

RAB Meeting Minutes – Monday, November 16, 2009

The 2008 RAB meeting took place on Monday, November 16, 2009 at the Hotel Deca in Seattle. Members of the RAB present at the meeting were:

Lu Dochtermann	David Beggs	Brad Mirau
Jim Hubbard	Rob Wurm	Tony Blore

Regrets: Richie Shaw, Dave Boyes, John Woodruff, Jay Hebert

IPHC staff present at the meeting:

Bruce Leaman	Thomas Kong	Gregg Williams
Claude Dykstra	Tracee Geernaert	Lauri Sadorus
Linda Gibbs	Eric Soderlund	Steve Wischniowski
Heather Gilroy	Aregash Tesfatsion	Juan Valero
Kirsten MacTavish	Robert Tobin	Tim Loher
Steve Kaimmer	Huyen Tran	Lara Erikson
Ray Webster	Evangeline White	

Issues from Previous Meeting and Issues Raised in Correspondence

1. **Whale depredation.** The Board spent considerable time on this topic. There is a broad consensus that depredation is staying as bad if not increasing in the Bering Sea, Gulf of Alaska, and British Columbia. In particular, it was noted that depredation continues even after whales no longer appear to be consuming the fish. Whales continue to bite at the fish and strip them from the lines. While it has previously been suggested that trap fishing for target species might provide relief from depredation, reports of whales tearing mesh out of traps to get at sablefish are now being made.

There was again a suggestion from the Board for a ‘clearing house’ for information on areas of depredation. Others suggested that such a clearing house might not be successful because either harvesters/processors would not submit information to avoid drawing attention to the issue, or might provide false reports to discourage competition for target species in desirable areas. It was suggested that the latter might be controlled through a social networking framework where commentary on individual reports was possible. Board members felt that any initiative should be industry-driven, perhaps similar to the Sea State program used by trawl fishermen to identify halibut bycatch hot spots. Bruce expressed the view that such a web-based program should be hosted on an industry website.

Education was raised as a necessary component of dealing with the issue. In particular, transmitting the understanding from the Commission that depredation does show up as mortality in the Commission’s stock assessment and is accounted for, albeit indirectly. It was also felt that the fear of reporting could only be overcome by educating harvesters/processors that depredation is a shared and common problem that needs to be documented. Board members also believed that some agency or group would have to take the initiative to see if the Marine Mammal Act could be

changed to allow culling of whale populations. The impact of commercial whaling on deterring whales from approaching vessels was noted by several and research suggests that animals old enough to have experienced commercial whaling are more cautious around vessels than younger, naïve animals. Sperm whales, in particular have been noted to be increasingly aggressive and of danger to smaller wooden vessels.

- 2. Distribution of fishing pre- and post-integrated management in B.C.** Board members and other harvesters in B.C. have repeatedly made comments about changes in fishing habits and patterns, as a result of constraints arising from the integrated groundfish management plan in B.C. after 2006. Staff had agreed to look at the data on distribution and magnitude of landings by statistical area to determine if this affect was detectable in the data. Staff showed several plots of catch by statistical area, depth, and year (attached). Somewhat surprisingly, given the relatively widespread comments about changes in the fishery, there were few changes in the distribution of catch by statistical area or depth. While several areas saw significant shifts in 2006, the distribution by 2008 was similar to the pre-2006 distribution by both area and depth. While some areas did see significant change after 2006, the percentage of the annual catch accounted for in these area was generally less than 5%. Board members were asked to consider this information and suggest alternate investigations, if they believed that changes had occurred that were not apparent in these presentations.

Also related to the Area 2B fishery, staff presented data showing the increasing percentage of U32 fish, some substantially below the 32 in limit, being landed in the commercial fishery. A letter has been sent to DFO bringing this issue to their attention and requesting action to eliminate such landings. A similar situation has been noted in Area 2A and a letter will also be sent to enforcement agencies in Area 2A.

- 3. Pus pockets.** Board members noted a lower incidence of this problem in 2009, similar to the decrease in 2008. Processors were unable to obtain any specimens for analysis. However, some occurrence was noted in Areas 3B and 4A in 2009. As yet, a cause for the condition remains unknown and even a comprehensive description is lacking.
- 4. EMF from wind farms and potential impacts on halibut orientation.** This issue has arisen in relation to the Naikun wind farm proposal for Hecate Strait. Bruce briefed the board on research conducted, primarily in Europe. For informational purposes, that summary is expanded here.

There are two types of fields generated by submarine electrical transmission cables, magnetic fields (MF) associated with high voltage direct current transmission (HVDC), and electromagnetic fields (EMF) associated with high voltage alternating current (HVAC). Most wind turbine transmission cables are HVDC so MFs are the features of concern. For all species that have been investigated (and there are only a limited number), the MF typical of transmission cables has been shown to be

detectable by the fish. Laboratory experiments dominate the literature on the topic and there are few *in situ* controlled experiments.

Of the latter, the best is one published in 2009 using sharks and rays, involving manipulation of the HVAC cables (i.e., generating EMF) in a field experiment (though not using the actual cables of operating wind farms for the manipulative portion of the experiment). It is available here:
http://www.offshorewind.co.uk/Assets/Report%20EMF%20COWRIE2%20EMF%20FINAL_Combined_april%2009.pdf

It was conducted under contract to several U.K. universities and used acoustic tracking arrays to determine fish distribution. However, detection of the EMF by fish does not necessarily mean a change in behaviour and, indeed, there are contradictory laboratory results concerning changes in fish behaviour associated with EMFs. Some species (rays) appear to be attracted to the EMF while others (eels, sharks) appear to avoid the EMF. The general conclusion of the study was:

Overall, the mesocosm study provided evidence that the benthic, elasmobranch species studied can respond to the presence of EMF that is of the type and intensity associated with sub-sea cables. The response we recorded was not predictable and did not always occur; when it did it appeared to be species dependent and individual specific, meaning that some species and their individuals are more likely to respond by moving more or less within the zone of EMF. The main result of catshark being found nearer to the cable and moving less is consistent with the area restricted searching that is associated with feeding in benthic Catsharks. The responses of some Ray individuals suggest a greater searching effort during cable switch on. After the cable was turned off some individual Rays did not return to their pre-EMF encounter behaviour which could be a result of the fish response to the EMF stimuli overlapping with the period immediately afterwards.

The study also measured fields at operating wind farms off Scotland and made several conclusions. In this case, the B field is the magnetic field (MF):

It still remains true that there is no burial to depths practically achievable that will reduce the magnitude of the B field and hence the sediment-seawater interface, induced E field, below that at which they could be detected by certain marine organisms.

Based on the responses of the fish in the Ardtoe experiment and the level of EM-emission at the wind farm sites we would predict that EM-sensitive species predict that EM-sensitive species would encounter fields at or above the lower limit of their detection 295m from a cable. Hence there is potentially a large area that the species could respond within.

The number of species and individuals involved in these studies is low and there is a great need for additional controlled field experiments on other species of interest. It is unlikely that additional laboratory experiments will provide sufficient evidence to determine potential impacts on fish populations and behaviour. Bruce will try to obtain information on environmental impact studies that may have been conducted for HVDC cables from wind turbines in the Strait of Juan de Fuca.

New Issues

1. **Chalky fish.** Processors reported some shifting of chalky fish occurrence in 2009 for the same harvesters. In 2008, there was reported to be a 40-60% occurrence during August-October in Area 3A, while in 2009 the same percentages were seen during the same period in Area 4A but not as predominantly in Area 3A. The data involved the same sets and treatment of fish in the same way. Average fish size was slightly larger in 2009. Board members questioned whether there had been similar changes in any known correlates of chalkiness and staff agreed to examine environmental data to determine if there had been any temperature shifts that might be associated with conditions likely to give rise to increased chalky occurrence. Board members also wondered if a change to shrimp as a primary diet item could have caused the shift but this would be very difficult to resolve in general, and particularly after the fact.

A second suggestion from the Board was to educate the buying public at both wholesale and retail levels that the chalky condition does not diminish the nutritional value or taste of the fish. It was suggested that this could be a function for HANA, and processors agreed to raise this issue with HANA at its annual meeting in January.

The issue of standardized designations for chalkiness was also raised. One suggestion was for an ASMI-type grading classification for chalkiness, including picture coding of condition, to address the lack of standardization in designation of 'chalky' at the wholesale and retail level. After discussion, Board members agreed that such a grading scheme would not address the issue of charge-backs at the wholesale level due to difficulties in verification for specific lots of fish.

2. **Bycatch monitoring.** Board members were extremely concerned about halibut bycatch mortality in Gulf of Alaska trawl fisheries and the ineffectiveness of bycatch monitoring and estimation in these fisheries. Low percentage coverage for smaller vessels and deliberate actions by trawlers to restrict representative observations renders the data that are collected of questionable accuracy and value. It was felt that actual bycatch mortality was well above the PSC limit, if the limit is estimated to have been reached annually based on such questionable data. The Board believes that all agencies should be addressing this problem, with the objective of developing comprehensive and accurate estimation of bycatch mortality of halibut in the Gulf of Alaska. Bruce noted that the halibut industry also needs to address its own bycatch estimation and mortality, particularly if it wishes to see progress in estimation and reduction of trawl bycatch mortality. Bycatch mortality of non-target species in the halibut fishery is not presently estimated, despite the need for such information in the management of directed and incidental fisheries for those species.
3. **Low abundance in Areas 3B and 2C.** Board members raised concerns about continued low abundance in these areas. Staff noted that we have been expressing concerns about Area 3B for several years and have this year recommended reducing the harvest rate from 20% to 15%, similar to areas in the Bering Sea. While catch limits have been reduced in this area over the past decade, the stock has not responded as the staff believes it should have. In addition, surplus production for the area has been well below removals for most of the past decade. Estimated abundance

in Area 2C, and all of Area 2, is estimated to be lower than previously believed due to changes in our understanding of fish movements and the resulting need to dismiss the closed-area stock assessments. Catch limits have been reduced accordingly, however it is also true that catch rates in the IPHC survey and the commercial fishery have been declining more or less continuously since 2002 and 2004, respectively. Area 2C has traditionally received lower recruitment than Area 2B and, based on evidence from the PIT tagging experiment, is a net exporter of fish. The stock assessment estimates that realized harvest rates in Area 2C reached a peak of approximately 50% of the exploitable biomass in 2006-2007, which were clearly non-sustainable, and is the primary cause of low abundance in the area.

- 4. Removal experiment.** David Beggs raised the issue of the design of the removal experiment. The staff report of the experiment concluded that short term immigration of fish within the experimental area was the primary cause for a lack decline in the repeated-fishing experiment. However, in the absence of data from tagged fish, it was not possible to conclude with certainty that movement into the area was the cause for the result, compared with saturation of the gear from a high abundance of fish in the area. David suggested that berthing the gear in parallel, across the tidal flux, might be a design that would allow determination if fish were moving into the area. With catch monitored on each skate, it might be possible to see if 'outside' skates maintained higher catch rates than 'inside' skates. This might allow determination of the direction of fish movement, if there was either an inside/outside differential or a directional trend in catch rates across the skates. Staff agreed to consider this idea further and also look at the existing data with a view to such an effect.
- 5. Size limit.** Board members wanted to have greater explanation of the potential effects of changing or eliminating the size limit. The staff explained that there was still active debate on the issue within the staff. Considerations included the facts that absence of a size limit would mean both increased catch of small, mature males and small, immature, females. If the fishery actually landed all the fish it caught, then fewer large, mature females would be harvested. It is believed by some that setting of an appropriate (and necessarily lower) harvest rate (on a larger exploitable biomass due to a different selectivity) will continue to provide sufficient protection for the spawning stock. However, there is concern by others that the fishery would not land the smaller fish, because of their lower unit value, and highgrading of the catch would occur, i.e., the selectivity of the fishery would not match the selectivity of the fishing gear. For fisheries in most areas, there would be no effective means of detecting if such highgrading were occurring. This would result in a larger catch limit being taken from the same exploitable stock as is currently fished – the worst possible result. Canadian Board members noted that the fully-observed fishery in Area 2B could be used as a test bed for such a concept because highgrading could be easily detected. Staff agreed to continue to examine the feasibility of eliminating the size limit.

2009 Research Highlights and 2010 Staff Proposals

Gregg Williams and primary investigators presented the review of 2009 research projects and highlighted several projects. The highlighted projects included the multi-agency Pacific Ocean Shelf Tracking (POST) project, the coastwide use of water column profilers on IPHC survey vessels, the pilot Electronic Monitoring in AK (similar to existing EM in the Area 2B commercial fishery), and ongoing genetics investigations. Staff then reviewed research proposals for 2010, highlighting four project areas: bomb carbon (^{14}C) reference curve for the Bering Sea (in conjunction with NMFS); scheduled PAT tag pop ups in the Bering Sea in 2010; aquarium holding experiments and preparations for additional archival tagging in 2011; and, assessment and survey issues.

The bomb carbon project is an extension of the same work conducted previously in the Gulf of Alaska. That project used the ^{14}C signature from atmospheric nuclear testing in the 1960s that is deposited in halibut otoliths to validate our ageing methodology. However, comparison of that curve with some ageing work by NMFS scientists on Bering Sea species suggests that the process of isotopic accumulation in the Bering Sea may not have been the same as that in the Gulf of Alaska. This project will use IPHC historical otolith collections to construct a similar reference curve for the Bering Sea, to determine if the NMFS ageing results are correct and a different isotopic accumulation process existed in the Bering Sea.

Due to the expense of PAT tags (~\$4k per complete deployment and satellite data acquisition), we have been working with a tag manufacturer to develop a less expensive tag, which would require recovery through the commercial fishery. Tagging locations on the fish for the new design are being tested in long-term aquarium holding experiments, to ensure choice of an appropriate tagging location. In addition, we will be conducting a field experiment in Area 4, using standard wire tags, to establish whether a geographic location for tag release can be found that will guarantee sufficient recoveries. This area has been characterized by low recoveries in the PIT tagging experiment and a release location with high recovery potential must be found, to justify the use of the new tags in this area.

The staff wishes to conduct a review of the survey program and the stock assessment model in 2010. The former will examine potential new stations associated with expanding the definition of halibut habitat to 400 fm, as well as determining whether additional stations in the 0-25 fm range should be added. The latter project is primarily a technical, housekeeping project for the model itself (e.g. re-coding some sections of the model), as well as comparing its performance against the NMFS standard assessment model, continuing the development of a formal Management Strategy Evaluation, and planning for a potential multi-agency symposium or workshop on catchability in 2011.

Staff also provided a brief review of the May 2009 Apportionment Workshop and the September 2009 Bycatch Workshop. Both of these workshops have been reported on the IPHC website:

<http://www.iphc.washington.edu/halcom/meetings/workshops.htm#reports>

Research Action Points

The 2009 RAB meeting identified several areas for further or continued research.

1. Investigation by IPHC and industry on the potential for an industry-based repository for real-time information on whale depredation, similar to the Sea State program used for trawl halibut bycatch mortality reduction in the Bering Sea. The potential to partner with marine mammal monitoring organizations should also be explored.
2. B.C. Board members will review information on distribution of fishing pre- and post-integrated groundfish management in Area 2B and suggest alternative data examinations, where required.
3. Board members will attempt to obtain samples of 'pus pockets' for laboratory analysis.
4. IPHC staff will try to obtain information on existing wind turbine transmission line impact studies in B.C.
5. Staff will examine existing data on the removal experiment to determine if fine scale analysis can detect directional movement of halibut.
6. Board members will raise the issue of consumer education on chalky halibut with the Halibut Association of North America.
7. Staff will continue its work on evaluation of the impacts of a changed or no size limit for the commercial halibut fishery, particularly focusing in Area 2B where there is complete monitoring of the catch through EM on vessels.
8. Staff will continue its review of the design of the IPHC setline survey, concerning the expanded depth range of defined halibut habitat and potential inclusion of shallow water stations (< 25 fm).