

**North Pacific Research Board
Semiannual Progress Report January to June 2009**

1. PROJECT INFORMATION

NPRB Project Number:	F2712-00
Title:	By-catch characterization in the Pacific halibut fishery: A field-test of electronic monitoring
Subaward period	June 2007 to 28 February 2010
Amount of funding	\$242,895
Report period	January 1 to June 30, 2009
Report submission date	July 15, 2009
Lead Author of Report*	Jennifer Cahalan, Pacific States Marine Fisheries Commission

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2. PROJECT OVERVIEW

a. Briefly (4-5 sentences) describe both the research purpose and the underlying need for this research.

The focus of our research is to improve our understanding of the ecosystem impacts of halibut fishing off Alaska through improved monitoring of halibut longline fishery bycatch and to provide data on mortality of bycatch species for input to stock assessments. The majority of vessels operating in this fishery are not required to carry observers; hence, estimates of bycatch are not based on direct observation of the fishery. We are conducting a study comparing and evaluating the relative effectiveness of electronic monitoring (EM) and the currently utilized National Marine Fisheries Service (NMFS) monitoring methods to operate effectively in a commercial longline (hook-and-line) setting. Previous research by one of the partners in this proposal (IPHC) documented successful electronic monitoring of Pacific halibut longline fishing conducted from chartered commercial vessels conducting research surveys. While this work supported the use of EM to monitor bycatch in numbers of fish, the research was not conducted under the complete range of commercial fishing conditions where a broader suite of environmental and physical factors affects the vessel operations.

b. State your hypothesis(es).

There are four main hypotheses that we are interested in testing (Figure 1).

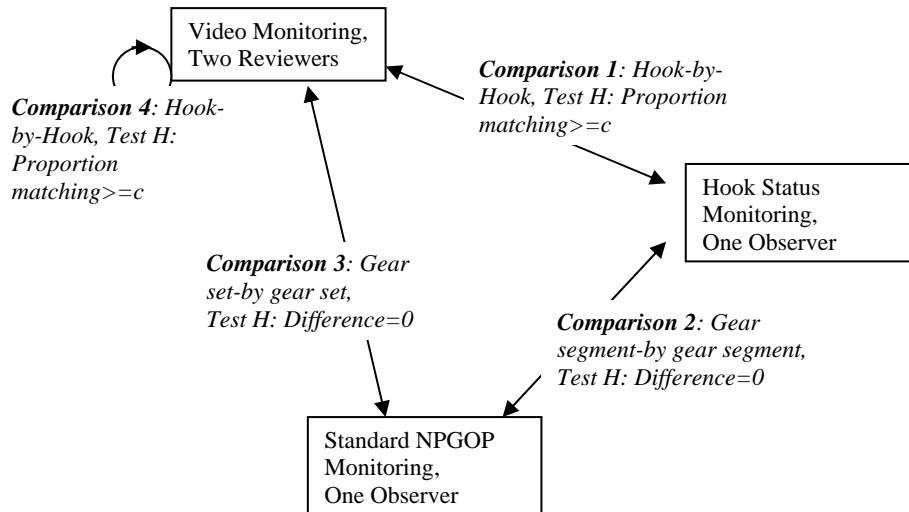


Figure 1: Data sources and comparisons used to assess the viability of video monitoring.

c. List the objective(s) of the research project, exactly as described in your approved Statement of Work.

The goal of this project is to test the ability of EM systems to operate in a commercial setting by comparing best estimates of bycatch based on a “census” of numbers of species hooked, with estimates of bycatch based on review of video monitoring, and estimates based on standard NMFS / NPGOP observer monitoring.

This study has two main objectives as follows:

1. Catch and bycatch estimation using several methods
 - a. Estimation of bycatch and bycatch rates from data collected using EM on commercial longline vessels.
 - b. Estimation of bycatch and bycatch rates from data collected using standard NMFS observer monitoring on commercial longline vessels.
 - c. Hook-by-hook documentation (by a second observer) of fish species on the fishing gear.
 - d. Accounting of retained bycatch based on a census of all bycatch (non-halibut) species landed on the vessel.
2. Evaluations of the relative efficiency, cost, and bias of each of the two bycatch estimation methods (EM, NMFS Observers) relative to a standard (hook-by-hook, and hook-by-hook comparisons with observer) to determine their suitability for use in fisheries management.

d. Provide a table showing the timeline and milestones for the entire project.

Table 1 reflects previous changes made to the study plan and timelines (see correspondence August 13, 2007 and July 15, 2008) and the approval of a grant extension that extends our timeframe to February 2010 (December 2008).

Table 1: Summary of proposed study activities, accomplishments, and deliverable products.

	<i>Time Period</i>	<i>Activity / Accomplishment</i>	<i>Deliverable</i>	<i>Status</i>
1	Dec 07 – Jan 08	Outreach to Halibut Fleet to solicit vessel participation. This outreach will be conducted in collaboration with the Fishing Vessel Owners Association.	Participating vessels	Complete
2	Feb – Mar 08	Prepare database, Contract for Observer and EM coverage	Database established; contractors available	Complete
3	Apr – Sep 08	Conduct field activities	Data Collection	Complete for 4 vessels
4	May 08 – Feb 09	Data entry and editing	Mid-study data set	Complete
5	Dec 08 – Mar 09	Additional outreach and solicitation of vessels	Participating vessels	Complete; No additional vessel participation
6	Jan – May 09	Analysis of available data, preparation of preliminary findings	Mid-study synopsis of results	Ongoing; Final report in lieu of mid-study report.
7	Mar – May 09	Conduct additional field activities	Data Collection	No 2009 vessel participation
8	Jun – Jul 09	Data entry and editing	Final data set	Ongoing
9	Jul – Nov 09	Analysis of results; Preparation of final report		
10	Feb 2010	Completion of final report; Presentation of findings to fishing groups, North Pacific Fishery Management Council, SSC	Published Report; Presentation of study results	

3. PROGRESS SUMMARY

a. Describe report period progress.

In this reporting period, we completed data error checking and editing the observer data collected during the 2008 season (relating to Objectives 1.a, 1.c, and 1.d). The final data sets from the two sources (observer and EM) have been combined. The EM contractor, Archipelago Marine Research, is in the final stages of completing the hook – to – hook alignment of the EM data to the observer data. Once this alignment is completed we will be able to start the data analysis, inclusive of estimating catch and bycatch amounts using the two data sources (Objectives 1.a, 1.c, 1.d; Objective 2).

We have compiled the cost information for the observer services provided for the study. The final billings for the EM services have not been received. Once the final invoices are available we will assess the relative cost of each monitoring method, within the constraints of the study (Objective 2).

We have completed timeline item #4 and # 5 this reporting period, and have started work on items #6 and #8. We expect to complete items # 6, #8, and #9 in the next reporting period.

b. Describe preliminary results.

We collected side-by-side EM and observer data on four vessels during the summer of 2008 with a total data collection of 13 trips and over 200 hauls sampled. We were not successful in obtaining additional study participants for the planned 2009 field season.

Of the four vessels that participated in the study, one was under 60 ft and therefore not typically subject to observer coverage. The other three vessels would be subject to observer coverage requirements while fishing for sablefish, but not if they were fishing solely for halibut. Three of the vessels fished in the Gulf of Alaska while one fished in the Bering Sea. This suite of vessel size and areas fished deviates somewhat from our original study plan to collect data balanced among areas and vessel sizes (observer coverage requirements), however, availability of vessels from the commercial fishery was a limiting factor.

Cooperation with the halibut industry was expected to result in a sufficient number of boats for the study. Many vessel owners expressed support for the project, particularly because of the identified lack of catch monitoring as a shortcoming during the MSC certification of the fishery. However, despite the efforts of a partnering fishing vessel owners association, we encountered reluctance by some vessel owners to bring either EM or observers aboard their vessels in the absence of a regulatory requirement or remuneration for the vessel. For those vessel owners who did wish to participate we also experienced difficulties in obtaining commitments due to:

- Perception of inadequate space onboard by the vessel for a sampler (or samplers)
- Lack of remuneration for taking a sampler
- Unexpected changes in vessel schedules and fishing plans

The last item was a significant issue because the program was voluntary. Samplers were often deployed to ports but were unable to make trips due to vessel schedule changes. Thus, the lack of a regulatory requirement for observations presented significant logistical difficulties.

EM Performance

As detailed in earlier progress reports, we encountered EM technical difficulties and failures on the first two vessels that were involved in the study. On these vessels the EM functioned properly for 23 of the 58 monitored sets. We did not encounter problems of the same magnitude on later trips. There appear to be several factors that affected the ability of the EM equipment to function during this study. The EM failure during the first trip in the study was due to a hard-drive error, potentially caused by power supply fluctuations to the computer equipment. Difficulties were also encountered resulting from incompatibilities in the computer software, which were later resolved. A complete assessment of the EM record has not been completed at this time, but those data are expected to be provided from AMR in the near future.

Total Data Captured

F/V Gretchen S (37 ft LOA): Captain Dan Hull, Observer Mel Kahn

- 3 Trips with EM data for 13 and observer data for 17 of the 19 longline sets.

F/V Sherrie Marie (65 ft LOA): Captain Norm Pillen, Observers Paula Hartzell and Suzie Hanlan

- 2 Trips with EM data for 10 and observer data for 41 of the 42 longline sets.

F/V Kristiana (69 ft LOA): Captain Bill Sauer, Observer Mike Cox

- 2 Trips with EM data for 12 and observer data for 18 of the 19 longline sets.

F/V Lisa Marie (78 ft LOA): Captain Jay Hebert, Observer Melany Haggard

- 6 Trips with EM data for 166 and observer data for 141 of the total 168 longline sets.

Species Composition of Catch

The predominant species in the catch were Pacific halibut and sablefish (the target species) and Pacific cod, based on the observer-collected data (Figure 2). Vessels were targeting either halibut or both halibut and sablefish. The non-predominant species observed in the catch of the four study vessels was diverse and included skates, rockfishes, sharks, grenadiers and flatfishes. These results reflect the fishing of these four vessels, and may not be indicative of the target and non-target catch of all vessels participating in the Pacific halibut fishery.

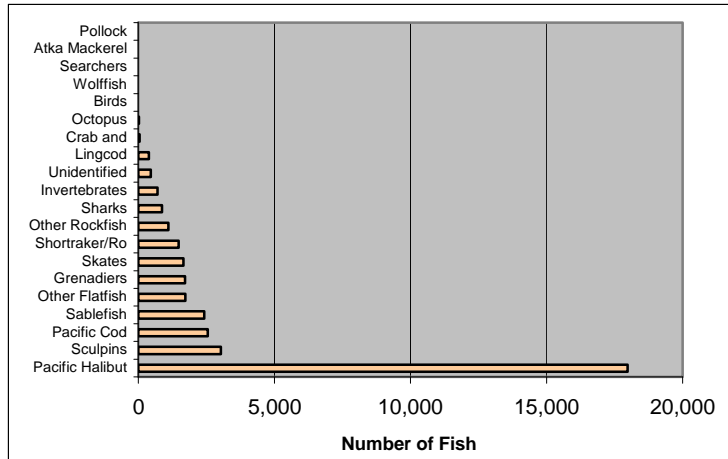


Figure 2: Species composition of catch for the four study vessels. Species are identified to species group.

c. Describe any concerns you may have about your project’s progress.

As documented in past progress reports, we faced many challenges during the implementation phase and have made adjustments to our study plan in response to vessel availability. As a result, our ability to compare results between fishing areas and seasons may be limited. Additionally, due to limited vessel accommodations resulting in deployment of single observers on each vessel, we were not able to collect catch data using both hook-by-hook methods and standard NPGOP sampling methods on the same sets. In all cases, we have communicated these changes to the NPRB (Dr. Wiese) and he has concurred with our revised study design and timeframes.

Since we have less data, and the data are no longer from the intended balanced design, we may not be able to make all the comparisons anticipated (*e.g.*, area or vessel size comparisons). However, we will be able to assess the general applicability and feasibility of EM technology relative to observer coverage.

For this reporting period, we have not had any substantial problems. We have experienced some delays in data processing and preparation, and as a result we have not completed the data analysis for the data collected in 2008 (Table 1, Item #6). Since we were unable to collect additional data in the spring of 2009, the final report will replace the anticipated mid-study report. We do not expect that this will hinder the completion of our project according to schedule.

d. Poster and oral presentations at scientific conferences or seminars

Poster Presentations: Alaska Marine Science Symposium, Anchorage, AK; January 2009

e. Education and outreach

We have not engaged in any additional education or outreach activities during this reporting period beyond our website posting of the project details.

4. PROGRESS STATUS

It appears that we will be able to meet the overall project goals of evaluating the feasibility and effectiveness of EM monitoring relative to observer monitoring in spite of several (approved) adjustments to the study design and time lines. While some of the comparisons we had originally planned (among vessels of different size, or between all of the standard NPGOP and EM methods) may not be possible, we will be able to compare the efficiency of EM-based and observer-based catch estimates under a broad range of commercial fishing conditions. We are currently on target for completing the project in December 2009.

During the next six-month period, we will complete the data analysis phase of this research. We will prepare a final report for the project and expect to present results at the Alaska Marine Symposium in January 2010.