Halibut DMRs

NORTH PACIFIC
Fishery Management Council

NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

INTERNATIONAL PACIFIC
HALIBUT COMMISSION

IDAHO · OREGON · ALASKA
PACIFIC STATES MARINE
FISHERIES COMMISSION
WASHINGTON · CALIFORNIA

General Approach

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

Current Approach

BSAI

Non-CDQ		
Gear	**Fishery**	**DMR (%)**
Trawl	Alaska plaice	66
	Arrowtooth flounder	84
	Atka mackerel	82
	Flathead sole	72
	Greenland turbot	82
	Non-pelagic pollock	84
	Pelagic pollock	81
	Other flatfish	88
	Other species	63
	Pacific cod	66
	Rockfish	66
	Rock sole	86
	Sablefish	66
	Yellowfin sole	84
Hook and line	Greenland turbot	11
	Other species	9
	Pacific cod	9
	Rockfish	9
Pot	Other species	9
	Pacific cod	9

CDQ		
Gear	**Fishery**	**DMR (%)**
Trawl		
	Atka mackerel	82
	Flathead sole	79
	Greenland turbot	89
	Non-pelagic pollock	86
	Pelagic pollock	90
	Pacific cod	87
	Rockfish	70
	Rock sole	86
	Yellowfin sole	85
Hook and line	Greenland turbot	10
	Pacific cod	10
Pot		
	Pacific cod	1
	Sablefish	41

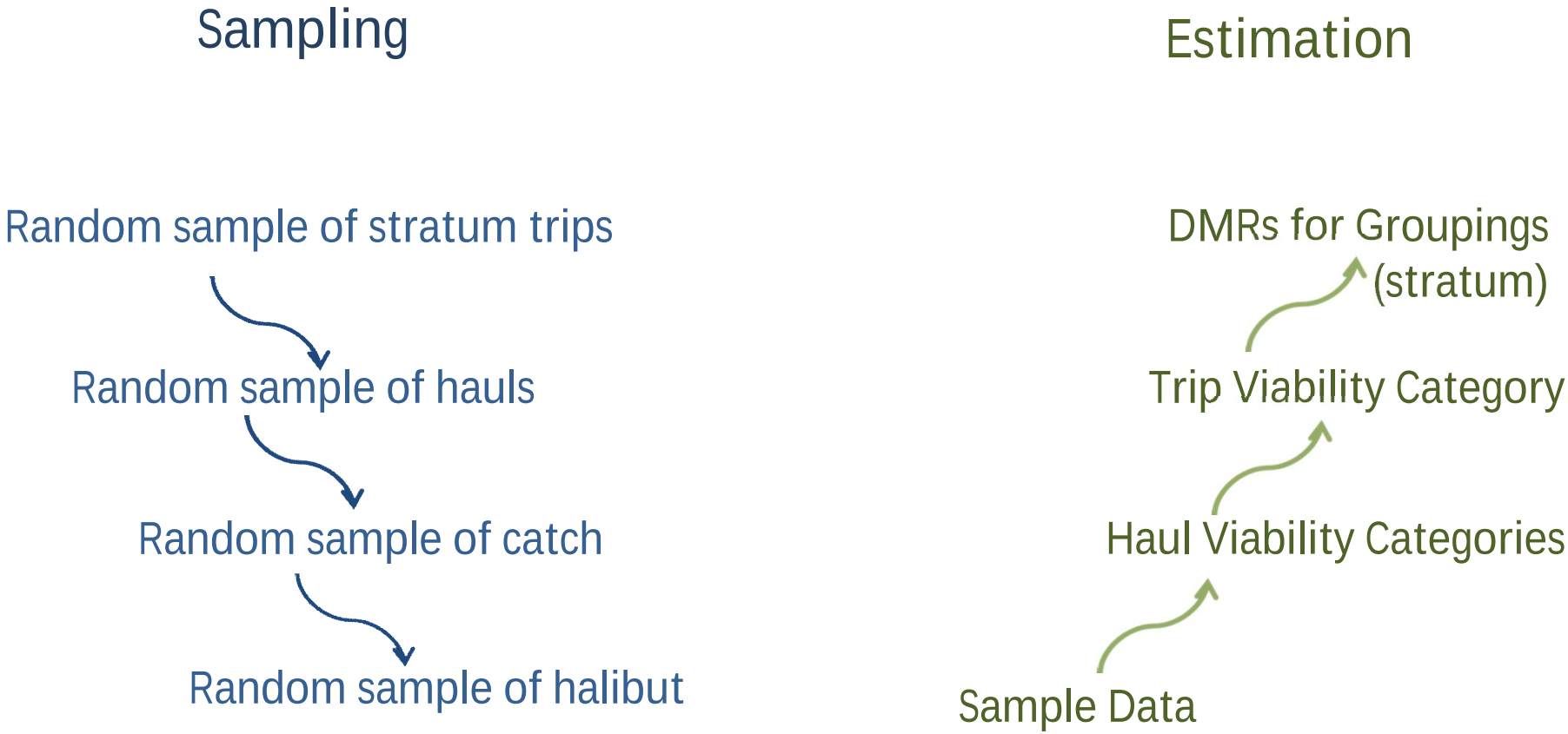
GOA

Gear	Fishery	DMR (%)
Trawl	Arrowtooth flounder	76
	Deepwater flatfish	62
	Flathead sole	67
	Non-pelagic pollock	58
	Other fisheries[1]	62
	Pacific cod	62
	Pelagic pollock	65
	Rex sole	72
	Rockfish	65
	Sablefish	59
	Shallow-water flatfish	66

Gear	Fishery	DMR (%)
Hook and line	Other fisheries[1]	10
	Pacific cod	10
	Rockfish	10
Pot	Other fisheries[1]	15
	Pacific cod	15

[1]"Other fisheries" includes all gear types for skates, sculpins, squids, octopuses, and hook-and-line sablefish.

Hierarchical Design



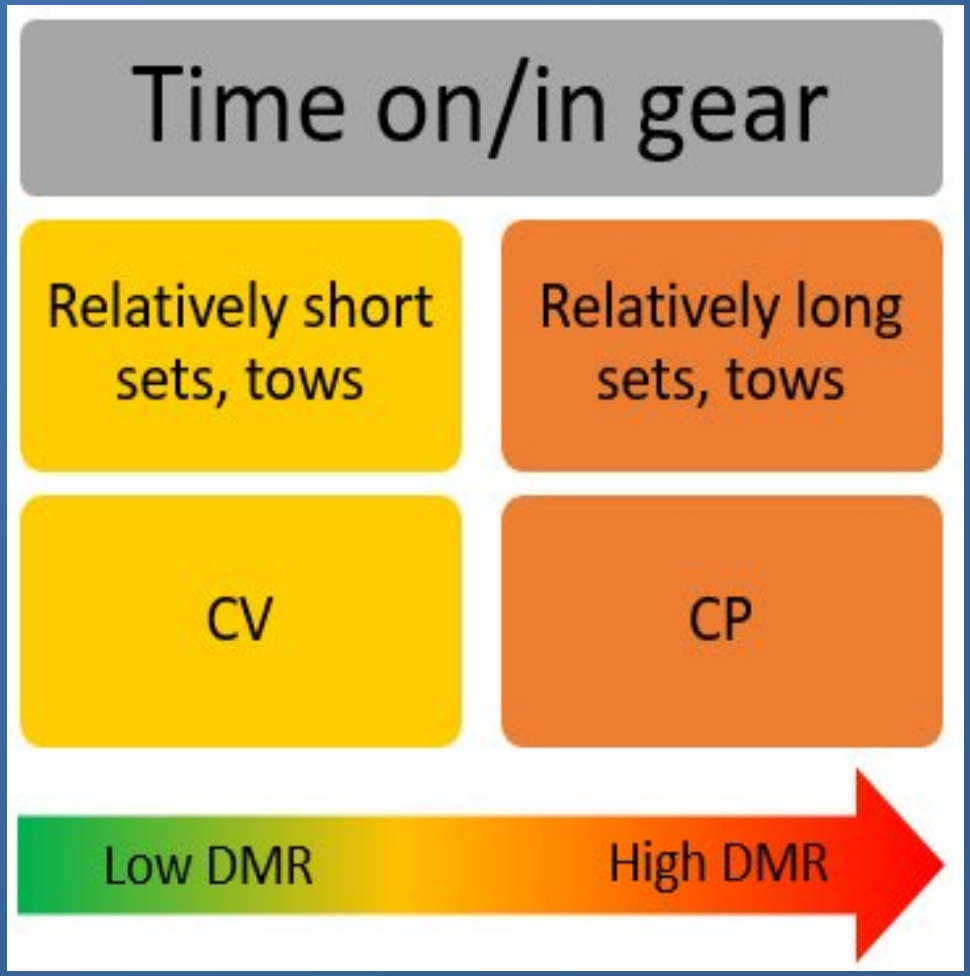
Viabilities

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

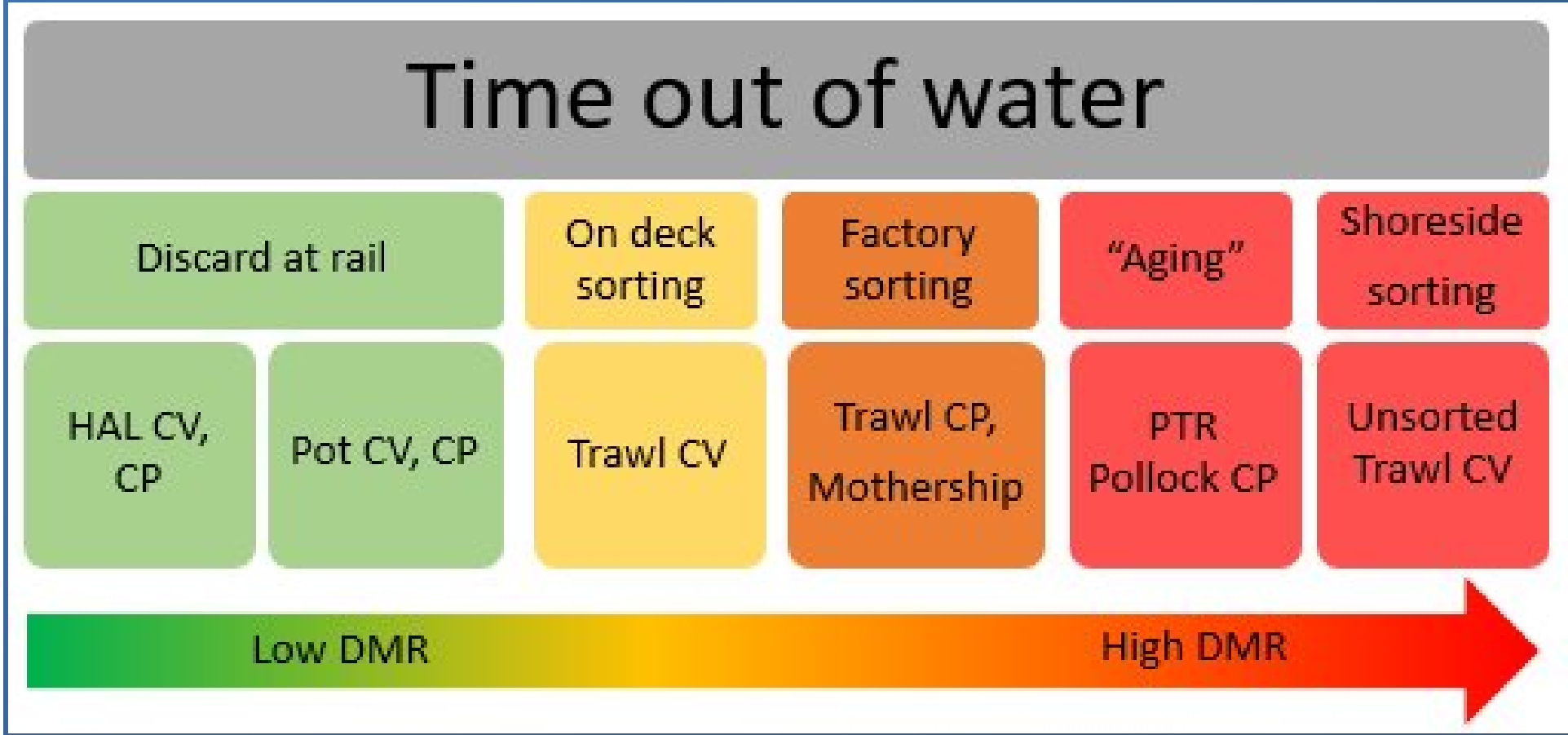
Gear	Condition			
	Excellent	Poor		Dead
Trawl[a]	0.20	0.55		0.90
Pot[b]	0.00	1.00		1.00
	Minor	Moderate	Serious	Dead
Longline[c]	0.035	0.363	0.662	1.000

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

Operational Causes of DMR variation



Operational Causes of DMR variation

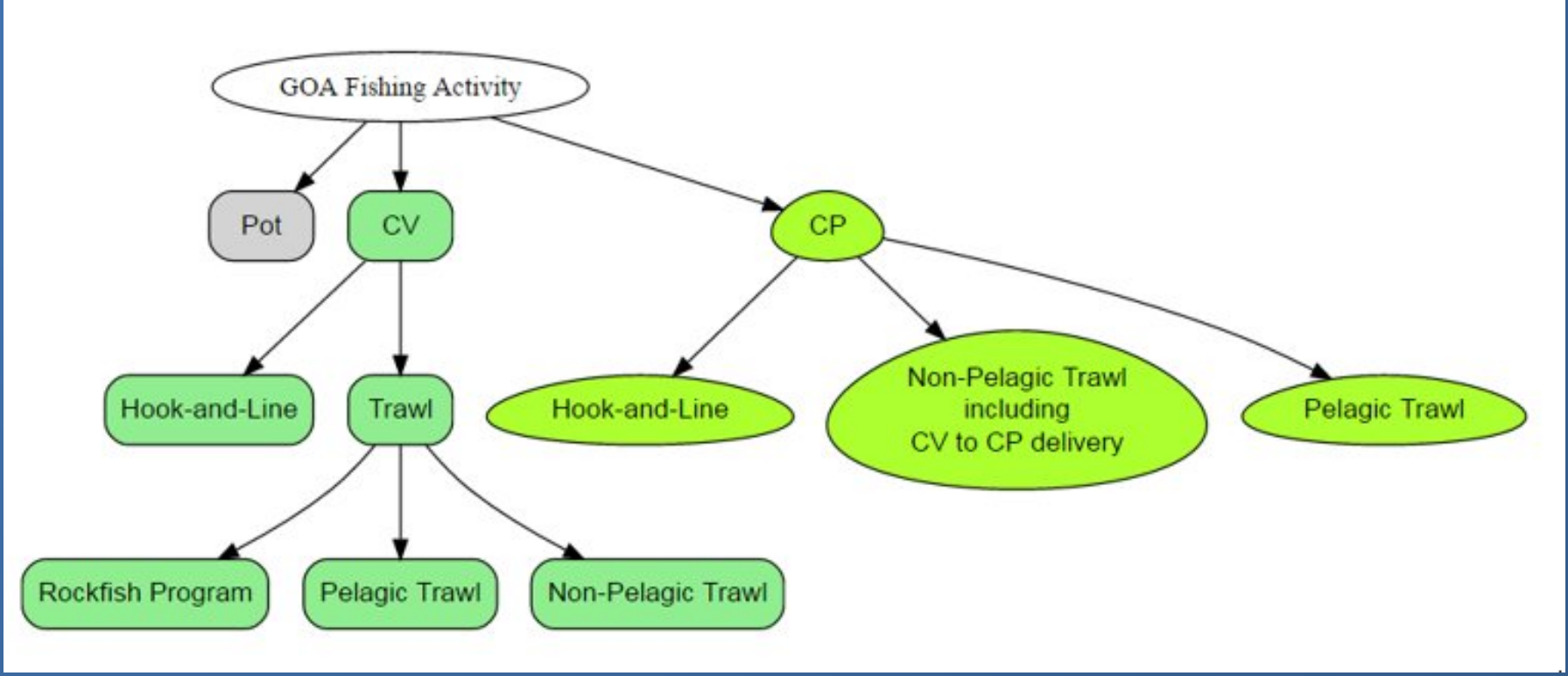


Operational Causes of DMR variation

Occurrence of physical injury

Gear			Vessel		
Hook injury, "sand fleas"	Puncture by fish spines	Compression, abrasion	Dehooking injury	Injury in factory	Injury, asphyxiation in hold
HAL CV,CP	Trawl, esp. RPP	Trawl CV, CP	HAL CV, CP	Trawl CP	RPP, PTR CP

Operational Groupings



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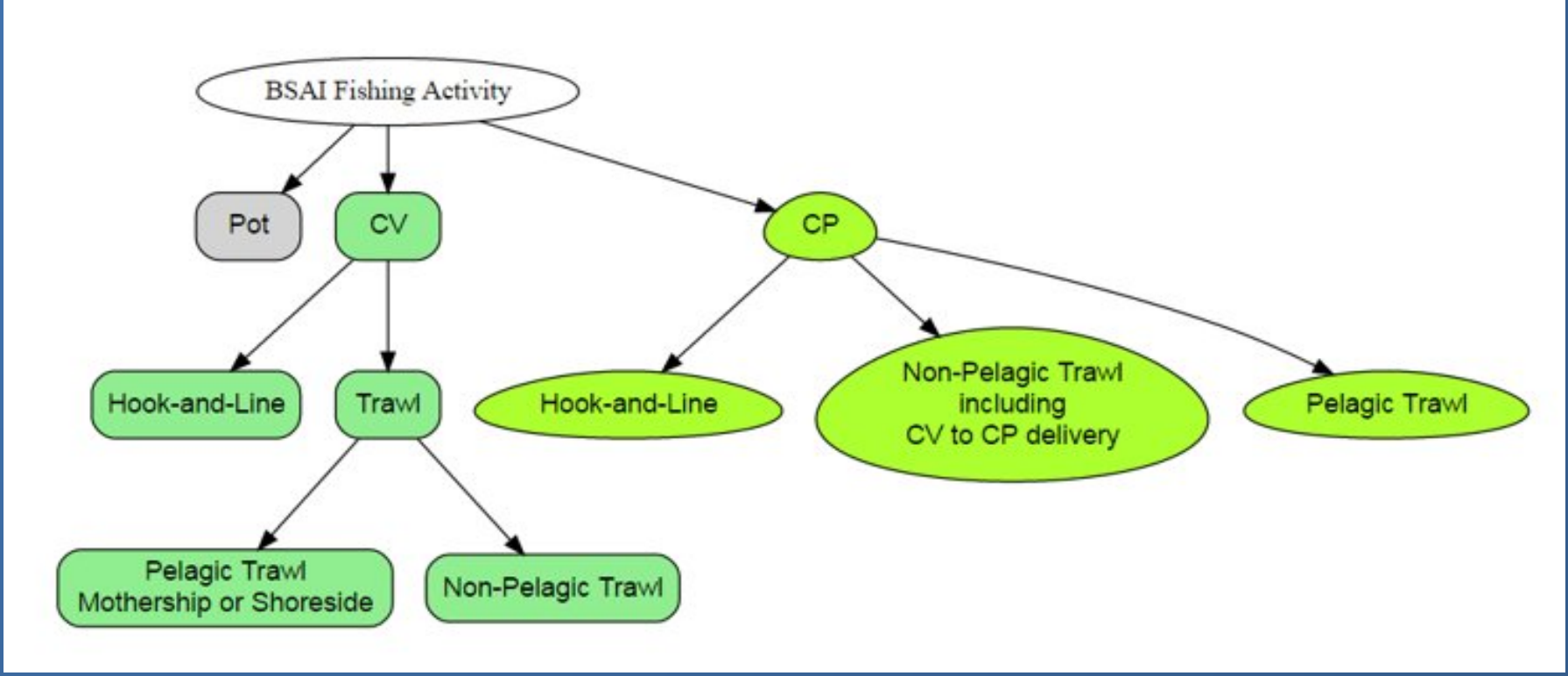

Results (21 groupings)

Operational Group				Sample Size (Mean Annual $N_{Viabilities}$)	Estimate DMR?	DMR
Sector	Region	Gear	Target			
CP	BSAI	PTR	pollock	6,051	N	100%
			non-pollock	1	N	100%
		NPT	all	4,306	Y	85%
		HAL	all	11,210	Y	8%
		POT	all	686[b]	Y	6%
	GOA	PTR	pollock	0	N	100%
			non-pollock	0	N	100%
		NPT[a]	all	493	N	85%
		HAL	all	1,295	Y	11%
		POT	all	523[c]	Y	10%
CV	BSAI	PTR	pollock	569	N	100%
			non-pollock	14	N	100%
		NPT	all	2,174	Y	52%
		HAL	all	62[d]	Y	14%
		POT	all	686[b]	Y	6%
	GOA	PTR	pollock	2	N	100%
			non-pollock	4	N	100%
		NPT	RPP[e]	103	Y	67%
			non-RPP	1,265	Y	65%
		HAL	all	490	Y	12%
		POT	all	523[c]	Y	10%

Current Approach (49 groupings)

BSAI

Non-CDQ		
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GOA Changes

Variable, but mostly smaller DMR
– NPT CV

Larger DMR
- All others

2015 Gulf of Alaska Halibut Mortality using proposed DMRs (as of August 30, 2016)

				Current			New		Difference	
Gear	Sector	Program	Halibut PSC	DMR	Halibut mortality	Target	DMR	Halibut mortality	Current minus New	PSC limit
								-	-	
NPT	CV	OA	150	0.60	90	Bottom pollock	0.63	95	(5)	
NPT	CV	OA	757	0.62	469	Pacific cod	0.63	477	(8)	
NPT	CV	OA	99	0.67	66	Shallow water flatfish	0.63	62	4	
NPT	CV	OA	0	0.66	0	Rockfish	0.63	0	0	
NPT	CV	OA	3	0.71	2	Pelagic pollock	0.63	2	0	
NPT	CV	OA	-	0.71	-	Shallow water flatfish	0.63	-		
NPT	CV	OA	488	0.73	356	Arrowtooth flounder	0.63	307	49	
NPT	CV	OA	8	0.69	5	Rex sole	0.63	5	0	
HAL	CP	OA	628	0.11	69	Pacific cod	0.11	69	-	
HAL	CP	OA	0	0.11	0	Other species	0.11	0	-	116

GOA Changes

Variable, but mostly smaller DMR – NPT CV

Larger DMR - All others

2015 Gulf of Alaska Halibut Mortality using proposed DMRs (as of August 30, 2016)

				Current			New		Difference	
Gear	Sector	Program	Halibut PSC	DMR	Halibut mortality	Target	DMR	Halibut mortality	Current minus New	PSC limit
									-	
NPT	CP	OA	0	0.60	0	Bottom pollock	0.85	0	(0)	
NPT	CP	OA	1	0.62	1	Pacific cod	0.85	1	(0)	
NPT	CP	OA	-	0.43	-	Deep water flatfish	0.85	-	-	
NPT	CP	OA	62	0.67	41	Shallow water flatfish	0.85	53	(11)	
NPT	CP	OA	46	0.66	30	Rockfish	0.85	39		
NPT	CP	OA	4	0.65	2	Flathead sole	0.85	3	(1)	
NPT	CP	OA	0	0.71	0	Sablefish	0.85	0	(0)	
NPT	CP	OA	306	0.73	223	Arrowtooth flounder	0.85	260	(37)	
NPT	CP	OA	35	0.69	24	Rex sole	0.85	30	(6)	
NPT	CP	RPP	77	0.66	51	Rockfish	0.85	65	(15)	
NPT	CP	RPP	3	0.73	2	Arrowtooth flounder	0.85	3	(0)	
PTR	CP	OA	-	0.66	-	Rockfish	1.00	-	-	
Total			4,002		1,620			1,677	(57)	2,021
Summary										
Hook-and-line CV			1,262		139			151	(13)	145
Hook-and-line CP			628		69			69	-	116
Trawl			2,112		1,413			1,457	(44)	1,759
Total			4,002		1,620			1,677	(57)	2,020

BSAI Changes

Variable, but mostly smaller DMR
- HAL CP
- NPT CV

Larger DMR
- All others

2015 BSAI Halibut Mortality using proposed DMRs (run on 8/30/2016, does not include decksorting EFP)

				Current			New		Difference
Gear	Sector	Program	Halibut PSC	DMR	Halibut mortality	Target	DMR	Halibut mortality	Current minus New
HAL	CP	CDQ	221	0.10	22	Pacific cod	0.08	18	4
HAL	CP	IFQ	-	0.04	-	Rockfish	0.08	-	-
HAL	CP	OA	0	0.09	0	Bottom pollock	0.08	0	0
HAL	CP	OA	3,207	0.09	289	Pacific cod	0.08	257	32
HAL	CP	OA	2	0.09	0	Other species	0.08	0	0
HAL	CP	OA	24	0.13	3	Greenland turbot	0.08	2	1

2015 BSAI Halibut Mortality using proposed DMRs (run on 8/30/2016, does not include decksorting EFP)

				Current			New		Difference
Gear	Sector	Program	Halibut PSC	DMR	Halibut mortality	Target	DMR	Halibut mortality	Current minus New
NPT	CP	A80	-	0.64	-	Greenland turbot	0.85	-	-
NPT	CP	A80	51	0.71	36	Pacific cod	0.85	44	(7)
NPT	CP	A80	3	0.71	2	Alaska Plaice	0.85	2	(0)
NPT	CP	A80	-	0.71	-	Other flatfish	0.85	-	-
NPT	CP	A80	61	0.73	44	Flathead sole	0.85	51	(7)
NPT	CP	A80	58	0.76	44	Kamchatka flounder	0.85	49	(5)
NPT	CP	A80	82	0.76	62	Arrowtooth flounder	0.85	70	(7)
NPT	CP	A80	111	0.77	85	Atka mackerel	0.85	94	(9)
NPT	CP	A80	23	0.77	18	Bottom pollock	0.85	20	(2)
NPT	CP	A80	75	0.79	60	Rockfish	0.85	64	(5)
NPT	CP	A80	696	0.83	578	Yellowfin sole	0.85	592	(14)
NPT	CP	A80	559	0.85	475	Rock sole	0.85	475	-
NPT	CP	CDQ	3	0.76	3	Arrowtooth flounder	0.85	3	(0)
NPT	CP	CDQ	0	0.79	0	Flathead sole	0.85	0	(0)
NPT	CP	CDQ	0	0.80	0	Rockfish	0.85	0	(0)
NPT	CP	CDQ	1	0.83	1	Bottom pollock	0.85	1	(0)
NPT	CP	CDQ	8	0.86	7	Atka mackerel	0.85	7	0
NPT	CP	CDQ	48	0.86	42	Yellowfin sole	0.85	41	0
NPT	CP	CDQ	27	0.88	24	Rock sole	0.85	23	1
NPT	CP	CDQ	12	0.90	11	Pacific cod	0.85	10	1
NPT	CP	OA	18	0.71	13	Pacific cod	0.85	15	(2)
NPT	CP	OA	3	0.73	2	Flathead sole	0.85	3	(0)
NPT	CP	OA	1	0.77	1	Atka mackerel	0.85	1	(0)
NPT	CP	OA	0	0.77	0	Bottom pollock	0.85	0	(0)
NPT	CP	OA	66	0.83	55	Yellowfin sole	0.85	56	(1)
NPT	CP	OA	1	0.85	1	Rock sole	0.85	1	-

BSAI Changes

Variable, but mostly smaller DMR
– HAL CP
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Larger DMR
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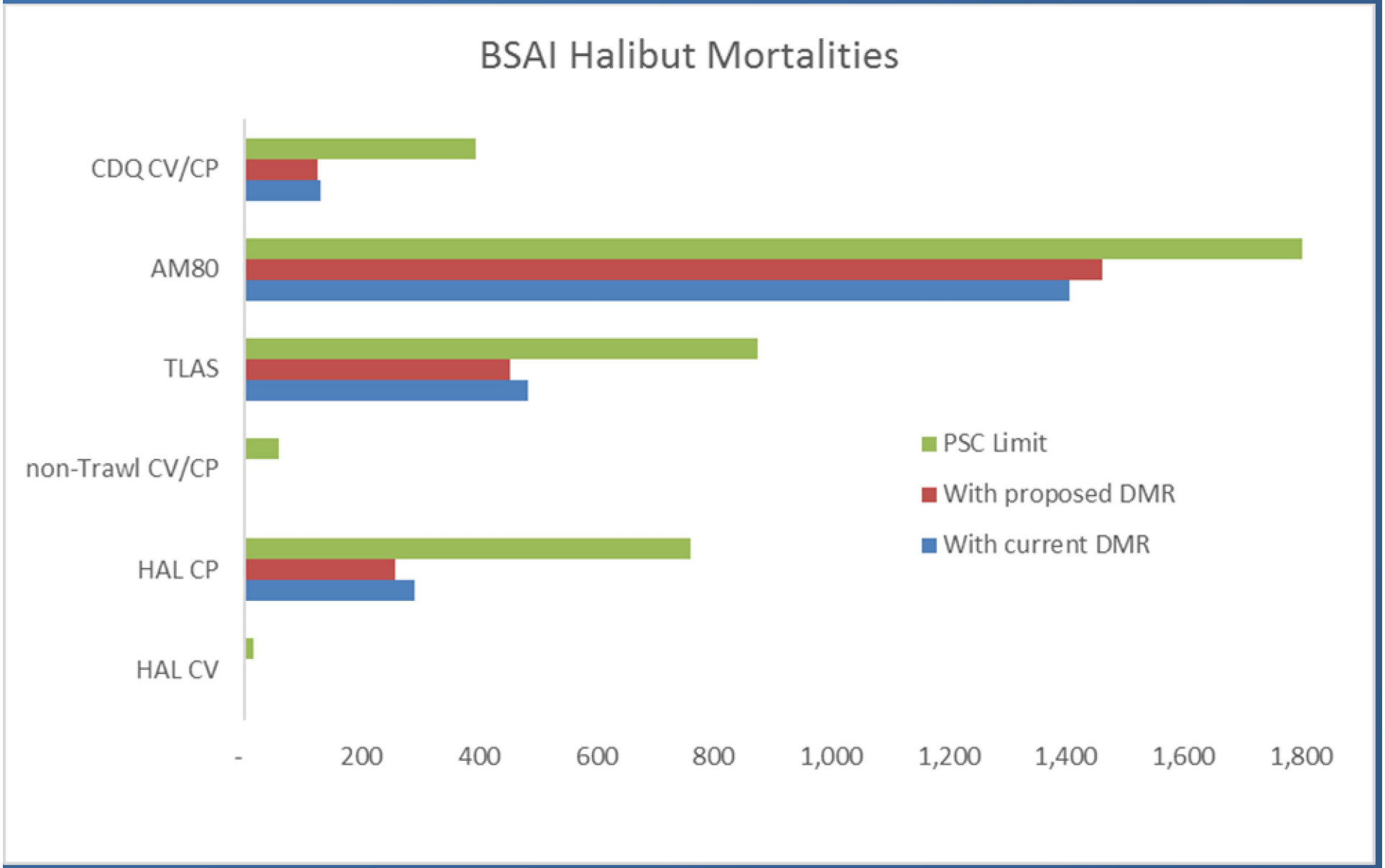
2015 BSAI Halibut Mortality using proposed DMRs (run on 8/30/2016, does not include decksorting EFP)

				Current				New		Difference
Gear	Sector	Program	Halibut PSC	DMR	Halibut mortality	Target		DMR	Halibut mortality	Current minus New
PTR	CP	AFA	7	0.77	5	Bottom pollock		1.00	7	(2)
PTR	CP	AFA	78	0.88	69	Pelagic pollock		1.00	78	(9)
PTR	CP	AIP	-	0.77	-	Bottom pollock		1.00	-	-
PTR	CP	AIP	-	0.79	-	Rockfish			-	-
PTR	CP	AIP	-	0.88	-	Pelagic pollock		1.00	-	-
PTR	CP	CDQ	0	0.83	0	Bottom pollock		1.00	0	(0)
PTR	CP	CDQ	8	0.90	8	Pelagic pollock		1.00	8	(1)
Total			5,942		2,312				2,300	12

Changes Relative to Current DMRs and PSC Limits



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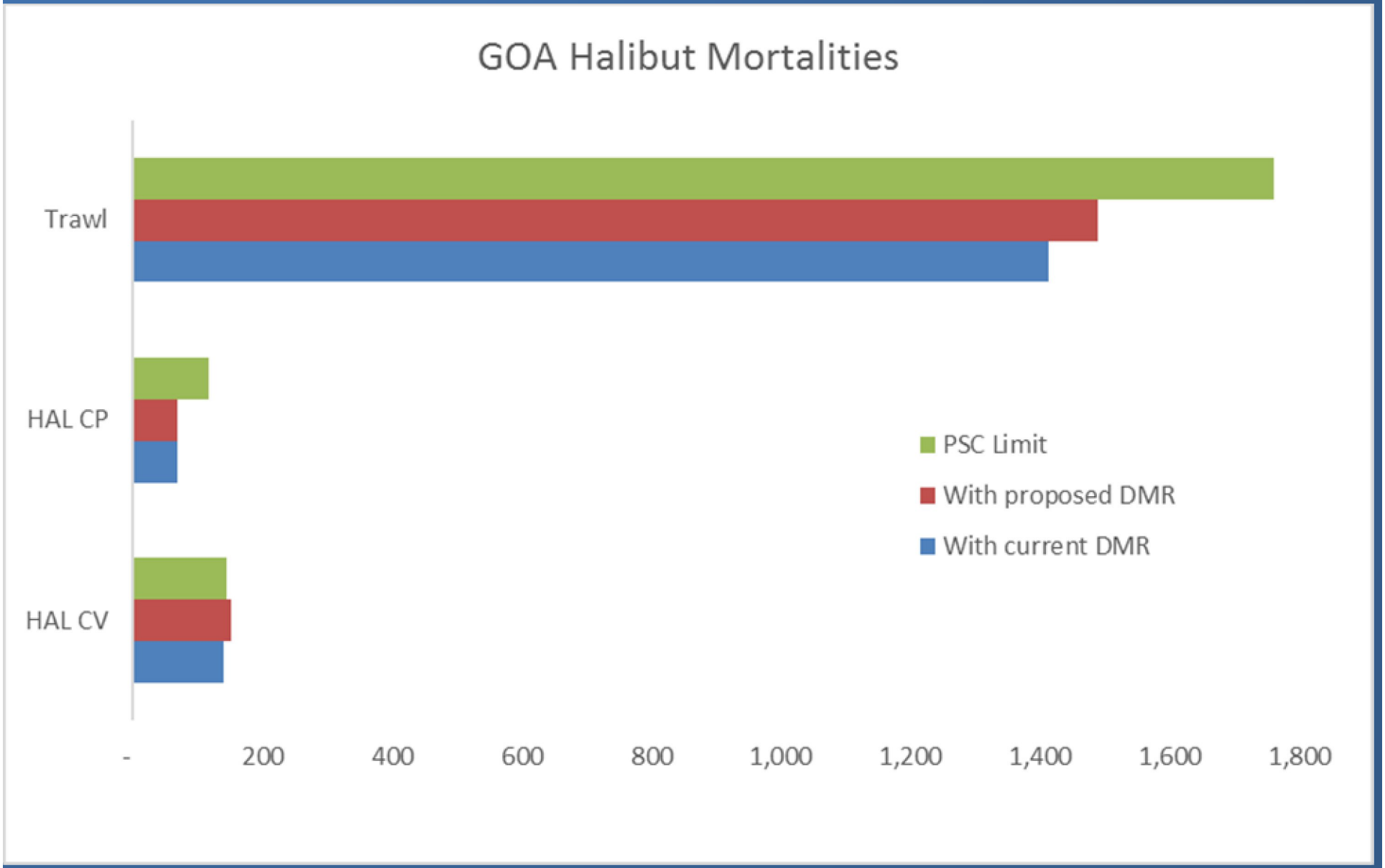

Changes Relative to Current DMRs and PSC Limits

BSAI

BSAI Sector		2016 Halibut mortality: With current DMR	With proposed DMR	Current minus Proposed	2016 Halibut PSC Limit	2015 Halibut mortality: With current DMR	With proposed DMR	Current minus Proposed	2015 Halibut PSC Limit
	CV	0	0	(0)	13	2	2	(1)	15
Hook-and-line Pacific cod	CP	134	119	15	648	289	257	32	760
Non-trawl	CV/CP	2	1	0	49	3	2	1	58
BSAI trawl limited access	CV/CP	537	502	35	745	484	453	31	875
Amendment 80	CP	918	934	(16)	1,745	1,404	1,461	(57)	2,325
CDQ	CV/CP	110	107	4	315	130	124	5	393
Total		1,701	1,663	38	3,515	2,312	2,300	12	4,426
Does not include the 2016 trawl deck sorting Experimental Fishing Permit (EFP) halibut mortality.									
Does not include the 2015 Amendment 80 deck sorting EFP halibut mortality of 232 mt.									

GOA

GOA Sector		2016 Halibut mortality: With current DMR	With proposed DMR	Current minus Proposed	2016 Halibut PSC Limit	2015 Halibut mortality: With current DMR	With proposed DMR	Current minus Proposed	2015 Halibut PSC Limit
	CV	151	181	(30)	129	139	151	(13)	145
Hook-and-line Pacific cod	CP	46	50	(5)	128	69	69	(0)	116
Trawl	CV/CP	1,047	1,042	5	1,706	1,413	1,487	(75)	1,759
Total		1,243	1,273	(30)	1,963	1,620	1,708	(87)	2,020

Summary Points

- New process
  - Consistent with sampling design
  - Operationally based
  - Abbreviated reference timeframe
  - Inter-agency
  - Review at all levels
  - Transparency/Transferability
  - Feedback to Observer Program
  - Ongoing Improvements

Next Steps (Long Term)

1. Resolve database issues with GOA RPP CVs
2. Seasonal variation in DMRs
3. Variance estimation
4. Respond to IPHC basis review
5. Explore differences based on tow time/size within operational groupings
6. Review viabilities for small GOA CP for possible categorization as CV