GROUNDFISH MANAGEMENT TEAM REPORT ON NON-TRAWL MORTALITY PROJECTION TOOLS

Summary

This document highlights issues that the Groundfish Management Team (GMT) encountered during our over-winter analysis when using the dated commercial non-trawl models (hereafter referred to as catch projection tools, because "model" may imply they are more sophisticated than they are). Historically, these tools estimated incidental catch for select species based on catch limits for other target species (e.g., bycatch of yelloweye rockfish in the nearshore sector). In essence, the projection tools apply bycatch rates to projected or assumed retained catch of the target species. These tools provide point estimates without capturing the associated uncertainty.

In brief, these models no longer work for the current fishery. The models were developed many years ago for use in a much different fishery management environment than the one at present. They were designed to address concerns related to overfished stocks that have since been rebuilt, with the exception of yelloweye rockfish. Additionally, the GMT does not have a vetted method to project discard impacts from the re-emerging non-trawl shelf rockfish fishery. The GMT requests Council direction in how to move forward with these concerns. The GMT anticipates three options that the Council could choose from to address the non-trawl catch projection tools (i.e., non-nearshore, nearshore, and shelf), and we expect to provide the Council with recommendations in a subsequent report:

- **No Action:** Continue using these dated tools with the risk of error that has not yet been fully evaluated.
- **Option 1:** Collaborate with external model developers to create models tailored to our needs by the start of the 2027-28 harvest specifications cycle.
- **Option 2:** Discontinue the use of these tools without replacing them, which would involve providing the Council with limited estimates of impact during harvest specifications, relying only on information such as historical mortality data in combination with management and fishery expectations.

Introduction

The GMT currently employs three projection tools: the sablefish trip limit model, the nearshore catch projection tool (Nearshore-CPT), and the non-nearshore catch projection tool (Non-Nearshore-CPT). The accuracy of the tools have not been rigorously tested or evaluated for errors through a formal methodology process in nearly a decade, except for the sablefish trip limit model, which underwent a Scientific and Statistical Committee (SSC) review in November 2023. This report focuses on the Nearshore-CPT and Non-Nearshore-CPT, which have or will exceed their original purpose. We also highlight the need for a new shelf catch projection tool (Shelf-CPT) to estimate impacts to the emerging non-trawl shelf rockfish fishery for future harvest specifications cycles.

Nearshore Catch Projection Tool

Developed through collaboration between the Fisheries Observation Science (FOS) Program, which encompasses the West Coast Groundfish Observer Program (WCGOP) and the GMT, the Nearshore-CPT aimed to project bycatch mortality of overfished species in the commercial non-trawl nearshore fishery for the harvest specifications process and limited inseason action. The Nearshore-CPT was specifically designed to monitor yelloweye and canary rockfishes caught shoreward of the Non-Trawl Rockfish Conservation Area (RCA) off Oregon and California. It uses the raw FOS data to estimate total mortality of the bycatch species given the total landings and the observed bycatch rates by depth with the appropriate depth-dependent mortality rates applied. The Nearshore-CPT was last reviewed by the SSC in 2013 (Agenda Item F.7.b Supplemental SSC Report June 2013).

Recent management changes, including restrictions on the nearshore fishery off California and alterations to the Non-Trawl RCA, have affected the Nearshore-CPT's applicability. These changes altered the nearshore fishery footprint, making the Nearshore-CPT unsuitable for future management cycles. Additionally, starting in 2025, the cessation of FOS observer coverage in state-managed fisheries will limit our ability to project discards, further undermining the tool's utility.

Non-Nearshore Sablefish Catch Projection Tool

The current Non-Nearshore-CPT was also developed in collaboration between the FOS and the GMT to project incidental mortality from the targeted sablefish fishery. It utilizes FOS data to establish a ratio of the observed catch of species *i* to observed retained sablefish, which is then multiplied by the projection of retained sablefish based on the new Annual Catch Limit (ACL) for each cycle to estimate the catch of species *i*. The Non-Nearshore-CPT assumes that there is a linear relationship between the ACL for sablefish and the incidental catch of non-sablefish species in the fishery and assumes full attainment of the primary tier fishery's sablefish catch share. Projected sablefish landings from the daily trip limit model are combined with the primary tier fishery's assumed landings (currently full attainment) to formulate the overall assumption of retained sablefish to be used in the Non-Nearshore CPT. See Figure 1 in the Appendix for an illustration of this.

A retrospective analysis conducted for 2017-2022 indicates that, since 2017, the Non-Nearshore CPT has been consistently underpredicting non-nearshore mortality of bocaccio rockfish south, canary rockfish, chilipepper rockfish south, lingcod north and south, nearshore rockfish north and south, OR cabezon/kelp greenling, OR/CA black rockfish, other flatfish, petrale sole, shelf rockfish south, widow rockfish, yelloweye rockfish, and yellowtail rockfish north (Table 1 in the Appendix). Consistently underpredicting mortality puts the non-trawl allocation, and the ACL, at risk of being exceeded if the sablefish Harvest Control Rule (HCR) is chosen according to the projected bycatch impacts. Since 2017, the Non-Nearshore CPT has underpredicted canary rockfish mortality by up to 18 mt, which accounts for 13 percent of the 2025 non-trawl allocation. Petrale sole's highest level of underprediction since 2017 also accounts for 13 percent of the 2025 non-trawl allocation of 30 mt. The shortspine thornyhead projections have gradually transitioned from underpredicting by ~50 percent in 2017-2019 to overpredicting by 41 percent in 2022. This could be due to the increasing sablefish ACLs from 2017 to 2022, as shortspine thornyhead is a

common co-occurring species with sablefish. As the ACLs have increased, non-nearshore sablefish catches have not been increasing at the same pace, but the Non-Nearshore CPT assumed they would. With even higher sablefish ACLs expected in the future, shortspine thornyhead mortality could continue to be overpredicted. The Non-Nearshore CPT underpredicted yelloweye rockfish mortality by 12 mt in 2022, whereas all other prior years' error was less than 2 mt. An underprediction of 12 mt accounts for 32 percent of the 2025 yelloweye rockfish non-trawl allocation.

The retrospective analysis only evaluates prediction error through 2022, since that is the most recent year of total groundfish mortality data at the time of drafting this report. However, during the 2025-26 cycle, when the sablefish ACLs tripled compared to previous cycles, the Non-Nearshore-CPT also predicted a threefold increase in incidental species catch, which seems unrealistic given current market constraints for sablefish. This type of trend in increasingly higher overpredictions as sablefish ACLs increase can already be seen to an extent in 2017-2022 for species like arrowtooth flounder, Dover sole, longspine thornyhead, Pacific hake, shortspine thornyhead, and slope rockfish north (Table 1). This simplistic catch projection tool does not adequately address these market limitations in projecting incidental catch. To account for the likely unrealistic tripling of predicted incidental mortality, the 2025-26 GMT projections incorporated high, medium, and low scenarios (based on percentages of the ACL) for sablefish attainment in an effort to display the uncertainty in the projected incidental catch. Figure 1 in the Appendix compares the approach used in 2025-26 to the default approach used in prior harvest specifications cycles, which was to assume full attainment of the primary sablefish fishery in combination with projected DTL landings. Since the primary fishery makes up 85 percent of the non-trawl sablefish fishery's catch share, the assumption of retained sablefish in that fishery has a greater impact on the overall assumption.

Non-Nearshore Shelf Catch Projection Tool

The Non-Nearshore-CPT was initially developed when the non-nearshore sector primarily targeted sablefish. However, recent regulatory changes (e.g., non-trawl opportunities provided through the 2023-24 Harvest Specifications and Management Measures action and Amendment 32 to the Pacific Coast Groundfish Fishery Management Plan) have spurred the growth of a targeted shelf rockfish fishery. The rebuilding of several constrained shelf species has led to increased targeting of lingcod and midwater rockfish species by the non-nearshore non-trawl fishery, particularly with the reopening of portions of the Non-Trawl RCA. The expansion of non-bottom contact gear opportunities within the Non-Trawl RCA in 2023, and the subsequent openings in 2024, have provided greater access to fishing grounds for this emerging shelf rockfish fishery.

This new fishery lacks a predictive model to estimate discard mortality, which is critical for managing groundfish off the West Coast. For instance, between 2021 and 2022, there was a notable increase in estimated total quillback rockfish discards, rising from 0.1 mt to 6.9 mt, within the OA hook-and-line sector, independent of the Non-Trawl RCA reopening. Given the potential for increased discarding of sensitive species, accurate predictions of discard mortality are essential for the GMT.

Appendix. Figures and Tables

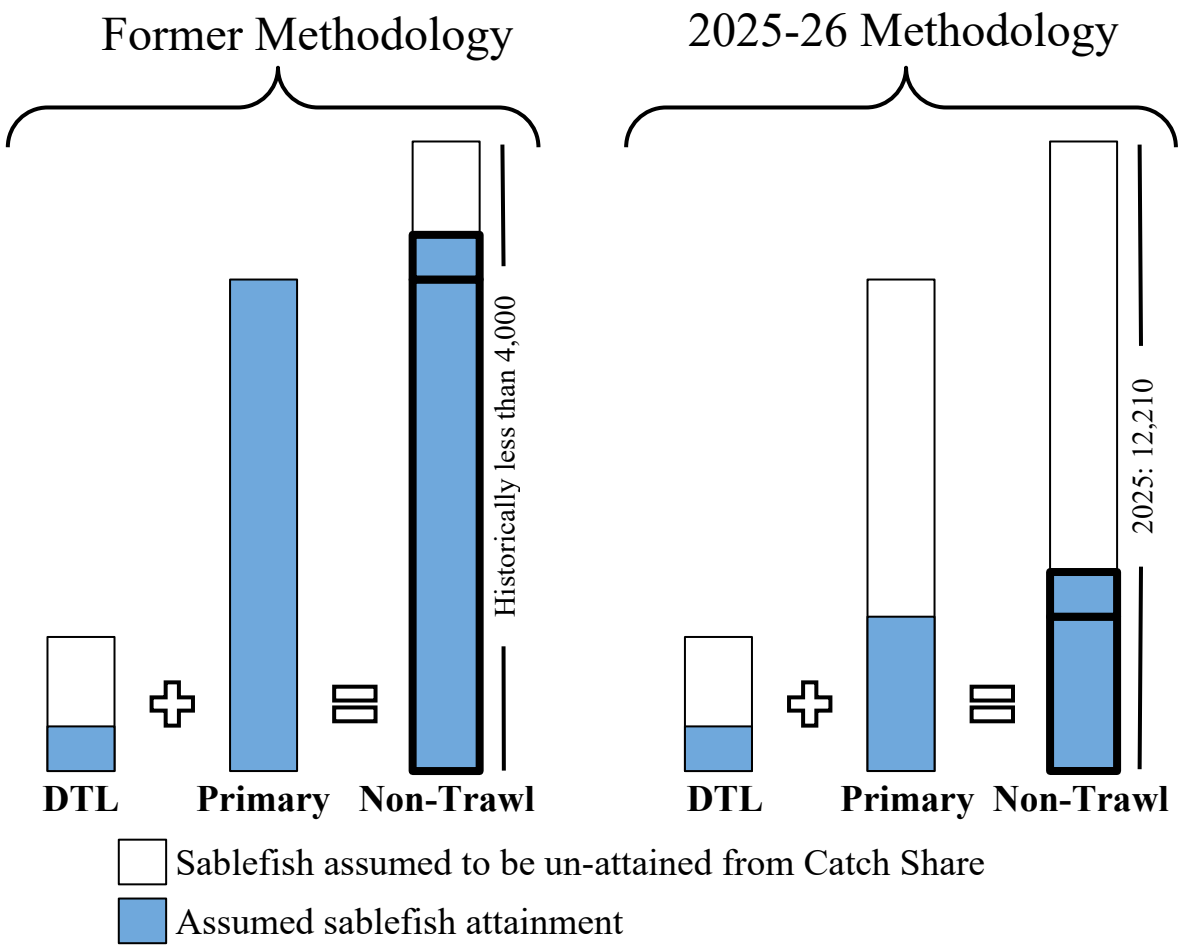

Figure 1. Cursory schematic illustrating the methodology of determining retained sablefish assumptions to input into the Non-Nearshore CPT. The methodology used in previous harvest specification cycles (left) is compared to the methodology used in 2025-26 (right) to account for threefold sablefish ACL increases.

Table 1. Retrospective analysis of the Non-Nearshore CPT, comparing projected mortality in the non-nearshore sector (total LE and OA mortality) to actual mortality, 2017-2022. Maximum annual error (mt) during that time is shown as a percent of the 2025 non-trawl allocation to indicate potential risk of exceeding the non-trawl allocation if the model severely underpredicts mortality. Annual sablefish ACLs north of 36° N. lat. are shown for reference. Red font indicates underpredictions. Percent error is blank if there was either no projection made that year or zero non-nearshore mortality reported, or both. Mortality Data Source: Groundfish Expanded Mortality Multiyear

Species Category/ Complex	Percent Error (difference between projected and actual mortality as % of actual mortality)							Error (mt)		2025 Non-Trawl Allocation (mt)	Max Error as % of 2025 NT Allocation
	2017	2018	2019	2020	2021	2022	Average	Avg.	Max.		
Sablefish North ACL (mt)	**5,252**	**5,475**	**5,606**	**5,723**	**6,892**	**6,566**					
Arrowtooth flounder	99%	53%	-16%	115%	134%	158%	90%	27.0	40.6	455	9%
Big Skate	49%	13%	-18%	310%	157%	85%	99%	3.3	6.4	58	11%
Black/Blue/Deacon Rockfish					-99%	-98%	-99%	-1.3	-2.0		
Bocaccio south	-100%	-100%	-97%	-99%	-99%	-99%	-99%	-21.8	-41.2	1,020	4%
Black rockfish (OR/CA)	-100%	-100%	59%	-98%	-79%	-99%	-89%	-1.3	-2.6		
CA Cabezon	-100%	-100%					-100%	-1.9	-3.0		
Canary rockfish	-93%	-91%	103%	-27%	-91%	-92%	-49%	-6.9	-18.3	141	13%
Chilipepper rockfish south	-90%	-96%	-55%	-97%	-98%	-99%	-89%	-15.7	-37.5	697	5%
Darkblotched rockfish	25%	72%	28%	126%	76%	64%	65%	2.5	3.5	37	9%
Dover sole	59%	90%	19%	21%	241%	135%	94%	3.4	5.4	2,421	0%
EC species	90%	169%	89%	64%	132%	58%	101%	48.9	67.9		
English sole	-100%	-100%	2839%	2105%	667%	2839%	1375%	0.0	-0.1	434	0%
Lingcod north	-61%	-58%	-75%	-76%	-71%	-80%	-70%	-45.1	-70.5	1,842	4%
Lingcod south	-90%	-87%	-82%	-77%	-72%	-75%	-80%	-17.9	-31.3	454	7%
Longnose skate	-9%	25%	-3%	56%	125%	164%	60%	21.8	51.6	137	38%
Longspine thornyhead north	-50%	-7%	8%	20%	19%	2%	-2%	-0.5	-3.6		
Nearshore rockfish north	-84%	-62%	-16%	-67%	-74%	-99%	-67%	-3.8	-20.7		
Nearshore rockfish south	-100%	-100%			-100%	-100%	-100%	-4.4	-7.8		

Species Category/ Complex	Percent Error (difference between projected and actual mortality as % of actual mortality)							Error (mt)		2025 Non-Trawl Allocation (mt)	Max Error as % of 2025 NT Allocation
	2017	2018	2019	2020	2021	2022	Average	Avg.	Max.		
Sablefish North ACL (mt)	**5,252**	**5,475**	**5,606**	**5,723**	**6,892**	**6,566**					
OR Cabezon/Kelp Greenling	-100%	-100%	-100%	-100%	-97%	-95%	-99%	-0.4	-0.9		
Other flatfish	-91%	-87%	-90%	-86%	-86%	-86%	-88%	-3.3	-6.3	714	1%
Pacific cod	37%	1133%	258%	147%	210%	305%	349%	1.8	2.6	55	5%
Pacific hake	-60%	-58%	-39%	4%	59%	271%	30%	-0.2	-1.0		
Pacific Ocean Perch	77%	32%	37%	132%	1037%	428%	291%	0.4	0.8	159	1%
Petrale sole			-83%	-67%	-16%	-40%	-51%	-1.8	-4.0	30	13%
Shelf rockfish north	26%	87%	23%	88%	-22%	21%	37%	1.3	3.3	528	1%
Shelf rockfish south	-100%	-100%	-100%	-100%	-100%	-100%	-100%	-61.7	-80.9	1,263	6%
Shortspine thornyhead north	-53%	-54%	-43%	-11%	19%	41%	-17%	-12.7	-35.9	22	163%
Slope rockfish north	-13%	18%	45%	259%	167%	199%	112%	50.1	100.3	272	37%
Slope rockfish south	-19%	9%	1%	35%	12%	-5%	5%	0.9	7.5	249	3%
Spiny dogfish	251%	8%	-18%	86%	277%	225%	138%	75.6	173.8		
Starry flounder	-100%	-100%	-95%	-33%	215%	-63%	-29%	0.0	-0.2	188	0%
Widow rockfish	-100%	-100%	-89%	-92%	-94%	-97%	-95%	-3.1	-8.5	300	3%
YELLOWEYE ROCKFISH	-66%	-42%	0%	36%	-50%	-90%	-35%	-2.5	-12.0	38	32%
Yellowtail rockfish north	-31%	-46%	-39%	-57%	-84%	-82%	-56%	-2.6	-6.8	626	1%