5-Year Review of the Oceanic Whitetip Shark (*Carcharhinus longimanus*)

March 2025

National Marine Fisheries Service

Office of Protected Resources

Silver Spring, Maryland

National Marine Fisheries Service
5-Year Review of the

Threatened Oceanic Whitetip Shark

Recommendation resulting from the 5-Year Review:

- ☐ Downlist to Threatened
- ☐ Uplist to Endangered
- ☐ Delist
- ☒ No change is needed

Review Conducted By (Name and Office):

Jennifer Schultz, Office of Protected Resources, Jennifer.Schultz@noaa.gov

HEADQUARTERS APPROVAL:

☒ Concur ☐ Do Not Concur

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Acting Assistant Administrator, NOAA Fisheries

5-Year Review of the
Oceanic Whitetip Shark (*Carcharhinus longimanus*)

The National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA) conducted this review in accordance with the Endangered Species Act of 1973, as amended (ESA). We based this 5-year review on the best scientific and commercial data available, identified in and since the publication of the NMFS (2024) Endangered Species Act Recovery Status Review for the Oceanic Whitetip Shark (*Carcharhinus longimanus*). We incorporate by reference and cite the 2024 Recovery Status Review (NMFS 2024) throughout this 5-year review.

1 GENERAL INFORMATION

1.1 Reviewer:

Jennifer Schultz, Office of Protected Resources, NMFS, *jennifer.schultz@noaa.gov*

1.2 Introduction

Section 4(c)(2) of the ESA requires us to conduct a review of listed species at least once every 5 years. During a 5-year review, we determine whether a species should be removed from the list (*i.e.*, delisted), reclassified from an endangered species to a threatened species (*i.e.*, downlisted), or reclassified from a threatened species to an endangered species (*i.e.*, uplisted; 16 U.S.C. 1533(c)(2)). Section 4(b)(1)(A) of the ESA requires us to make the determination based solely on the best scientific and commercial data available at the time of the review and after taking into account efforts to protect the species (16 U.S.C. 1533(b)(1)(A)).

1.3 Methodology Used to Complete the Review

As required under 50 CFR 424.21, we announced initiation of the 5-year review in the Federal Register (FR) and solicited relevant information (89 FR 56865; July 11, 2024). We specifically requested electronic submission of data that have become available since the species was listed as a threatened species under the ESA (83 FR 4153; January 30, 2018). We received two comments. One provided citations of such data and stated that during the 5-year review, we should consider whether the species is endangered throughout a significant portion of its range (Davenport 2024); see section 5 of this review. The other comment provided information about the shark fin trade (McDavitt 2024); see section 3.2.

The Recovery Status Review recently identified and reviewed the best available scientific and commercial data on the species from 2018 to 2024. In 2024, those data were incorporated into the Recovery Plan for the Oceanic Whitetip Shark, which was peer reviewed. For this 5-year review, we reviewed the Recovery Status Review, information provided during the public comment period, and information that has become available since the publication of the Recovery Status Review. Based on the best available information, we recommend retaining the threatened classification of the oceanic whitetip shark.

1.4 Listing, Review, and Recovery Planning History

For this species, we have initiated or completed the following actions under section 4 of the ESA.

1.4.1 Initiation of this 5-Year Review

FR notice: 89 FR 56865
Date published: July 11, 2024

1.4.2 Listing History

Original Listing
FR notice: 83 FR 4153
Date listed: January 30, 2018
Entity listed: Species
Status: Threatened

1.4.3 Recovery Plan

Name of plan or outline: Recovery Plan for the Oceanic Whitetip Shark
FR notice: 89 FR 56865
Date published: July 11, 2024

1.4.4 Species Recovery Priority Number

Based on NMFS Recovery Priority Guidance (84 FR 18243, April 30, 2019), the oceanic whitetip shark was assigned 6C in the most recent Report to Congress (2021-2022). The assigned number reflects the species' moderate demographic risk, an adequate understanding of its major threats, the low level of U.S. influence for addressing major threats through management or protective actions, and moderate certainty that management actions will be effective. Commercial fisheries incidentally capture the

oceanic whitetip shark, and therefore the species is in conflict ("C") with economic activity.

1.4.5 Associated Proposed Rulemakings

Proposed Protective Regulations
FR notice: 89 FR 41917
Date published: May 14, 2024
Extension of public comment period: 89 FR 63393; July 11, 2024
Announcement of public hearings: 89 FR 56847; August 5, 2024

2 DEMOGRAPHIC FACTORS

Abundance estimates of the species were not available at the time of listing and are still not available. Historical bycatch, research survey, and observational data indicate that the species was once abundant worldwide (NMFS 2024). Evaluating bycatch data available since the 1990s, the species has declined by at least 75% throughout its range (Pacoureau *et al*. 2019) and at similarly high levels in all regions (NMFS 2024). The International Union for Conservation of Nature (IUCN) Red List also identified severe declines (Rigby *et al*. 2019) and concluded that the species is decreasing. The Recovery Status Review (section 3) concluded, and we agree, that overall abundance is likely low relative to historical levels. In the northwestern Atlantic Ocean, pelagic longline fisheries observer data suggest that relative abundance may have stabilized or even increased since 2010 (NMFS 2024). Similarly, there may be positive population growth in the western and central Pacific Ocean (NMFS unpublished data 2025). Recent data are not available in other regions.

The oceanic whitetip shark has a global distribution in epipelagic tropical and subtropical waters. New data on the population structure of the species have become available since publication of the Recovery Status Review. Nuclear and mitochondrial DNA demonstrate genetic differentiation between samples collected in the Atlantic and Indo-Pacific Oceans (Ruck *et al*. 2024). There may also be additional substructure (*e.g.*, mitochondrial differentiation between the eastern and western Atlantic Ocean); however, the authors recommend further study (Ruck *et al*. 2024). Within the Indo-Pacific, there is little evidence for genetic differentiation between samples from Taiwan and the Arabian Sea; adequate sample sizes were not available from other locations throughout the Indian and Pacific Oceans (Ruck *et al*. 2024). Oceanic whitetip sharks are highly migratory, and satellite telemetry data of seven sharks tagged in French Polynesia revealed movement across net distances of 1,625 to 7,885 km (Burkhardt *et al*. 2025).

Five of the seven returned to French Polynesia, demonstrating site fidelity. Shen *et al*. 2024) also found evidence for both connectivity and site fidelity. Comparisons of vertebral microchemistry detected differential habitat usage by adults in the central and eastern Pacific Ocean; however, they also detected evidence for developmental trans-Pacific movement (Shen *et al*. 2024). At present, oceanic whitetip sharks in the Indo-Pacific are considered to be one panmictic (*i.e.*, interbreeding) population; however, additional research on genetic population structure may be informative.

Compared to other shark species, the oceanic whitetip shark exhibits moderate genetic diversity, indicating some adaptive resilience to future environmental changes (Ruck *et al*. 2024).

3 ESA SECTION 4(A)(1) FACTORS OR THREATS

Section 4(a)(1) of the ESA requires us to determine whether any species is an endangered species or a threatened species because of any of the following factors (16 U.S.C. 1533(a)(1)):

(A) the present or threatened destruction, modification, or curtailment of its habitat or range;
(B) overutilization for commercial, recreational, scientific, or educational purposes;
(C) disease or predation;
(D) the inadequacy of existing regulatory mechanisms; or
(E) other natural or manmade factors affecting its continued existence.

In the sections below, we summarized the impact of these 4(a)(1) factors or threats on the species. A thorough review is available in section 4 of the Recovery Status Review, which identified pollution and toxins, aquaculture and fish farming activities, and tourism as manmade factors affecting the species continued existence. For each threat, we identify the magnitude of the impact on the species (*e.g.*, high, moderate, low, or unknown) and the trend of the impact (*e.g.*, increasing, decreasing, stable, or unknown). We also identify how the threat impacts the demographic factors described above (*e.g.*, reducing abundance through mortality). Because regulatory mechanisms are intended to reduce the other threats, we address this factor last.

3.1 Present or Threatened Destruction, Modification, or Curtailment of its Habitat or Range

Oceanic whitetip sharks occupy the upper water column (to 1,000 m depth) and forage on pelagic prey. As described in section 4.1 of the Recovery Status Review, habitat

threats include degradation from fishing activities, increased ocean temperature, reduced oxygen levels, and changes in prey availability due to ocean warming and acidification. Surface-oriented epipelagic sharks (*e.g.*, oceanic whitetip sharks) may be the most vulnerable to “dead zones” of depleted oxygen levels (Dedman *et al.* 2024). Oceanic whitetip sharks dive to depths found within the oxygen minimum zone (Waller *et al.* 2024). While they may be capable of withstanding mild to moderate hypoxia, warming water temperatures are likely to reduce this capacity (Waller *et al*. 2024). Depleted oxygen levels are likely to cause shifts in the species’ spatial distribution, possibly increasing interactions with fisheries (Waller *et al*. 2024). For the oceanic whitetip shark, Xia *et al*. (2025) found that bycatch per unit effort (BPUE) was higher in low oxygen environments. Based on the best available data, we conclude that the present or threatened destruction, modification, or curtailment of habitat or range is a low-level, emerging threat to the species. Temperature increases, reduced oxygen, and prey limitations would likely alter the species’ spatial distribution.

3.2 Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Overutilization includes bycatch in commercial fisheries (especially longlines) and harvest for use in the international shark fin trade. The Recovery Status Review (section 5) rated the overall risk of longline bycatch as either moderate-high or high throughout the species’ range. Illegal, unreported, and unregulated (IUU) fishing, bycatch in other fisheries (*e.g.*, purse seines, gillnets, *etc*.), and illegal retention for the fin trade further contribute to the overall threat to the species.

Since the publication of the Recovery Status Review, Xia *et al.* (2025) evaluated longline BPUE and bycatch risk, using 2013 to 2022 data made available by the Western and Central Pacific Fisheries Commission. They found that areas with elevated BPUE do not necessarily align with areas of high bycatch risk (Xia *et al.* 2025; Figure 1).

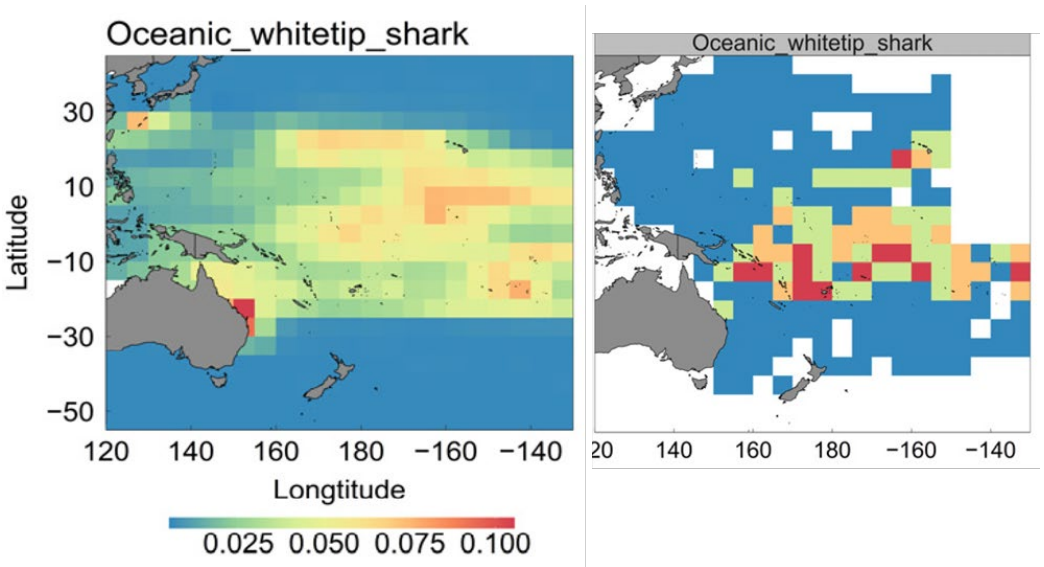

FIGURE 1. PACIFIC LONGLINE BPUE AND BYCATCH RISK
Left: annual average BPUE (sharks/1000 hooks). Right: bycatch risk levels from low (blue) to high (red; Xia *et al.* 2025).

All regional fisheries management organizations (RFMOs) prohibit retention of oceanic whitetip sharks. Gear modifications (*e.g.*, monofilament leaders), proper handling, and removal of trailing gear reduce fishery impacts (NMFS 2024). In a study released after publication of the Recovery Status Review, Worm *et al*. (2024) found a decrease in retention and an increase in observed live-releases of oceanic whitetip sharks since 2012. Between 2012 and 2019, shark mortality (all species, of which the oceanic whitetip shark was a large component) decreased 7% in pelagic fisheries, especially across the Atlantic and western Pacific Oceans (Worm *et al*. 2024). From 2016 to 2018, average annual fishing mortality ranged from 2 to 1,096 sharks (Worm *et al*. 2024; Figure 2).

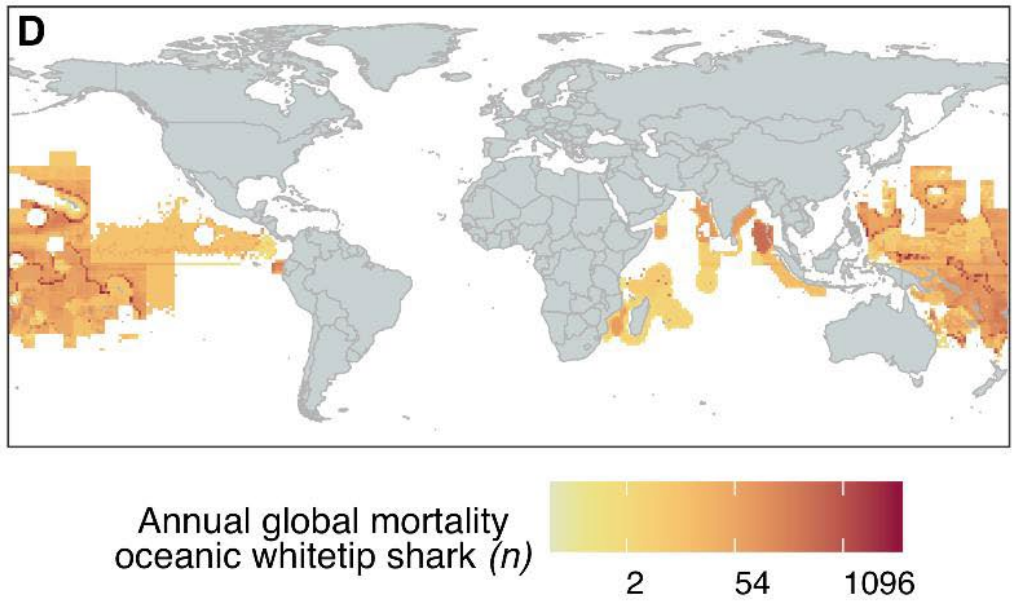

FIGURE 2. AVERAGE ANNUAL FISHING MORTALITY FROM 2016 TO 2018 (Worm *et al*. 2024)

The demand for shark fins continues to drive illegal and opportunistic retention of the species (NMFS 2024). The occurrence of oceanic whitetip shark in the dried fin trade is still relatively high, comprising 6.6% of shark fins sold in a Hong Kong market from 2014 to 2018 (Cardeñosa *et al*. 2022). During the public comment period, we received additional information indicating the continued prevalence and persistence of the species in illegal shark fin trade throughout the Indo-Pacific (McDavitt 2024).

Overutilization results in mortality to individuals, which reduces the species' abundance and productivity. Based on information available in and since the publication of the Recovery Status Review, we conclude that the impact of overutilization likely remains high despite some evidence for reduced bycatch mortality. We do not have enough data to determine the trend of this threat due to inadequate reporting and misreporting.

3.3 Disease and Predation

Section 4.3 of the Recovery Status Review concluded that disease and predation are not threats to the oceanic whitetip shark, and additional information is not available.

3.4 Other Natural or Manmade Factors

Other factors affecting the species' continued existence include pollution and toxins, aquaculture and fish farming activities, and tourism. Oceanic whitetip sharks are likely

exposed to toxins through their diet, pollution, and oil spills; however, individual or population level impacts have not been identified (NMFS 2024). Disturbances caused by aquaculture, fish farming, and tourism activities may alter individuals' behavior and the spatial distribution of the species. The Recovery Status Review (section 4.5) concludes that these are low-level, emerging threats.

3.5 Inadequacy of Existing Regulatory Mechanisms

Section 4.4 and the appendices of the Recovery Status Review describe numerous regulatory mechanisms that exist to protect and conserve the oceanic whitetip shark through trade restrictions and fishing regulations (*e.g.*, prohibitions on retention, gear modifications, and proper handling requirements). Retention prohibitions enacted throughout the range of the species appear to be effective at reducing bycatch mortality in pelagic fisheries (Worm *et al.* 2024). Despite protections, IUU fishing continues (Worm *et al.* 2024), and the species' incidence in the shark fin trade is still relatively high (Cardeñosa *et al.* 2022). Therefore, the Recovery Status Review concludes, and we agree, that inadequacy of existing regulatory mechanisms remains a moderate-high level threat to the oceanic whitetip shark, restricting its abundance and productivity. We do not have adequate data to determine the trend of this threat.

4 EFFORTS TO PROTECT THE SPECIES

Section 4(b)(1)(A) of the ESA requires us to make our determinations based solely on the best scientific and commercial data available at the time of the review and after taking into account efforts, if any, being made by any State or foreign nation, or any political subdivision of a State or foreign nation, to protect such species, whether by predator control, protection of habitat and food supply, or other conservation practices, within any area under its jurisdiction, or on the high seas (16 U.S.C. 1533(b)(1)(A).

The Recovery Status Review considered the best available data and described numerous efforts to protect the species, including regulatory efforts to deter retention, modify gear, and ensure proper handling (see appendices in NMFS 2024). We conclude that these efforts have had a positive impact on the species, but significant threats to the species remain.

5 SYNTHESIS

In 2024, we published the Oceanic Whitetip Shark Recovery Status Review, which identified and evaluated the best available scientific and commercial data on the species. We based this 5-year review on those data and additional data that have become available since the publication of that report.

The greatest threat to the species is overutilization, which includes bycatch in numerous fisheries (especially longline) and retention of bycaught individuals for the international shark fin trade. Overutilization has caused a large decline in the species' relative abundance, as indicated by bycatch data available since the 1990s. The Recovery Status Review and IUCN Red List review (Rigby *et al*. 2019) concluded that the species continues to decline, but there are some indications that these trends have slowed or even reversed. Numerous regulatory mechanisms exist to deter retention, modify gear, and ensure proper handling; and recent data suggest declining mortality rates in pelagic fisheries, especially in the Atlantic and Pacific Oceans (Worm *et al*. 2024). However, IUU fishing and the demand for shark fins continue throughout the global range of this species.

The IUCN Red List and ESA listings are based on different extinction risk analyses and criteria. The IUCN Red List review concluded that the oceanic whitetip shark is a critically endangered species because of an inferred population size reduction of greater than 80% over three generations (Rigby *et al*. 2019). The ESA requires that we determine whether a species is endangered or threatened because of the section 4(a)(1) factors. In 2018, we determined that oceanic whitetip shark was a threatened species because of overutilization for commercial purposes and the inadequacy of regulatory mechanisms. We determined that the species was likely to become an endangered species within the foreseeable future, which we estimated at approximately 30 years or 3 generations.

Based on the best available commercial and scientific data, and taking into account protective efforts, we continue to find that the oceanic whitetip shark is threatened by these 4(a)(1) factors, which occur at moderate to high levels throughout the entire range of the species. Since the 2018 listing, other low-level threats have emerged including the threatened modification or curtailment of its habitat, pollution, aquaculture, and tourism.

A commenter suggested that the species may be endangered throughout a significant portion of its range, but there is insufficient information available to make this

determination. Bycatch data available since the 1990s indicates similar levels of decline across all regions. Where available, recent data indicate possible stabilization or increases; however, in most regions, recent data are not available. The species remains threatened by several 4(a)(1) factors throughout its range, the greatest of which continue to be overutilization and inadequate regulatory mechanisms. Retention prohibitions have reduced mortality in pelagic longline fisheries worldwide, but illegal fishing continues in many locations to meet the demand for shark fins (Worm *et al.* 2024). Available estimates of BPUE, bycatch risk, and mortality vary spatially (Figures 1 and 2), but elevated levels are not concentrated in any region. Thus, data available since 2018 do not demonstrate high extinction risk in any portion of the species range. Rather, the best available data indicate that the oceanic whitetip shark is likely to become an endangered species within the foreseeable future throughout its range because of habitat modification, overutilization, inadequate regulatory mechanisms, and manmade factors. Therefore, we recommend that the species remain classified as threatened.

6 RESULTS

Based on the best available scientific and commercial data identified in and available since the Recovery Status Review, we provide the following recommendation.

6.1 Recommended Classification

_____Downlist to Threatened
_____Uplist to Endangered
_____Delist *(Indicate reason for delisting per 50 CFR 424.11):*
_____Extinction
_____Recovery
_____Original data for classification in error
_X___No change is needed

Brief Rationale: The oceanic whitetip shark is threatened by overexploitation, inadequate regulatory mechanisms, and other emerging threats (Table 1).

TABLE 1. SUMMARY OF ESA SECTION 4(A)(1) FACTORS OR THREATS

Magnitude and trend of each threat and how it impacts the species.

Threat	Magnitude	Trend	Impact to Species
Habitat	Low	Emerging	Spatial distribution
Overutilization	High	? Unknown	Abundance, productivity
Disease/Predation	NA	NA	NA
Inadequacy of Regulatory Mechanisms	Moderate-High	? Unknown	Abundance, productivity
Pollution, Aquaculture and Tourism	Low	Emerging	Spatial distribution

7 REFERENCES

For a full list of references, please see the Oceanic Whitetip Shark Recovery Status Review. The following references were not available in that document:

Burkhardt K, Papastamatiou YP, Seybald P, Pere O, Ramage JL, Tiarii I, Tixier T, Heitaurari O, Lecours V (2025). Horizontal and vertical movement ecology of the oceanic whitetip shark (*Carcharhinus longimanus*) in French Polynesia. Marine Biology. 172(2): 1-7.

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