



IPHC research topics selected for 2019

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PURPOSE

To provide the RAB with a description of the new research projects proposed by IPHC Secretariat for 2019 and contemplated within the 5-year Biological and Ecosystem Science Research Program.

BACKGROUND

Since its inception, the IPHC has had a long history of research activities devoted to describing and understanding the biology of the Pacific halibut (*Hippoglossus stenolepis*). At the present time, the main objectives of the Biological and Ecosystem Science Research Program at IPHC are to:

- 1) identify and assess critical knowledge gaps in the biology of the Pacific halibut;
- 2) understand the influence of environmental conditions; and
- 3) apply the resulting knowledge to reduce uncertainty in current stock assessment models.

Typically, the IPHC Secretariat propose new projects annually that are designed to address key biological issues as well as the continuation of certain projects initiated in previous years. Proposals are based on their own input as well as input from the Commissioners, stakeholders, and specific subsidiary bodies to the IPHC such as the Scientific Review Board (SRB) and the Research Advisory Board (RAB). Proposed research projects are presented to the Commissioners for feed-back and subsequent approval. Importantly, biological research activities at IPHC are guided by a Five-Year Research Plan that is put forward by the Branch Manager identifying key research areas that follow Commission objectives. As described in the Five-Year Research Plan for the period 2017-21, the primary biological research activities at IPHC can be summarized in five main areas:

- 1) Reproduction
- 2) Growth and Physiological Condition
- 3) Discard Mortality and Survival
- 4) Distribution and Migration
- 5) Genetics and Genomics

These research areas have been selected for their important management implications. The studies conducted on Reproduction are aimed at providing information on the sex ratio of the commercial catch and to improve current estimates of maturity. The studies conducted on Growth are aimed at describing the role of some of the factors responsible for the observed changes in size-at-age and to provide tools for measuring growth and physiological condition in Pacific halibut. The proposed work on Discard Mortality and Survival is aimed at providing updated estimates of discard mortality rates in both the longline and the trawl fisheries. The studies conducted on Distribution and Migration are aimed at further understanding larval and juvenile dispersal, distribution of all life stages in relation to the environment, and reproductive

and seasonal migration and identification of spawning times and locations. The studies conducted on Genetics and Genomics are aimed at describing the genetic structure of the Pacific halibut population and at providing the means to investigate rapid adaptive changes in response to fishery-dependent and fishery-independent influences.

In this document, we present an outline of the new projects proposed by the IPHC Secretariat for the coming year.

DISCUSSION

For 2019, six new projects are proposed that cover specific research needs ([Appendix I](#)).

Project 2019-01 (“*Integrating migration and genetics research to refine Pacific halibut population structure, distribution and movement*”) proposes performing studies to improve our understanding of spawning site contributions to nursery areas in relation to year-class and recruit survival and strength, as well as of the relationship between nursery origin and adult distribution and abundance over temporal and spatial scales through the application of genetic approaches to address management-relevant questions on population structure, distribution and movement.

Project 2019-02 (“*Whale detection methods relevant for Pacific halibut*”) proposes testing electronic monitoring-based methods to detect whale presence in the directed longline Pacific halibut fishery. Plug-and-play towed array hydrophones will be developed and tested under operational fishing conditions on fishing vessels. Towed array data will be incorporated into an existing real-time sperm whale avoidance network. This study will be performed in the framework a Bycatch Reduction Engineering Program (BREP-NOAA)-funded study led by the Alaska Longline Fishing Association in which IPHC is a collaborating partner ([Appendix II](#)).

Project 2019-03 (“*Adult Pacific halibut captive holding studies*”) proposes performing studies on captive adult Pacific halibut to establish or validate measures or protocols required for other ongoing projects, such as (1) determining the permanence of individual tail markings for tracking individual movement rates, (2) calibrating measures of fat content for condition factor determinations and of stable isotope (C^{13} and N^{15}) ratios for inferring growth and dietary information, (3) calibrating O^{18} otolith signatures with environmental temperature and (4) producing larvae for behavioral studies.

Project 2019-04 (“*Use of LEDs to reduce Pacific halibut catches before trawl entrapment*”) proposes evaluating if artificial illumination (e.g. green LEDs) in trawl gear can reduce Pacific halibut bycatch by facilitating escape responses inside trawl gear and if trawl gear avoidance is related to the physiological condition of the fish. This study will be performed in the framework of a Bycatch Reduction Engineering Program (BREP-NOAA)-funded study led by Pacific States Marine Fisheries Commission in which IPHC is a collaborating partner ([Appendix II](#)).

Project 2019-05 (“*Improving the characterization of discard mortality of Pacific halibut in the recreational fisheries*”) proposes estimating mortality rates of discarded Pacific halibut in the Pacific halibut guided recreational fishery. This study will be conducted with partial funding from a grant from the National Fish and Wildlife Foundation awarded to IPHC ([Appendix II](#)) in collaboration with academic and industry partners.

Project 2019-06 (“**Assessing the incidence of chalky Pacific halibut**”) proposes collecting information from stakeholders on the incidence of chalky flesh in Pacific halibut through surveys in order to understand the nature and timing of possible causes leading to its development.

RECOMMENDATION/S

That the RAB:

- 1) **NOTE** paper IPHC-2019-RAB020-12 which outlined the new research projects proposed by the IPHC Secretariat for 2019.

APPENDICES

Appendix I: Summary of new research projects proposed for 2019.

Appendix II: Externally-funded research grants linked to new research projects for 2019.

APPENDIX I**Summary of research projects proposed for 2019**

Project #	Project Name	Priority	Budget (\$US)	External funding for FY2019 (\$US)	Management implications
2019-01	Migration and genetics	High	105,092	-	Population structure, distribution and movement
2019-02	Whale detection methods	High	7,511	TBD	Mortality estimations
2019-03	Adult captive holding studies	High-Medium	63,183	-	Changes in biomass/migration
2019-04	Use of LEDs to reduce Pacific halibut catches before trawl entrapment	High	-	TBD	Bycatch reduction
2019-05	Improving the characterization of discard mortality of Pacific halibut in the recreational fisheries	High	-	98,901	DMR estimations
2019-06	Investigations on chalky Pacific halibut	High	-	-	Product quality
Total - New Projects (\$US)			\$175,786		
External Funding (for FY2019) (\$US)				\$98,901	

APPENDIX II**Externally-funded research grants linked to new research projects for 2019**

Project #	Grant agency	Project name	PI	Partners	IPHC Budget (\$US)	Management implications	Grant period
1	Bycatch Reduction Engineering Program - NOAA	Adapting Towed Array Hydrophones to Support Information Sharing Networks to Reduce Interactions Between Sperm Whales and Longline Gear in Alaska	Alaska Longline Fishing Association	IPHC, University of Alaska Southeast, AFSC-NOAA	TBD	Whale Depredation	September 2018 – August 2019
2	Bycatch Reduction Engineering Program - NOAA	Use of LEDs to reduce Pacific halibut catches before trawl entrapment	Pacific States Marine Fisheries Commission	IPHC, NMFS	TBD	Bycatch reduction	September 2018 – August 2019
3	National Fish & Wildlife Foundation	Improving the characterization of discard mortality of Pacific halibut in the recreational fisheries	IPHC	Alaska Pacific University, U of A Fairbanks, charter industry	\$98,902	Bycatch estimates	2019
Total awarded (\$)					\$98,902		