United States Department of the Interior

FISH AND WILDLIFE SERVICE
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IN REPLY REFER TO:
FWS/R8/VFWO

August 18, 2016

Herb Pollard, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, #101
Portland, Oregon 97220

Subject: Agenda Items F.2 and F.3 – Stock Assessment Workshop Report and Anchovy Management Update

Dear Mr. Pollard and Council Members:

The U.S. Fish and Wildlife Service (USFWS) appreciates the efforts of the Pacific Fishery Management Council (Council) to obtain updated information on the central substock of northern anchovy (*Engraulis mordax*) and the Council's consideration of potential management and policy approaches to protect the stock and its ecological functions. We recognize that convening the Coastal Pelagic Species Stock Assessment Workshop in May 2016 required a substantial commitment of resources and time by the Council, the National Oceanic and Atmospheric Administration's Southwest Fisheries Science Center (SWFSC), and invited scientists. The workshop report acknowledges that conducting a full model-based assessment of the central substock of northern anchovy may not be possible in time for the November 2016 Council meeting given the assessment capacity and schedule of SWFSC. However, it presents several options for a short-term approach that could provide preliminary information in time for that meeting. We urge the Council to request and utilize an interim stock assessment as the basis for potential management actions while the full assessment is underway. We believe that this precautionary approach is warranted in light of the multiple lines of evidence indicating low northern anchovy biomass over the past several years and its limited availability to California brown pelicans (*Pelecanus occidentalis californicus*) and other marine predators in the California Current Ecosystem (CCE).

Our May 2015 letter to the Council provided information on the dependence of California brown pelicans on northern anchovy, particularly during the pre-breeding and breeding periods, and documented mortality events and breeding failures from 2008-2014 indicating the low availability of forage in the CCE (USFWS 2015). Although final data for 2016 are not yet available for the Southern California Bight, data from the 2015 California brown pelican breeding season demonstrate that low availability of forage continues to impact reproductive performance. At Anacapa Island, the largest U.S. colony, productivity (number of young fledged/nest attempt) was 0.64 in 2015 (Mazurkiewicz 2016a), slightly above the mean productivity rate for Anacapa Island (0.63 from 1985-2005) (USFWS 2007). However, due to

the relatively small number of nest attempts (2,034), the total number of young fledged was approximately 1,300 (Mazurkiewicz 2016a), less than half the long-term (1983-2003) mean of 2,717.[1] The breeding colony at Santa Barbara Island had a considerably higher productivity rate in 2015 (0.95), but due to the much smaller number of nest attempts there (140), total chick production was also low, approximately 133 (Mazurkiewicz 2016b). This number is well below the long-term (1983-2003) mean for Santa Barbara Island of 597.[2]

California brown pelicans are buffered from short-term temporal and spatial fluctuations in food availability by their "boom or bust" reproductive strategy, which can compensate for stochastic environmental fluctuations from year to year (Hayward 2000), and by their metapopulation structure, whereby redistribution of adults from one breeding colony to another can compensate, to some extent, for spatial differences in prey availability (Anderson et al. 2013). El Niño-Southern Oscillation (ENSO) events are associated with reduced reproductive success and significant mortality of brown pelican chicks (Hayward 2000, Anderson et al. 2013). In light of the strong ENSO event that began in early 2015, below-average production of fledglings would be expected. However, 2015 continues a pattern of poor reproductive performance that has occurred in California since approximately 2009 (USFWS 2015). Additionally, catastrophic breeding failures have occurred from 2014-2016 in the Gulf of California (Anderson and Gress 2015, Anderson 2016a), which accounts for approximately 62 percent of the total California brown pelican breeding population (Anderson et al. 2013). Whereas forecast La Niña conditions (www.cpc.ncep.noaa.gov) may bring improvements in the prey base, the temporal and spatial extent of poor reproductive success in California brown pelicans indicates that the typical buffers have failed to serve their protective function over the past several years.

Central-place-foraging predators (such as breeding seabirds and pinnipeds) are more vulnerable to contractions in the distribution of northern anchovy and Pacific sardine during times of low abundance than are predators with greater mobility, such as humpback whales (*Megaptera novaeangliae*) (Punt et al. 2016). While some recent evidence exists of local availability of northern anchovy to central-place-foraging predators (for instance, young-of-the-year northern anchovy accounted for more than 90 percent of the diet of rhinoceros auklets at Año Nuevo Island in 2015, leading to high reproductive success; Beck et al. 2016), other evidence indicates a widespread pattern of continuing low prey availability. In fall 2015, an unprecedented die-off of primarily young-of-the-year common murres (*Uria aalge*) occurred along the Pacific Coast, resulting in beached bird rates 6-28 times higher than normal (Gibble et al. 2016). Northern anchovy typically represents at least 10 percent of the adult diet and (along with Pacific sardine) 53 percent of the chick diet (Roth et al. 2008). Limited prey abundance or availability is believed to have been the primary cause of the event, although domoic acid exposure and increased murre population size may have been contributing factors (Gibble et al. 2016). The California sea lion (*Zalophus californianus*) Unusual Mortality Event in California, which has been attributed to low availability of energy-rich forage such as Pacific sardine (*Sardinops sagax*) and northern anchovy (http://www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm, McClatchie et al. 2016), has persisted through 2016.

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[1] This number is derived from data reported in Table 7 of Harvey and Gress (2008).

[2] This number is derived from data reported in Table 1 of Burkett et al. (2007). No fledging data are available for 1994-1995, so the average given here excludes those years.

Management measures to protect an adequate prey base for marine predators are particularly important when biomass is low and predators may come into direct competition with fisheries. Seabirds in particular are unlikely to out-compete fisheries (Bertrand et al. 2012, Pichegru et al. 2010, 2012). In its evaluation of potential management and policy approaches for northern anchovy, we encourage the Council to consider measures based not only on biomass but also on the stock's spatial and temporal availability to marine predators (Ainley et al. 2014). For a central-place-foraging seabird like the California brown pelican, which during the breeding season is heavily dependent on the availability of northern anchovy within foraging distance (30-50 kilometers) of the colony (Anderson et al. 1982, USFWS 1983), closures surrounding U.S. colonies[3] could serve an important protective function should concentrations of anchovy and increased fishing effort occur in these waters.

We thank the Council for its continuing commitment to ecosystem-based management of fisheries. If you have questions regarding this letter, please feel free to contact Lilian Carswell, of my staff, at (805) 612-2793 or Lilian_Carswell@fws.gov.

Sincerely,

Stephen P. Henry
Field Supervisor

[3] Breeding season length is approximately 5.25 months for a single breeding pair (Anderson 2016b), but the degree to which nesting is synchronous in a colony varies from year to year. For instance, breeding effort at Anacapa Island occurred over 12 months during the 2004 and 2005 breeding seasons (Harvey 2008) but only approximately 7 months (January to mid-July) in 2014 (Harvey and Mazurkiewicz 2015).

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