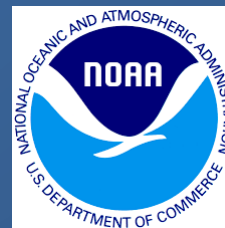


Halibut DMRs for In-Season Management of 2018 Groundfish Fisheries



NORTH PACIFIC
Fishery Management Council



INTERNATIONAL PACIFIC



HALIBUT COMMISSION



Action

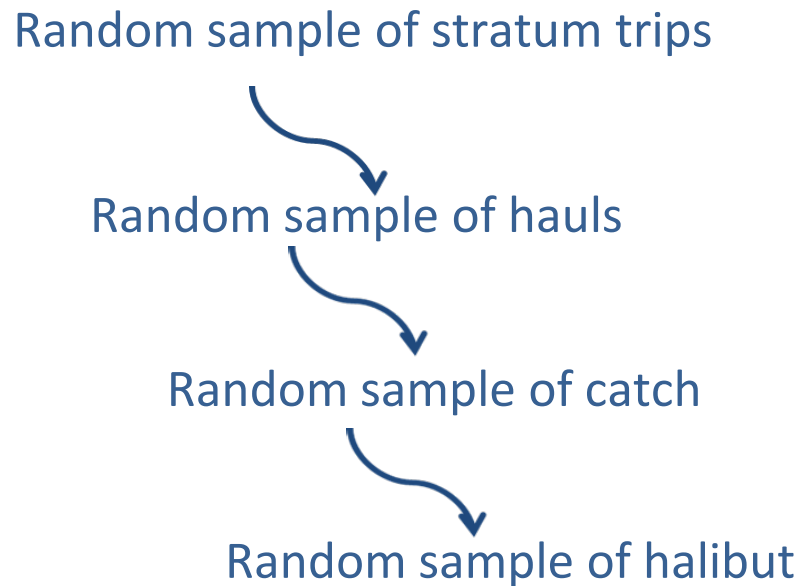
- Recommend Halibut DMRs for 2018

General Approach

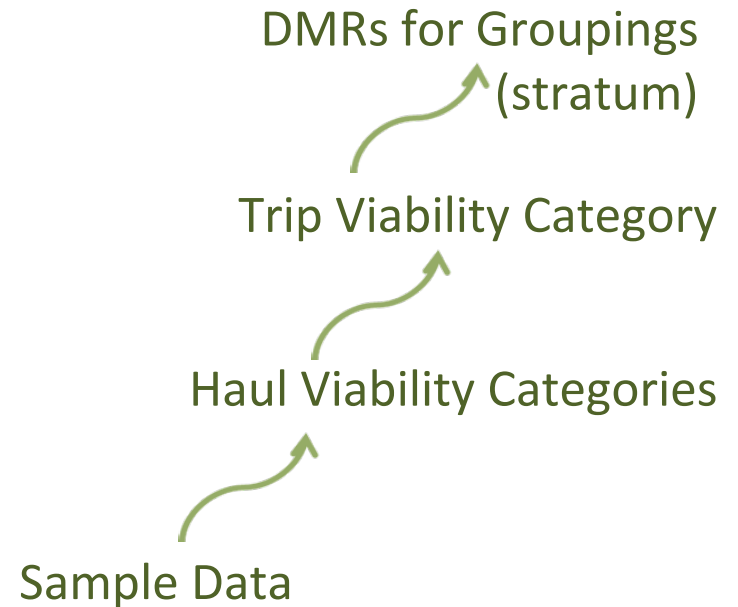
- Consistency with Observer Program sampling design
- Consistency with the operational causes of variation in DMRs

Hierarchical Design

Sampling



Estimation



Viabilities

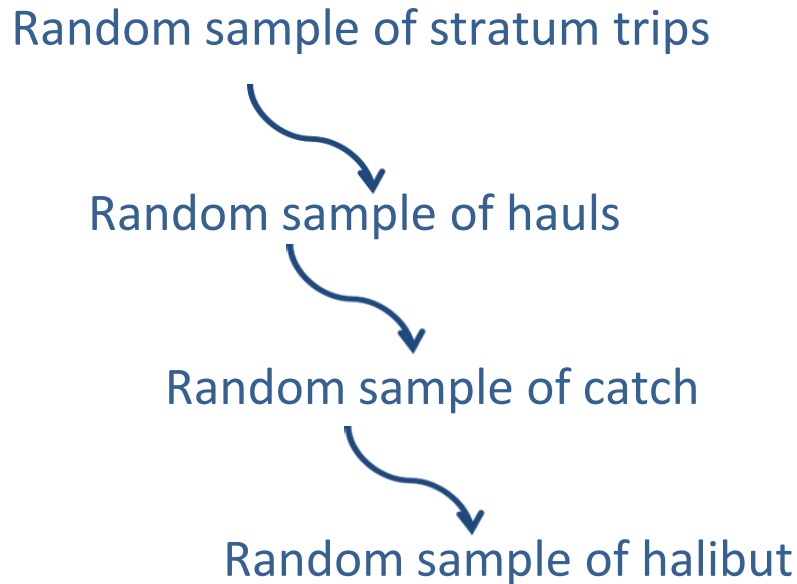
Assumed gear/condition-specific mortality probabilities for halibut in calculating DMRs.

Gear	Condition			
	Excellent	Poor	Dead	
Trawl ^a	0.20	0.55	0.90	
Pot ^b	0.00	1.00	1.00	
	Minor	Moderate	Serious	Dead
Longline ^c	0.035	0.363	0.662	1.000

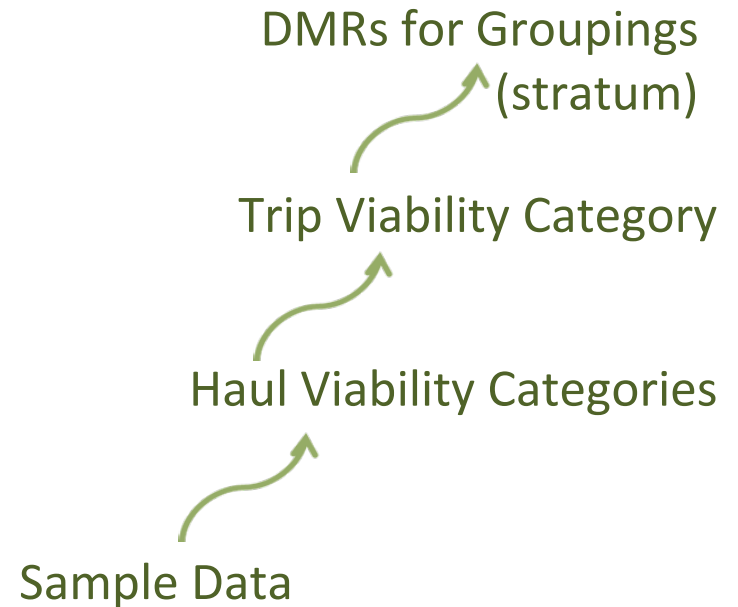
From ^a Clark et al. (1992), ^b Williams (1996), and ^c Kaimmer and Trumble (1998)

Hierarchical Design

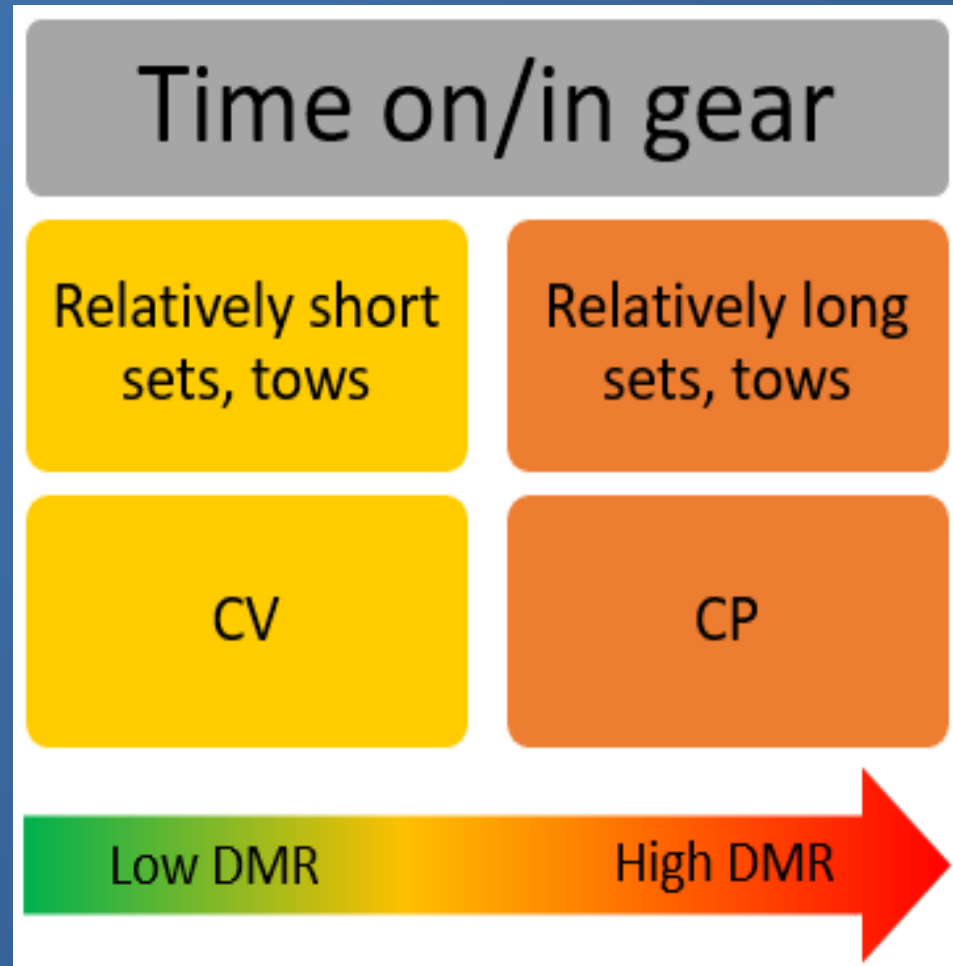
Sampling



Estimation



Operational Causes of DMR variation



Operational Causes of DMR variation

Time out of water

Discard at rail

On deck
sorting

Factory
sorting

“Aging”

Shoreside
sorting

HAL CV,
CP

Pot CV, CP

Trawl CV

Trawl CP,
Mothership

PTR
Pollock CP

Unsorted
Trawl CV

Low DMR

High DMR



Operational Causes of DMR variation

Occurrence of physical injury

Gear

Hook injury,
"sand fleas"

Puncture by
fish spines

Compression,
abrasion

HAL CV,CP

Trawl, esp.
RPP

Trawl CV, CP

Vessel

Dehooking
injury

Injury in
factory

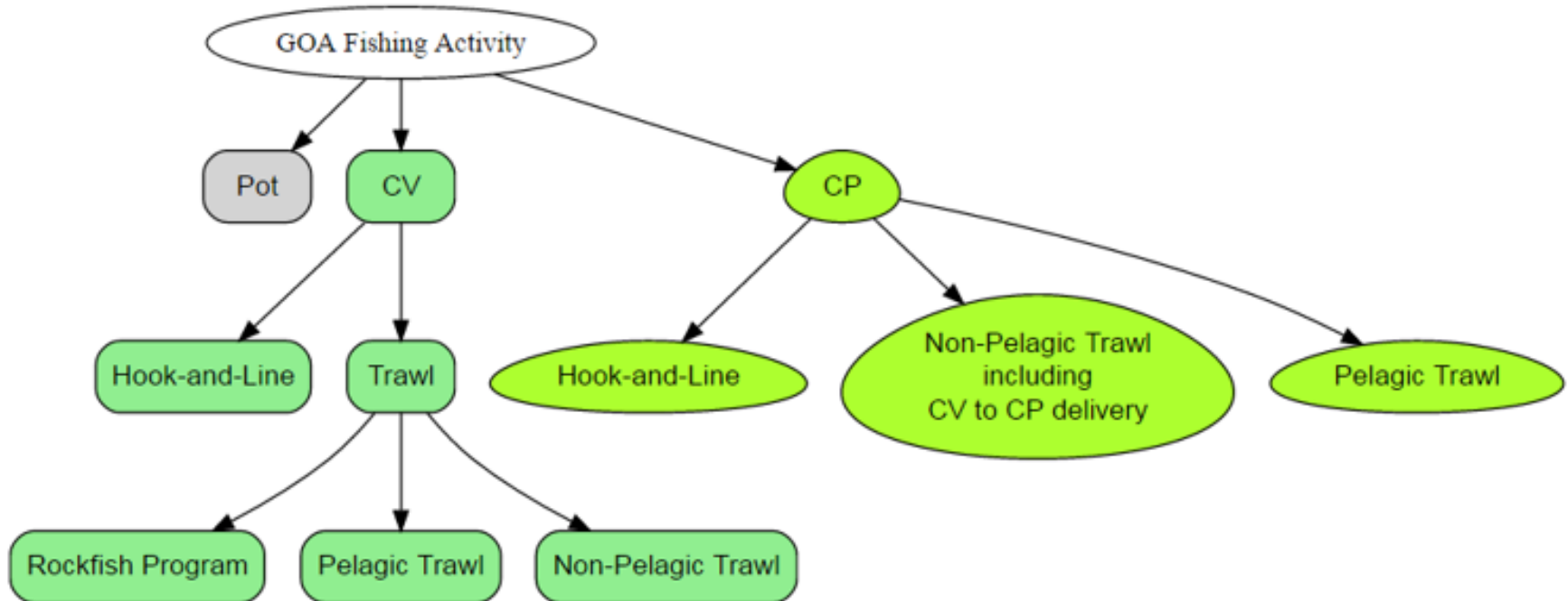
Injury,
asphyxiation
in hold

HAL CV, CP

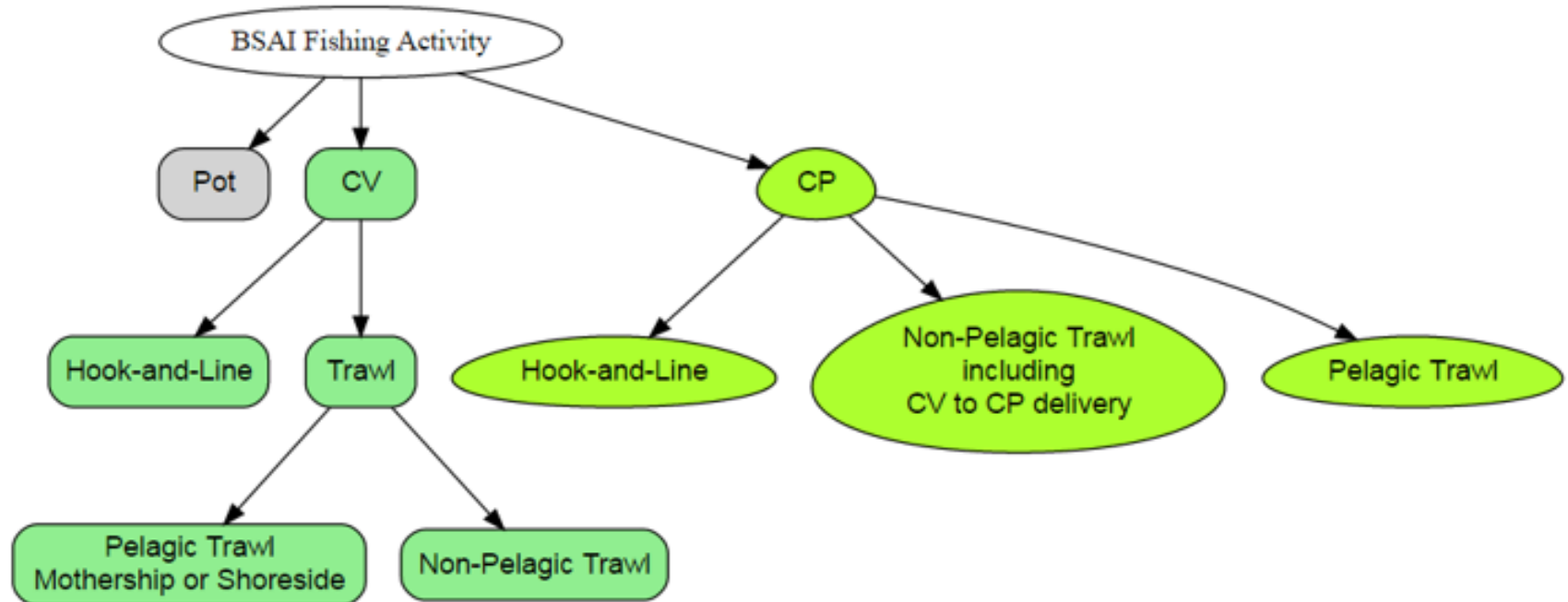
Trawl CP

RPP,
PTR CP

Operational Groupings



Operational Groupings



2017 Specs

Operational Group				Sample Size (Mean Annual N _{Viabilities})	Estimate DMR?	DMR
Sector	Region	Gear	Target			
CP	BSAI	PTR	all	4,151	N	100%
		NPT	all	1,753	Y	85%
		HAL	all	11,676	Y	8%
		POT	all	571	Y	6%
	GOA	PTR	all	0	N	100%
		NPT	all	196	N	85%
		HAL	all	1,247	Y	11%
		POT	all	479	Y	10%
CV	BSAI	PTR	all	224	N	100%
		NPT	all	2,282	Y	52%
		HAL	all	44	Y	14%
		POT	all	571	Y	6%
	GOA	PTR	all	1	N	100%
		NPT	RPP ^e	547	Y	67%
			non-RPP		Y	65%
		HAL	all	729	Y	12%
POT	all	479	Y	10%		

			VESSELS										
Sector	Region	Gear	2009	2010	2011	2012	2013	2014	2015	2016	ave 13-15	ave 14-16	
CP	BSAI	PELAGIC	14	14	14	13	14	14	13	14	14	14	
		NON PELAGIC	21	21	22	16	19	20	10	14	16	15	
		HOOK AND LINE	36	34	29	30	30	29	30	30	30	30	30
		POT OR TRAP*	16	25	32	27	21	20	24	24	24	22	23
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0	0
		NON PELAGIC	9	4	8	5	6	2	1	7	3	3	
		HOOK AND LINE	17	15	9	5	8	9	8	9	8	9	
		POT OR TRAP*	9	11	16	15	26	17	32	37	25	29	
CV	BSAI	PELAGIC	47	26	28	22	19	17	16	15	17	16	
		NON PELAGIC	27	28	25	35	24	22	34	43	27	33	
		HOOK AND LINE	0	0	0	0	5	9	2	8	5	6	
		POT OR TRAP*	3	5	1	0	2	0	0	0	1	0	
	GOA	PELAGIC	3	5	1	0	2	0	0	0	0	1	0
		NON PELAGIC	32	32	30	36	32	25	24	40	27	30	
		HOOK AND LINE	3	2	1	2	23	45	48	42	39	45	

			HAULS									
Sector	Region	Gear	2009	2010	2011	2012	2013	2014	2015	2016	ave 13-15	ave 14-16
CP	BSAI	PELAGIC	2,067	1,457	1,958	1,175	1,490	1,288	975	891	1,251	1,051
		NON PELAGIC	1,680	1,717	801	600	892	535	186	881	538	534
		HOOK AND LINE	2,395	2,105	2,499	2,668	3,444	2,986	2,895	2,279	3,108	2,720
		POT OR TRAP*	129	236	348	428	259	264	310	245	278	273
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0
		NON PELAGIC	216	170	201	78	167	73	73	1	104	49
		HOOK AND LINE	218	275	354	80	121	321	321	431	254	358
		POT OR TRAP*	42	40	200	228	163	68	68	210	100	115
CV	BSAI	PELAGIC	552	155	407	162	150	146	86	54	127	95
		NON PELAGIC	200	411	514	430	459	581	446	652	495	560
		HOOK AND LINE	0	0	0	0	8	19	7	10	11	12
		POT OR TRAP*	3	10	1	0	2	0	0	0	1	0
	GOA	PELAGIC	3	10	1	0	2	0	0	0	1	0
		NON PELAGIC	374	464	280	506	161	122	96	349	126	189
		HOOK AND LINE	22	27	9	49	200	181	155	127	179	154

			TRIPS									
Sector	Region	Gear	2009	2010	2011	2012	2013	2014	2015	2016	ave 13-15	ave 14-16
CP	BSAI	PELAGIC	108	97	141	123	134	135	109	144	126	129
		NON PELAGIC	133	134	108	67	93	66	22	96	60	61
		HOOK AND LINE	360	301	363	380	515	447	529	496	497	491
		POT OR TRAP*	47	62	87	78	45	52	78	66	58	65
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0
		NON PELAGIC	22	14	18	8	18	12	1	13	10	9
		HOOK AND LINE	44	50	48	38	28	42	58	42	43	47
		POT OR TRAP*	13	23	51	67	56	31	82	62	56	58
CV	BSAI	PELAGIC	99	36	58	38	28	25	24	22	26	24
		NON PELAGIC	63	89	117	127	129	169	146	162	148	159
		HOOK AND LINE	0	0	0	0	9	18	8	8	12	11
		POT OR TRAP*	3	6	1	0	2	0	0	0	1	0
	GOA	PELAGIC	3	6	1	0	2	0	0	0	1	0
		NON PELAGIC	120	139	95	171	76	51	50	141	59	81
		HOOK AND LINE	10	14	4	18	99	122	89	80	103	97

Results

Sector	Region	Gear	VESSELS								ave 13-15	ave 14-16
			2009	2010	2011	2012	2013	2014	2015	2016		
CP	BSAI	PELAGIC	14	14	14	13	14	14	13	14	14	14
		NON PELAGIC	21	21	22	16	19	20	10	14	16	15
		HOOK AND LINE	36	34	29	30	30	29	30	30	30	30
		POT OR TRAP*	16	25	32	27	21	20	24	24	22	23
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0
		NON PELAGIC	9	4	8	5	6	2	1	7	3	3
		HOOK AND LINE	17	15	9	5	8	9	8	9	8	9
		POT OR TRAP*	9	11	16	15	26	17	32	37	25	29
CV	BSAI	PELAGIC	47	26	28	22	19	17	16	15	17	16
		NON PELAGIC	27	28	25	35	24	22	34	43	27	33
		HOOK AND LINE	0	0	0	0	5	9	2	8	5	6
	GOA	PELAGIC	3	5	1	0	2	0	0	0	1	0
		NON PELAGIC	32	32	30	36	32	25	24	40	27	30
		HOOK AND LINE	3	2	1	2	23	45	48	42	39	45

Results

Sector	Region	Gear	HAULS									
			2009	2010	2011	2012	2013	2014	2015	2016	ave 13-15	ave 14-16
CP	BSAI	PELAGIC	2,067	1,457	1,958	1,175	1,490	1,288	975	891	1,251	1,051
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		POT OR TRAP*	129	236	348	428	259	264	310	245	278	273
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0
		NON PELAGIC	216	170	201	78	167	73	73	1	104	49
		HOOK AND LINE	218	275	354	80	121	321	321	431	254	358
		POT OR TRAP*	42	40	200	228	163	68	68	210	100	115
CV	BSAI	PELAGIC	552	155	407	162	150	146	86	54	127	95
		NON PELAGIC	200	411	514	430	459	581	446	652	495	560
		HOOK AND LINE	0	0	0	0	8	19	7	10	11	12
	GOA	PELAGIC	3	10	1	0	2	0	0	0	1	0
		NON PELAGIC	374	464	280	506	161	122	96	349	126	189
		HOOK AND LINE	22	27	9	49	200	181	155	127	179	154

Results

Sector	Region	Gear	TRIPS								ave 13-15	ave 14-16
			2009	2010	2011	2012	2013	2014	2015	2016		
CP	BSAI	PELAGIC	108	97	141	123	134	135	109	144	126	129
		NON PELAGIC	133	134	108	67	93	66	22	96	60	61
		HOOK AND LINE	360	301	363	380	515	447	529	496	497	491
		POT OR TRAP*	47	62	87	78	45	52	78	66	58	65
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0
		NON PELAGIC	22	14	18	8	18	12	1	13	10	9
		HOOK AND LINE	44	50	48	38	28	42	58	42	43	47
		POT OR TRAP*	13	23	51	67	56	31	82	62	56	58
CV	BSAI	PELAGIC	99	36	58	38	28	25	24	22	26	24
		NON PELAGIC	63	89	117	127	129	169	146	162	148	159
		HOOK AND LINE	0	0	0	0	9	18	8	8	12	11
	GOA	PELAGIC	3	6	1	0	2	0	0	0	1	0
		NON PELAGIC	120	139	95	171	76	51	50	141	59	81
		HOOK AND LINE	10	14	4	18	99	122	89	80	103	97

Results

Sector	Region	Gear	VIABILITIES									
			2009	2010	2011	2012	2013	2014	2015	2016	ave 13-15	ave 14-16
CP	BSAI	PELAGIC	12,098	5,853	8,923	6,613	6,018	4,047	2,389	2,856	4,151	3,097
		NON PELAGIC	8,967	7,375	2,363	1,410	2,868	1,928	463	3,685	1,753	2,025
		HOOK AND LINE	10,350	9,023	11,477	12,841	15,338	10,332	9,357	6,825	11,676	8,838
		POT OR TRAP*	231	616	1,259	1,502	491	498	723	424	571	548
	GOA	PELAGIC	1	0	0	0	0	0	0	0	0	0
		NON PELAGIC	1,170	569	903	591	424	164	1	232	196	132
		HOOK AND LINE	1,246	1,689	2,112	319	660	1,459	1,621	1,399	1,247	1,493
		POT OR TRAP*	78	179	1,067	1,070	363	179	895	732	479	602
CV	BSAI	PELAGIC	1,172	277	1,262	693	316	222	135	97	224	151
		NON PELAGIC	765	2,151	2,972	2,228	2,090	2,780	1,977	2,610	2,282	2,456
		HOOK AND LINE	0	0	0	0	40	72	20	17	44	36
	GOA	PELAGIC	4	28	1	0	4	0	0	0	1	0
		NON PELAGIC	1,783	2,369	1,664	2,882	657	545	440	1,826	547	937
		HOOK AND LINE	90	163	18	147	972	606	609	556	729	590

Results

Notable changes:

- BSAI NPT CVs increase 52% to 60%
- GOA HAL CVs increase 12% to 17%
- GOA Rockfish Program (RPP) CVs decrease 67% to 62%

Combined groupings due to low sample size:

- BSAI HAL CVs - 2 vessels observed in 2014-2016. *Combined with GOA*
- GOA NPT CPs - 10 vessels observed in 2014-2016. *Combined with BSAI*

2018 Specs

Operational Group						
Sector	Region	Gear	Target	Sample Size	Estimate	DMR
				(Mean Annual N _{Viabilities})	DMR?	
CP	BSAI	PTR	all	3,097	N	100%
		NPT	all	2,025	Y	84%
		HAL	all	8,838	Y	8%
		POT	all	548	Y	9%
	GOA	PTR	all	0	N	100%
		NPT	all	132	N	84%
		HAL	all	1,493	Y	10%
		POT	all	602	Y	7%
CV	BSAI	PTR	all	151	N	100%
		NPT	all	2,456	Y	60%
		HAL	all	36	Y	17%
		POT	all	548	Y	9%
	GOA	PTR	all	0	N	100%
		NPT	RPP ^e	937	Y	62%
			non-RPP		Y	67%
		HAL	all	1	Y	17%
POT	all	602	Y	7%		

Questions for the Plan Teams

- Support combined groupings?
- Support reference period?
- Recommend newly estimated DMRs for 2018?

Next Steps (Long Term)

- Two-year reference period likely for 2019 (2016-2017)
- IPHC study on HAL release methods
- Increased use of EM, but human observers still provide data for DMRs
- Improved basis studies for DMRs