

HIGHLY MIGRATORY SPECIES ADVISORY SUBPANEL REPORT ON  
REVIEW OF ESSENTIAL FISH HABITAT - PHASE 2

***Input on Broader Highly Migratory Species (HMS) Essential Fish Habitat (EFH) Process***

The Highly Migratory Species Advisory Subpanel (HMSAS) received an update on Review of EFH – Phase 2 from Pacific Fishery Management Council (Council) staff, Mr. Kerry Griffin, on Thursday, March 4. We agree with the specific objectives and Scope of Phase 2 as described in [H.2, Attachment 1: Phase 2 Action Plan for Highly Migratory Species Essential Fish Habitat Review](#). In terms of the proposed schedule, we defer to the HMS Management Team (HMSMT), National Marine Fisheries Service (NMFS), Southwest Fisheries Science Center, and Council Staff.

The HMSAS calls the Council’s attention to discussion draft legislation introduced towards the end of the last Congress, which will likely provide the foundation for subsequent legislation, that address both EFH and Habitat Areas of Particular Concern (HAPC). Potential legislation may change the definitions of EFH or provide a definition of HAPCs that differs from that contained in regulation ([50 CFR 600.815\(a\)\(8\)](#)). We do not opine whether that will change the task at hand; but do want to acknowledge it is possible that it may have such an impact.

***Input on Impact of Fisheries on HMS Prey Species***

We address preferred prey separately as components of EFH. Many HMS are opportunistic foragers. Food preferences may vary based on local availability or seasonal trends while they feed within the U.S. Exclusive Economic Zone (EEZ). These are important considerations when determining the extent to which HMS rely on forage fish for prey, and secondarily in relation to the public comment received on this agenda item. Stomach content analysis studies may prove useful in determining the frequency with which HMS are interacting with any particular forage species. It is also important to ensure that studies analyzed are from the relevant geography (i.e., the Pacific Ocean). Some examples of this can be seen in the table below based on the scientific literature.

<b>HMS Species</b>	<b>Diet</b> (Based on Stomach Content Analysis)	<b>Evidence of Seasonal or Geographic Shifts in Feeding</b>	<b>Works Cited</b>
Blue shark ( <i>Prionace glauca</i> )	Jumbo and <i>Gonatus</i> spp. squids (most important)	Yes	Preti et al. 2012
Shortfin mako ( <i>Isurus oxyrinchus</i> )	Jumbo squid and Pacific saury (most important)	---	Preti et al. 2012
Common thresher shark ( <i>Alopias vulpinus</i> )	Northern anchovy and Pacific sardine (most important)	Yes – evidence of regional shifts, with northern anchovy not seen in stomachs north of 34° N; dietary shifts with cold (anchovy, squid) vs. warm water (opportunistic feeding) regimes of California	Preti et al. 2012; Preti et al. 2004; Preti et al. 2001
Swordfish ( <i>Xiphias gladius</i> )	Ommastephid and gonatid squids (most important)	---	Markaida and Hochburg 2005; Trujillo-Olvera et al. 2018
Bluefin tuna ( <i>Thunnus orientalis</i> )	Bramids and scombrids (most important)	---	Moteki et al. 2001
Yellowfin Tuna ( <i>Thunnus albacares</i> )	Squids, crustaceans, <i>Auxis</i> spp., jacks (most important – albeit very diverse diet)	Yes – evidence of decadal shifts in dietary composition	Olson et al. 2014

Forage fish managed under the Coastal Pelagic Species (CPS) Fishery Management Plan (FMP) are mainly available in areas closer to shore where they are harvested by CPS fisheries in very limited quantities and represent a very small proportion to the overall forage pool. These forage species are only available to HMS species on a limited basis at certain points in their normal migration. There is also limited take by CPS fisheries of all forage fish, as shown in the table below from public comment submitted for the Fishery Ecosystem Plan Five-Year Review (see page 6) during your September 2018 Council meeting. Total fishery removal of these key forage fish species by CPS fisheries was only 2% of annual consumption for the period of 2000 to 2014, and with the cessation of directed take of sardines in 2015 this drops to around 1 percent currently.

## Biological Context:

### **Anchovy is only one species in the larger forage pool**

Fisheries harvest **only 2%** of key forage species, **only 0.6%** anchovy

### **California Current Forage Fish Consumption**

Agenda Item G.2.b. Sep '18-Parrish FEP Scoping

Table 1. **Annual consumption (mt) of forage** by major faunal groups and average (2000-2014) U. S. landings. (Calculated from Koehn et al. 2016: Table 1 and supplemental data).

<b>Key Forage Species</b>	<b>TOTAL</b>	<b>Fishes</b>	<b>Mammals</b>	<b>Birds</b>	<b>Fishery</b>	<b>Fishery %</b>
Sardine	918,256	379,032	530,061	9,163	76,754	8.4%
Anchovy	1,318,094	633,862	429,545	254,687	8,095	0.6%
Herring	913,513	709,657	136,559	67,297	1,829	0.2%
Other for. fish	1,322,808	906,608	220,288	195,911	16	0.0%
Juvenile fishes	2,887,172	1,691,576	842,913	352,682	0	0.0%
Market squid	1,309,632	406,604	650,128	252,901	80,460	6.1%
Pacific mackerel	100,146	23,915	75,512	718	5,860	5.9%
<b>Total</b>	<b>8,769,620</b>	<b>4,751,254</b>	<b>2,885,006</b>	<b>1,133,360</b>	<b>173,014</b>	<b>2.0%</b>
Euphausiids	52,478,145	49,085,682	3,132,986	259,478	0	0.0%

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In summary, for the various reasons listed above, concerns about CPS fishery impacts to currently managed forage species should not be considered in the HMS EFH phase 2 scoping process since consumption of these managed forage fish by HMS may be seasonal or a small component of overall diets, the actual impact of CPS fisheries on forage species may be minimal, and the CPS FMP is already highly precautionary in setting harvest guidelines, which supports one of the stated goals of the CPS FMP – “Provide adequate forage for dependent species.” See [Sec 1.6 CPS FMP current through Amendment 17](#), page 13 (last accessed March 7, 2021).

### **Works Cited**

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PFMC  
03/08/21