40, and 43 pounds, with an upper limit of 130 pounds.[39]

An RQE would strive to plan long-term for the charter sector. Therefore if there was a short-term decrease in angler demand, representing less overall effort and requiring less QS in order to relax halibut management measures, an RQE would not necessarily be expected to adjust funding needs to meet this new demand. If it did, less QS could mean lower prices for anglers, and in a cyclical fashion, the angler demand may grow again. An RQE would need to be informed of and monitoring the relationship between changes in management measures, changes in charter fishing trip cost associated with the chosen funding mechanism, and changes in angler demand.

Additionally an RQE would need to be sensitive to the fact that these relationships could be different for different charter operators. If an operation depends heavily on cruise ship passengers, for example, and these passengers are not as interested in trying to stock their freezer as they are interested in some type of fishing or small boat excursion, they may be more sensitive to price given the available substitute options.

4.8.2.1.2 Halibut Charter Operators and Support Sectors

Charter operators, including deckhands, any other individuals involved in the business of charter fishing, sport fish processors, or other charter support sectors may or may not be economically affected by the development of an RQE. If the number of charter anglers participating in the fishing was held constant, and the funding mechanism chosen was a halibut stamp with a fee that went directly to an RQE for the acquisition of QS, there might be no change in compensation to the charter operators. However, changes in angler demand based on either changes in charter prices or changes in annual management measures are likely. The effect on charter operators depends on the specific scenario. If there was significant willingness-to-pay among anglers for relaxed management measures, and an RQE was able to attain QS through that fee, this may even increase the number of individual seeking halibut charter fishing opportunities. This additional demand could benefit charter operators. Also, if the willingness-to-pay was significantly high enough, anglers may be willing to pay above the straight fee that would be required to purchase QS from the commercial sector. This additional compensation could also benefit the charter operators. If the number of anglers leaving the market due to increased price was equal to the number of anglers entering the market due to increased halibut fishing opportunity, there may be no change in benefits to charter operators.

Presumably, an RQE would be striving to benefit the charter sector as a whole in that regulatory area, and this entity would be considering QS acquisitions based on an understanding of angler demand, angler willingness-to-pay for relaxed management measures, and its distributional impact on the charter operators.

[39] They noted the caveat that since 2012, the upper reverse slot limit has consistently been greater than 130 pounds (approximately 63 inches). Also, it should be noted that resident angler behavior may differ from these results.

4.8.2.2 Effects on the Commercial Halibut Fishery and Halibut QS Market

The development of an RQE(s) would be expected to have an economic effect on the commercial halibut fishery and the market for halibut QS. In this Initial Review Draft effects are discussed qualitatively, however, there is opportunity in future drafts to more rigorously tease out the magnitude of some of these effects, given for example, different total QS transfer caps.

The commercial halibut fishery could experience some distributional benefits from the proposed RQE. Individual QS holders may benefit from an increase in economic efficiency available through transactions with an RQE. If an RQE is able to acquire the funding, they may be able to offer QS holders a premium price for their QS. Any entity that currently holds QS could benefit as the value of their QS increases with expanded pool of interested buyers. If an individual QS holder would not benefit from engaging in a QS transaction with the RQE, they would not be required to participate in the exchange. Therefore QS holders are expected to act in their best interest and maximize their own net benefits (i.e., the first scope of economic efficiency discussed in Section 4.8.2).

While there is certainly not a surplus of Area 2C and 3A halibut QS available in the open market (refer to Table 4-22 and Figure 4-10 demonstrating the downward trend of Area 2C and Area 3A QS transfers), there are a number of reasons why some QS holders may be considering selling their QS under current conditions. As halibut has been at low abundance in recent years, some QS holders with a small number of units struggle to find a vessel to fish on. Vessels might reach their vessel IFQ caps quicker during years of low halibut abundance and so they may be less willing to take on small amounts of QS. QS holders in this situation may be interested to sell QS.

In addition, a regulatory amendment effective December 1, 2014, changed some of the rules governing the use of hired skippers to fish commercial CV IFQ. This amendment no longer allows initial QS issuees the ability to have a hired master fish their CV IFQ for any QS they received by transfer after February 12, 2010 (see Section 4.5.1). If the QS holder does not want to or cannot fish this QS themselves, they may be in the market to sell.

Considering economic efficiency at the sector level (scope 2) conveys a different story. While an individual with QS would be expected to act in their own best interest when deciding whether and at what price to sell their QS, this decision may not necessarily maximize the net benefits from a sector-level perspective.

The commercial sector has voiced concerns over the potential RQE program. One of the primary concerns is the potential to further consolidate the fleet, which can negatively impact captains, crew, processors, and support sectors. As demonstrated in Table 4-21, the number of vessels participating in the halibut IFQ fishery has dropped fairly consistently every year in both areas since program inception, with only a few exceptions representing small increases. While limiting participation in order to promote economic stability for the fisheries and communities was one of the goals of the IFQ program, another one of the program goals was to limit the concentration of QS ownership and IFQ usage that would occur over time. This inherent contradiction represents the fact that the Council understood that some unidentified threshold would be considered "too much consolidation". This threshold is subjective to a stakeholder's perspective, and it provides a constant balancing act of consideration for most amendments to the IFQ program.

Specifically under action Alternative 2, some commercial halibut fishery stakeholders are concerned that a transfer of QS from a commercial halibut participant to the charter sector may displace crew members and potentially eliminate the need for some vessels. Both of these changes could have an impact on support sectors as well.

The extent to which consolidation would be expected to occur, depends on the magnitude of QS transferred. The magnitude of QS transferred is likely to be highly influenced by the availability of RQE funds and QS available for transfer. However, these elements are outside of the Council's decision-making scope. If the Council chose to allow for the formation of RQE(s) and it was concerned about the potential for over-consolidation, the Council would focus on transfer restrictions in order to mitigate this impact. In particular, total QS caps for the RQE could be used as tool to limit consolidation.

Despite the provisions for two-way transfers (i.e., the RQE could sell QS back to participants of the commercial halibut fishery), commercial sector stakeholders may be concerned that QS would never return to be used in the commercial sector. In a scenario where an RQE has holdings in excess of the amount of QS needed to provide charter clients with harvest opportunities greater than the unguided recreational bag limit, if transfers did not occur and there was no mechanism to redistribution QS, optimal yield might not be achieved. However, even in times of high halibut abundance, an RQE may be unmotivated to sell QS back into the commercial sector, due to the potential of low abundance in the future.

With less QS being used in the commercial fishery, vessel owners and crew may lose out in this exchange. Any level of consolidation means that there would be less vessels needed and less crew jobs. Restrictions on total transfers to an RQE by area may be one way to alleviate some of this concern. For example, Element 2, Option 3, Sub-option 3 would dictate that no more than 10 percent of the Area 2C QS could be transferred to the charter sector and that no more than 15 percent of the Area 3A QS could be transferred to the charter sector. Some consolidation may still occur if the RQE transferred up to these levels; however, total transfer caps could control how much of that consolidation could occur.

The acquisition of halibut QS by an RQE could also have a negative distributional impact on halibut processors. Depending on the magnitude of QS transferred and rate of transfer, as well as the diversification of the processor, the processing plant could end up in a place where it is not economically feasible to stay open during certain times of the year or at all. This could negatively impact employees at processing plants and support sectors. Again here, total sector caps for each area could mitigate some of this negative effect. In addition, annual caps may keep any rate of change at a relatively slow pace allowing the businesses to adapt to a shift in total commercial QS. This type of restriction may provide the processor time to consider diversification opportunities.

A rising QS price is good for sellers but bad for any individual looking to acquire QS. The change in the QS market could negatively impact new entrants or those seeking to expand current commercial halibut fishing operations. A prohibition on D class QS could be one way to mitigate some of the effect on new entrants as explained further in Section 4.8.1.2. A wider pool of QS buyers could also impact the CQE's acquisition of QS and in turn this could impact the communities that they represent. Total and annual QS use caps could also diminish the shock to the market.

More practically speaking, even at high price, the availability of QS is often one of the biggest challenges. Halibut QS holders understand the value of their privilege in perpetuity, and many would be unwilling to sell at any reasonable price. This can make finding QS on the market, particularly of the appropriate vessel class, block status, and quantity, a challenge. This would be the case for both the historical players in the market: individuals in the commercial fishery, as well as CQEs, but also for an RQE. Particularly if an RQE has restrictions through QS use caps by QS vessel class, identifying available QS will likely be a challenge.

4.8.2.3 Effects on Subsistence/ Personal Use Fishing, Non-guided Sport Fishing, and Communities

In 2014, subsistence/ personal use fishing produced 0.40 Mlb of harvest, non-charter sport fishing made up 1.14 Mlb of harvest, and charter halibut fishing (plus wastage) contributed 0.76 Mlb of harvest in Area 2C. In Area 3A, subsistence fishing contributed 0.25 Mlb of harvest, non-charter sport fishing harvested 1.49 Mlb, and charter fishing (plus wastage) contributed 1.78 Mlb (IPHC 2014). In Area 2C and 3A, non-charter sport fishing and subsistence fishing halibut removals are not included in the FCEY. Instead removals are subtracted from the subsequent year's total CEY (see Figure 4-1).

Because authorized subsistence/ personal use and non-guided halibut fishing effort are not directly linked to the harvest intensity of the charter sector, a shift in harvest intensity from the commercial sector to the charter sector does not affect how these user groups are managed. However, in many regions these halibut users tend to concentrate effort in around the same general area close to a port or public access. A shift in relative harvest intensity from the commercial sector to the charter sector could concentrate angler activity further. This could impact subsistence and non-guided sport users to the extent that localized depletions may occur. Localized depletion of halibut grounds is also a point of discussion in Section 6.3.2. To the extent that localized depletion may occur, annual QS caps on QS transfer may moderate some of this negative impact.

Distributional impacts to communities would not necessarily be represented in economic values associated with a transaction from an individual IFQ holder to an RQE. Communities could be impacted in both positive and negative ways from the development of an RQE program. Both commercial and charter fishing can have a significant economic impact in Alaskan communities. Commercial fishing relies on inputs from a multitude of support sectors: fuel, bait, vessel parts and maintenance, food, ice, labor, etc. It prompts activity from intermediate demand sectors like seafood dealers and processors. This economic activity can create local employment opportunity. A percent of ex-vessel revenue is taxed by the state and also contributes to some municipality taxes.

Similarly, the charter sector propagates economic activity for a community as a tourist industry; by catering to resident and non-resident visitors. The charter sector relies on some of the same types of input industries: fuel, bait, vessel parts and maintenance, food, labor, etc. Some charter fishing operations rely on sport processing sectors. There are also several types of taxes specific to charter sector, for example fish box tax and a tax on all sport fishing gear. Additionally, as a tourist industry, it also encourages other types of non-fisheries economic activity among retail businesses, restaurants, and accommodations services that benefit from the presence of non-local charter anglers visiting their community. It would be inappropriate to contribute all tourism-related economic activity in a community to halibut charter fishing, as there are often many other substitute activities. There are some types of economic analyses that specialize in estimating overall economic impact.[40]

These methods are currently outside the scope of this analysis. The challenge that these methods would need to overcome, would be in teasing out the explicit effect of halibut charter fishing compared to all other substitutes. It may be that an individual purchased a cruise, and would have visited the community, eaten at a restaurant, and spent a given amount on retail, regardless of the opportunity to fish. It may be that an individual is passionate about fishing, but would just as easily visit an Alaskan community to take

[40] The Input/ Output (I/O) model and the social accounting matrix (SAM) model are two examples of economic models used to estimate regional economic impacts. Both of these models seek to capture the impact of a shock to a regional economy based on inter-industry transactions between businesses and final consumers in an economy. These models do not measure specific benefits, but rather changes in overall economic activity in a region. In Appendix III of the 2007 Council analysis investigating compensated reallocation as a component of the catch sharing plan, Chang and Waters review the available literature on Pacific halibut economic impact studies (NPFMC 2007).

part in charter salmon fishing exclusively. Or it may be that an individual specifically sought the opportunity to charter halibut fish, and would not have come to the community otherwise. In any scenario, the opportunity for visitors to charter halibut fish is a benefit to the community's tourism economy because it diversifies the community's opportunities for recreational activities, making it more appealing for visitors.

There is also a multiplier effect associated with the wage that participants in the commercial sector (QS holders, vessel owners, vessel operators, crew) and charter operations (CHP holder, vessel operators, crew, administration, lodge employees) receive. To the extent that these individuals are residents of the community or chose to spend their income in the community, this could provide additional positive impact in the community. Both halibut harvesting sectors can constitute seasonal work; therefore, participants in both sectors have the opportunity to spend part of their residency living outside the community, and spending their money outside of the community.

Overall, impacts of an RQE would be to expected differ across communities and in part would depend on how engaged the communities are in the two different sectors. Setting total and annual QS caps could significantly slow impact and alert the Council to any communities which are shifting from a primarily commercial fishing community to a charter community.

4.8.2.4 Safety Considerations

The primary change resulting from Alternative 2 is the potential for a shift in harvest intensity from the commercial sector to the charter sector. Safety conditions are expected to be consistent with the status quo, as neither commercial nor charter sectors would be expected to change the way they catch fish or run their operations.

4.9 Alternative 3, Purchase of Charter Halibut Permits

Alternative 3 states:

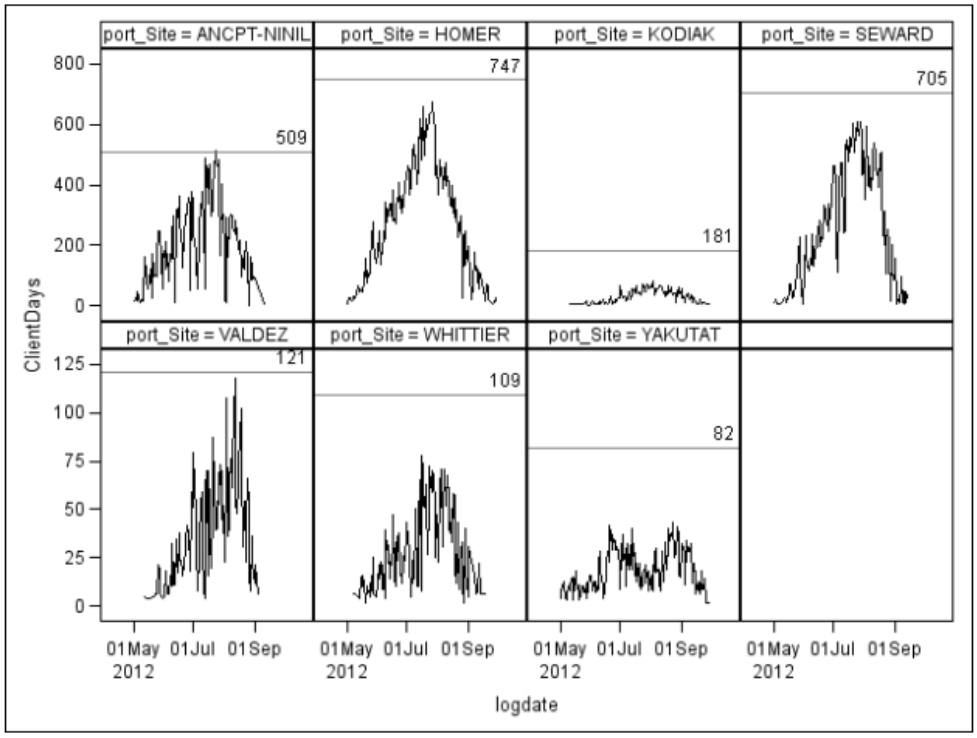
> *RQE purchase of charter halibut permits. The RQE shall be limited in the purchase of charter halibut permits to [options:10%-30%] of the permits in each area.*

This alternative would allow the RQE to purchase CHPs from CHP holders. The RQE would want to purchase CHPs if it felt that purchasing the CHPs could provide remaining permit holders with a more stable and predictable operating environment. Economically, we might expect that permits which are being used less frequently would be less valuable to their owners than the permits used by charter businesses that take paying clients out on trips more frequently. In addition, the destabilizing effect that unused (latent) and underutilized CHP endorsements could have depends on both the magnitude of latent effort as well as the likelihood of this effort actually being realized. The reasons these CHP are unused or underutilized are unknown and expected to be as diverse as the holders themselves. This makes it difficult to predict the risk of a sudden spike in angler-effort or harvest-per-unit effort. One extreme way to calculate this would be to multiply the total number of angler endorsements by the number of days in the season and compare this to current angler-days in the fishery.[41] This would result in a very unrealistic representation of latent effort because while the full charter halibut season is open from February 1 to December 31, actual fishing tends to occur mid-May to early September. The number of days could be truncated to just the 100 days representing peak season, multiplied by total number of angler

[41] Anglers technically could fish more than one trip in a day, but this is found to be a rare occurrence. Therefore it is assumed anglers would only take one halibut trip a day for purposes of this discussion. Regulations in 3A also prevent a CHP from being used on one vessel more than once a day; however this is not necessarily the case in 2C. An assumption is also made for this discussion that a CHP, with its corresponding angler endorsements is only used once a day.

endorsements, and then compared to realized angler-days during those 100 days. An example using a very similar method, illustrating underutilized effort can be seen in a figure on Area 3A from a December 2013 report to the Council on Management Options for the charter halibut fisheries in 2014 (Meyer & Powers 2013).

Figure 4-29 Daily charter client effort (angler-days) relative to total angler endorsements at major ports in Area 3A, 2012



Source: Meyer & Powers (2013).
Table notes: Reference lines and values indicated the total angler endorsements for the corresponding vessels. Port site "ANCPT-NINIL" represents Anchor Point, Ninilchik, and Deep Creek.

This figure demonstrates the difference between the number of angler endorsements specified on a CHP and anglers-days. Theoretically, the total number of angler endorsements represents the number of anglers that could fish on a particular day.[42] Logbook data and charter halibut permit data for 2012 were combined to examine the amount of effort that occurred in relation to the potential effort for major ports of landings in Area 3A.

This figure is a useful illustration of what effort could theoretically look like, and in what parts of the season is capacity close to using all angler endorsements. However the risk of full angler effort that this calculation (100 days * total angler endorsements - realized angler-days) would produce is unrealistic. Not every vessel is going to be at capacity during every trip. The charter halibut fishery has distinct seasonal patterns that peak mid-summer, as illustrated in Figure 4-29. This pattern is expected to continue due to angler demand; it is unlikely that shoulder seasons will ever reach the harvest intensity of peak season.

An additional challenge in predicting changes in charter effort involves the leasing behavior of CHPs. Even if the supply of permits is constrained, effort may not change if the leasing behavior increases.

[42] Given the previous assumptions.

There is no prohibition on leasing CHPs. While non-transferable permits were not intended to be leased, the lack of options to enforce such a prohibition has inhibited the creation of regulations. Such a prohibition would likely require an owner-on-board provision, which could have significant negative consequences on the structure of certain types of charter operations. The topic of CHP leasing will be the subject of a forthcoming discussion paper.

4.9.1 Charter Sector Participation in Area 2C, 2014

In 2014 there were a substantial number of CHPs which did not report any logbook trips where halibut was kept. The data indicate that 122, or 21 percent of all CHPs, did not record a logbook trip that year where halibut was kept. Additionally, another 19 percent of CHPs (110 permits) took 15 or fewer trips during the entire 2014 season. These permits averaged just 6 trips and harvested roughly 3 percent of all charter halibut kept in 2014. Thus, the bottom 40 percent of CHPs are responsible for just 3 percent of overall harvest. At the other end of the spectrum are the top 10-11 percent of all CHPs. This group averaged 85 trips during what is functionally a 90-day prime season. The top permit in this group took 156 trips between April and October. This group is just 11 percent of permits, but accounted for 29 percent of all trips and 32 percent of the harvested halibut. The next ten percent (i.e., the second decile) averaged 63 trips in season and accounted for 21 percent of all trips and 22 percent of all halibut. Thus, the top 20 percent of all CHPs (124 permits) as measured by trip activity account for 54 percent of all harvest. The next 20 percent, permits used 3-4 times per week, account for 30 percent of all trips and 28 percent of all harvest. If this group were to increase its average frequency from 49 trips in a season to the second decile's average of 63 trips per season then total sector harvest would increase by 8 percent assuming static CPUE.

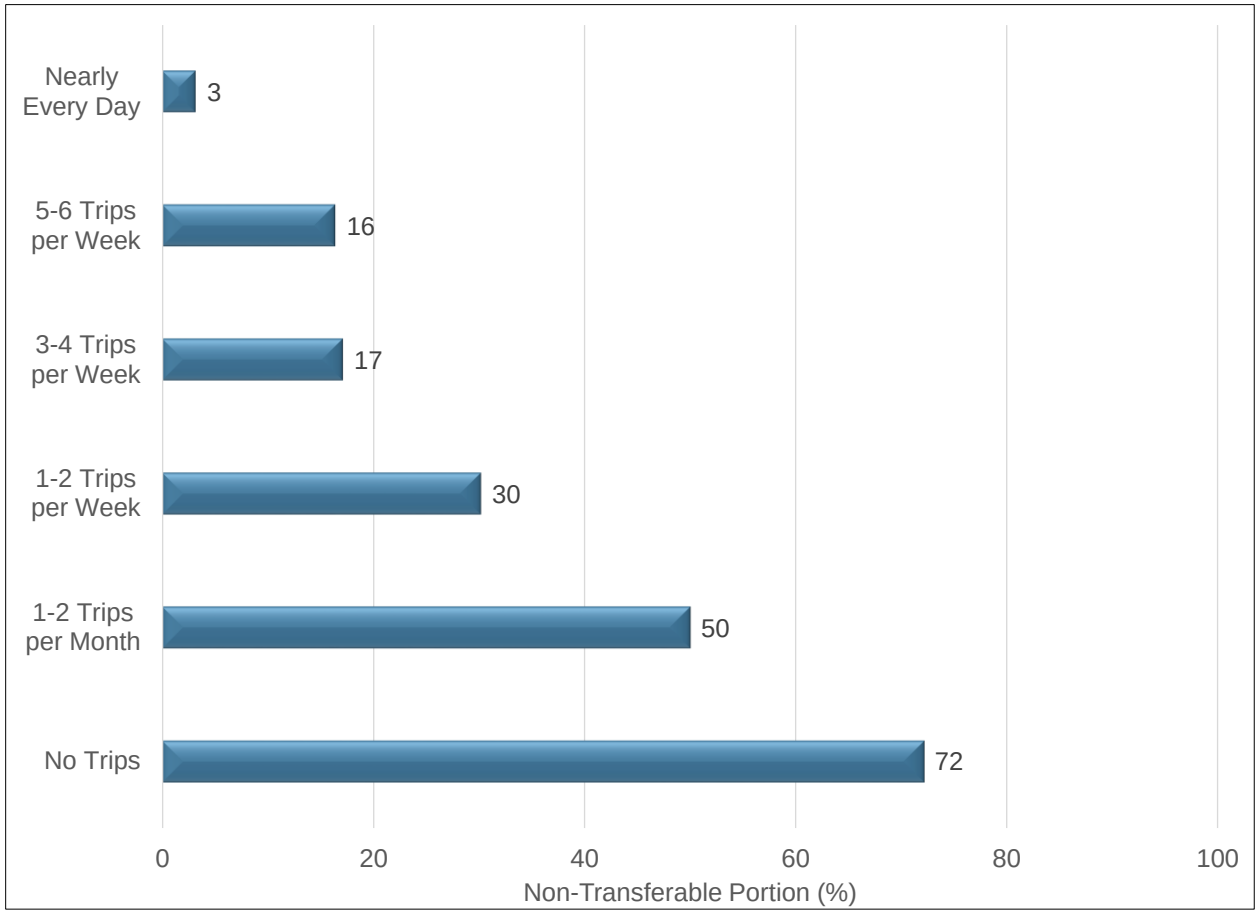
Table 4-62. 2014 Area 2C Charter Halibut Participation Statistics

Usage Group	Number of Permits	2015 Trips	2015 Halibut Kept	Average Number of Trips	Portion of Permits	Portion of Trips (%)	Portion of Halibut Kept (%)
No Trips	122	0	0	0	21	0	0
1-2 Trip per Month	110	636	2,027	6	19	3	3
1-2 Trips per Week	116	3,102	9,298	27	20	17	15
3-4 Trips per Week	111	5,442	17,924	49	19	30	28
5-6 Trips per Week	61	3,831	14,284	63	10	21	22
Nearly Every Day	63	5,377	20,324	85	11	29	32

Source: ADFG Logbook Data, 2014.

The data make it abundantly clear that, at least for 2014, there is substantial latency and underutilization within the Area 2C charter sector. An underlying factor in latency appears to the non-transferrable permits which NMFS issued to businesses "with relatively low participation in the qualifying years." So that these business could continue operation in the short-run while reducing capacity in the long run. Non-transferrable permits are invalidated upon holder death, the dissolution of the business entity, or with the addition of new business partners. Analyzing the logbook data and CHP database indicate that non-transferrable permits accounted for 72 percent of all of the CHPs which did not record a halibut trip in 2014. They also accounted for 50 percent of the group which averaged 1-2 trips per month while accounting for just three percent of decile that fishes nearly every day and 16 percent of the decile that takes five to six trips per week.

Figure 4-30 Non-Transferrable Permits by Participation Group



Source: ADFG Logbook Data, 2014 and NMFS CHP Permit Holder Database, 2016.

4.9.2 Charter Sector Participation in Area 3A, 2014

The 2014 participation statistics in Area 3A are very similar to those in Area 2C:

- Roughly 25 percent of all CHPs did not record a trip where halibut was kept in 2014 while another 13 percent of permits took an average of just 4 trips. In summary, nearly 4 in 10 CHP permits is functionally latent.
- Another 21 percent of permits took just 1-2 trips per week across the season and while these permits are active they are substantially underutilized.
- The remaining 41 percent of CHPs are fished at least 3-4 times per week with the top twenty percent of CHPs fishing most days of the week with relatively few days off. The top 40 percent of permits caught 89 percent of all Area 3A charter halibut in 2014.

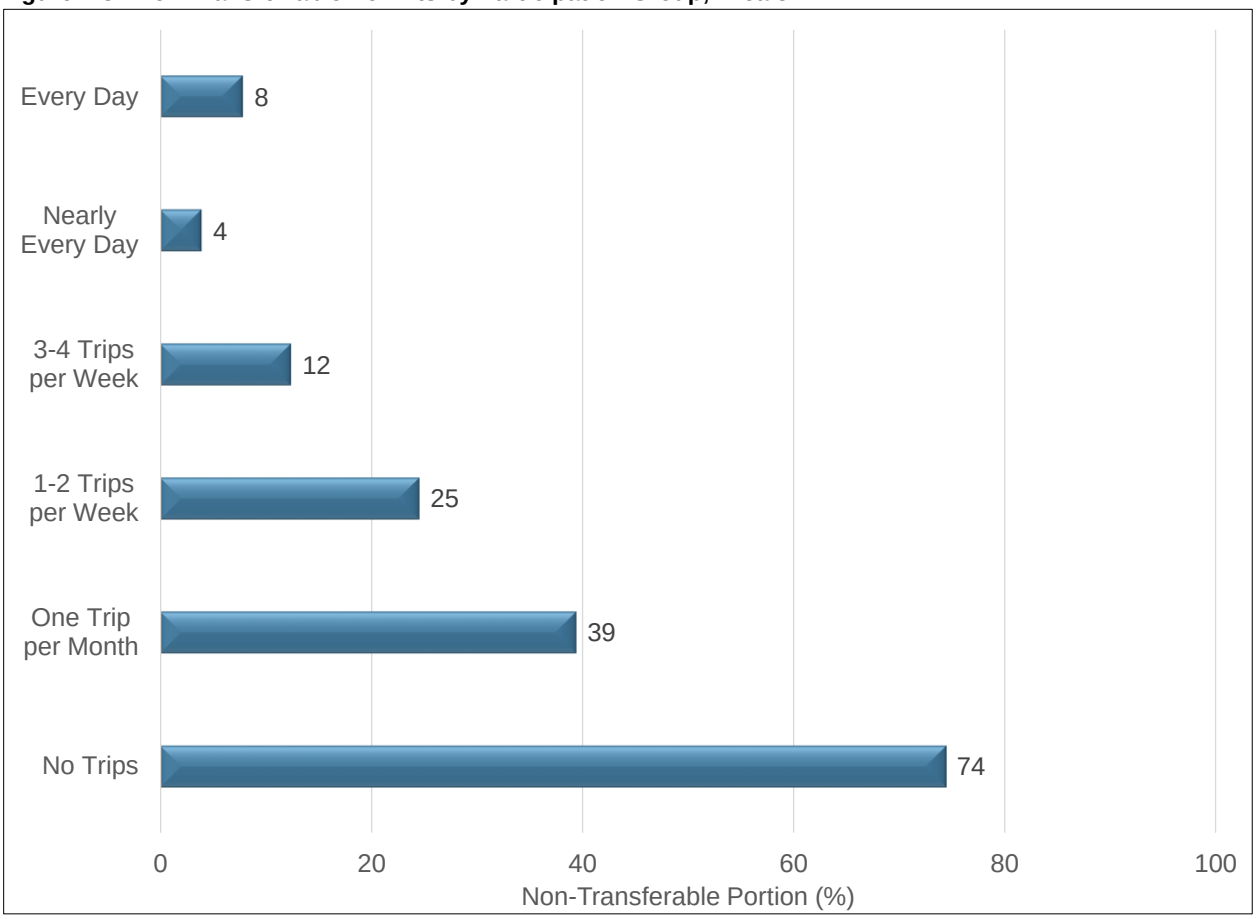
Table 4-63. 2014 Area 2C Charter Halibut Participation Statistics

Usage Group	Number of Permits	2015 Trips	2015 Halibut Kept	Average Number of Trips	Portion of Permits	Portion of Trips (%)	Portion of Halibut Kept (%)
No Trips	129	0	0	0	25	0	0
One Trip per Month	66	251	1,711	4	13	2	1
1-2 Trips per Week	106	2329	18,315	22	21	14	10
3-4 Trips per Week	105	5315	54,942	51	21	32	30
5-6 Trips per Week	51	3551	40,607	70	10	21	22
Nearly Every Day	51	5206	70,583	102	10	31	38

Source: ADFG Logbook Data, 2014.

The data also show a similar pattern within participation by owners of the non-transferable permits. Non-transferable permits comprised 74 percent of the 129 permits without a recorded 2014 trip while comprising 39 percent of the group that took just an average of roughly one trip per month. Of the top, 102 permits in the fishery (i.e., the top quintile) just 6 of the permits charter businesses used were non-transferable.

Figure 4-31 Non-Transferrable Permits by Participation Group, Area 3A



Source: ADFG Logbook Data, 2014 and NMFS CHP Permit Holder Database, 2016.

4.10 Summation of the Alternatives with Respect to Net Benefit to the Nation

The calculation of net benefits to the Nation from the two action alternatives proposed would require a summation of the welfare change to all groups impacted by action. This analysis does not attempt to provide that calculation for either action alternative. Instead, at this stage in the analytical draft, this section qualitatively discusses three possible general outcomes of the proposed action under **Alternative 2**, each of which would be expected to result in different net National benefits. This is followed by a discussion of the net benefits to the Nation under **Alternative 3.**

The first possible outcome under adoption of **Alternative 2** is that no RQE would purchase QS. Net benefits will not change under this outcome as the market for QS is unchanged and any administrative expenses are close to zero in terms of National net benefits. The second scenario is that an RQE purchases a moderate amount of QS in order to make incremental changes in the management measures the charter sector is willing to pay for. The third possible outcome is that RQEs purchase a substantial share of the QS in the market. This last possible outcome overlaps with the second, as small scale purchases of QS are likely to precede any larger purchases that would substantially affect the market price of QS.

In the previous section on effects of an RQE, the net benefits from action were first discussed in terms of an individual commercial halibut QS holder and the charter halibut sector. This approach relies primarily on private benefits and private costs. This relatively narrow analysis suggests that an RQE program would result in positive net benefits regardless of the level of QS transfer that was achieved. The RQE would purchase QS from a willing seller, relieving the management measures that it understands are most burdensome on angler demand, until the point where the cost of an additional unit of QS would reach the benefits it could provide the charter sector. A mechanism for transfer is not currently in place, so from an individual commercial halibut QS holder and the charter halibut sector scope, there could be inefficiencies in this missed opportunity for transfer.

Brining the scope of net benefits out to both of the sector-levels (commercial and charter) introduces more uncertainty into the magnitude and even direction of net benefits. While an RQE would be expected to act in the best interests of the whole charter sector for the regulatory area which it represents, an individual halibut QS holder may not act in the best interests of the whole commercial sector. Considering the net benefits at the sector level introduces new costs, such as the effect on the QS market for the QS holders that did not choose to sell to an RQE. Particularly in a scenario in which a substantial quantity of QS is transferred to an RQE, net benefits may turn out negative at the sector level. A substantial decrease in catcher vessel IFQ being landed at a processor that relies on this species, could potentially put this processor out of business. If active QS holders rely on that processor, they will be disadvantaged as well.

Evaluating the net benefits at a National level, as is the task of this section, presents additional social benefits and costs for consideration, that may not be in individual-level or sector-level transactions decisions. This perspective introduces the consideration of halibut consumers. Consumers benefits around the Nation (also world-wide) from the ability to purchase a quality halibut product 12 months out of the year. As an extreme example, regardless of the individual private efficiency gains in open-access to QS transfers, the total dissolution of one of these fishing sectors would arguably result in negative net benefits to the Nation.

National net benefits could be negative if there was a scenario in which halibut was left unharvested. If an RQE purchased a substantial amount of QS, halibut abundance increased and either the RQE was not inclined to sell QS, or there was no temporary transfer mechanism to bring this QS back into the commercial market, optimal yield might not be achieved.

Whether Council action on Alternative 2 would result in an overall increase in net National benefits if a moderate level of QS is transfer is undetermined. It is likely action would produce a negative net benefit to the Nation if substantial transfers occurred. This reinforces the ideas that total and annual transfer restrictions may be an important tool if the Council takes action on Alternative 2.

The net benefits to the Nation from **Alternative 3**, allowing an RQE to purchase CHPs, are expected to be very minor. This action may benefit current active CHP holders that are seeking greater stability and long-term planning by limiting the number of latent CHP that could suddenly because active (through purchase by an active holder or increased usage by current holder). However changes in effort in the halibut charter fishery could still occur through increased utilization of active CHPs. Furthermore, there are other external factors that may detract from the ability of this action to provide stability on its own. For example, changes in halibut biomass, particularly without a sector-wide mechanism to adjust the charter catch limit.

Alternative 3 is expected to disadvantage new entrants or those looking to expand operations in the halibut charter fishery, as less CHP are available for transfer. This may in turn disadvantage charter anglers as, particularly in peak season, they may have more difficulty booking a halibut charter trip.

This action would be expected to have limited indirect impact on other halibut user groups, and the welfare of the majority of the general public. This option does not propose any change to the annual combined catch limit set by the IPHC for the charter and commercial sectors. The footprint of the fishery, relative timing, seasons, gear type, and localized harvest intensity would remain consistent with status quo.

Overall, it is difficult to say with certainty which direction the net benefits to the Nation would result in from action in Alternative 3; however, it is presumed this effect would be insignificant.

5 INITIAL REGULATORY FLEXIBLITY ANALYSIS

5.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) addresses the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (5 U.S.C. 601-612). This IRFA evaluates the potential adverse economic impacts on small entities directly regulated by the proposed action.

The RFA, first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities.

The RFA emphasizes predicting significant adverse economic impacts on small entities as a group distinct from other entities, and on the consideration of alternatives that may minimize adverse economic impacts, while still achieving the stated objective of the action. When an agency publishes a proposed rule, it must either 'certify' that the action will not have a significant adverse economic impact on a substantial number of small entities, and support that certification with the 'factual basis' upon which the decision is based; or it must prepare and make available for public review an IRFA. When an agency publishes a final rule, it must prepare a Final Regulatory Flexibility Analysis, unless, based on public comment, it chooses to certify the action.

In determining the scope, or 'universe', of the entities to be considered in an IRFA, NMFS generally includes only those entities that are directly regulated by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis.

5.2 IRFA Requirements

Until the North Pacific Fishery Management Council (Council) makes a final decision on a preferred alternative, a definitive assessment of the proposed management alternatives cannot be conducted. In order to allow the agency to make a certification decision, or to satisfy the requirements of an IRFA of the preferred alternative, this section addresses the requirements for an IRFA. Under 5 U.S.C., section 603(b) of the RFA, each IRFA is required to contain:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant federal rules that may duplicate,

overlap, or conflict with the proposed rule;

- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:

1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
3. The use of performance rather than design standards;
4. An exemption from coverage of the rule, or any part thereof, for such small entities.

In preparing an IRFA, an agency may provide either a quantifiable or numerical description of the effects of a proposed action (and alternatives to the proposed action), or more general descriptive statements, if quantification is not practicable or reliable.

5.3 Definition of a Small Entity

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) small government jurisdictions.

Small businesses. Section 601(3) of the RFA defines a 'small business' as having the same meaning as 'small business concern', which is defined under Section 3 of the Small Business Act (SBA). 'Small business' or 'small business concern' includes any firm that is independently owned and operated and not dominant in its field of operation. The SBA has further defined a "small business concern" as one "organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor…A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the firm is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture."

The SBA has established size criteria for all major industry sectors in the United States, including fish harvesting and fish processing businesses. Effective July 14, 2014, a **business involved in *finfish harvesting*** is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual gross receipts not in excess of **$20.5 million** for all its affiliated operations worldwide. A business that ***both harvests and processes*** fish (i.e., a catcher/processor) is a small business if it meets the **criteria for the applicable fish harvesting operation (i.e., finfish or shellfish)**. A **wholesale business** servicing the fishing industry is a small business if it **employs 100 or fewer persons** on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. Charter operators would fit under the category of ***other marine fishing,*** and would have a threshold in which combined annual gross receipts not in excess of **$7.5 million** for all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control

both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) a person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) if two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors, or general partners, controls the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint venturers if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations. The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated, and is not dominant in its field.

Small governmental jurisdictions. The RFA defines "small governmental jurisdictions" as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of fewer than 50,000.

5.4 Reason for Considering the Proposed Action

In December 2015 the Council developed the following purpose and need:

> *Alaska's guided halibut anglers have seen recent increases in regulatory restrictions due to declining halibut stocks and guided recreational allocations. A market-based mechanism for the guided halibut recreational sector may be an effective means to supplement their annual allocations. Allowing an RQE (Recreational Quota Entity) to hold a limited amount of commercial halibut QS on behalf of guided recreational halibut anglers under a "willing seller and willing buyer" approach may result in less restrictive annual harvest measures for guided recreational anglers in times of low halibut abundance, while complying with total halibut removals under the guided halibut catch limits determined by the International Pacific Halibut Commission. The guided recreational halibut allocation under the Halibut Catch Sharing Plan would be combined with the halibut quota share held by the RQE to determine the annually*

adjusted total guided halibut allocation. The total allocation would be the basis for the determination of appropriate management measures for the guided halibut sector each year. The intent is to consider such a mechanism without undermining the goals of the halibut IFQ Program or significant adverse impacts to other halibut sectors.

5.5 Objectives of Proposed Action and its Legal Basis

The principal objectives of the proposed actions are to promote long-term planning, as well as social and economic flexibility in the charter halibut sector. Under Alternative 2, the purpose is to allow for the development of an entity that can represent halibut charter guided anglers in order to seek out halibut QS for transfer from the commercial halibut sector in Areas 2C and 3A. This action may promote long-term efficiency in the use of the halibut resource. The objective of Alternative 3 is to create stability in the halibut charter fishery by seeking to reduce the risk of a sudden increase in charter halibut effort from latent CHPs. This alternative proposes to reach this objective by allowing an RQE to purchase CHPs, temporarily removing them from use.

The Halibut Act grants the Council the authority to oversee allocations of the halibut fishery in Alaskan and Federal waters. Setting overall removals of halibut is under the authority of the International Pacific Halibut Commission. The proposed action would require amendments to a number of Federal regulations.

5.6 Number and Description of Directly Regulated Small Entities

This section provides estimates of the number of *small, directly regulated entities*. The operative action in **Alternative 2** is to allow for an RQE(s) to be an eligible entity to transfer, hold, and use commercial halibut QS on behalf of charter angler in that area. As described in Section 4.8.2, there are many types of entities that would be expected to experience indirect, induced, secondary, and distributive economic impacts from **Alternative 2**. However, based on guidance from the NMFS Regional Economist (Queirolo 2011), the threshold for small entities to be considered directly regulated for purposes of the RFAA, means the action must require some specific affirmative action on the part of the specific entity. In light of that, the universe of entities that might be directly regulated by **Alternative 2** is limited to those entities that would be engaging in QS transfer (i.e., QS holders and an RQE).[43]

Under action in **Alternative 3**, entities that would be considered directly regulated include CHP holders that may choose to sell their CHP to an RQE.[44]

The thresholds that define a small entity are described in Section 5.3. The following section estimates the number of directly regulated entities that are considered to be small. The RFA requires a consideration of affiliations between entities for the purpose of assessing if an entity is small. There is not a strict one-to-one correlation between vessels and entities; many persons and firms are known to have ownership interests in more than one vessel, and many of these vessels with different ownership, are otherwise affiliated with each other. The estimates cannot always take into account all affiliations between entities, based on available data. Therefore, these estimates may overstate the number of small entities (and conversely, understate the number of large entities).

QS holders in the commercial halibut fishery would be directly regulated in **Alternative 2** of this action, as regulatory amendments would be made to expand the QS market that they would have the opportunity to participate in. According to Table 4-19, there were 1,080 halibut QS holders at the end of 2014 in Area

[43] As an RQE is still a proposed entity at this time, it is not further considered in the IRFA.
[44] Since CQE and MWR charter permits are available to these entities free of charge, it is assumed an RQE would not be actively buying these permits.

2C. There were 1,453 QS holders at the end of 2014 in Area 3A. Depending on the Council's preferred alternative the number of entities may be truncated. If an RQE was not able to purchase D class QS, this would exclude some QS holder from being directly regulated by this action (although that is not to say they might not be indirectly impacted). Table 4-19 illustrates that if D class halibut QS was not able to be held by an RQE, the number of halibut QS holders drops to 725, and 1079 for Area 2C and 3A, respectively.

Because there are no data to directly link QS holders with all other fishery revenue they may generate, it is not possible to determine the number of small entities with certainty. Vessels that are used to harvest IFQ are examined as a proxy. While vessels are not the entity directly regulated by this action more than one QS holder will often consolidate their IFQ on one vessel. For example, in Table 4-19 it is illustrated that there are 1,080 commercial QS holders in Area 2C and 1,453 QS holders in Area 3A (in 2014). However, in 2014, 901 vessels reported IFQ landings. Therefore, it is very likely that most of the QS holders' total gross revenues are less than this amount and would be considered small entities. To the extent that a QS holder uses several vessels to harvest their IFQ (this may be the case if they hold QS in multiple regulatory areas), there may be entities greater than the threshold.

Of the 901 vessels that targeted halibut IFQ in 2014, revenue from five of these vessels are understood to exceed the $20.5 million threshold. This number includes vessel from all regulatory areas, although only QS holders from Area 2C and 3A would be directly impacted. Therefore, less than five entities are expected to be considered "large entities" in the commercial halibut fishery, while the vast majority are considered small.

For **Alternative 3**, the number of CHP holders is listed in Table 4-5. This table indicates that of the CHPs in Area 2C there are 368 unique CHP holders for 535 unique CHPs. For Area 3A, there are 416 unique CHP holders for 439 unique CHPs.

The analysis for the CSP determined that charter halibut businesses regulated under that action were all or almost all expected to be small entities, based upon SBA criteria that their annual gross revenue, from all sources, does not exceed $7.5 million (NPFMC 2013). This analysis provides some estimates of gross revenue earned by an average charter operator in Area 2C (for example Table 2-59 in the RIR, NPFMC 2013). These data indicate that an average permit holder would need to hold more than 140 CHPs to generate $7.0 million in gross revenue (from only the charter fees). Since that time the threshold for a small entity category "other marine fishing" has increased by 0.5 million. Regardless, this threshold would be considerably high for an operation that just provided charter tours. While it is not uncommon in this sector for a single entity to hold and operate multiple charter vessels, the analysis concludes that all operators are likely to be small businesses, based upon the $7.5 million SBA threshold for RFA, and assumes this is the case.

Considering the 1,080 commerical halbiut QS holders in Area 2C, the 1,453 commerical halbiut QS holders in Area 3A, and the counts of CHP holders, it is important to note that there is also assumed overlap in these counts of assumed small entities. This is expected to be the case between commercial halibut QS holders in Area 2C and 3A and also between those who may hold both commercial halibut QS and a CHP (those who self-transfer GAF, for example). Table 4-7 indicates that there are 43 individuals in Area 2C and 37 individuals in Area 3A that hold at least one CHP and also hold QS.

5.7 Recordkeeping and Reporting Requirements

Once the Council identifies a preliminary preferred alternative (PPA) this analysis will determine any reporting, record keeping and other compliance requirements of the alternatives, and if these reporting

requirements necessitate specialized skills. The analysis will ultimately estimate the public reporting burden to comply, measured in time, across all directly regulated small entities, and multiply by a 'reasonable' wage rate to derive a crude estimate of the labor costs of compliance. These costs are then added to any capital costs (e.g., electronic broadcast costs, fax or phone costs), across the directly regulated entities.

5.8 Federal Rules that may Duplicate, Overlap, or Conflict with Proposed Action

Once the Council identifies a PPA this analysis will determine if any Federal rules have been identified that would duplicate or overlap with the proposed action.

5.9 Description of Significant Alternatives to the Proposed Action that Minimize Economic Impacts on Small Entities

After the Council has identified a PPA analysis will describe any significant alternatives to the proposed actions that accomplish the stated objectives, are consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities.

6 ENVIRONMENTAL ASSESSMENT

There are four required components for an environmental assessment (EA). Some of these components are addressed in other sections of this document. The need for the proposed action is described in Section 2.1, and the alternatives in Section 3. This EA addresses the probable environmental impacts of the proposed action and alternatives. A list of agencies and persons consulted is included in Section 8.

The purpose of this EA is to analyze the environmental impacts of the proposed federal action to allow a representative entity hold commercial halibut QS for a guided angler common pool in Area 2C and Area 3A, and to provide sufficient evidence to determine the level of significance of any potential impacts. This section evaluates the impacts of the alternatives and options on the various environmental components. The socio-economic impacts of this action are described in detail in the Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis portions of this analysis (Sections 4 and 5).

Recent and relevant information, necessary to understand the affected environment for each resource component, is summarized in the relevant subsection. For each resource component, the analysis identifies the potential impacts of each alternative, and uses criteria to evaluate the significance of these impacts. If significant impacts are likely to occur, preparation of an Environmental Impact Statement (EIS) is required. Although an EIS should evaluate economic and socioeconomic impacts that are interrelated with natural and physical environmental effects, economic and social impacts by themselves are not sufficient to require the preparation of an EIS (see 40 CFR 1508.14).

The National Environmental Protection Act (NEPA) also requires an analysis of the potential cumulative effects of a proposed action and its alternatives. An EA or EIS must consider cumulative effects when determining whether an action significantly affects environmental quality. The Council on Environmental Quality (CEQ) regulations for implementing NEPA define cumulative effects as:

> *"the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).*

The cumulative impact of reasonably foreseeable future actions will be discussed in Section 6.4.

6.1 Documents incorporated by reference in this analysis

This EA relies heavily on the information and evaluation contained in previous environmental analyses, and these documents are incorporated by reference. The documents listed below contain information about the fishery management areas, marine resources, ecosystem, social, and economic elements of the groundfish and halibut fisheries. They also include more comprehensive analysis of the effects of the fisheries on the human environment, and are referenced in the analysis of impacts throughout this chapter.

Final EA: Regulatory Amendment for a Pacific Halibut Catch Sharing Plan for the Charter Sector and Commercial Setline Sector in International Pacific Halibut Commission Regulatory Area 2C and 3A (November 2013).

This EA was produced in during the development of the CSP for halibut in Areas 2C and 3A. It provides thorough background on the Pacific halibut stock: the life history, removals, stock status, harvest policy, coast-wide stock assessment and specific fisheries. The CSP was considered to be an action that promoted

long-term conservation of the halibut stock by establishing a more stable allocation between the sectors and fostering a more easily managed charter halibut fishery. Separate accountability for wastage, implemented under the CSP, also promotes conservation by encouraging better handling of discarded fish by both the commercial and charter sectors (78 FR 39122). This document is available from: http://alaskafisheries.noaa.gov/analyses/halibut/eariririfa_halibut_csp1113.pdf

Final EA: For Amendment 66 to the Fishery Management Plan for Gulf of Alaska Groundfish To Allow Eligible Gulf of Alaska Communities to Hold Commercial Halibut and Sablefish Quota Share for Lease to Community Residents (March 2004).

This EA was produced during the development of the Community Quota Entity (CQE) program to examine environmental effects that may be expected from allowing a community entity to hold and lease QS to community residents. While the CQE has a very different practical intent than the proposed RQE, there is overlap in the structure used to develop such an entity. Therefore it is worthwhile to consider the CQE as a reference for impacts on the environment. This document is available from: http://alaskafisheries.noaa.gov/analyses/amend66/AM66_finalea.pdf

International Pacific Halibut Commission Report of Assessment and Research Activities (RARA) for 2015 (January 2016)

This document is produced annually by the International Pacific Halibut Commission (IPHC) and contains a description of the fishery and changes to regulations, population assessments, incidental catch assessments, and a description of recent research and survey work done by the IPHC. This document serves as a reference for latest status of the halibut stock and is used throughout this EA. This document is available from: http://www.iphc.int/library/raras.html

Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (NMFS 2007).

This EIS provides decision makers and the public an evaluation of the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the GOA and the Bering Sea and Aleutian Islands management areas and is referenced here for an understanding of the groundfish fishery. The EIS examines alternative harvest strategies that comply with Federal regulations, the Fishery Management Plan for Groundfish of the GOA, the BSAI FMP, and the MSA. These strategies are applied using the best available scientific information to derive the total allowable catch (TAC) estimates for the groundfish fisheries. The EIS evaluates the effects of different alternatives on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the groundfish fisheries. This document is available from: http://alaskafisheries.noaa.gov/analyses/specs/eis/default.htm.

6.2 Analytical Method

The two proposed action alternatives, allowing for a recreational quota entity (RQE) to purchase and hold commercial halibut quota share (**Alternative 2**) and allowing for an RQE to purchase charter halibut permits (CHPs) (**Alternative 3**) are chiefly motivated by social and economic concerns. Extensive environmental analysis is not necessary for many environmental components. This section identifies the components of the environment that may be affected by Council action and warrant further discussion. Table 6-1 shows the eight components of the human environment and whether the proposed action or its alternatives may have an impact on the component and require further analysis. No effects over the status quo are anticipated for ecosystem, benthic community, seabirds, groundfish, or marine mammals. Table 6-1 shows the potentially affected components: Pacific halibut and socioeconomic components of the human environment.

Table 6-1 Resources potentially affected by the proposed action and alternatives

	Potentially affected component						
Alternatives	Pacific halibut	Seabirds	Ecosystem	Benthic Community	Groundfish	Marine Mammals	Socio-economic
Alt 1: No Action	N	N	N	N	N	N	N
Alt 2: Development of RQE Program	**Y**	N	N	N	N	N	**Y**
Alt 3: Retirement of latent CHP	N	N	N	N	N	N	**Y**

N = no impact beyond status quo anticipated by the option on the component.
Y = an impact beyond status quo is possible if the option is implemented.

In order to consider which environmental components may be impacted by the proposed alternatives, it is necessary to understand how the fishery could change, compared to the status quo. (See Section 3 for a more thorough description of the two action alternates.) Alternative 2 in this analysis discusses a resource allocation issue: whether or not to allow an entity to be developed on behalf of charter halibut anglers, with the opportunity to purchase commercial halibut QS. No combination of the elements and options under Alternative 2 would influence the annual combined catch limit set by the IPHC for the charter and commercial sectors. Both sectors would still be constrained by the total catch limits set for each regulatory area based on halibut abundance. As both types of fishing occur under the status quo, the footprint of the fishery and relative timing of the fisheries would be expected to remain the same; as would regulations around seasons and gear type. The primary change that would occur would be related to size selectivity and the opportunity to shift in harvest intensity from the commercial halibut IFQ fishery in Area 2C and Area 3A to the charter halibut fishery in the corresponding area. The level of harvest intensity shifting sectors will depend on many factors, including the elements and options under Alternative 2. Along with the change in relative intensity of halibut harvest by each sector, there could be a possible change in the intensity halibut is harvested in specific locations (e.g., nearshore versus further off-shore).

Given this potential movement of halibut harvest opportunity between user groups within a regulatory area under Alternative 2, it is important to consider the effects that changes in the distribution and selectivity of fishing may have on the halibut stock. Using available information, Section 6.3.2 of this analysis examines the potential implications of this shift in sector harvest in terms of the halibut conservation efforts and accountability.

No effects are expected on ecosystems, benthic community, sea bird, groundfish, and marine mammal components of the environment from the proposed Alternative 2 (including its elements and options). No effects are presumed for these components because, as mentioned, the current manner in which the fish are harvested would remain unchanged from the status quo.

- No effects on the **ecosystem** are anticipated because the seasons, gear type, harvest limits and regulations protecting habitat and important breeding areas would remain the same. The impact of current fishing patterns on ecosystems are analyzed in in previous NEPA documents (NOAA 2007) and would not be changed by this alternative.

- Similarly the **benthic community** would not be affected from a shift in the intensity of hook-and-line halibut fishing from the commercial to the charter sector as proposed in Alternative 2. The footprint of these fisheries would be expected to remain consistent with the status quo and the levels of intensity would not reach a higher degree than they have in the past. That is, regardless of QS acquired by a potential RQE, guided anglers would not be able to exceed harvest limits above the current limits for the unguided sector (i.e., two halibut of any size).

- No impacts are expected on **seabirds** because the proposed action Alternative 2, would not introduce a new gear type or change fishing pattern in a way that would be more likely to result in the incidental take of seabirds. This alternative also would not affect the availability of forge fish for prey or their benthic habitat because the overall harvest allocation of halibut would not be changed by this action and the hook-and-line gear types used by both sectors would not change due to this action.

- Effects on **groundfish** under **Alternative 2** are difficult to precisely specify due to the nature of the different fisheries and multitude of state and federal regulations that apply. In the commercial sector, groundfish is considered bycatch. In some instances in federal water, groundfish is required to be retained, in some instances it is required to be discarded, and in some instances it can be retained up to a certain maximum retainable amount (MRA). An MRA is ratio of incidentally caught species (groundfish species) compared to a basis species (halibut) calculated on an instantaneous basis. In GOA, there is a prohibition against discarding rockfish when halibut or sablefish IFQ is onboard, and the vessel operator has a Federal Fisheries Permit[45] (§679.7(8)). There is a similar mechanism in place for commercial halibut fisheries in state waters. In Central and Southeast state waters, all rockfish caught in the commercial halibut fishery must be retained and the portion above the bycatch allowance is surrendered to the state. In most state waters of the GOA, most rockfish are defined as bycatch only. For example, in Central Region, the only rockfish that can be targeted is black rockfish (Scott Meyer, 11/6/2015, personal communications).

  If halibut QS was moved from the commercial sector to the charter sector, it might be expected that groundfish bycatch would decrease proportionately. However, depending on the species, this amount of groundfish could be reallocated to the directed fishery if that target fishery were nearing the TAC.

  Groundfish catch in the charter sector is difficult to compare to bycatch rates in the commercial sector, because in many cases it is not bycatch. Anglers will often target groundfish simultaneously or sequentially to targeting halibut. Certain groundfish species can be caught in the same areas, at about the same depth, using the same bait as halibut (for example, some types of rockfish and Pacific cod). While fishing for halibut, anglers (or their charter operators) know that the gear is effective for other groundfish and fully intend to keep the other groundfish if caught (up to the daily bag limit set by the state). If halibut fishing is poor, anglers may switch to groundfish fishing sooner. If the area has less strict management measures due to QS moved from the commercial sector to the charter sector there may be variable impacts on amount of groundfish caught as "bycatch" and the amount of time spend targeting groundfish.

[45] An FFP is free of charge and unrestricted in number. It is required for the harvest of any groundfish species in Federal waters.

Overall this is an area of research that could be expanded in effort to demonstrate a more precise impact on groundfish; however, a shift of halibut fishing intensity from the commercial sector to the charter sector is not expected to result in greater groundfish wastage, impact groundfish prey, effect stock biomass, or spatial or temporal distribution of groundfish in any significant way.

- In addition to the components listed above, it is not anticipated that Alternative 2 will affect **marine mammals** present in Area 2C or 3A. As the footprint of the fisheries and the gear types remain unchanged from the status quo, no changes in incidental takes or disturbance of marine mammals would be expected under action Alternative 2.

  Halibut is not a primary prey species for the majority of marine mammals in Area 2C and 3A. While a small halibut may occasionally contribute to the diet of the Steller sea lion, primary prey species include pollock, Pacific cod, and Atka mackerel. Halibut contributes to the diet of some cetaceans in Area 2C and 3A, such as killer whales; however, it is not considered a primary prey species. Killer and sperm whale depredation on halibut long-line vessels has become increasingly common as these whales have learned to track these vessels based on sounds of their acoustic signatures. While a potential shift in harvest intensity between commercial and charter halibut fisheries may slightly impact the accessibility of halibut to whales, due to the use of long-line gear in the commercial sector, it is not expected to impact the overall availability of halibut to whales.[46] An incremental reduction in the availability of Pacific halibut on longlines may result in incremental changes in the energy budget of a few whales, but killer and sperm whale behavior is sufficiently plastic to allow them to forage effectively for prey without depredating longline gear. Moreover, any potential localized depletion that may occur from changes in harvest intensity of halibut from the commercial sector to the charter sector would be unlikely to create significant adverse effects for a predator as mobile as a killer or sperm whale.

Alternative 3 would not expand an existing fishery: this alternative would allow the RQE the option of purchasing CHPs with the intention of temporarily removing some charter harvest capacity within the fishery, in order to mitigate sudden spikes in angler effort. Similarly to **Alternative 2**, under this alternative no combination of the elements and options would change the annual combined catch limit set by the IPHC for the charter and commercial sectors. The footprint of the fishery, relative timing, seasons, gear type, and localized harvest intensity would remain consistent with status quo. The potential changes in size selectivity and potential shift in harvest intensity possible with the creation of the RQE is analyzed under Alternative 2. Therefore, this alternative is not expected to contribute any additionally on the environmental components. This alternative is socio-economic in nature. Continued discussion about the impacts of **Alternative 3** on the human environment are found in Section 4 and Section 5.

6.3 Pacific halibut

6.3.1.1 Life History, Development, and Feeding Behavior

Pacific halibut (*Hippoglossus stenolepsis*) are among the largest teleost fish in the world, with individuals growing up to eight feet in length and over 500 lb. IPHC studies show that female halibut typically grow faster and attain much larger sizes than males. For this reason the commercial catch, which has a minimum size limit, is predominantly female. The North American catch of Pacific halibut, mostly by longline gear, consists of individuals chiefly from 10 to 200 lb. Few males reach greater than 80 lb, and nearly all halibut over 100 lb are females (IPHC 2014).

[46] Although studies have been done on whale depredation in the commercial long-line sector, no comparable studies where identified for the charter sector. It is assumed that in the charter sector, where anglers use jig gear, whale depredation is a significantly limited issue.

While female halibut tend to grow faster than the males, they are also shown to mature slower. Most male halibut are sexually mature by about eight years of age, while half of the females are mature by about age twelve. At this age, most females are generally large enough to meet the minimum size limit for the commercial fishery of 32 inches.

The number of eggs produced by a female is related to its size. A 50 lb female will produce about 500,000 eggs, whereas a female over 250 lb may produce four million eggs. Eggs are fertilized externally by the males. Halibut are believed to be "batch spawners", meaning that only a portion of a female's eggs are hydrated at a time and released, and this process is repeated several times over the spawning season until all the eggs have been expelled. Halibut range from depths up to 250 fathoms for most of the year and up to 500 fathoms during the winter spawning months. During the winter spawning months (November through March), the eggs are released, slowly move up in the water column, and are caught by ocean currents. Prevailing currents carry the eggs north and west. By the age of 6 months, young halibut settle to the bottom in shallow nearshore areas such as bays and inlets. Research has shown that the halibut then begin what can be called a journey back. This movement runs counter to the currents that carried them away from the spawning grounds and has been documented at over 1,000 miles for some fish.

Larvae begin life in an upright position with an eye on each side of the head. When the larvae are about an inch long, an extraordinary transformation or metamorphosis occurs: the left eye moves over the snout to the right side of the head and pigmentation on the left side fades. When the young fish are about six months old, they have the characteristic adult form and settle to the bottom in shallow inshore areas. The survival of young halibut, and the varying strength of each year class, may be driven by food availability, proximity to predators, temperature or other environmental factors, or a combination of these. Recruitment of juvenile halibut to the stock has been highly variable over the historical record, with apparently strong links to the productivity cycles of the north Pacific (i.e., the Pacific Decadal Oscillation).

Halibut feed on plankton during their first year of life. Young halibut (one to three years old) feed on euphausiids (small shrimp-like crustaceans) and small fish. As halibut grow, fish make up a larger part of their diet. Larger halibut eat other fish, such as herring, sand lance, capelin, smelt, pollock, sablefish, cod, and rockfish. They also consume octopus, crabs, and clams.

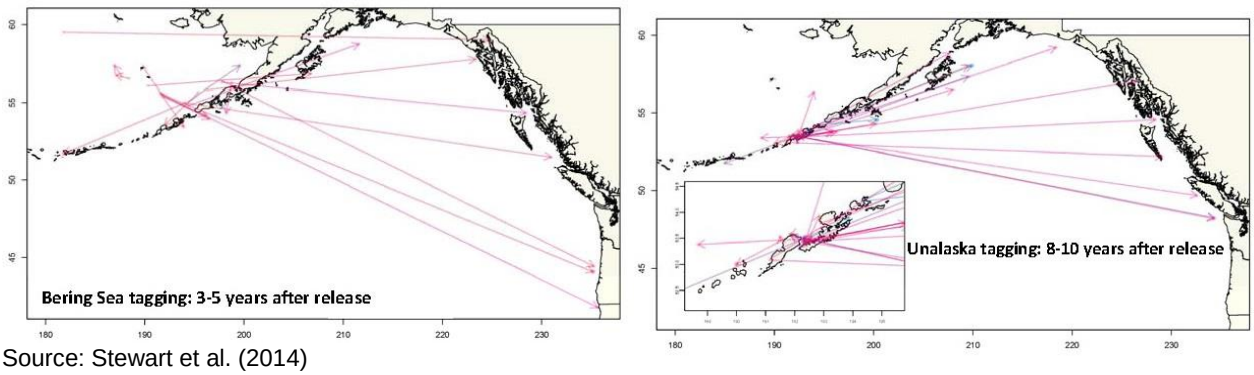
6.3.1.2 Distribution and Migration

The range of Pacific halibut that the IPHC manages, covers the continental shelf from northern California to the Aleutian Islands and throughout the Bering Sea. Pacific halibut are also found along the western north Pacific continental shelf of Russia, Japan, and Korea. Research shows that Pacific halibut form a single genetic stock across their entire range, and abundance estimates are therefore derived for the coast-wide population (IPHC 2014). However, management of the resource is conducted on a regulatory area basis (see Figure 2-1).

Stewart et al. (2014) provides a general understanding of Pacific halibut distribution, indicating that the bulk of the pelagic juvenile halibut occurs in the western GOA, Aleutian Islands and southeastern Bering Sea. Densities of one to four year old halibut (not frequently encountered in setline surveys or the directed fishery) are typically also very high in these areas; this has been observed in trawl surveys, directed IPHC trawl investigations, and in the length-frequencies of halibut captured as bycatch in various trawl fisheries operating in these areas. One- and two-year-old Pacific halibut are commonly found in inshore areas of central and western Alaska, but are virtually missing from southeast Alaska and British Columbia (IPHC 2014).

The IPHC has tagged almost 450,000 halibut since 1925 and over 50,000 tagged fish have been recovered. Traditionally, the tags are attached on the outside of the fish, where they will be seen by fishers and processors. A reward is paid for their return. The aggregate result of historical IPHC tagging programs indicates that the Bering Sea is a net exporter of halibut of all sizes to all other regulatory areas. New analysis of historical tagging projects conducted by the IPHC in the BSAI has recently been undertaken (Webster 2015). Results of this analysis indicate that juvenile halibut tagged in the BSAI and near Unalaska tend to remain near the area of tagging for the first year at large, but then distribute broadly to the Aleutian Islands, Gulf of Alaska (70 to 90 percent), and Area 2 (Figure 6-1). This would imply that by the time they enter the directed fishery (and are fully selected by the setline survey), halibut spending their first few years of life in the Bering Sea could be in virtually any regulatory area.

Figure 6-1 Release and recovery locations for juvenile halibut tagged in the Bering Sea, and near Unalaska



Source: Stewart et al. (2014)

It was long believed that most adult halibut tend to remain on the same grounds year after year, making only a seasonal migration from the more shallow feeding grounds in summer to deeper spawning grounds in winter, sometimes covering large distances. Recent research, however, has demonstrated that a measurable proportion of the adult population continues to migrate, generally, though not entirely, eastward, even at large sizes and older ages (IPHC 2014).

By the time Pacific halibut become large enough to be caught by the commercial fishery, much of the extensive counter-migration to balance egg and larval drift has apparently taken place. However, many adult halibut continue to migrate along the continental shelf and also migrate across the shelf annually, moving to deeper depths on the slope during the winter for spawning, and returning to shallow coastal waters in the summer months for feeding. Although halibut have been caught as deep as 4,000 ft., they are most often caught between 90 and 900 ft. (IPHC 2014).

Halibut also move seasonally between shallow waters and deep waters. Mature fish move to deeper offshore areas in the fall to spawn, and return to nearshore feeding areas in early summer.

6.3.1.3 Biomass, Abundance, and Assessment

The IPHC is responsible for monitoring and promoting the health of the Pacific halibut resource and engages in basic scientific research, fishery-dependent and fishery-independent sampling, as well as quantitative analyses to support management decisions. These scientific results are provided annually to the IPHC and stakeholders for decision-making during the Annual Meeting process, which typically occurs in January each year.

The process relies on several key steps: 1) the annual stock assessment integrates available data into a statistical framework which produces coastwide stock estimates and a decision table-based risk assessment; 2) coastwide stock estimates are apportioned by regulatory area; 3) the current harvest policy

is applied to these area-specific estimates to produce yield estimates; and 4) these estimates, along with the coastwide risk assessment and input from stakeholder groups are used by the Commissioners to set annual catch levels for the upcoming year (IPHC 2014).

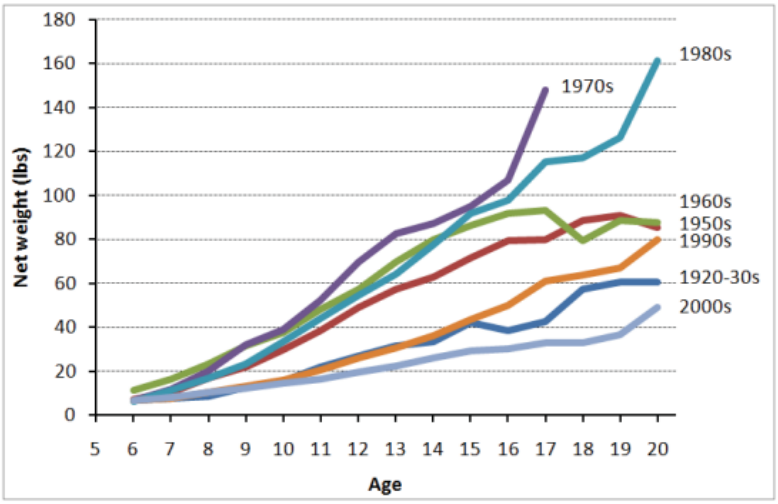
The annual stock assessment produced by the IPHC integrates observed data on removals from all directed and non-directed fisheries and the setline survey, along with the current understanding of biological processes such as maturity, natural mortality, and growth, in order to estimate the relative trend and abundance level of the resource coastwide. The stock assessment procedure underwent a major change in the mid-2000s to reflect a new understanding of halibut movements. As previously mentioned, until the mid-2000s, it was believed that halibut over 65 cm in length were essentially non-migratory, and the IPHC assessed the halibut stock in each regulatory area separately. Since tagging studies in the mid-2000s demonstrated that a substantial portion of the adult stock is migratory, the IPHC has assessed the halibut population as a single stock since 2006 (Meyer 2014). The IPHC combines directed and non-directed fishery and longline survey data coastwide in a single age and sex structured model of halibut abundance. For more rigorous description of the process the IPHC uses to model and predict risk neutral levels of halibut removal see Stewart and Martell (2015).

The halibut stock has undergone many fluctuations in abundance with consequent effects on the commercial fishery removals. These fluctuations are understood to be linked to changes in recruitment (the number of young halibut entering the population each year), which appears to be linked to the productivity of the northeastern Pacific Ocean, specifically, the Pacific Decadal Oscillation (an El Niño-like pattern of Pacific climate variability) (IPHC 2014).

In addition to changes in population, the Pacific halibut stock has experienced significant change in biomass due to changes in average size-at-age. In 2012, the coastwide average size in the commercial catch was was 23.2 lb. This is a large decrease from 20 to 30 years before when the coastwide average weights in the catch were 30 to 40 lb. For the past 25 years, weight at a given age has been decreasing. Similarly low weight-at-age was seen in the 1920s, but subsequently increased to a maximum in the 1980s (Figure 6-2).

The mechanisms creating these changes are poorly understood, but may represent a combination of density-dependent competition for food, ocean productivity, fishing effects, and other natural and anthropogenic factors. Such changes in size-at-age can result in fluctuations in the catch, even when similar numbers of fish are being removed from the stock. These changes in stock abundance have not been identical among all regulatory areas, with some showing much more pronounced trends and others more stability. To better understand the role of environment on the halibut stock, the IPHC began an environmental monitoring program aboard its setline survey in 2009, which provides an annual summer snapshot of conditions along the continental shelf of the eastern north Pacific and Bering Sea (IPHC 2014).

Figure 6-2 Changes in weight-at-age of Pacific halibut from the 1920s – 2000s

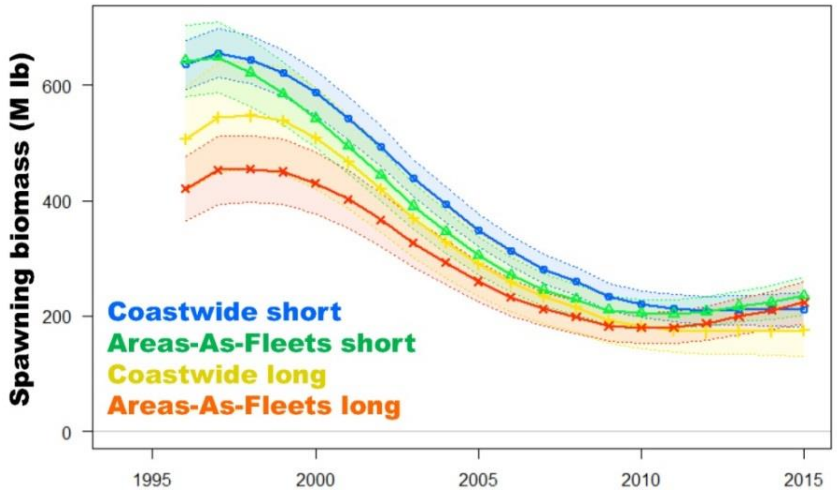


Source: The Pacific Halibut: Biology, Fishery, and Management, Tech Memo No. 59 (IPHC 2014).

For the past two years, the IPHC has used an ensemble approach to its coastwide stock assessment for the Pacific halibut stock, described in Stewart and Martell (2015). In this approach, multiple models are included in the estimation of management quantities, and uncertainty about these quantities. For 2014, these included two coastwide models and two areas-as-fleets models, in each case one using more comprehensive data available only since 1996, and the other using the full historical record (Figure 6-3). The results of the 2014 assessment indicate that the stock declined continuously from the late 1990s to around 2010. That trend is estimated to have been a result of decreasing size-at-age, as well as recent recruitment strengths that are much smaller than those observed through the 1980s and 1990s.

Since that time period, the estimated female spawning biomass appears to have stabilized near 200 Mlb, with flatter trajectories estimated in coastwide models and slightly increasing trends in areas-as-fleets models (Stewart & Martell 2015).

Figure 6-3 Trend in spawning biomass estimated from each of the four models included in the 2014 stock assessment ensemble



Source: Stewart & Martell 2015
Figure notes: Series indicate the maximum likelihood estimates, shaded intervals indicate approximate 95% confidence intervals

The ensemble model approach was developed to more accurately convey the uncertainty in the estimation of stock status and as a more robust assessment tool to avoid abrupt changes in the halibut stock assessment, such as that occurring between annual cycles in 2011 and 2012. In 2012, IPHC staff reported that then-recent stock assessments for Pacific halibut had consistently overestimated biomass and underestimated harvest rates due to a retrospective bias in the stock assessment. While the 2012 assessment was corrected for the retrospective bias and the assessment results were found to track observed halibut trends, estimates of stock size were decreased by approximately 30 percent compared to previous assessments.

Following the correction of the retrospective bias, historical female spawning and coastwide exploitable biomass of halibut have again been hindcast in the stock assessment. Table 6-2 provides biomass estimates from 1996 through 2015, and also identifies estimates of halibut fishing intensity (from all sources of estimated removals) during that time period. Fishing intensity (*F*) is the calculated fishing mortality rate at which the equilibrium spawning biomass per recruit is reduced to x percent of its value in the equivalent unfished stock.

Generally, studies of similar BSAI groundfish have confirmed that an exploitation rate of $F_{35\%}$ is an adequate proxy for the level of fishing that will achieve maximum sustainable yield (F_{MSY}; Goodman et al. 2002), commonly used as an "overfishing level" in Alaskan flatfish and other groundfish fisheries. Catch that corresponds to an $F_{40\%}$ rate provides a safety buffer to account for uncertainty in the stock assessment and catch estimates. An $F_{40\%}$ harvest rate is considered a conservative maximum catch limit in Alaskan fisheries (established in the Council's formulas for setting acceptable biological catch (ABC)). In the past three years, the IPHC has set catch limits that result in a total fishing impact that would be considered conservative by fishery management scientists (Table 6-2). However, the IPHC harvest policy is not an equilibrium MSY-based harvest policy like that for BSAI groundfish. Instead the IPHC policy is a dynamic policy including environmental influence on recruitment and target harvest rates that are less that MSY rates.

Table 6-2 Median population (millions of pounds, net weight) and fishing intensity estimates (based on median spawning potential ratio)

Year	Female Spawning Biomass	Fishing Intensity ($F_{xx}\%$)	Coastwide Exploitable Biomass
1996	584.6	49%	779.2
1997	605.7	43%	809.6
1998	591.4	42%	762.7
1999	567.1	40%	746.8
2000	529.5	40%	688.3
2001	483.9	38%	603
2002	434.5	34%	532.2
2003	382.6	30%	460.5
2004	339.5	28%	403.6
2005	299.5	26%	352.6
2006	266.7	26%	307.9
2007	241.5	25%	266.9
2008	224.4	25%	236.3
2009	204.6	26%	203.9
2010	197.8	27%	186.4
2011	195.3	31%	175.6
2012	197.2	35%	169.2
2013	203.9	38%	168.8
2014	208.5	43%	169.7
2015	215.1	44%	180.6

Source: Stewart & Martell 2015.

The IPHC's harvest policy is based on the coastwide exploitable biomass of halibut, or fish that are accessible in the IPHC setline survey and to the commercial halibut fishery (generally over 26 inch halibut (O26)). The resulting coastwide estimates of biomass are apportioned to regulatory areas based on the area-specific setline survey weight per unit effort, weighted by the area of bottom habitat (0-400 fathoms) in each area. There are additional adjustments for harvest taken prior to the average survey date in each area and hook competition by other species (see Webster and Stewart 2015). Section 4.4.1.2.1 discusses the process by which the IPHC will then set the annual combined catch limit (CCL) for the charter and commercial allocation in Area 2C and Area 3A.

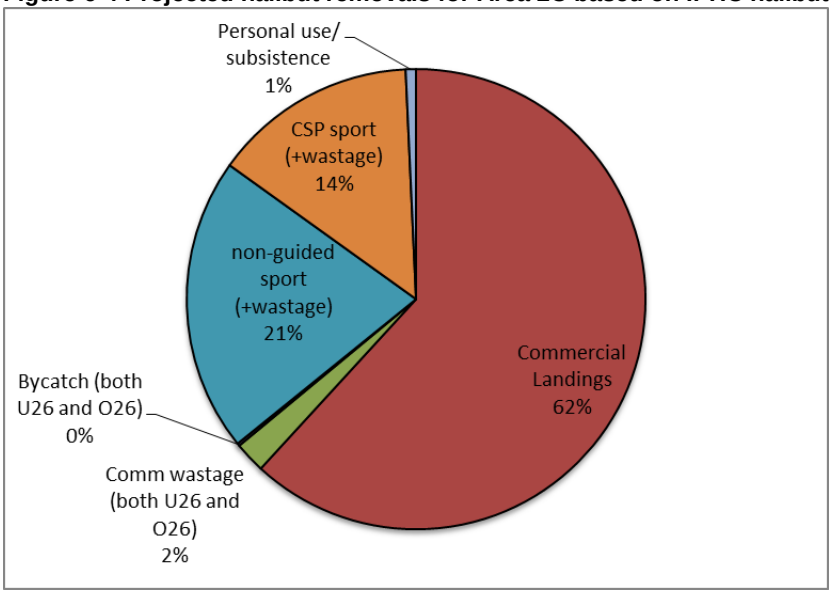
6.3.1.4 Removals

In the last four years, there is no information to suggest that halibut is subject to "overfishing," as that term is commonly applied to stocks managed under the Magnuson-Stevens Act. The Halibut Act does not define "overfishing" or require that an overfishing limit be defined. The halibut stock is currently managed conservatively, in a manner that is not likely to result in a chronic long term decline in the halibut resource due to fishing mortality (from all sources of removals) (NPMFC 2015).

However, the exploitable biomass of halibut is fully utilized. Five major categories of use occur in Alaska: commercial landings, sport (guided and unguided), subsistence and personal use, discard mortality in halibut targeted fisheries, and discard mortality in non-halibut directed fisheries. Sport removal of halibut (including the unguided sector) is an important proportion of halibut removals (Figure 6-4 and Figure 6-5). In Area 2C, the IPHC catch table for 2015 allocated 0.79 mt to the guided halibut sport fishing sector and its wastage (i.e. 14 percent of the total removals). As prescribed in the CSP, this

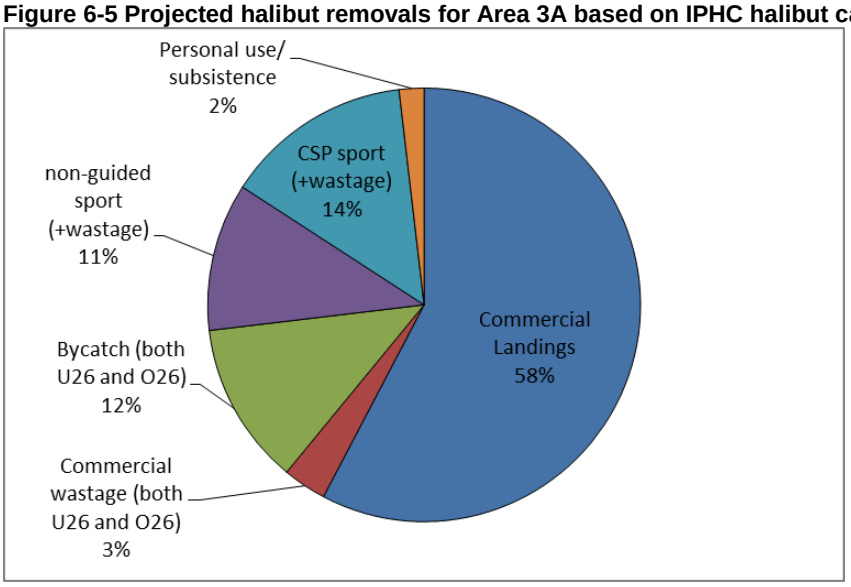
represents 18.3 percent of the total O26 FCEY. Area 3A guided halibut sport fishing sector was allocated 1.49mt (14 percent of the total projected removals for 2015).

Figure 6-4 Projected halibut removals for Area 2C based on IPHC halibut catch for the 2015 blue line values



Source: IPHC (2015) Final decision table, available at:
http://www.iphc.int/meetings/2015am/Final_Adopted_catch_limits_1_30_15.pdf

Figure 6-5 Projected halibut removals for Area 3A based on IPHC halibut catch for the 2015 blue line values



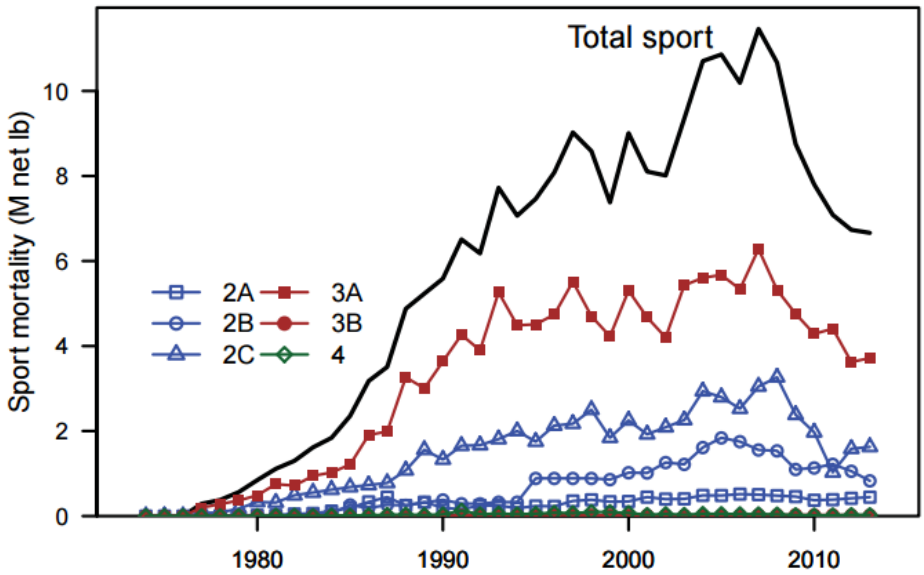
Source: IPHC (2015) Final decision table, available at:
http://www.iphc.int/meetings/2015am/Final_Adopted_catch_limits_1_30_15.pdf

The coastwide sport harvest of halibut (including guided and unguided) has grown considerably since IPHC began keeping sport catch statistics in the late 1970s (Figure 6-6). The sport harvest first reached one Mlb in 1981 and continued to grow, surpassing five Mlb in 1989 and 10 Mlb in 2004. Sport harvest peaked at 11.5 Mlb in 2007 and has since declined somewhat to 7.5 million pounds in 2011.

In Alaska, the harvest by the sport fishery has followed a similar trend, in part because it makes up the vast majority of coastwide sport halibut fishing. Alaska sport fishing harvest of halibut peaked at 9.4 Mlb

in 2009. Increased fishery restrictions coupled with declines in abundance have resulted in the harvest in 2012 of 6.87 Mlb Figure 6-6 reinforces the fact that all nearly all of Alaskan sport halibut harvest comes from Area 3A and Area 2C.

Figure 6-6 Sport catch removals (millions of pounds, net weight) since accounting began, 1977-2012



Source: The Pacific Halibut: Biology, Fishery, and Management, Tech Memo No. 59 (IPHC 2014).

Estimates of removals include estimates of wastage in the guided sport fishery. As described in Section 4.4.1.2.5, ADF&G has estimated wastage (i.e., discard mortality) for the guided sport halibut fishery in Areas 2C and 3A since 2007. These estimates rely on available Statewide Harvest Survey estimates of the numbers of released fish, an assumed mortality rate based on hook use data, and modeling of the size distribution of released fish. Discard mortality rates for guided and unguided recreational fisheries are dependent on the hook type (circle versus other) that is used. The rates were derived as weighted estimates, with 3.5 percent mortality rate for halibut released on circle hooks and a 10 percent mortality rate for halibut released on all other hook types, weighted by the proportions of released fish caught on each hook type.

Table 4-10 and Table 4-11 in Section 4.4.2.2 illustrate harvest limits and guided angler harvest for the past twenty years in Area 2C and Area 3A. Since the second year the guideline harvest limit (GHL) was in place (2004), Area 2C exceeded its harvest limit from between 15 to 58 percent up until 2010. Management measures became stricter and Area 2C was able to stay within its GHL/ allocation until 2014, the first year of the CSP. Under the first year of the CSP, the 2C charter sector was estimated to be nine percent over its allocation. Preliminary estimates indicate the 2C charter sector to be 0.4 percent under its allocation for 2015, the second year of the CSP.

Between 2003 to 2013, Area 3A was able to stay very near or below its GHL, with one year contributing an overage of 10 percent. In the first year of the CSP, Area 3A was estimated at 16 percent over the catch limit, which was cut by almost one Mlb from 2013. Preliminary estimates for 2015 demonstrate that with increase management restrictions and a 100,000 lb increase in the harvest limit, Area 3A was nine percent over the charter catch limit for this area.

6.3.2 Effects of the Alternatives

The analysis of environmental effects is focused around **Alternative 2**, as **Alternative 1** represents status quo environmental conditions, and **Alternative 3** is socio-economic in nature, and not focused around conservation concerns. **Alternative 2** would allow for the formation of a non-profit RQE, for Area 2C and Area 3A. This alternative would provide an RQE(s) with the opportunity to purchase commercial halibut QS for use in a common pool for charter anglers in the regulatory area it represents.

The overall effects of the Pacific halibut directed fishing and other removals on the halibut stock is assessed annually in the IPHC's RARA (e.g., IPHC 2015). Table 6-3 describes the criteria used to determine whether the impacts on target fish stocks are likely to be significant. As described in Section 6.3.1.4, while the Halibut Act does not define "overfishing" or require such a limit to be defined, no information suggests that the Pacific halibut stock is subject to "overfishing". It is estimated that the Pacific halibut fishery under the status quo is sustainable as defined by IPHC harvest policy.

Table 6-3 Criteria used to determine significance of effects on target Pacific halibut stock

Effect	Criteria			
	Significantly Negative	Insignificant	Significantly Positive	Unknown
Stock Biomass: potential for increasing and reducing stock size	Changes in fishing mortality are expected to jeopardize the ability of the stock to sustain itself at or above its CEY	Changes in fishing mortality are expected to maintain the stock's ability to sustain itself above its CEY	Changes in fishing mortality are expected to enhance the stock's ability to sustain itself at or above its CEY	Magnitude and/or direction of effects are unknown
Fishing mortality	Reasonably expected to jeopardize the capacity of the stock to yield sustainable biomass on a continuing basis.	Reasonably expected not to jeopardize the capacity of the stock to yield sustainable biomass on a continuing basis.	Action allows the stock to return to its unfished biomass.	Magnitude and/or direction of effects are unknown
Spatial or temporal distribution	Reasonably expected to adversely affect the distribution of harvested stocks either spatially or temporally such that it jeopardizes the ability of the stock to sustain itself.	Unlikely to affect the distribution of harvested stocks either spatially or temporally such that it has an effect on the ability of the stock to sustain itself.	Reasonably expected to positively affect the harvested stocks through spatial or temporal increases in abundance such that it enhances the ability of the stock to sustain itself.	Magnitude and/or direction of effects are unknown
Change in prey availability	Evidence that the action may lead to changed prey availability such that it jeopardizes the ability of the stock to sustain itself.	Evidence that the action will not lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself.	Evidence that the action may result in a change in prey availability such that it enhances the ability of the stock to sustain itself.	Magnitude and/or direction of effects are unknown

As discussed in the environmental scan (Section 6.2), there are many characteristics of the halibut fisheries that would not change under **Alternative 2**. The framework for the CCL, as described in Section

4.4.1.2.1, would not change with this action and the allocation tiers would still be determined by the thresholds detailed in Table 4-1 for Area 2C and Table 4-2 for Area 3A. Both sectors would still be constrained by the total catch limits set for each regulatory area based on halibut abundance. While there are differences in the way each sector is managed (i.e., the commercial halibut IFQ fishery is subject to in-season closure upon reaching the commercial catch limit by area, whereas the charter sector is not), an overage or an underage from either sector is accounted for in the subsequent year by increasing fishery removals that result in a lower estimated initial biomass. On average, over the past five years (2010-2014), Area 2C was approximately 580,000 lb under its harvest limit, and Area 3A was approximately 86,000 lb under its harvest limit. Therefore, despite variability in harvest rates compared to harvest limit (particularly for these year in the charter sector), these removals are still accounted for. Under the currently proposed alternatives and options **it can be reasonably expected that the ability of stock to yield sustainable biomass by IPHC regulatory area on a continuing basis will not be significantly impacted by action under Alternative 2.**

One element that has been discussed outside of the proposed action could influence the magnitude of expected impacts on halibut biomass. At the Council meeting in February 2014, Gregg Williams of the IPHC staff spoke to the possible conservation and biological issues that could arise if an RQE was able to participate in the same **overage/ underage adjustment** that currently applies in the commercial halibut IFQ fishery. As described in Sections 4.5.1 the IFQ provisions provide for administrative adjustment of IFQ permits as a result of under-and over- fishing the prior year up to ten percent. If IFQ pounds remain unfished, a regulatory provision allows up to ten percent of the pounds remaining at the time of landing may be carried over to the following year. If a person exceeds an IFQ permit by some amount, not greater than ten percent, the next year the holder of the QS may see a deduction in their permit account. Mr. Williams highlighted that while the amount of IFQ rolled-over from QS holders has essentially been a wash in the long-run (i.e., a small amount over, a small amount under), the ability for an entity that represents a much larger pool of individuals to impact the stock, could be much greater due to the amount of halibut this represents. In the case of the recreational sector, there would be no individual accountability for such overage/underage. The Council's current list of alternatives and options does not include this potential flexibility, and the Council should be clear whether it warrants further IPHC investigation.

It is not anticipated that Alternative 2 would have significantly adverse impacts on status quo levels of fishing mortality or wastage. In the IFQ fishery, vessel operators are prohibited from discarding any halibut (above the legal size limit) for which anyone aboard the vessel has available quota for.

In the halibut sport fishery, discarding can occur up to a certain period of time. With recent management measures designed to limit the charter sector harvest and change size selectivity, the charter anglers have likely changed their patterns of discarding. For example, under the reverse slot limit restrictions for Area 2C in 2015, charter anglers were required to discard halibut between 42 and 80 inches in length. However, these discards to not all constitute wastage. Halibut released by charter anglers have very high survival rates, depending on the type of hook used. A discard mortality rate has been estimated by ADF&G since 2007. The CSP introduced separate accountability for wastage (Section 4.4.1.2.5), and applies it to the total charter removal under the charter allocation. From a conservation perspective, benefits may change as slot limits and minimum size limits require the discard of halibut in different size thresholds.

Under **Alternative 2**, the primary environmental consideration with regards to the sustainability of the halibut resource includes the consideration of what could result from the opportunity to shift some harvest intensity from the commercial halibut IFQ fishery to the charter halibut fishery. **Will there be effects on the spatial or temporal distribution of the halibut stock? Will there be localized depletion?**

This is a challenging impact to assess, because there are some pieces of information that are unavailable, including halibut biomass estimates by sub-areas and migratory patterns of halibut by sub-area.

While biomass information is not available at a localized level, creel sampling occurs at the major ports, so harvest-per-unit-effort can be understood in terms of number of retained halibut (harvest) and angler-days (effort). Figure 4-27and Figure 4-28 and demonstrate these trends for by Area. As part of the assessment of annual management measures, ADF&F often produces this type of information on harvest, effort, and harvest-per-unit effort in sub-areas of 2C and 3A. This continuous monitoring can aid management in tracking significant changes in number of fish, average weight of halibut, number of angler days, and overall effort relative to the management measures set each year.

IPHC has conducted general research on localized depletion of halibut. One of their studies occurred in 1988, published in the 1992 RARA, before the IPHC considered the Pacific halibut population to be of one stock (Greernaert et al. 1992). In this early work, the IPHC conducted a depletion and tagging study in the northern portion of Area 2B, Graham Island. Two research trips were made, the first between May 31 and June 20, and the second July 17 through July 27. This made a combined 21 days fishing. They fished an area of about 1 by 2.5 miles with depths ranging between 87 and 105 fathoms. The same fishing patterns were repeated, the same bait used, time and number of hooks that were set. Halibut catch was reported to vary, but depletion never occurred.

More recent research on localized depletion occurred from the IPHC in 2008 (Webster 2008). The intent of this study was to model factors affecting catchability of Pacific halibut. The probability of capture is one factor that impacts catch per unit effort (CPUE) in IPHC setline surveys. This probability can be influenced by environmental covariates (depth, temperature), individual covariates (sex, maturity, size prior injuries), and fishing design variables (location of set, time of day or year, length of soak).

The study took place in the eastern part of Area 3A. Five clusters were selected for this study, three in the Yakutat setline survey region, and two in the Prince William Sound survey region. Fishing occurred in each area over five days. The technique is called removal sampling, in which a closed population is repeatedly sampled over multiple occasions in quick succession. The basic idea was that the catch at a station will decline on each successive set as more of the local population is removed, and modeling the rate of decline will allow the researchers to estimate the number of fish that were present prior to the first set. Successful modelling of catch probability depended on observing a declining catch and on the rate of migration not being too high. As the rate of migration approaches 1, it becomes harder to distinguish high catchability and low local abundance from low catchability and high local abundance.

The results of this research showed daily catches of legal-sized halibut had declined little over the five days, with some clusters showing no decline at all. IPHC researchers determined that with such large daily movement of animals into the catchable population, they would not be able to obtain useful estimation of catch probabilities. It is also noteworthy that the amount of fishing effort applied in this study is relatively low compared with season-long fishing effort. An alternative conclusion could be that the catch rates were not high enough to affect the local population. Catch rates and migration may be confounded in these studies. Relatively speaking, the fishing effort applied is quite small compared with a season-long effort of multi-year localized fishing such as might happen in some sport fisheries.

However importantly, as discussed in Section 6.3.1.3 , based on research around the migratory nature of the adult halibut, the IPHC considers Pacific halibut to be a single stock, and assesses it as such. Therefore, it can be concluded **that Alternative 2 is unlikely to affect the distribution of harvested**

stock either spatially or temporally such that it has an effect on the ability of the stock to sustain itself.

This is not to say that there could not be localized effects under **Alternative 2**. The Council has received numerous public comments in the past on the perceived impact or expected impacts of localized depletion. Depending on the type of charter operation (lodge versus day trips), vessel operators typically do not travel more than two to three hours from a home port. In many sub-areas for both Area 2C and 3A, the footprint of the halibut charter fishery overlaps with the footprint of the other halibut user groups, such as non-guided sport anglers and subsistence users.[47] Any potential localized depletion resulting from a shift in harvest intensity to more nearshore areas could impact these user groups. Given the importance of this resource, this could also be an important area of future research.

It should also be noted that one effect not analyzed here are the different size compositions of halibut that the commercially harvested halibut IFQ and recreationally harvested halibut may have. Depending on the amount transferred, effects of this difference might be evident. Particularly if there were annual transfer limits in place, this type of effect may be noted early on the program's development.

Finally, **Alternative 2 is not expected to have an impact on prey availability** such that it jeopardizes the health of the halibut stock. Both sectors of halibut fishing occur under the status quo. The footprint of the fishery and relative timing of the fisheries would be expected to remain the same; as would regulations around seasons and gear type. Therefore, prey availability is not expected to be jeopardized by the potential for some redistribution of commercial halibut QS to the charter sector.

6.4 Cumulative Effects

NEPA requires an analysis of the potential cumulative effects of a proposed federal action and its alternatives. Cumulative effects are those combined effects on the quality of the human environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions (RFFA), regardless of which federal or non-federal agency or person undertakes such other actions (40 CFR 1508.7, 1508.25(a) and 1508.25(c)). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The concept behind cumulative effects analysis is to capture the total effects of many actions over time that would be missed if evaluating each action individually. Concurrently, the Council on Environmental Quality (CEQ) guidelines recognize that it is most practical to focus cumulative effects analysis on only those effects that are truly meaningful. Based on the preceding analysis, the effects that are meaningful are potential effects on Pacific halibut. The cumulative effects on the other resources have been analyzed in numerous documents and the impacts of this proposed action and alternatives on those resources is minimal, therefore there is no need to conduct an additional cumulative impacts analysis.

This section will provide a review of the cumulative effects of each alternative and the effects of past, present, and RFFA that may result in cumulative effects on the Pacific halibut stock. Actions are understood to be human actions (e.g., a proposed rule to designate northern right whale critical habitat in the Pacific Ocean), as distinguished from natural events (e.g., an ecological regime shift). CEQ regulations require consideration of actions, whether taken by a government or by private persons, which are reasonably foreseeable. This requirement is interpreted to indicate actions that are more than merely possible or speculative. In addition to these actions, this cumulative effects analysis includes climate change.

[47] This is a prime motivator for the Sitka Sound Local Area Management Plan (LAMP). This LAMP restricts commercial fishing vessels and charter vessels from halibut fishing in Sitka Sound to allow personal use fishermen and non-guided sport fishermen greater opportunity to catch halibut in waters near Sitka.

Actions are considered reasonably foreseeable if some concrete step has been taken toward implementation, such as a Council recommendation or NMFS's publication of a proposed rule. Actions only "under consideration" have not generally been included because they may change substantially or may not be adopted, and so cannot be reasonably described, predicted, or foreseen. Identification of actions likely to impact a resource component within this action's area and time frame will allow the public and Council to make a reasoned choice among alternatives.

The following RFFAs are identified as likely to have an impact on a resource component within the action area and timeframe:

1) Regulatory amendment published in 79 FR 43679, limiting the use of hired masters to fish IFQ that was transferred after December 10, 2014.

2) Recent amendment to the GOA groundfish FMP: Allowing the use of pot gear in the GOA sablefish fishery, with expectations.

As this analytical process develops, this section will be expanded to analyze any direct and indirect potential environmental impacts of Alternative 2 in the context of these recently implemented or pending actions. This section will evaluate the potential significance of the impacts from **Alternative 2** and the RFFA listed above, cumulatively.

7 PACIFIC HALIBUT ACT CONSIDERATIONS

7.1 Northern Pacific Halibut Act

The fisheries for Pacific halibut are governed under the authority of the Northern Pacific Halibut Act of 1982 (Halibut Act, 16 U.S.C. 773-773k). For the United States, the Halibut Act gives effect to the Convention between the United States and Canada for the Preservation of the Halibut Fishery of the North Pacific Ocean and Bering Sea. The Halibut Act also provides authority to the Regional Fishery Management Councils, as described in § 773c:

(c) Regional Fishery Management Council involvement

The Regional Fishery Management Council having authority for the geographic area concerned may develop regulations governing the United States portion of Convention waters, including limited access regulations, applicable to nationals or vessels of the United States, or both, which are in addition to, and not in conflict with regulations adopted by the International Pacific Halibut Commission. Such regulations shall only be implemented with the approval of the Secretary, shall not discriminate between residents of different States, and shall be consistent with the limited entry criteria set forth in section 1853(b)(6) of this title. If it becomes necessary to allocate or assign halibut fishing privileges among various United States fishermen, such allocation shall be fair and equitable to all such fishermen, based upon the rights and obligations in existing Federal law, reasonably calculated to promote conservation, and carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of the halibut fishing privileges.

It is necessary for the Council to consider the directions in the Halibut Act about the regulations that may result from this action. Much of the direction listed in § 773c(c) is duplicative with the Magnuson-Stevens Act's National Standard 4, requiring that regulations not discriminate between residents of different States, and directing that if halibut fishing privileges are allocated or assigned among fishermen, such allocation shall be fair and equitable.

The Halibut Act also directs regulations to be consistent with the limited entry criteria set forth in the Magnuson-Stevens Act. These are criteria that the Council and the Secretary must take into account when establishing a limited access system for a Magnuson-Stevens Act fishery. The criteria are listed below.

(A) present participation in the fishery;
(B) historical fishing practices in, and dependence on, the fishery;
(C) the economics of the fishery;
(D) the capability of fishing vessels used in the fishery to engage in other fisheries;
(E) the cultural and social framework relevant to the fishery and any affected fishing communities;
(F) the fair and equitable distribution of access privileges in the fishery; and
(G) any other relevant consider actions.

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9 RERFERENCES

Alaska Department of Fish and Game (ADF&G). 2014. Letter from ADF&G to IHPC. Juneau, AK. November 07, 2014.

Call, I.L. and D.K. Lew. 2015. Tradable permit programs: What are the lessons for the new Alaska halibut catch sharing plan? Marine Policy, (52) 125-137.

Commercial Fisheries Entry Commission (CFEC). 1999. Changes under Alaska's halibut IFQ program 1995 to 1998. Juneau, Alaska. November 1999.

Criddle, K.R., M. Herrmann, S.T. Lee, C. Hamel. 2003. Participation decisions, angler welfare, and the regional economic impact of sport fishing, Marine Resource Economics. 18(2003)291–312.

Criddle, K.R. 2008. Examining the interface between commercial and sport fishing: a property rights perspective, In Evolving Approaches to Managing Marine Recreational Fisheries, edited by D. R. Leal and V. Maharaj, 123-147. Lanham, MD: Lexington Books.

Davis, S., G. Sylvia, and C. Cusack. 2013. Economic implications of a strategy to purchase Alaska halibut fishery commercial fishing sector quota shares to create a recreational guided angler sector harvest common pool. Prepared by The Research Group, LLC. Corvallis, OR for the CATCH Project, Auke Bay, Alaska.

Herrmann, M. and K. Criddle. 2006. An econometric market model for the Pacific halibut fishery. Marine Resource Economics; 21 (2), 129-158.

International Pacific Halibut Commission (IPHC). 2014. The Pacific halibut: Biology, fishery, and management, Technical Report No. 59. Seattle, WA. Available at: http://www.iphc.int/publications/techrep/tech0059.pdf

IPHC. 2015. International Pacific Halibut Commission report of assessment and research activities (RARA) for 2014. Seattle, WA. Available at: http://www.iphc.int/library/raras/394-rara2014.html

Kroetz, K., J.N. Sanchirico, and D.K. Lew. 2015. Efficiency costs of social objectives in tradable permit program. Resources for the Future Discussion Paper 14-32. Washington, D.C. March 2015.

Lew, D.K. and D.M. Larson. 2012. Economic values for saltwater sport fishing in Alaska: A stated preference analysis. North American Journal of Fisheries Management, 32:4, 745-759.

Lew, D.K. and D.M. Larson. 2015. Stated preference for size and bag limits of Alaska charter boat anglers. Marine Policy, (61) 66-76.

McDowell Group. 2005. Community Quota Entity Financial Analysis, prepared for Southeast Alaska Inter-tribal Fish and Wildlife Commission. Juneau, AK. October 28, 2005.

Meyer, S.C. 2007. Halibut discard mortality in recreational fisheries in IPHC Areas 2C and 3A. Unpublished discussion paper for the North Pacific Fishery Management Council, October 2007 meeting.

Meyer, S.C. 2014. Estimation and projection of statewide recreational halibut harvest. Alaska Department of Fish and Game, Division of Sport Fish, Regional Operational Plan ROP. SF.4A.2014.08, Homer, AK. Available at: http://www.sf.adfg.state.ak.us/FedAidPDFs/ROP.SF.4A.2014.08.pdf

Meyer, S.C. and R. Powers. 2013. Analysis of management options for the Area 2C and 3A charter halibut fisheries for 2014. A report to the North Pacific Fishery Management Council, Alaska Department of Fish and Game, Division of Sport Fish. December 6, 2013. Available at:

http://npfmc.legistar.com/gateway.aspx?M=F&ID=e1529a88-da67-4a0f-852a-ca1ef1d4d392.pdf

Meyer, S.C. and R. Powers. 2014. Analysis of management options for the Area 2C and 3A charter halibut fisheries for 2015. A report to the North Pacific Fishery Management Council, Alaska Department of Fish and Game, Division of Sport Fish. December 5, 2014. Available at: http://npfmc.legistar.com/gateway.aspx?M=F&ID=6efdf6a0-d500-40d6-98d9-9d5f1b24f943.pdf

NOAA. (National Oceanic and Atmospheric Administration). 2005. Final Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska (EFH EIS). Juneau, April.

NOAA. 2007. Environmental impact statement for the Alaska groundfish harvest specifications. National Marine Fisheries Service, Alaska Region, P.O. Box 21668, Juneau, Alaska. January 2007. Available at: http://www.alaskafisheries.noaa.gov/index/analyses/analyses.asp.

NOAA. Pacific halibut-sablefish IFQ report for fishing year 2012 ("Report to the fleet"). National Marine Fisheries Service, Restricted Access Management Division. Juneau, AK. Available at: http://alaskafisheries.noaa.gov/ram/ifq/rtf12.pdf

NOAA. 2015a. Transfer report: Changes under Alaska's halibut IFQ program, 1995 through 2014. National Marine Fisheries Service, Restricted Access Management Division. Juneau, AK. August 2015. Available at: http://alaskafisheries.noaa.gov/ram/halibut-transferfrpt2015.pdf

NOAA. 2015b. Effect of Overage/ Underage Adjustments on the 2014 IFQ Allocations. National Marine Fisheries Service, Restricted Access Management Division. Juneau, AK. September 25, 2015.

NPFMC (North Pacific Fishery Management Council). 2004. Final EA/ RIR for Amendment 66 to the Fishery Management Plan for the Gulf of Alaska Groundfish to allow eligible Gulf of Alaska communities to hold commercial halibut and sablefish quota share for lease to community residents. Anchorage, AK. March 15, 2004. Available at: http://alaskafisheries.noaa.gov/analyses/amend66/AM66_finalea.pdf

NPFMC. 2007. EA/RIR/IRFA for a regulatory amendment to set an allocation between the charter and commercial sectors and allow for a compensated reallocation program in IPHC regulatory Area 2C and 3A: Draft for Initial Review. Anchorage, AK. September 17, 2007. Available at: http://www.npfmc.org/wp-content/PDFdocuments/halibut/HalibutReallocation907.pdf

NPFMC. 2010. Review of the Community Quota Entity (CQE) Program under the halibut/ sablefish IFQ program: Final report. Anchorage, AK. March 2010. Available at: http://www.npfmc.org/wp-content/PDFdocuments/halibut/CQEreport210.pdf

NPFMC. 2013. Final EA/ RIR/ IRFA: Regulatory amendment for a Pacific halibut catch sharing plan for the charter sector and commercial setline sector in International Pacific Halibut Commission regulatory Area 2C and 3A. Anchorage, AK. November 2013.

NPFMC. 2014. Discussion Paper on the CATCH Proposal for a Recreational Quota Entity in the Commercial Halibut Program. Anchorage, AK. September 2014. Available at: http://npfmc.legistar.com/gateway.aspx?M=F&ID=ba2738da-e84f-47d7-bcb2-d409dfa8ef83.pdf

NPFMC. 2015. EA/RIR/IRFA for a proposed regulatory amendment to the fishery management plan for groundfish of the Bering Sea/ Aleutian Islands Management Area: Revise Bering Sea/ Aleutian Islands Halibut Prohibited Species Catch Limits, Public Review Draft. Anchorage, AK. May 2015.

Pautzke, C.G. and C.W. Oliver. 1997. Development of the Individual Fishing Quota Program for Sablefish and Halibut Longline Fisheries off Alaska. North Pacific Fishery Management Council. Anchorage, AK. Available at: https://alaskafisheries.noaa.gov/ram/ifq/ifqpaper.htm

Queirolo, L. E. 2011. Conducting Economic Impact Analyses for NOAA Fisheries Service. (Revised in response to Presidential Executive Order 13563). National Marine Fisheries Service. Juneau, AK. February 23, 2011.

Stewart, I.J., S.J.D. Martell, B.M. Leaman, R.A. Webster, L.L. Sadorus. 2014. Report to the North Pacific Fishery Management Council on the status of Pacific halibut in the Bering Sea and Aleutian Islands and the impacts of Prohibited Species Catch. Available: https://npfmc.legistar.com/View.ashx?M=F&ID=3093393&GUID=19570543-A2A1-41D5-B935-3D5D62387BD5

Stewart, I. J., and S.J.D. Martell. 2015. Assessment of the Pacific halibut stock at the end of 2014. IPHC Report of Assessment and Research Activities 2013. p. 161-180. Available at: http://www.iphc.int/publications/rara/2014/rara2014_11stockassessment.pdf

Szymkowiak, M. 2014. Estimating the costs of quota share trading restrictions in the Alaskan halibut IFQ program: Using linear programming. Oral presentation at IIFET. Brisbane, Australia.

Webster, R.A. 2015. Trawl tag releases of small halibut in the Bering Sea. IPHC Report of Assessment and Research Activities 2014. p. 475-510.

Wilen, J.E. and G.M. Brown. 2000. Implications of various transfer and cap policies in the halibut charter fishery. Report for the Alaska Fisheries Science Center. Seattle, WA.

Yamada, R. and S. Flumerfelt. 2014. Integrating a recreational fishery into a catch share program: Case study of Alaska's guided angler halibut sport fishery. Report prepared for the Catch Accountability Through Compensated Halibut (CATCH) project. January 2014.

10 APPENDICES

Appendix A: Discussion of Observer Coverage and Fees

At the December 2015 Council meeting, testifiers had concerns about the potential for reduced funding contributions to the observer program if QS was transferred to, and used in a sector that is not subject to observer coverage requirements and would therefore not be liable for observer coverage fees. The Council included a statement in the RQE motion requesting further evaluation of the effects of transferring commercial IFQ shares to the charter sector on observer fee revenues, IFQ administrative fees, and other related expenses. Section 4.8.1.6.2 contains a short discussion of potential cost recovery fees, this section focuses on the observer coverage and fees.

Catcher vessels participating in the commercial halibut IFQ fishery are in the partial coverage observer category.[48] In the partial coverage category, NMFS has the flexibility to assign observer coverage when and where it is needed as described in the annual deployment plan (ADP) developed in consultation with the Council. The ADP describes how NMFS plans to assign observer coverage to vessels (and processors) in order to meet scientifically based catch estimation needs while accommodating the realities of a dynamic fiscal environment. NMFS's goal is to achieve a representative sample of fishing events. The ADP for 2016 describes the 3 partial coverage deployment pools, or "strata" (NMFS 2015a):[49]

- No selection pool: The "no selection" pool is comprised of vessels that will have no probability of carrying an observer on any trips for the 2016 fishing season. These vessels are divided into two categories:
    - **Fixed-gear vessels less than 40 ft LOA** and vessels fishing with jig gear, which includes handline, jig, troll, and dinglebar troll gear.
    - Electronic Monitoring (EM) selection pool: Fixed gear vessels that have opted into the EM selection pool. For 2016, 58 fixed-gear vessels 40- 57.5 ft LOA have chosen to participate in the EM selection pool and will carry EM systems as described in the EM Pre-Implementation Plan. An additional 3 vessels >57.5 ft LOA have volunteered to carry stereo camera equipment and will also be placed in the no selection pool.

- Trawl trip-selection pool: This pool is comprised of all catcher vessels in the partial coverage category fishing trawl gear.

- **Hook-and-line trip-selection pool: This pool is comprised of vessels in the partial coverage category that are greater than or equal to 40 ft LOA that are fishing hook-and-line gear.**

- Pot trip-selection pool: This pool is comprised of vessels in the partial coverage category that are greater than or equal to 40 ft, LOA that are fishing pot gear.

Under the 2016 ADP, vessels that participate in the halibut IFQ fishery fall into the hook-and-line selection pool by definition, or the no selection pool. All vessels in the partial observer coverage category,

[48] Freezer longliners, that use A shares, fall into the full observer coverage category. Vessels and processing plants in the full coverage category pay observer providers directly for the observer on their vessel or in their plant. Therefore to the extent that an RQE could obtain A shares, any impact on the observer program would be directly linked with the decreased demand for full observer coverage. There would be no impact on partial observer coverage fee revenues or observer coverage days.

[49] Note that the sampling strata outlined in the ADP can change each year. In the 2014 ADP the partial coverage pools were: 1) no selection, 2) vessel selection, and 3) trip selection. Under the 2015 ADP the partial coverage pools were: 1) no selection, 2) small-vessel trip selection, and 3) large-vessel trip selection.

including those in the "no selection pool," pay the observer fee, thus sharing the cost burden of funding observer deployment under the partial observer coverage category.

Since the restructuring of the observer program in 2013, processors and registered buyers are required to pay an ex-vessel value-based fee to NMFS to support the funding and deployment of observers on vessels and in processing plants in the partial coverage category. The observer fee is 1.25 percent of the ex-vessel value of the groundfish and halibut subject to the fee. The intent is for owners and operators of catcher vessels delivering to shoreside processors or stationary floating processors to split the fee liability 50/50 with the processor, such that each operation pays 0.625 percent of the total ex-vessel value of the landing. Ex-vessel value used in this calculation is based on standard ex-vessel price from prior years of landings that did not occur in the full coverage category.[50] Standard ex-vessel prices for halibut IFQ or CDQ, sablefish IFQ, and sablefish accruing against the fixed gear sablefish CDQ reserve are based on the volume and value data collected on the annual IFQ Buyer Report from the previous year.[51]

Fees collected on landings made by vessels in the partial coverage observer category contribute to the overall partial observer coverage budget. Therefore the fee liability is used to place observers on all participating vessels in all sectors of the partial observer coverage category. The process of creating an ADP allows NMFS to adjust deployment in each year so that sampling can be achieved throughout groundfish and halibut fisheries, but within financial constraints. Changes in observer fee revenue or projected fishing effort in the partial observer coverage category impact the selection rates set in the ADP. The amount of observer coverage in the partial coverage category for any given year is dependent on available revenue generated from fees on groundfish and halibut landings in the prior year.[52] The budget is converted from dollars to observer days as derived from confidential information in the partial coverage contract. NMFS estimates anticipated fishing effort in the upcoming year and using the available sea-day budget as the primary input into simulation models used to generate anticipated outcomes from different selection rates.

The proposed RQE raises a two-part question with regard to observer coverage and fees:

1) **How much observer fee liability would be foregone if halibut IFQ were used in the halibut charter sector rather than the commercial halibut IFQ sector?**
2) **How would the proposed RQE change the demand for the number of observer-days in the partial coverage fleet?**

Changes in observer fee liability

The first question is analyzed in the context of the current proposal, specifically taking into account the transfer restrictions under **Alternative 2, Element 2**. If no transfer restrictions were set, it would be difficult to estimate impacts on observer fee revenues, because there would be no basis to estimate how much QS an RQE might acquire. The total observer coverage fee liability for all hook-and-line vessels landing halibut in GOA amounted to $855,533 in 2014 (NMFS 2015b).

[50] Vessels may be in full coverage for some fisheries, and in partial coverage for others.
[51] It is not possible to use the current year IFQ halibut and sablefish standard prices because Registered Buyers collect the harvester's portion of the fee liability throughout the year and the standard price for the year is not known until the end of the year.
[52] Note that since 2013, Federal dollars have also used to fund observer some coverage days (NMFS 2015b). However, these additional funds are not guaranteed and are not likely to be available from NMFS in the future. Therefore this analysis is based on fees that are available from the observer fee liability.

Considering the different types of transfer restrictions provides clear benchmarks for understanding the maximum observer fee liability that may be displaced from a non-commercial entity holding halibut QS. This analysis first applies to the range of total cumulative transfer restrictions for each regulatory area listed under **Alternative 2, Element 2, Option 3, Sub-option 1** (i.e., restricting total transfers to 5-20 percent of commercial QS units, in 2015 units, in each Area 2C and 3A). The range of proposed total cumulative caps translate into the pounds represented in Table 4-38 (Area 2C) and Table 4-39 (Area 3A).

The range of pounds represented in Table 4-38 and Table 4-39 can be multiplied by the standard ex-vessel price that is set based off the IFQ buyers report for purposes of observer program fees. The product is a measure of ex-vessel revenue displaced from the commercial fishery in the transaction. Table 10-1 and Table 10-2 apply the 1.25 percent observer fee to the range of ex-vessel revenue represented in each scenario of total transfer restrictions to illustrate the reduction in observer fee revenue associated with the maximum amount of QS being purchased by an RQE under each scenario.

In Area 2A, the values range from a reduction of about $11,000 under a 5 percent cap in 2013, up to a reduction of about $56,500 of observer fee liability in 2015 under a 20 percent cap. In Area 3A, a 5 percent cap would have amounted to about a $22,000 reduction in observer fee revenue in 2014, ranging up to $166,000 reduction in observer fee revenue in 2013 using a 20 percent cap. Note that the table only extends back to 2013 because these standard ex-vessel values have only been used since the restructuring of the observer program implemented in 2013.

Table 10-1 and Table 10-2 go a step further to estimate the number of observer days that would not have been funded in each year. The tables use an average cost per day of $1,067, for observers in partial coverage category as listed in most recent annual report (NMFS 2015b). If RQE transfers were restricted to Area 2C, this reduction ranges from 10 to 53 observer days (Table 10-1). If RQE transfers were restricted to Area 3A, the number of observer days that would not have been funded ranges from 21 to 156 (Table 10-2).

Alternative 2, Element 2, Option 3, Sub-option 2 (restricting total RQE transfers to 5-20 percent of *each class of QS units*) could ultimately reach the same place in terms of reduced observer fees revenue and budget for observer days, because maxing out on these restrictions would effectively be the same total amount of IFQ pounds transfers as **Alternative 2, Element 2, Option 3, Sub-option 1**. Therefore an additional table is not provided for transfer restrictions by vessel class.

Table 10-1 Reduction in observer fee revenue under Alternative 2, Element 2, Option 3, Su-option 1 with RQE transfers in Area 2C

Cumulative Cap (Percent)	Maximum QS units Allowed	Foregone observer fee liability			Converted into observer days		
		2013	2014	2015	2013	2014	2015
5	2,973,870	$11,137	$10,458	$14,122	10	10	13
6	3,568,644	$13,395	$12,537	$16,962	13	12	16
7	4,163,418	$15,652	$14,616	$19,802	15	14	19
8	4,758,192	$17,834	$16,695	$22,565	17	16	21
9	5,352,966	$20,092	$18,774	$25,404	19	18	24
10	5,947,740	$22,349	$20,916	$28,244	21	20	26
11	6,542,514	$24,532	$22,995	$31,084	23	22	29
12	7,137,288	$26,789	$25,074	$33,847	25	23	32
13	7,732,061	$29,047	$27,153	$36,687	27	25	34
14	8,326,835	$31,229	$29,232	$39,526	29	27	37
15	8,921,609	$33,486	$31,311	$42,366	31	29	40
16	9,516,383	$35,744	$33,390	$45,206	33	31	42
17	10,111,157	$37,926	$35,532	$47,969	36	33	45
18	10,705,931	$40,184	$37,611	$50,809	38	35	48
19	11,300,705	$42,441	$39,690	$53,648	40	37	50
20	11,895,479	$44,623	$41,769	$56,488	42	39	53
Southeast Alaska IFQ buyers price per pound:		$6.02	$5.04	$6.14	Average cost per observer day:		$1,067

Source: Observer fee standard ex-vessel prices based on 2012, 2013, and 2014 IFQ Buyers Reports,

Table 10-2 Reduction in observer fee revenue under Alternative 2, Element 2, Option 3, Su-option 1 with RQE transfers in Area 3A

Cumulative Cap (Percent)	Maximum QS units Allowed	Foregone observer fee liability			Converted into observer days		
		2013	2014	2015	2013	2014	2015
5	9,244,650	$41,538	$22,176	$29,856	39	21	28
6	11,093,580	$49,816	$26,586	$35,842	47	25	34
7	12,942,511	$58,093	$31,059	$41,829	54	29	39
8	14,791,441	$66,446	$35,469	$47,815	62	33	45
9	16,640,371	$74,723	$39,879	$53,802	70	37	50
10	18,489,301	$83,001	$44,352	$59,788	78	42	56
11	20,338,231	$91,278	$48,762	$65,775	86	46	62
12	22,187,161	$99,631	$53,235	$71,761	93	50	67
13	24,036,091	$107,909	$57,645	$77,748	101	54	73
14	25,885,021	$116,186	$62,055	$83,734	109	58	78
15	27,733,951	$124,539	$66,528	$89,644	117	62	84
16	29,582,881	$132,816	$70,938	$95,631	124	66	90
17	31,431,811	$141,094	$75,348	$101,617	132	71	95
18	33,280,741	$149,447	$79,821	$107,604	140	75	101
19	35,129,672	$157,724	$84,231	$113,590	148	79	106
20	36,978,602	$166,002	$88,704	$119,577	156	83	112
GOA except SEAK IFQ buyers price per pound		$6.02	$5.04	$6.14	Average cost per observer day:		$1,067

Source: Observer fee standard ex-vessel prices based on 2012, 2013, and 2014 IFQ Buyers Reports.
Table notes: Standard prices for Area 3A are made of three port groupings: Central GOA, Western GOA and Eastern GOA except SEAK (Southeast Alaska). For these three years the standard prices happened to be the same for all sub-areas, therefore this price was applied to the region.

Table 10-3 and Table 10-4 use the same technique as the previous tables to identify the reduction in observer fee revenue translated to observer days under **Alternative 2, Element 2, Option 4, Sub-options 1 and 2** (restrict purchase of D class QS and restrict purchase of certain blocked QS, respectively). Since both of these sub-options mean there is less QS units available for transfer (i.e. the cumulative cap is applied to the QS pool without the units associated with D class or blocked units being included in the calculation), they naturally correspond to smaller reductions in observer fee revenues and a greater budget for observer days.

Table 10-3 Reduction of observer fee revenues and observer days under Alternative 2, Element 2, Option 4 if RQE transfers were limited to Area 2C.

Cumulative Cap (Percent)	Maximum QS units Allowed	Foregone observer fee liability				Converted into observer days			
			No D-Class	No 1,500 Blocks	No 2,000 Blocks	No Restrictions	No D-Class	No 1,500 Blocks	No 2,000 Blocks
5	2,564,940	$14,122	$11,973	$12,203	$10,822	13	11	11	10
6	3,077,928	$16,962	$14,429	$14,583	$12,971	16	14	14	12
7	3,590,916	$19,802	$16,808	$17,039	$15,120	19	16	16	14
8	4,103,904	$22,565	$19,188	$19,495	$17,346	21	18	18	16
9	4,616,892	$25,404	$21,644	$21,951	$19,495	24	20	21	18
10	5,129,880	$28,244	$24,023	$24,330	$21,644	26	23	23	20
11	5,642,868	$31,084	$26,402	$26,786	$23,793	29	25	25	22
12	6,155,856	$33,847	$28,781	$29,242	$25,942	32	27	27	24
13	6,668,845	$36,687	$31,237	$31,698	$28,091	34	29	30	26
14	7,181,833	$39,526	$33,617	$34,077	$30,316	37	32	32	28
15	7,694,821	$42,366	$35,996	$36,533	$32,465	40	34	34	30
16	8,207,809	$45,206	$38,452	$38,989	$34,614	42	36	37	32
17	8,720,797	$47,969	$40,831	$41,368	$36,763	45	38	39	34
18	9,233,785	$50,809	$43,210	$43,824	$38,912	48	40	41	36
19	9,746,773	$53,648	$45,590	$46,280	$41,138	50	43	43	39
20	10,259,761	$56,488	$48,046	$48,736	$43,287	53	45	46	41
		Southeast Alaska IFQ buyers price per pound:			$6.14	Average cost per observer day:			$1,067

Source: Observer fee standard ex-vessel prices based on 2012, 2013, and 2014 IFQ Buyers Reports.

Table 10-4 Reduction of observer fee revenues and observer days under Alternative 2, Element 2, Option 4 if RQE transfers were limited to Area 3A

Cumulative Cap (Percent)	Maximum QS units Allowed	Foregone observer fee liability				Converted into observer days			
		No Restrictions	No D-Class	No 1,500 Blocks	No 2,000 Blocks	No Restrictions	No D-Class	No 1,500 Blocks	No 2,000 Blocks
5	8,576,868	$29,856	$27,860	$27,707	$25,942	28	26	26	24
6	10,292,242	$35,842	$33,386	$33,310	$31,161	34	31	31	29
7	12,007,616	$41,829	$38,989	$38,836	$36,303	39	37	36	34
8	13,722,990	$47,815	$44,515	$44,362	$41,522	45	42	42	39
9	15,438,363	$53,802	$50,118	$49,888	$46,741	50	47	47	44
10	17,153,737	$59,788	$55,721	$55,490	$51,883	56	52	52	49
11	18,869,111	$65,775	$61,247	$61,016	$57,102	62	57	57	54
12	20,584,484	$71,761	$66,849	$66,542	$62,321	67	63	62	58
13	22,299,858	$77,748	$72,375	$72,145	$67,463	73	68	68	63
14	24,015,232	$83,734	$77,978	$77,671	$72,682	78	73	73	68
15	25,730,605	$89,644	$83,504	$83,197	$77,901	84	78	78	73
16	27,445,979	$95,631	$89,107	$88,723	$83,044	90	84	83	78
17	29,161,353	$101,617	$94,710	$94,326	$88,263	95	89	88	83
18	30,876,726	$107,604	$100,236	$99,852	$93,405	101	94	94	88
19	32,592,100	$113,590	$105,838	$105,378	$98,624	106	99	99	92
20	34,307,474	$119,577	$111,364	$110,904	$103,843	112	104	104	97
		GOA except SEAK IFQ buyers price per pound:			$6.14	Average cost per observer day:			$1,067

Source: Observer fee standard ex-vessel prices based on 2012, 2013, and 2014 IFQ Buyers Reports.

Not currently depicted in this analysis, are the effects that an annual transfer cap may have in slowing the impacts to observer fee revenues. This could be done in a very similar fashion to what is depicted for total transfer caps. However, concerns about the impacts to the observer fee revenue represent a longer-term issue; therefore, effort was focused around the types of cumulative caps under consideration.

Changes in the demand for observer-days in the partial coverage fleet

Halibut QS held by an RQE and used in the charter sector could also result in a reduction in the number of commercial fishing days and therefore lower the demand for observer days. Compared to estimating the amount of displaced observer fee liability, this calculation is not straightforward. The challenge is in understanding who would transfer QS and how it would affect current commercial fishing operations. Less QS available for commercial operations could impact whether a vessel takes any trips in a season, it could reduce the number of trips they take, shorten the duration of a trip, or there could be a scenario where it does not impact operations at all. If there are fewer vessels fishing the remaining QS or vessels take shorter duration trips, this could result in fewer observer days used to monitor this sector. The expectation is that there would be variability in how QS transfers would impact specific operations.

The greatest impact to the observer program budget would be if an RQE obtained only halibut QS that was traditionally used on vessels less than 40ft LOA. Recall that these vessels fall into the "no selection pool". Therefore, their observer fees are included in the budget to fund at-sea observer days, but these vessels do not use any observer days. If these vessels were to scale back their operations or not take any trips in a year, there would be no reduced demand in observer coverage to offset the reduced revenue from observer fees. Since observer fee revenue is used to deploy observers on all sectors in the partial coverage category, a reduction in fees from the less than 40ft LOA sector could impact the overall selection rates set for all sectors in the ADP.

However it is expected that an RQE would attempt to acquire QS from several vessel classes, based on market availability, which would include QS that is traditionally harvested on vessels greater than or equal to 40ft LOA. Particularly if the Council adopted either of the sub-options under **Alternative 2, Element 2, Option 4** (restrictions on purchasing D class QS and/ or restrictions on purchasing blocked QS) the RQE's effort in the market for QS would be directed towards those QS more traditionally harvested on vessels greater than 35ft LOA, and likely in the trip selection pool (vessels greater than or equal to 40ft LOA).

Given the uncertainly of where the QS would come from, the following exercises use some assumptions to consider scenarios that might result in the lowest negative impact (even a positive impact) to the observer program.

As one example, imagine Area 2C RQE had a 10 percent cumulative transfer cap and a prohibition on D class QS: [53]

- This would result in a maximum of 313,000 pounds of halibut IFQ it could hold in 2015 (as established in Table 4-38).
- Assume that all (because this is a low impact scenario) of this market pressure went to acquiring QS that had been previously fished on vessel greater than 40 ft LOA; QS that was used on vessels in the hook-and-line trip selection strata under the 2016 ADP (NMFS 2015a).
- Based on eLandings, sourced through AKFIN, the median halibut IFQ landing of vessels greater than or equal to 40 ft LOA was about 5,000 pounds (in 2014).[54]
- If each trip landed the median amount of pounds, dividing the potential 313,000 pounds of 2C RQE holdings by 5,000 pounds per trip, results in a potential reduction of 62.6 halibut IFQ trips.
- According the ADP for 2016 there is a 15 percent selection probably for hook-and-line vessel in the hook-and-line trip selection pool (NMFS 2015a).
- Therefore an estimated 9.4 of these 62.6 trips would have been selected for coverage.
- The average trip duration is between 3 to 5 days based on the 2014 Annual Report (NMFS 2015b) resulting in a range between 28 and 47 of the number of observer sea-days that are no longer needed.[55]
- This can be compared to the 23 observer sea-days that are no longer afforded due to the reduced observer fee liability (Table 10-3).

Using the same method for Area 3A, imagine the Council set a 10 percent cumulative transfer cap for Area 3A and a prohibition on D class QS:[56]

- This would result in a maximum of 726,000 pounds of halibut IFQ it could hold in 2015 (refer to Table 4-39).

[53] This example of transfer restrictions was chosen for ease of calculation. A similar exercise could be done with any of the transfer restrictions.

[54] One of the caveats of this example analysis is that hook-and-line vessels fishing halibut IFQ have significantly different levels of capacity. Halibut landings from 2014 demonstrate a much higher mean that median indicating that there are many smaller deliveries below the average landing size, with several larger deliveries pulling the average much higher than the median. Deliveries range from 20 pounds to more than 70,000 pounds. In this example, capacity is just represented as a single number (median). While capacity could be split out by different categories based on vessel size, this would require more assumptions about where the RQE QS holdings had been historically fished.

[55] It should be noted that these examples are simplified. In reality, the unused observer days and the reduction in fee revenue do not impact the same year. The reduced budget would impact the observer fees that are available for the next year.

[56] This example of transfer restrictions was chosen for ease of calculation. A similar exercise could be done with any of the transfer restrictions.

- The 726,000 pounds of holdings divided by the median halibut IFQ landing of vessels greater than 40ft LOA (5,000 pounds in 2014), could amount to about 145 trips.
- With a 15 percent selection probability for hook-and-line vessels in the trip selection pool (NMFS 2015a), an estimated 21.8 of these 145 trips would be selected for coverage.
- This number of trips can be multiplied by the same 3 to 5 days for trip duration (NMFS 2015b) resulting in a range of about 65 to 109 observer sea-days that are no longer needed.
- Again, this can be compared to the 52 observer days that are no longer afforded due to the reduced observer fee liability (Table 4).

These examples leave the unsatisfying conclusion that the impacts are difficult to quantify and will depend on who sells QS to an RQE, and how it affects current commercial operations. On one hand, the proposed action could result in an overall decrease in the observer fee revenue and budget for observer coverage, which would have spillover effects into the coverage rates that can be afforded in other fisheries. On the other end of the spectrum the action could provide a net benefit by removing more demand for observer sea-days than observer fee revenue.

References

National Marine Fisheries Service [NMFS]. 2014. 2015 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. National Oceanic and Atmospheric Administration, Juneau, Alaska.

NMFS. 2015a. 2016 Annual Deployment Plan for Observers in the Groundfish and Halibut Fisheries off Alaska. National Oceanic and Atmospheric Administration, Juneau, Alaska.

NMFS. 2015b. North Pacific Groundfish and Halibut Observer Program 2014 Annual Report. National Oceanic and Atmospheric Administration, Juneau, Alaska.

Appendix B: Cumulative GAF and RQE Transfer Limits

The December 2015 Council RQE motion requested that further analysis evaluate the mechanics of creating RQE transfer limits that are additive to the current GAF transfer restrictions. Specifically the motion stated:

> *Staff should also evaluate the mechanics of a concept by which the Guided Angler Fish (GAF) limit is reduced in accordance with RQE quota holdings to meet a cumulative limit. [For example, under status quo, commercial QS holders in Area 2C can lease up to 10% of their IFQ as GAF. If the cumulative limit for RQE purchases of commercial quota was 15% of the Area 2C catcher vessel QS pool, then if by October 1 the RQE holds up to 5% of the Area 2C catcher vessel QS pool, the GAF limit remains at 10% for the upcoming year. If by October 1 the RQE holds 6% of the Area 2C catcher vessel QS pool, the GAF limit is reduced to 9% for the upcoming year. Any example could be used within the range of the cumulative limits under Element 2, Option 3.]*

Therefore this section begins to evaluate the regulatory and practical implications of connecting the transfer limits of the GAF program with any potential RQE transfer restrictions as a cumulative transfer limit.

Section 4.4.1.2.4 describes the GAF program. As alluded to in the Council motion, current regulations for the GAF program have several restrictions on use (listed at 50 CFR 300.65(c)(5)(iv)(H)). These include:

- No more than 400 GAF may be assigned to a GAF permit in a year that is assigned to a CHP or community CHP[57] endorsed for six or fewer anglers

- No more than 600 GAF may be assigned to a GAF permit in a year that is assigned to a CHP endorsed for more than six charter vessel anglers in a year

- In Area 2C, a maximum of 1,500 pounds or ten percent, whichever is greater, of the start year fishable IFQ pounds for an IFQ permit, may be transferred from IFQ to GAF

- In Area 3A, a maximum of 1,500 pounds or fifteen percent, whichever is greater, of the start year fishable IFQ pounds for an IFQ permit, may be transferred from IFQ to GAF

In other words, there are use restrictions for how many GAF a CHP holder can have access to in a year and there are restrictions on how much a halibut QS holder can lease in a year. It also means that, theoretically, if every halibut QS holder leased up to the maximum for their regulatory area, ten and fifteen percent of the halibut QS would be available for use in charter fisheries in Area 2C and Area 3A (respectively).
The program has been in place for two full seasons (2014 and 2015) and has been far from the maximum transfer caps in both regulatory areas thus far (Table 10-5). The average number of GAF transferred per GAF permit was low in 2014, and was further reduced in 2015 when then IFQ to GAF conversion factor increased (refer to Table 4-3). In 2014 and 2015, about one percent of the total Area 2C IFQ allocation was transferred as GAF. In Area 3A, less than a quarter of a percent of the total Area 3A IFQ allocation was transferred as GAF during the first two seasons of the program.

[57] There are additional regulations specifying how use restrictions apply to CQEs. For instance, if a CQE transfers IFQ as GAF to a GAF permit that is assigned to a community CHP or another CHP held by a CQE, the use restrictions do not apply. For more details, refer to 50 CFR 300.65(c)(5)(iv)(H).

Table 10-5 GAF transfers in 2014 and 2015

Area	Year	Average GAF transferred per GAF permits issued	IFQ pounds transferred	Total IFQ allocation	Percent of area IFQ transferred
2C	2014	12	29,498	3,318,720	0.89%
	2015	5	36,934	3,679,000	1.00%
3A	2014	48	11,654	7,317,730	0.16%
	2015	11	10,337	7,790,000	0.13%

Source: NMFS GAF Program 2015 Annual Report and NMFS RAM.

The Council has not currently proposed to revoke the GAF program if the RQE program were to be implemented. A Council discussion paper in October 2014, suggested the merits of retaining the program even in the event of RQE program development (NPFMC 2014). Despite the low rate of participation displayed in Table 10-5, there are a number of reasons why the program has not been proposed to be revoked. If the Secretary of Commerce approves an RQE as an eligible entity to hold commercial halibut QS there are several more steps interested stakeholders would need to achieve in order to establish such an entity (e.g. establish a source of funding). There is no basis to know if and when an RQE would be a functioning non-profit group. In the meantime, some charter stakeholders may still be interested in the opportunity of the GAF program.

Additionally, the objective and product of the GAF program and a potential RQE are different. The GAF program provides individual charter operators the chance to provide their clients, or certain clients, the opportunity to retain a halibut they would not have had under the existing management regime. Participation in this program is voluntary and determined at the individual-level. Considering the cost of the additional fish, this generally means the charter angler using GAF places a very high value on this additional opportunity. For example, in the case of Area 2C, GAF may be used when an angler highly values keeping a second fish. Charter operators have also testified that GAF is sometimes used when an angler catches a trophy halibut that they would not otherwise be able to keep.

The proposed RQE would be seeking to purchase halibut QS on behalf of all charter anglers as a whole by allowing for the adjustment of annual management measures. This could mean inches on a fish, or a change in the daily bag or annual limit. While this might be an objective that charter stakeholders are interested in pursuing, it does not necessarily have the same effect as the GAF program. Some charter stakeholders may rely on the nature of the GAF opportunity for their operations, and this type of opportunity might not be available under just an RQE.

However, other stakeholders have requested the consideration of cumulative transfer limit for these programs stating that these programs have similar consequences at the commercial sector level, i.e. halibut IFQ is not being used in the commercial fishery. These stakeholders provided testimony at the December 2015 meeting that transfer caps made for the RQE should be additive to those limits currently in place for the GAF program in order to account for the cumulative impacts of IFQ that is not being harvested in the commercial sector.

Regulations, Implementation, and Enforcement

If total transfer restrictions were additive between GAF and RQE, establishing a cumulative transfer limit for halibut available for use in the charter sector, several Federal regulations around the GAF program would need to be amended (in addition to the regulations created for establishing an RQE).

Primarily, regulations would need to establish a formula for how a cumulative transfer limit would apply. There are several inconsistencies between the current regulations for GAF and the proposed transfer restrictions for an RQE that create complexities in the implementation of a cumulative transfer limit.
Thus far, the proposed RQE transfer restrictions examined in this analysis have been applied **as a percentage of the 2015 QS pool**. In other words, the analysis has considered a proportion of the QS pool for a specific year (which provides a set number of units) that could be transferred, rather than a proportion of the QS pool (allowing the units to change if the QS pool changes).

This small distinction can make a difference. The QS pool does not change very often or very much, but it has changed over time. Specifically, the QS pool can change if QS is revoked or added. For example, say 10,000 units of QS were revoked. This would make all other QS holders units more valuable; they would be worth slightly more pounds of IFQ the next year. Therefore, RAM would not necessarily know that 5% of the QS pool one year would be the same as 5% of the QS pool the next year, if they were approving a transfer. Establishing a transfer cap for the acquisition of QS by using a proportion of the QS pool for a specific year (using a set number of QS units), means that if QS is removed from the pool, it would not bump a QS holder into a position where they are suddenly over the cap. If caps are established as a percentage of the pool, theoretically, that could happen. Thus, regulations that apply to the underlying holdings of QS, are often based on a proportion of the QS pool for a specific year rather than a general a proportion of the QS pool.[58]

In contrast, transfer restrictions that are applied seasonally are often established as a percentage of the available IFQ for that year. For example, vessel IFQ caps limit the amount of pounds an individual vessel can harvest in a given season. This type of cap is more appropriate for decisions an IFQ user would make on an annual basis, once the QS:IFQ ratio is established. Since GAF transfers are seasonal leasing arrangements, the current regulations are applied **as a percentage of an individual's fishable IFQ**. At the point leasing takes place or harvesting occurs, the QS:IFQ ratio for the year is known. Establishing caps by pounds (rather than a set number of units) is more relatable to the participants, which helps with annual planning, and seems appropriate if there is no difference in the effect.

A percentage of an individual's fishable IFQ should be equivalent to the corresponding percentage of the QS pool in that year; i.e., *in a given year*, six percent of the IFQ for an area is the same as six percent of the QS pool in an area. However, as mentioned, the QS pool can change overtime. Given the proposed timeline for an RQE this could create problems for approving RQE transfers. **Alternative 2, Element 3** states, "…*Use October 1 each year as the basis to estimate IFQ pounds to add to the estimated guided recreational allocation under the catch sharing plan for the upcoming year. This amount must be maintained for the following fishing year*…".

The RQE's holdings would be established by October 1 for the subsequent fishing season. This is necessary because at this point in time ADF&G begins to analyze options for charter management measures for the subsequent year. Under this proposal, ADF&G will estimate the charter sector allocation for each areas under the catch sharing plan based on the catch limits that result from the stock assessment and the application of the IPHC's harvest policy. ADF&G will need to add the approximate IFQ equivalent of any RQE holdings to the catch sharing plan allocation to determine the total allocation to the charter sector in each area. However, the catch limits and corresponding QS:IFQ ratio for the following season have not yet been determined by the IPHC by October 1. The amount of pounds that any

[58] For example, the halibut QS use caps in the IFQ program apply a limit to the underlying holdings of QS by an individual. They are established as a percentage of the 1996 QS pool. For Area 2C, the QS use cap is 1% of the 1996 QS pool and for Area 2C, 3A, and 3B the QS use cap is 0.5% of the 1996 QS pool. For more detail about this example, refer to: https://alaskafisheries.noaa.gov/sites/default/files/reports/limits-on-quotashares0113.pdf

RQE QS holdings would represent would be undetermined as this point in time. Therefore applying a cumulative transfer limit in terms of fishable IFQ would be problematic when being compared against an entity that could potentially hold QS in perpetuity.

In sum, creating a cumulative transfer limit that encompasses both a restriction on leasing in the GAF program as well as restrictions on the holdings of an RQE creates an additional complexity by applying a mismatched unit of measure in regulations. The ultimate effect is straightforward (limiting the total amount of halibut that can be transferred from the commercial sector to be used in the charter sector), but the regulatory formula that implements such a restriction could be convoluted.

The second inconsistency between the current GAF regulations and the transfer restrictions that have been proposed for the RQE, is that the GAF transfer restrictions are currently set at the individual level, rather than the regulatory area level. An individual in Area 2C cannot transfer more than 10 percent of their annual IFQ (or 1500 pounds, whichever is greater) as leased GAF, and individual in Area 3A cannot transfer more than 15 percent of their annual IFQ (or 1500 pounds, whichever is greater) as leased GAF in a year. Therefore the Council would need to determine whether the cumulative transfer limits would be *in addition* to the individual IFQ transfer limits of the GAF program or if they would *replace* these transfer restrictions.[59]

Therefore there are two ways in which a cumulative transfer limit between GAF and RQE could be implemented:

RAM would approve RQE transfers up until the cumulative transfer limit (also considering any annual transfer limits that may have been set). NMFS would be able to identify the cumulative transfer opportunity that remains for the GAF program during that fishing season. In practice, RQE holdings would preempt GAF leasing because they would be carried over year-to-year, whereas GAF transfers must be re-established on an annual basis, after the fishing season begins.

1) The remaining opportunity for transfer for the GAF program under the cumulative limit would apply as a percent of the **total IFQ available for harvest in a regulatory area** and **be in addition to** individual halibut IFQ transfer caps currently in place (at §300.65(c)(5)(iv)(H)).
    - For example, if the Area 2C cumulative limit for GAF and RQE holdings was 10 percent of the combined Area 2C halibut 2015 QS pool, and the RQE had acquired 6 percent of the QS pool by October 1 of 2020, then in 2021, the GAF transfers would be restricted to leasing the IFQ that results from 4 percent of the total Area 2C halibut QS pool.[60] This would function as a "first-come-first-serve" opportunity, since this additional restriction would not allow for a circumstance where all IFQ holders could lease 10 percent of their annual IFQ. Transfer applications that were submitted after the cumulative limit was reached would not be approved by RAM.
    - The likelihood of the cumulative limit acting as a real constraint on GAF use depends on the ability of an RQE to acquire QS. Given the current use the GAF program, this would not

[59] A third option would be a cumulative transfer restriction at the individual level. However, RQE transfer restrictions would not be practical at the individual level. In effect, if regulations attempted to limit QS holders to only selling x percent of their QS holding to an RQE, there would be nothing to stop that individual from selling x percent again in a different transaction under their adjusted QS holdings.

[60] This example could be applied to any combination of cumulative transfer caps under Alternative 2, Element 2, Options 2 through 4.

produce negative effects on GAF users unless an RQE acquires a substantial proportion of the available QS.

- With the expectation that an RQE would require additional time after the Council and regulatory process in order to develop, all harvest opportunity under the cumulative limit would be available to the GAF program participants during this time.
- Any annual QS transfer restrictions for the RQE would slow the rate of acquisition, and allow more time for the GAF program to have more access to transfer opportunities.
- If an RQE is able to obtain funding and identify and purchase QS, this would restrict the GAF as demonstrated in the example.
- If an RQE is never able to develop a funding mechanism, all harvest opportunity under the cumulative limit would be available for GAF users.
- If the natural abundance of halibut, or the charter allocation plus RQE holdings were able to bring halibut charter management measures equal to those of the non-guided sector, there would be no use for GAF, regardless of the harvest opportunity still available under the cumulative transfer limits.

2) The remaining opportunity for transfer under the cumulative transfer limits would apply as a percent of the **total IFQ for each regulatory area** and **replace** the individual halibut IFQ transfer caps currently in place (at §300.65(c)(5)(iv)(H)).

    - Implementation would be consistent with previously described example.
    - The implications of this distinction could be important. The current GAF regulations prevent a person with 150 days at sea from purchasing halibut QS with the sole intention of leasing it all as GAF (either to themselves or others). When aggregated to the regulatory area level, the current rates of GAF usage are nowhere near the transfer restrictions. However, some individuals may have reached their limits. As mentioned earlier, theoretically, if every halibut QS holder leased up to the maximum allowable as GAF, the regulatory areas could reach the same percent as the individual transfer restrictions. Practically speaking, that is very unlikely to happen.

Assuming the IFQ transfer database is able to be modified as needed, enforcement of this program would be straight-forward. If a requested GAF transfer went over the cumulative IFQ transfer limit, RAM would not approve this transfer. Although straight-forward, this additional uncertainty may cause additional concern from charter operators using the GAF program as transfer application already can take up to ten days to process. There would be additional uncertainty for purpose of planning out their fishing season associated with the RQE holdings.

There is no other aspect of the IFQ Program that establishes a sliding restriction as currently proposed under the cumulative transfer limits. It is possible that NMFS would need to make annual programming changes to the already complex IFQ transfer system. At a minimum, RAM would need to make fairly significant one-time programming changes. The process could be complex and NMFS might need to annually post the calculations of the GAF limits based the RQE holdings as of October 1 of the previous year. These components all add management costs, which would be recoverable under the cost recovery program.

References

North Pacific Fisheries Management Council [NPFMC]. 2014. Discussion paper on the CATCH proposal for a recreational quota entity in the commercial halibut IFQ Program. (September 2014). Anchorage, AK.