

June 3, 2015

Ms. Dorothy Lowman, Chair  
Pacific Fishery Management Council  
7700 NE Ambassador Place, Suite 101  
Portland, OR 97220

**RE: Agenda Item G.2: Pacific mackerel assessment and management measures**

Dear Chair Lowman and Council members:

Pacific mackerel is an important component of the California Current forage fish assemblage. Like other coastal pelagic species (CPS), Pacific mackerel can undergo wide fluctuations. While the precise biomass estimate in the current stock assessment<sup>1</sup> is highly uncertain, the assessment indicates that the population remains at very low levels relative to the last major peak in abundance which occurred in the 1980s and supported a significant commercial fishery. Since that time, biomass has remained relatively low, and fishery landings have consistently fallen short of harvest guidelines, providing further evidence of low relative abundance. At this time, the west coast forage fish assemblage appears to be in a dire situation, as Pacific mackerel, Northern anchovy, Pacific sardines, and Pacific herring are all at historically low levels. Given uncertainties in the stock assessment, the need to reassess several key elements in the harvest control rule, the low relative biomass, recent catch levels, and evidence of insufficient forage for predators known to feed on Pacific mackerel, we request the Council set an Annual Catch Limit and/or Annual Catch Target of no greater than 10,000 mt for the 2015-16 and 2016-17 seasons. We further request the Council prioritize improvements to the stock assessment by incorporating acoustic trawl survey data and revisit the harvest control rule (HCR) for this species.

**Pacific Mackerel as a Forage Species**

While adults grow to larger sizes than similar coastal pelagic species like sardines and anchovies, Pacific mackerel are a key forage species for a wide suite of predators. Pacific mackerel also exhibit similar stock dynamics characterized by wide natural fluctuations in abundance. Pacific mackerel are prey for larger fishes including striped marlin, black marlin, sailfish, bluefin tuna, white seabass, yellowtail, giant sea bass, and various sharks; marine mammals including porpoise and California sea lions; and seabirds including brown pelicans.

---

<sup>1</sup> NOAA Fisheries, Southwest Fisheries Science Center, Pacific Mackerel Stock assessment for USA Management in the 2015-16 Fishing Year; [http://www.pcouncil.org/wp-content/uploads/2015/05/G2a\\_PMackerel\\_Assmt\\_Full\\_E-Only\\_JUN2015BB.pdf](http://www.pcouncil.org/wp-content/uploads/2015/05/G2a_PMackerel_Assmt_Full_E-Only_JUN2015BB.pdf)

Both California sea lions and brown pelicans are currently experiencing reproductive failures due to lack of forage. California sea lions are experiencing their third year of elevated pup strandings, which has prompted NOAA to declare an unusual mortality event since January 2013, with the lack of adequate forage identified as the primary explanation.<sup>2</sup> The U.S. Fish and Wildlife Service has also raised concerns with the provision of adequate forage for brown pelicans, and points out that Pacific mackerel are among the forage species for brown pelicans.<sup>3</sup> Other predators like Chinook salmon are also experiencing concerns throughout the U.S. West Coast. These more visible, iconic species are likely the tip of the iceberg, as a wide suite of other predators rely on coastal pelagic species for food.

The Magnuson Stevens Fishery Conservation and Management Act (MSA) and National Standard One (NS1) guidelines direct fishery managers to reduce optimum yield (OY) catch levels below Maximum Sustainable Yield to account for relevant social, economic, and ecological factors.<sup>4</sup> Such factors include “impacts on ecosystem component species, forage fish stocks, other fisheries, predator-prey or competitive interactions, marine mammals, threatened or endangered species, and birds.”<sup>5</sup> In addition, “consideration should be given to managing forage stocks for higher biomass than BMSY to enhance and protect the marine ecosystem.”<sup>6</sup>

Furthermore, the CPS Fishery Management Plan (FMP) requires consideration of ecological factors when making annual catch specifications. Specifically, the Council and NMFS must consider “[i]nformation on ecological factors such as the status of the ecosystem, predator-prey interactions, or oceanographic conditions that may warrant additional ecosystem-based management considerations.”<sup>7</sup>

Therefore, to achieve the stated goal of the CPS FMP to provide adequate forage for predators, the current ecological factors necessitate a more precautionary catch level. We ask that the Council include an additional reduction in either the ACL or ACT below the level specified in the Harvest Guideline to account for the lack of forage available to predators that rely in part on Pacific mackerel as a food source.

### **Improving Pacific Mackerel Stock Assessments**

Based on the Stock Assessment Review (STAR) panel meeting report<sup>8</sup> and the issues raised in the stock assessment by its authors, the current stock assessment for Pacific mackerel is extremely uncertain. We believe that the acoustic trawl survey has the potential to be the best available index of abundance for

---

<sup>2</sup> NOAA Fisheries. 2013-2015 California Sea Lion Unusual Mortality Event in California.  
<http://www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm>

<sup>3</sup> US Fish and Wildlife Service Report, May 14, 2015, Agenda Item G.3.a. [http://www.pcouncil.org/wp-content/uploads/2015/05/G3a\\_USFWS\\_Rpt\\_JUN2015BB.pdf](http://www.pcouncil.org/wp-content/uploads/2015/05/G3a_USFWS_Rpt_JUN2015BB.pdf)

<sup>4</sup> 50 C.F.R. § 600.310(e)(3).

<sup>5</sup> *Id.* § 600.310(e)(3)(iv)(C).

<sup>6</sup> *Id.*

<sup>7</sup> Pacific Fishery Management Council, Coastal Pelagic Species Fishery Management Plan 44-45 (Sept. 2011).

<sup>8</sup> Pacific Mackerel Stock Assessment Review (STAR) Panel Meeting Report. June 2015. Agenda Item G.2. Attachment 1. [http://www.pcouncil.org/wp-content/uploads/2015/05/G2\\_Att1\\_STAR\\_Rpt\\_JUN2015BBpdf.pdf](http://www.pcouncil.org/wp-content/uploads/2015/05/G2_Att1_STAR_Rpt_JUN2015BBpdf.pdf)

Pacific mackerel. As such, we encourage NMFS to expand the spatial coverage of this survey to assess the CPS assemblage into Mexican and Canadian waters, and we support the STAR panel's recommendation for a two-phase meeting approach to incorporate acoustic trawl survey data into the next assessment.<sup>9</sup> In the meantime, based on the major concerns raised by the STAR panel review, the Council should exercise extreme caution in management decisions based on the current biomass estimate.

### **Refining and Updating the Pacific Mackerel Harvest Control Rule**

As stated in previous communications, the current harvest control rule for Pacific mackerel used to set the Harvest Guideline is not sufficiently risk averse, particularly when the Pacific mackerel stock is at a relatively low population size and biomass may be overestimated. The Pacific mackerel HCR has a CUTOFF that is 6.3% of the estimated virgin (unfished) biomass according to the current stock assessment (see Table 1). The CUTOFF is a crucial parameter to reduce risk to the stock, provide forage for dependent predators, and buffer against uncertainty. Based on these considerations, the Lenfest Forage Fish Task Force recommended setting CUTOFF values for forage fish with intermediate information at 40% of their mean unfished, or virgin, biomass. More recently, Essington et al. 2015 recommended a similar magnitude of CUTOFF for forage species management.<sup>10</sup> Applying a 40% CUTOFF value to the virgin biomass reported in the last Pacific mackerel assessment would result in a CUTOFF of 115,922 mt (Table 1). While we recognize that virgin biomass may vary depending on the choice of assessment model, 40% of the virgin Pacific mackerel biomass is approximately equivalent to current projected biomass levels. We request that the Council consider and analyze a CUTOFF of 40% of virgin biomass.

**Table 1. Key reference points for Pacific mackerel from 2015 stock assessment.**

Unfished (virgin) Age 1+ biomass	289,805 mt <sup>11</sup>
Cutoff in current CPS FMP	18,200 mt
Cutoff as % of mean unfished biomass	6.3%
40% mean unfished biomass	115,922 mt

<sup>9</sup> Pacific Mackerel Stock Assessment Review (STAR) Panel Meeting Report. June 2015. Agenda Item G.2. Attachment 1. [http://www.pcouncil.org/wp-content/uploads/2015/05/G2\\_Att1\\_STAR\\_Rpt\\_JUN2015BBpdf.pdf](http://www.pcouncil.org/wp-content/uploads/2015/05/G2_Att1_STAR_Rpt_JUN2015BBpdf.pdf)

<sup>10</sup> Essington et al. 2015. Fishing amplifies forage fish populations collapses. Proceedings of the National Academy of Sciences. [www.pnas.org/cgi/doi/10.1073/pnas.1422020112](http://www.pnas.org/cgi/doi/10.1073/pnas.1422020112). Note: Study's recommendation based on simulation of hypothetical harvest rule where fishing was suspended if biomass was less than one-half of the mean.

<sup>11</sup> NOAA Fisheries, Southwest Fisheries Science Center, Pacific Mackerel Stock assessment for USA Management in the 2015-16 Fishing Year at p. 57, Table 8, "Age 1+ Virgin Biomass"; [http://www.pcouncil.org/wp-content/uploads/2015/05/G2a\\_PMackerel\\_Assmt\\_Full\\_E-Only\\_JUN2015BB.pdf](http://www.pcouncil.org/wp-content/uploads/2015/05/G2a_PMackerel_Assmt_Full_E-Only_JUN2015BB.pdf)

Regarding other aspects of the Harvest Control Rule, we note that the DISTRIBUTION term of 70%, which serves to allocate the U.S. portion of the coastwide target catch in the Pacific mackerel control rule, has aligned well with the proportion of total coastwide landings caught in the U.S. However, this would not have been the case had the U.S. fishery obtained its entire Harvest Guideline.

The current Pacific mackerel FRACTION of 30% is a relatively aggressive harvest rate relative to other forage fish stocks, and does not account for changes in environmental conditions and recruitment which are known to fluctuate widely. The Council should revisit the FRACTION and CUTOFF parameters in the Pacific mackerel harvest control rule to ensure consistency with current understanding of the boom and bust nature of this forage stock. In the meantime, these concerns with the harvest control rule illustrate the need for precaution in the near-term.

### **Recommendations on Management Measures for 2015-16 and 2016-17**

Relative to productive periods when Pacific mackerel supported major fisheries over the last century such as the 1930s-1950s and 1980s, Pacific mackerel are currently at very low levels. The stock assessment states that “Past and present assessments of this stock indicate that since at least the late 1990s, abundance has remained at historically low levels (<150,000 mt)”.<sup>12</sup> While the current and forecasted stock biomass appear to be increasing, it is important to set harvest levels based on the current biomass in the context of a stock that is not capable of supporting a major expanded commercial fishery. For the last decade, U.S. landings have consistently been far below (less than half) of the U.S. Harvest Guideline set by the Council. We have heard repeatedly from industry proponents that it is important to keep as high a Harvest Guideline as allowable so that they can fish Pacific mackerel when they show up. However, the fact that Pacific mackerel have yet to show up in levels high enough to support landings that achieve the Harvest Guideline is further indication that this stock is at very low levels. Now that the sardine fishery is closed, additional fishing pressure on Pacific mackerel should be anticipated. However, until the Pacific mackerel stock biomass increases (or other CPS stocks for that matter), it seems prudent to prevent any significant increase in fishing levels.

The Council has the ability to determine ACLs and ACTs at lower levels than in the current harvest guideline formula for a variety of reasons. We ask that the Council adopt an ACL or ACT of no greater than 10,000 mt for the U.S. fishery. From 2004-14, the entire U.S. commercial and recreational harvest has averaged 5,870 mt, only exceeding 10,000 mt in one year (in 2013, US catch totaled 11,922 mt). Other similar forage species such as herring, sardines, and anchovies are currently at historically low levels, resulting in severe impacts to California current predators. The recent closure of the directed Pacific sardine fishery is expected to result in increased fishing effort on Pacific mackerel and Northern anchovy. While we recognize the desire to keep boats fishing by providing alternative opportunities, the forage base is in a critical situation now, as unusual mortality events and breeding failures in CPS-dependent predators are now recognized by both NOAA and the US Fish and Wildlife Service, and these

---

<sup>12</sup> NOAA Fisheries, Southwest Fisheries Science Center, Pacific Mackerel Stock assessment for USA Management in the 2015-16 Fishing Year, at 6; [http://www.pcouncil.org/wp-content/uploads/2015/05/G2a\\_PMackerel\\_Assmt\\_Full\\_E-Only\\_JUN2015BB.pdf](http://www.pcouncil.org/wp-content/uploads/2015/05/G2a_PMackerel_Assmt_Full_E-Only_JUN2015BB.pdf)

Ms. Dorothy Lowman  
Pacific Mackerel Management  
Page 5 of 5

other CPS species need additional safeguards. Given these concerns, we ask that you take action to prevent Pacific mackerel catch from exceeding 10,000 mt through an ACL or ACT. In the meantime, we ask that the Council prioritize a more reliable stock assessment and revisit the parameters in the harvest control rule to ensure more accurate biomass estimates, adequate precaution, and incorporation of ecological factors.

Sincerely,

A handwritten signature in black ink, appearing to read "Geoff Shester". The signature is fluid and cursive, with the first name "Geoff" being more prominent than the last name "Shester".

Geoffrey Shester, Ph.D.  
California Campaign Director