Electronic Monitoring Workgroup - Minutes

July 30-31, 2015 meeting, Coast Hotel, Anchorage, AK

Workgroup: Bill Tweit (chair)

<u>Appointed</u>: Dan Falvey (ALFA), Don Lane (NPFA), Howard McElderry (Archipelago Marine Research), Nancy Munro/Stacey Buckelew (Saltwater, Inc.), David Polushkin (KBFA), Jeff Stephan (UFMA)

<u>Agency</u>: Sally Bibb (NMFS AKR), Dave Colpo (PSMFC), Sam Cunningham (NPFMC), Jane DiCosimo (NMFS NOP), Claude Dykstra (IPHC), Diana Evans (NPFMC), Alisha Falberg (NOAA GC Enforcement), Nicole Kimball (ADFG), Nathan Lagerwey (NOAA OLE), Bruce Leaman (IPHC), Alicia Miller (NMFS AKR), Jennifer Mondragon (NMFS AKR), Chris Rilling (NMFS FMA), Kim Rivera (NMFS AKR), Matt Robinson (NPFMC), Maura Sullivan (NOAA GC), Farron Wallace (NMFS FMA)

Others attending included: Karl Haflinger, Eric Torgeson

The Chair opened the meeting with introductions and the agenda. Meeting materials are posted online.

Reports on 2015 research

Field Program

<u>Operational testing vessels</u>: Howard McElderry reported that with respect to the operational testing program's objective of capacity building in 2015, 12 vessels participated in the program, with service ports set up in Sitka and Homer, as well as basic technical support in Seward also for the Homer fleet. The technician in Sitka has begun to oversee technicians in the other Alaska ports, which has been effective, and has also done preliminary assessments of the video footage to speed up feedback to vessels with respect to data quality issues. The Workgroup noted that it is also important for PSMFC to provide early feedback, as they may note different impediments to their task of species identification. AMR will report further on the time frames for data turnaround from vessels to the Sitka technician, and to PSMFC.

Equipment has been removed from all but two of the vessels, as the two are participating in State water surveys that would allow the ability to compare camera data with onboard observer data. The time, effort, and costs associated with the total of 12 installations, 30 data retrievals, 10 equipment services, and 30 dockside monitoring events has been tracked. Although limited in diversity by being a volunteer program, AMR also tracked vessel attributes (e.g., side/stern haul, snap/fixed gear, autoline/none, shelter/open deck, target fishery), to see what effect they may have on data quality. AMR developed a vessel scorecard mid field season, to track data quality issues.

<u>IPHC survey vessels</u>: Farron Wallace reported that both AMR and stereo cameras were deployed on two IPHC survey vessels in 2015[1]. The data will be used to inform the accuracy of species counts and species composition, and for stereo cameras, to compare length data with at-sea sampler lengths. The IPHC provided input on working with both systems, noting that the AMR cameras generally worked unaided, while the stereo cameras needed more care on the boat as well as field servicing between trips (challenges with moisture, some unexpected shutoffs). The Workgroup discussed that working through these issues is an inevitable part of developing a new technology.

<u>NPRB stereo camera work / Northern Endurance</u>: Farron reported on building the next generation of stereo camera rail camera, which resolves issues that occurred on the Northern Endurance cruise at the beginning of the year, and also on the IPHC surveys. Weatherproofing issues with the camera housing have been addressed, and also download speed issues associated with the large file sizes. The software has also been updated. NMFS is looking to field test the camera at sea this fall.

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[1] Following the meeting, additional information was provided showing that the AMR cameras collected a complete image record on 9 of 10 trips, while the stereo cameras collected the same on 6 of 10 trips.

Seabird monitoring: With respect to the seabird cameras, Howard reported that the power problem associated with the seabird compliance cameras (identified in April) has been resolved. The Workgroup clarified that the EM objective for 2016 is to record presence/absence of streamer lines. During 2016, it will be helpful to test how to set up appropriate triggers for the different types of boats so that it is easy to identify when gear is set in the video review. It may also be worthwhile for the future to think not just about how to identify when streamer lines are set, but also when they are set correctly. Looking ahead to future seabird EM objectives, and the desire to do species identification at some point, we should have experts look at the screen captures of seabirds in 2015 and 2016, to see whether they can identify the species using the three-second presentation of the bird to the camera.

ALFA exit survey: Sam Cunningham and Howard reported on the operational testing program vessels' feedback on participating in the program. The Workgroup considers building outreach and participant feedback into the 2016 program to be important, whether through voluntary exit surveys or some other mechanism (e.g., group meetings). The purposes could be to capture: 1. the user experience or perspective of the captain; 2. the time crew needed to make the system work; 3. travel factors – willingness to travel for installations/service, time involved ; 4. planning tradeoffs – impacts of lead time to install cameras on fishing plans ; 5. other impacts of participating (e.g. changing fishing plans) – maybe none in 2016, but in future that might change. The Workgroup also noted that, as with data quality, it will be useful to track vessel attributes and configurations to the surveys as well, to see if that affects the user experience. Sam will lead a subgroup to work on this issue for 2016.

Video Review

Dave Colpo briefed the Workgroup on the most recent PSMFC report on 2015 video review to date. So far, the focus has been on reviewing trips with a complete data record that have an associated dockside monitoring report of rockfish. Generally, the EM species identifications have been good, although distinguishing between shortraker and rougheye rockfish, and among thornyheads, is difficult.

Some conclusions in the report that the Workgroup highlighted for planning the program are:

- There will always be some accidents (e.g., 200 yelloweye rockfish were appropriately retained, but 4 were discarded). What is the appropriate threshold for tolerating accidents?
- On the first trip, there are many more failures (8 of 12). We are unlikely to get good data on the first trip. The Workgroup wants to track whether there is a difference in the data quality between first time ever participants, and first time of the year participants; also for the latter, whether data quality can be improved by keeping the sensor system and/or cameras installed from year to year.

The Workgroup also discussed how to estimate costs associated with video review. The report identifies the average review rate by target fishery (approximately half of real time for halibut and sablefish, and 73% of real time for longline cod). Reviewer rates are approximately $50/hour. NMFS can provide average hauls per trip, and average length of hauls, or industry could provide estimates. The Workgroup will revisit these estimates both for 2016 budgeting and to inform whether and how to subsample the video review in future (as opposed to reviewing 100% of all video).

Priorities for review of the remaining 2015 fieldwork video: 1. IPHC events that were captured on both the stereo and AMR cameras; 2. IPHC events that were only captured with AMR cameras; 3. Operational testing vessel trips without associated dockside monitoring which extend the data captured from vessels across diverse attributes (final list of attributes to be provided by AMR/Dan Falvey); 4. Compliance review of seabird cameras. Although not specifically prioritized, the Workgroup also discussed reviewing video from the 2 volunteer vessels that participated in observed surveys.

Requests for additions to the PSMFC report in future: 1. Incorporate vessel attributes in reporting (referencing AMR final list); 2. Statistics on presence/absence of seabird streamer lines in setting, and feedback on which setting triggers are effective for identifying a set in video review; 3. EM failure by haul as well as by trip; 4. Whether the haul was done at night, and effect on data quality.

Infrastructure / programming work

Farron reported that the contract with UW students to work on automated processing of stereo camera images is continuing, looking both at catch detection (capturing an individual image of each fish to identify), and segmentation (calculating the pixels in the length of each fish, to convert to an actual length). While the analysis is working well in processing chute camera data, there is a lower success rate for rail-mounted stereo cameras (about 85% catch detection, and 50% segmentation), due to the complexity of the background.

Draft Pre-Implementation Plan for 2016

Issue-specific presentations

Chris Rilling updated the Workgroup on the results from the 2016 EM program opt-in letter that was sent out to all longline vessels from 40 to 57.5 ft LOA, at the recommendation of the EM Workgroup in April. 56 vessels responded by the July 27th deadline. The Workgroup affirmed the criteria giving priority to longline vessels of this size class, for which carrying an observer is problematic due to life raft or bunk space. Howard presented the demographic profile of all vessels potentially eligible for the EM pool in 2016.

Farron provided a first draft of simulation modeling to inform the discussion of deployment options. The modeling is based on the 2014 fishing history of the 56 vessels that opted in by the deadline, and uses a fully loaded daily rate based on total costs in the 2015 operational testing program (AMR and video review) divided by the total number of days at sea. There was discussion about the best way to simulate costs of an EM program, and whether a full loaded daily rate is the most appropriate method for this type of program. The Workgroup will continue to refine methods to evaluate program costs as part of the development of the EM analysis for integrating EM into the Observer Program.

Jennifer Mondragon reviewed the operator responsibilities in the 2016 EM program in terms of which might appropriate for pre-implementation, but would might be different in a regulated program. The Workgroup agreed to discuss these further, especially what options might be available to the vessel operator in a regulated program if a camera system breaks. Jennifer also described initial thoughts about the components of Vessel Monitoring Plans (VMPs) for 2016, and agreed to lead a subgroup to work through the exact contents prior to 2016 implementation, and to discuss whether there needs to be NMFS approval of the VMPs.

Alicia Miller and Sally Bibb spoke to what would be required for an Exempted Fishing Permit (EFP) for EM program participants to retain all rockfish. The EFP would be for retention of all rockfish, but the management need would specifically be to speciate shortraker and rougheye rockfish. To allow implementation in 2016, work on developing the EFP would need to begin immediately. The Workgroup discussed the workload involved, the fact that most of the rockfish are currently retained with the MRA, and the possibilities of workarounds for speciation. The Workgroup did not initiate work on an EFP for 2016, but left open for discussion the possibility of an EFP in 2017.

Sally also discussed how to structure incentives within the program, and what the agency can authorize. She distinguished between what is in regulations, and is addressed through enforcement action, and performance criteria for future participation. The following steps are useful for future discussion: 1. identify specifically the behavior you are trying to achieve through incentive (e.g., how well are people making sure that we get good data quality); 2. identify the benefit people get (e.g., staying in the EM pool), and the consequence for not behaving that way (e.g., returning to the trip selection human observer pool); 3. communicate to those getting or not getting the benefit; and 4. establish an evaluation process – who monitors the behavior, who decides whether or not the condition was met, how do you document that and communicate to the participant (e.g., NMFS? EM provider?). The Workgroup agreed to use the vessel scorecard to develop the criteria in 2016, and try to test incentives for participation in 2017.

Jennifer laid out a roadmap of how information flows from EM vessels through the Observer database to the Region's Catch Accounting System, and the series of estimation and data quality/validation decision points that need to be resolved in order to use EM data in catch accounting. She noted that the next step is to think about a plan for addressing each of these decision points, what analysis needs to be done, using what data, by whom, and on what timeline, with the first priority being the estimation decision points.

Farron described the benefits of e-logbooks (versus paper logbooks) and a data-logger system that captures sensor data even when the cameras and control box are not onboard (it is anticipated that sensors will remain on EM program vessels even if the vessel is not selected in subsequent periods). The Workgroup asked for an evaluation of sensor data from existing fieldwork, to validate whether the hydraulic sensors can reliably be used to identify hauling events, especially for vessels that use an autoline system. The Workgroup will consider data loggers for deployment on a subset of volunteer EM program vessels in 2016.

Funding / Budget

Chris Rilling updated the Workgroup on NMFS funding that can support EM work. All FY15 funds are obligated to PSMFC, to administer for EM work in 2016 on NMFS's behalf. In addition, ALFA has also procured NFWF grant funding for EM camera deployment in the pre-implementation pool in 2016 and 2017. It may be possible that additional FY16 NMFS funding becomes available to support EM work in 2017, but this will not be known for some time to come.

There was a discussion of how the stereo camera work should be reflected in the budget, whether it should fall under funds for the pre-implementation pool or under research and development. This led to a discussion as to whether operational testing for the three available stereo cameras should be conducted by rotating the stereo cameras throughout the pre-implementation pool of vessels, or whether they should be deployed through independent field tests. The Workgroup articulated pros and cons of each scenario, and will revisit the discussion in September.

Chris also discussed the possibility of going out with another RFP in 2016 with some of the NMFS EM funds. Currently, PSMFC has contracted with a single EM provider through 2019, and none of the NMFS funds that have been granted to PSMFC may be used with any other provider. The new RFP could allow for Alaska work by other providers, and foster a competitive process for the regulated program.

Revisions to the Draft 2016 Pre-implementation Plan

The Workgroup debated what the maximum size of the EM pool should be, and whether it is appropriate to accommodate additional vessels beyond the 56 that opted in by the July 27th deadline. The discussion focused on what the budget can afford, what would represent a significant but also incremental step for increasing the EM pool, and what the human observer pool can accommodate in terms of fewer vessels. The Workgroup recommends a maximum of 60 40-57.5 ft LOA longline vessels in the EM pool, which supports some additional movement into the pool, especially for vessels that have received a life raft exemption in 2015 but have not yet opted in to the EM pool.

The Workgroup recommends four deployment periods for EM, and a 30% selection rate in each deployment period for the EM pool. Vessels will need to pre-register if they intend to fish in each deployment period, and will then be randomly selected. They will not need to log each trip in ODDS. Industry representatives conveyed that EM participants want to feel that there is some parity between the EM pool and the human observer pool, and having to carry a camera for an entire year would not seem fair. The four deployment periods are recommended as Jan-Feb, March-June, July-Oct, and Nov-Dec (a 2-4-4-2 month quarterly deployment pattern). This time distribution fits well with the fishing patterns of the small boat fixed gear fleet. The February/March break avoids bisecting the early part of the IFQ fishery, and June/July is a natural break when IFQ vessels switch to State fisheries. Positioning the EM

deployment period breaks in this way will hopefully avoid chokepoints and fishing disruptions for moving cameras between vessels.

Despite the risk of poorer quality data, the Workgroup does not recommend excluding vessels that only make a single trip during the year. As in 2015, the EM service ports would be Sitka and Homer. Smaller regional ports would be supported with technicians flying in, to the extent possible within the budget, in order to estimate costs and evaluate whether this can be part of a regulated program.

The outcome of the Workgroup's discussions is captured in the Draft 2016 EM Pre-Implementation Plan: Draft resulting from the July 30-31, 2015 EMWG meeting. The Workgroup also plans to revisit the discussion in September once a specific budget is calculated for the 2016 pre-implementation pool.

Pacific cod research

Stacey Buckelew and Nancy Munro presented the results of their 2014-2015 EM study with North Pacific Fishermen's Association on small Pacific cod pot vessels, and their plans for Phase II of the study beginning this winter. The next phase of the study will obtain species lengths and deploy RFIDs on pots to identify when retrieval occurs, and the data will be shared with NMFS in the hope that the pot cod research can be folded into the framework of the EM analysis to implement EM as part of the Observer Program. The Workgroup supports the Saltwater and NPFA request for NMFS to review the data review protocols for the study prior to the start of the research program, and for NMFS to provide catch estimation and stock assessment priorities. The Workgroup also discussed possibilities for providing additional funding to increase the sample size in the next phase of work, but was cautioned by Chris that NMFS funding through PSMFC can only be used with a single contractor at this time.

Other business

EM in other longline sectors: The Workgroup continues to be interested in expanding EM to other sectors In September, the Workgroup can discuss how much funding is available to be allocated as a pre-implementation pool reserve for 2017, and how much is left to fund other EM research in 2016. The Workgroup expressed interest in using the available cameras in the first and last selection periods to begin expanding EM to other sectors, particularly under 40 ft and over 58 ft LOA longline vessels. The group was reminded that of these categories, the Council's prioritized vessels under 40 ft, and recommended soliciting 5 volunteer vessels to test EM in 2016.

Open source software: Nancy Munro and Karl Haflinger provided an update on their NFWF proposal, which has been funded, to develop open source software for reviewing EM video. The Workgroup requested periodic updates as their work progresses.

Scheduling and EM analysis: The Workgroup discussed planning a November EM Workgroup meeting to refocus on the EM analysis for implementing EM as part of the Observer Program. The Workgroup needs to rethink the original alternatives that were proposed in 2014, in light of the progress that has been made in the last year, and should begin to think about a process and timeline for completing the various components of the eventual analysis.