

Draft Summary Minutes
Yelloweye Rockfish Survey Design Workshop

Pacific Fishery Management Council
Large Conference Room
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Portland, Oregon
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Workshop Participants:

Dr. Ian Stewart, National Marine Fisheries Service Northwest Fisheries Science Center
Dr. Owen Hamel, National Marine Fisheries Service Northwest Fisheries Science Center
Dr. Bruce Leaman, International Pacific Halibut Commission
Mr. Claude Dykstra, International Pacific Halibut Commission
Dr. Ray Webster, International Pacific Halibut Commission
Ms. Lynn Mattes, Oregon Department of Fish and Wildlife
Ms. Jessica Moll, Oregon Department of Fish and Wildlife
Mr. Craig Good, Oregon Department of Fish and Wildlife
Mr. Bob Hannah, Oregon Department of Fish and Wildlife
Dr. Theresa Tsou, Washington Department of Fish and Wildlife
Dr. Henry Cheng, Washington Department of Fish and Wildlife
Mr. Farron Wallace, Washington Department of Fish and Wildlife
Mr. Corey Niles, Washington Department of Fish and Wildlife
Mr. Colby Brady, The Makah Tribe
Mr. Mike Burner, Pacific Fishery Management Council
Ms. Kelly Ames, Pacific Fishery Management Council
Mr. John DeVore, Pacific Fishery Management Council

A workshop to discuss survey designs for yelloweye rockfish was held December 1, 2009 in Portland, Oregon. Representatives from the Makah Tribe, Northwest Fisheries Science Center (NWFSC), International Pacific Halibut Commission (IPHC), Washington Department of Fish and Wildlife (WDFW), Oregon Department of Fish and Wildlife (ODFW), and the Pacific Fishery Management Council (PFMC) were in attendance. Workshop participants reviewed the [2009 yelloweye rockfish stock assessment](#) and considered current efforts to improve the design of the extended IPHC rockfish survey, which is used as an index of relative abundance in the

yelloweye assessment. Attention focused primarily on efforts by WDFW and ODFW to expand the IPHC longline survey for Pacific halibut to further investigate rocky reef habitat as well as work conducted by WDFW using a remotely operated vehicle (ROV). The following report is a summary of the workshop and the recommendations to the Council.

The workshop commenced with a review of the 2009 yelloweye rockfish stock assessment, presented by Dr. Ian Stewart (NWFSC). Key sources of fishery independent data in the assessment are the IPHC longline survey for Pacific halibut and the National Marine Fisheries Service (NMFS) trawl survey. Separate indices of abundance were developed for the Washington and Oregon IPHC longline surveys. In addition, time series of yelloweye rockfish abundance in the triennial and NWFSC combined trawl surveys were estimated and incorporated into the base model. Catch, length-frequency, and conditional age-at-length data from six fisheries were used in the assessment (i.e., commercial and recreational fisheries in each of the three states). The fishery-dependent relative abundance indices used in the model were developed from recreational fisheries data and were unchanged from the last assessment done in 2007. Considerable uncertainty regarding the time-series of historical catches was identified as a key source of uncertainty in the assessment. In particular, the historical harvests from Washington may be biased low, a concern likely to be addressed when the next assessment is completed.

Next, a review of the IPHC longline survey for Pacific halibut was presented by Dr. Bruce Leaman. Waters off Washington and Oregon (IPHC Area 2A) were first surveyed by the IPHC in 1995 and 1997. The survey was redesigned and the current methodology has been in effect since 1998. This survey methodology was employed in Washington and Oregon in 1999 and from 2001-2009. The standardized survey consists of a regular distribution of stations on a ten nautical mile by ten nautical mile grid within a nominal depth range of 20 to 275 fathoms. The survey uses conventional Pacific halibut gear consisting of 1,800 foot skates (i.e., a unit of longline gear) with 100 hooks per skate; 18-foot spacing between the 24-inch to 48-inch gangions; and number three (16/0) circle hooks baited with 1/3 to 1/4 pounds of #2 chum salmon. The number of skates deployed per station per year in waters off Washington and Oregon has varied from five to eight. During setting operations, the depth at the start of each skate is recorded. Starting in 2007, more detailed environmental data has been collected at each station using a SeaCat SBE-19*plus* water column profiler including depth, temperature, salinity, dissolved oxygen, pH, and chlorophyll a concentration.

Historically, bycatch information on the IPHC survey was recorded using a hook count methodology where at-sea samplers recorded the species caught on 20 consecutive hooks from each skate. Typically, these counts were performed at or near the beginning of a skate. Since 2002, IPHC at-sea samplers have tagged all retained rockfish caught during the survey by station. Generally, all yelloweye rockfish are retained in the Washington and Oregon charter regions. When the survey trips were landed, dockside samplers from the Pacific States Marine Fisheries Commission, WDFW, and ODFW conducted biological sampling including length,

weight, sex, and removal of the otoliths to obtain age information. Since 2006, rockfish were tagged by skate and thus can be related to the beginning of the skate depth recorded during each set. Samples collected during the IPHC longline survey are the most informative source of biological data in the yelloweye rockfish assessment.

Dr. Leaman also presented information on IPHC survey catchability by area. During the 20 hook count process, at-sea samplers record species on hooks and whether whole baits or bait skin/empty hooks are retrieved which is used to infer potential differences in catchability relative to a coastwide standard. The Washington and Oregon survey efforts typically have a fewer number of baits returning compared to other areas (British Columbia and Alaska) and the coastwide estimates. As such, correction factors have been applied to standardize Pacific halibut CPUE by area.

The IPHC is currently exploring modifications to the current survey design in order to reduce the coefficient of variation associated with Pacific halibut catches in Washington and Oregon. These modifications could include additional grid stations, which may change interactions with rockfish and thus influence inputs to the yelloweye rockfish stock assessment.

Dr. Henry Cheng presented an overview of the enhanced rockfish survey which has been conducted in coordination with the annual IPHC longline survey for Pacific halibut since 2006. This survey uses the same standardized Pacific halibut gear employed in the IPHC longline survey; however, the number of skates is reduced to three in order to constrain catches of yelloweye rockfish to below the research set-aside amount (note: the yelloweye OY is so low and constraining to fishing opportunities that research catch is a significant removal of yield that can affect fishing opportunities). The survey design employs adaptive sampling at fixed stations. The primary goal of the WDFW enhanced rockfish survey is to lower the uncertainty of the estimated mean CPUE of yelloweye rockfish on the IPHC longline survey. Additional objectives have been explored throughout the years as follows:

- **2006:** Investigate the spatial distribution of yelloweye rockfish in rocky habitat outside of the IPHC survey area;
- **2007:** Investigate spatial changes of yelloweye rockfish distribution;
- **2008:** Investigate the spatial attacking bait behavior of Pacific halibut, dogfish, and yelloweye rockfish;
- **2009:** Investigate the relationship between environmental changes and yelloweye rockfish CPUE.

The proposed goal for the 2010 WDFW enhanced rockfish survey is to investigate seasonal changes in yelloweye rockfish CPUE.

Mr. Bob Hannah from ODFW reviewed the 2008 enhanced rockfish survey completed in coordination with the IPHC longline survey for Pacific halibut. Like the WDFW survey, three

skates of standardized IPHC survey gear were deployed. The ODFW survey, however, employs a stratified random survey design, with stations selected within rocky reef habitat as defined by the Council's essential fish habitat analysis. Buffers (3.75 nautical miles) surround the IPHC survey stations in order to prevent interference (e.g., competition) from the rockfish stations. Although the variability of a randomized design may be larger than that of a fixed station design, ODFW recognized that there will be no station selection bias, nor potential for localized depletion. For these reasons they favored retaining the randomized design, albeit with very small sample sizes and lack of direct comparability with WDFW results. Additionally, a paired station experiment was conducted to investigate the possibility of localized depletion at standard IPHC longline survey stations. A Wilcoxon signed rank test was used to compare catch per skate of yelloweye rockfish between the paired stations and no significant difference was found. The investigators concluded that if localized depletion is occurring, it is not a strong effect.

Mr. Farron Wallace (WDFW) reviewed work completed by WDFW in 2008 for developing a non-lethal yelloweye rockfish survey. The objective of the survey was to estimate yelloweye rockfish densities along the track of the 2007 WDFW enhanced rockfish stations surrounding IPHC station 1082 using an ROV. Video from the ROV has been processed and data analysis is underway. The overall conclusion was that ROV surveys were a promising survey technique for yelloweye rockfish given that they were easily distinguished in the video and did not seem to react to the presence of the ROV.

Recommendations for Extractive Rockfish Surveys

For 2010, WDFW and ODFW are scheduled to continue the enhanced rockfish surveys in coordination with the IPHC stock assessment survey for Pacific halibut. WDFW scientists propose to continue the adaptive sampling approach as used in previous years. Additional objectives for 2010 include investigating whether yelloweye rockfish CPUE varies seasonally by re-surveying selected IPHC stations in the fall (September) and comparing those data to historical catch data from the summer (June/July). It was generally recognized that these efforts would not result in a more precise IPHC index for Washington for use in 2011. However, the effort could inform variability in historical survey catches.

ODFW intends to conduct a stratified random survey, with stations selected within rocky reef habitat defined in the essential fish habitat analysis, similar to the 2008 design. Investigators expressed difficulty in selecting additional random stations, given the lack of available rocky reef habitat and the buffers (3.75 nautical miles) around the IPHC survey stations. It was recommended that the investigators work with IPHC to explore the logistics of fishing the rockfish stations after the IPHC stations, instead of implementing a buffer zone. It was also thought that yelloweye surveys could occur less frequently than annual given the species longevity and low productivity. The paired sample design to investigate depletion will not be repeated in 2010.

Stock assessment authors present at the workshop expressed a desire to have common sample designs for the WDFW and ODFW enhanced surveys. However, no conclusion was reached at the workshop on the preferred methodology for extractive surveys. It was generally concluded that neither design had a large enough sample size to produce precise indices of abundance. Participants thought it would be very important to convey this information to managers. Specifically, current IPHC survey methods will not appreciably reduce uncertainty in current status for the yelloweye rockfish stock in the near future. Increasing sample size may be feasible operationally; however, it would require more yelloweye impacts than what could reasonably be accommodated in the research set-aside. Fixed stations also present a challenge if yelloweye rockfish exhibit strong site fidelity and thus would be subject to local depletion. The current stock assessment model assumption is that adult yelloweye rockfish are site-attached and do not move appreciably among the three states whereas larval dispersal is widespread; assumptions that are well-supported in the scientific literature.

Participants also explored the selectivity issues surrounding the survey gear employed in both the IPHC and rockfish surveys. The current survey gear uses relatively large hooks and bait, since it is designed to catch Pacific halibut. A workshop participant noted that traditional fisheries for rockfish used different gear including Portuguese gear, dingle bar, and longline gear associated with the sablefish fishery (i.e., generally smaller hooks), as well as different baits (e.g., squid or octopus). Additionally, participants discussed whether yelloweye length data collected on IPHC longline surveys in British Columbia (IPHC Area 2B) and Southeast Alaska (IPHC Area 2C) could be used to inform selectivity. No recommendations were made regarding survey gear for yelloweye rockfish surveys; these issues will continue to be explored by investigators and stock assessment scientists.

Participants also noted the difficulty in identifying rocky reef habitat suitable for conducting a rockfish survey. Habitat data off the coast of Washington is particularly sparse. Further, anecdotal evidence suggests that some rocky reef areas identified through the essential fish habitat process in Oregon may not actually represent rocky substrate. Participants agreed that the ability to design a rockfish survey located on rocky reef habitat will improve as habitats for waters off all states are further mapped.

Recommendation for Non-Extractive Survey Techniques

The workshop participants discussed the challenges of continuing and expanding extractive research projects, given future projected low annual catch limits, even after the yelloweye rockfish stock is rebuilt. As such, the workshop participants recommended that the Council create an ad hoc committee tasked with developing a coastwide non-extractive visual survey methodology for yelloweye rockfish. Workshop discussions focused primarily on ROV technologies, though participants were interested in exploring other visual survey methodologies (e.g., AUV). The ad hoc committee's recommended survey design should be forwarded to the Council's Scientific and Statistical Subcommittee for final review and approval.

All participants agreed that a coastwide visual survey would be ideal, however impossible given current resources. As such, the participants recommended that all three states collaborate on granting and alternate years in which the states are surveyed. As an initial step, the ROV could survey the IPHC stations that have historically caught yelloweye rockfish in Washington and Oregon. The objective would be to generate estimates of yelloweye rockfish abundance as well as characterize the habitat surrounding the IPHC stations. A better understanding of the species associations, oceanic, biological and habitat characteristics surrounding current IPHC stations may help explain the annual variability in yelloweye rockfish catches. Since the IPHC survey does not extend into California, participants were also interested in investigating the area north of 40°10 N. latitude, where the majority of yelloweye rockfish catch in California occurs.