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THE OVERFISHED PACIFIC BLUEFIN TUNA: THE TRAGEDY OF A HIGHLY MIGRATORY FISH SPECIES

by Theresa Geib*

I. INTRODUCTION

The ocean is an abundant resource; however, overutilization is becoming an increasing threat to biodiversity. Approximately 90% of the ocean's fisheries are overexploited, fully exploited, or have collapsed entirely.¹ The issue of overfishing arose in the mid-1900s after the industrialization of the fishing industry. Once dominated by local fishermen, the industry now features commercial fleets with the technology to locate, extract, and process large numbers of specific fish species.² An early 2000s study reported that only 10% of large ocean fish remained after years of industrial fishing, including the highly migratory Pacific Bluefin Tuna ("PBT").³

In 2016, the PBT was at a historical low — only 2.6% of its unfished population size.⁴ In response, several environmental groups, led by the Center for Biological Diversity, petitioned the Secretary of Commerce through the National Marine Fisheries Service ("NMFS"), to list the PBT as endangered or threatened under the Endangered Species Act ("ESA").⁵ NMFS, a division of the National Oceanic and Atmospheric Administration, issued a preliminary finding that listing may be warranted.⁶ Following the twelve-month review, the agency published in the Federal Register a finding that listing was not warranted.⁷ However, that finding was incorrect because it relied on regulations that perpetuate overutilization by mischaracterizing both fish stocks and reproductive potential, thus overestimating the species' capacity to avoid extinction.

II. STATUTORY BASIS FOR LISTING PACIFIC BLUEFIN TUNA

A. THE ENDANGERED SPECIES ACT LISTING REQUIREMENTS

The purpose of the ESA is to conserve species that are endangered or threatened as a result of "economic growth and development untempered by adequate concern and conservation" and to "reverse the trend towards species extinction, whatever the cost."⁸ "Endangered" means a species is in "danger of extinction throughout all or a significant portion of its range," and "threatened" means a species "is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."⁹ When a species is listed as endangered, a range of legal protections are triggered, including a prohibition on "take" by both the federal government and private individuals.¹⁰

The Secretary of Commerce must list a species as endangered or threatened if any of the following five factors are sufficiently implicated.¹¹ The Secretary must consider whether there is "the present or threatened destruction, modification, or curtailment of its habitat or range; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanisms; or other natural or manmade factors affecting its continued existence."¹²

The evaluation must be made "solely on the basis of the best scientific and commercial data available to [the Secretary]."¹³ The "best available science" is a highly deferential standard reliant on the expertise of the agency.¹⁴ If the agency thoroughly reviews the readily available scientific information, uncertainties in the scientific data will not defeat this standard.¹⁵ Additionally, economic considerations are not factors in determining whether to list a species.¹⁶

B. CHALLENGING A LISTING DECISION UNDER THE APA

Any challenge to an agency's ESA listing decision is governed by § 706 of the Administrative Procedure Act, which establishes the "arbitrary and capricious" standard.¹⁷ The review of an agency's action is "deferential and narrow" and requires a "high threshold for setting aside agency action."¹⁸ Any agency action may be overturned if the agency does not "consider[] the relevant factors and articulate[] a rational connection between the facts found and the choices made."¹⁹

III. THE PACIFIC BLUEFIN TUNA SHOULD BE LISTED UNDER THE ESA

The PBT meets the listing requirements under the ESA and should be listed either as threatened or endangered. The PBT's current population status puts it at risk of extinction because of its low population size, decreased recruitment, and overfishing pressures.

A. THE PRESENT OF THREATENED CURTAILMENT OF THE PACIFIC BLUEFIN TUNA'S RANGE

The PBT's range covers a vast expanse of the Pacific Ocean; however, its range is substantially reduced compared with historical conditions.²⁰ The reduction is mainly attributable to a decline in species abundance, primarily due to commercial exploitation.²¹ As a highly migratory fish species, the PBT is

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less vulnerable to site-specific habitat loss (excluding spawning sites) which can often obscure traditional markers of habitat strain.²² NMFS's analysis of the PBT's range relied on its ability to adapt or alter range to reduce the harmful effects of habitat modification or destruction.

NMFS did not thoroughly consider all relevant factors that impact the species' range in response to habitat modification. The PBT utilizes a diverse scope of habitats which obscures the traditional markers of habitat strain on the species. Thus, the agency cannot make a rational conclusion without additional considerations, such as the impacts range reductions can have on the species' viability.

1. THE EXPANSION OF MESOPREDATORS AND PACIFIC BLUEFIN TUNA

As the range of PBT has decreased, the Skipjack tuna has expanded its range into the historical range of PBT.²³ This expansion is evidence of an ecological trend where generalist predators expand into the niche once occupied by top pelagic predators.²⁴ The Skipjack tuna's encroachment into the PBT's range has a greater potential to alter the ecosystem structure and trigger biodiversity loss, affecting this habitat's suitability in the future.²⁵ NMFS's assessment did not consider the implication that range reductions may have on the PBT's ability to occupy its prior range. Skipjack tuna replacing PBT is thus relevant to determining a present or threatened modification of the PBT's range. Therefore, NMFS's review incorrectly limited its analysis by not considering the habitat alteration from introducing a new primary predator.

2. THE VULNERABILITY OF SUBPOPULATIONS

Unlike other pelagic fish species, the PBT depends on returning to annual spawning sites.²⁶ This type of site-specific spawning can lead to genetically diverse subpopulations.²⁷ A decline in abundance and a loss of these genetically diverse subpopulations may explain the PBT's observed range reductions.²⁸ NMFS dismissed concerns of decreased genetic diversity, stating the PBT is not at risk of traditional small population genetic concerns.²⁹ NMFS noted that the PBT's site-specific spawning behavior prevents small population concerns because finding a mate is more probable.³⁰ However, this conclusion does not address potential genetic diversity lost by subpopulations; rather, NMFS relies on the likelihood of high overall genetic diversity.³¹ To make an informed decision, NMFS must consider whether the range reductions represent a loss of unique subpopulations because any loss in genetic diversity decreases the species' resiliency.

3. HIGHER CONCENTRATIONS OF PACIFIC BLUEFIN TUNA INFLUENCING OVERFISHING

Typically, as the abundance of a species decreases, the cost associated with fishing increases, such that it is no longer economically feasible to continue the same level of fishing efforts.³² However, the PBT catch levels have remained constant because the species' density remains constant over a shrinking expanse of the Pacific Ocean, and high market prices enable fishermen to continue at similar catch rates despite the decline in species abundance.³³ The range reductions experienced by the PBT thus promote harvesting to extinction.³⁴ Consequently, NMFS did not consider a relevant factor modifying the PBT's historical range that could exacerbate the threat of overfishing and subsequently threaten the species' continued existence.

B. THE COMMERCIAL OVERUTILIZATION OF THE PACIFIC BLUEFIN TUNA

NMFS's reliance on population numbers to estimate recruitment limits its ability to accurately assess the status of the PBT. The management of fish stocks is assessed based on biomass in existing fishery legislation, meaning there is no mechanism to track the number of individuals caught each year.³⁵ Consequently, the number of remaining individuals will be speculative because any number of small to large fish could be caught in complying with the quotas.

Additionally, the connection is not sufficiently tested between spawning stock biomass and recruitment to draw affirmative conclusions from this data, especially considering those factors do not account for variability in fecundity.³⁶ Reliance on an isometric relationship for reproductive potential will underestimate the significance of larger females for recruitment.³⁷ Conversely, following a hyperallometric model, a 190 centimeter fish is likely to produce five million eggs, while a 250 centimeter fish is likely to produce twenty-five million eggs.³⁸ NMFS's emphasis on recruitment for species recovery does not account for the importance of older fish for rebuilding depleted fish stocks; therefore, the decision not to list the PBT as an endangered or threatened species under the ESA should be reconsidered as the agency did not accurately apply the listing criteria to the species.³⁹

IV. CONCLUSION

While there is high deference given to agency decisions, this decision should be reconsidered as it did not accurately apply the listing criteria to the PBT. The agency did not follow the "best science available" standards and considered factors that exceeded the statutory criteria under the ESA. Therefore, the listing decision should be challenged.



ENDNOTES

- ¹ See generally LESLIE DURAM, ENVIRONMENTAL GEOGRAPHY: PEOPLE AND THE ENVIRONMENT 80–81 (2018) (explaining the impacts of overfishing).
- ² Blog, REFERENCE, *Overfishing: Plenty of the Fish in the Sea? Not Always*, NATIONAL GEOGRAPHIC, [https://www.nationalgeographic.com/environment/article/critical-issues-overfishing#:~:text=Some fish that we eat,by the late 20th century \(last visited May 2, 2021\)](https://www.nationalgeographic.com/environment/article/critical-issues-overfishing#:~:text=Some fish that we eat,by the late 20th century (last visited May 2, 2021).).
- ³ See DURAM, *supra* note 2, at 80.
- ⁴ See Amanda Nickson, *Pacific Bluefin Tuna Stock Remains Highly Depleted, New Science Shows*, PEW CHARITABLE TRS. (May 21, 2018), <https://www.pewtrusts.org/en/research-and-analysis/articles/2018/05/21/pacific-bluefin-tuna-stock-remains-highly-depleted-new-science-shows> (exploring the new scientific study on Pacific Bluefin Tuna).
- ⁵ See Petition to List the Pacific Bluefin Tuna (*Thunnus orientalis*) as Endangered Under the Endangered Species Act (June 20, 2016) [hereinafter Petition] https://www.biologicaldiversity.org/species/fish/Atlantic_bluefin_tuna/pdfs/PBF_ESA_Petition_6-20-16.pdf.
- ⁶ Listing Endangered and Threatened Wildlife and Plants; Notice of 12-Month Finding on a Petition to List the Pacific Bluefin Tuna as Threatened or Endangered Under the Endangered Species Act, 82 Fed. Reg. 37060, 37060 (Aug. 8, 2017) [hereinafter Listing Decision].
- ⁷ *Id.* at 37080.
- ⁸ 16 U.S.C. § 1531(a)(1), (b); *Alaska Oil & Gas Ass'n v. Jewell*, 815 F.3d 544, 550–51 (9th Cir. 2016).
- ⁹ § 1532(6), (20).
- ¹⁰ § 1532(19) (“The term ‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”).
- ¹¹ § 1533(b)(1)(A).
- ¹² § 1533(a)(1).
- ¹³ § 1533(b)(1)(A).
- ¹⁴ See *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 602 (9th Cir. 2014).
- ¹⁵ See *id.*
- ¹⁶ *Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054–55 (9th Cir. 1994) (explaining the ESA commands agencies to ensure any action will not jeopardize the existence of any endangered species, without exception).
- ¹⁷ 5 U.S.C. § 706(2) (2019); see, e.g., *Alaska Oil & Gas Ass'n v. Pritzker*, 840 F.3d 671, 675 (9th Cir. 2016).
- ¹⁸ *Alaska Oil & Gas Ass'n v. Jewell*, 815 F.3d 544, 554 (9th Cir. 2016).
- ¹⁹ *Nw. Ecosys. All. v. U.S. Fish & Wildlife Serv.*, 475 F.3d 1136, 1140 (9th Cir. 2007).
- ²⁰ See Boris Worm & Derek P. Tittensor, *Range Contraction in Large Pelagic Predators*, 108 PNAS 11942, 11943, 11945 (2011) (observing greater than 70% decline in range for PBT).
- ²¹ See *id.* at 11942 (comparing a terrestrial macroecological pattern of abundance influencing species range to the range of highly-mobile pelagic predators, including PBT).
- ²² See *id.* at 11945 (explaining how PBT spawning behavior exposes it to more risk from spawning site habitat loss than species that spawn and produce larvae throughout the ocean).
- ²³ See *id.* at 11945–46; Thomas M. Newsome et al., *Top Predators Constrain Mesopredator Distributions*, 8 NATURE COMMUNICATIONS 1, 3–4 (May 23, 2017).
- ²⁴ See Worm & Tittensor, *supra* note 20, at 11945; Newsome et al., *supra* note 23, at 3.
- ²⁵ Newsome et al., *supra* note 23, at 5.
- ²⁶ Worm & Tittensor, *supra* note 20, at 11945.
- ²⁷ See *id.* at 11945.
- ²⁸ See *id.*
- ²⁹ See Listing Decision, *supra* note 6, at 37076. *But see* B.B. Collette et al., *High Value and Long Life—Double Jeopardy for Tunas and Billfishes*, 333 SCI. 291, 292 (2011) (acknowledging a bluefin tuna’s high value “makes them likely to be exploited far beyond the maximum sustainable yield . . . and are in danger of an anthropogenic Allee effect (low populations densities lead to reduction of reproductive success and increased possibility of collapse).”).
- ³⁰ Listing Decision, *supra* note 6, at 37075.
- ³¹ See Worm & Tittensor, *supra* note 20, at 11943; Newsome et al., *supra* note 23, at 2.
- ³² Matthew G. Burgess et al., *Range Contraction Enables Harvesting to Extinction*, 114 PNAS 3945, 3945 (Apr. 11, 2017).
- ³³ See *id.* at 3947; Francesca Paris, *Threatened Bluefin Tuna Sells for \$3 Million In Tokyo Market*, NPR (Jan. 5, 2019), <https://www.npr.org/2019/01/05/682526465/threatened-bluefin-tuna-sells-for-5-000-per-pound-in-tokyo-market>.
- ³⁴ See Burgess, *supra* note 32, at 3949.
- ³⁵ *E.g.*, *Nat. Res. Def. Council, Inc. v. Nat'l Marine Fisheries Serv.*, 421 F.3d 872 (restricting quotas by metric tons); Inter-American Tropical Tuna Commission, Amendment to Resolution C-16-08 on a Long-Term Management Framework for the Conservation and Management of Pacific Bluefin Tuna in the Eastern Pacific Ocean, at 3, C-18-02 (Aug. 27-30, 2018) (adopting rebuilding targets based on spawning stock biomass).
- ³⁶ Inter-American Tropical Tuna Commission, Updated Assessment and Management of Pacific Bluefin Tuna, at 1, SAC-07-05d (May 9-13, 2016).
- ³⁷ Diego R. Braneche et al., *Fish Reproductive-Energy Output Increases Disproportionately with Body Size*, 360 SCI. 642-43 (May 11, 2018).
- ³⁸ Sawada Y. et al., *Completion of the Pacific bluefin tuna, Thunnus orientalis, life cycle under aquaculture conditions*, AQUACULTURE RESEARCH 36, 415 (2005); K.S Chen et al., *Reproductive biology of female Pacific bluefin tuna Thunnus orientalis from south-western North Pacific Ocean*, 72 FISHERIES SCIENCE 985, 985–994 (2006).
- ³⁹ Listing Decision, *supra* note 6, at 37069; Braneche et al., *supra* note 37, at 643.