5.0 Executive summary

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The research activities performed by the International Pacific Halibut Commission (IPHC) Secretariat staff during 2016 and that are reported here, highlight several of the research topics that IPHC has been investigating over the last few years. It is worth noting that a great majority of these studies are conducted using the fishery-independent setline survey (setline survey) that IPHC conducts annually covering the distribution range of the Pacific halibut and underscores the importance of the setline survey as an essential research platform for IPHC. One of the landmark activities that are performed annually (since 2009) in our setline survey is the environmental monitoring effort that collects oceanographic data from all setline survey stations in the form of depth, salinity, temperature, dissolved oxygen, pH and chlorophyll concentration information. In 2016, oceanographic data was successfully collected from a total of 1,206 stations (Sadorus and Walker 2017). The setline survey has also allowed for the collection of biological data from Pacific halibut in order to understand the biology of this species, with emphasis on growth, physiological condition, reproduction and migration.

In the present report of research activities we report on recent studies evaluating growth in the context of the marked decrease in size-at-age observed over the last four decades. On one hand, by comparing somatic and otolith growth from male and female Pacific halibut of four different year classes and caught in three different regulatory areas, we report that otolith growth is independent of somatic growth and, therefore, that otolith growth patterns cannot be used to infer changes in somatic growth in this species (Rudy and Forsberg 2017). On the other hand, state-of-the-art molecular techniques on Pacific halibut growth-related tissues (e.g., skeletal muscle, liver, heart) have led to the identification of a large set of potential molecular growth markers for monitoring growth patterns in the Pacific halibut population (Planas and Dykstra 2017).

In the present report we also describe the results of studies investigating aspects related to the reproductive biology of the Pacific halibut. These studies range from the identification of sex-specific loci and development of molecular assays for sex identification in the commercial fishery (Drinan et al. 2017), to the initial description of oocyte development by histological examination of ovaries from Pacific halibut collected in the winter (i.e. reproductive season) and in the summer (i.e. non-reproductive season) (Planas et al. 2017), to the identification of molecular markers for reproductive development and maturation (Planas and Dykstra 2017), and to investigating spawning migration in female Pacific halibut with the use of pop-up archival transmitting (PAT) tags (Loher 2017). All these studies have been proposed as either new or continuing projects for FY2017 (Chapter 1.1). Other studies on Pacific halibut migration are also described, including a summary of past tagging efforts and current tag recovery success (Forsberg 2017a) and the results of a pilot study conducted to explore the feasibility of tagging U32 fish in the setline survey (Forsberg et al. 2017b). The success of this last project has prompted a proposal in FY2017 on U32 tagging of all viable U32 collected in the setline survey that are not selected for otolith sampling in all surveyed stations (Chapter 1.1). Finally, the results of a study designed to evaluate the applicability of physiological condition determinations in Pacific halibut, and that represented the work performed by the 2016 IPHC Intern, are presented (Briones 2017). The results of this study are important because they have resulted in the identification of several indicators of physiological condition that can be used in the Pacific halibut and that will be applied in proposed

studies evaluating reproductive, growth and migratory performance, as well as the survival of fish discarded at sea (Chapter 1.1).

Reference

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