



North Pacific Fisheries Commission

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Small Working Group on NPA and SA - Summary for 2023

by

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The Small Working Group on North Pacific Armorhead and Splendid Alfonsino (SWG NPA-SA) held three online meetings in 2023 (May 16th, Aug 22nd and September 27th). By SSC BF-ME03, the group was tasked with six items as follows:

1. Continue joint work on life history based approach to stock assessment
2. Consider other possible approaches to stock assessment, especially for NPA
3. Assist the Secretariat to edit the fish ID guide
4. Update species summaries
5. Monitor the effectiveness of current management measures in sustaining the bottomfish fishery for NPA and SA, given the historically low catch and effort in the fishery and continuing low levels of recruitment in monitoring surveys since 2019
6. Conduct CPUE standardization and comparison with other indices of abundance (e.g., acoustic survey abundance) (lower priority)

Progress on those tasks is summarized below.

1. Continue joint work on life history based approach to stock assessment

The SWG agreed that this approach cannot be used to NPA last year, and thus continued joint work to estimate life history parameters (growth and maturity) of SA.

1-A. Growth curve for SA

Hyejin Song (Korea) led the analysis (see Appendix 1) and concluded that the growth curve estimate was improved (in terms of the convergence of the numerical optimization and AIC) by incorporating locations (seamounts) as a random factor. The posterior modes of von Bertalanffy parameters were summarized in Table 1.

Table 1. Posterior modes of von Bertalanffy parameters

Parameter	Mode	95% credible interval
L_{∞}	571.5	531.6 ~ 628.0
K	0.074	0.063 ~ 0.085
t_0	-5.096	-5.375 ~ -4.814

The SWG NPA-SA agreed to use growth parameters as estimates of SA growth, while Korea will continue its analyses and present them in future meetings.

1-B. Maturity ogive for SA

Christopher Gardner Ayer and Satoi Arai (Japan) led the analysis to improve statistical modeling of maturity (Hasegawa and Sawada 2021; Nishizawa and Sawada 2022), especially by the use of gometric method (Flores et al. 2019). The SWG concluded that the further work is needed. Japan informed that the progress will be presented at the SSC BFME04 meeting as a working paper.

2. Consider other possible approaches to stock assessment, especially for NPA

The SWG agreed to conduct individual-based bioenergetic modeling (see Gibson et al. 2019) to estimate recruitment success, and depletion analysis (Kiyota et al. 2014) to estimate past recruitment, harvest rate and spawning stock biomass, as possible approaches for NPA.

The SWG reviewed data requirements for bioenergetic modeling on NPA and agreed to begin with a literature survey. The SWG agreed to share catch and effort data on NPA for depletion analysis, and endorsed the Terms of Reference (Appendix 2) and template (Appendix 3) for data sharing. These documents will be further reviewed by the SSC BFME04.

3. Assist the Secretariat to edit the fish ID guide

The Science Manager presented draft specifications for the design and content of the Fish ID Guide. The SWG reviewed them and agreed with the specifications shown in Table 2.

Table 2. Specifications for the fish ID guide.

Design		Content	
Paper quality	Waterproof	Structure of Guide	One page – one to three specimen
Size of paper	A4	Introduction	2 pages
Orientation	Portrait	Taxonomic resolution	Species
Number of pages	~100	Species name	Common English and Latin name
Theme font	TNR	Size information (text or scale)	Text + scale
Size of font	12		
Color of main text font	Black	Physical description	+

Size of illustrations	As large as possible	Diagnosis	+
Illustration background	various	Habitat and depth	+
Deck/lab photo	+	FAO Code	+

4. Update species summaries

The SWG reviewed and endorsed the updates species summaries on NPA and SA.

5. Monitor the effectiveness of current management measures in sustaining the bottomfish fishery for NPA and SA, given the historically low catch and effort in the fishery and continuing low levels of recruitment in monitoring surveys since 2019

The SWG reviewed the current measures and agreed to evaluate the effectiveness of encouraged catch for NPA (CMM 2023-05 4.M and 4.N) and of mesh size regulation of the trawl nets for SA (CMM 2023-05 4.Q).

The SWG agreed to evaluate encouraged catch by testing the hypothesis that the setting of encouraged catch reduced directed fishing effort and fishing pressure on NPA, even though recent annual catch is smaller than the encouraged level, and noted that depletion analysis, which is planned to be conducted under task 2, will also contribute to this evaluation by estimating harvest rate. In addition, the SWG also agreed to monitor the trend of directed effort through observer data on intended target species and catch species composition (see Sawada et al. 2017). The SWG noted that it would be useful to know the socio-economic background of recent effort reduction.

The SWG agreed to evaluate mesh size regulation by the comparison of catch size composition of SA before and after the implementation of regulation. It also noted that the conclusion from a previous analysis by Japan (Sawada and Ichii 2020) was ambiguous and further analysis is required, and that a previous analysis by Korea (Park et al. 2021) found an increase of size for NPA, but SA was not analyzed.

6. Conduct CPUE standardization and comparison with other indices of abundance (e.g., acoustic survey abundance)

The SWG made no progress on this task and agreed to keep it in lower priority. The SWG encouraged Members to continue discussion on methodology and framework for CPUE standardization.

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