GROUNDFISH MANAGEMENT TEAM REPORT ON PROPOSED CHANGES TO
SHORTSPINE THORNYHEAD ACL APPORTIONMENT METHOD

Overview

Shortspine thornyhead was assessed at a coastwide scale in 2023 and is managed using separate annual catch limits (ACLs) north and south of 34° 27′ N. lat. Reductions in the projected ACL north of 34° 27′ N. lat. are expected to constrain fisheries, while much of the ACL south of 34° 27′ N. lat. is likely to go unharvested. To ensure that harvest specifications reflect the best scientific information available, the GMT proposes two methods for ACL apportionment for Council consideration.

Below, we discuss the scientific and management pros and cons of the currently-used method and the potential alternative method. The GMT notes that no method will completely capture spatial and temporal differences in age-structure or population dynamics, nor capture potential movement of fish between U.S. and Canadian waters.

Background

The 2023 assessment of shortspine thornyhead (Zahner et al., 2023) assumed a coastwide population structure that produces coastwide estimates for the overfishing limit (OFL) and ACL projections, based on applying the 40-10 rule to the coastwide acceptable biological catch. The coastwide ACL can then be apportioned north and south of 34° 27′ N. lat. to set area-based ACLs.

The shortspine thornyhead apportionment method used in previous biennial cycles was based on information available at the time of the last assessment, 2013, that determined the proportions by area based on data from the Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Bottom Trawl (WCGBT) survey between 2003-2012. For the 2025-26 biennium, the NWFSC provided estimates of the percent by area for shortspine thornyhead applying the same approach applied to sablefish that uses a five-year rolling average but have also provided percentages calculated between 2003-2022 (Figure 1 and Table 1). Therefore, the Council has two options for shortspine thornyhead apportionment methods to consider at the November meeting.

Options:
- **Status Quo:** long-term (2003-2022) average of biomass observed by NWFSC WCGBT survey
- **Option 1:** rolling five-year average of biomass observed by NWFSC WCGBT survey

Tables 2 and 3 below show the area-based ACLs for 2025-26 based on the Status Quo or Option 1 apportionment methods and for the default Harvest Control Rule (HCR) P* of 0.40 and the Alternative 1 HCR P* of 0.45.
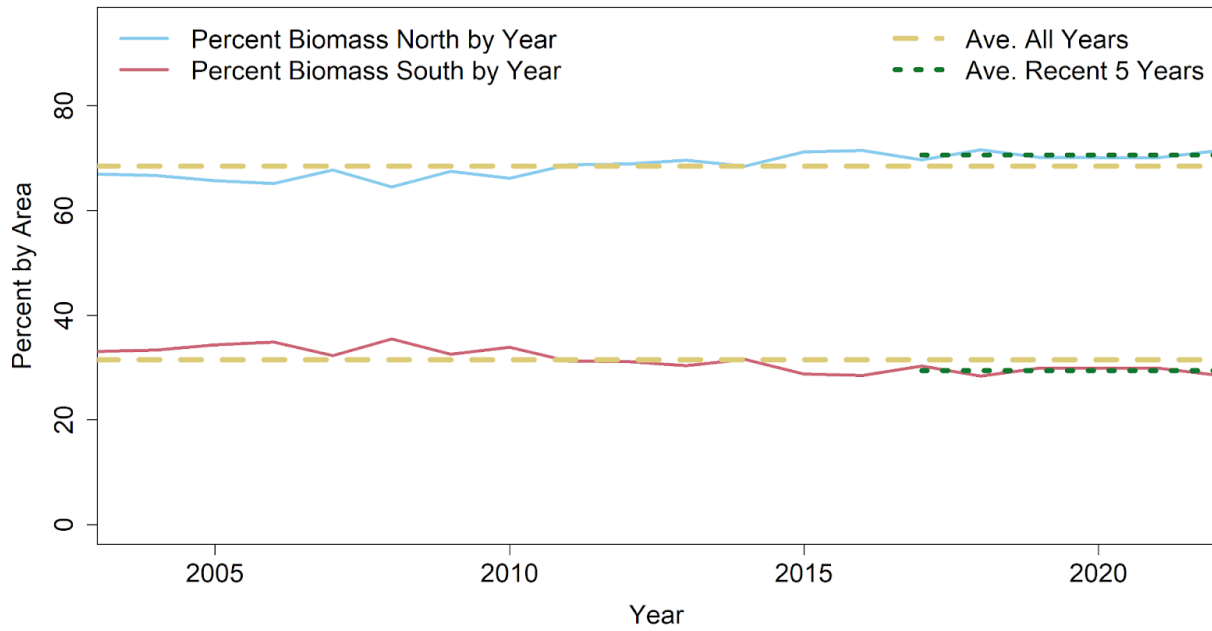
Figure 1. The estimated percent of shortspine thornyhead by year for areas north and south of 34° 27′ N. lat. and the averages across all years (2003-2022) of 68.5 percent north and 31.5 percent south or the averages of the most recent five years (2017, 2018, 2019, 2021, 2022) of 70.6 percent north and 29.4 percent south from the NWFSC WCGBT survey model-based biomass estimates.

Table 1. Estimated shortspine thornyhead biomass by area and year from the NWFSC WCGBT survey and the percent by area north of 34° 27′ N. lat. and south of 34° 27′ N. lat.

	Estimated Biomass by Area			Percent by Area	
Year	Coastwide	North	South	North	South
2003	48,341	32,357	15,984	66.9%	33.1%
2004	48,010	32,010	15,999	66.7%	33.3%
2005	54,339	35,692	18,647	65.7%	34.3%
2006	49,204	32,052	17,151	65.1%	34.9%
2007	52,366	35,473	16,893	67.7%	32.3%
2008	47,121	30,401	16,719	64.5%	35.5%
2009	47,353	31,948	15,405	67.5%	32.5%
2010	44,829	29,647	15,182	66.1%	33.9%
2011	50,098	34,436	15,661	68.7%	31.3%
2012	51,413	35,408	16,005	68.9%	31.1%
2013	51,808	36,077	15,730	69.6%	30.4%
2014	51,333	35,140	16,193	68.5%	31.5%
2015	52,881	37,650	15,230	71.2%	28.8%
2016	57,349	40,993	16,356	71.5%	28.5%
2017	59,171	41,222	17,948	69.7%	30.3%
2018	59,657	42,713	16,943	71.6%	28.4%
2019	60,575	42,471	18,103	70.1%	29.9%
2020	-	-	-	-	-
2021	70,484	49,383	21,100	70.1%	29.9%
2022	76,810	54,847	21,962	71.4%	28.6%

Table 2. Shortspine thornyhead ACLs under the Alternative 1 P* of 0.45 for each of the apportionment methods and the difference between the ACLs by area north of 34° 27′ N. lat. and south of 34° 27′ N. lat. in 2025 and 2026. The 2023 and 2024 ACLs are provided for reference. Note that the default HCR for 2023 and 2024 coastwide ACLs use a P* of 0.40.

Year	P* 0.45 Coastwide ACL	Long-Term Average a/ North ACL	Long-Term Average a/ South ACL	5-Year Average b/ North ACL	5-Year Average b/ South ACL	Long-Term Minus 5-Year Average North	Long-Term Minus 5-Year Average South
2023	2,078	1,359	719	-	-	-	-
2024	2,030	1,328	702	-	-	-	-
2025	815	558	257	575	240	-17	17
2026	825	565	260	582	243	-17	17

a/ 68.5 percent north and 31.5 percent south
b/ 70.6 percent north and 29.4 percent south

Table 3. Shortspine thornyhead ACLs under a default P* of 0.40 for each of the apportionment methods and the difference between the ACLs by area north of 34° 27′ N. lat. and south of 34° 27′ N. lat. in 2025 and 2026. The 2023 and 2024 ACLs are provided for reference. Note that the 2023 and 2024 coastwide ACLs use a P* of 0.40

Year	P* 0.40 Coastwide ACL	Long-Term Average a/ North ACL	Long-Term Average a/ South ACL	5-Year Average b/ North ACL	5-Year Average b/ South ACL	Long-Term Minus 5-Year Average North	Long-Term Minus 5-Year Average South
2023	2,078	1,359	719	-	-	-	-
2024	2,030	1,328	702	-	-	-	-
2025	711	487	224	502	209	-15	15
2026	713	488	225	503	210	-15	15

a/ 68.5 percent north and 31.5 percent south
b/ 70.6 percent north and 29.4 percent south

Status Quo: Long-term average

In the 2025-26 biennium, the apportionment method under the Status Quo method would be 68.5 percent north of 34° 27′ N. lat. and 31.5 percent south of 34° 27′ N. lat.

Pros:
The Status Quo method utilizes a long time series and thus incorporates long-term variability in shortspine thornyhead distributions, which respond to environmental metrics, fishing pressure, and other variables. This increases the ability of apportionment to reflect the overall signal rather than chasing the noise of an individual year.

Cons:

The Status Quo method that utilizes data across 2003-2022 is less reflective of the estimated proportion by area by the NWFSC WCGBT survey where the observed biomass north of 34° 27′ N. lat. has been slightly increasing in recent years while the observed biomass in the south has been slightly declining. Additionally, applying a long-term average would be less responsive to below or above average recruitment events non-randomly spatially distributed across the coast entering the population, potentially resulting in apportionments that differ from changes in biomass by area.

Option 1: Five-year rolling average

In the 2025-26 biennium, the apportionment method under Option 1 would be 70.6 percent to north of 34° 27′ N. lat. and 29.4 percent south of 34° 27′ N. lat.

Pros:

Rolling averages tend to be more responsive to both near- and long-term changes in survey distributions than a long-term average. As shown in Figure 1, the five-year rolling average results more closely align with the survey biomass distributions each year from approximately 2014-2022 (Table 1; Figure 1). This method would align with the apportionment method already used by the Council for sablefish north and south of 36° N. lat., increasing management consistency.

Cons:

Option 1 that applies a rolling five-year average could be subject to larger variations in the estimated proportions by area compared to a long-term average. Variations could be driven by outlier data points if the WCGBT survey encountered an anomalously high or low proportion of biomass in either area simply due to sampling which may or may not be indicative of changes in the biomass. Shortspine thornyhead are a long-lived, slow-growing rockfish that are unlikely to have large changes in biomass year to year, hence, applying a rolling five-year average may not be necessary.

GMT Recommendation

The GMT sees merit in aligning apportionment methods across stocks and recommends the Option 1 apportionment method (five-year rolling average) be used for shortspine thornyhead.

PFMC
10/23/23