

NATIONAL MARINE FISHERIES SERVICE (NMFS) REPORT ON DEEP SET BUOY
GEAR (DSBG) AUTHORIZATION AND REVIEW OF ANALYSIS

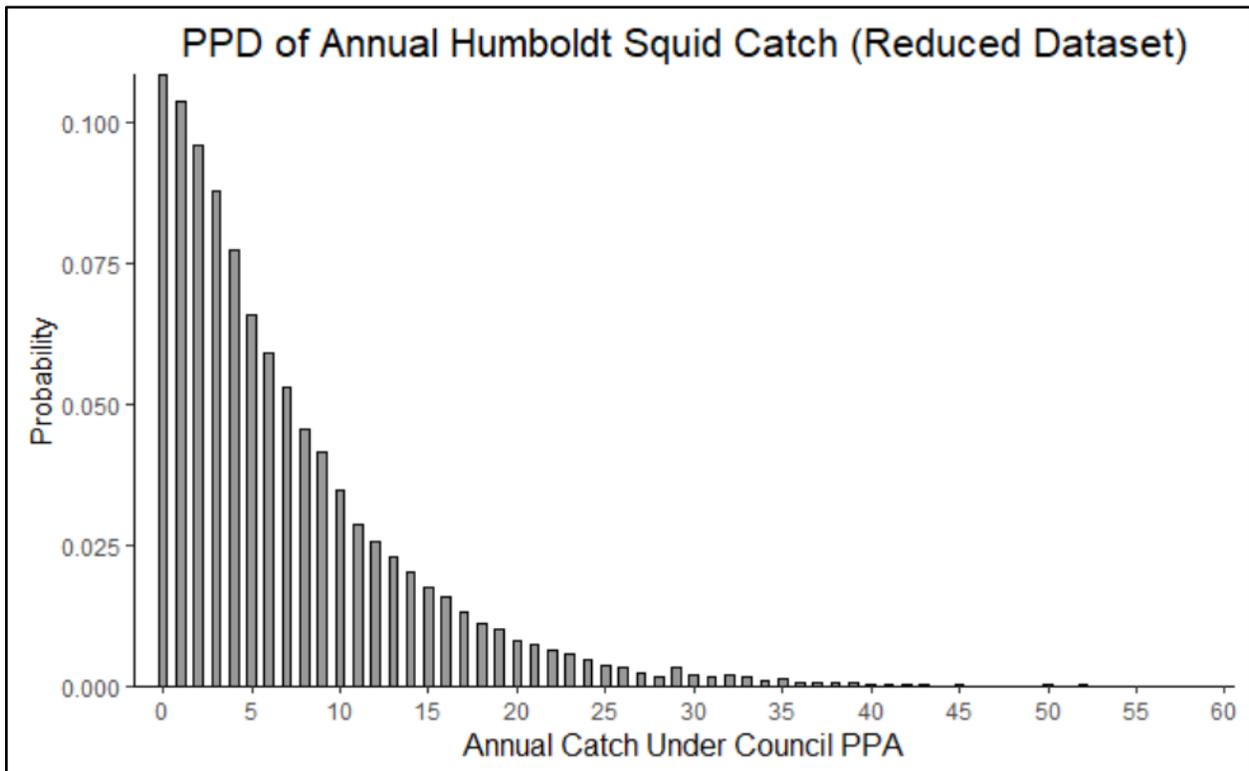
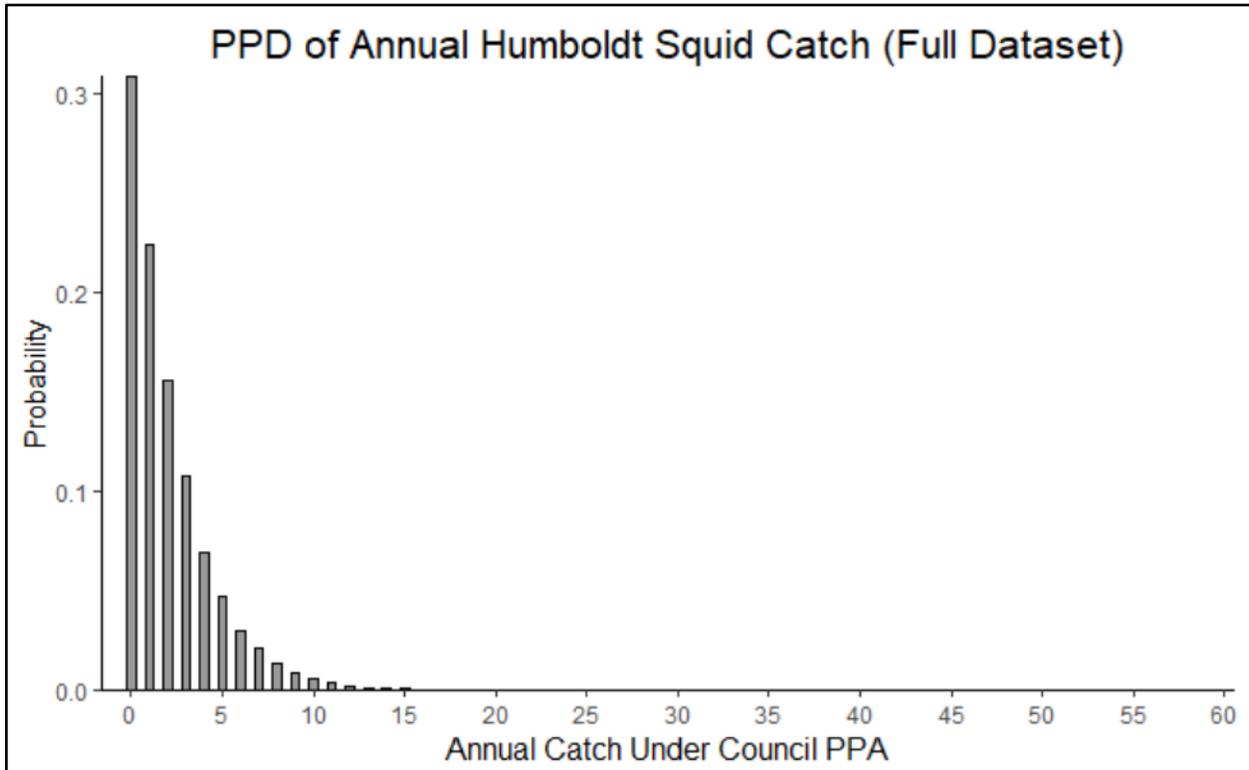
Biological Impact Sensitivity Analysis

NMFS staff carried out a preliminary analysis of biological impacts of the Council’s range of alternatives (ROA) to authorize DSBG under the Highly Migratory Species Fishery Management Plan (HMS FMP). The results are reported in the Advanced Briefing Book under [Agenda Item J.6.a, NMFS Report 1](#). The results demonstrate uncertainty in predicted catch and protected species interactions under a fully authorized fishery, largely because of the small amount of DSBG fishing to date relative to the number of permits proposed under the Council’s ROA.

To evaluate the sensitivity of our results to different formations of the analytical dataset, and to better understand the impact of the amount of available data on the predictive power of our analysis, we repeated the analysis using NMFS observer data only. No data from fisher logbooks were included in this reduced dataset. Preliminary takeaways from this analysis include:

- Removing logbook data reduces the amount of analyzed effort to 429 days fished, down from 1,250 in the "full" dataset. This also reduces the temporal range of the dataset to 2017 and 2018 only, as data prior to 2017 was reported to NMFS only through logbooks for both observed and unobserved trips.¹
- For commonly caught species (swordfish and bigeye thresher sharks) the posterior predictive distributions of catch are similar; i.e., the estimates for these species are robust to inclusion or exclusion of logbook data. This is likely due to the relatively high frequency of catch for these species, which reduces the uncertainty when analyzing higher levels of effort.
- For uncommonly-caught species, the predictive power of our analysis is significantly reduced, with the posterior predictive distributions indicating a wider range of possible catch values with similar probabilities. This is likely due to the low frequency of catch for these species (i.e., small presence in the data rendering a lower number of observations with which to “train” the model). See below for a comparison of histograms for one uncommonly-caught species:

¹ Vessels fishing under Pflieger Institute of Environmental Research (PIER) and Ferguson EFPs reported data through logbooks, although a portion of their trips prior to 2017 carried NMFS-trained-and-approved observers contracted by PIER and Ferguson EFP holders.



- Similarly, the predictive statistics for the uncommonly-caught species are inflated compared to the analysis using the “full” dataset. The predicted ranges are wider, and the means and modes are generally higher. This is due to a higher absolute catch per unit of effort (CPUE) in the reduced dataset; i.e, reducing the effort basis causes the model to interpret single catch events as more frequent than they are shown to be in the complete dataset. This also reflects increased uncertainty when making predictions using a reduced

dataset. See below for a comparison:

Humboldt Squid (Full Dataset)

		Mean	CI 2.5%	Median	CI 97.5%	Mode
<i>CPUE</i>	<i>Per Hook Hour</i>	0.00001	0.00000	0.00001	0.00005	
	<i>Per Day Fished</i>	0.00094	0.00002	0.00068	0.00323	
<i>Open Access</i>	12-Yr Ramp-Up	41	1	30	146	3
	Ongoing Annual	3	0	2	14	0
<i>LE 3.1</i>	12-Yr Ramp-Up	13	0	10	48	0
	Ongoing Annual	2	0	1	9	0
<i>LE 3.2</i>	12-Yr Ramp-Up	20	0	14	71	2
	Ongoing Annual	2	0	1	8	0
<i>LE 3.3</i>	12-Yr Ramp-Up	23	0	16	82	2
	Ongoing Annual	2	0	1	9	0
<i>LE 3.4</i>	12-Yr Ramp-Up	25	0	18	89	2
	Ongoing Annual	2	0	1	8	0
<i>LE 3.5</i>	12-Yr Ramp-Up	15	0	11	55	2
	Ongoing Annual	2	0	1	9	0

Humboldt Squid (Reduced Dataset)

		Mean	CI 2.5%	Median	CI 97.5%	Mode
<i>CPUE</i>	<i>Per Hook Hour</i>	0.00005	0.00000	0.00003	0.00016	
	<i>Per Day Fished</i>	0.00311	0.00012	0.00227	0.01076	
<i>Open Access</i>	12-Yr Ramp-Up	140	4	101	496	34
	Ongoing Annual	12	0	8	43	1
<i>LE 3.1</i>	12-Yr Ramp-Up	45	1	33	163	7
	Ongoing Annual	7	0	5	26	0
<i>LE 3.2</i>	12-Yr Ramp-Up	66	2	48	237	9
	Ongoing Annual	7	0	5	26	0
<i>LE 3.3</i>	12-Yr Ramp-Up	77	2	56	273	11
	Ongoing Annual	7	0	5	26	0
<i>LE 3.4</i>	12-Yr Ramp-Up	84	2	61	298	18
	Ongoing Annual	7	0	5	26	0
<i>LE 3.5</i>	12-Yr Ramp-Up	52	1	37	185	10
	Ongoing Annual	7	0	5	26	0

- Two species, opah and common mola, do not appear in the reduced dataset at all; these species were only reported in fisher logbooks. Therefore, the reduced dataset shows takes of 0 for these species, and cannot be used to make accurate predictions, even though we know from the logbook data that they have been encountered at least once in DSBG EFP fishing.

These results demonstrate the effects of incorporating additional data when attempting to predict the probability of catch under the Council’s ROA, especially for uncommonly-caught species. When reducing the amount of data used in the analysis, our estimates show a substantially higher degree of uncertainty than those developed using the “full” dataset. As more data become available, we expect that our estimates will increase in precision, resulting in less-widely-distributed ranges of predictions for levels of catch under the Council’s ROA.

Public Comments on NMFS' Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) for Authorizing DSBG

NMFS published a NOI to prepare an EIS ([84 FR 7323](#)) for authorizing DSBG on March 4th, 2019. The NOI invited interested parties to provide comments on alternatives to be considered in an EIS, and to identify potential issues, concerns, and additional alternatives that might be considered. The public comment period closed on April 3rd, 2019. NMFS received six comments, which are available at www.regulations.gov under docket [NOAA-NMFS-2019-0015](#). The commenters requested that NMFS:

- Include a gear definition in the ROA that requires inclusion of tubing on surface lines to reduce the risk of entanglement;
- Analyze the benefits of incentivizing drift gillnet (DGN) fishermen trade in their DGN permit through a DSBG limited entry program;
- Continue to consider dual authorization of both standard (SBG) and linked (LBG) configurations of DSBG;
- Evaluate DSBG data generated by researchers from PIER in addition to DSBG EFP data;
- Clarify in the EIS why active gear tending is a key regulatory requirement;
- Explore an alternative for a single DSBG gear endorsement on the General HMS permit, or clarify that DSBG fishermen would receive both an SBG and an LBG endorsement on their General HMS permit;
- Clarify and justify an acceptable range of observer coverage for a DSBG fishery;
- Evaluate a limited entry program coastwide, not just one limited to Southern California;
- Consider whether modifying the limited entry qualifying criteria to include DSBG crewmembers before non-active fishermen is more likely to achieve a goal of producing more swordfish;
- Consider using “highest landing of swordfish by weight” as the metric for determining who would qualify for a limited entry DSBG permit under the Council’s tiered criteria that would “[give] highest priority within a tier to those individuals with the highest landings”; and
- Clarify that “gear may not be deployed prior to sunrise” in the DSBG deployment and retrieval requirements consistent with the Council’s ROA. The NOI inaccurately stated that “gear must be deployed prior to local sunrise.”

Comments on the NOI also included copies of public comments regarding DSBG authorization made at previous Council meetings, and a PIER research manuscript. NMFS received additional public comment on the NOI during a public hearing on March 26th, 2019. Public comments made during the hearing were similar in nature and scope to the comments detailed above.