

After reviewing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed actions are not likely to jeopardize the continued existence of listed CCC coho salmon.

2.9 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102).

"Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

This incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary or appropriate to minimize impacts and sets forth terms and conditions in order to implement the reasonable and prudent measures.

2.9.1 Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur for the reasons outlined in the sections below. The number of estimated salmon taken as bycatch through the proposed action, both listed and non-listed, is used to define the extent of take rather than the number of listed fish from individual ESUs for several reasons: (1) it is a key parameter used to analyze the effects of the proposed action; (2) while information is available inseason to assess the overall take of salmon by species and inform management actions; information is not available inseason to assess impacts on specific salmon ESUs; (3) salmon bycatch can be monitored and assessed; (4) it is directly related to the take of listed species and, (5) the associated take of listed species associated with the bycatch is low. The stock composition of Chinook bycatch and the magnitude of impacts on individual ESUs are influenced primarily by location (latitude and depth), distribution of groundfish catch and the bycatch rate between

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the different sectors. Therefore, bycatch is defined by sector because of the substantial differences in the timing, location, and capacity of the fleets.

Whiting Fishery

Estimates of the bycatch of listed coho and Chinook salmon in the whiting sector are based on the distribution of the fishery, recent bycatch patterns in the case of coho, and the guidelines provided in the proposed action. The estimated bycatch of listed salmon in the whiting sector in the future assumes the following

- That the distribution of bycatch will not change substantially from that described in Section 2.5.2,
- That the sector will take actions to reduce bycatch to remain within the guideline of 11,000 Chinook per year,
- That bycatch will not exceed 14,500 Chinook per year including a Reserve of 3,500 Chinook per year in the event that bycatch increases unexpectedly,
- That coho bycatch will not exceed 474 coho salmon per year.

Bycatch resulting from EFPs in 2018 and beyond will be included within these bycatch limits.

Consultation shall be reinitiated if any of the following events occur: (1) the total bycatch in the sector exceeds 14,500 Chinook salmon or 474 coho in a calendar year, (2) any of the Reserve is used in three out of any consecutive five years, (3) the distribution of the whiting fleet changes substantially from that described in Figures 24 and 26 under the Northern distribution or Figures 25 and 27 under the Southern distribution. In particular, bycatch and bycatch rates are anticipated to be higher and more variable when the whiting fleet fishes under a Southern distribution; the fleet therefore has a substantial risk of exceeding the allowable take limits without effective management measures. The limit of 474 coho salmon is the highest annual bycatch of coho salmon observed since 2002.

Non-whiting Fishery (Bottom trawl, midwater non-whiting trawl, LE and OA fixed gear, and recreational fisheries combined)

Estimates of the bycatch of listed salmon in the non-whiting sector are based on the distribution of the fishery and the guidelines provided in the proposed action. The estimated bycatch of listed salmon in the non-whiting sector in the future assumes the following:

- That the distribution of bycatch will not change substantially from that described in Section 2.5.2,

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- That the sector will take actions to reduce bycatch to remain within the guideline of 5,500 Chinook salmon per year,
- That the sector will not exceed 9,000 Chinook salmon per year, including a Reserve of 3,500 Chinook salmon per year in the event that bycatch increases unexpectedly,
- That coho bycatch will not exceed 560 coho per year.

Bycatch resulting from EFPs in 2018 and beyond will be included within these bycatch limits. Consultation shall be reinitiated if any of the following occurs: (1) the total bycatch of Chinook in the sector exceeds 9,000 Chinook salmon per year, (2) any of the Reserve is used in three out of any consecutive five years, (3) the distribution of the fleets changes substantially from that described in Figure 28. In particular, the RPMs include a precautionary measure to ensure that management proceeds cautiously if fishing effort increases in nearshore areas, during the winter months, or in the Eureka or Monterey areas where current information on bycatch, bycatch rates, and associated stock composition is extremely limited, to ensure that impacts do not exceed those analyzed in the opinion. Reinitiation will be triggered if more than 560 coho salmon are taken as bycatch in any year. This is the highest annual bycatch of coho salmon observed in the non-whiting commercial trawl and non-trawl fisheries since 2002 combined with a buffer for uncertainty in the commercial non-trawl and recreational sectors.

Reserve

Consistent with the take amounts described above, one or both of the whiting or non-whiting sectors may access some or all of the Reserve in any year. Access of the whiting and non-whiting sectors to the Reserve in any year shall not exceed 3,500 Chinook salmon.

2.9.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed actions, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.9.3 Reasonable and Prudent Measures

“Reasonable and prudent measures” are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). Measures for this action are listed below.

1. NMFS, in consultation with the Council, will review existing mechanisms for monitoring salmon

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- bycatch in the groundfish fishery, and will develop mechanisms (if they do not already exist) that
- a) provide timely inseason data regarding the amount and location of salmon bycatch by sector, and;
 - b) provide timely inseason data regarding the geographic distribution of the at-sea whiting fleet.
2. The Council and NMFS will review existing regulatory mechanisms for reducing salmon bycatch, and will revise these mechanisms or develop and implement new mechanisms to ensure that, should inseason data show the annual coastwide bycatch will exceed 11,000 Chinook or 474 coho for the whiting sector or 5,500 Chinook or 560 coho for the non-whiting sector, NMFS and the PFMC will take timely and effective inseason action to avoid an exceedance of these bycatch thresholds.
 3. The Council and NMFS will develop and implement regulations regarding the Reserve and its use, ensuring that the Reserve will be available only to address unexpected high bycatch levels, and it will not be available as a matter of course to allow the sectors to exceed their bycatch guidelines.
 4. NMFS and the Council shall take steps to eliminate data gaps and implement adaptive management to minimize and avoid take of coho and Chinook salmon prior to allowing fishing at times and in areas where it has not been allowed since the year 2001. The analysis indicates a potential for continued high variability in salmon bycatch and uncertainty surrounding distributional bycatch effects with changing ocean conditions and increased access to rebuilt rockfish species.
 5. Given the uncertainties in the analysis, NMFS and the Council shall identify factors that contribute to greater bycatch of Chinook and coho salmon in order to improve our ability to predict when greater levels of bycatch may occur, and to address these factors in the future. The Council shall consider this information when developing bycatch reduction management measures.
 6. NMFS, working with the Council, shall compile and provide a report on an annual basis summarizing the following: a) all observed, reported, and estimated take of salmon by fishery sector, species, gear type, and location of bycatch in the groundfish fishery; b) stock composition of the Chinook bycatch by fishery sector and gear type including analysis of genetic data and expanded CWTs recovered by fishery sector, species and gear type, and c) the use of bycatch reduction measures in that year and evaluation of their effectiveness.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and NMFS or any applicant must

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comply with them in order to implement the RPMs (50 CFR 402.14) described above. NMFS or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, the protective coverage for the proposed actions would likely lapse.

MONITORING

- 1a. NMFS, in cooperation with the Council, shall monitor salmon bycatch and implementation of other management measures to address salmon bycatch at levels that are sufficient to ensure compliance with specified management limitations.
 - i. NMFS shall monitor inseason salmon bycatch by species, groundfish management area, and sector for the trawl fisheries on a weekly basis.
 - ii. NMFS shall work with WCGOP and the Council to ensure that information collected on the salmon bycatch, and implementation of other management measures designed to control salmon bycatch, associated with fisheries that are the subject of this opinion is of comparable or better quality to currently collected information. If the Council in the future considers different levels of monitoring coverage in the fisheries, the Council and NMFS would compare the quality of estimates produced by the new levels compared to the status quo.
 - iii. NMFS shall work with WCGOP and the Council to ensure that salmon bycatch in the fisheries that are the subject of this opinion are monitored and evaluated as follows to allow for a thorough post-season analysis of fishery impacts on listed Chinook and coho salmon ESUs species:
 - a. Monitoring of bycatch and implementation of bycatch control measures required in this opinion will be conducted using the best available methods.
 - b. The location at which salmon bycatch is taken in the fisheries shall be recorded and reported to NMFS.
 - c. Salmon taken in as bycatch in the fisheries shall be sampled for stock composition, CWTs, and other biological information including age, sex and size. For the whiting, bottom trawl and non-whiting midwater trawl fisheries, this includes taking genetic samples from the bycatch.
 - iv. NMFS shall work with WCGOP and other entities as appropriate to ensure that the distribution of fishing effort will be tracked and reported to NMFS.

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1.b. NMFS shall evaluate changes in the geographic and temporal distribution of fishing effort by gear type, compare them to the distribution of effort assumed in the opinion, and develop a report to characterize changes on a biennial basis. For example, NMFS shall report any significant changes in the spatial and temporal characteristics of fisheries. If the information indicates that the geographic distribution of the fishery is substantially different than that underlying the analysis in this opinion, NMFS will evaluate whether the change has resulted in impacts on listed salmon ESUs outside the effects analysis in this opinion.

DEVELOPING MEASURES TO KEEP BYCATCH WITHIN GUIDELINES

2.a. As part of its process for developing the biennial specifications for the groundfish fishery for 2019 and 2020, the Council will review the existing mechanisms in the FMP and regulations for avoiding and reducing salmon bycatch, including but not limited to 50 CFR 660.60(d), to determine if these measures are adequate to allow for timely inseason management to keep the sectors from exceeding their bycatch guidelines. This review shall consider, at a minimum, (1) the effectiveness of the Ocean Salmon Conservation Zone and Bycatch Reduction Zones for addressing the potential for bycatch guideline exceedances inseason, and (2) the efficacy of using BRAs to reduce interactions between the whiting fisheries and salmon. The review shall include recommendations for increasing the effectiveness of these measures.

2.b. If the Council determines that additional management measures are needed to allow for timely inseason management to keep the sectors from exceeding their bycatch guidelines, the Council will develop such measures and recommend them to NMFS within three years of the issuance of this opinion. Such measures may include, but are not limited to: sector-specific catch limits, bycatch thresholds, harvest guidelines, time and area closures, and gear restrictions. They may be described as NMFS automatic actions or Council inseason actions.

2.c. No later than May 15th, 2019, NMFS will amend the provisions regarding reapportionment of the treaty tribes' whiting allocation to the non-treaty sectors (50 CFR 660.131) to require that NMFS consider the level of Chinook bycatch when determining whether to reapportion whiting.

2.d. The Council and NMFS shall retain the following restrictions to minimize Chinook bycatch for the duration of this opinion:

- The 10,000-lb trip limit restriction on targeted harvest of whiting inside of 100 fathoms in the Eureka area,
- The delay of the start of the primary Pacific whiting season until May 15th for all sectors, north of 40°30' N. latitude.

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- The prohibition on at-sea processing south of 42°00' N. latitude,
- When shore-based fishing for whiting beginning April 15 south of 40°30' N. latitude is allowed, no more than 5 percent of the shore-based allocation may be taken prior to the opening of the main shore-based fishery on May 15.

2e. All whiting trawling within the nearshore Klamath and Columbia River Salmon Conservation Zones is prohibited. NMFS and the Council shall implement regulations within 2 years of issuance of this opinion to prohibit the following within the nearshore Klamath and Columbia River Salmon Conservation Zones:

1. Bottom trawling (except with a selective flatfish trawl gear), and
2. All non-whiting midwater trawling.

RESERVE

3.a. The Council and NMFS shall develop and implement initial regulations governing the Reserve of 3,500 Chinook as part of the 2019-2020 biennial specifications and management measures. These regulations will be designed to, among other things, allow for inseason action to prevent any exceedance of a sector guideline plus the full amount of the Reserve and minimize the chance that the Reserve is used in three out of any consecutive five years.

3.b. NMFS shall monitor the use of the Reserve in 2019 and will provide a report to the Council during the process of developing the biennial specifications for 2021-2022. The report will summarize the use of the Reserve and recommending, if needed, changes to the regulations governing the Reserve.

3.c. If, at any time during the fishery, it is anticipated that the coastwide bycatch will exceed the annual Chinook bycatch guideline of 11,000 for the whiting sector or 5,500 for the non-whiting sector, NMFS and the Council will take action to avoid an exceedance of either guideline. If either sector exceeds its guideline plus the Reserve, fisheries for that sector will close for the remainder of the year. If a sector exceeds its guideline plus the Reserve, but the other sector has not exceeded its guideline, only the sector that has exceeded its guideline plus the Reserve will be closed. If one sector has been closed for the remainder of the year under the above scenario, and the other sector reaches its guideline, all sectors would be closed for the remainder of the year. NMFS and the Council shall develop and implement regulations governing closure of the fishery sector(s) as described here as part of the biennial harvest specifications and management measures for 2019-2020.

NEW TIMES AND AREAS

4.a. Opening the trawl RCAs off Oregon and California according to the Council's PPA is part of the

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proposed action, however, as discussed in the effects analysis there is significant uncertainty regarding the effects of bycatch in the trawl RCA on individual listed ESUs. Therefore, NMFS and the Council should proceed cautiously and include measures to ensure the impacts are consistent with the analysis in this opinion. If salmon bycatch rates in the RCAs exceed the rates used in this analysis by more than 25 percent, the Council and NMFS will evaluate whether the change could subsequently result in salmon bycatch levels higher than the thresholds or impacts to listed salmon ESUs that would be outside the effects analysis in this opinion. If so, the Council and NMFS will develop and implement measures to reduce those rates to keep within the bycatch thresholds and ESU impacts of the opinion.

4b. As discussed in the effects analysis, there is significant uncertainty regarding the bycatch effects on individual listed ESUs in the non-whiting midwater fishery and bottom trawl fishery; particularly in areas south of 42° N. latitude. Data on the status of Chinook and coho ESUs from this area are very limited and what is available indicate they are in critical status. Prior to allowing additional non-whiting trawling south of 42° N. latitude, NMFS will implement one or more EFPs designed to collect information about Chinook and coho bycatch levels and stock composition from fishing in those areas or at those times for a minimum of three years.

4.c. A coastwide, year around non-whiting midwater trawl fishing is part of the proposed action, i.e., “midwater yellowtail/widow rockfish fishery is conducted in a manner similar to historical patterns when such a fishery took place”. However, as discussed in the effects analysis there is significant uncertainty regarding the effects of bycatch during January through mid-May on individual listed ESUs since a non-whiting midwater trawl fishery has not occurred in that time since routine data collection began. Chinook ESUs with spring-run type life histories are more prevalent during this time than at times later in the year. Therefore, NMFS and the Council should proceed cautiously and include measures to ensure the impacts are consistent with the analysis in this opinion. Prior to allowing additional open non-whiting trawling from January through mid-May, NMFS shall implement EFPs designed to collect information about Chinook and coho bycatch levels and stock composition from fishing during that time for a minimum of three years. In doing so, NMFS should take into account relevant information from existing EFPs. Information from the EFPs will be used to inform measures the Council may adopt to ensure the impacts are consistent with the analysis in this opinion.

4.d. The Council and NMFS will consider data collected as described in 4.a. and 4.b. in developing future management measures for the fishery.

IDENTIFYING AND ADDRESSING HIGH BYCATCH TIMES/AREAS/CONDITIONS

5.a. NMFS, working with the Council shall identify areas (‘hot spots’) and times of consistently high

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Chinook and coho bycatch and shall incorporate that information as appropriate in developing mitigation measures to reduce bycatch.

5.b. Over the next two years then every five years thereafter, NMFS, working with the Council and its advisory bodies, will conduct analysis to identify the following:

- i. Indicators that are most useful in indicating anomalous ocean conditions that are likely to result in high Chinook bycatch, and;
- ii. The most important indicators or combinations of circumstances that are likely to result in extreme salmon bycatch events in the whiting and non-whiting trawl fisheries. Information suggests that the top 0.5 percent of hauls in a gear type (i.e., at-sea whiting, shoreside whiting, bottom trawl, non-whiting midwater trawl) can account for a disproportionate amount of Chinook bycatch (NMFS 2017d).

5.c. NMFS working with the Council shall produce a report(s) summarizing the findings of its analyses in T&C 5a and 5b and recommendations on how the information could be incorporated into management. The first report(s) is due within two years of issuance of this Opinion and every 5 years thereafter.

REPORTING & EVALUATION

6a. NMFS will produce an annual postseason report by November 1 the year following each season that includes the following:

- A summary of the observed salmon bycatch by season, fishing depth, bottom depth, and area for the previous fishing year.
- A summary of stock composition (genetic data and available estimated CWTs) and any other biological information regarding the salmon taken as bycatch during the season.
- A summary of the bycatch reduction measures used and an evaluation of their effectiveness.
- A comparison of the fishery's geographic distribution during the season against the assumptions made about that distribution in this opinion.

6b. NMFS, in consultation with the Council, and the states of Washington, Oregon and California, shall review existing monitoring and reporting systems used in the commercial fixed gear and recreational groundfish fisheries with respect to the timeliness of bycatch reporting and assessment of salmon bycatch. NMFS shall produce a report summarizing the findings of this review and recommendations to address deficiencies in existing systems within two years of issuance of this opinion. NMFS shall work with the Council and states to implement the recommendations within one year after issuance of its report.

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2.10 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). NMFS believes the following conservation recommendations are consistent with these obligations and, therefore, should be implemented by NMFS.

- (1) NMFS in collaboration with the Council and groundfish industry should continue to evaluate improvement in gear technologies and fishing techniques to reduce impacts on listed Chinook and coho salmon.
- (2) NMFS in collaboration with the Council, and with assistance from the GMT and STT, should develop methods that would assess impacts to listed salmon ESUs in the groundfish fishery in terms of exploitation rates that could be compared with those in salmon fisheries in order to provide more comprehensive accounting of impacts to the listed salmon ESUs and to improve management flexibility.
- (3) NMFS in collaboration with the Council should continue to investigate the relationship between salmon bycatch in the groundfish fishery and salmon abundance, and consider harvest guidelines that vary annually in accordance to the projected abundance of salmon. This could be particularly important in years of low abundance of one or more Chinook stocks where a single bycatch guideline may be insensitive to the bycatch of a relatively substantial proportion of smaller Chinook populations. The Council could set harvest guidelines at amounts below the take limits for the individual sectors dependent upon the salmon forecast. If a harvest guideline was reached, it could trigger implementation of a mitigation measure (e.g. time or area closure) which could either be done automatically or through a Council recommendation to NMFS.

2.11 “Not Likely to Adversely Affect” Determinations

Sacramento winter-run and Central Valley spring-run Chinook salmon ESUs

The above ESA-listed salmon ESUs may occur in the action area and may be directly affected by interaction with gear under the proposed fishing. However, available data indicates Sacramento winter-run and Central Valley spring-run Chinook salmon are not present in the bycatch (Table 2-65). This is despite observed bycatch of other spring Chinook ESUs with similar migration timing through the action

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area and bycatch for which abundance is as low or lower. Returning adults from the Sacramento winter-run and Central Valley spring-run Chinook salmon ESUs enter their natal rivers beginning in December and March, respectively; exiting the ocean prior to the current start of some groundfish fisheries in the area and outside peak fishing for other groundfish sectors. Nonetheless, given the evolving nature of the fishery, we will continue monitoring stock composition in the groundfish fishery with observer programs, which will allow us to identify any take of these ESUs that would occur. Based on the low potential for exposure and the lack of observed bycatch, it is extremely unlikely that the proposed fishing effort will result in interactions with either of the above salmon ESUs and the potential effects are, therefore, discountable.

Table 2-65. Average 2008 to 2015 (range) contribution by Chinook ESU to the at-sea and shoreside whiting fisheries used to assess stock composition of Chinook bycatch in this opinion.

Salmon ESU	% contribution to the catch	
	At-sea	Shorebased
Puget Sound Chinook	7.0%	1.1%
Upper Columbia River spring Chinook	0.2%	0.0%
Upper Willamette River Chinook	0.2%	0.0%
Lower Columbia River Chinook	5.9%	4.1%
Snake River spring/summer Chinook	0.2%	0.0%
Snake River Fall Chinook	1.5%	1.5%
California Coastal Chinook	4.0%	2.5%
Sacramento Winter-run Chinook	0.0%	0.0%
Central Valley Spring-run Chinook	0.0%	0.0%

2.12 Reinitiation of Consultation

This concludes formal consultation for the impacts of programs administered by the Bureau of Indian Affairs that support Puget Sound tribal salmon fisheries, salmon fishing activities authorized by the USFWS, and fisheries authorized by the U.S. Fraser Panel in 2016.

As 50 CFR 402.16 states, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the ITS is exceeded; (b) if new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was

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not considered in the biological opinion; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action.