

## SUMMARY OF DATA AVAILABLE TO SUPPORT A STOCK ASSESSMENT FOR THE CENTRAL SUBPOPULATION OF NORTHERN ANCHOVY

At its November 2018 meeting, the Pacific Fishery Management Council (Council) requested that the Scientific and Statistical Committee (SSC) review the quantity and quality of data available for a stock assessment for the central subpopulation of northern anchovy (CSNA). This document summarizes the data streams that have been reported on at past Council meetings, workshops, and review meetings. It also provides a modified table originally compiled by the National Marine Fisheries Service (NMFS) Southwest Fisheries Science Center (SWFSC) in September 2016, as part of the small pelagics stock assessment [workshop](#) (see September 2016 Agenda Item E.2.a, Stock Assessment Workshop Report). This table should be updated with more recent information on data streams, and to reflect the quality of the available data.

### April 2019

The SSC reported on three tasks assigned to them and NMFS in [Agenda Item E.4.a, Supplemental SSC Report 1](#). These tasks were: 1) Determine a method to estimate the nearshore component of the stock not sampled by the Acoustic-Trawl (AT) Methodology, 2) Determine the timeline and process necessary to conduct the near-term establishment of an overfishing limit (OFL) for the CSNA stock using the methods described in the SSC report ([Agenda Item C.4.a, Supplemental SSC Report 1, April 2018](#)), and 3) Scope the process for recommending the frequency of revisions to OFLs and acceptable biological catches (ABCs) based on the potential impacts of changing reference points less frequently against potentially increased risk associated with not basing reference points on the most recent data. Some of the planning and discussion on this item occurred at their November 2018 and March 2019 meetings. These discussions were captured in the [November 2018 SSC minutes](#) and the [March 2019 SSC minutes](#), respectively.

### April 2018

The SSC reported on three requests from the Council from April 2017 in [Agenda Item C.4.a, Supplemental SSC Report 1](#). These three requests were: 1) evaluate methods for developing an OFL, 2) evaluate alternative methods for calculating long-term maximum sustainable yield (MSY), and 3) evaluate the results of the January 2018 acoustic-trawl survey methodology review as it could apply to anchovy biomass and  $F_{MSY}$  estimates.

### April 2017

A joint SSC/CPSMT report detailing potential approaches for estimating an OFL was provided in [Agenda Item G.2.a, Joint SSC/CPSMT Report](#). Further, the SSC reported both short term and long term approaches they would recommend for estimating an OFL in [Agenda Item G.2.a, Supplemental SSC Report](#).

### November 2016

The SWFSC provided a report (November 2016 [Agenda Item G.4.a Supplemental SWFSC Report](#)) on current information available to support CPS stock assessments, with an emphasis on CSNA.

The SSC received a briefing on the SSC CPS Subcommittee review of indices of CSNA abundance from October 2016 and provided their recommendations on data needed to assess the CSNA population in [Agenda Item G.2.a, Supplemental SSC Report](#).

#### September 2016

The SSC provided their recommendations on CSNA management in [Agenda Item E.3.a, Supplemental SSC Report](#). They recommended it was not necessary to transition the stock from Monitored to Active management to establish an annual catch target or to modify an ACL with new or updated information. The SSC recommended convening a workshop to develop harvest control rules for CSNA.

#### November 2015

The SSC provided their recommendations on the general status of CSNA in [Agenda Item H.3.a, Supplemental SSC Report](#). They recommended frequent monitoring and assessments would be needed to obtain reliable stock status estimates of CSNA. They recommended convening a CSNA assessment workshop.

#### November 2013

The SSC provided their recommendations on establishing a MSY reference point for CSNA in [Agenda Item E.3.c, Supplemental SSC Report](#).

#### November 2010

The SSC provided their recommendations on determining reference points for monitored stocks such as CSNA in [Agenda Item I.2.c, Supplemental SSC Report](#). The SSC explained the catch time series for CSNA is too limited to estimate biomass and productivity. There are only two biomass estimates available, egg and larval production estimates from the 1970s and one from a recent acoustic survey. They recommended averaging these two estimates to determine a biomass of 130,000 mt for CSNA, multiplying this biomass estimate by 0.3, the  $F_{MSY}$  value for Pacific mackerel, to determine an OFL of 39,000 mt. They also recommended a 75 percent uncertainty buffer to determine an ABC of 9,750 mt. They recommended updating these OFL and ABC values when new biomass estimates or information on productivity become available.

INDICES OF ABUNDANCE (from Stock Assessment Workshop Report, September 2016)

Source	Data type	Data quality	N. anchovy (central sub-stock)
<i>Acoustic Trawl (AT) survey - spring</i>	<i>Acoustic biomass</i>		<i>2017</i>
	<i>Adult</i>		<i>2017</i>
<i>AT CPS survey - summer*</i>	<i>Acoustic biomass</i>		<i>2015 - 2018</i>
	<i>Adult</i>		<i>2015 - 2018</i>
	<i>comp/biology</i>		<i>2015 - 2018</i>
AT/DEPM CPS survey - spring (SD-SF, CA)	Ichthyoplankton		1994-15
	Acoustic biomass		2015
	Adult comp/biology		1994-15 (not aged)
AT Sardinia/Hake survey - summer (CA-BC)	Ichthyoplankton		2008; 2011-12 (2013-15 in prep.)
	Acoustic biomass		2015-2019
	Adult comp/biology		2008; 2012-15 (not aged)
SWFSC CalCOFI survey - winter (SD-SF, CA)	Ichthyoplankton		1951-12
SWFSC CalCOFI survey - spring (SD-SF, CA)	Ichthyoplankton		1951-15
SWFSC CalCOFI survey - summer (SCA)	Ichthyoplankton		na
SWFSC Juvenile rockfish midwater-trawl survey (CA)	Abundance, length		1990-19
<del>MRFSS (WA OR CA)/CRFS (CA)- [ReeFIN data base]</del>	<del>Catch effort, length</del>		<del>na</del>
<del>CPFV logbook (CA)</del>	<del>Catch effort</del>		<del>na</del>
NWFSC BPA pelagic surface-trawl survey (WA-OR)	Adult comp/biology		na
NWFSC Predator-forage trawl survey (Columbia R.)	Adult comp/biology		na
NWFSC Estuary seine survey (Columbia R.)	Adult comp/biology		na
CWPA/CDFW Aerial (Spotter pilot) survey	Biomass		2013-19

\*Complemented by nearshore estimation methods: saildrones, CDFW/CWPA aerial survey, and WCPCG industry cooperative research

FISHERY DATA		
Source	Data type	CSNA
Washington (WA)	Landings	na
	Length	na
	Age	na
	Maturity	na
Oregon (OR)	Landings	na
	Length	na
	Age	na
	Maturity	na
California (CA)	Landings	1916-15
	Length	1966-82; 2014-15
	Age	1966-82 (2014-15 not aged)
	Maturity	1966-82; 2014-15
Mexico (Ensenada-ENS)	Landings	1971-15
	Length	1978-89
	Age	1978-89
	Maturity	1978-89