

2014 Research Advisory Board (RAB) Meeting

IPHC Offices, Seattle WA
18 November, 2014

RAB members: Tony Blore, Steve Daniels (new member), Art Davidson, Charles McEldowney (standing in for John Woodruff), Al Pazar (new member). Absent: John Woodruff, Brad Mirau, Jim Hubbard, Lu Dochtermann, Jay Hebert.

IPHC staff: Bruce Leaman, Claude Dykstra, Lara Erikson, Tracee Geernaert, Heather Gilroy, Ed Henry, Steve Kaimmer, Steve Keith, Tim Loher, Kirsten MacTavish, Steve Martell, Dana Rudy, Eric Soderlund, Ian Stewart, Ray Webster

Opening comments

Bruce welcomed the RAB members and opened the meeting. All the participants introduced themselves for the benefit of new members Steve Daniels and Al Pazar.

The agenda for the meeting is appended to this report.

Issues raised by RAB members and IPHC staff

This list of issues and concerns was developed in an initial discussion by the RAB members. Some topics were discussed briefly and comments are summarized here. Others were simply noted as items of concern. The list was left on the board for reference during the remainder of the meeting.

1. Dropping catch limits for the directed fishery.
2. Trend in size at age (SAA). Whether the overall trend is flat or still declining is difficult to tell in Area 3A. Has Area 3B leveled off? It does not seem to be getting worse; experienced fishers can find fish. The average weight at the plant in Seward has gone from about 13lb last year to over 14lb this year.
3. Differences between east and west in Area 3. Area 3A seems to have bigger fish in the east and smaller in the west. The majority in Area 3B seem to be small – as much as 70% sublegal in places.
4. Total mortality. What is total mortality? As quotas drop, does total mortality rise? Is there more highgrading in the halibut fishery? Are there more discards in the black cod fishery?
5. The state of the fishery in Area 2A.
 - a. The availability and distribution of fish has changed; there seems to be high seasonal movement of fish in Area 2A, and fishers are not seeing halibut where they did when the fishery took place later in the summer.
 - b. There is a lot of mortality in the derby fisheries, and the derby needs fixing. The grounds get pre-empted by boats arriving early before the fishery opens. Maybe they could go to A and B squads for the derby?
 - c. Many are fishing with 32” black cod gear and fishing a lot of gear.

- d. Rockfish Conservation Areas limit the areas available for fishing. Do RCAs concentrate the population?
 - e. Sometimes seeing chalky fish. Can it be a function of immediate handling?
 - f. Seeing evidence of fin embolism.
 - g. High frequency of juveniles sometimes.
6. Whale depredation.
 - a. Both killer whales and sperm whales, and as far south as Westport, WA.
 - b. Having trouble getting fishers to target black cod because of the whales.
 - c. Learned behavior of the whales. They were boat-shy until recent generations because of commercial whaling. How do we get them to unlearn it?
 - d. Difficult to deter the unwanted behavior itself. Recent study in Southeast Alaska used a Lucite ball to create a big sonar return to obscure the target (the fish on the line), but it has not been effective. The Orca Saver device is expensive and whales are habituating to it. There are risks with attempts to mitigate depredation, including bad press if whales are harmed. Skepticism that there will be a solution for whales.
 7. Fishing behavior. As quotas decline and depredation increases, desperation sets in and fishers may fish less responsibly.
 8. Sport fishing on both sides of the Gulf of Alaska (Areas 2C and 3A).
 - a. Not happy with the slot limit in Area 2C. Measurement issues and associated release mortality with the slot limit.
 - b. Seeing a lot of sea lion depredation.
 - c. Effect of multiple capture of individual fish?
 - d. The fish always weighs less when it gets to port. It's not as heavy as the chart says.
 - e. Seeing increasing efficiency of all sport fishing sectors.

IPHC staff members added a number of comments regarding several of these issues:

9. Softer wire hooks have been suggested as a means of reducing injury to released fish.
10. The IPHC is participating in the Alaska Halibut Angler Release Mortality (HARM) Reduction Project, which uses photographic measurements of the head to estimate fork length. The goal is to measure the fish without bringing it on board to reduce handling of released fish.
11. The first-year operation of the Area 2C/3A Guided Angler Fish (GAF) program was discussed, noting issues with enforcement and sampling.
12. An anti-depredation technique used in Chile was described, which uses a "Christmas tree" of 8-hook gangions that are covered by a mesh net as the gear is recovered. It is very labor-intensive because the gear comes up a tangled mess, but they seem to be having success with this method to keep fish from the whales.

Several additional issues were raised by IPHC staff members for the RAB's consideration:

1. Recruiting vessels for the annual IPHC setline survey. Claude described how the survey is conducted and the challenges in contracting enough vessels. The ensuing discussion focused on several topics:
 - a. Attracting vessels to the survey.
 - 1) Current costs of the survey and what IPHC pays its survey vessels.

- 2) For vessels that do not already fish with fixed gear, could IPHC purchase the fixed gear and transfer it to the vessel? The consensus was that the bigger challenge facing the vessel is not the provision of the gear itself, but setting up for that gear (hauler vs. drum).
 - 3) Also noted that more autoline gear being used because a different (lower) level of skill involved in fishing the gear, and often less manpower.
 - b. The possibility of using snap gear for the survey, due to diminishing pool of vessels and expertise at fishing fixed gear. The survey uses standardized fixed gear exclusively.
 - 1) Methods could include using a marked groundline with 18-ft spacing in order to match the hook spacing of the fixed gear.
 - 2) To illuminate the differences between gears, Ian presented an analysis of commercial data conducted this year by graduate student Cole Monnahan:
 - a) Directed fishery logbook records from 1991 to 2013 were evaluated and a spatial data analysis tool developed.
 - b) Because the commercial gear varies across the regulatory areas, fixed, snap, and autoline data were compared, with a view toward the possibility of using all of them in the future for stock assessment. Only fixed and some snap data are used in the current assessment.
 - c) The current catch-rate relationships among fixed, snap, and autoline gear held up in this analysis, but spatial relationships (inshore/offshore) also influenced CPUE, irrespective of gear type.
 - 3) Because of the difference in catch rates, there would be significant data and analysis implications if the survey were to shift its standardized methods to include or exclusively use snap gear. There would need to be an overlap period of using both gears – possibly 3-5 years – in order to connect the time series of data from before and after the shift, which would be a massive endeavor.
 - c. The need for vessels to be able to economically fish their quotas.
 - 1) Ways to help the boats fish their own quota during the survey.
 - 2) Owned vs. leased quota.
 - 3) Vessels make fewer targeted trips as quota drops, so tend to use more combination gear.
 - 4) There tends to be about the same overall number of deliveries, but less weight per delivery.
 - d. Other benefits or challenges for vessels.
 - 1) Getting crew is a challenge in 2A: experienced crew are leaving vessels, resulting in attrition of skills in the fleet. This is a perk to survey work in other areas, in that it gives the crew 1-3 months more work, so the business operator can maintain a dedicated crew. Reduces crew turnover and associated costs.
 - 2) Is the IPHC gear allowance too low? This has been seen as more a switch-over challenge than the actual gear allowance.
2. Discard Mortality Rate (DMR) validation on fixed-gear vessels.
 - a. There are three specified careful release methods, but more methods are in use. We have some data for the three methods, but not for the others.
 - b. Bruce highlighted the challenges of integrating and validating electronic monitoring (EM) data for use in estimating DMRs, including how to assess release methods for fish

over the rail and how to assess a released fish for injury without influencing the release itself.

- 1) The EM camera could assess the release method, but a database linking the release method to injury codes, hence survival, is required to be able to use the camera data.
- 2) There followed a discussion of methods, sample design, observer effects, and safety aspects of possible experiments with EM, noting the following:
 - a) For safety, we would not want to have the observer work near the roller to assess the fish. Perhaps a second rail could be rigged inboard? Some form of ramp to catch the fish? Or a ring or basket surrounding the line while hauling?
 - b) In any configuration, it will be difficult to get around the observer presence/bias issue.
 - c) How much of an experimental sacrifice is it if we bring the fish aboard rather than assess it overboard? For example, shaking and hook-straightening are not the same, and it difficult to assess injury without examining the fish, but bringing it aboard incurs further possible injury or bias in handling.
- 3) Tim noted that two experiments are needed:
 - a) One to compare EM and observer data on injuries, plus
 - b) One to assess survival of fish from injuries. Several people noted that the second experiment had already been conducted in various forms.
- c. Steve Martell pointed out that the absolute mortality rate is the most important information, questioning why we should spend money on the estimation process for DMRs. Instead, we should get the DMR basis correctly to begin the process.
 - 1) We can't actually assess mortality, just injury, and we rely on injury studies from 1968 and 1974 to estimate mortality. He noted several limitations to these historical studies and the uncertainty in the results.
 - 2) The majority of injured released fish are from the longline fisheries, and the condition of the majority of them is evaluated as 'excellent.' The assumed DMR has more effect than the injury assessment. Therefore validating the survival of 'excellent' condition fish should be a priority.
- d. Steve Martell suggested bringing all discards into the stock assessment, applying uncertainty to discard and bycatch mortality. He noted that DMRs may be more uncertain than we currently assume. Ian noted that this would have less effect on assessment – essentially an accounting issue – than on harvest policy, where it could have huge implications.
- e. On a separate but related question about whether inaccurate DMRs are the source of the mismatch between the trawl survey data (where we see more young, unrecruited fish) and the recruitment we eventually see in the stock assessment survey (where we see more older, recruited fish), Ian replied that the two are not unrelated, but we can't differentiate among different effects on recruitment estimates.

Selected IPHC staff research proposed for 2015

Ian described a new project to estimate the sex composition of the commercial catch. We have found the sex ratio at age to have a significant effect on the assessment of the population, and the sex ratio of the survey catch is currently used as a proxy for the commercial catch. What

we need is a direct measure of the sex ratio of the landed catch. Preliminary work in 2014 tested methods of marking the sex of individual fish at sea and collecting that data at landing. In 2015 we are looking for volunteers to test these methods unobserved on their regular fishing trips. Genetic samples would be collected during the marking experiment, to use in a coincident examination of direct genetic testing of gender for landed fish. Art Davidson indicated his willingness to participate in the at-sea marking protocol.

Issues from previous RAB meetings

The staff updated the RAB on a number of topics from earlier RAB meetings:

1. Orange-yellow halibut flesh. Claude reported on results of testing tissue samples collected last year. RAB members noted that they had not seen any orange-yellow flesh this year.
 - a. Art reported that last year he had also seen white-side pus pockets, but none this year. Steve Daniels suggested that the charter fleet may be a good source for samples if they occur this year.
 - b. In response to a question about radioactive contamination from Fukushima, Claude reported that ongoing sampling programs have demonstrated that this is not an issue in seafood at present.
2. Alaska observer program fleet experience and results.
 - a. Steve Martell reported on the staff's analysis of data from the first year of the revised NMFS observer program (2013), highlighting the following points:
 - 1) Costs to implement the program were higher than expected, so coverage was lower. In addition, over 57% of the Alaska halibut fleet is less than 40ft and not subject to observation.
 - 2) One third of all reported bycatch by weight in Alaska is halibut. 60Mlb of halibut are caught, of which 22Mlb are the directed fishery landings and 37Mlb are bycatch and wastage in the directed fishery, and some fraction of that bycatch dies. This is why DMR estimates are so important to the stock assessment and the harvest policy. Because of the numbers involved, relative to other sources of mortality, the 'excellent' survival bycatch category is currently the highest uncertainty in our harvest policy for hook-and-line fisheries with high levels of observer coverage. The magnitude of discards on unobserved trips is also a significant source of uncertainty in fisheries where observer coverage is low.
 - b. In response to a question about observer coverage of tendering operations, Steve reported that NMFS cannot currently deploy observers to tenders, and there is no solution yet to covering that sector.
 - c. RAB members discussed fishers' perspectives on observer coverage, and Art related the experience of implementing observer coverage in BC.
3. Survey expansion. Ray reported on the results of the 2014 setline survey expansions in 2A and 4A, and how those data are used. He also briefed the RAB on plans for survey expansions in the remaining regulatory areas over the coming years. In response to a question about the hierarchy of expansion efforts, Ray and Bruce discussed the prioritization

and sequencing of survey expansion relative to importance of the data to be collected and the resources available for conducting the survey.

4. Assessment modeling. Ian reported on this year's developments in assessment modeling, including the addition of the Areas-As-Fleets (AAF) modeling approach.
5. Sport fishery DMR estimates. Ian reported that we now have sport fishery DMR estimates from all areas except 2B. Bruce noted that we have also received bycatch data from the crab and scallop fisheries in Alaska.

Review of ongoing IPHC studies

Staff members reported on a number of ongoing research efforts:

1. Management Strategy Evaluation (MSE). Steve Martell briefed the RAB on MSE work to date, including the new equilibrium model for testing proposed management procedures.
2. Size at age (SAA). Steve Martell discussed the progress of the various elements of the current SAA study by the IPHC staff, NMFS, the Univ. of Washington, and the Univ. of Alaska, working cooperatively under an NPRB grant.
 - a. Steve noted that halibut is one of few species for which size changes in both directions have been documented, and that the changes in halibut are one of the largest, if not the largest, magnitudes seen in any fish.
 - b. Steve discussed the range of hypothesized causes for changing SAA, noting that they have added a hypothesis that hooking injuries incurred by released fish could affect SAA by limiting their ability to eat.
 - c. Art related his experience with an earthquake near Haida Gwaii and its effect on WPUE.
 - d. Tim mentioned experiments with using electrical currents to measure fat in Greenland halibut, and with using Nitrogen-15 levels in otoliths to measure changes in the trophic level of diet.
3. Length-weight relationship. Ray discussed the current data collection efforts to support re-examination of the length-weight table and the conversion factors for heads and ice and slime, noting that the preliminary data show converted weights lower than the current table suggests. He noted that we do not have U32 data for the commercial catch, but can use survey data to help fill in the table.
 - a. Tony and Charles commented on an apparent change in girth since the 1990s. Eric noted that the survey consistently gets about 7% lower weights at delivery than estimated.
 - b. Tony and Tracee noted that it used to be customary to head halibut through the eye, which was the source of the 10% conversion factor, but now it is customary to cut more than that. Charles reported that in response to market demand they now take off 1-3% more in the head cut than in pre-IQ days. They weigh after heading, and the extra loss has been covered by rising prices.

- c. Charles noted that the head is a bigger proportion of the body in small fish. With smaller fish overall (about 20% 10-20lb fish in 1995, compared to ~60% now), the head is now actually a bigger deduction on average.
4. Hooking success for large halibut. Ian reported on an experiment to measure hooking success for larger fish. Understanding the relative vulnerability of larger halibut in the fishery and survey is important for structuring the assumptions of the stock assessment and harvest policy analyses. They did not get enough observations of the largest fish to draw conclusive results, but were able to corroborate existing data for smaller fish.
5. Tagging updates. Tim reported on the status of IPHC tagging experiments. He described the evolving technology of tags and the possibilities to describe movement that seem to be perpetually just beyond the horizon. However, there are exciting new developments in accelerometer PAT tags that may be very useful at assessing short-term mortalities, e.g., getting at the elusive survival for 'excellent' condition fish.

Further discussion by RAB

RAB members returned to the list they generated at the beginning of the meeting, with a focus on projects they would like the staff to undertake. They produced the following list of recommended issues:

1. Whale depredation, including the question of whether whales are shifting to halibut because the use of pots is keeping them from other fish.
2. The impact of subsistence fishing on the fishery. Ian noted that subsistence or personal-use fishing takes about 1Mlb per year.
3. Size limits. Steve Martell noted that the fleet handles large numbers of sublegal fish to get its quota, which may result in size limits doing more harm than good to the spawning stock biomass. A change in the minimum size limit could improve the efficiency of the fleet, but will markets accept smaller fish?
4. Improving mortality estimates. The DMR for 'excellent' discards is a major question. Bruce noted the importance of the magnitude of bycatch mortality, particularly in the Gulf of Alaska.
5. Understanding how fishing patterns change because of observation. Tony mentioned the example of the trawl rationalization in Area 2A, where some quotas for some species can be fished with any gear.
6. Market mechanisms to encourage observation, such as paying vessels to take observers.

Closing comments

Bruce thanked the members for their attendance and spirited discussion. He noted the value of the RAB's input to the staff's work, and that many staff members count RAB meetings among their favorite IPHC activities.

**IPHC Research Advisory Board Meeting
November 18, 2014
IPHC Offices
2320 West Commodore Way, Suite 300**

9 a.m. - Introductions and maybe an Intriguing Question

- 1. New issues – RAB members and IPHC staff**
 - 1.1. Discard Mortality Rate validation on fixed-gear vessels – Bruce
 - 1.2. Recruiting survey vessels – Bruce/Claude

- 2. Issues from previous meetings and issues from RAB members in correspondence**
 - 2.1. Orange-yellow halibut flesh – Claude/Tony
 - 2.2. AK observer program – fleet experience and results – Steve M
 - 2.3. Survey expansion – Ray/Ian
 - 2.4. Fleets as areas assessment approach – Ian
 - 2.5. Sport fishery discard mortality estimates – Ian

- 3. Brief review of some ongoing project results 2012/3, highlighting those below – Gregg Williams, staff**
 - 3.1. Management Strategy Evaluation/MSAB – Steve M
 - 3.2. Size at age project – Steve M/Bruce
 - 3.3. Length-weight project – Ray
 - 3.4. Hooking success for large halibut – Steve Kaimmer/Ian
 - 3.5. Tagging updates – Tim/Ray

LUNCH

- 4. Selected IPHC Research proposed for 2014**
 - 4.1. Sex composition of the catch from marking fish at sea in commercial fishery – Ian
 - 4.2. Sex composition from genetic analysis – Tim
 - 4.3. Eastern Bering Sea flats calibration survey – Ray/Ian

- 5. New research suggested from issues raised**

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