CALIFORNIA, OREGON, AND WASHINGTON JOINT REPORT ON OCEAN SALMON FISHERY SAMPLING AND ESTIMATION PLANS UNDER POTENTIAL COVID-19 CONSTRAINTS DURING THE 2020 SEASON

The COVID-19 pandemic, with its related safety concerns and social distancing restrictions, may restrict the participation in salmon fisheries, and may affect the ability of fish and wildlife agencies to sample fisheries according to their established protocols and procedures. The Pacific Fishery Management Council (Council) agenda item E.4.a *Supplemental STT Report 2: Ramifications of Curtailed Sampling of Ocean Salmon Fisheries in 2020* identifies the possible implications of reduced sampling on the existing West Coast salmon stock assessment system; however, this document provided a high-level overview and did not address the proposed 2020 fisheries, different management approaches (e.g., quota vs. season management), or contingency plans under consideration within individual jurisdictions. Council discussions and interest from National Marine Fisheries (NMFS) prompted the Council representatives from California, Oregon and Washington to draft a tentative plan for how their respective states might adapt their ocean salmon fishery sampling programs to provide necessary information, given the potential for pandemic-related fishery and sampling constraints.

Summary plans are provided on the following pages for each jurisdiction. Plans differ from state to state, but all provide an overview of the following items, separately for each sector (commercial/recreational):

(1) The sampling approach(es) traditionally used to obtain information about effort and catch, as well as to collect coded-wire tags (CWT) from landed fish;

(2) Outlines of reduced/contingency sampling approach(es) that might be implemented if fisheries commence and traditional sampling approaches cannot be used;

(3) The alternative estimation approaches that could be used to estimate catch, effort, and CWT stock-age composition if necessary, given altered sampling approaches.

In addition, the implications of reduced/contingency sampling possibilities on a more general level are considered, and several issues/concerns pertinent to all jurisdictions are acknowledged by the agency representatives, including:

- The approaches shared here are preliminary and conceptual at this time, subject to change as state or local orders are revised or agency restrictions on staff are updated. Management entities will continue to coordinate closely with NMFS and the Council on such changes as they arise throughout the season.
- It is anticipated that the impact of any reduced sampling regimes (should they occur) on long-term datasets and/or the models used for management will be lessened if a ‘return to normal’ occurs early in the fishing season.
- Although considered, the states concur that relying on the voluntary returns of heads/snouts by members of the recreational and commercial fleet to recover CWTs from landed catch may not be uniformly viable due to the uncertainty that voluntary programs may introduce (e.g., sampling rates and representative sampling), but the approach may be valid in some cases. Such uncertainty may mean that in many cases, use of existing information and harvest models are likely to provide more accurate estimates of stock composition and fishing impacts compared to voluntary collection of CWTs.

Lastly, while the plans summarized here aim to help agencies navigate the unique circumstances created by the COVID-19 pandemic with minimal disruption to long-term datasets central to salmon management, they are stopgap measures only. It is hoped that this report will serve as a reference for the Council, NMFS, and stakeholders documenting that agencies are preparing accordingly.

California's Tentative ocean salmon fishery sampling and estimation contingency plan under potential COVID-19 restrictions in 2020

Standard sampling approaches for effort, catch, and coded wire tag (CWT) and other biological data collection

Commercial ocean troll fisheries: The California Department of Fish and Wildlife (CDFW) determines commercial fishing effort (days fished) and catch (number of fish) using dockside samples of average days fished and average weight, respectively, applied to fish tickets for the purpose of post-season evaluation. Quota fisheries, when they occur, are monitored in-season using electronic fish tickets and further verified using dockside sampling. When quotas are not utilized, inseason management is not typically applied. Stock and age composition of the harvest is determined from dockside collection of CWTs for the purpose of post-season evaluation and assessment.

Recreational ocean fisheries: California's recreational fishery is comprised of two sectors: (1) private skiffs, and (2) commercial passenger fishing vessels (charters). The recreational fishery is not managed using quotas and inseason management is not typically utilized. Skiff and charter fishing effort (angler days) and catch (number of fish) is estimated via dockside sample programs for the purpose of post-season evaluation. Stock and age composition of the harvest is determined from dockside collection of CWTs for the purpose of post-season evaluation and assessment.

Contingency sampling approaches if fisheries commence and traditional sampling cannot occur due to COVID-19 work restrictions

CDFW has considered a variety of contingency sampling plans that address health and safety concerns brought about by COVID-19 while continuing to meet salmon management data-input requirements. The approaches described in this document are conceptual and may require additional refinement. Additionally, these concepts are contingent on actions or orders that may be enacted by state, county, or local jurisdictions or the California Fish and Game Commission and CDFW with regards to access. CDFW intends to use status quo sampling methods in all times and areas where possible, and alternative sample methods will be considered only when public health concerns from COVID-19 preclude the use of status quo methods.

Commercial ocean troll fisheries: Fishing effort (days fished) and total catch (number of fish) may be estimated by applying the historical average days fished per landing and historical average fish weight, respectively, to total fish ticket landings and pounds for the purpose of post-season evaluation. CWTs and other biological data would not be collected from the fishery. Stock and age composition may be assumed from preseason modeling and/or based on recent averages for time-area fisheries for the purpose of post-season evaluation. No quota-managed fisheries have been proposed for 2020.

Recreational ocean fisheries: Skiff fishing effort (angler days) may be estimated from peak trailer counts and historical trip type composition and number of anglers per vessel, while charter fishing effort may be estimated from an expanded phone survey and logbooks for the purpose of post-season evaluation. Total sport catch (number of fish) may be estimated from preseason modeling scaled to actual effort for the purpose of post-season evaluation. CWTs and other biological data would not be collected from the fishery. Stock and age composition may be assumed from preseason modeling and/or based on recent averages for time-area fisheries for the purpose of post-season evaluation. No quota-managed fisheries have been proposed for 2020.

Implications of the contingency sampling approaches if fisheries commence and traditional sampling cannot occur

Management concerns associated with non-traditional sampling regimes described above are expected to be minor. Data streams will remain uninterrupted with regards to fishing effort, total catch, and stock and

age composition. CDFW notes that sampling restrictions due to COVID-19 are anticipated to be temporary, and a return to normal sampling protocols will be implemented as early as is practicable.

Commercial ocean troll fisheries: Fishing effort and catch estimates for commercial troll fisheries would be minimally affected. Inaccuracies may arise if the historical average days fished or average weight of fish differ substantially from actual, or if stock composition varies considerably from harvest model-projected or historical contributions.

Recreational ocean fisheries: Fishing effort and catch estimates for recreational fisheries would be minimally affected. Similar to commercial, error in estimates may arise if the historical skiff trip type composition or catch per unit effort varies substantially from actual. Charter fishing effort and catch is unlikely to be significantly impacted by the proposed alternate sample program, as both metrics can be validated against mandatory logbooks. The accuracy of stock composition projections may be similarly affected if actual distributions vary considerably from harvest model-projected or historical average contributions.

Oregon's tentative ocean salmon fishery sampling and estimation contingency plan under potential COVID-19 restrictions in 2020

Oregon Ocean Salmon Harvest Monitoring:

While no estimates of the duration of COVID related health and safety orders can be made for Oregon, based on current trends, 'Stay Home' orders appear likely to last into at least May. Under current Oregon Stay Home orders, ODFW still remains able to conduct field monitoring to support data collection needs for managing recreational and commercial ocean salmon fisheries. This monitoring includes the ability to collect CWTs, from both recreational and commercial troll salmon fisheries, estimate angler effort in real time across multiple ports, and make estimates of salmon harvest including quota tracking in both fisheries.

At this time, ODFW is expecting to conduct normal approaches to ocean salmon fishery monitoring and sampling, with the exception of adjustments for social distancing, PPE, and hygiene guidance to field sampling staff. These current safety and health adjustments may slow the sampling process for both recreational and commercial troll landings, but are not anticipated to create any major impediment to meeting fishery management needs.

It is also understood that at any time, sampling procedures may need to change if new instructions are received from Governor Brown or ODFW Director Melcher, or new safety guidelines related to COVID-19 are implemented. Given the uncertainty of such potential changes, it is impossible to project what exact responses might be necessary. Any alternative sampling approaches would need to be adapted to fit within whatever new limitations might be imposed. In order to attempt to provide some assessment of potential changes, ODFW is providing a range of alternate sampling procedures that could be applied. These alternate approaches are not intended to be proscriptive nor exhaustive; additional or altered approaches may be needed to adapt to new circumstances. ODFW is committed to keeping NMFS and our PFMC partners advised of any such changes as they occur.

Oregon Commercial Troll Sampling:

We currently are planning to operate as usual with some new guidelines related to social distancing, hygiene, etc. Area of catch, number of days fished, count of salmon by species and grade, and weights are all available via commercial fish ticket data. Field sampling is used to collect counts of adipose fin marks within sampled landings, scan sampled salmon for CWTs, recover snouts from tagged salmon for later tag extraction and decoding, and collect length and weight data. Monitoring of total landings and tracking of quotas are directly through fish receiving tickets (including electronic fish tickets) and mandatory call-ins/e-mail reporting in all quota managed troll salmon seasons.

It is important to note that commercial troll Chinook Salmon landings in April and May in Oregon can be significant in many years. Recovery of CWTs in April has averaged 224 readable tags per year since 2015 (average 16 open days), and 435 readable tags in May (average 28 open days). The 2020 season is currently planned with 11 open days in April, and 11 open days in May.

The range of potential alternative sampling approaches below reflect two levels of sampling reductions from standard monitoring:

1. **Moderate Limitations:** General sampling approach would be unchanged from standard practices, but increased efforts to further lower health risks to staff and public by reducing sampling contact (compared to normal). Reduced dockside sampling with likely only 'bulk sampling' for CWTs. This would entail coordination with fish buyers to delay icing fish down or packing for shipment until sampling can occur. Sampling of Chinook Salmon for CWTs from multiple boats/trips would occur from bulk totes. Estimation of total landings and quota tracking would not be compromised, and likely that only minimal degradation of the CWT recoveries would occur via the bulk sampling approach. No effects to inseason or postseason assessments would be anticipated.

2. **Minimize Contact with Public:** No dockside presence by ODFW staff. No recovery of CWTs would be available, except as described below, or through other voluntary measures. Estimation of total landings and quota tracking would not be compromised. If no representative sampling of CWTs can occur, then there will be some limited effects to models and postseason assessment of stock impacts. Stock and age composition may be assumed from standard fishery models and/or based on recent averages for time-area fisheries for the purpose of post-season evaluation.

    a. Potential to work with fish buyers to have them collect snouts from all adipose fin marked salmon from a portion of their deliveries (e.g., 20%). If this can be implemented, it may be possible to maintain appropriate CWTs to meet postseason assessment needs.

Oregon Recreational Salmon Sampling:

Effort counts in all major ports and most minor ports, are conducted using video recordings of bar or harbor exits. Those video boat counts (VBC) are expected to continue in all scenarios discussed below. More detail on the methodology of the Oregon recreational ocean fishery sampling can be found here: http://www.dfw.state.or.us/MRP/salmon/docs/ORBS_Design.pdf

ODFW currently anticipates being able to conduct sampling using the same general approaches as normal. In this case, the VBCs are matched by week and port to dockside interviews, which provide information on number of anglers per boat, boat type (charter, guide, or private), the ocean area fished, departure time, number of released fish by species, and a number of other supplemental informational details. The interview also includes a physical count of all retained fish by species, examination of all salmon for fin clips, electronic scanning of all salmon for CWTs, and recovery of snouts from tagged salmon for submission to the ODFW CWT lab. Biological subsampling for length and weight data elements from a number of species also occurs.

The potential range of sampling adjustments for the recreational fishery are described below as two levels of sampling reductions from standard monitoring:

1. **Moderate Limitations:** The general sampling approach would be unchanged from standard practices, but additional steps would be taken to lower the risk of viral exposure to staff and members of the public by reducing sampling contact. Interviews would be conducted from an extended distance (beyond 10 feet from the contact), and catch rate and angler information from charter vessels would be collected by phone interview. No actual handling of fish would occur at the interview level. Species composition would be dependent upon correct identification and reporting by the anglers. All other data elements from interviews would be available, and estimates of harvest - including for quota tracking - would not be compromised. It is anticipated that, unless "1.b." below is required, sampling rates would remain near levels associated with standard sampling activities.

    a. Recovery of CWTs would likely either be based on anglers dropping off heads through a voluntary program, or as directed by sampling staff (all salmon heads from each boat being interviewed). No length or weight data would be available, though this information is not necessary to track ESA impacts or compliance with the Council management process or FMP. Expansion factors for sampling rates of CWTs could still be generated if snouts are collected and batched by statistical week, port, and fishery.

    b. Overall field staff presence might be reduced to lower levels based on additional guidance from the state or agency level. Such reductions would be expected to reduce interview rates and CWT snout recovery rates. ODFW could also consider application of observed effort and conservative catch rates in order to create a conservative (biased high) estimate of total harvest. Such estimate could be validated and/or updated by post-season assessment once data from 2020 catch-record cards are available.

2. **Minimize Contact with Public:** VBC effort counts would continue to be conducted by field staff. Interview-based information on number of anglers per boat, boat type (charter, guide, or private), the ocean area fished, departure time, number of released fish by species, and direct assessment of kept catch and species would not be available and would be inferred from prior years' data for similar timeframes and areas. Because VBC counts are used to estimate port-specific effort, they can be used to detect effort shifts that may occur. COVID-19 social distancing guidelines are expected to result in a reduced number of anglers per boat and subsequently less catch per boat. Therefore, it follows, that using averages from prior years are likely to result in estimates of effort and catch estimates that are higher than likely to occur. CWTs might be still be recoverable via voluntary measures as outlined, but agency staff would not be collecting CWTs from fish directly. Stock and age composition may also be assumed from preseason modeling and/or based on recent averages for time-area fisheries for the purpose of post-season evaluation.

Additional possible alternatives:

a. Voluntary trip reporting: This could be accomplished by developing a web-based portal; or leaving interview forms and instructions on vehicles, at boat slips, and having data drop boxes for completed forms in port. We already have a stock form being deployed for the 2020 season that can be modified to work for such purposes. This would provide information that could be matched against VBC counts to generate effort and catch estimates that should be more representative of current conditions than using prior year interviews.

b. Voluntary snout/head collection sites in ports that could be emptied daily, and labeled to date and port of recovery. Additional materials might be provided to allow anglers to record species ID and location of catch for any snouts being dropped off.

Further Discussion:

ODFW has examined past fishery information in light of expected continuing issues associated with COVID-19 effects on fisheries and fishery management, with particular focus on the early period of the season, between now (April 8) and the end of May. As has already been discussed, the effects of Stay Home orders and local closures of many coastal boating and access facilities has already been observed to have dramatically reduced angling effort, when compared to recent years.

In terms of monitoring catch, the primary monitoring concern during the recreational salmon fishery between Cape Falcon and Humbug Mountain from March 15 through May is tracking angler effort and catch rates of Chinook Salmon to generate total catch estimates for use in providing annual aggregate fishery data, information needed for run reconstructions, as well as collection of CWTs. This fishery is managed without a quota.

The recreational fishery between Cape Falcon and Humbug Mountain opened for Chinook Salmon, on a non-quota basis, on March 15, 2020. Figure 1 below illustrates the average angler salmon trips from 2015-19 for the five major ports in Oregon, by statistical landing week, in order to visually display the typical pattern of annual Oregon salmon angling effort.

Over the period 2015-19, total angler trips in the Cape Falcon to Humbug Mountain area has averaged 51 trips in March, 51 trips in April, and 797 trips in May. These result in cumulative estimates of 0.2% (102 trips) of the total salmon angling effort for the year, which occurred from March 15-April 30, and about 1.9% (900 trips) which occurred from the period of March 15-May 31. Over the period 2015-19, catches of Chinook Salmon in the recreational fishery from Cape Falcon to Humbug Mountain have averaged 3,500 fish from March 15-October 31. Of this, an average of 20 fish (0.5% of the total) have been caught between March 15 and April 30, and an average of 124 fish (3.5% of the total) have been caught between March 15 and May 31. From 2015-19, in the area from Cape Falcon to Humbug Mountain, ODFW has collected a

total of 4 readable CWTs in March and April and a total of 30 in May. These result in per-year averages of <1 per year for March and April and 6 for May (see Figure 1).

Due to issues described above, angler trips in April and May are expected to be markedly lower in 2020. As of April 4, 2020, ODFW has observed one salmon angler trip, with no catch.

Another concern for the recreational salmon fishery from Cape Falcon to Humbug Mountain is tracking coho catch against the quota via fishery monitoring. This fishery is not planned to begin until June 27 under current Council options (as of April 8, 2020). At this time, ODFW does not anticipate that COVID-19 related issues will inhibit our ability to sample this fishery under regular monitoring approaches. The recreational fishery from Humbug Mountain to the OR/CA border will remain closed until June 20, when it will open for Chinook Salmon only, on a non-quota basis. At this time, ODFW does not anticipate that COVID-19 related issues will inhibit our ability to sample this fishery under regular approaches.

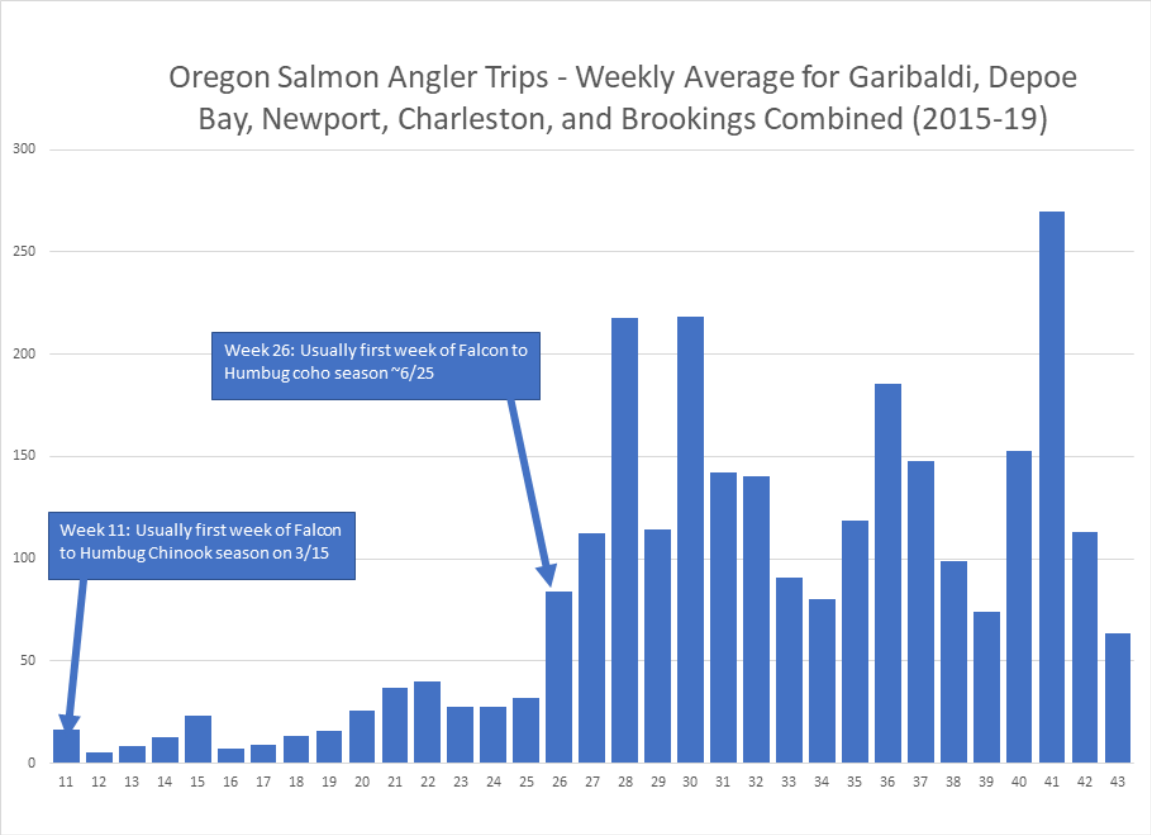

Figure 1. Average number of Oregon salmon angler trips by statistical week for Garibaldi, Depoe Bay, Newport, Charleston, and Brookings combined (2015-19).

Washington's tentative ocean salmon fishery sampling and estimation contingency plan under potential COVID-19 restrictions in 2020

Standard sampling approaches for effort, catch, and CWT and other biological data collection

Commercial ocean troll fisheries: The Washington Department of Fish and Wildlife (WDFW) relies on state commercial fish receiving tickets to estimate effort and catch, both post-season and in-season. Fish tickets must be completed for each landing and data include number of days fished and numbers and pounds of salmon landed by species. Legally, information from each fish ticket must be transmitted to WDFW by phone, FAX, or electronically by 10:00 AM the morning following the landing. In addition, port samplers record the same fish ticket information from major buyers each day to provide a cross-check. On average, port samplers verify 85% of submitted troll fish tickets, and find that less than 2% of the tickets fail to get reported on time. Those reported fish tickets and any additional information from port samplers are the basis of inseason catch and effort estimates used for quota management.

Post-season, the finalized error-checked fish ticket data, available both from WDFW and from the coastwide PacFIN database are used to generate final historic estimates of effort and catch. These postseason estimates of catch by species are used in the Pacific Salmon Commission's (PSC) Chinook Technical Committee (CTC) and Coho Technical Committee (CoTC) postseason assessment.

For coded wire tag (CWT) and biological data collection from the commercial fishery, WDFW deploys sampling staff to major coastal ports of landing (Neah Bay, La Push, Westport, and Ilwaco). Commercial salmon vessels are intercepted as they land catch; the complete catch of Chinook and coho in a landing is sampled electronically for CWTs, and scales are collected from a systematic sample of approximately 10% of the encountered Chinook. The CWT sample rate in the WA troll fishery averages close to 50% of the total catch in most seasons. CWT information is used in the Chinook and coho FRAM models periodically to update base period stock composition; however, this update does not occur annually. Both Chinook and coho FRAM are used by the PFMC to estimate stock-specific impacts of proposed fisheries during preseason planning. Chinook and coho FRAM are also both used for postseason fishery assessment and to assess impacts to ESA listed stocks. However, while coho FRAM is used bilaterally by the CoTC and PFMC, Chinook FRAM is only used domestically. The CTC uses Chinook CWT recoveries of specific indicator stocks from fisheries coast-wide in its annual exploitation rate analysis and calibration of the PSC Chinook Model.

Recreational ocean fisheries: Effort in Washington ocean recreational fisheries is estimated based on daily exit or entrance counts (physical counts by port samplers of sport vessels exiting or entering port during the entirety of the fishing day). Vessels returning to port are systematically selected for interview and catch examination at a minimum rate of 20% (average sample rate in quota fisheries is approximately 40% coastwide). The target species and number of anglers is recorded; effort by target species from sampled vessels is expanded to the count of total vessels to determine angler trips by target species. Catch per vessel is speciated and enumerated, then expanded to the total count of vessels to estimate total catch by species. Inseason catch estimates generated by sample data are the basis of quota tracking and inseason management.

Post-season, the finalized error-checked catch and effort data, available both from WDFW and from the coastwide RecFIN database are used to generate final historic estimates of effort and catch. These postseason estimates of catch by species are used in the Pacific Salmon Commission's (PSC) Chinook Technical Committee (CTC) and Coho Technical Committee (CoTC) postseason assessment.

For CWT and biological data collection from the recreational fishery, as part of the interview process described above, the complete catch of Chinook and coho aboard a sampled vessel is sampled electronically for CWTs, and scales and DNA are collected from a systematic sample of approximately 10% of the encountered Chinook. The CWT sample rate in the WA recreational fishery averages approximately 40% of the total catch in most seasons. CWT information is used in the Chinook and coho FRAM models

periodically to update base period stock composition; however, this update does not occur annually. Both Chinook and coho FRAM are used by the PFMC to estimate stock-specific impacts of proposed fisheries during preseason planning. Chinook and coho FRAM are also both used for postseason fishery assessment and to assess impacts to ESA listed stocks. However, while coho FRAM is used bilaterally by the CoTC and PFMC, Chinook FRAM is only used domestically. The CTC uses Chinook CWT recoveries of specific indicator stocks from fisheries coast-wide in its annual exploitation rate analysis and calibration of the PSC Chinook Model.

Contingency sampling approaches if fisheries commence and traditional sampling cannot occur due to COVID-19 work restrictions

Please be aware that all contingency sampling plans suggested in this document are preliminary concepts that may require more development, investigation or modification in conjunction with comanagers and other management partners. These approaches are contingent upon Washington State government and WDFW orders in response to the COVID-19 virus and upon access to Tribal lands that are currently closed to public access by order of tribal governments. WDFW intends to use status quo sampling methods in all times and areas where possible, and alternative sample methods will be considered only when public health concerns from COVID-19 preclude the use of status quo methods.

Commercial ocean troll fisheries: WDFW fish ticket reporting requirements would continue as usual, allowing daily monitoring of total landings in the troll fishery. Effort and catch estimates could be generated as usual, lacking the typical verification of port samplers. Knowing that, on average, less than 2% of tickets are not reported in a timely manner, a conservative 2% error factor could be applied to inseason catch and effort estimates for quota tracking. Postseason, final error-checked fish ticket catch and effort data would be available as usual for postseason analysis and historical records.

Collection of CWTs and other biological data would not occur in the absence of port sampling staff.

Recreational ocean fisheries: Boat effort counts could be performed as usual in all ports without violating social distancing protocol. This assumes that the activity is deemed safe and essential by WA State government and WDFW. In-person daily boat effort counts would provide good estimates of boat effort, would capture any effort shifts as a result of COVID-19 or other related factors, and could be combined with historic target species data and average anglers per boat to estimate angler effort by target species. Historic CPUE data (dataset to be determined) could be applied to estimated effort to generate an estimate of catch by species. Estimates could be generated inseason to monitor quota progress. Post-season (1-2 years), WDFW catch record card data could be used to verify and/or adjust inseason estimates.

Collection of CWTs and other biological data would not occur in the absence of port sampling staff.

Implications the contingency sampling approaches if fisheries commence and traditional sampling cannot occur

Below, we estimate to the best of our current ability, the potential effects of using non-standard methods of estimating effort and catch in WA ocean fisheries for some or all of the 2020 fishing season. We also discuss lost biological data. There may be additional impacts or limitations as plans develop. WDFW notes that sampling restrictions due to COVID-19 are anticipated to be temporary, and a return to normal sampling protocols will be implemented as early as is practicable.

Commercial ocean troll fisheries: Catch and effort estimates for commercial troll fisheries would be minimally affected inseason and unaffected postseason. Precision may be slightly reduced inseason by using a small error adjustment, opportunity could be lost using a precautionary inseason error adjustment, and lag time could experience some increase with remote work requirements. Postseason estimates of effort and catch would be unaffected.

CWT and other biodata would be lost for some or all of the 2020 fishing season. This loss would have no effect inseason but would jeopardize the ability of the CTC to perform its annual Chinook stock-specific

postseason exploitation rate analysis and calibration of the PSC Chinook Model. The loss of CWT data may also exclude the 2020 fishery data and its associated cohort groups from inclusion in future FRAM base period updates.

Recreational ocean fisheries: Effort estimates for recreational fisheries both inseason and postseason would be less precise in the absence of typical sampling if based on either a combination of boat counts and average historic anglers per vessel (inseason) or catch record cards (postseason). Precision estimates may not be available. Precautionary approaches to inseason management could result in lost opportunity; conversely, variation in catch composition or average angler trips per vessel from historic data could result in management objectives being exceeded. Postseason assessments for both Chinook and coho that rely on estimates of catch and effort would be less precise.

CWT and other biodata would be lost for some or all of the 2020 fishing season. This loss would have no effect inseason but would jeopardize the ability of the CTC to perform its annual Chinook stock-specific postseason exploitation rate analysis and calibration of the PSC Chinook Model. The loss of CWT data may also exclude the 2020 fishery data and its associated cohort groups from inclusion in future FRAM base period updates.