Halibut DMR Working Group
Recommended DMRs for 2019

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Background

At the upcoming October 2018 Council meeting, updated discard mortality rates (DMRs) for in-season management of GOA and BSAI groundfish fisheries in 2019 will be presented. Starting in 2016, the fishery definitions for DMR estimates and application transitioned from species composition to vessel/gear operational characteristics causatively linked to halibut mortality. Additionally, while the previous approach used a 10-year reference period for DMR estimates, we are now using a reduced reference period (2-3 years) to better incentivize improvement in halibut handling practices.

A description of methods used to calculate halibut DMRs is provided in the attached "2017 - 2018 Halibut DMR Recommendations from the Halibut DMR Working Group". As in past years, the estimation process uses weighted averages of halibut mortality (condition data) to expand estimated DMRs from the sample to the haul, trip, and fishery following the sampling hierarchy. All computations are completed within each sampling stratum (full coverage, gear-specific partial coverage, and EM) before estimates are combined across the strata to produce final DMR estimates.

Since the Plan Teams previously reviewed DMR estimation methods in 2017, several improvements have been made. First, Rockfish Program (RPP) trips are now better identified in the dataset. This has resulted in some changes to the estimated values throughout the times series. In addition, halibut condition data from the halibut deck-sorting EFP (Amendment 80 CP trawl) were excluded from the data summaries. Halibut sorted from the catch prior to observer sampling in the factory (on-deck) have a lower post-capture mortality than halibut recovered during observer sampling in the factory, hence these data are not appropriate for DMR estimates that would be applied to non-EFP CPs.

Special note on EM

For this year, we are adding a note on the use electronic monitoring (EM) in the observer program. This is to emphasize to the Plan Teams and subsequent reviewers the reliance of current DMR estimation methods on observer-based viability assessments in light of the growing use EM for a range of data collection purposes. EM reviewers record information related to halibut condition in the longline and pot gear sectors. Nevertheless, the Fisheries Monitoring and Assessment Division (FMA) is considering eliminating assessments of halibut condition (injury and viability) from EM vessels until there are EM-specific condition keys for reviewers. The review for assessment takes a long time, and often still results in an "unidentified" condition because the reviewer can't see both sides of the fish or can't determine a key condition criterion. EM reviewers would continue to document release method and any mishandling of halibut that would affect their condition (e.g., gaffing, lifting by the caudal peduncle, etc). Table 3 is provided to indicate the number of vessels participating in the EM program relative to the total number of active vessels. Note that *area* is not indicated in Table 3, however, almost all of the EM vessels are in the GOA.

Recommendations:

Apply the current estimation methods to a 2-year reference period (2016-2017) for application in the 2019 fishing year. Note that, as with groundfish harvest limits, the Council's specifications process applies to a

two-year period, so the halibut DMRs would apply to 2019 and nominally to 2020. The DMR working group will revisit DMRs in 2019 with updated data for 2020.

Noteworthy results:

Operational Group	2018 DMR*	2019 DMR	Comments
BSAI POTs	9%	19%	
BSAI HAL CV	17%	4%	No viabilities in 2016
BSAI CP NPT	84%	78%	
GOA NPT CP	84%	79%	10x increase in N_viabilities
GOA NPT CV RPP	62%	49%	

*specified value

Recommended to mitigate issues:

- BSAI HAL CVs *Use average of most recent 2 years (2015,2017)*

Future directions:

- Continued IPHC study on HAL release methods
- Increased use of EM, will likely continue to decrease the number of vessels from which halibut condition data are available. Human observers will still provide data for DMR estimation.
- Continued sorting of halibut on-deck may require an additional operational grouping depending on the final regulations anticipated to take effect in 2020.
- Improved basis studies for DMRs

Questions for PTs:

- Support combined groupings?
- Support updated reference period?
- Recommend newly estimated DMRs for 2019?

Table 1. Proposed 2019 DMRs and currently *specified* 2018 DMRs. Green font indicates reduced DMRs and red font indicates increase. DMRs for mothership operations are included under CPs.

2018 Operational Group							2019 Operational Group							
Area	Gear	Sector	RPP	Mean Annual $N_{\_viabilities}$	Estimate DMR?	DMR	Area	Gear	Sector	RPP	Mean Annual $N_{\_viabilities}$	Estimate DMR?	DMR	
BSAI	POT	None	N	548	Y	9%	BSAI	POT	None	N	380	Y	19%	10%
	HAL	CP	N	9,547	Y	8%		HAL	CP	N	6,886	Y	8%	0%
		CV	N	832	Y	17%			CV	N	360	Y/N ?	4%	-13%
	NPT	CP	N	2,025	Y	84%		NPT	CP	N	2,844	Y	78%	-6%
		CV	N	2,456	Y	60%			CV	N	2,736	Y	59%	-1%
GOA	POT	None	N	602	Y	7%	GOA	POT	None	N	450	Y	4%	-3%
	HAL	CP	N	1,631	Y	10%		HAL	CP	N	1,672	Y	11%	1%
		CV	N	3,286	Y	17%			CV	N	2,367	Y	21%	4%
	NPT	CP	N	132	N	84%		NPT	CP	N	1,300	Y	79%	-5%
		CV	N	755	Y	67%			CV	N	1,106	Y	67%	0.00%
		CV	Y	176	Y	62%			CV	Y	389	Y	49%	-13%

Table 2a. Numbers of vessels, hauls, trips for 2009 – 2017 groundfish operations. Values for pot gear are combined CP/CV. Source: AKFIN Data

Vessels														
AREA	**GEAR**	**SECTOR**	**RPP**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2014-2016**	**2016-2017**
	POT	CP and CV	N	16	25	32	26	21	20	24	24	14	23	19
	HAL	CP	N	36	34	29	30	30	29	30	30	27	30	29
BSAI	**HAL**	CV	N						19	21		15	20	15
	NPT	CP	N	21	21	22	16	19	20	10	14	11	15	13
	NPT	CV	N	27	28	25	35	24	22	34	43	46	33	45
	POT	CP and CV	N	9	11	16	15	26	17	32	37	20	29	29
	HAL	CP	N	17	15	9	5	8	9	8	9	10	9	10
GOA	**HAL**	CV	N	3	2	1	2	55	107	120	119	95	115	107
	NPT	CP	N	9	4	8	5	6	2	1	7	5	3	6
	NPT	CV	N	32	31	29	36	27	21	19	36	28	25	32
	NPT	CV	Y	11	14	14	15	16	12	10	16	17	13	17
Hauls														
AREA	**GEAR**	**SECTOR**	**RPP**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2014-2016**	**2016-2017**
	POT	CP and CV	N	129	236	348	428	259	264	310	245	191	273	218
	HAL	CP	N	2395	2105	2499	2668	3471	2986	2905	2281	1979	2724	2130
BSAI	**HAL**	CV	N						250	187		128	219	128
	NPT	CP	N	1680	1717	801	600	892	535	186	881	517	534	699
	NPT	CV	N	200	411	514	430	459	581	446	652	567	560	610
	POT	CP and CV	N	42	40	200	228	163	68	210	158	50	145	104
	HAL	CP	N	218	275	354	80	121	321	431	211	258	321	235
GOA	**HAL**	CV	N	22	27	9	49	416	1026	620	703	524	783	614
	NPT	CP	N	216	170	201	78	167	73	1	76	424	50	250
	NPT	CV	N	327	410	247	443	111	99	66	239	144	135	192
	NPT	CV	Y	47	54	33	63	50	23	30	108	99	54	104
Trips														
AREA	**GEAR**	**SECTOR**	**RPP**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2014-2016**	**2016-2017**
	POT	CP and CV	N	47	62	87	78	45	52	78	66	33	65	50
	HAL	CP	N	180	151	182	190	259	224	266	249	226	246	238
BSAI	**HAL**	CV	N						42	32		21	37	21
	NPT	CP	N	133	134	108	67	93	66	22	96	61	61	79
	NPT	CV	N	63	89	117	127	129	169	146	162	152	159	157
	POT	CP and CV	N	13	23	51	67	56	31	82	62	25	58	44
	HAL	CP	N	22	25	24	19	14	21	29	21	25	24	23
GOA	**HAL**	CV	N	5	7	2	9	104	238	166	174	137	193	156
	NPT	CP	N	22	14	18	8	18	12	1	13	38	9	26
	NPT	CV	N	97	106	76	138	48	35	33	94	59	54	77
	NPT	CV	Y	23	33	19	33	28	16	17	46	47	26	47

Table 2b. Numbers of viabilities and annual DMR estimates for 2009 – 2017 groundfish operations. Values for pot gear are combined CP/CV. Source: AKFIN Data

Rate													2018 DMRs	2019 DMRs
AREA	**GEAR**	**SECTOR**	**RPP**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2014-2016**	**2016-2017**
BSAI	**POT**	CP and CV	N	8.56%	21.49%	16.02%	14.64%	7.89%	6.69%	5.20%	9.81%	28.76%	7.23%	19.29%
	HAL	CP	N	9.52%	8.56%	9.67%	8.53%	8.54%	7.98%	7.77%	7.63%	8.80%	7.79%	8.22%
	HAL	CV	N						21.12%	3.50%		3.50%	12.31%	3.50%
	NPT	CP	N	86.82%	85.61%	83.88%	81.71%	85.51%	85.26%	81.07%	83.23%	73.13%	83.19%	78.18%
	NPT	CV	N	50.60%	70.81%	59.50%	65.97%	45.49%	52.91%	57.94%	64.92%	53.67%	58.59%	59.29%
GOA	**POT**	CP and CV	N	0.00%	10.42%	4.48%	13.20%	8.31%	14.94%	5.38%	8.35%	0.00%	9.55%	4.18%
	HAL	CP	N	9.22%	8.60%	8.33%	17.38%	9.76%	7.83%	10.22%	9.99%	12.92%	9.35%	11.46%
	HAL	CV	N	12.14%	7.40%	5.47%	27.45%	16.63%	7.99%	12.85%	23.90%	19.05%	14.91%	21.47%
	NPT	CP	N	74.41%	83.10%	70.78%	81.84%	80.55%	73.54%	90.00%	83.78%	74.82%	82.44%	79.30%
	NPT	CV	N	56.46%	58.94%	52.03%	56.63%	65.95%	66.31%	64.26%	65.89%	67.53%	65.48%	66.71%
	NPT	CV	Y	62.98%	54.87%	55.11%	56.40%	54.41%	44.36%	69.70%	40.76%	57.68%	51.61%	49.22%
Viabilities														
AREA	**GEAR**	**SECTOR**	**RPP**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2014-2016**	**2016-2017**
BSAI	**POT**	CP and CV	N	231	616	1259	1502	491	498	723	424	335	548	380
	HAL	CP	N	11394	9790	12666	14303	17284	11149	10268	7224	6548	9547	6886
	HAL	CV	N						1052	612		360	832	360
	NPT	CP	N	8967	7375	2363	1410	2868	1928	463	3685	2003	2025	2844
	NPT	CV	N	765	2151	2972	2228	2090	2780	1977	2611	2860	2456	2736
GOA	**POT**	CP and CV	N	78	179	1067	1070	363	179	895	732	168	602	450
	HAL	CP	N	1367	1921	2326	367	740	1546	1785	1562	1781	1631	1672
	HAL	CV	N	90	180	18	147	2025	4385	2687	2786	1948	3286	2367
	NPT	CP	N	1170	569	903	591	424	164	1	232	2367	132	1300
	NPT	CV	N	1628	2256	1558	2726	533	487	346	1433	778	755	1106
	NPT	CV	Y	155	113	106	156	124	58	94	375	402	176	389

Table 3. Total number of vessels associated with operational groupings (top) and number of vessels in the electronic monitoring (EM) pool. Source: AKFIN Data

TOTAL								
AREA	**GEAR**	**SECTOR**	**RPP**	**2013**	**2014**	**2015**	**2016**	**2017**
BSAI	POT	CP and CV	**N**	62	59	51	59	69
	HAL	CP	**N**	33	31	31	32	29
	HAL	CV	**N**	30	18	17	14	14
	NPT	CP	**N**	26	28	25	24	22
	NPT	CV	**N**	53	48	52	56	58
GOA	POT	CP and CV	**N**	130	103	117	119	129
	HAL	CP	**N**	11	14	13	13	12
	HAL	CV	**N**	344	339	336	327	293
	NPT	CP	**N**	14	11	10	13	10
	NPT	CV	**N**	60	59	57	59	52
	NPT	CV	**Y**	29	28	27	27	24
EM								
AREA	**GEAR**	**SECTOR**	**RPP**	**2013**	**2014**	**2015**	**2016**	**2017**
	HAL	CV	N			16	33	61
	POT	CV	N					25