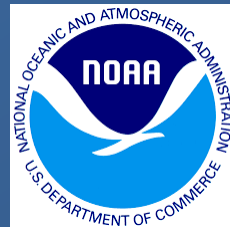


Halibut DMRs



NORTH PACIFIC
Fishery Management Council



INTERNATIONAL PACIFIC



HALIBUT COMMISSION



Council Action

- Recommend Halibut DMRs for 2017-2018

General Approach

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

Current Approach

BSAI

Non-CDQ			CDQ		
Gear	Fishery	DMR (%)	Gear	Fishery	DMR (%)
Trawl	Alaska plaice	66	Trawl		
	Arrowtooth flounder	84			
	Atka mackerel	82		Atka mackerel	82
	Flathead sole	72		Flathead sole	79
	Greenland turbot	82		Greenland turbot	89
	Non-pelagic pollock	84		Non-pelagic pollock	86
	Pelagic pollock	81		Pelagic pollock	90
	Other flatfish	88			
	Other species	63			
	Pacific cod	66		Pacific cod	87
	Rockfish	66		Rockfish	70
	Rock sole	86		Rock sole	86
	Sablefish	66			
	Yellowfin sole	84		Yellowfin sole	85
Hook and line	Greenland turbot	11	Hook and line	Greenland turbot	10
	Other species	9			
	Pacific cod	9		Pacific cod	10
	Rockfish	9			
Pot	Other species	9	Pot		
	Pacific cod	9		Pacific cod	1
				Sablefish	41

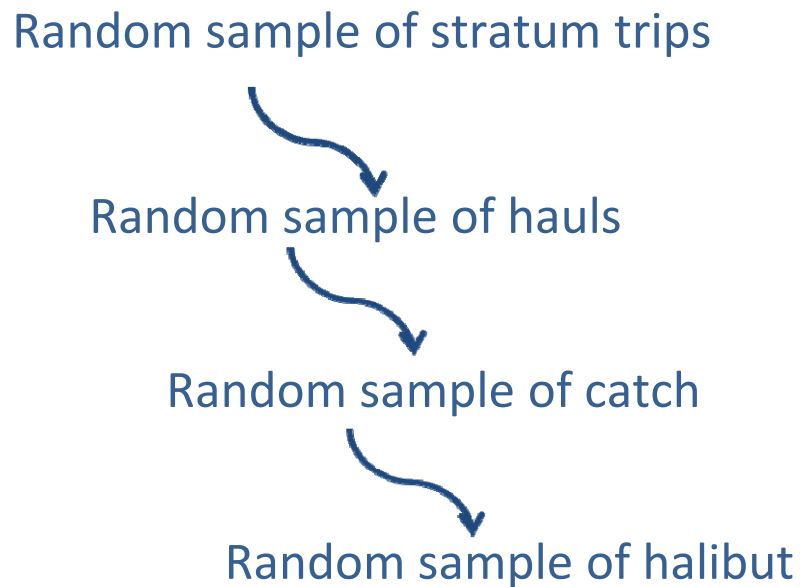
Gear	Fishery	DMR (%)	Gear	Fishery	DMR (%)
Trawl	Arrowtooth flounder	76	Hook and line	Other fisheries ¹	10
	Deepwater flatfish	62		Pacific cod	10
	Flathead sole	67		Rockfish	10
	Non-pelagic pollock	58			
	Other fisheries ¹	62	Pot	Other fisheries ¹	15
	Pacific cod	62		Pacific cod	15
	Pelagic pollock	65			
	Rex sole	72			
	Rockfish	65			
	Sablefish	59			
	Shallow-water flatfish	66			

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

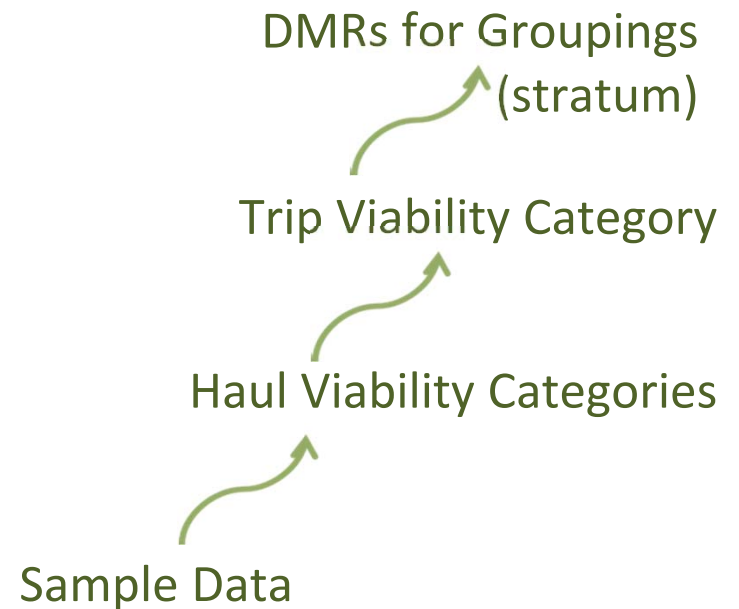
GOA

Hierarchical Design

Sampling



Estimation



Viabilities

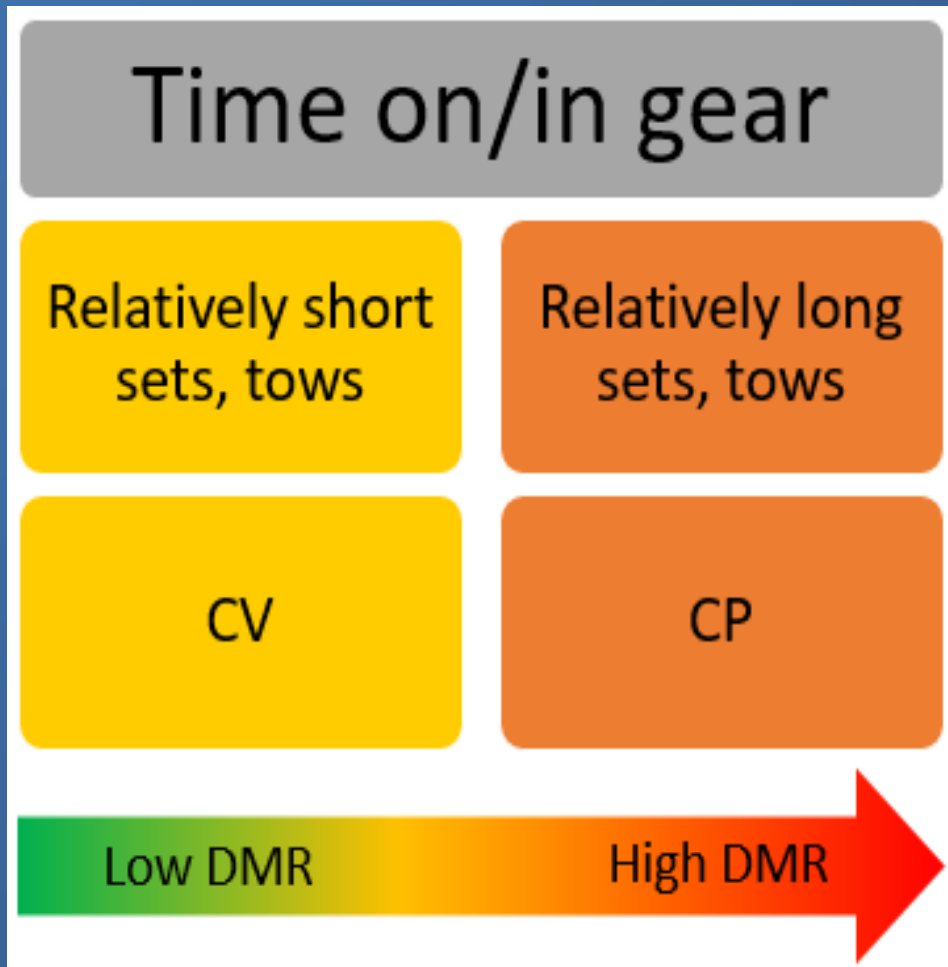
Assumed gear/condition-specific mortality probabilities for halibut in calculating DMRs.

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)

**IPHC Review – Report expected in
2016 RARA (later in Dec)**

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

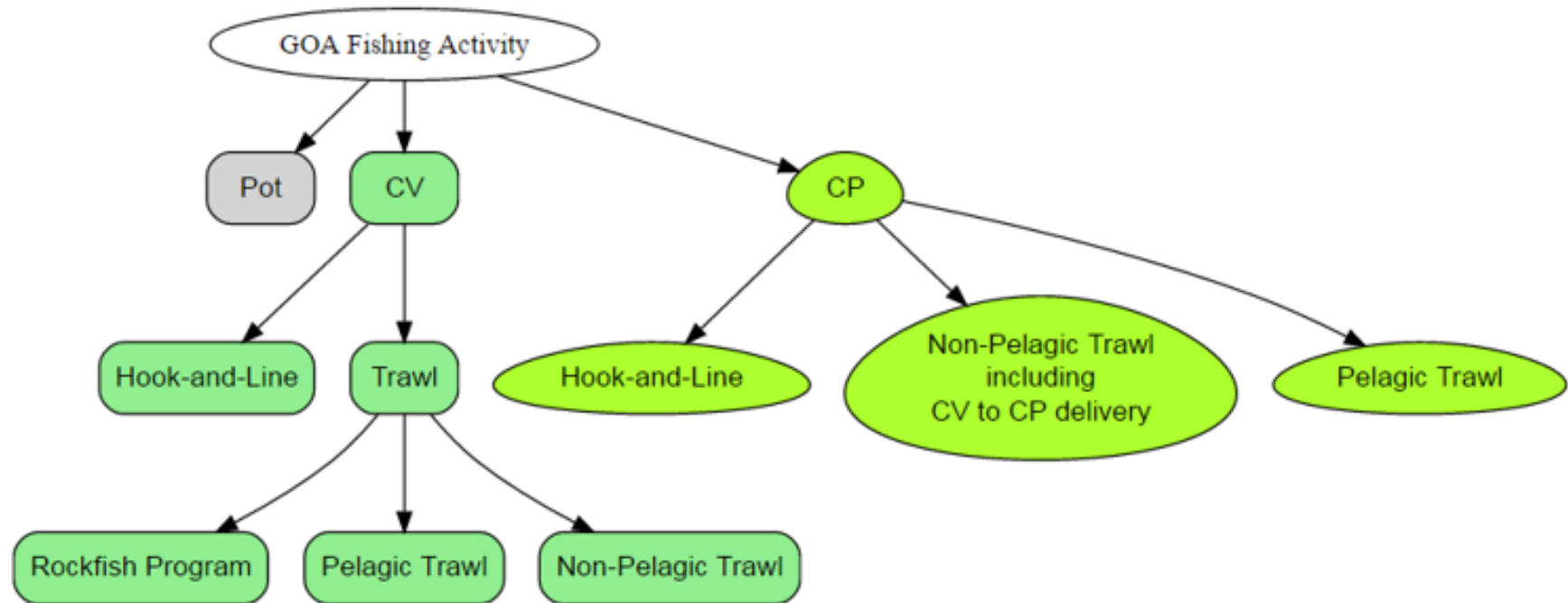
Injury,
asphyxiation
in hold

HAL CV, CP

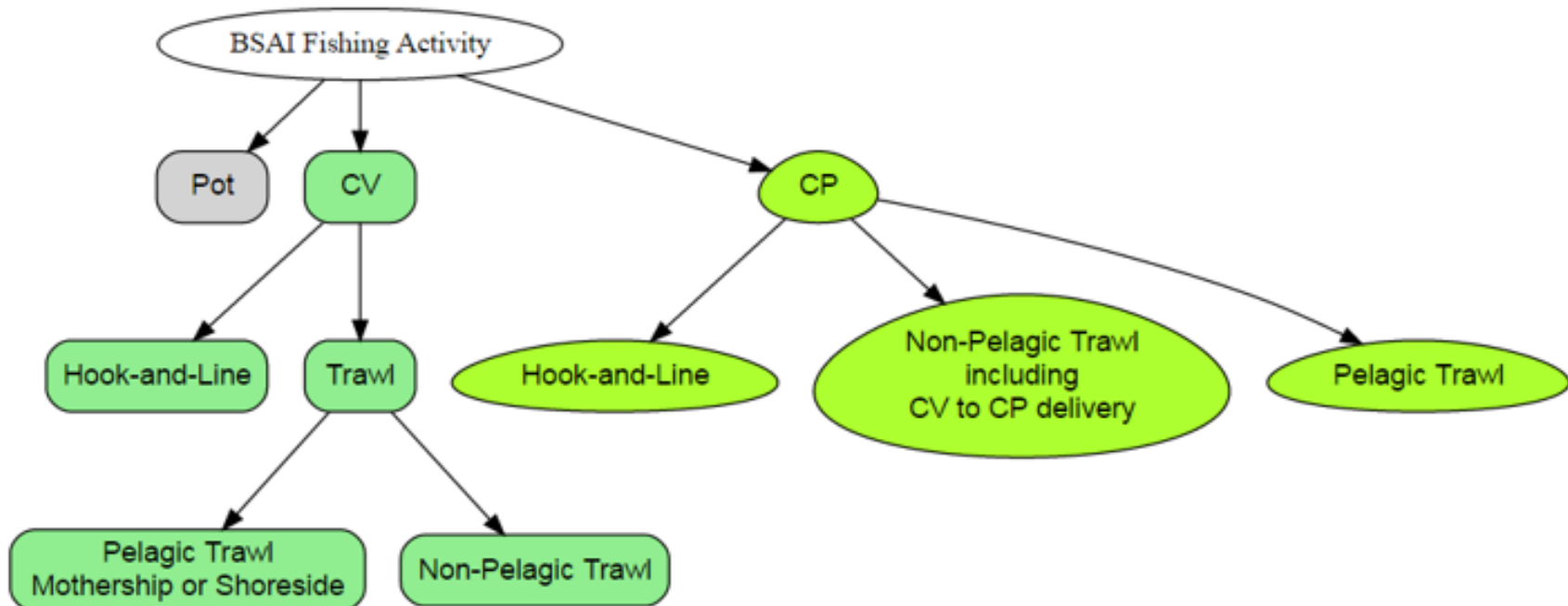
Trawl CP

RPP,
PTR CP

Operational Groupings



Operational Groupings



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			CDQ		
Gear	Fishery	DMR (%)	Gear	Fishery	DMR (%)
Trawl	Alaska plaice	66	Trawl		
	Arrowtooth flounder	84			
	Atka mackerel	82		Atka mackerel	82
	Flathead sole	72		Flathead sole	79
	Greenland turbot	82		Greenland turbot	89
	Non-pelagic pollock	84		Non-pelagic pollock	86
	Pelagic pollock	81		Pelagic pollock	90
	Other flatfish	88			
	Other species	63			
	Pacific cod	66		Pacific cod	87
	Rockfish	66		Rockfish	70
	Rock sole	86		Rock sole	86
	Sablefish	66			
	Yellowfin sole	84		Yellowfin sole	85
Hook and line	Greenland turbot	11	Hook and line	Greenland turbot	10
	Other species	9			
	Pacific cod	9		Pacific cod	10
	Rockfish	9			
Pot	Other species	9	Pot		
	Pacific cod	9		Pacific cod	1
				Sablefish	41

Gear	Fishery	DMR (%)	Gear	Fishery	DMR (%)
Trawl	Arrowtooth flounder	76	Hook and line	Other fisheries ¹	10
	Deepwater flatfish	62		Pacific cod	10
	Flathead sole	67		Rockfish	10
	Non-pelagic pollock	58			
	Other fisheries ¹	62	Pot	Other fisheries ¹	15
	Pacific cod	62		Pacific cod	15
	Pelagic pollock	65			
	Rex sole	72			
	Rockfish	65			
	Sablefish	59			
	Shallow-water flatfish	66			

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

GOA

Results

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%

Results

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%

Results

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%

Results

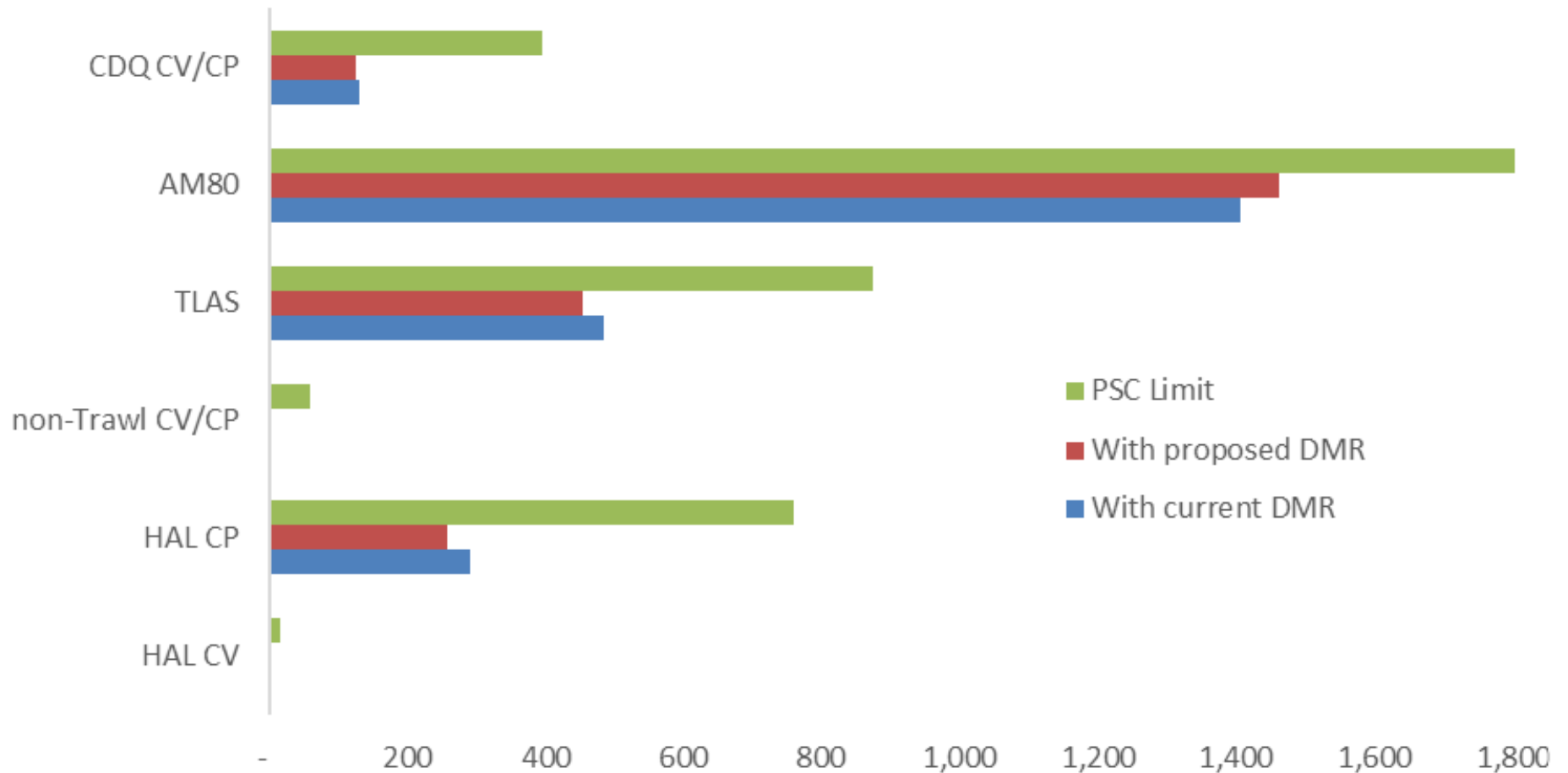
Operational Group				Sample Size (Mean Annual N _{Viabilities})	Estimate DMR?	DMR
Sector	Region	Gear	Target			
CP	BSAI	PTR	pollock	6,051	N	100%
			non-pollock	1	N	100%
		NPT	all	4,306	Y	85%
		HAL	all	11,210	Y	8%
		POT	all	686 ^b	Y	6%
	GOA	PTR	pollock	0	N	100%
			non-pollock	0	N	100%
		NPT ^a	all	493	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%

Results

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%

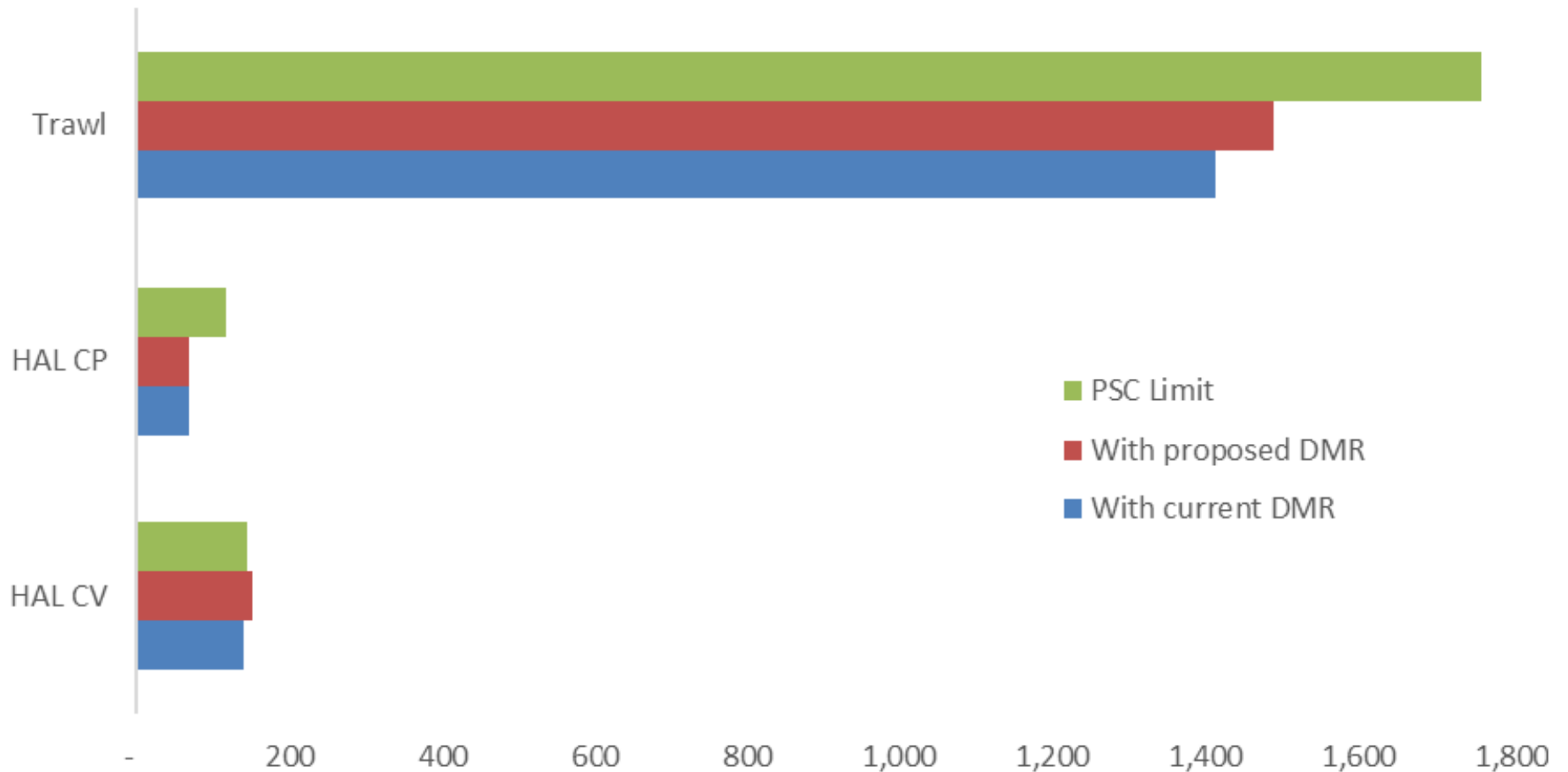
Changes Relative to Current DMRs and PSC Limits

BSAI Halibut Mortalities



Changes Relative to Current DMRs and PSC Limits

GOA Halibut Mortalities



Changes Relative to Current DMRs and PSC Limits

BSAI

BSAI Sector		2016 Halibut mortality			2016 Halibut PSC Limit	2015 Halibut mortality			2015 Halibut PSC Limit
		With current DMR	With proposed DMR	Current minus Proposed		With current DMR	With proposed DMR	Current minus Proposed	
	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			2016 Halibut PSC Limit	2015 Halibut mortality			2015 Halibut PSC Limit
		With current DMR	With proposed DMR	Current minus Proposed		With current DMR	With proposed DMR	Current minus Proposed	
	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 (Short Term)

- ~~1. Revisions, improvements to supporting document~~
- ~~2. Final review by PT in November~~
3. Final review by SSC, AP, Council in December
4. Specification for 2017, 2018

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