

Age distribution of the commercial halibut catch for 2011

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Abstract

The age distribution of halibut sampled from the 2011 commercial catch is summarized. Fish from five to 51 years old were captured, with 12-year-olds comprising the largest age group in the overall catch. Average age for all areas combined was slightly lower than in 2010.

Age distribution

The 1999 year class (12-year-olds) accounted for the largest proportion (in numbers) of the sampled commercial catch (17%) for all areas combined in 2011 (Table 1). The next most abundant year classes for all areas combined were 2000 and 1998, accounting for 15% and 12% of the sampled catch, respectively. Twelve-year-olds were the most abundant age class in Regulatory Areas 2B, 2C, 3, 4A, 4B, and 4D, and the second most abundant in Areas 2A and 4C. In Areas 2A and 4C, 11-year-olds made up the most abundant age class.

The average values for age, length, and estimated weight by regulatory area for 2011 are presented in Table 2. Average size (measured fork length) of sampled halibut increased in Areas 2C, 4A, and 4B in 2011, but decreased in all other areas. Average fork length for all areas combined decreased by 1.8 cm in 2011.

Average age of fish sampled from Areas 2, 3B, and 4A increased in 2011 relative to 2010, while average ages from all other areas decreased (Table 3). The average age from all areas combined in 2011 was 0.3 years lower than in 2010.

The youngest and oldest halibut in the 2011 commercial, or *market*, samples were determined to be five and 51 years old, respectively. There were two fish determined to be five years old: one from Area 2B, measuring 91 cm, and one from Area 2C that was 86 cm long. The 51-year-old was captured in Area 4A, and had a fork length of 167 cm. The largest halibut in the 2011 commercial samples was a 204-cm fish from Area 4A, which was determined to be 25 years old. The smallest halibut in the 2011 commercial catch samples was a 68-cm fish from Area 2A aged at 10 years old. Length frequencies by regulatory area for halibut sampled in the 2011 commercial catch are presented in Table 4.

Table 5 contains percent agreement values for quality control (QC) readings. All QC readings from 2002 through 2011 were conducted on burned or baked otolith sections. QC readings for years prior to 2002 were either surface ages or burned/baked section ages. Ten percent of each year's market samples are read twice for QC. At the time of writing, QC readings for the 2011 commercial samples were not complete, but the current year QC results that were available at the time were included in Table 5. The remainder of the QC readings of 2011 market samples will be performed over the winter of 2011-12.

The commercial otolith collection target is 1,000 for Area 2A and 1,500 (± 500) per regulatory area for each of Areas 2B, 2C, 3A, 3B, 4A, and 4B, and Areas 4C/4D combined. Otolith targets were met or exceeded in all areas except Area 4B in 2011.

In 2011, port samplers reported collecting over 11,860 market sample otoliths for stock assessment; however, only 11,215 otoliths had been aged at the time of writing this document.

Several hundred otoliths had not yet been processed or aged, and some of the difference in totals was due to discards of crystallized, right-side, or broken otoliths by age room staff. An additional 197 otolith pairs were collected by port samplers for the clean otolith archive collection; these otoliths were not aged but were dried and stored for future studies (Wischniowski and Forsberg 2012).

Reference

Wischniowski, S. and Forsberg, J. E. 2012. Clean otolith archive collection. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2011: 453-458.

Table 1. Age distribution of commercial catch of Pacific halibut by regulatory area, 2011.

Age (years)	Regulatory Area									Total
	2A	2B	2C	3A	3B	4A	4B	4C	4D	
5		1	1							2
6			1				1			2
7	6	13	1	3	8	2	2	1	2	38
8	41	46	22	20	29	13	13	8	12	204
9	156	146	71	61	132	54	35	36	40	731
10	283	236	137	115	156	84	87	91	78	1,267
11	325	248	166	233	223	161	78	121	136	1,691
12	303	264	187	348	250	235	90	105	156	1,938
13	174	172	163	253	158	152	79	82	128	1,361
14	119	111	103	213	71	102	49	41	62	871
15	60	58	87	166	64	67	61	25	38	626
16	25	32	57	166	56	39	46	14	36	471
17	11	26	38	99	34	39	34	8	27	316
18	12	12	15	74	28	28	49	5	33	256
19	7	7	7	56	13	26	29	4	19	168
20	4	3	8	68	19	36	20	2	25	185
21	4	5	10	65	14	48	9	6	12	173
22	2	5	3	53	20	44	12	4	14	157
23	3	4	4	55	9	55	29	10	19	188
24	1	3	5	34	16	64	27	7	26	183
25	2	2	5	29	7	32	21	1	15	114
≥26	2	5	3	63	7	60	70	14	49	273
Total	1,540	1,399	1,094	2,174	1,314	1,341	841	585	927	11,215

Table 2. 2011 commercial samples: average length, age, weight by regulatory area, and otoliths collected and aged.

Regulatory Area	Average age (years)	Average length (cm)	Average weight (lbs)¹	Otoliths collected²	Otoliths aged³
2A	11.7	93.2	17.7	1,856	1,540
2B	11.9	97.7	21.4	1,428	1,399
2C	12.8	106.3	28.5	1,163	1,094
3A	15.0	95.7	19.4	2,234	2,174
3B	12.8	94.9	18.9	1,397	1,314
4A	15.6	103.4	26.0	1,373	1,341
4B	16.0	109.0	31.1	858	841
4C	12.9	100.4	23.3	610	585
4D	14.7	99.3	22.1	946	927
All Areas	13.7	99.0	22.3	11,865	11,215

¹Weights calculated from measured fork lengths entered through November 30, 2011

²From market sample data entered through November 30, 2011.

³Numbers of otoliths aged by November 29, 2011

Table 3. Mean age (in years) and estimated mean weight¹ (in pounds) of sampled commercially-caught Pacific halibut by regulatory area, 2002-2011.

Reg. Area		Year									
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
2A	Age	13.3	12.1	11.2	11.9	13.4	12.3	12.1	11.5	11.4	11.7
	Weight	23.6	20.0	19.9	20.9	19.2	19.6	17.7	19.1	18.3	17.7
2B	Age	13.0	12.3	11.7	12.0	11.8	11.8	12.2	11.7	11.6	11.9
	Weight	23.5	22.4	21.2	21.0	20.5	20.9	21.2	21.4	22.5	21.4
2C	Age	13.6	13.6	13.1	12.4	12.4	12.7	13.1	12.9	12.2	12.8
	Weight	34.4	33.0	30.9	29.3	28.6	28.1	28.9	29.6	27.3	28.5
3A	Age	15.8	15.3	15.9	15.6	15.5	16.0	15.9	15.1	15.2	15.0
	Weight	26.5	26.6	26.4	25.2	25.0	22.8	22.9	22.1	20.9	19.4
3B	Age	15.2	14.6	15.0	14.4	14.3	13.8	14.0	12.8	12.7	12.8
	Weight	24.8	23.7	22.9	23.8	21.9	22.7	20.3	20.6	19.7	18.9
4A	Age	14.5	15.1	14.3	13.3	14.5	14.5	15.6	15.4	13.9	15.6
	Weight	32.1	34.5	29.0	28.7	27.9	25.4	25.9	24.0	22.8	26.0
4B	Age	16.4	17.0	15.4	15.8	15.0	16.0	15.5	16.7	16.4	16.0
	Weight	31.8	29.6	26.8	24.0	27.1	30.4	33.3	29.2	29.6	31.1
4C	Age	13.8	11.9	12.1	10.6	10.5	11.0	11.7	12.2	13.2	12.9
	Weight	30.2	27.5	24.7	29.8	30.6	27.9	26.3	25.4	23.8	23.3
4D	Age	15.5	15.0	13.1	13.4	16.7	15.3	16.1	15.9	16.1	14.7
	Weight	32.4	35.1	33.3	30.5	28.3	26.6	25.5	26.5	25.3	22.1
All Areas	Age	14.7	14.5	13.5	13.4	14.0	14.1	14.3	13.7	14.0	13.7
	Weight	28.6	27.8	25.8	25.9	24.8	24.8	24.2	23.6	23.8	22.3

¹Weights calculated from measured fork lengths

Table 4. Number of halibut sampled by 5-cm length category in the 2011 commercial catch by regulatory area. (The 80-84 cm category is further divided to designate the U32/O32 split within that category.)

Fork Length (cm)	Regulatory Area									TOTAL
	2A	2B	2C	3A	3B	4A	4B	4C	4D	
65-69	1									1
70-74		1								1
75-79	12	21	1	1	1	1		13	2	52
80-81	73	65	7	20	31	10	2	27	16	251
82-84	251	172	42	268	187	94	26	66	66	1,172
85-89	450	286	172	563	385	217	77	100	167	2,417
90-94	332	227	147	434	234	198	104	83	178	1,937
95-99	165	143	138	337	184	159	113	86	140	1,465
100-104	117	116	121	185	95	131	94	71	107	1,037
105-109	83	84	91	134	78	138	91	51	78	828
110-114	75	83	87	74	46	99	76	51	58	649
115-119	37	60	71	65	52	80	65	34	59	523
120-124	25	49	61	46	28	40	28	17	22	316
125-129	14	30	57	28	20	48	43	23	18	281
130-134	5	18	41	16	12	39	33	13	6	183
135-139	8	11	29	12	8	34	20	4	5	131
140-144	2	12	27	14	10	26	18	8	7	124
145-149		9	16	6	4	9	15	8	2	69
150-154		5	11	4		8	5	1	7	41
155-159	1	2	7	2	1	9	8	2	1	33
160-164		2	2	2	2	2	15	2	1	28
165-169		1	7			1	2		3	14
170-174		3	1	1		2	3		1	11
175-179			2	1		1	4			8
180-184		1				1				2
185-189								1		1
190-194	1									1
195-199							1			1
200-204						1				1
Total	1,652	1,401	1,138	2,213	1,378	1,348	843	661	944	11,578

Table 5. Between-reader percent agreement for market sample ages 1996-2011 (CV = coefficient of variation, APE = average percent error).

Year	Tot. aged	No. aged twice	% agreement (± 1 year)	CV	APE
1996	13,452	1,839	92.3	2.8	2.0
1997	15,500	2,203	93.6	2.4	1.7
1998	14,395	2,110	91.9	2.6	1.8
1999	12,796	1,117	92.0	2.5	1.8
2000	13,982	1,002	88.8	3.0	2.1
2001	13,181	2,025	86.3	3.9	2.8
2002	17,770	2,135	87.9	3.2	2.3
2003	13,738	984	82.6	3.9	2.8
2004	11,866	809	82.6	3.6	2.5
2005	13,945	1,315	85.9	3.7	2.6
2006	12,330	1,241	88.3	3.5	2.5
2007	13,910	1,488	85.8	3.9	2.8
2008	13,460	1,337	90.3	3.1	2.2
2009	13,718	1,348	91.5	2.9	2.0
2010	16,106	1,617	91.7	2.9	2.1
2011	11,215	1,035	88.0	3.5	2.5

