2006 Research Advisory Board Meeting

The RAB meeting was held on November 14, 2006 at the Watertown Hotel in Seattle.

Members of the Research Advisory Board in attendance were Dean Adams, David Beggs, Tony Blore, David Boyes, Lu Dochtermann, Jim Hubbard, Brad Mirau, Richie Shaw, Gary Williamson and Rob Wurm. Attendees from IPHC were Erica Anderson, Claude Dykstra, Tracee Geernaert, Linda Gibbs, Heather Gilroy, Kirsten Gravel, Steven Hare, Lara Hutton, Steve Kaimmer, Tom Kong, Bruce Leaman, Tim Loher, Laurie Sadorus, Eric Soderlund, Aregash Tesfatsion, Ray Webster, Gregg Williams and Steve Wischniowski.

The meeting began with the members of the Research Advisory Board introducing themselves, briefly detailing their involvement in the halibut fishing industry, and supplying a bit of their personal interests. IPHC staff followed suit.

Bruce then led the meeting by suggesting that each board member speak about three potential research issues that they would like to have IPHC delve into.

Lu Dochterman:

1. Due to a considerable decrease in halibut biomass in area 4B, Lu would like IPHC to investigate the origin of halibut from area 4B (migration from 4A?).
2. Lu has concerns that harvesting of halibut in area 4D is too intense and noted his experience at St. Matthew in 2006. He would like IPHC to investigate why there are fewer fish in that area, why they showed up one month later this season compared to previous seasons (would colder water temperatures be affecting the time of year that halibut show up on those grounds?), and what the origins of those fish are. He noted that fishing was better on the shelf edge this year and he didn't experience any whale depredation near the shelf edge. He suggested distributing wire tags on the 4D Edge.
3. Trawl bycatch in the Bering Sea, especially in closed areas (e.g., the Halibut Savings Area), is also a great concern of Lu's.
4. Lu has seen an increased occurrence of killer whale depredation in Kodiak and is concerned about this issue.

Gary Williamson:

1. One of Gary's main concerns this year is with the high numbers of sublegal-sized fish caught in area 2B. He is concerned that the mortality on these fish is adversely affecting recruitment.
2. He also mentioned that the majority of the fish harvested come from four concentrated areas. His concerns with harvesting the fish in concentrated areas are the long term effects that this exploitation might have on the biomass in those areas (local depletion).

Brad Mirau:

1. Brad is concerned with the huge exodus of fishermen from the Queen Charlotte Islands because of rockfish bycatch, since the advent of the integrated fisheries (he labeled this an unintended consequence of integrated fisheries management practices).
2. Chalky fish (always a concern for processors)
3. He is very enthusiastic about the tagging studies that IPHC has undertaken and encourages more as it provides essential data about spawning and behavior of halibut.

David Beggs:

1. At the top of David's list is whale depredation research as he has had, for the first time in his fishing career, negative interactions with a pod of killer whales. He is an advocate of 'dealing with the problem in a positive way' as he believes that public perceptions of the fishing industry are very important.
2. He would like to see more public outreach on the research being done by IPHC (outreach to fishermen, consumers, etc). He gave as an example that he was quite surprised to find out that halibut contains relatively small amounts of mercury compared to other fish and is not considered one of the fish to be wary of.

Dean Adams:

1. Dean believes that IPHC's stock assessment analysis is the most important aspect of the work being done by IPHC and commended us for it.
2. Eco-research is an area he would like to see more emphasis on.
3. Chalky fish are an issue Dean has and he was wondering if there was any way to pinpoint where the chalky fish are and how to avoid fishing those grounds.
4. He also has concerns about the growth of the charter industry and its consequences on commercial fishing, as well as long-term management of the sport fishery.

Tony Blore:

1. Tony has concerns over Area 4 halibut. He doesn't buy much fish from Area 4 but has the impression that Area 4D is 'getting hammered' because the fishery is so localized. He is also concerned with the decreasing biomass of Area 4B halibut (are the halibut moving eastward?)
2. He would like to know more about sex-, size- and age-related aggregations and would like to know if this is a chalky fish issue?
3. Tony is also concerned with fishing practices in concentrated areas and the possible long-term effects (localized depletion).

Rob Wurm:

1. Rob also commended IPHC on the great job it does with the stock assessment work (he even said he thought it was the best assessed stock that he knew of). He believes this is the most important work IPHC can do.
2. He is particularly interested in the dynamics of Area 4B which seem to be entirely different from the areas on eastern end of the Aleutian chain. In order to

accomplish this, Rob suggested enhancing survey areas in 4B and investigating diel dynamics.

David Boyes:

1. One of David's concerns is that DFO imposed strict bycatch caps for rockfish which prevented many halibut fishermen from fishing traditional areas, hence resulting in possible local depletion of halibut and increased catch of sublegal halibut. But by the end of the season most of the rockfish quotas still have, on average, above 60% of their quota remaining (from Sector Catch Summary presented by David).
2. David is concerned about the changing fishing patterns (as detailed in the above issue) and the long term effects of these changes.
3. He was also wondering about the possible retention (seasonal) of halibut by traps. This is a hot topic right now in Canada.
4. David would like to see some gear research done on differential rates of mortality between different types of gear, e.g., hook size, hook spacing, etc.
5. Whale depredation is another issue that David brought up.
6. Leakage from ceremonial and subsistence fishing, i.e. commercial catch being claimed under ceremonial and subsistence permits, and how it is an uneven playing field within the integrated management plan.
7. PHMA has started their own research and survey program to estimate rockfish biomass and they are attempting to cover parts of the coast that IPHC doesn't cover during their surveys.

Richie Shaw:

1. Richie's first concern is with the Dixon Entrance depletion that he has observed (smaller and fewer fish) whereby CPUE had decreased significantly in the last four years.
2. He is also concerned with bycatch issues and has expressed that a lot of the young fishermen are adapting more readily to the new integrated plan than older ones in that they seem to be experimenting more with the gear (e.g., larger bait, larger hook spacing, using fixed gangions instead of swivel gangions, etc) and figuring out how to make the gear more selective.

Jim Hubbard:

1. Jim noted that previous members had expressed many of his concerns but did stress concerns about local depletion around specific ports. He expressed that many charter businesses are blaming the 'out-of-state' charter vessels and clients for this depletion – much conflict between charter and commercial fleets over this issue, as well.
2. He also expressed concern over whale depredation issues.
3. He has also seen a steady decline of halibut bycatch in Clarence Strait over the last five years.

This was the end of the morning session. We took a break for lunch and reconvened at 12:45 PM.

The afternoon session began with a broader discussion of miscellaneous topics. Among the points mentioned were:

1. Electronic Monitoring Onboard Vessels
    - Richie Shaw mentioned that a collateral result of the electronic monitoring was an increase in observer responsiveness aboard vessels and reliability of observer data.
    - He said it was developed as a tool to prove that the industry could harvest in a 'clean' manner and that the fishermen were providing data that was as good if not better than observer data.
    - This system was not developed for enforcement purposes.

2. Tagging Studies
    - Jim Hubbard wanted to know if any tagging studies had been done around the local depletion areas? [The answer, other than the general application of PIT tags on survey stations, is no.]

3. Water Temperature Changes
    - David Beggs commented on the biological differences that are not indexed by looking only at surface water temperatures. He noted that water column profile seems much more influential and dynamic than the simple surface temperatures and wanted to know about research into the entire water column characteristics. [Staff explained water column profiler work and noted that it had requested major funding for water column profilers, to study temperature, salinity, dissolved oxygen, and acidity (pH) but had not received same].

4. PAT Tag Studies
    - Lu Dochterman was curious about the timing of pop-up tags. He would like to have the tags pop up at certain times of the year when they don't have a clue as to where the halibut are (if they're not in area 4B, where are they?).

At this point Bruce focused the discussion on seven general topics that emerged from the morning discussions and solicited ideas on research that might be planned to address these topics. The seven topic areas were:

1. Local depletion – microscale distribution and dynamics
2. Bering Sea dynamics
3. Impact of integrated fishery in Area 2B in relation to the distribution of the fishery and selectivity.
4. Whale depredation
5. Fish movements – diel (i.e., diurnal and nocturnal), seasonal, and annual
6. Ecosystem approach to fishery management (EAFM)
7. Research on gear in relation to selectivity, bycatch avoidance, and depredation avoidance

In addition, the idea of summer interns being dedicated to lower priority projects was raised. Dealing with each topic in turn, the following ideas and suggestions emerged from discussion by staff and Board members.

1. **Local depletion -- microscale, distribution and dynamics (diel and seasonal)**. Bruce noted that tagging, genetic, and assessment work indicates that local area depletion is generally not a stock conservation issue but is certainly a local area management issue concerning allocation and removals. Ideas on how to research this issue were:
    - tagging study with returns from all sectors (commercial, sport fishing, subsistence, etc.)
    - new application of PIT and/or PIT and wire tags, with dedicated recovery effort. This type of program would use existing technology with an enhanced recovery effort for non-traditionally censused users. Tagging would need to be concentrated and occur pre-season. Cost for such a project could be in the $200k range, depending on areas, and scanning needs.
    - Pacific Ocean Shelf Tracking project (POST)/ NEPTUNE. The POST program (http://www.postcoml.org/index.html) employs surgically implanted acoustic tags that broadcast signals to an array of subsea receivers. The program became operational on a small scale in 2004 and employed more extensive receiving arrays in 2005/2006. At present the arrays are concentrated around Vancouver Island, with an additional array near Icy Strait, AK. Maximum distance offshore, at present, is approximately 50 km (31 mi). Tags and receivers are battery powered and current receivers have battery life of 7-10 years; larger fish can host tags with 10-20 yr battery life. Tags transmit unique identity codes. Current limitations are the receiver array density, requirement for on-site uploads of receiver data (via telemetry uplink), low per-tag data recovery probability, and lower detection probability for bottom-living animals. This technology may have definite attractions for halibut movement studies, although its potential is somewhat limited at present.

      The NEPTUNE program is narrower and less suited to tracking studies (http://www.neptunecanada.ca/index.html) but does involve permanently wired deepsea observation nodes, with multi-sensor capability. Acoustic tag listening receivers nodes are longer-term potential enhancements of these nodes.
    - Existing PIT program. The existing PIT program has much more limited capability to address local area depletion problems. Tagging density for such an application was much to low and general to address this need. Nonetheless, the existing program can furnish some information on out-of-area tag recoveries, which may give indication of replenishment rates for depleted areas.
    - Microscale and diel dynamics. The existing PAT program and the new work using implanted archival tags addresses the diel behavioural component for halibut.

2. Bering Sea Dynamics

The major issue here is the potential local depletion in various areas, such as Area 4C, northern 4D (St. Matthew), and portions of 4B. As in the discussion concerning local depletion above, this could be addressed via tagging programs, although the relative lack of PIT tag recoveries in Area 4 means that any program needs to account for potential recovery issues. Alternately, the program might employ a mixture of wire and PIT tags to examine these recovery issues, as well. A series of high-reward tags might be incorporated into the design, as one approach to the reporting rate issue for wire tags.

A second component of the dynamics of the Bering Sea stocks is establishing stock structure. Programs underway are addressing this using fine spatial-scale genetic analysis, and the ongoing PAT tag experiments. There is scope for additional PAT work in the area, using a higher proportion of in-season pop-up dates, in an attempt to determine movements on finer spatial scale. Lastly, radio-tracking tags are technologically feasible, although it might be very difficult to implement such an experiment for halibut because of the large spatial scale of concern.

A separate approach to this using high-resolution assessment was also considered. However the emerging results of the PIT tagging program argue convincingly against high-resolution assessments because of movement of adult fish. This movement is much greater than previously assumed and invalidates the closed-population assumption required for small spatial scale analysis. Therefore, high-resolution assessment does not appear to be a viable approach to address this problem.

Also need section here on 4B: unique dynamics, micro-scale clustering of population re males or females; temp driven dispersion; enhanced survey or treatment of commercial data.

3. Impact of Area 2B Integrated Management Plan re distribution and selectivity

The concern about the new management plan in B.C. is displacement of traditional commercial fishing activity into times or areas that will minimize bycatch of species that are perceived to be limiting on opportunities to fulfill the harvesters' IVQs. Board members reported that more fishing happened earlier in 2006 (prior to the implementation of integrated management) and in localities where size categories of halibut were different that in traditional fishing locations.

The approach to this issue can be twofold: first, examination of the size frequency of halibut captured and sampled from the commercial fishery in relation to previous years; and, second, a high resolution spatial analysis of the distribution of fishing effort, again relative to previous years. The staff will be initiating that analysis in the new year.

4. Depredation

Gear research: the Board was briefed on the limited work with pots that was undertaken this year. The DIDSON sonar, essentially a dual-beam acoustic 'camera', was used to observe fish behaviour around conical blackcod traps off BC. Unfortunately, too few halibut were encountered to yield meaningful results. Staff suggested that further work on this aspect of bycatch avoidance should be pursued, at least initially, in the laboratory. The ideal facility for this is at the NMFS laboratory in Newport, OR, although that lab has limited availability for outside investigators. One Board member noted that some harvesters believe that blackcod traps cease fishing for blackcod when a halibut enters the trap.

Steve Kaimmer also briefed the Board on his plan to investigate magnets and rare-earth 'mystery' metals, that have been used as shark deterrents in the Atlantic. The magnets have been used on gangions, near the hooks, and have been shown to be effective against sharks on pelagic longline gear. He has finally received some samples and intends to try them out initially against dogfish in the lab. If successful, we may move into a field trial, although their usefulness on conventional gear would be limited because the magnets are strong enough to 'collect' hooks during setting of the gear. The active component of the rare-earth metals is not well understood, although they do undergo a hydrolytic reaction, giving off hydrogen bubbles and an insoluble hydroxide precipitate..

Distribution mapping for industry: Board members asked if the staff could produce maps of occurrence of bycatch species for the industry. Staff expressed some concern about this because it would also reflect distribution of fishing effort and catch and staff could not use confidential logbook data for this purpose. There was some discussion of previous similar attempts about occurrence of chalky fish. In that instance, self-reporting was unsuccessful because not all processors participated and many did not want it known that they were encountering chalky fish, for marketing reasons. Staff described an industry-funded program (SeaState) in Alaska that uses observer information voluntarily submitted by vessels to identify areas of bycatch, so that other participating vessels can avoid these areas. A similar industry-funded process (which the EM program in Canada is) concerning high depredation areas could be implemented for the halibut fishery, but would require industry initiatives.

Education process: the Board queried whether the Commission could act as a conduit for information on depredation research, through it's website. Staff thought this was a possibility and agreed to examine its capability to do so.

Staff also noted that a scientist from the National Marine Mammal Laboratory would be making a presentation on toothed-whale status in the northeast Pacific to the Commissioners at the annual meeting, and could be available to make a similar presentation to the Conference Board. We will attempt to distribute a copy of his presentation to the Board. Lastly, we will distribute the summary of

the depredation conference held in British Columbia in the fall of 2006, when it becomes available.

5. **Movements and Tagging** – covered above in 1. and 2.
6. **EAFM (Ecosystem Approach to Fisheries Management)**

Bruce outlined the general concept here and noted that little concrete progress on actually designing management programs has been made. There has been a great deal of international discussion on the topic but little implementation because the underlying data on interrelationships may be absent, the total catch (cf. landed catch) by fisheries is unknown, the benchmarks for the target or desired ecosystem status are undefined, or the fisheries governance structure that will permit ecosystem-based management does not exist. Some progress has been made on trying to understand interrelationships but for EAFM to work, the impact of fisheries must be understood. This will require a comprehensive understanding of total catch (landings and discards) for fisheries. The pilot integrated management structure being used for groundfish in B.C. is in the forefront of the programs that will be necessary to obtain these fishery impact data. The missing data are, of course, the bycatch data and the electronic monitoring (EM) approach being used in Canada are the primary source of verification for the logbook data. The Commission has looked at EM on our survey vessels as a proof of concept. Reports are here:

http://www.iphc.washington.edu/halcom/pubs/scirep/SciReport0080.pdf
http://www.iphc.washington.edu/halcom/pubs/rara/2004rara/2k4RARA08.pdf

One of the prime benefits of the EM systems will be to demonstrate that industry can fish cleanly, avoiding discards, and thereby gaining access to greater amounts of the desired target species. The Commission has a funding request in for FY2008 to obtain 50 EM systems for use aboard Alaskan longlingers. This project is supported by the Fishing Vessel Owners Association in Seattle, as an adjunct to the MSC eco-certification of the U.S. halibut fishery and the required action plan to address the lack of monitoring for this fishery. A presentation to the Commissioners on the preliminary results of the EM-logbook comparison for the integrated fishery in BC will be made at the annual meeting in January. This presentation will also be made to the Conference Board if its schedule permits. Staff will endeavour to distribute a copy of the presentation to the Board.

We have also tested the EM systems with multiple cameras aboard a large factory trawler in Alaska. While not adequate for species identification purposes, the EM system proved to be adequate for verification of discarding practices aboard the vessel, as well as enhancing the observer's capabilities for oversight of factory operations and potential violations.

The final discussion on this topic involved activism on the part of the industry and the Commission concerning the mis-information about fisheries which occurs frequently in the popular media. The Board felt that the Commission should be

more pro-active at countering some of this mis-information. Staff explained that such activities are something of a bottomless pit because the general public has little appreciation or understanding of fisheries issues. Nonetheless, the staff is undertaking a study with the University of Washington School of Management to develop a communications framework that will better serve the needs of both the Commission and its clientele.

7. Gear Research

Steve Kaimmer briefed the Board on the pot selectivity work conducted in 2006. The staff felt that this work continued to merit investigation but that future work should begin in the laboratory to refine trap modifications prior to the survey.

The Board noted mixed impressions of the effectiveness of swivels on longline gear. While some components of the fleet switched to swivels, the impact on halibut catch and bycatch was unknown. The Board encouraged the staff to examine the potential impacts of swivels on selectivity of both sizes and species of bycatch, as well as CPUE and size composition of halibut.

The requirement for complete monitoring and accountability for mortality of non-directed catch in B.C. prompted Board members to request that staff examine the impacts of using barbless hooks on both retention of target catch and the discard mortality rate for non-retained catch. The latter will be important to the correct accounting of mortality within the integrated management plan in B.C.

Lastly, the Board discussed the issue of hook design, in the context of selectivity and bycatch mortality rates. It was felt that additional research on alternate hook designs may assist in the process of making the halibut fisheries more selective.

8. Intern project

Board members commented on the broad array of projects undertaken by the staff and felt that additional work to publicize these projects and their results to the general public would be beneficial. Accordingly, the Board suggested that such outreach activity project should be considered as an ongoing component for the summer Intern's project, by using an intern from outside the biology field., i.e., marketing.