

Shrimp Trawl Bycatch Methodology for Finfish Workgroup

Meeting Summary

Virtual Meeting

Noon-3pm EDT, May 11-12, 2026

The Shrimp Trawl Bycatch Methodology for Finfish Workgroup convened May 11-12, 2026, for a virtual meeting. The Workgroup included members of Council staff, Scientific and Statistical Committee (SSC), Shrimp Advisory Panel, National Marine Fisheries Services, and was chaired by Gregg Bray (Gulf States Marine Fisheries Commission). Workgroup members and their affiliations are listed at the end of the meeting summary. The meeting agenda was adopted, and workgroup members were asked to email Council staff with any changes to the March 30, 2026, summary.¹

Species-specific shrimp effort estimates:

Mr. Dettloff (Southeast Fisheries Science Center [SEFSC]) presented on the process of how shrimping effort is allocated by penaeid species after the total is estimated. Fishery independent Southeast Area Monitoring and Assessment Program (SEAMAP) data are used to determine species distributions in space and time, and those data are paired with fishery dependent electronic logbook (ELB) data to statistically apportion targeted effort. Species-specific effort estimation is not used in bycatch estimation, but rather season, area, depth, time of day, and number of nets predict bycatch as the actual shrimp species being targeted is secondary to those factors. As a result, total shrimp effort, not species-specific effort, is used to estimate bycatch and in finfish stock assessments.

A workgroup member stated that effort estimation in the past has used landings and effort from vessels with cellular ELBs (cELBs) to calculate catch-per-unit-effort (CPUE), and total effort was back calculated since total landings are known and since CPUE is assumed to be the same for vessels with and without cELBs. After computing total effort, these new parameters are applied to break total effort down into finer scale information and split it into white, brown, and pink shrimp effort. She inquired if the Southeast Fisheries Science Center (SEFSC) was now incorporating one CPUE for a 2-net vessel and a different CPUE for a 4-net vessel to arrive at total effort. Mr. Dettloff responded that, on average, the 4-net configuration catches 1.23 times more shrimp than the 2-net configuration, in the same amount of time. He added that it's not a perfect doubling because the nets on 2-net vessels are larger than those on 4-net vessels. He stated that more vessels with cELBs have 4 nets and that a net scalar accounts for that bias in the cELB sampling by way of post stratification, and he commented that this is detailed in the

¹ Council staff did not receive any emails with changes to the March 30, 2026, meeting summary.

SEDAR 98 Data Workshop Paper 23.² Mr. Dettloff added that the CPUEs for a 4-net vessel versus and a 2-net vessel are estimated from observer data, which accounts for area and time of day, and weights for observed effort from the cELB data in each of the area strata.

At the conclusion of Day 1, a workgroup member inquired if Mr. Dettloff could present at the start of Day 2 a rerun of total effort with CPUE for 2-net and 4-net configurations set equal, without a scalar of 1.23 for 4-nets, to show the effect the scalar is having and if the effect is directional. At the start of Day 2, Mr. Dettloff responded that the effect was less than 1% in 2024; with the scalar for 2-net and 4-net configurations set equal to 1, it was 33,840 tow days in 2024, whereas it was 33,932 tow days with the 1.23 scalar. He added that the 95% confidence interval for the 1.23 scalar is 1.16 to 1.30.

Protocols to expand bycatch estimates from observer data:

Dr. Smith (NMFS contractor) presented on protocols to expand bycatch estimates from observer data. A trip-level cross-check is performed to see if the scale-up procedure presented any bias into the process, by comparing it trip-ticket data. The sample size of 374 matched trips showed a mean difference of zero with the cross-check of trip catch between the observer and the trip ticket. Some variation does exist, so while bias is not inserted into the mean estimate, it is adding uncertainty. They are currently attempting to address with their research if the subsampling procedure can be made more robust.

The effort per tow and the catch per tow are used to generate an average annual CPUE per stratum (area, season, depth, and gear/time [nighttime 2-net, nighttime 4-net, daytime 2-net, and daytime 4-net]). Because there is a sparse sampling procedure, years are pooled together with a stratum, and while some year-to-year variation exists, that variation hovers around the general mean and does not introduce bias. Therefore, each stratum includes a pooled set of years to produce the average annual CPUE.

Mr. Decossas noted that the observer program, from 2007 to 2025, did not explicitly include net configuration into the selection protocol. In practice, that means the random list of vessels selected in any given time period for the observer program should reflect how the fishery at large operates. Starting in 2026, the observer program explicitly incorporates net configuration into the selection protocol for Gulf shrimp.

Gear selectivity and efficiency:

Mr. Decossas (SEFSC) presented on gear configuration (2-net versus 4-net) effort and selectivity. He noted that the proportion of effort by net configuration, from 1984 to 2023, was 75% or greater for the 4-net configured vessels in zones 1 and 4. The switch from 2-net towards 4-net configurations occurred in the mid-1990s for zone 2 and mid-1980s for zone 3. A workgroup

² <https://sedarweb.org/documents/sedar-98-dw-23-estimation-of-commercial-shrimp-effort-in-the-gulf-of-mexico-from-1984-2023/>

member inquired if there was any info on the delay from the 2-net to 4-net configuration switch when examining zones 2 and 3. Mr. Decossas responded that he did not have that historical knowledge.

Mr. Decossas reviewed the 2021-2025 trip ticket landings by federally permitted shrimp vessels by area (grouped stat zones) and by net configuration (2-net or 4-net). A workgroup member stated that in stat zones 1-6, only seven vessels had 2 nets, so the odds that an observer was onboard one of those vessels are small, which reinforces her hesitancy about calculating CPUE. Mr. Decossas noted that was why Dr. Smith had to pool data over time stanzas. He added that, beginning in 2026, consideration of net gear configuration is part of the stratification for the observer program. Mr. Decossas then reviewed the 2026 shrimp observer program vessel sampling frame and noted that the 1-2% fleet coverage rate by the observer program is in terms of industry tow hours for an effort metric. He stated that, in general, 50 to 70 vessels in the Gulf are selected in each time period.

Mr. Decossas explained that “total landings” is for penaeid shrimp and other shrimp, since “RS landings” are rock shrimp and “aux species” are auxiliary species like Atlantic sea bob (slide 10). Mr. Dettloff added that vessels could have tows in multiple stat zones but can only record one stat zone on the trip ticket, leading to landings of certain species to appear high for a stat zone, as a result of coarse trip ticket data resolution.

Estimation of shrimp trawl bycatch of gray triggerfish using SEAMAP data and the proxy species lane snapper (SEDAR 100):

Dr. Peterson (SEFSC contractor) presented on gray triggerfish bycatch estimation, as it was not quantified in the observer program until 2025. He noted that SEAMAP data can be used along with observer data as an alternative bycatch estimation method; he then discussed how SEAMAP data were filtered to include only tows representative of habitat in which the shrimp fleet operates. He later specified that the SEAMAP data set for CPUE was filtered down to tows that they thought were in shrimp habitat, not just tows where the gray triggerfish and lane snapper were caught. Cumulatively, about 37% of tows were removed after applying four filters. He then discussed use of a co-occurrence analysis to determine associations between gray triggerfish and co-occurring species to identify proxy species for bycatch estimation, and he acknowledged that the use of multiple proxies is possible if associations are spatio-temporally variable.

Lane snapper was positively associated with gray triggerfish in most areas, but red snapper had a stronger positive association for depth <10 fathoms in all seasons in Area 2 (statistical zones 7-12). SEAMAP conversion factors were used to adjust bycatch estimates from co-occurring species to gray triggerfish, and those factors ranged from 0.002 to 8.59, with a mean of 0.80, and a conversion factor is applied at the strata level. Therefore, the bycatch estimate was generally reduced within a given stratum, meaning less gray triggerfish bycatch than that of the proxy species. Dr. Peterson noted a suggestion from the SEDAR 100 data workshop to examine if the ratios change through time, leading to time-varying conversion factors. Three eras were identified: 1987-2006, 2007-2013, and 2014-2023. He then presented the gray triggerfish

bycatch by subregion (east and west Gulf) using the time-varying conversion factors, which was a final product of SEDAR 100.

Use of 2025 observer data to estimate gray triggerfish bycatch rates:

Dr. Peterson presented on the use of 2025 observer data to estimate gray triggerfish bycatch rates. A workgroup member commented that he understood, mathematically and statistically, what was done here and stated that the numbers appear usable; however, he inquired about the confidence intervals. Dr. Peterson deferred to the stock assessment biologists as to how the estimates would be used in the model. Another workgroup member requested additional information on sample sizes and how pooling of data is performed.

Council staff inquired if the G-FISHER survey, or another survey that perhaps would not have a gear bias, could be used to look at statistical zones 1-10 for co-occurrence of lane snapper and gray triggerfish to further determine if lane snapper is an appropriate proxy. She noted Elizabeth Scott-Denton's publications around 2003 with characterization of lane snapper and gray triggerfish, with about 3 years of data, and recommended ground-truthing the 2025 observer data with Denton's work. A workgroup member (Dr. Farmer) commented that he published a joint paper around 2010 looking at stock complexes, where they looked at 26 different cluster analyses within MRFS, commercial longline, commercial vertical line, reef fish observer program, and other survey programs, and for gray triggerfish, lane snapper was the fourth most commonly occurring species. For lane snapper, gray triggerfish was the most commonly occurring species. So, there is some evidence of co-occurrence for those in a variety of fisheries.

A workgroup member referenced the error bars around SEAMAP ratios and the high percentage of 2025 observer ratios that fall outside the error bars and stated that she views this as a need for a research recommendation rather than for current use in a stock assessment. She commented that good work was performed with not very good data but that the workgroup should consider if it could recommend this being put into a stock assessment, with so much volatility.

Discussion and recommendations to the Council's Scientific and Statistical Committee:

A workgroup member commented that she would still like to see information to gauge how much the net fishing power and other strata were having on red snapper bycatch estimates, as well as how many gaps in the data exist and how those gaps are being filled in.

Mr. Peterson noted that selection of a proxy species is limited to a pool of 13 species and that lane snapper was the most promising proxy species for gray triggerfish, with the exception of red snapper in area 2. Another workgroup member stated that he has concern with use of lane snapper as a proxy species because of habitat differences for the age-0 and age-1 gray triggerfish and lane snapper and because of only one year of observer data for comparison, so he has hesitancy to recommend the values for use in a gray triggerfish stock assessment. Dr. Peterson

stated that the correlation between or magnitude of catch of grey triggerfish and lane snapper is not fundamental to the method, as it is the ratio that is important.

A workgroup member noted that, with 2,472 tows in the 2025 observer data, they should be able to say something analytically about whether or not an association between two species exists, with some level of certainty. Another workgroup member inquired what was deficient in the species interaction factor from the chi-square analyses such that one would not believe it would not hold in 2025. The other workgroup member responded that the analyses were very thorough but that the data lend themselves to interpretation; he added that they have independent analysis that could be used to confirm the results of that model and either provide additional support or not. He stated that the 2025 observer data do not appear to provide that support, as the number of gray triggerfish and the number of lane snapper are not positively correlated but rather negatively correlated, which doesn't lend support to the species co-occurrence. Dr. Peterson noted that there is not enough observer data (solely from 2025) to compare bycatch estimates, but he stated that he could see if the sample size is large enough to run a co-occurrence analysis on the 2025 observer data. In that case, it may be possible, in some strata at least, to compare the species interaction factor and see if they're going in the same direction.

The workgroup discussed that the king mackerel bycatch estimation methodology is similar to that of red snapper, but the collection of observer data for king mackerel is different from red snapper, as king mackerel is a sample approach.

Recommendations:

- The effort values used to expand bycatch estimates are acceptable.
- The methodology using observer data that's been proposed and being used to estimate red snapper bycatch in the Gulf is acceptable.
- A consistent method for bycatch estimation for the uncharacterized species in the observer data needs to be developed for use in finfish stock assessments.
- The methodology using observer data that's been proposed and being used to estimate red snapper bycatch in the Gulf needs to be reviewed for the other characterized species in the observer data by the work group.
- The methodology reviewed for the gray triggerfish bycatch estimate was mathematically and statistically valid. However, using proxy species to develop ratios was questioned.

Requests for next meeting of the workgroup:

- King mackerel methodology
 - Spreadsheet showing the observer data (number of observations) of king mackerel by stratum and CPUE by stratum
 - Show how the methodology filled any holes in the data and what the annual estimates are

- King mackerel was recommended since it is migratory; recommendation to also pick a data-poor species that is not migratory to also present on to the workgroup
- For king mackerel, if the workgroup can say it's less robust from a data standpoint or from an observation standpoint but we still have a high degree of confidence in the methodology and the result it produces, then maybe that will help others gain confidence in the few other characterized species this approach might be applied to.

Public comment:

No public comment was given on either day of the webinar meeting.

<u>Shrimp Bycatch Methodology for Finfish Workgroup Members:</u>	<u>Attendance</u>
Gregg Bray, GSMFC – <i>Chair</i>	X
John Froeschke – Gulf Council Staff	X
Jim Nance – SSC	X
Steve Saul – SSC	Absent
Don Behringer – Special Shrimp SSC	X
Jason Saucier – Special Shrimp SSC	X
Konner Lockfield – Special Shrimp SSC	X
Gary Decossas – SEFSC	X
Kyle Dettloff – SEFSC	X
Adam Pollack – SEFSC	X
Steve Smith – SEFSC Contractor	X
Cheston Peterson – SEFSC Contractor	X
Nick Farmer – SERO	X
Leann Bosarge – Shrimp AP	X
Gary Graham – Shrimp AP	X
Justin Versaggi – Shrimp AP	Absent
<u>Support Staff:</u>	
Katie Siegfried – SEFSC	X
Matt Freeman – Gulf Council Staff	X
Ryan Rindone – Gulf Council Staff	X
Carrie Simmons – Gulf Council Staff	X
<u>Other Attendees:</u>	
Chris Schieble – Gulf Council Member	X