

Fish Analysis OCNMS

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Exploratory analysis

These are some analyses based on the 2015-19 survey data for fish. I've done a bunch of processing in the Git repo (file “/GitHub/OCNMS/R scripts/Fish Analysis/Swath Fish.R”).

I first plotted a bunch of species together to look at the fish community. Then I plot individual species by site and time.

During the sampling, the sampling they observed a total of 31 species and species groups. A few of these are redundant, though. Here is how the sampling was distributed across sites and depths among years (underscores indicate sampling depth).

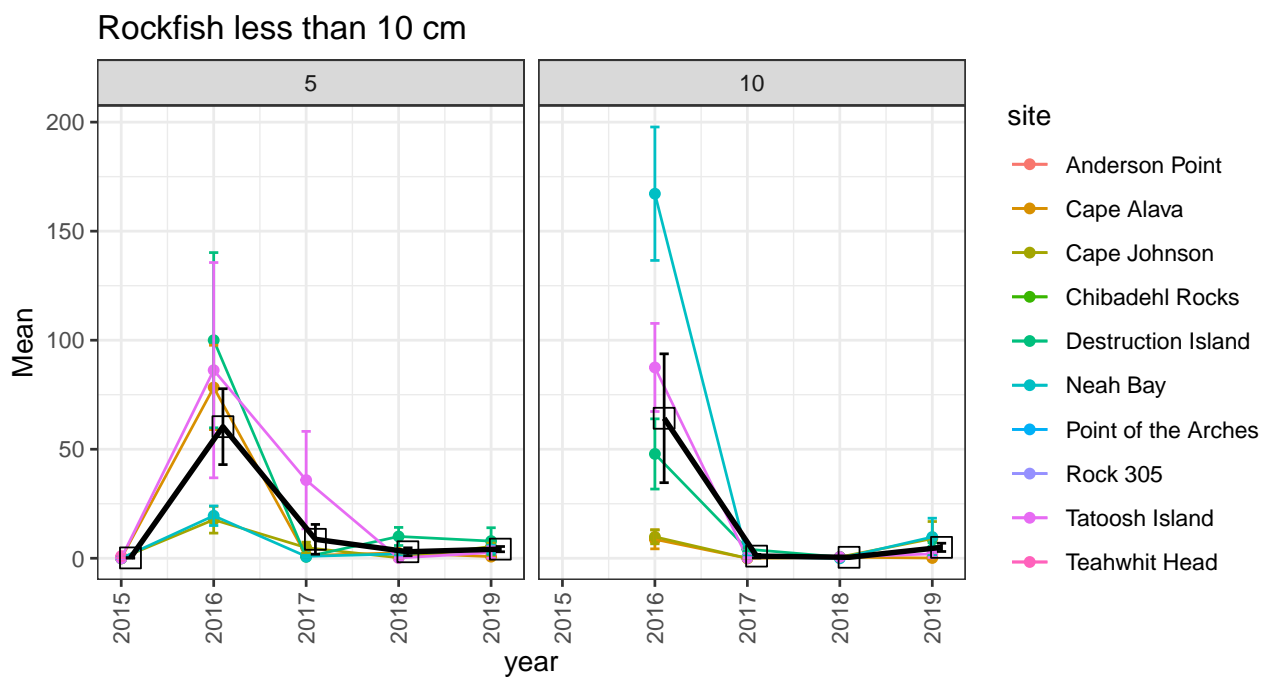
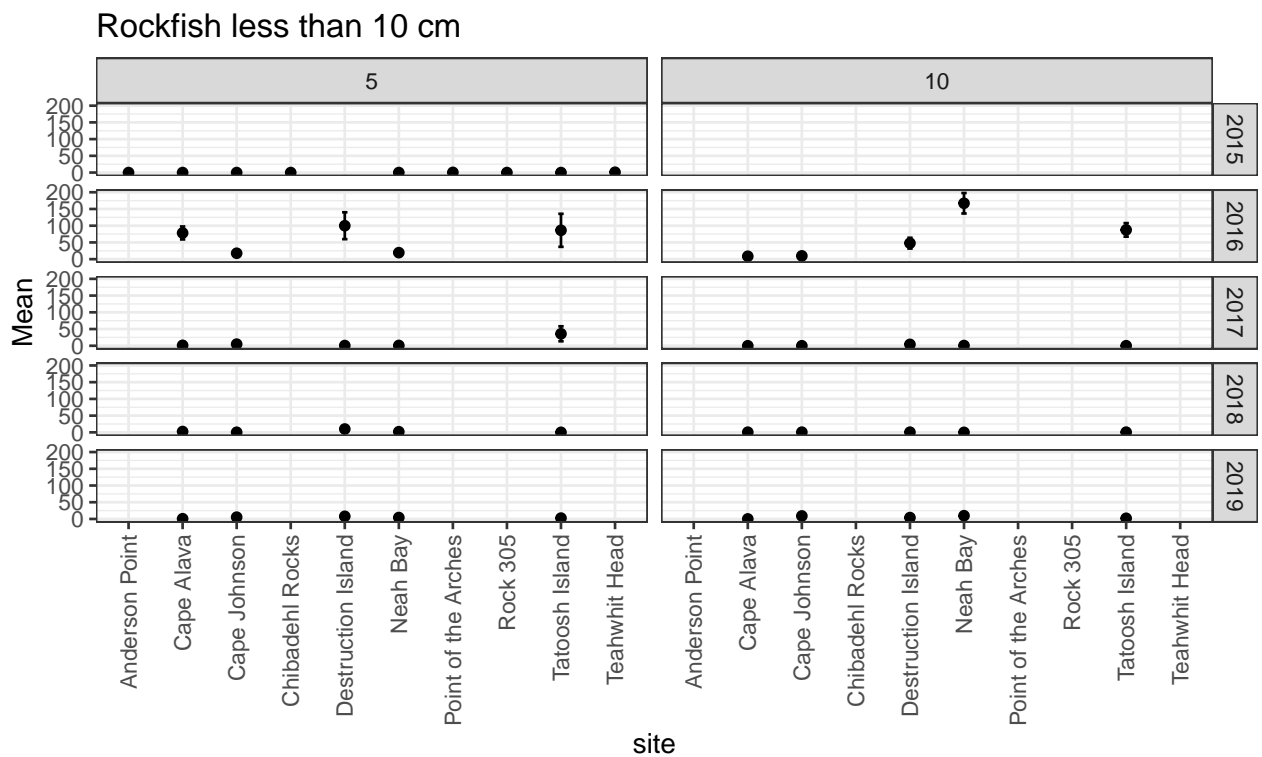
##	site	2015_5	2016_5	2016_10	2017_5	2017_10	2018_5	2018_10
## 1	Destruction Island	0	4	6	8	6	8	7
## 2	Teahwhit Head	4	0	0	0	0	0	0
## 3	Cape Johnson	4	6	6	8	8	8	7
## 4	Rock 305	4	0	0	0	0	0	0
## 5	Cape Alava	4	6	6	8	11	8	8
## 6	Point of the Arches	6	0	0	0	0	0	0
## 7	Anderson Point	4	0	0	0	0	0	0
## 8	Tatoosh Island	4	4	4	6	7	8	7
## 9	Chibadehl Rocks	4	0	0	0	0	0	0
## 10	Neah Bay	7	4	6	8	8	7	8
##	2019_5	2019_10						
## 1	8	8						
## 2	0	0						
## 3	8	7						
## 4	0	0						
## 5	8	8						
## 6	0	0						
## 7	0	0						
## 8	8	6						
## 9	0	0						
## 10	7	8						

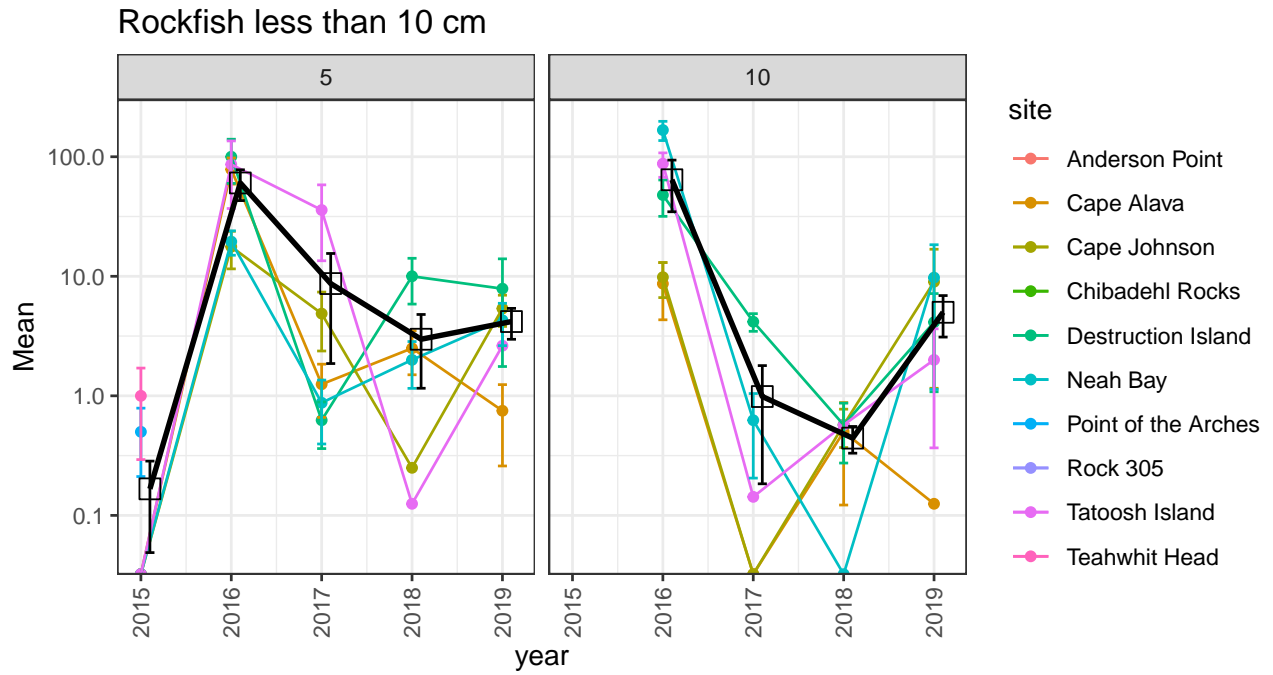
Here is a cheat sheet for species abbreviations and associated common names (ordered by abbreviation):

##	species	common.name
## 1	ARHA	<NA>
## 2	AUFL	Tubesnout
## 3	BAITBALL	Bait, Sardines/Anchovies
## 4	CHNU	Mosshead warbonnet
## 5	CLUP	Sardines and anchovies
## 6	COTT	Sculpins
## 7	EMBI	Surfperches
## 8	EMLA	Striped Surfperch
## 9	ENBI	Buffalo Sculpin
## 10	HEDE	Kelp Greenling
## 11	HEHE	Red Irish Lord
## 12	HELA	Rock Greenling
## 13	HEST	Whitespotted greenling
## 14	JOZO	Longfin Sculpin
## 15	MYOPOL	<NA>
## 16	NO_ORG	No organisms present in this sample
## 17	OPEL	Lingcod
## 18	OXPI	Painted Greenling
## 19	RHNI	Blackeye Goby
## 20	RHVA	Pile perch
## 21	RIMU	Kelp clingfish
## 22	RYOY	Rockfish young of the year, unidentified sp.
## 23	SCMA	cabezon
## 24	SEBYTy	black and yellowtail rockfish YOY complex
## 25	SECA	copper rockfish
## 26	SEFL	Yellowtail rockfish
## 27	SEMA	Quillback rockfish
## 28	SEME	black rockfish
## 29	SEMY	blue rockfish
## 30	SENE	china rockfish
## 31	SEPIy	canary rockfish YOY
## 32	SYGI	<NA>

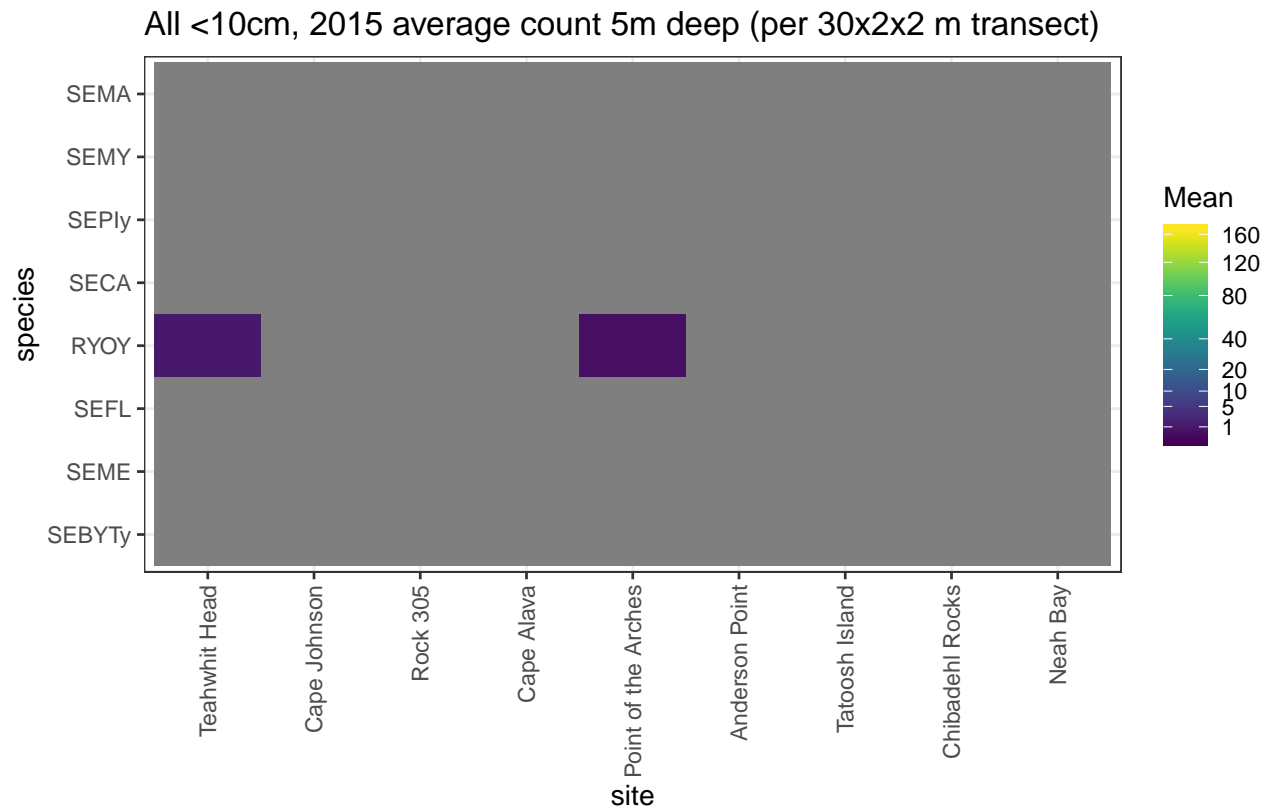
Small Rockfish (<10cm)

Here are the rockfish plotted in a couple different ways. This is for all small rockfish combined. I have included all transects here, not just those with visibility > 2m. See the end for information about the transects and visibility. In the bottom panel, the black boxes and error bars are simple the among site means and SE using the site means. For all panels, the 5 vs. 10 columns indicate water depth category.

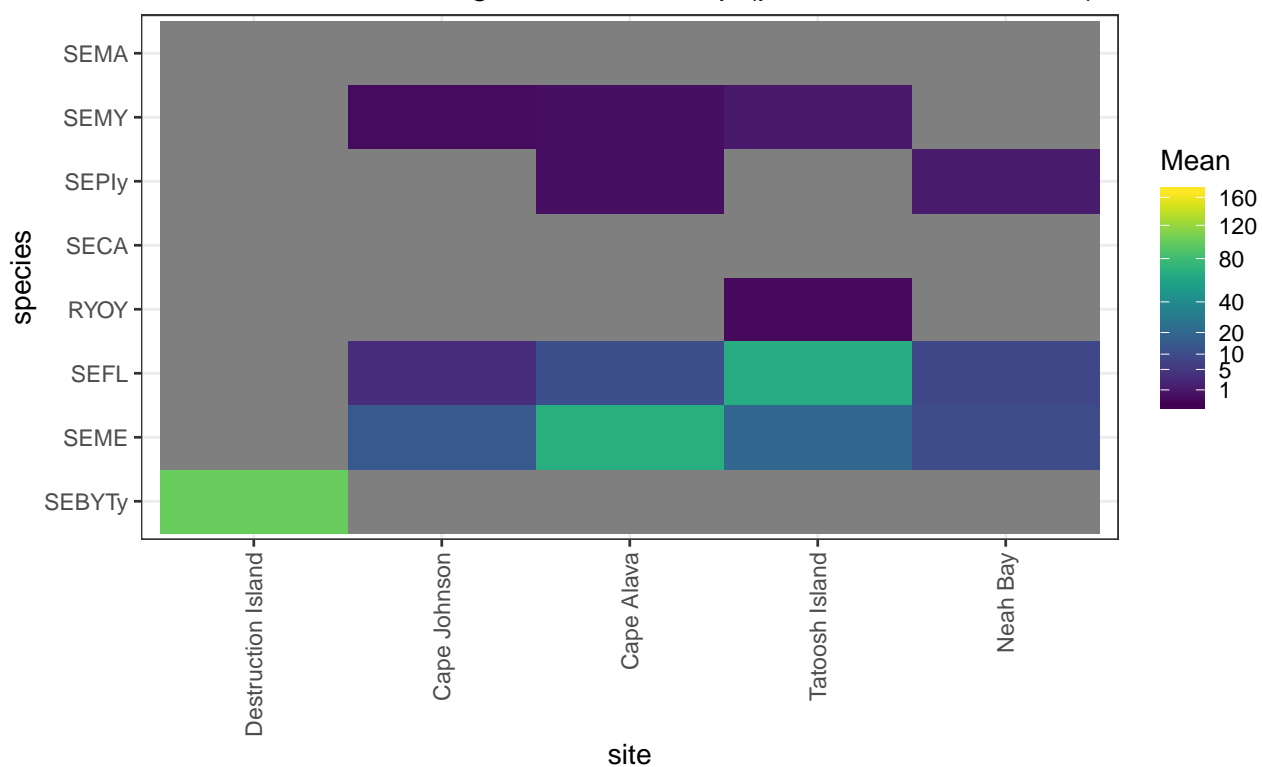




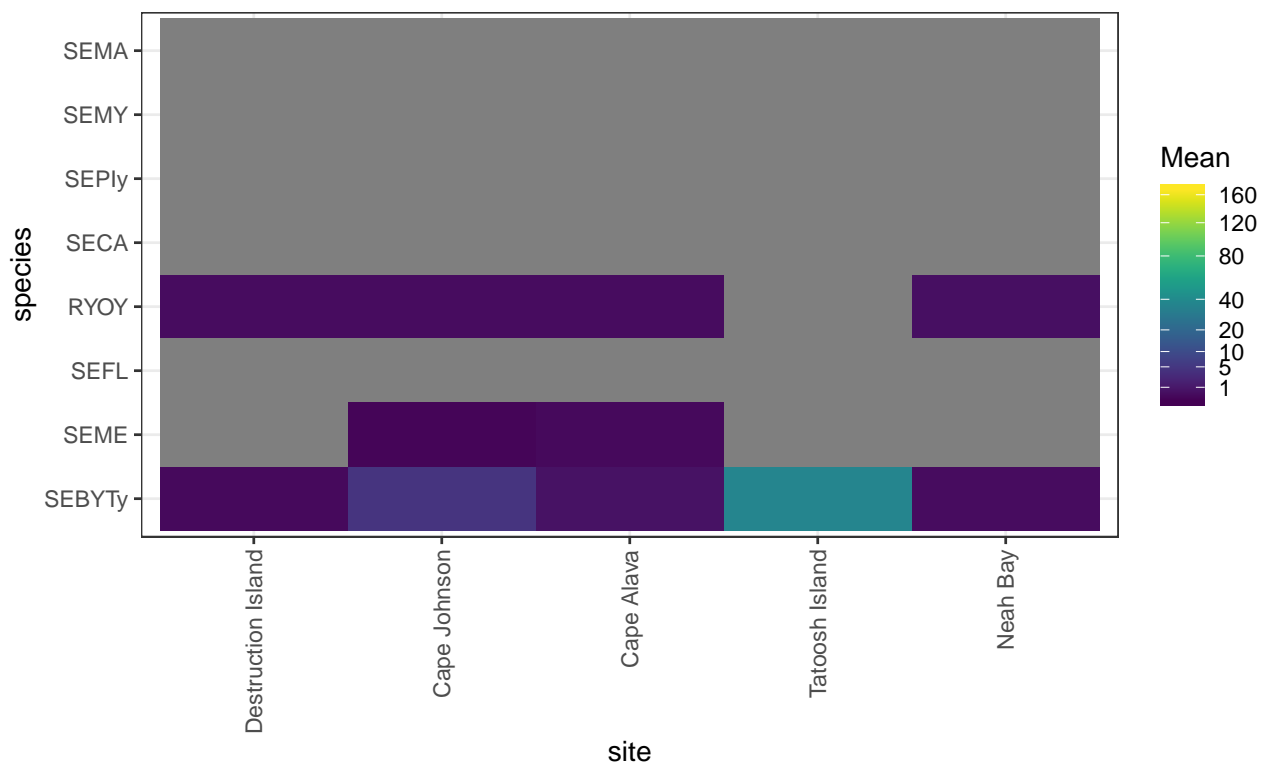
Here is why I didn't make plots of species by sub-types. Different levels of taxonomic specificity are available for different observers and years.



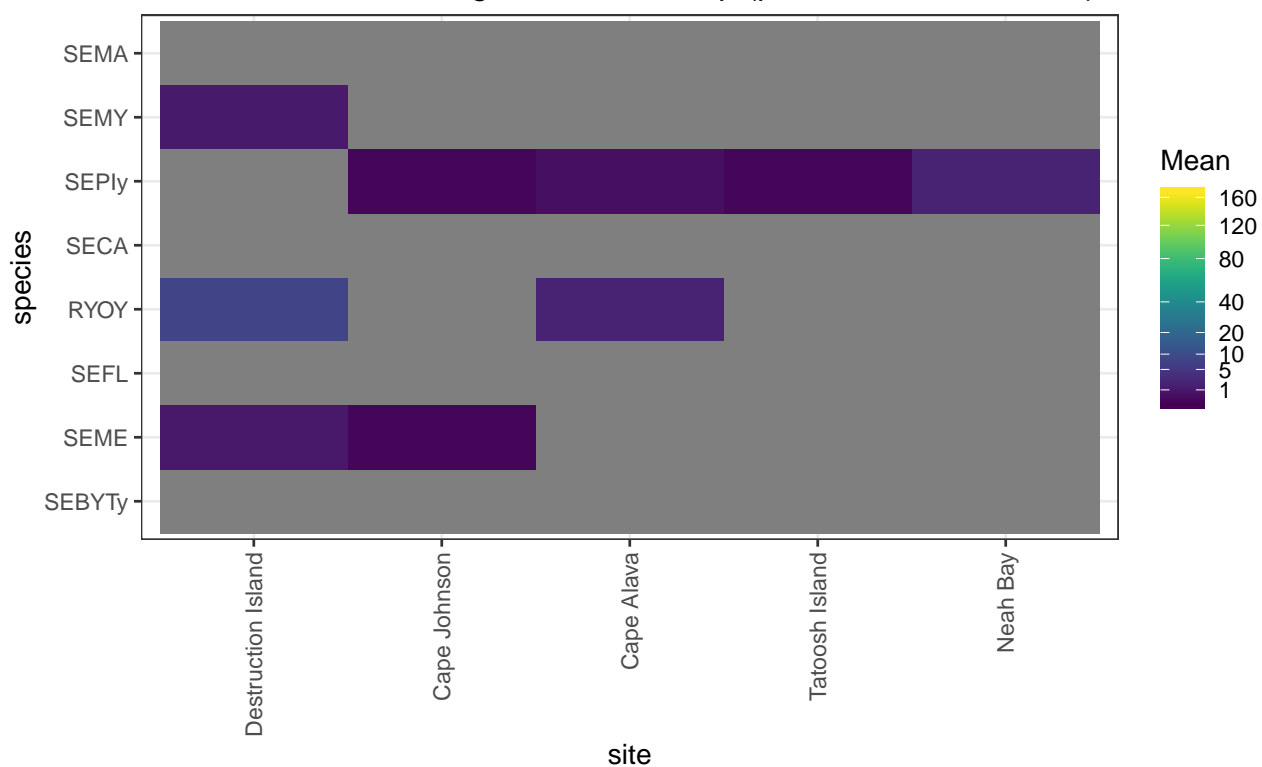
All <10cm, 2016 average count 5m deep (per 30x2x2 m transect)



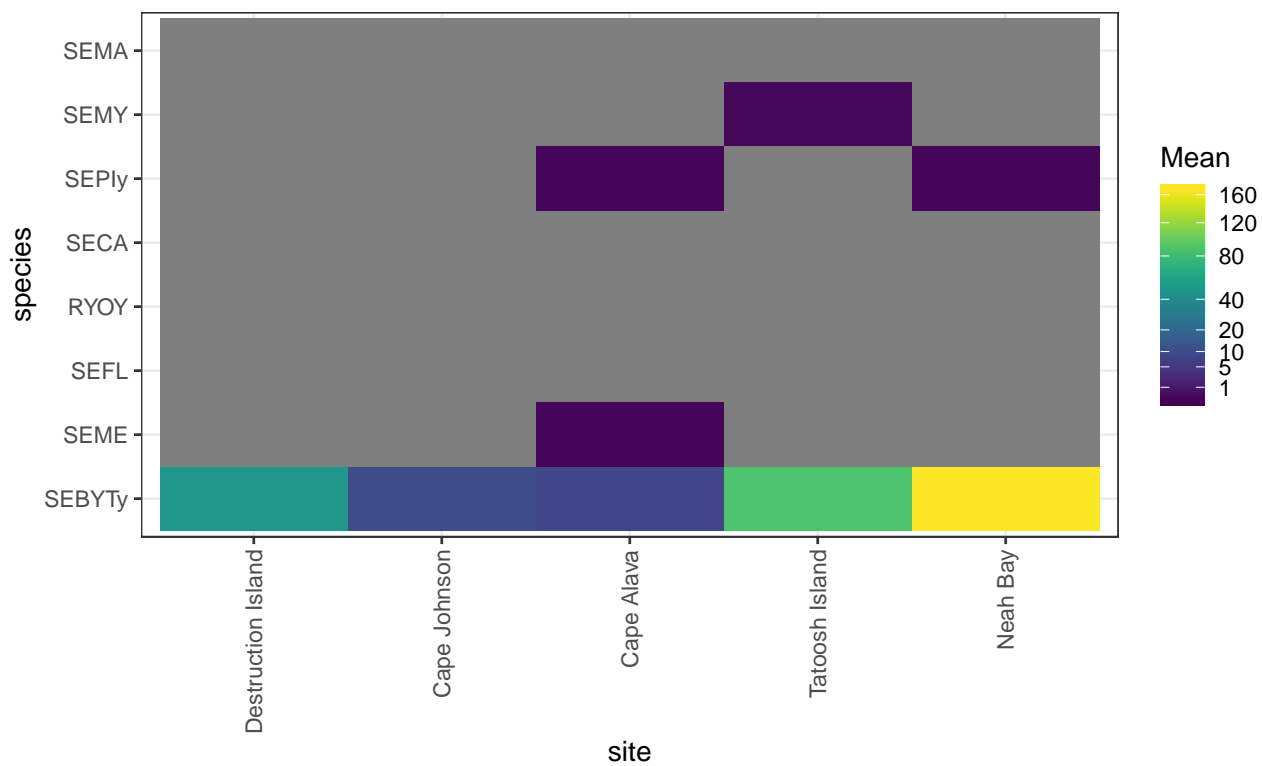
All <10cm, 2017 average count 5m deep (per 30x2x2 m transect)



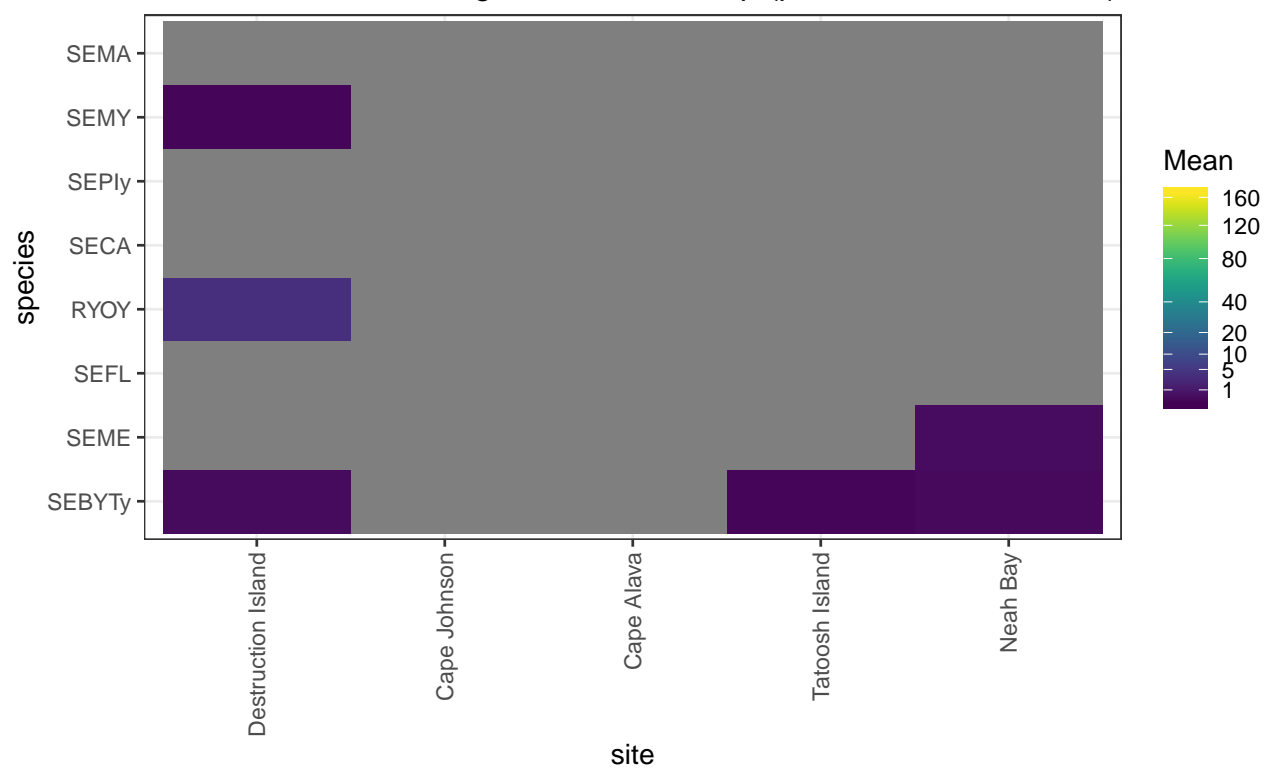
All <10cm, 2018 average count 5m deep (per 30x2x2 m transect)



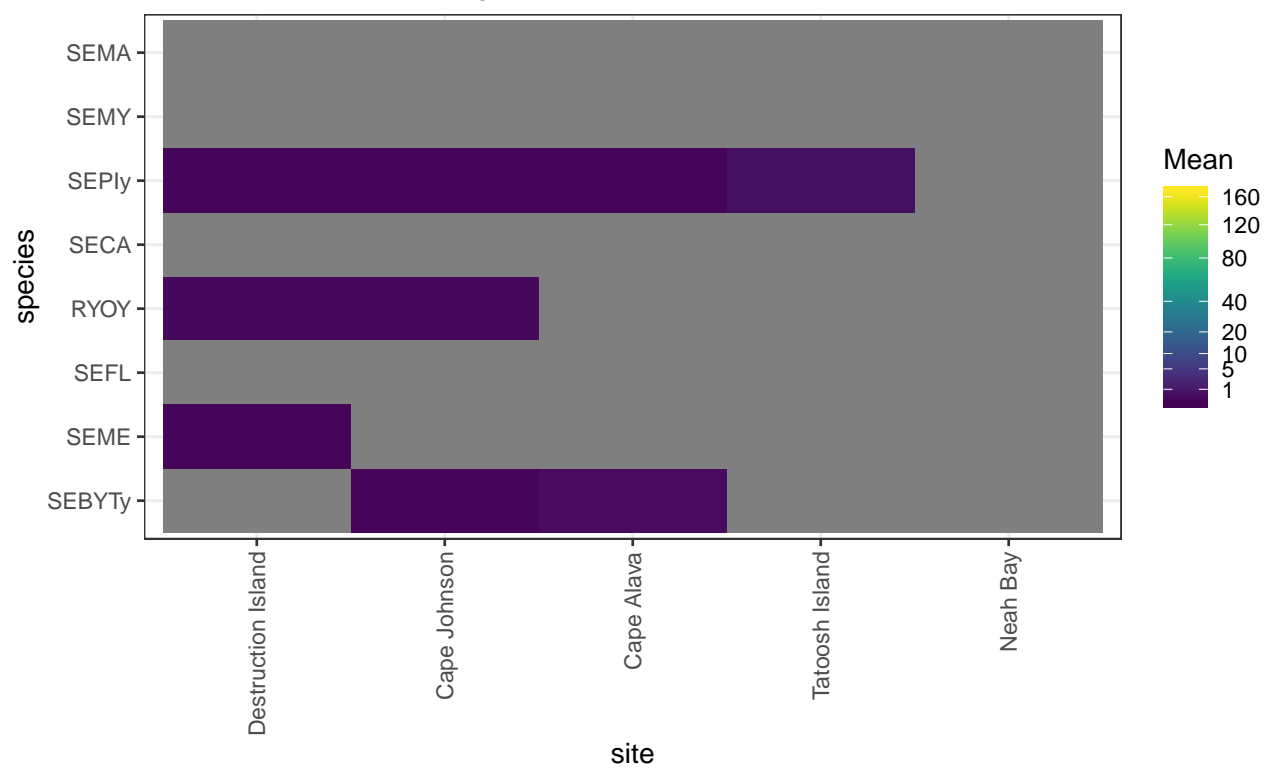
All <10cm, 2016 average count 10m deep (per 30x2x2 m transect)



All <10cm, 2017 average count 10m deep (per 30x2x2 m transect)

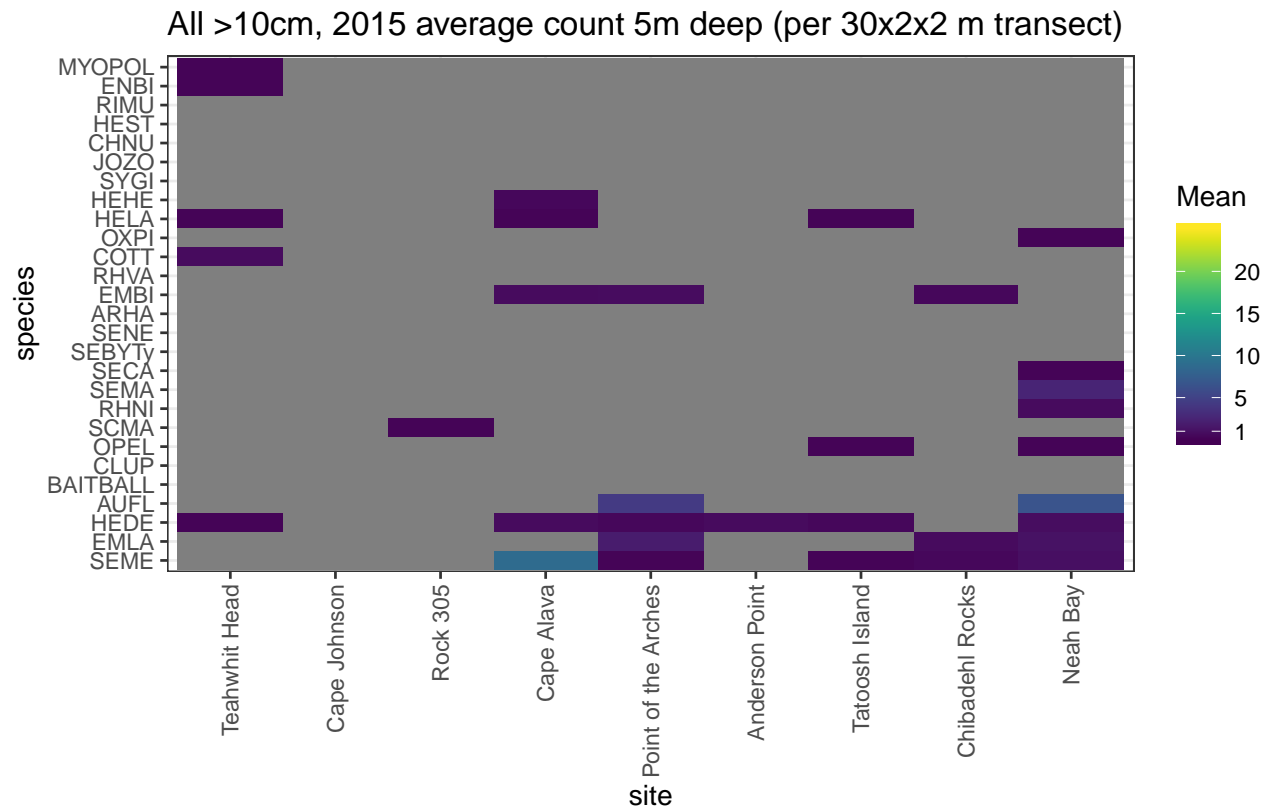


All <10cm, 2018 average count 10m deep (per 30x2x2 m transect)

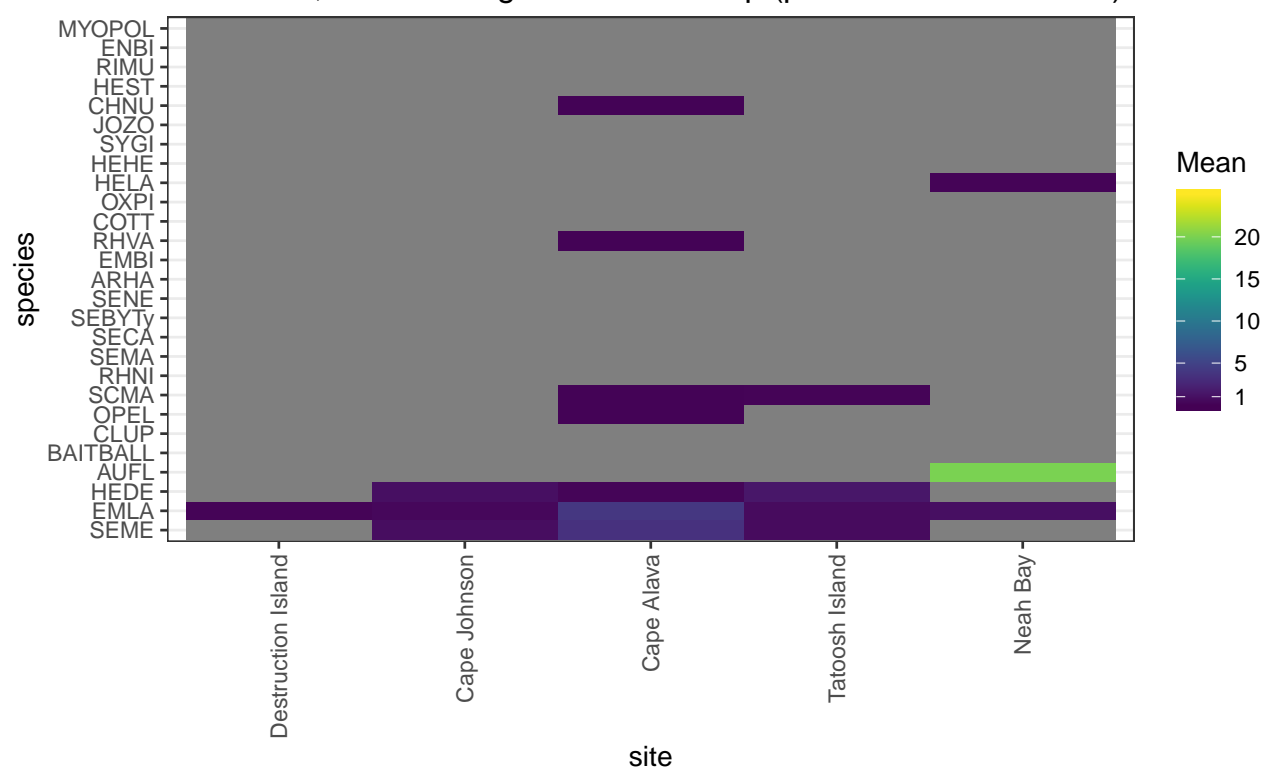


All Other Fish Except small rockfish

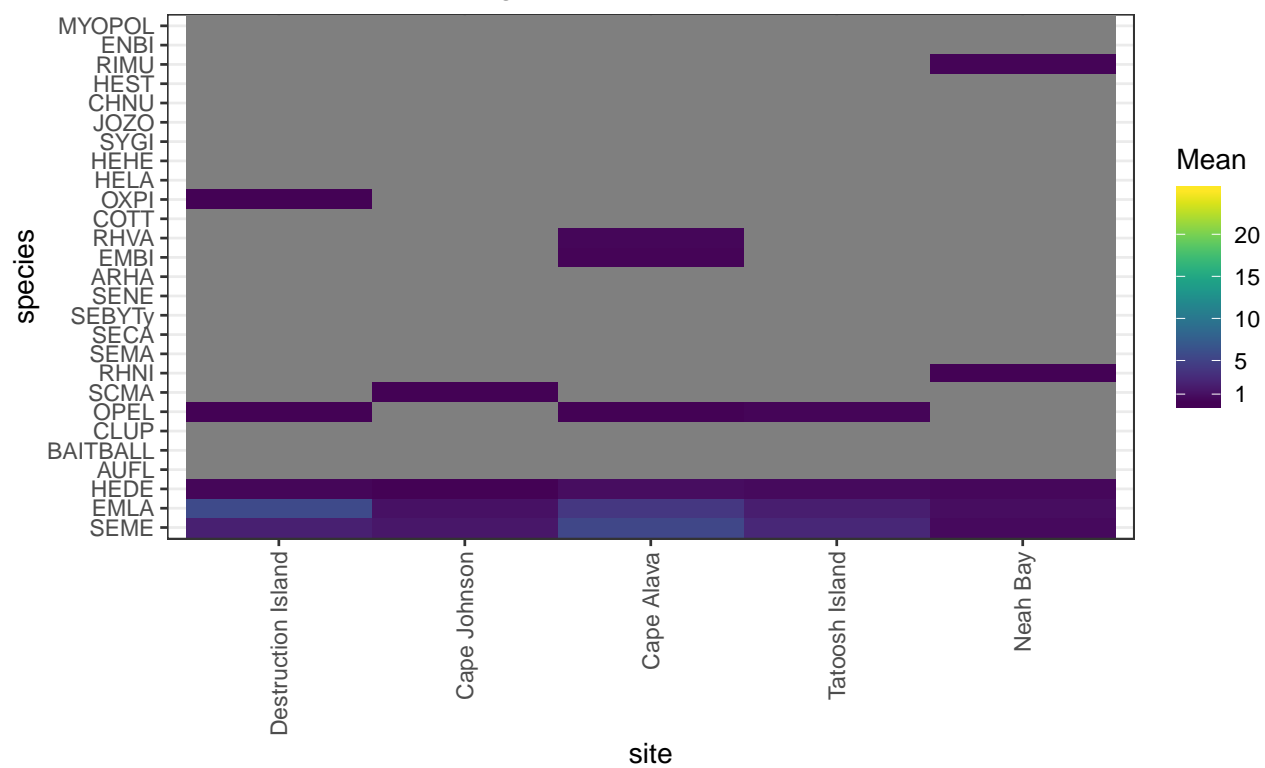
Here, here are the fish > 10 cm. In general, you will notice a lot of grey in the figures. This means most species were not observed in any transect at that site-year combination.



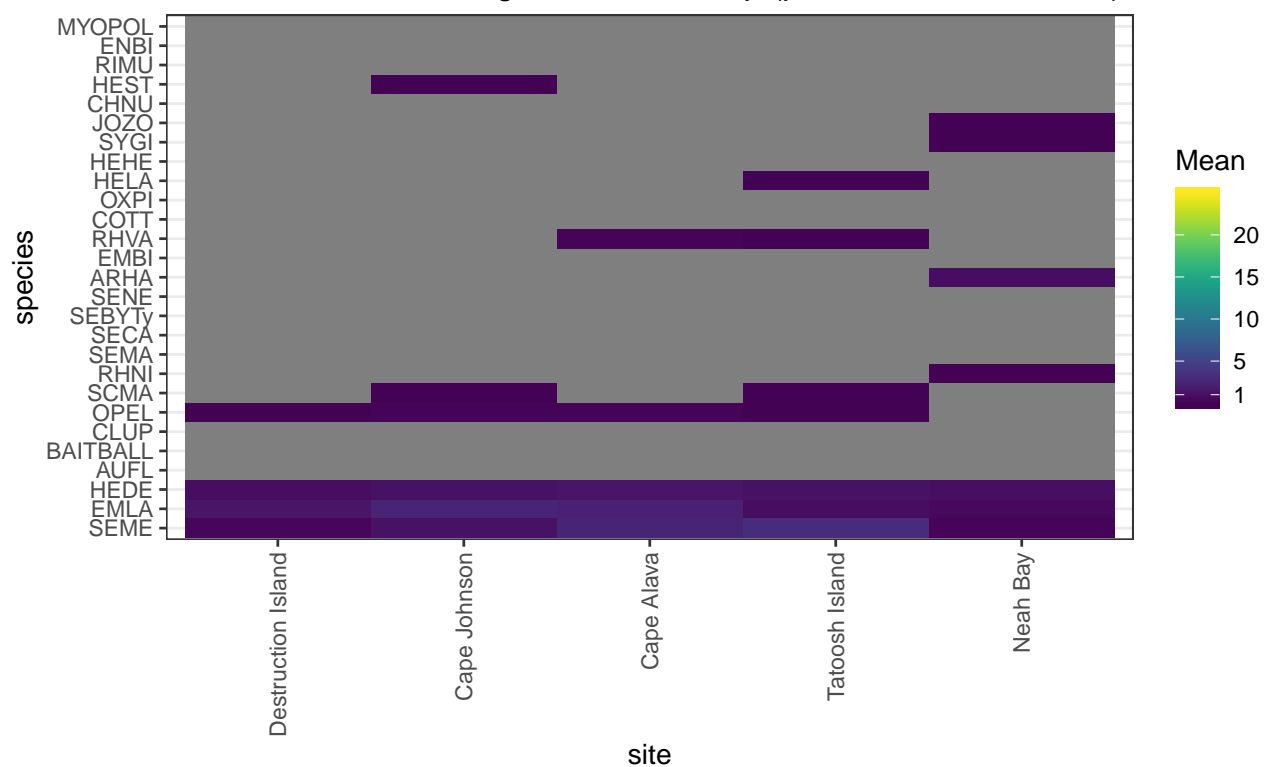
All >10cm, 2016 average count 5m deep (per 30x2x2 m transect)



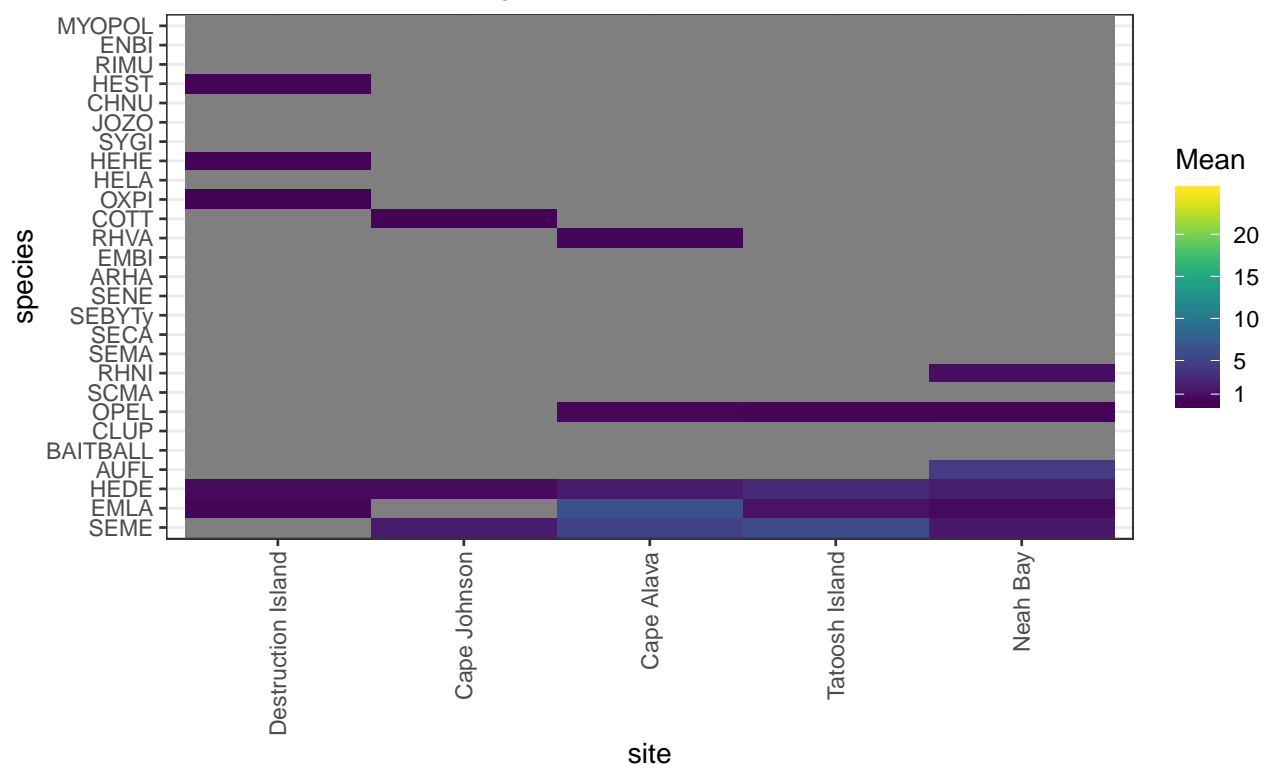
All >10cm, 2017 average count 5m deep (per 30x2x2 m transect)



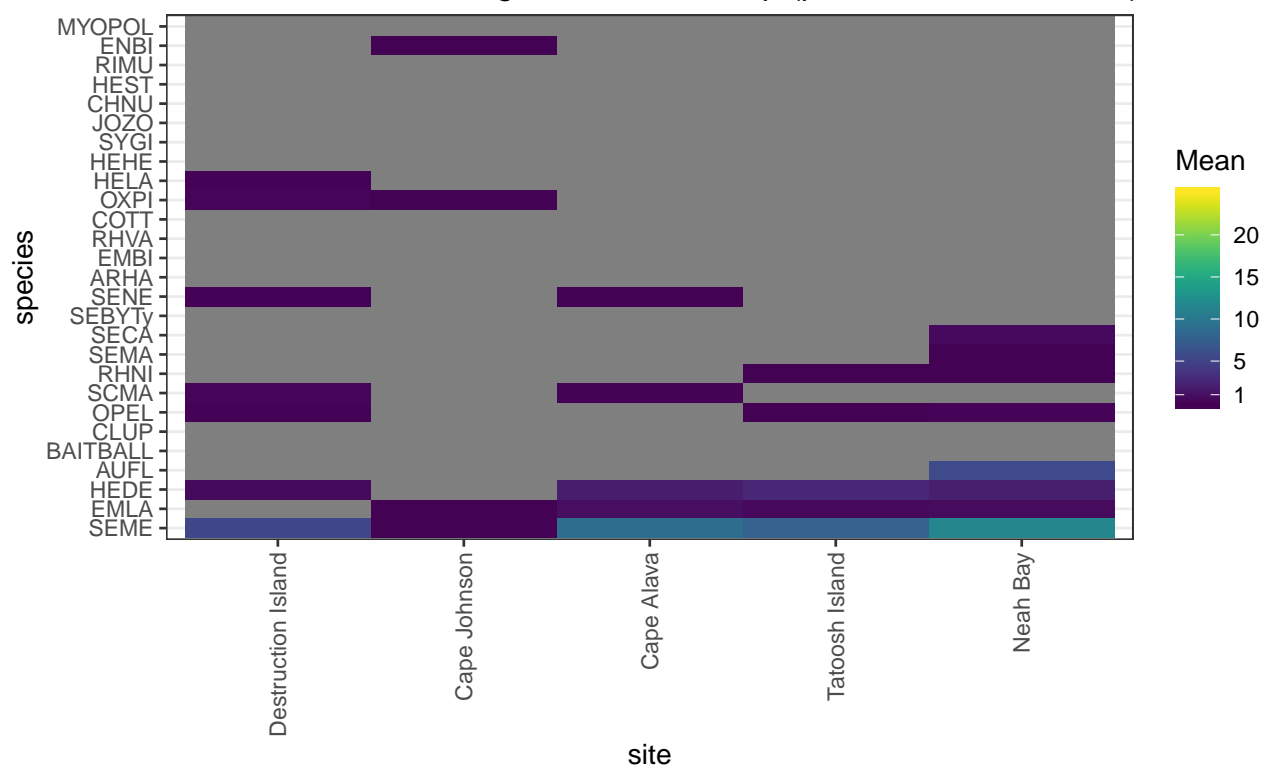
All >10cm, 2018 average count 5m deep (per 30x2x2 m transect)



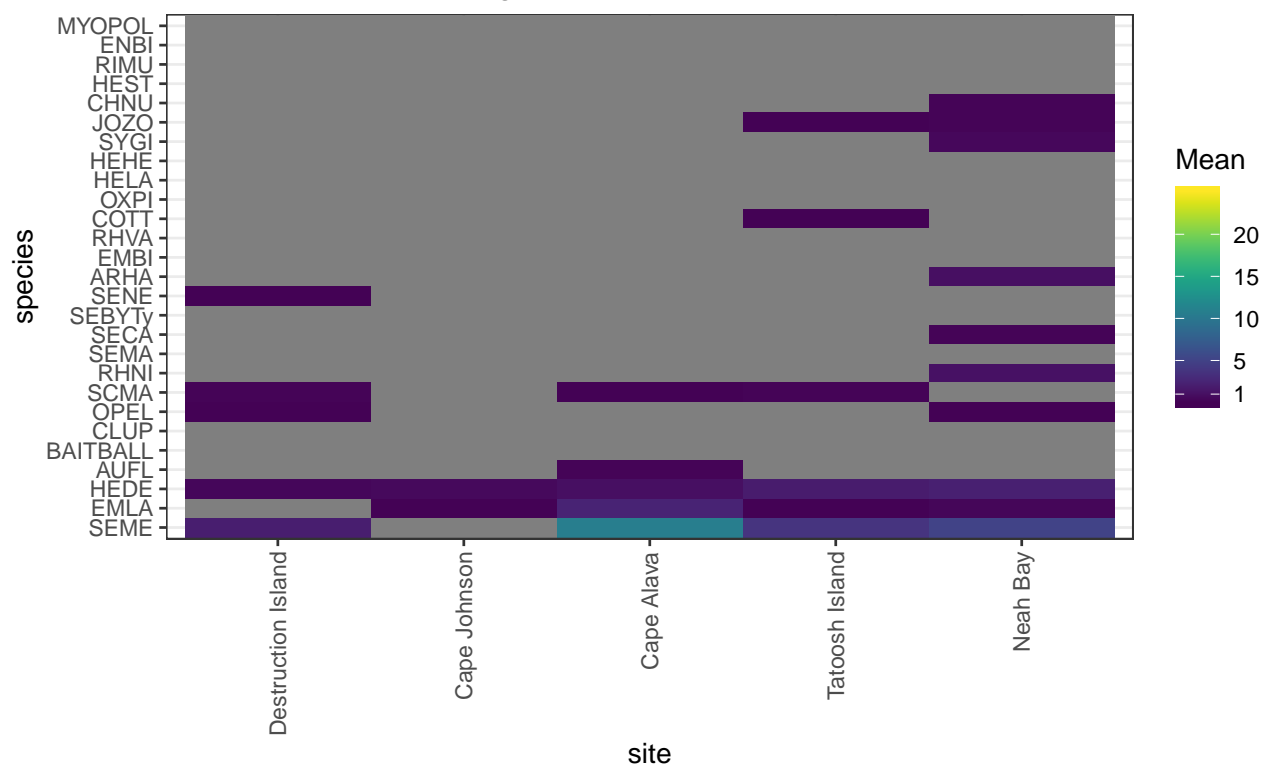
All >10cm, 2016 average count 10m deep (per 30x2x2 m transect)



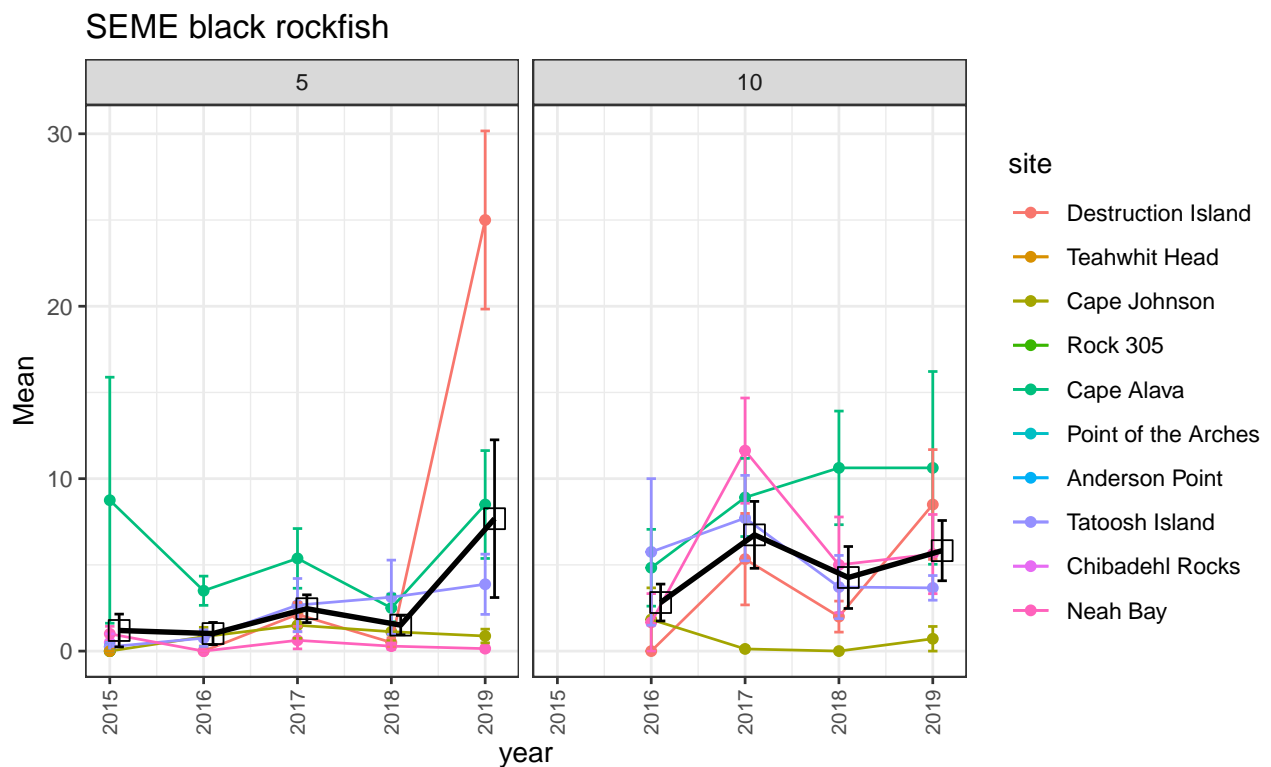
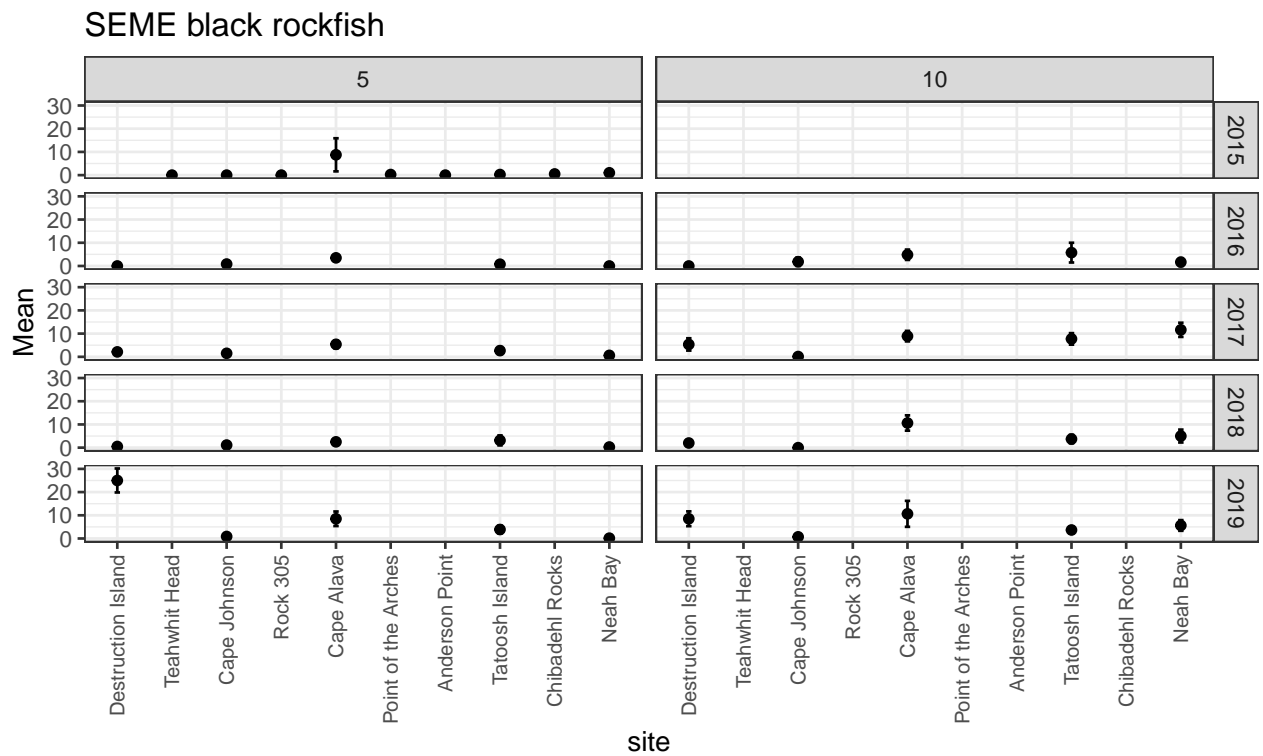
All >10cm, 2017 average count 10m deep (per 30x2x2 m transect)



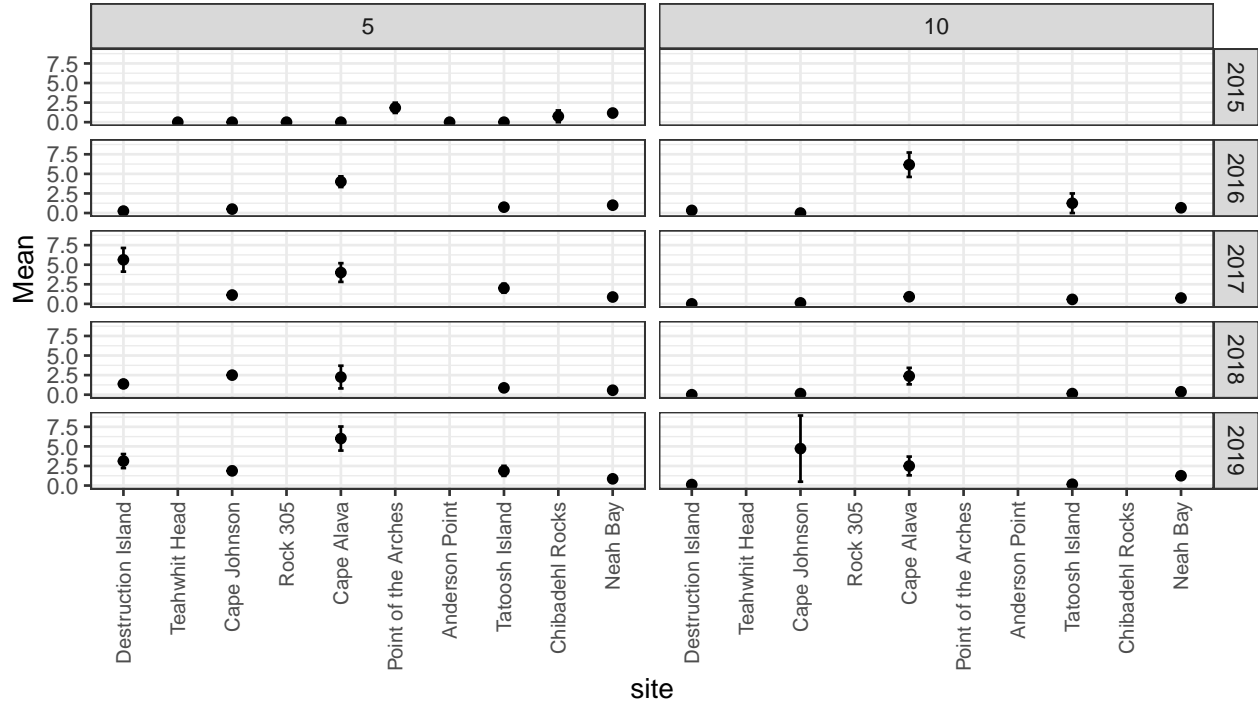
All >10cm, 2018 average count 10m deep (per 30x2x2 m transect)



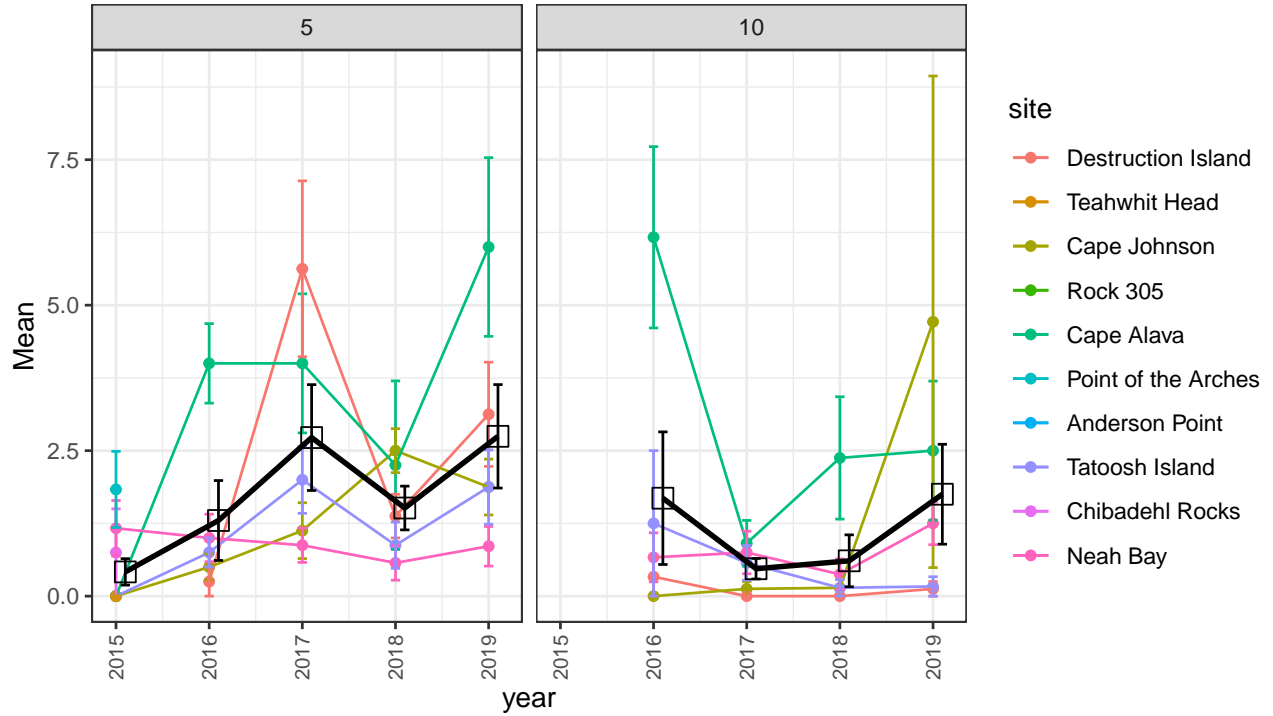
Example time series and spatial variation for the top 8 most common species.

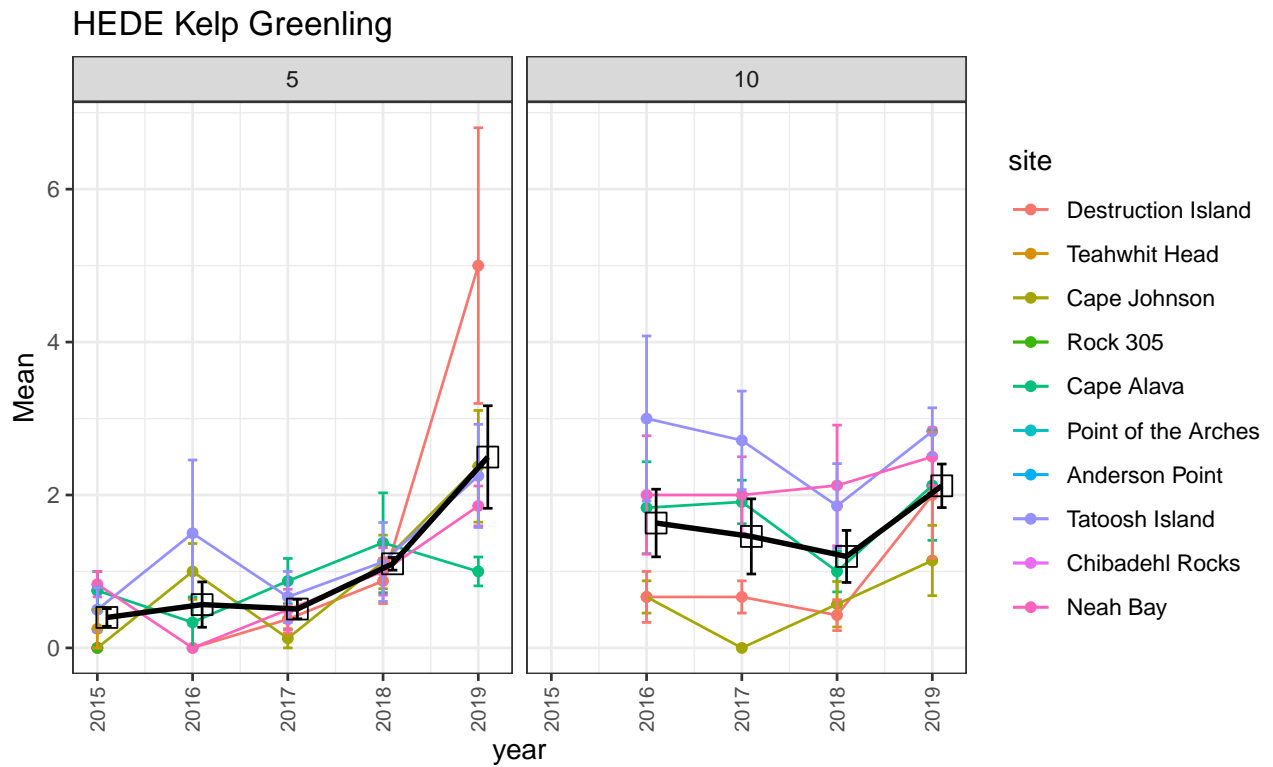
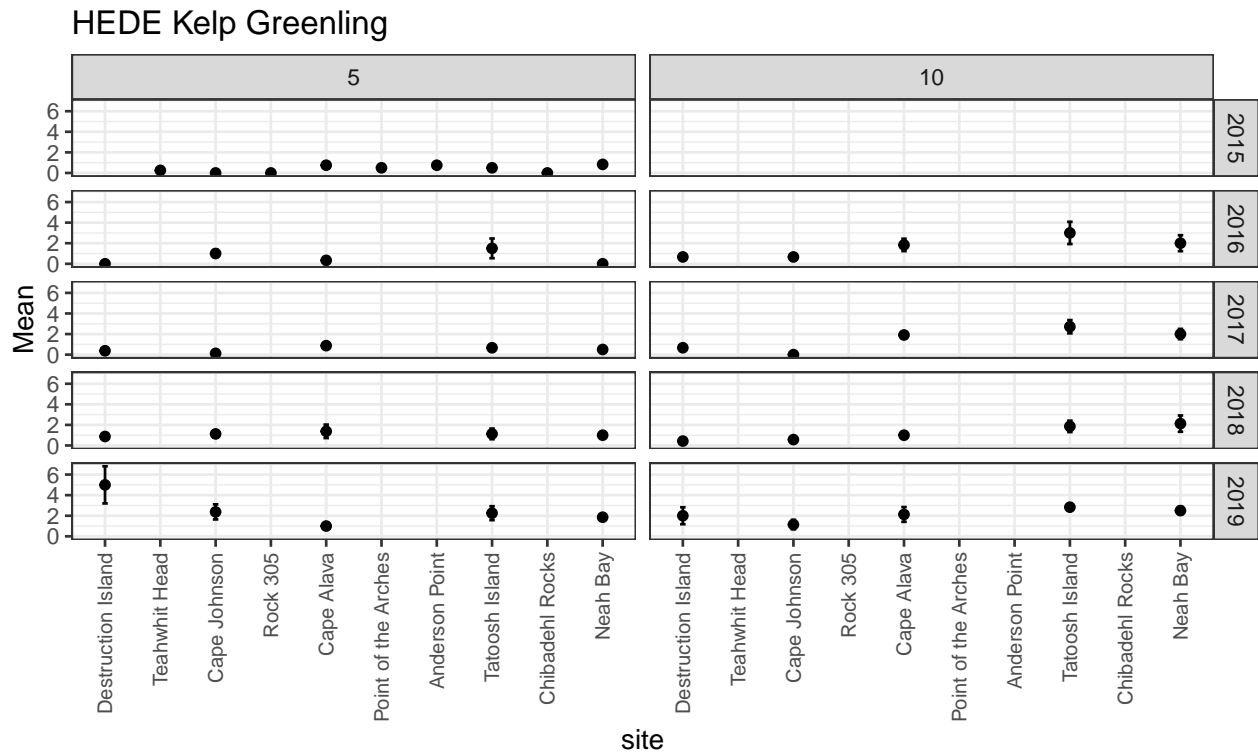


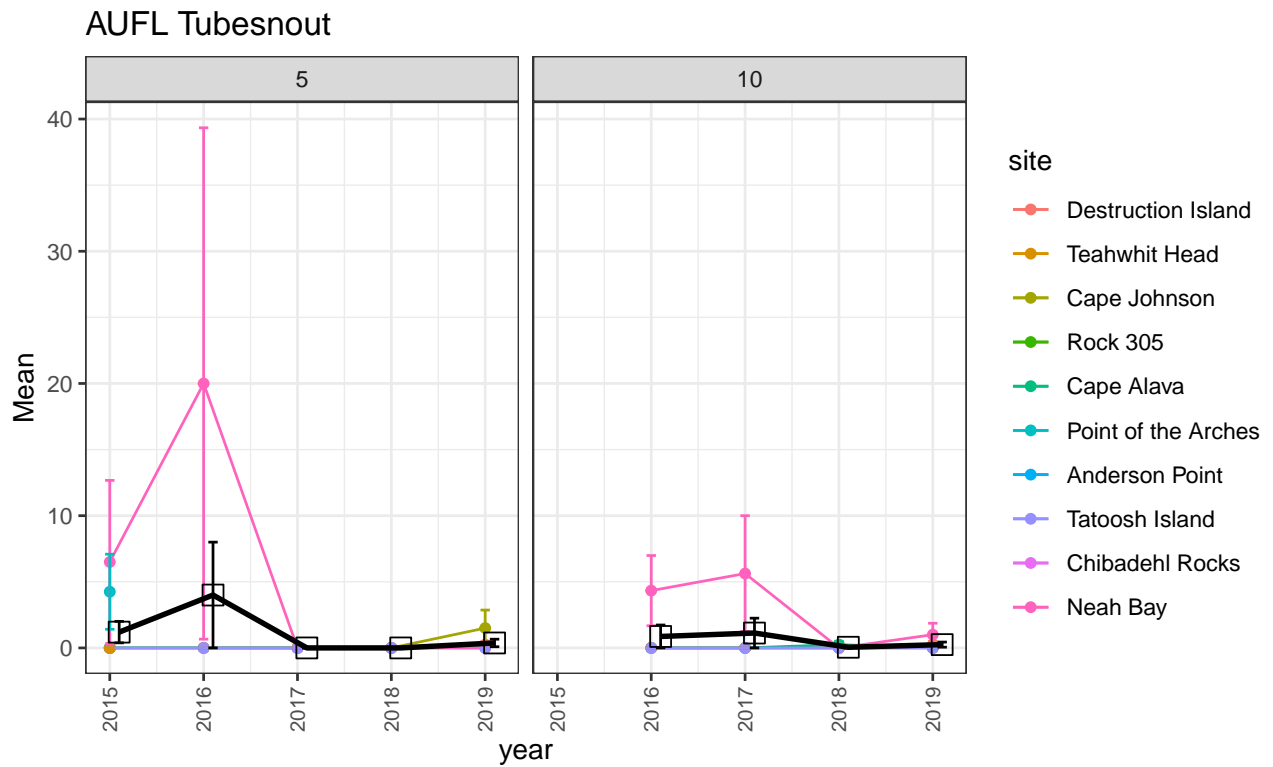
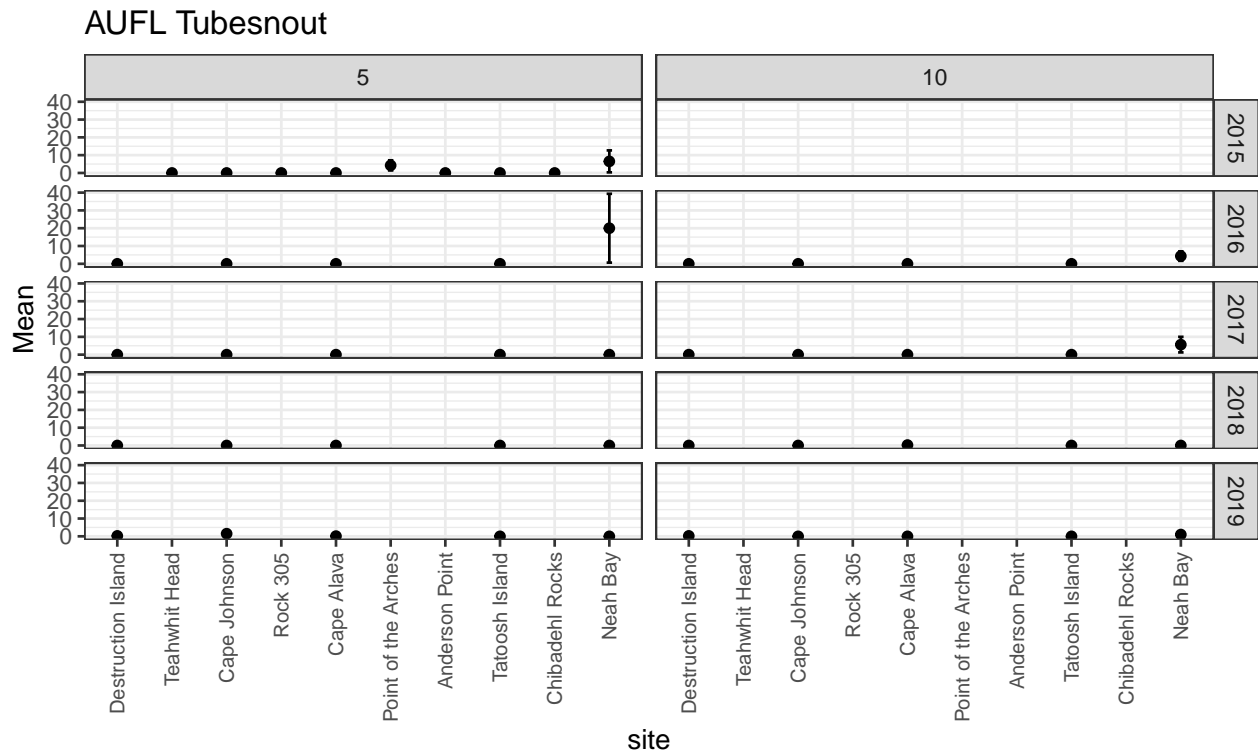
EMLA Striped Surfperch

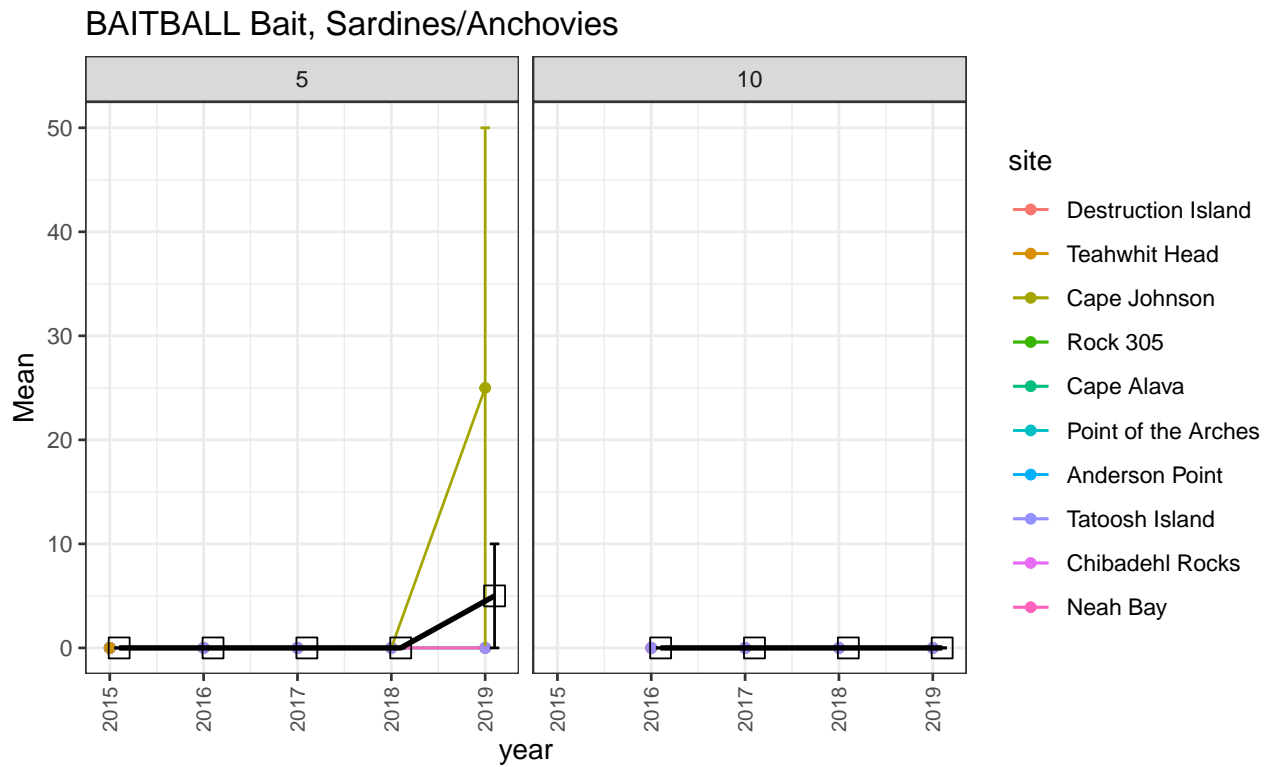
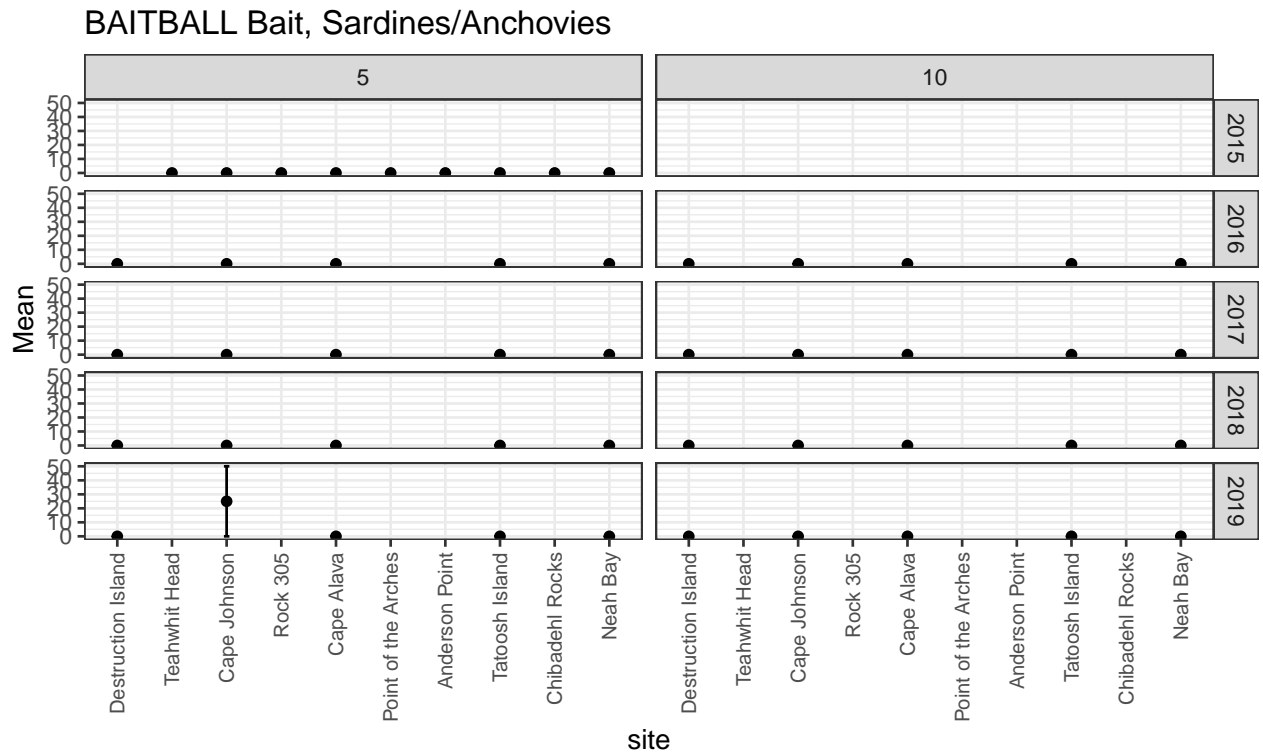


EMLA Striped Surfperch

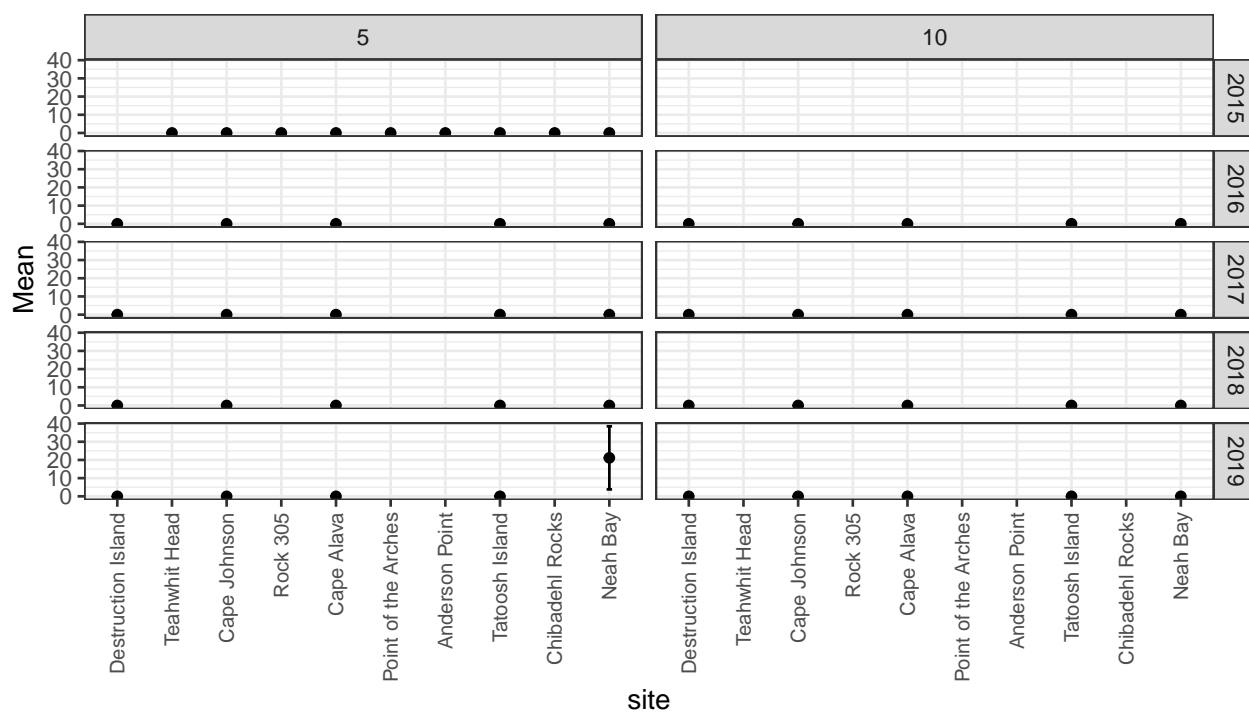




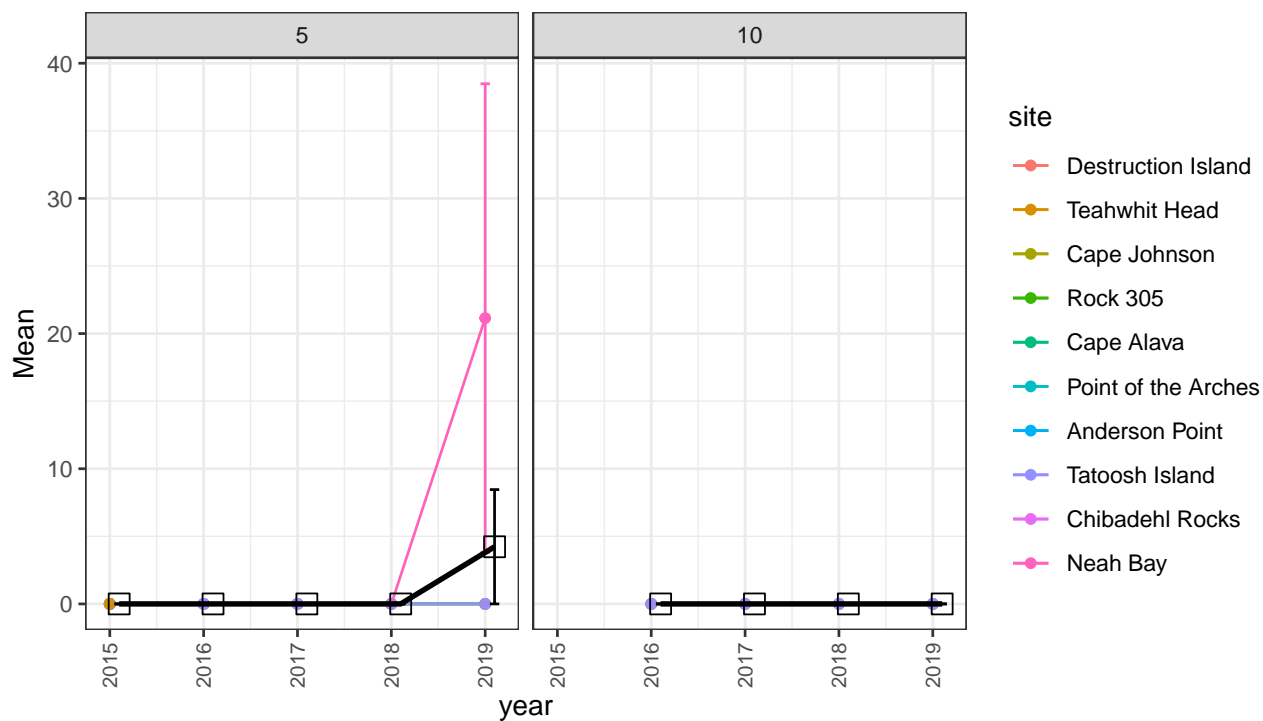


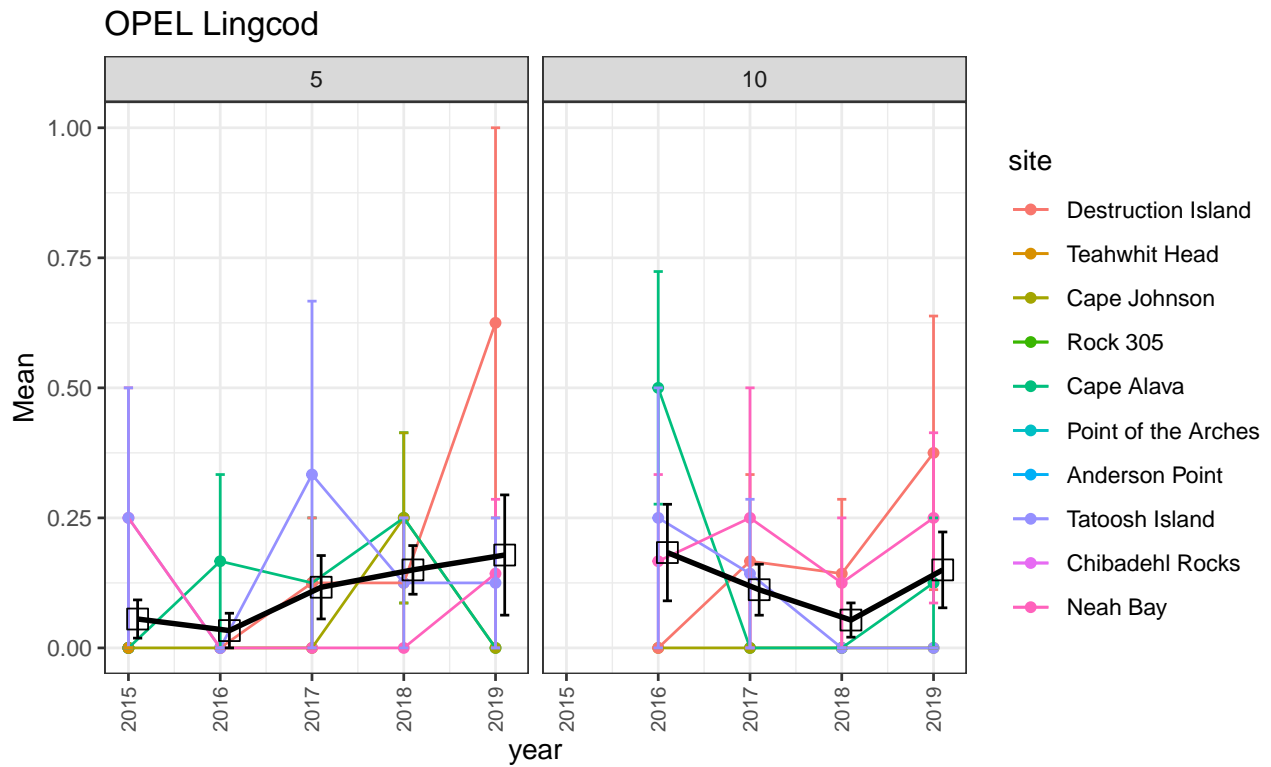
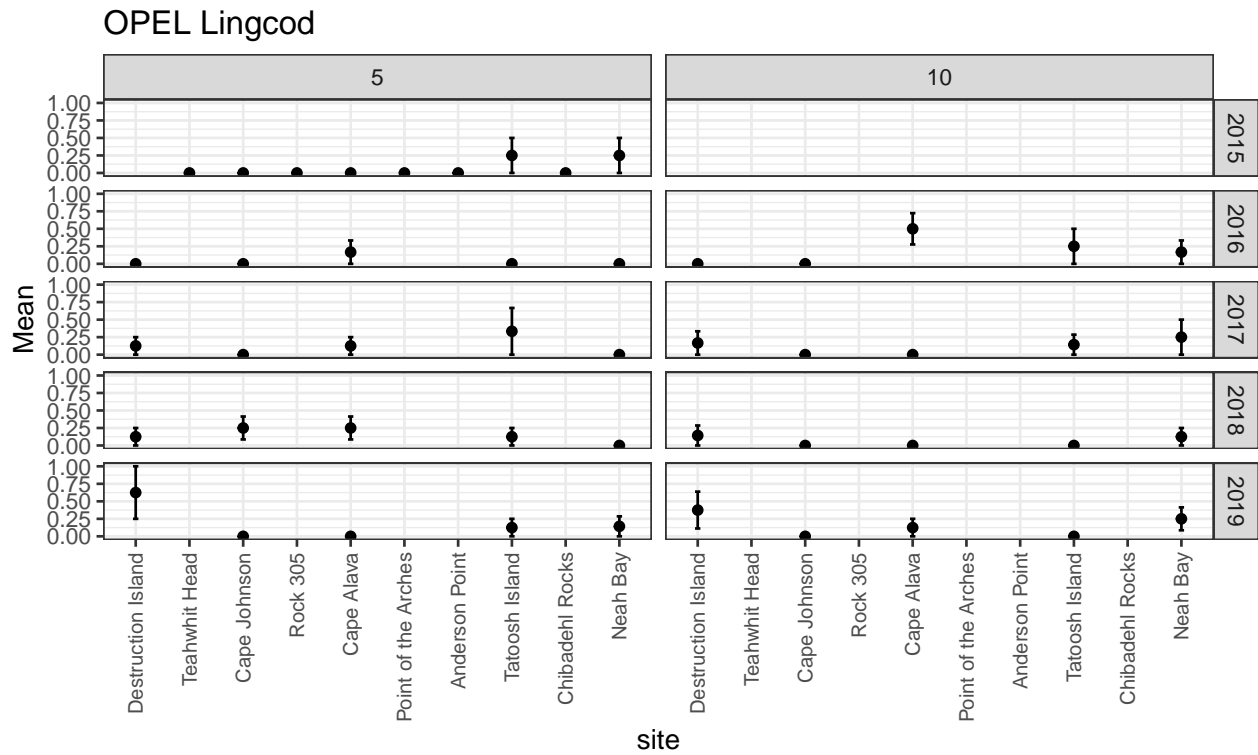


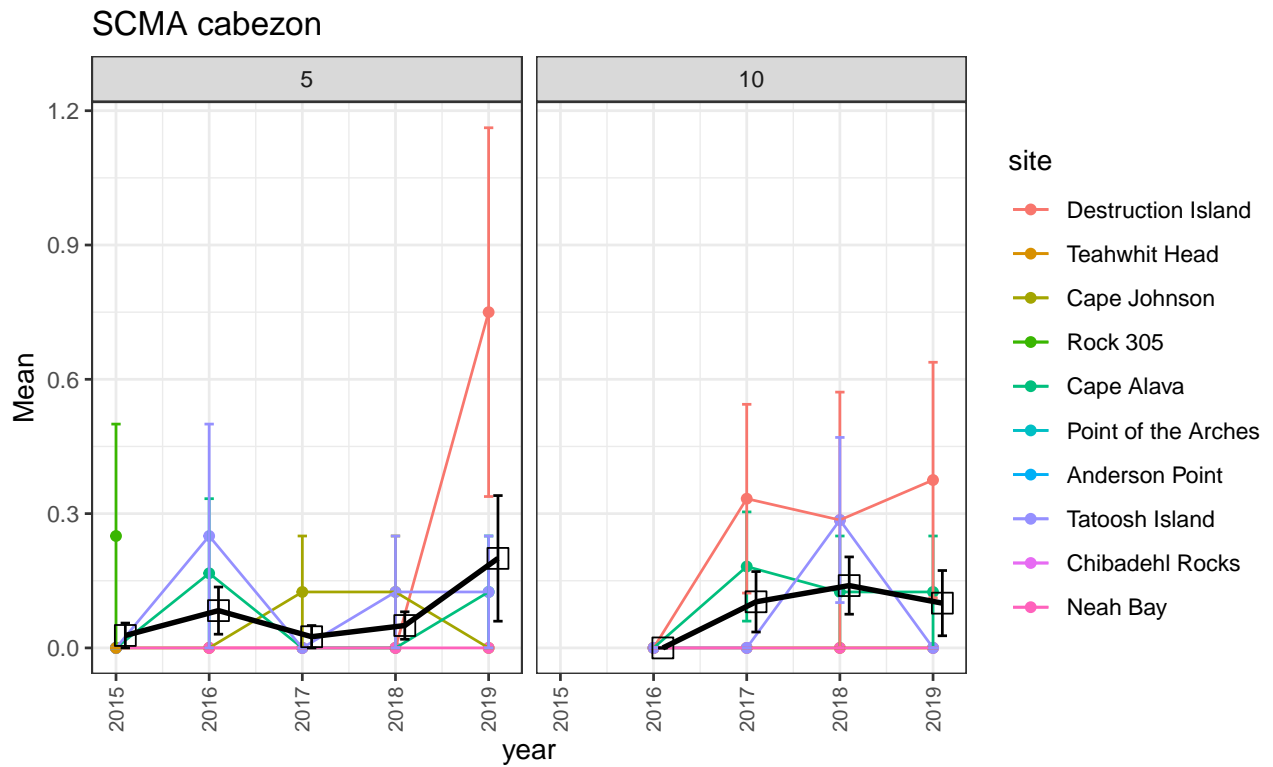
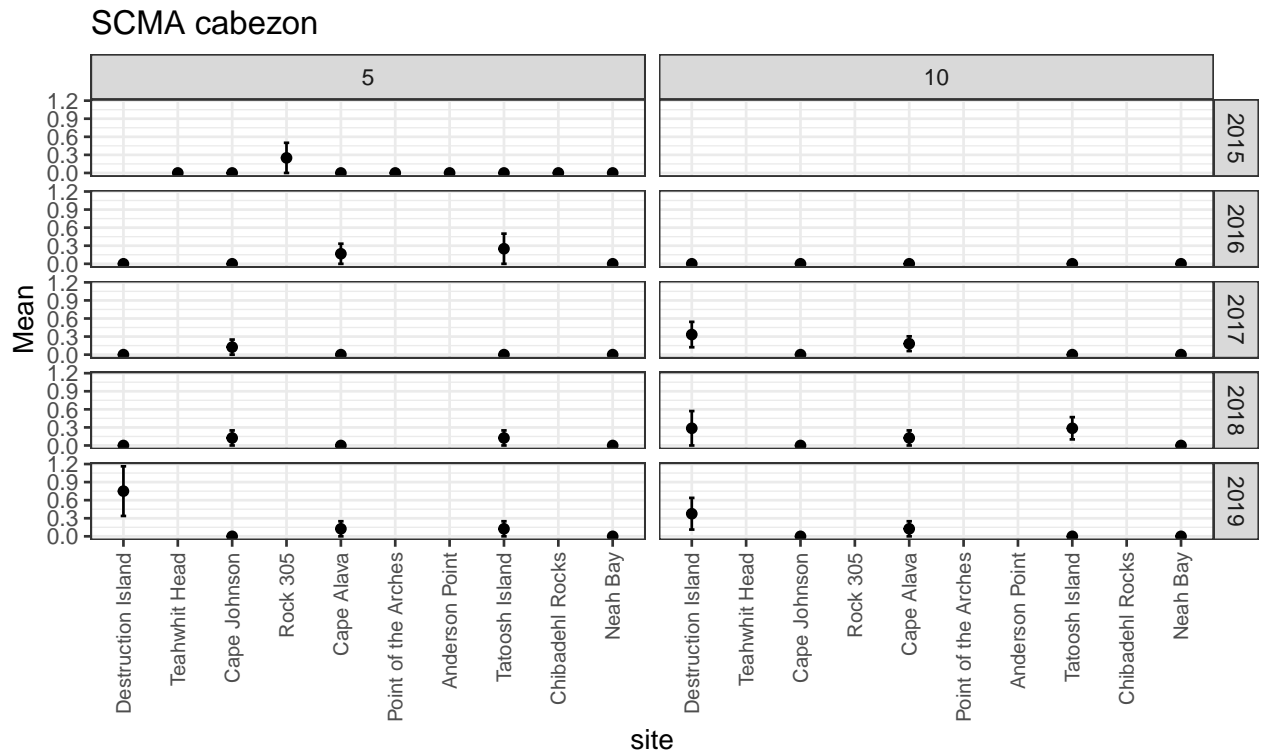
CLUP Sardines and anchovies



CLUP Sardines and anchovies







Some plots on visibility by site and depth zone

These suggest to me that the 2m cut off that PISCO uses is going to be problematic... there are a lot of surveys that are right on the cusp of 2m visibility.

