



March 10, 2019

RE: Stakeholder Input into MSC Fishery Assessments

Dear Mr. Alzarez and Anhalzer:

The Pacific Seabird Group (PSG) is an international, non-profit organization that was founded in 1972 to promote knowledge, study, and conservation of Pacific seabirds with a membership drawn from the entire Pacific basin, including Canada, Mexico, Japan, China, Malaysia, Australia, New Zealand, and the USA. Among PSG's members are biologists who have research interests in Pacific seabirds, government officials who manage seabird refuges and populations, and individuals who are interested in marine conservation. PSG members serve as scientific experts and conservation leaders within their local communities. Collectively, the Group's members have a great deal of knowledge and experience with respect to fisheries and seabird interaction.

Sardines and anchovies are small pelagic fish that form a critical part of the Gulf of California marine ecosystem. These forage fish serve as an important food source to large predatory fish, marine mammals such as seals, dolphins and whales, and seabirds. As a key food resource, the health of sardine and anchovy populations are representative of the health of the greater Gulf of California ecosystem. And the health of the Gulf of California ecosystem is important for the myriad ecosystem services it provides, including commercial fishery landings, sport fishing, and tourism.

PSG recognizes the significance of this fishery to the economy of Northwest Mexico, but we are also concerned about the environmental impacts. Specifically, we wish to address the issue of seabird mortality associated with the fishery and the ecosystem impacts of the heavy level of fishing in the Gulf of California.

### **Seabird Mortality**

Seabirds are often attracted to fishing vessels and this can lead to mortality when the birds become entangled, or otherwise impacted, by the fishing operations. Mortality of seabirds associated with the Gulf of California purse seine fishery can be placed into two main categories – immediate and delayed mortality. Immediate mortality in this fishery occurs from events such as broken wings, drowning in the net, and other injuries that result in near immediate death. Delayed mortality in this fishery is primarily due to exposure to fish oil during fishing operations. Similar to petroleum oil, fish oil causes seabird mortality by compromising the waterproofing properties of feathers, leading to loss of buoyancy and death through drowning or hypothermia. Research suggests that fish oil exposure is equally harmful to seabirds as petroleum oil (Morandin and Ohara 2014).

Observer data from approximately 10% of fishing trips (576 out of a total of 5,162) in the Sonoran fleet purse seine fishery in 2013 and 2014 quantified seabird impacts. The top three impacted species were

Brown Pelicans (NOM-059-SEMARNAT-2010 status Threatened) Blue-footed Boobies ((NOM-059-SEMARNAT-2010 status Under Special Protection) and Brown Boobies. Making the reasonable assumption that all birds exposed to fish oil eventually die from the fish oil, annual mortality can be extrapolated to be: Brown Pelican – 19,430 individuals; Blue-footed Booby – 3,083 individuals; and Brown Booby – 1,927 individuals. This represents nearly 30% of the regional population for Brown Pelicans (19,430 out of ~63,000 total in the region), and 18% of the Blue-footed Booby population (3,083 of ~17,000 total in the region). This level of mortality is unsustainable for these species and represents a significant threat to the future of these birds in the Gulf of California and elsewhere.

Presently, fishing regulators in Mexico and the MSC certification for this fishery do not include delayed mortality from fish oil in the evaluation of seabird impacts. This means that the true impact to Mexico's natural resources are far higher than what the government regulators and MSC certification process include in their calculations.

We recognize that some birds exposed to fish oil survive. And we accept that it is difficult to regulate fishery activities in light of this uncertainty. We strongly recommend two courses of action:

- 1) Accept that a significant portion of fish oil exposed birds do die and immediately enforce and increase efforts by the fishery to limit exposure of birds to fish oil, i.e., water curtains.
- 2) Support research that will enable a better estimate of bird mortality associated with fish oil exposure and adjust regulations for the fishery as appropriate according to the revised mortality data.

During the annual meeting of the Pacific Seabird Group, held in La Paz, Mexico in February 2018, a group of experts convened a meeting to discuss ways to evaluate the mortality rate of seabirds exposed to fish oil in the Gulf of California purse seine fishery. This group identified a recommended research approach involving placing satellite tags individual Brown Pelicans exposed to fish oil during fishing operations and tracking them to determine their survivorship. It was decided to follow Brown Pelicans because they are the species most frequently oil exposed. The data from this study should then be used to update the mortality estimates for Brown Pelicans exposed to fish oil, and projections also be made for mortality of Blue-footed and Brown Boobies.

### **Ecosystem Impacts of Forage Fish Fishery in Gulf of California**

We are also concerned by the potential ecosystem level impacts of the Gulf of California purse seine fishery. Beginning in the 1970s, this fishery grew almost continuously until the collapse experienced in 1991/92. Since then, there have been numerous fishery collapses, including 1998/99, 2003/04 and 2013/14. We believe it is important for both wildlife and the fishery that it be more conservatively managed.

Integrating the feeding requirements of marine birds and mammals into fishery and ecosystem management is not a new concept. In Peru and South Africa, fishery managers have worked to develop strategies and energetic-based consumption models to balance the needs of marine birds and mammals with those of large-scale fisheries (Duffy & Schneider 1994).

Duffy and Schneider (1994) recommended that fishery managers quantify the potential impact of harvest on seabirds relative to stock, production, and re-supply, when establishing harvest limits of fishery

resources. More recently, Curry et al. (2011) suggest that the fisheries conserve “one third for the birds,” and that more than 2/3<sup>rd</sup> level of take adversely impacts seabird reproduction and eventually population levels.

We believe that population level indicators should be included in the form of biological data to influence management of this resource towards a holistic ecosystem approach. This approach should also be taken into consideration for the regulation of the sardine fleet fishing effort itself, in anticipation for years when the target species is observed to decline below a certain threshold value for other consumers; for example, the superior, more sensitive parameter of proportion in seabird diet. The extensive experience of many PSG members in these kinds of interactions and their problems in other systems, attests to the utility and value of this added approach in more balanced management of several important, large-scale fisheries around the world. We stand ready to help.

Thank you for your consideration,

A handwritten signature in black ink, reading "Mark J. Rauzon". The signature is fluid and cursive, with the first name "Mark" and last name "Rauzon" clearly legible.

Mark J. Rauzon  
Vice-Chair for Conservation  
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#### **Literature Cited:**

Curry, et al. 2011. Global Seabird Response to Forage Fish Depletion—One-Third for the Birds. *Science*. December 2011, vol. 334 (6063), pp. 1703-1706

Duffy, D. C. and D. C. Schneider. 1994. Seabird-fishery interactions: a manager's guide. Pp. 26–38 *In*: Nettleship, D.N., and J. Burger, and M. Gochfield, editors. *Seabirds on islands: threats, case studies and action plans*.

Morandin, L. A. and O'hara, P. D. 2014. Fish oil disrupts seabird feather microstructure and waterproofing. *Science of the Total Environment*. 496. 10.1016/j.scitotenv.2014.07.025.