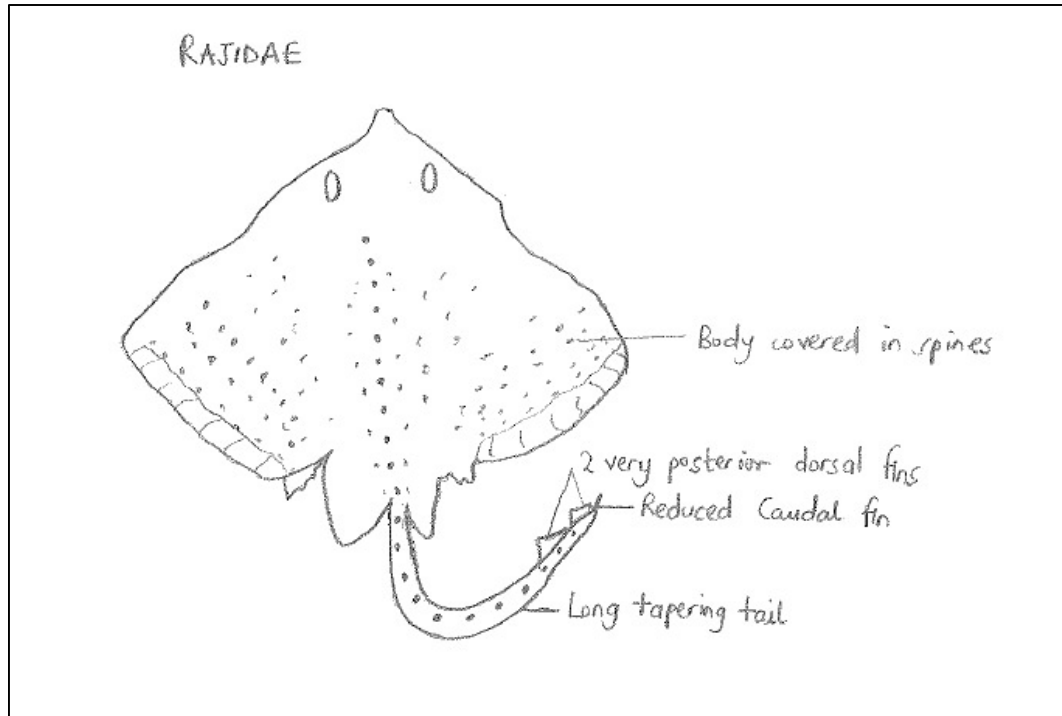


Improved catch estimation for individual species in the BSAI skate complex



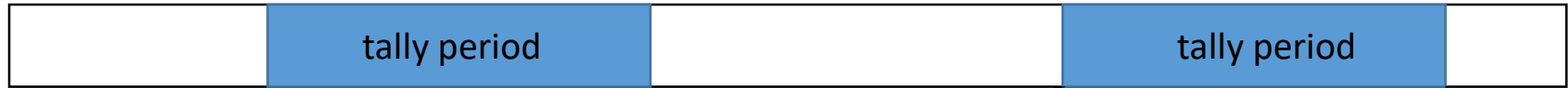
Olav Ormseth, AFSC/REFM
BSAI Plan Team * September 2018

overview

- 1) explanation of problem
- 2) current method for Alaska skate catch estimation
- 3) new method for estimating catch for all skate species
- 4) general results
- 5) Alaska skate results
- 6) conclusions

observer longline sampling

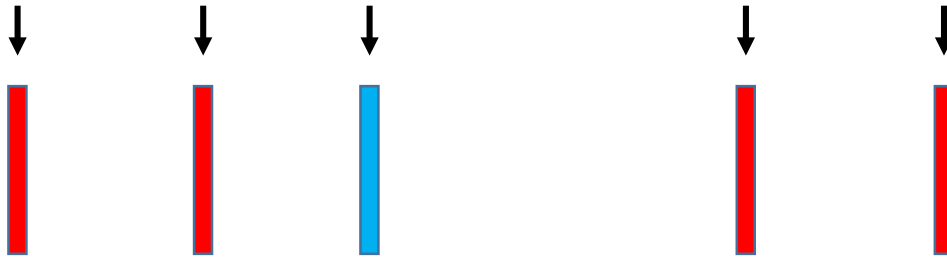
haul



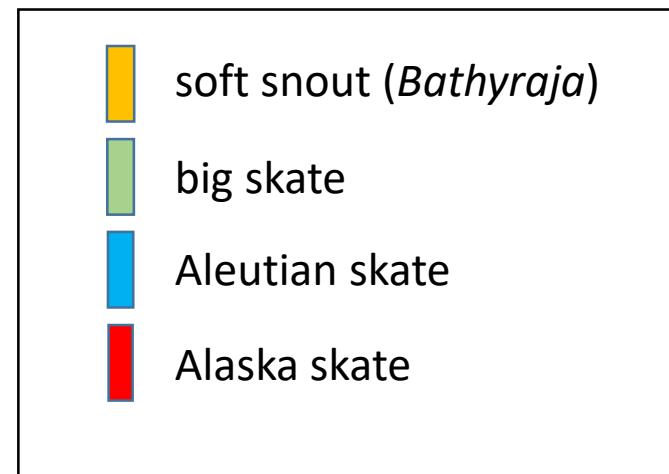
tallied at rail



saved for direct examination



resulting skate species composition for sampling period



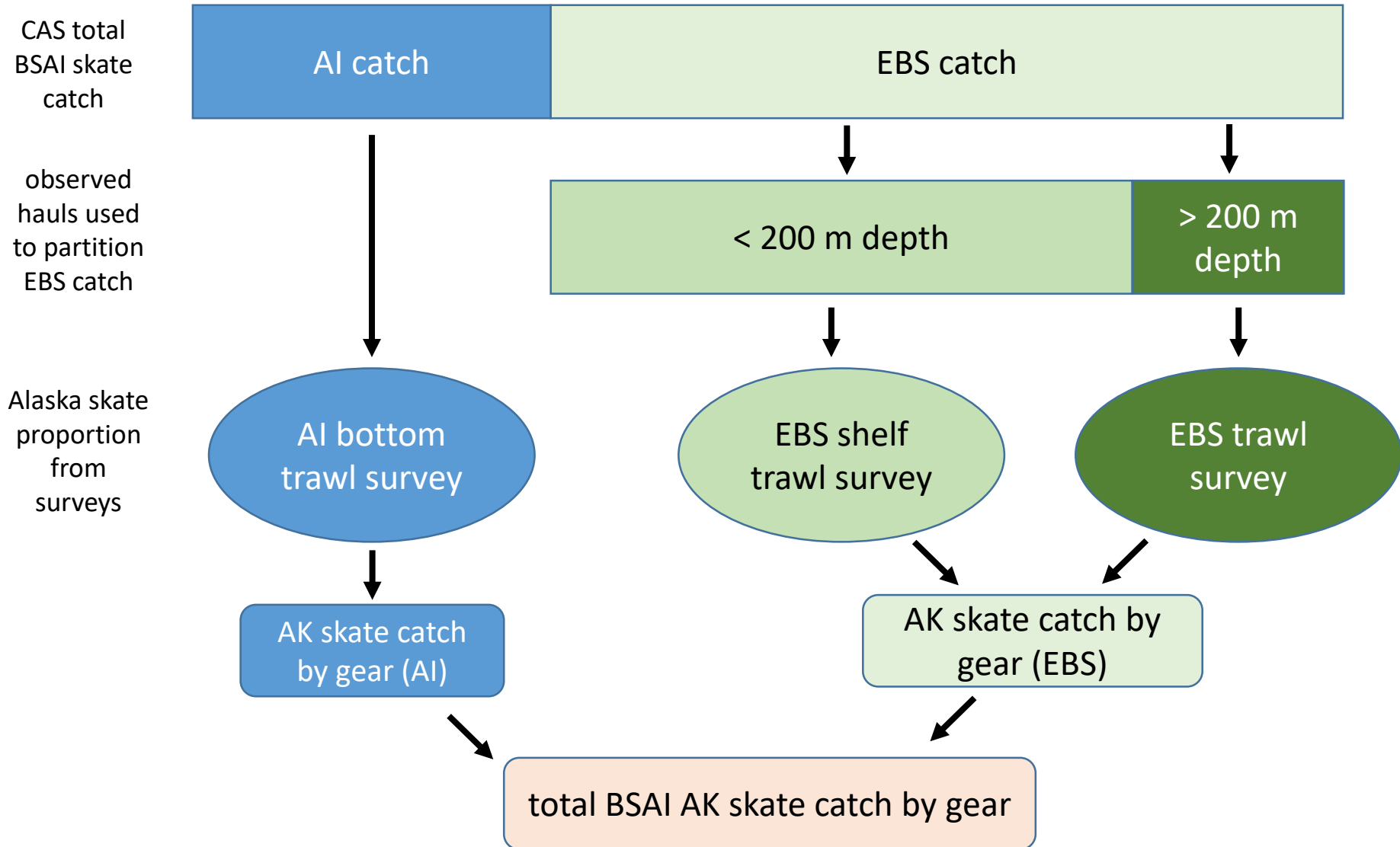
observer skate catch composition

taxonomic group	2014	2015	2016	2017
soft snout skate	0.813	0.830	0.839	0.864
Alaska skate	0.136	0.123	0.119	0.102
Bering skate	0.020	0.021	0.015	0.014
big skate	0.014	0.011	0.010	0.010
Aleutian skate	0.009	0.009	0.006	0.005
stiff snout skate	0.001	0.001	0.004	0.002
whiteblotched skate	0.002	0.002	0.002	0.001
Commander skate	0.002	0.001	0.001	0.001
skate unidentified	0.004	0.000	0.004	0.000
mud skate	0.000	0.000	0.000	0.000
whitebrow skate	0.000	0.000	0.000	0.000
skate egg case unidentified	0.000	0.000	0.000	0.000
longnose skate	0.000	0.000	0.000	0.000
rougtail skate	0.000	0.000	0.000	0.000
deepsea skate	0.000	0.000	0.000	0.000

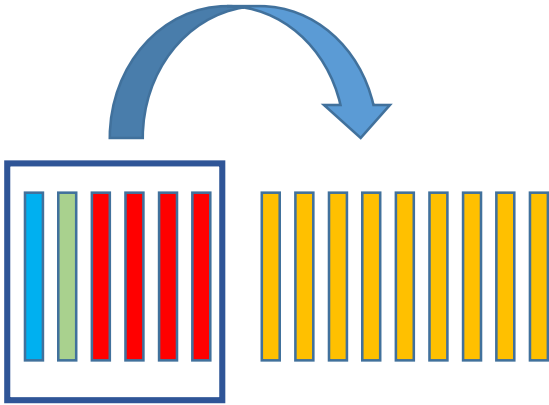
Alaska Region skate catch composition

species code	species name	2011	2012	2013	2014	2015	2016	2017	2018
total catch									
700	other skate	15,945	16,133	17,498	18,957	21,266	22,248	24,316	12,014
703	Alaska skate	6,941	7,357	8,386	7,049	5,593	5,417	6,067	3,843
705	whiteblotched skate	480	503	592	806	652	751	695	532
702	big skate	186	308	240	387	360	445	487	273
704	Aleutian skate	266	520	306	384	379	320	322	220
701	longnose skate	10	5	10	16	16	14	3	17
longline only									
700	other skate	15,268	15,506	17,150	18,656	21,053	22,072	24,113	11,765
703	Alaska skate	2,001	2,563	3,043	3,336	3,228	3,183	3,051	1,365
702	big skate	97	269	208	288	278	305	306	158
705	whiteblotched skate	139	51	134	173	142	104	100	145
704	Aleutian skate	141	322	170	293	243	185	144	139
701	longnose skate	3	2	6	7	13	2	2	14
trawl only									
703	Alaska skate	4,940	4,794	5,343	3,714	2,365	2,234	3,016	2,478
705	whiteblotched skate	341	453	457	633	510	648	595	388
700	other skate	676	627	347	301	213	176	203	249
702	big skate	88	40	32	99	82	140	181	115
704	Aleutian skate	125	198	136	92	136	135	179	81
701	longnose skate	7	2	5	9	3	12	1	3

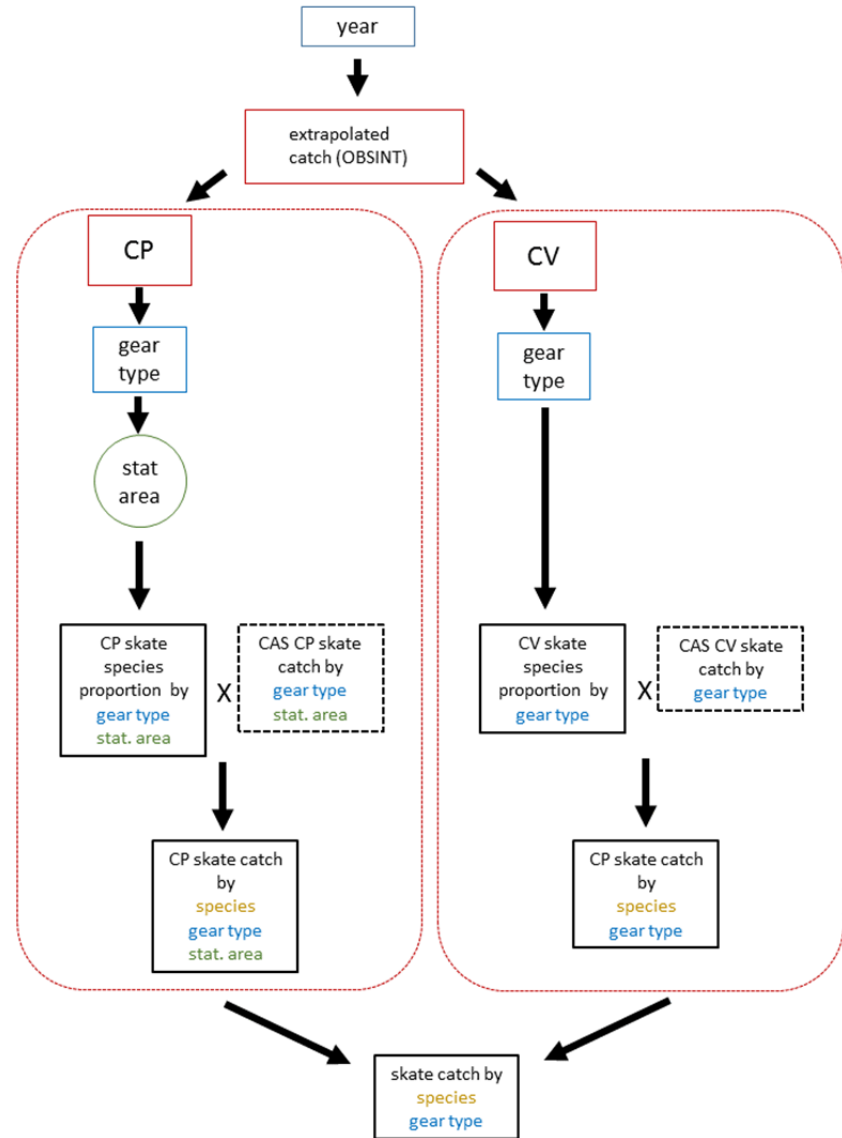
current method for estimating AK skate catches



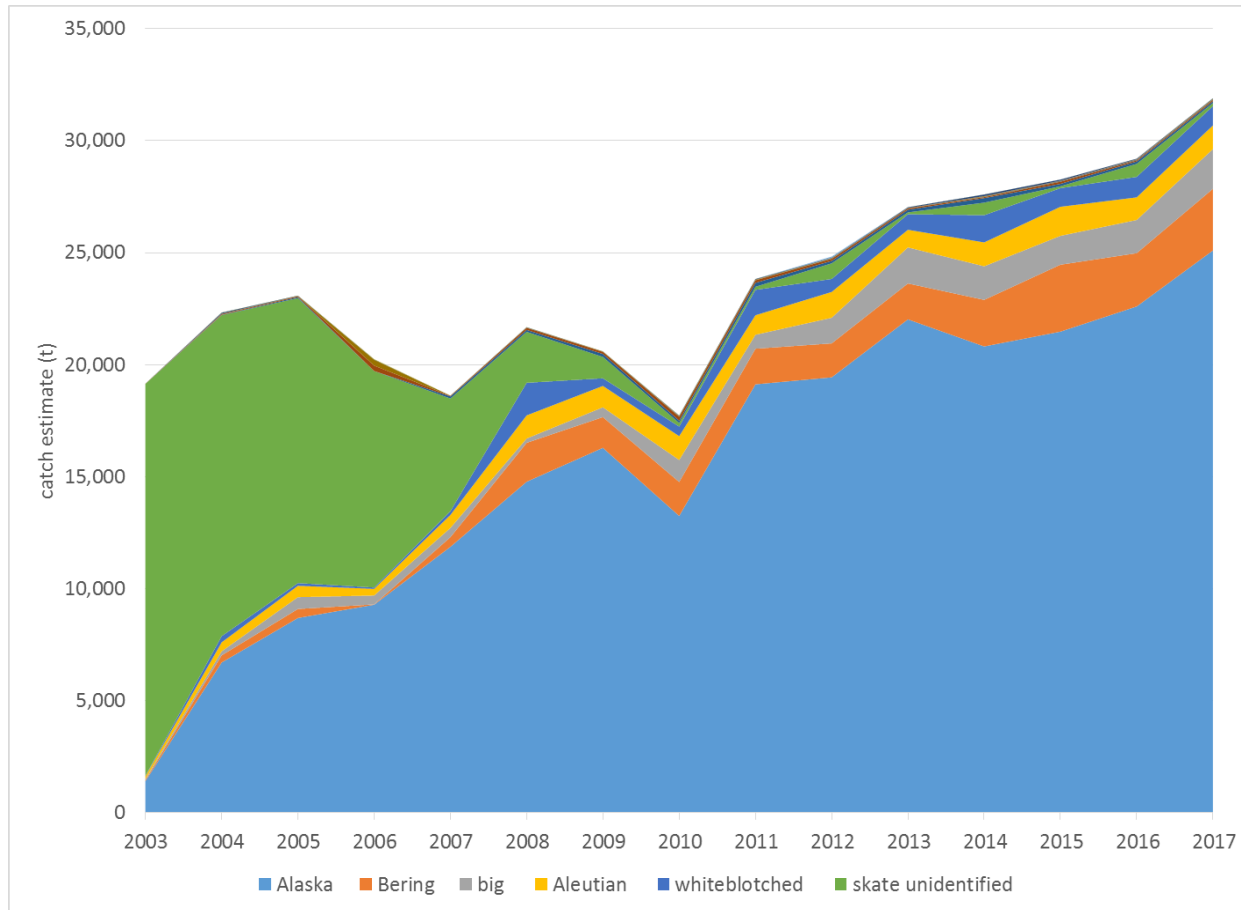
new method for estimating skate catches



- assume examined skates representative of tally period
- disregard “soft snout” and “stiff snout” categories
- identical stratification in CAS & observer species comp

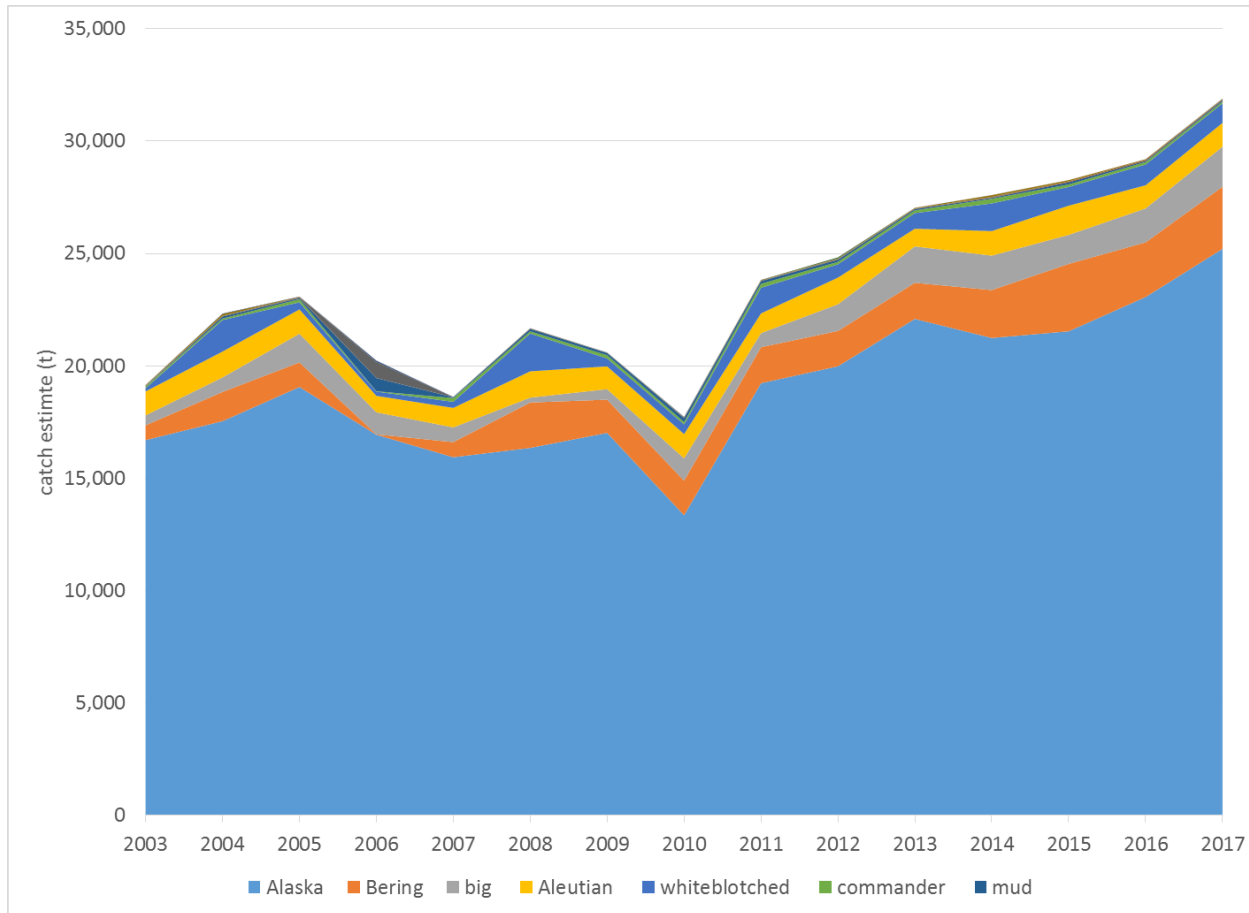


skate catch with “skate unID”



- “unidentified skates” dominate species composition 2003-2006
- observer species ID improved dramatically 2005-2009 (thanks Dwayne!)
- 2010-present almost all examined skates identified to species

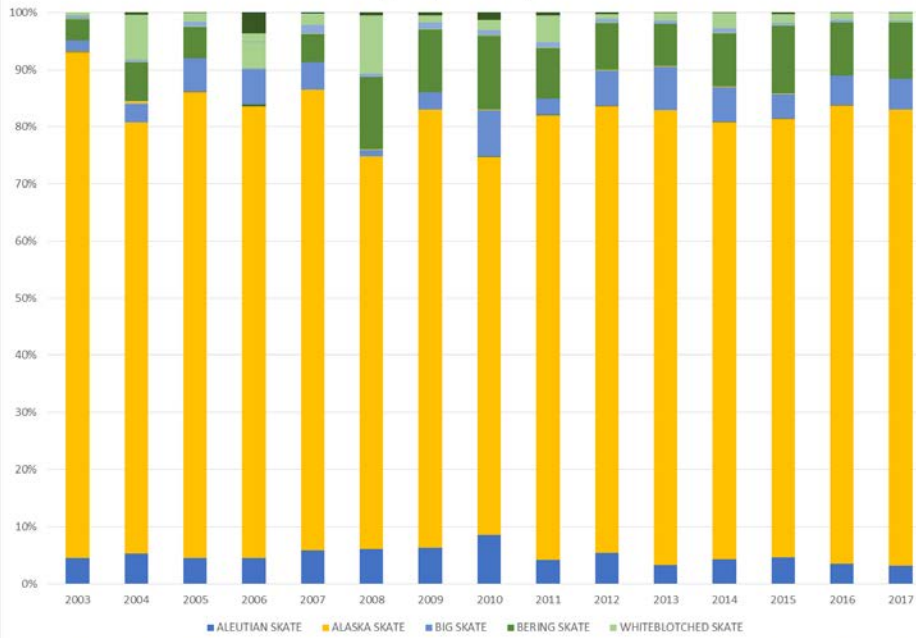
skate catch without “skate unID”



- “unidentified skates” apportioned to species based on that year’s comp
- 2003-2006 uncertain skate species ID, view data with caution

BSAI skate catch composition

longline species composition



longline

- species comp variable but no clear trend
- majority is Alaska skate

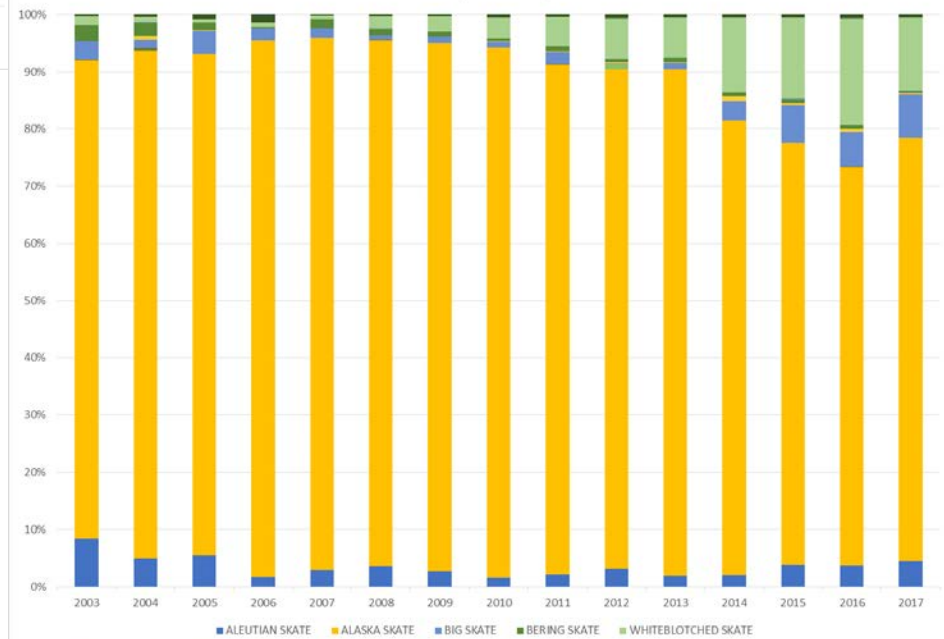


trawl

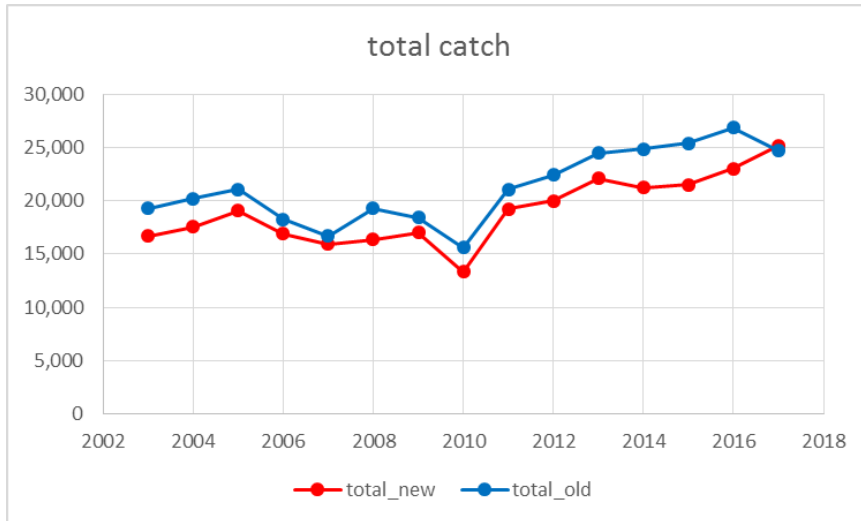
- Recent increases in proportion of whiteblotched skate and big skate
- majority is Alaska skate



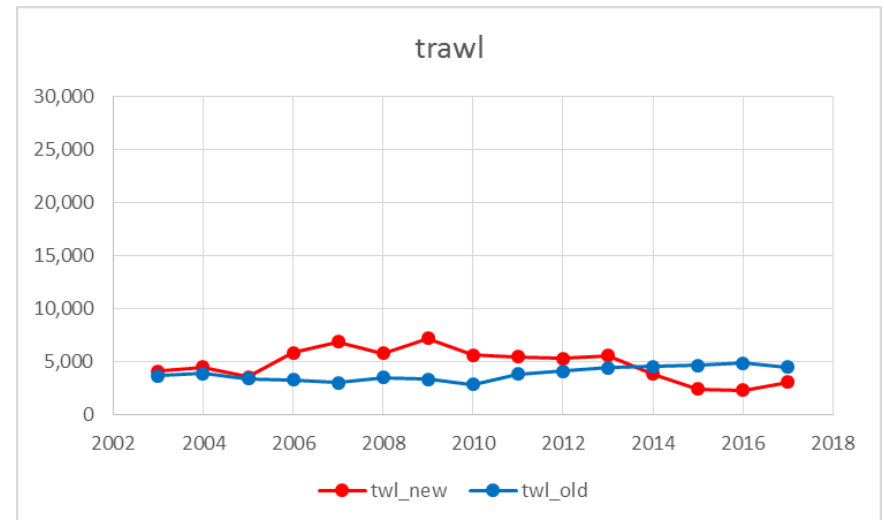
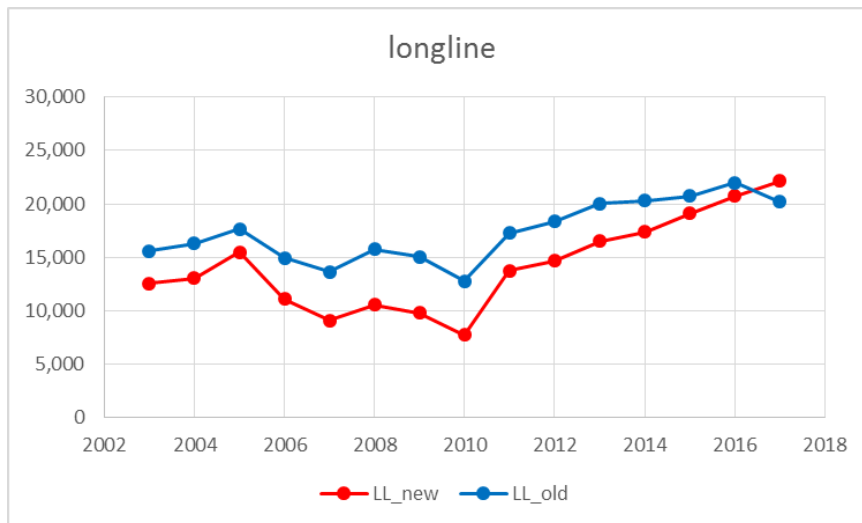
trawl species comp



Alaska skate catch: new vs old



- new total catch estimate slightly lower than existing
- new longline estimate mostly lower than existing
- 2014-2017 change in relationship for trawl- (b/c increases in other species?)



effects on Alaska skate model

	new catch	old catch
total likelihood	202.087	202.119
R_0	24,738	24,685
B_0	334,622	333,800
2016 B	251,012	250,165
2016 longline F	0.049	0.049
2016 trawl F	0.003	0.003

- re-ran 2016 model with new catch estimates 2003-2016
- minimal changes to model results
- Likely b/c new estimates not wildly different and catch is relatively low

conclusions

- 1) The method for skate catch estimation presented here is a **marked improvement** over the existing method, and the new approach should be used for estimating Alaska skate catches used in the population model.
- 2) Although official skate catch is tracked only at the complex level, the species-level catches generated using **the new method will be useful for discerning trends in catches of individual species**. This will be particularly useful for identifying increases in exploitation rates.
- 3) Due to the severe lack of species identification in observer coverage before 2003, pre-2003 estimates of Alaska skate catch should continue to be made using the existing survey-based method. In addition **estimates from 2003-2006, when most skates were not identified to species, should be used with caution**.