North Pacific Fisheries Commission

NPFC-2021-SSC BFME02-WP07

Species summary of Splendid alfonsino (*Beryx splendens*) in the Emperor seamounts

by
SWG NPA-SA

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2nd Floor Hakuyo Hall,
Tokyo University of Marine Science and Technology,
4-5-7 Konan, Minato-ku, Tokyo
108-8477, JAPAN

TEL +81-3-5479-8717
FAX +81-3-5479-8718
Email secretariat@npfc.int
Web www.npfc.int

Splendid alfonsino (*Beryx splendens*)

Common names: Splendid alfonsino (English); 红眼金鲷 (Chinese); キンメダイ (Japanese); 빛금눈돔 (Korean); Низкотелый берикс (Russian)

Biological Information

Global distribution ranges from tropical to temperate oceans. Historical catch records in the Emperor Seamount suggest the distribution from Nintoku (45 °N) to Hancock (30 °N). Settlement occurs following a certain period of the pelagic life stage. Adults show a vertical distribution from 200 to 800 m with diel vertical migration, feeding on crustaceans, cephalopods, and fish during the night. Limited information is available for recruitment and reproduction processes in the Emperor Seamounts, whereas the population in the Japanese coast shows 4–5 years to sexually mature and spawning occurs during summer (Shotton 2016).

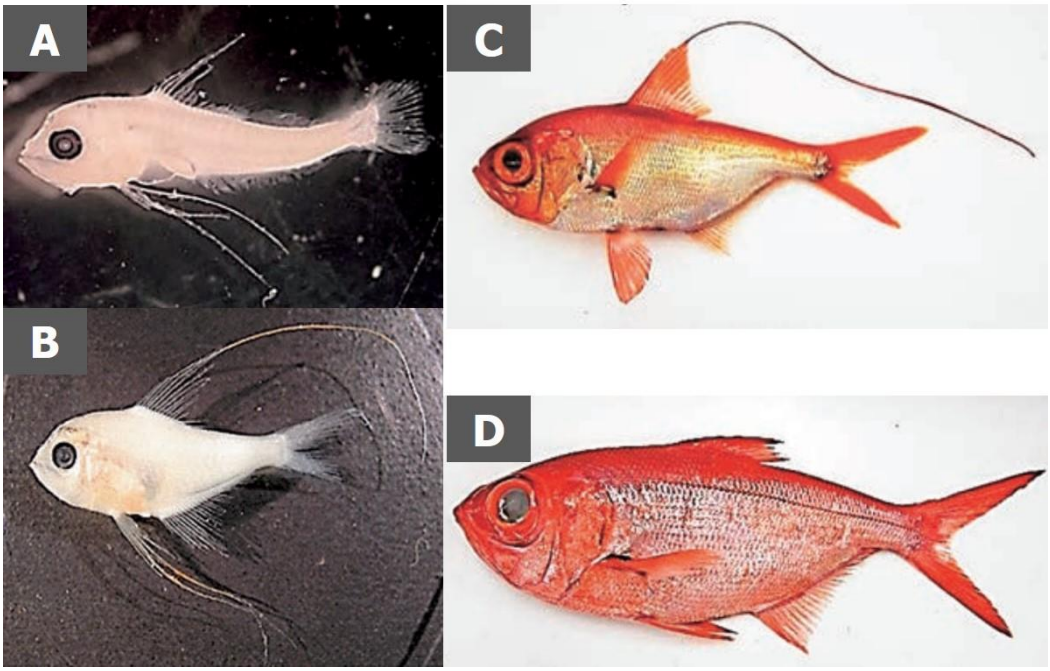

Figure 1: Photographs of Splendid alfonsino on different developmental stages A) postlarva, B) juvenile, C) young, D) adult (from Watari et al. 2017)

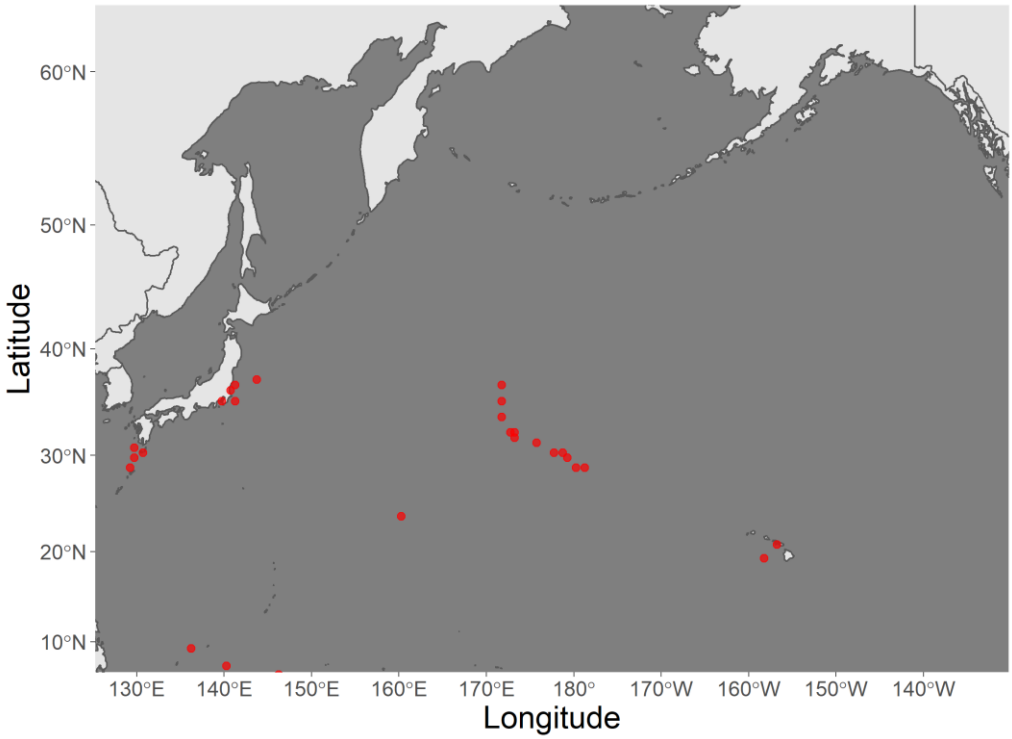

Figure 2: Known distribution of Splendid alfonsino around NPFC waters. Points indicate observation data from original sources (AquaMaps 2019, October)

Fishery

Since the discovery of large populations of North Pacific armorhead in the Emperor Seamount in the late 1960s, Splendid alfonsino has been exploited as an alternative resource to the armorhead due to the large temporal fluctuation of the armorhead population. The main fishing methods are bottom trawls and gillnets.

Historical catch record (Figure 3) shows the highest catch proportion by Japan, followed by Korea and Russia. Russia terminated their fishery nearly a decade ago. Fishing pressure somewhat reflects the recruitment condition of North Pacific armorhead. In 2010 and 2012, when high recruitment of the armorhead occurred, the annual catch decreased below 1,000 tons, whereas it increased up to 4,000 tons ever since then.

Size composition analysis from the catch data by Japanese trawlers suggests the substantial decrease in size of fish in catches over the past decade, raising the concern about recruitment overfishing (Sawada et al. 2018).

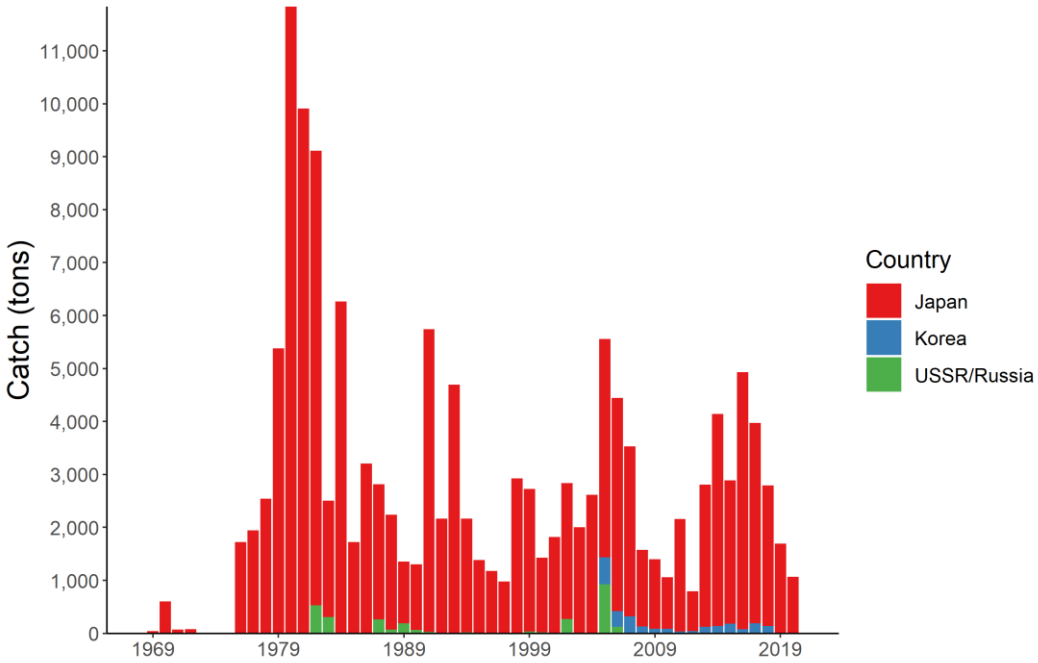

Figure 3: Historical trends of Splendid alfonsino catches in NPFC waters. The annual amounts of catch by each country are shown by the bar plot.

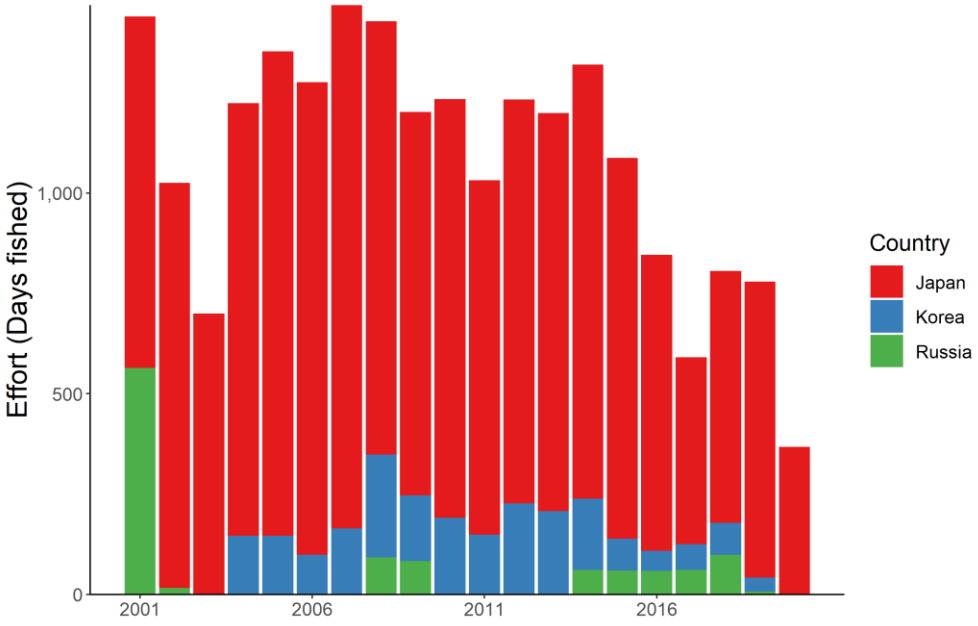

Figure 4. Historical fishing efforts for Splendid alfonsino. The annual fishing efforts by each country are shown by barplot. The efforts are calculated by the total fishing days operated during the year

Assessment

There are no biomass estimates available for Splendid alfonsino in NPFC waters.

An age- or length-structured stock assessment may be feasible given the life history of this species. Surplus production models developed by Japan in 2008 showed that the average fishing mortality is 20–28 % higher than the MSY level (Nishimura and Yatsu 2008). This analysis, however, remains unreliable as the estimated CPUE is biased due to target shifts between North Pacific armorhead and Splendid alfonsino and the estimated intrinsic population growth rate parameter was too high for long-lived deep-sea fish.

Data limited approaches, such as YPR or SPR analysis that do not require detailed resource parameters or fishing data, should be explored in the future.

Management

Active Management Measures

The following NPFC conservation and management measures pertain to this species:

- CMM 2021-05 For Bottom Fisheries and Protection of VMEs in the NW Pacific Ocean
- CMM 2019-06 For Bottom Fisheries and Protection of VMEs in the NE Pacific Ocean

Available from https://www.npfc.int/active-conservation-and-management-measures

Item	Status	Comment
Biological reference points	Not accomplished	Not established
Stock status	Unknown	Status determination criteria not established
Catch limit	Intermediate	No operation from November to December
Harvest control rule	Not accomplished	Not established
Other	Intermediate	No expansion of fishing beyond established areas, No operation in the designated areas, No more increase in the fishing vessels, Restriction of trawl mesh size

Currently, there is no accepted harvest control rule for this species.

In 2016, the management measures were implemented, which includes limiting the fishing effort to the 2007's level, prohibiting fisheries from November to December (which corresponds to the spawning season for North Pacific armorhead) and not allowing fisheries in C-H Seamount and the southeastern part of Koko Seamount (for the protection of VMEs).

In 2019, an additional measure was adopted, which includes the regulation of the mesh size (trawl: > 10 cm) to protect juvenile fish. Effectiveness of this measure yet to be clearly demonstrated (Sawada and Ichii 2020).

Data Summary

Catch data

Data	Country	Source	Fishery	Year	Comments
Annual catch	Japan	Commercial	Trawl	1969-present	
		Commercial	Gillnet	1990-present	
	Korea	Commercial	Trawl	2004-2019	Catches are collected by electronic reporting system since 2015. Catches before 2015 are from the fishing catch provided by the fishery company
	Russia	Commercial	Trawl	1969-1988; 2002; 2005; 2006; 2010; 2011; 2013; 2019	Data coverage details to be reviewed
CPUE	Japan	Commercial	Trawl	1970-present	Possible impact by misreporting (NPFC-2018-TCC03-Final Report)
		Commercial	Gillnet	2008-present	
		Survey	Trawl		0 catch of SA in 2020 monitoring surveys, Preliminary surveys in 2018 not included
	Korea	Commercial	Trawl	2013-2019	One fishing vessel. Standardization?

	Russia	Commercial	Trawl	1969-1988; 2010; 2019	Data coverage details to be reviewed
		Survey	Trawl	1969-present	Data coverage details to be reviewed

Biological data

Data	Country	Year	Comments
Length	Japan	2009-present	Protocol revised (see NPFC-2018-SSC BF01-WP03)
	Korea	2013-2019	Data coverage review
	Russia	NA	Data coverage details to be reviewed
Age	Japan	2013-present	Annual ring analysis
	Korea	2013-2017, 2019	Details to be reviewed
	Russia	NA	Data coverage details to be reviewed
Maturity	Japan	2013-present	
	Korea	2013-2017, 2019	Data coverage review
	Russia	1969-1988; 2010; 2011; 2013; 2019	Data coverage details to be reviewed

References

Watari, S., Yonezawa, J., Takeuchi, H., Kato, M., Yamakawa, M., Hagiwara, Y., & Ochi, Y. (2017). Fisheries biology and resource management of Splendid alfonsino *Beryx splendens*. Bulletin of Japan Fisheries Research and Education Agency, 44, 1-46.

Kaschner, K., Kesner-Reyes, K., Garilao, C., Segschneider, J., Rius-Barile, J. Rees, T., & Froese, R. (2019, October). AquaMaps: Predicted range maps for aquatic species. Retrieved from https://www.aquamaps.org.

Sawada, K., Nishida, K., Yonezaki, S. and Kiyota, M. (2018). Review of biology and fisheries of Splendid alfonsino *Beryx splendens*, especially in the Emperor seamounts area. NPFC-2018-SSC- BF01-WP03. 26 pp.

Sawada, K., and Ichii, T. (2020) Catch size composition of splendid alfonsino in the Emperor Seamounts area before and after the implementation of the mesh size regulation. NPFC-2020-SSC BFME01-WP05 (Rev. 1). 3 pp.

Shotton, R. (2016). Global review of alfonsino (Beryx spp.), their fisheries, biology and management. FAO Fisheries and Aquaculture Circular, (C1084), I.

Nishimura, A., & Yatsu, A. (2008, October). Application of surplus-production models to splendid alfonsin stock in the Southern Emperor and Northern Hawaiian Ridge (SE-NHR). In Fifth Intergovernmental Meeting on Establishment of New Mechanism for Management of High Seas Bottom Trawl Fisheries in the North Western Pacific Ocean (NWPBT/SWG-05), Tokyo, 17-18 October 2008 (pp. 1-11).