CALIFORNIA DEPARTMENT OF FISH & WILDLIFE RECOMMENDATION ON FINAL PREFERRED ALTERNATIVE FOR A SONCC COHO SALMON HARVEST CONTROL RULE

California Department of Fish and Wildlife (CDFW) greatly appreciates the additional work done by the SONCC Coho Ad Hoc Workgroup since the September Meeting. The new report (Agenda Item F.3.a) content provides much-needed insight on the projected distribution of ocean fishery impacts on the ESU, as well as the primary assessment tool (i.e., the Coho Fishery Regulation Assessment Model [FRAM]) with which pre-season projections and post-season estimates of impacts are made for ocean fisheries. This new information, combined with the existing modeling results, allows better understanding of the stock and fishery implications of different total exploitation rate (ER) limits (or harvest control rules [HCRs]).

CDFW understands that the selection of a final-preferred alternative at the November meeting for a total (ocean + inland) ER limit creates a need for the co-managers to work out an arrangement for sharing available impacts between tribal and non-tribal fisheries, and CDFW looks forward to having those discussions in the future. Notably, the Council's action at this meeting does not assume a particular outcome from those forthcoming discussions, and is limited to consideration of a total ER that would apply to all ocean and inland habitats and co-managing agencies.

CDFW supports the position that a total ER for the stock is the most effective way to ensure that harvest mortality on this fragile ESU is considered and evaluated in an aggregate form. However, as documented by the workgroup report, contemporary harvest management is not the primary factor limiting the viability of this stock – dam construction, channelization, water management, and land-use practices have substantially reduced and degraded freshwater habitats; and the hatcheries constructed to mitigate for some of these effects may also impede recovery through genetic interactions between hatchery and wild fish.

CDFW views a total ER limit, as well as accompanying assessment and regulatory actions, as tools that are designed to effectively ensure the future persistence of the SONCC coho salmon ESU is not compromised.

The risk assessment report indicates there are two distinct population groups with differing levels of productivity and, consequently, viability in the presence or absence of fishing. The more productive and predominantly natural-origin Scott River, Rogue River, and Freshwater Creek populations showed a low level of quasi-extinction risk on a 20-year time horizon (20-year risk, hereafter) under a no fishing scenario (HCR 1, ER of 0%; risk range: 3-14%) and at most of the fishing levels (ER range: 7-20%) considered (risk range at max ER [20%]: 19-29%). The Trinity River, Bogus Creek, and Shasta River model populations, in contrast, showed a high 20-year risk across all HCRs, even in the absence of fishing (risk range with no fishing: 64-100%; risk range at max [20%] ER: 86-100%). Stock-recruit parameters for these populations are indicative of poor productivity, which may be due to their heavy hatchery influence (i.e., 42-83% of spawners are hatchery strays) and/or poor habitat conditions. Reducing the impact of

fisheries on these populations therefore has little potential for increasing their viability or persistence, particularly when California's existing prohibition on the retention of coho salmon in commercial and recreational fisheries is considered.

These observations suggest that an ER limit in the middle of the range considered poses minimal risk to the ESU as a whole and does not compromise ongoing work aimed at increasing the productivity, capacity, and viability of its weaker populations. **CDFW therefore supports a maximum allowable total ER limit of 15% (HCR 5) for Council adoption, a value that is expected to satisfy ESA requirements.**

This ER limit will be shared between ocean and inland waters for rivers or populations with permitted coho fisheries. While agreements for sharing this new limit between tribal and non-tribal fisheries do not yet exist, a new HCR will clearly limit ocean fisheries more frequently than did the prior 13% ocean-only ER limit. As documented in the Workgroup's report, this new limit may restrict fishing opportunity in 1-2 out of every five years (Figure 39) for some times and areas, and California's northern management areas may feel the brunt of this new constraint (Appendix E). Consequently, CDFW in consultation with ocean fishery representatives, may need to explore new regulatory and non-regulatory actions to reduce coho salmon encounters in order to preserve time on the water during years of good Chinook salmon abundance. Doing so, however, requires that the reduction in impacts resulting from such actions can be quantified and incorporated into Coho FRAM runs, similar to how the Oregon troll fishery's four-spread gear restrictions are currently captured.

To complement this new 15% ER limit, CDFW also supports the following actions to help ensure HCR implementation achieves the intended conservation and fishery objectives:

1) State, federal, and tribal agencies, as well as non-governmental partners, should continue their efforts to monitor natural and hatchery populations of SONCC coho salmon, and pursue new or expanded monitoring opportunities as they arise. For CDFW, this means a continued emphasis on escapement monitoring for populations considered in the risk assessment, as well as other coastal streams that could not be included due to their short (but growing) monitoring histories.

2) If evidence of predictive relationships supportive of forecasting become apparent in the future, the feasibility of developing and implementing an abundance- or a matrix-based harvest management framework should be revisited. It may be sensible to postpone any such reassessment until after the Klamath dams are removed, given that this restoration effort will open considerable habitat to coho salmon which is expected to enhance the viability for a major portion of the ESU.

3) The primary tool used to assess the impacts of ocean fisheries on coho salmon, Coho FRAM, should be validated and improved for SONCC coho salmon applications. FRAM's preseason projections of ocean ER for the ESU have tracked 67% higher than postseason values since 2018, when non-retention input calculations changed, and 49% higher than preseason values since 2004 (Figure 1). In addition to this pattern of systematic error, FRAM's pre- and postseason estimates of ER for the ESU are poorly related (R^2 = 0.11, P = 0.20). These issues suggest that relying solely on FRAM in preseason planning may unnecessarily constrain fisheries and will result in an implementation approach that is at

odds with the workgroup's HCR-development directive to '*allow fishing on abundant salmon stocks while not impeding the recovery of SONCC Coho Salmon*' (Workgroup Terms of Reference, Appendix A).

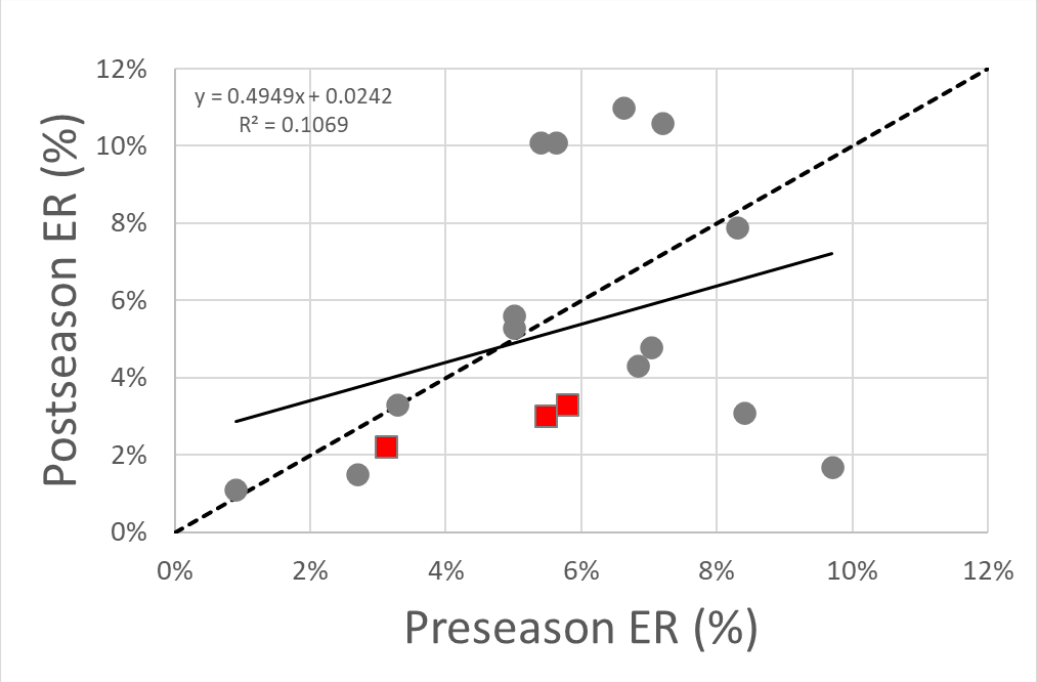

Figure 1. Preseason vs. postseason-projected ocean exploitation rates (ER) for SONCC coho salmon made using the Coho FRAM model, for the 2004-2020 period. The 2018-2020 estimates, generated using the new non-retention impact estimation approach developed in 2018, are displayed as red squares. In this period, the preseason forecasts have tracked 67% higher than postseason estimates.

For these reasons, efforts to validate and improve FRAM's use for SONCC coho salmon assessments should be pursued wherever possible. Such assessments could focus on (a) its base period exploitation rate parameters and draw upon existing coded-wire tag data, future expansions to marking and tagging, and genetic stock identification methods, and (b) its annual pre- and postseason inputs, such as stock abundance and effort forecasts.

CDFW believes that these actions, combined with a total exploitation rate limit that is adequately protective, will successfully limit the impact of ocean and river fisheries on the SONCC coho salmon ESU.

Finally, given the concerns outlined in item 3 above, CDFW does not support the existing approach of relying solely on a preseason application of Coho FRAM, in combination with preseason river fishery expectations, to assess compliance with the adopted HCR limit. Doing so will allow model deficiencies to unduly constrain ocean fisheries and create real hardships for coastal fishing communities. For this reason, CDFW recommends that the

Council recommend that Coho FRAM be used only as a guide for HCR attainment in a preseason setting, and instead assess HCR compliance using postseason data. More specifically, CDFW proposes that compliance be measured based on the ability of fisheries (ocean + freshwater, combined) to remain at or below the adopted limit of 15% on a running average, postseason basis. This approach is within the bounds of implementation error assessed by the workgroup, and simply shifts the focus of HCR attainment to what is ultimately the more important measure of fishery impacts – those which actually happened.

However, acknowledging the need to ensure that each year's proposed ocean fishery season structure is risk-averse specifically with regard to SONCC coho, CDFW recommends that ocean ER guidelines continue to be an element of the preseason planning process. An annual pre-season cap on ocean impacts will ensure that the postseason estimate will not increase risk to the ESU beyond what is encompassed in the assessed HCR. To this end, it is recommended that the preseason ocean ER remain conservatively within the range of error modeled by the workgroup in its evaluation of a 15% ER limit, and more specifically at or below the 75th percentile of the modeled ER distribution. Considering that a total ER limit will be shared between ocean and inland waters, this equates to ocean ER guideline of 9%. Additionally, this guideline should not be attained more often than once in every four years to ensure that no single brood line is affected on a repeated basis.

CDFW Recommendations:

Adopt Harvest Control Rule 5 as described in Agenda Item F.3.a, the Fishery Harvest Control Rule Risk Assessment. This amounts to a total fishery exploitation rate (ER) limit of 15% on SONCC coho salmon, to be implemented as follows:

> *Evaluation of attainment of the limit occurs on a postseason basis each year using the annual postseason exploitation rate, which is the sum of the fishery exploitation rates experienced in the year across all ocean and inland sources of fishery mortality (ER). The annual ERs are then averaged over the available postseason record for the period following HCR adoption, and this average must not exceed the adopted limit of 15%.*
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> *Postseason estimates of the ocean ER will be generated using the Coho Fishery Regulation Assessment Model (FRAM), whereas the in-river ER component will be determined using data provided by co-managing agencies as described in Appendix C and Appendix I of the risk assessment report.*

In addition, ocean fishery seasons shall be designed pre-season each year such that Coho FRAM projections of ocean fishery impacts to SONCC coho salmon do not exceed 9% more frequently than once every four years, which is a reduction in the status-quo allowable ocean impact rate of not more than 13%.