

SALMON TECHNICAL TEAM REPORT ON THE RAMIFICATIONS OF CURTAILED SAMPLING OF OCEAN SALMON FISHERIES IN 2020

In response to the Council's request, the Salmon Technical Team (STT) assembled information on the projected ramifications of reduced or eliminated sampling of ocean salmon fisheries in 2020 due the COVID-19 pandemic. Our current understanding of potential sampling impacts include: (1) reduced or no sampling of fishing effort in commercial and recreational fisheries, (2) reduced or no sampling for catch estimation in recreational fisheries, and (3) reduced or no sampling for coded-wire tags (CWTs) in commercial and recreational fisheries. The STT evaluated how the reduction or loss of data from these sampling programs could affect inseason management (where it occurs), postseason estimation of stock abundance and/or exploitation rates, future effort forecasts, future abundance forecasts, and future implementation of harvest models.

Inseason Management

If there is a lack of sampling data for estimation of catch, assessment of fishery performance relative to fishery-specific quotas will not be possible. There would be no mechanism for closing a fishery upon nearing quota attainment, nor would there be the information necessary for performing impact-neutral quota rollovers. It may be possible to track catch in commercial fisheries using fish ticket data, but lags in reporting may not allow for rapid enough action and may require a more precautionary approach to quota management. In some cases (e.g., Oregon and Washington troll), quota tracking occurs through mandatory call-ins which is sufficient for inseason management purposes. For fisheries that are not actively managed on an inseason basis, as is the case for many time/area fisheries South of Cape Falcon, the consequences of reduced sampling for any single year are likely minor. For these areas, impacts are projected on a preseason basis using harvest models and given abundance forecast and season assumptions; the performance of the management system is assessed postseason and may result in changes to models or re-initiation of Endangered Species Act (ESA) consultation when problems occur. Thus, for these fisheries, the impacts of reduced sampling on long-term datasets and model parameters (e.g., forecast models, harvest models), are not inconsequential and are discussed further below.

Postseason Estimates

Without catch sampling or other mechanisms for tracking catch (e.g., fish tickets), we will be unable to estimate total harvest. If catch sampling is reduced from normal levels, we anticipate greater uncertainty in postseason harvest estimates.

A lack of sampling for CWTs will preclude the implementation of cohort reconstructions and other salmon stock assessment methods. These methods are used to estimate stock-specific exploitation rates (including for ESA-listed stocks) and abundance as well as other metrics (e.g., stock composition of catches). In the absence of CWT recovery data, new data-limited methods might be developed to estimate exploitation rates and abundance, but their accuracy and precision would likely be lower than the CWT-based methods. If sampling of CWTs is not completely eliminated but substantially reduced, the uncertainty in CWT-based estimates would be higher because of large and uncertain sample expansion factors. The total number of recoveries for some stocks might also be so low that credible estimates of exploitation rates and abundance could not be made.

Sampling for CWTs is also a requirement for some ESA-listed stocks. For example, the Sacramento River winter Chinook 2018 Biological Opinion emphasizes the need to sample fisheries for stock composition, including the collection of CWTs. We note that a reduction or lack of CWT recovery data in a single fishing year would affect multiple broods of Chinook salmon.

Harvest models used in the management of California Chinook stocks are updated annually based on CWT data and thus would be affected by changes to CWT sampling. Chinook and coho FRAM are not updated annually with new CWT data and would be less affected, however, insufficient or a lack of CWT sampling would eliminate the possibility of using brood years of Chinook and coho encountered in 2020 fisheries in future FRAM base period updates. Reduced or no CWT sampling would inhibit our ability to meet and assess obligations for Chinook under the Pacific Salmon Treaty as annual Chinook Technical Committee analyses rely heavily on CWT data.

Fishing Effort Forecasts

There would likely be relatively small effects on future effort forecasts if there is reduced or no effort estimation in a single year. Effort forecasts are based on multi-year averages of vessel days in commercial fisheries and angler days in recreational fisheries. Omission of a single year would therefore have a relatively minor effect. It is possible that if actual effort is substantially reduced from typical levels in 2020, the estimates may not be representative and could be omitted from future effort forecasts.

Abundance Forecasting

The inability to implement cohort reconstructions or other stock assessment methods would result in complications for estimating past abundance. Sibling regressions and other abundance forecasting methods often rely on reconstructed ocean abundance estimates to predict future abundance. However, there may be little effect on abundance forecasting if estimates of river returns (and the age structure of those returns) are able to be made. An inability to estimate postseason abundance would result in the loss of one data point in among the many that are used to forecast future abundance. There are however potential complications from a missing abundance estimate for methods that include autocorrelation, such as the method used to forecast the Sacramento Index.

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