



# Adaptive Management Report 2018

Fish Habitat Management System for Yukon Placer  
Mining

Revised December 2019

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# Acronyms

AMF	Adaptive Management Framework
CSAS	Canadian Science Advisory Secretariat
DFO	Fisheries and Oceans Canada
EHM	Economic Health Monitoring
FHMS	Fish Habitat Management System
IMG	Intergovernmental Management Group
JPIC	Joint Placer Implementation Committee
RCA	Reference Condition Approach
TSS	total suspended solids
WQO	Water Quality Objective
WQOM	Water Quality Objective Monitoring
YPS	Yukon Placer Secretariat

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# Executive Summary

## Introduction

The Fish Habitat Management System for Yukon Placer Mining (hereafter, referred to as the FHMS) is designed to manage placer mining activity under the *Fisheries Act*. Founded on principles of adaptive management and incorporating a risk-based approach to decision-making, the FHMS is intended to balance the objectives of a sustainable Yukon placer industry with the conservation and protection of fish and fish habitat supporting fisheries.

Adaptive management recognizes that the effectiveness of any management system is hampered by a degree of uncertainty and lack of knowledge. To improve a system's effectiveness over time, the adaptive management process is applied, whereby management actions are planned, implemented, evaluated, and adjusted over time. In the context of managing Yukon placer mining, this process is guided by the Adaptive Management Framework (AMF; YPS 2008). The AMF outlines a detailed process for monitoring and evaluating the effectiveness of the FHMS, and the management responses that are considered appropriate. Information that is considered in the evaluation phase of the AMF includes the results of a water quality monitoring program, aquatic health monitoring program, economic health monitoring program, and Traditional Knowledge provided by Yukon First Nations.

This report communicates the results of the 2018 effects monitoring programs and the adaptive management process that was followed. An update on other activities that occurred in 2018 that relate to the adaptive management process have also been included. The executive summary provides an overview on these topics and more comprehensive information is available in Appendices A-C.

## 2018 Effects Monitoring Programs and Adaptive Management Process

### Water Quality Objective Monitoring Program

Water quality monitoring for the AMF follows the Water Quality Objective Monitoring (WQOM) Protocol. The objective of the WQOM Protocol is to monitor and assess whether the water quality objectives established under the FHMS are being achieved and whether exceedances are due to placer mining activity or other causes. The protocol measures the concentration of sediment total suspended solids (TSS) in the watercourse and compares the results to water quality objectives established for the watercourse. In 2018, WQO monitoring took place between May 2018 and September 2018 at 13 sites in the Klondike River Watershed, 21 sites in the Indian River Watershed, 9 sites in the South Big Salmon Watershed.

In the Klondike River Watershed, the average TSS was below the water quality objective 80% of the time at all 13 sites; however, 9 sites did experience some daily events when the WQO were not met. Two sites did exceed the WQO on more than one occasion through the monitoring period. Bonanza Creek at the mouth and Eldorado Creek at the mouth. These sites are located in moderate-low, and low fish habitat suitability watercourse reaches.

In the Indian River Watershed, the average TSS was below the water quality objective at all 21 sites monitored in the sub-basin. 2 sites did experience some daily events when the WQO were not met.

In the South Big Salmon Watershed, the seasonal average TSS was below the water quality objective at all 9 sites monitored in the basin. Four sites did experience some daily events when the WQO were not met and one site, South Big Salmon River downstream of an Unnamed Creek just above the mouth of the river, was heavily impacted by an eight-day rain event from June 15 through to late in the day, June 22<sup>nd</sup>.

While the average TSS for most sites in 2018 were below the water quality objective, on some specific days of monitoring in all three watersheds, the TSS levels were greater than the water quality objective. On these occasions, a direct correlation

between environmental conditions and the volume of solids in the water was observed. In order to understand whether the causes of the water quality objective exceedances are due to placer mining, additional information is required. For more information, please see the comprehensive report for water quality monitoring in Appendix A.

## Aquatic Health Monitoring Program and Aquatic Health Monitoring Protocol Model Review

The Aquatic Health Monitoring Program is intended to assess how effective the FHMS is in maintaining aquatic health for fish and fish habitat in placer mining watersheds. Information from aquatic health monitoring is then used to make changes to the FHMS, if necessary, through adaptive management.

In 2018, the Canadian Science Advisory Secretariat (CSAS) undertook an evaluation of the suitability of the Yukon Regional Reference Model and provided guidance regarding the adequacy of the reference condition approach (RCA) for informing regulatory decisions for placer mining in the Yukon. Recommendations from this review will be used to inform the Intergovernmental Management Group (IMG) on the effectiveness of the RCA model in detecting changes in aquatic health in streams exposed to placer mining activity.

Watersheds sampled in 2018 included: Alsek River, Indian River, Klondike River, Mayo River, McQuesten River, Nisutlin River, Sixty Mile River, Stewart River, Yukon River South, and Yukon River North. Site visits were carried out from July 17 to July 27, 2018. A total of 39 sites were sampled among 10 watersheds. Sampling was carried out at 10 reference sites and 29 test sites. For sites that were sampled in 2018, all available years of data were included in the analysis to evaluate trends over time.

The conclusions from the CSAS evaluation confirmed inherent challenges with the reliability of the Yukon Regional Reference Model, as such results from the 2018 monitoring program were not compared to the Yukon Regional Reference Model. An interim assessment approach has been used for the 2018 samples, which relies on characterization of physical habitat, degree of placer mining development, evaluation of several invertebrate community metrics and a qualitative description of the invertebrate



community in comparison to multiple local reference sites. Detailed results and an overall site assessment for each site are provided in the aquatic health monitoring report (Appendix B).

The IMG is currently in the planning phase of a study re-design process. DFO and Yukon government will carry out targeted studies in 2019 to answer several key questions that will be used to inform a revised approach to aquatic health monitoring. An interim approach to evaluating aquatic health will be used while the new program is being developed.

## Economic Health Monitoring Program

The Economic Health Monitoring (EHM) Protocol describes the way in which trends in economic health are monitored and assessed. The EHM program collects economic health indicator data and evaluates where there are changes in the industries viability year to year and whether these changes are attributed to the FHMS. In 2018, no decline in economic health was detected for any of the viability indicators. Data for three of the indicators was unavailable at the time of monitoring.

The EHM Panel Survey was conducted for the 2018 placer mining season. The panel survey includes questions designed to determine whether an adverse trend can be attributed to factors unrelated to the FHMS. According to the protocol, the survey is administered if an adverse change of more than 15% in two of the top four indicators was detected, or an adverse change of more than 10% in four or more of any eight indicators was detected. While no such adverse trends have been detected by the viability indicator assessment that would trigger advancement to the panel survey, it has been conducted on an annual basis since 2008. For more information, please see the comprehensive report for economic health monitoring in Appendix C.

## Traditional Knowledge

The use of Traditional Knowledge is an essential part of the FHMS and the AMF requires that Traditional Knowledge be considered during adaptive management processes. In the past, First Nation governments were invited on an annual basis to share Traditional Knowledge that may be significant to the management of placer



mining activity in their traditional territories. No Traditional Knowledge has been shared in response to the annual invitations. Reasons for this have been documented in the Implementation Status Review and relate to the collection process, ownership, storage, and use of this information. In response to the Implementation Status Review recommendations (YPS 2018), a formal invitation to share Traditional Knowledge has not gone out for the 2018 monitoring year, although First Nation governments are welcome to share Traditional Knowledge at any time. Discussions regarding the approach to Traditional Knowledge in the AMF have been initiated.

## Adaptive Management Process

Through the adaptive management process, the results of the monitoring programs and Traditional Knowledge are considered together to determine if the management objectives of conserving and protecting fish and fish habitat and maintaining a viable placer mining industry are being achieved for the FHMS. However, several obstacles have hindered the AMF process for the FHMS. These issues were identified in the Implementation Status Assessment report (YPS 2018), and during the AHMP Reference Condition Approach and Model Review (DFO 2019). To address these concerns, multiple projects are being lead by Government of Yukon, DFO, and the IMG.

The IMG is in the planning stage for a technical evaluation of the AMF. This evaluation would identify issues with the design of the AMF along with proposed solutions. Following the evaluation, the responsible agencies would determine how the AMF would be modified, and changes may then be applied. IMG anticipates that this work would occur over several years, during which, management decisions would not be made using the process prescribed in the AMF. Effects monitoring would continue on an annual basis in order to detect and address concerns. Compliance monitoring would not be impacted, and would continue following existing protocols.

IMG is confident that completing this work and improving the adaptive management process would contribute to the effective management of placer mining in Yukon.

## Annual IMG Adaptive Management Meeting

On May 29, 2019 IMG's Annual Adaptive Management Meeting was held to discuss the adaptive management program. IMG members were invited to this meeting including Yukon First Nations, Council of Yukon First Nations, Fisheries and Oceans Canada, and Yukon government. Presentations included an introduction to the program and adaptive management process, and an overview and 2018 results of the Economic Health Monitoring Program, Water Quality Objective Monitoring Program, and Aquatic Health Monitoring Program. A status update on the Interim Sediment Discharge Standards was also provided.

## Literature Cited

DFO (Fisheries and Oceans Canada). 2019. Evaluation of the Reference Condition Approach for Yukon Placer Mining Monitoring. Canadian Science Advisory Secretariat Science Response 2018/053

YPS (Yukon Placer Secretariat). 2018. Implementation Status Review of the Fish Habitat Management System for Yukon Placer Mining. Summary of Findings and Recommendations.