Implementation Status Review of the Fish Habitat Management System for Yukon Placer Mining

Summary of Findings and Recommendations

Prepared by
Yukon Placer Secretariat

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Note to reader: The report was drafted in 2015. Its purpose is to inform decisions of the Joint Placer Implementation Committee and the Intergovernmental Management Group. Work to address many of the issues identified in recommendations contained in the report began as issues were identified. Processes, procedures, and policy documents have changed since this report was drafted. Prior to referencing this report you are advised to contact the Yukon Placer Secretariat for the most up to date information.

Introduction

Placer mining, which recovers gold from gravel, is one of the oldest resource development industries in Yukon, well over a century old. It plays an important role in Yukon, contributing an average of $50 million per year to the territory's economy.

Placer mining takes place in and around creeks and streams, and some aspects of the work can result in the permanent alteration or destruction of fish habitat. These activities include diverting streams, instream works (such as settling facilities, dams and dugouts), water use and sediment discharge. The *Fisheries Act* requires that projects avoid causing serious harm to fish unless authorized by the Minister of Fisheries and Oceans Canada. For that reason, placer miners are required to obtain a *Fisheries Act* authorization prior to carrying out any works that will result in the permanent alteration or destruction of fish habitat.

A variety of systems have been used since 1988 to manage the effects of placer mining on fish and fish habitat. The implementation of the current system, the Fish Habitat Management System for Yukon Placer Mining (Management System) began to be phased in during the spring of 2008. The Management System was collaboratively developed over five years by partners that included Fisheries and Oceans Canada (DFO), the Government of Yukon (YG), and the Council of Yukon First Nations (CYFN), with involvement from all 14 individual Yukon First Nations, and input from industry and other Non-Governmental Organizations (NGO). It was designed to balance the objectives of 1) conservation and protection of fish and fish habitat supporting fisheries and 2) a sustainable placer mining industry in Yukon.

The Yukon Placer Secretariat (YPS) was established to coordinate the completion, implementation and administration of the Management System. In 2015, the YPS also led a review to assess the status and effectiveness of the implementation. The review compared the actual delivery of the Management System with the original vision and direction as outlined in several key guiding documents.

In general, the review found that although the Management System was designed to be consistent with the original vision and direction, it has not been fully implemented. This document summarizes the review's findings and lists recommendations to help achieve a full and effective implementation.

The main elements of the Management System that were reviewed are Governance Structure; Watershed Authorizations; Watershed Sensitivity and Fish Habitat Suitability; Compliance Monitoring and Inspections; Operational Standards; Reclamation Standards; Traditional and Local Knowledge; Harmonized Approach to Assessment and Licensing; and Adaptive Management, including Monitoring Protocols.

In this summary, the findings regarding each of these elements are described and discussed, with additional detail found in the Table of Recommendations and in the full report.

Governance Structure

The effective application and delivery of the Management System over the long term relies on continued engagement and decision-making by multiple parties. These include DFO, YG, CYFN, First Nation governments, industry and NGOs.

The existing governance structure is an effective way to keep most parties engaged. It consists of the Joint Placer Implementation Committee (JPIC), the Yukon Placer Secretariat (YPS), the Intergovernmental Management Group (IMG), and the Yukon Placer Advisory Council (YPAC).

The Joint Placer Implementation Committee was established to provide a high level of oversight for the Management System, to give direction to YPS and IMG, and to make recommendations to decision-makers. Its membership includes senior-level representatives from DFO, YG and CYFN, who must be able to make decisions on behalf of their organization. Challenges include frequent changes in JPIC membership and the lack of JPIC terms of reference.

The Yukon Placer Secretariat is fully funded and staffed by the Yukon government. In addition to its general responsibilities described in the previous section, YPS work includes leading First Nation consultation; providing information and education (including maintaining the website www.yukonplacersecretariat.ca, and the Yukon Placer Watershed Atlas); coordinating monitoring programs and adaptive management; chairing the IMG; and maintaining working relationships with the Yukon Water Board (YWB), the Yukon Environmental and Socio-economic Assessment Board (YESAB), the Yukon Fish and Wildlife Management Board as well as its Yukon Salmon Sub-committee, and Yukon Renewable Resource Councils. A key challenge is funding. Federal funding terminated in 2009-2010 although DFO has continued to provide in-kind support as well as financial assistance on a project-by-project basis.

The Intergovernmental Management Group has representatives from DFO, the Yukon government departments of Environment and Energy, Mines and Resources, and CYFN. First Nation governments are invited to participate on the IMG when the discussions are related to the results of monitoring of watersheds in their traditional territory. The key role of the IMG is to make recommendations to address operational and implementation issues related to the Management System.

The Yukon Placer Advisory Council has not yet been established. Once it is formed, its role will be to provide a forum for NGOs to exchange information, discuss the implementation and effectiveness of the Management System, and make recommendations to JPIC or IMG. The delay in setting up this group was due to a concern from the Klondike Placer Miners' Association, which has now been resolved, and is now awaiting CYFN's agreement on the final terms of reference.

The review recommends that YPAC be established as an active party to the Management System and proposes several solutions or measures to support more effective participation from all parties involved in the system (refer to items 1 to 9 in the attached table).

Watershed Authorizations

In the past, Yukon placer mining was authorized using a "class" or "blanket" approach that covered multiple operations with one *Fisheries Act* authorization. The Management System implemented in 2008 replaced this Yukon-wide authorization with an approach that was designed to recognize the diverse environments throughout the territory.

Eighteen unique watersheds with placer mining activity were identified. Fifteen individual Watershed Authorizations were completed by 2008 and a sixteenth, Mayo River, was issued in 2010. These sixteen Watershed Authorizations allow placer miners to carry out specific works under predetermined standards on certain streams. These standards are incorporated into an integrated review and licensing process conducted by the YESAB and the YWB.

Authorizations for two watersheds (Liard River and Alsek River) were not developed, so placer miners in those areas must be issued site-specific authorizations by DFO. Work to support the development of watershed authorizations in these two watersheds is not yet complete. In the meantime to help applicants in these watersheds obtain site-specific authorizations, a draft streamlined process for requesting a site-specific review or authorization was developed. Nevertheless, the process in these two watersheds is still more complex and uncertain than in the other 16 watersheds.

It is also worth noting that amendments to the *Fisheries Act* were made in 2013. They had very little effect on the 16 existing Watershed Authorizations, but did make the conditions of the 16 authorizations and any site-specific authorizations enforceable. As well, new operations in the Liard River and Alsek River watersheds are now subject to a mandatory requirement for financial security.

The *Final Report to the Minister of Fisheries and Oceans* identified the key features necessary for implementation of the watershed authorizations. They include pre-determined standards, adaptive management to change standards, use of traditional knowledge, incorporation of the requirements of watershed authorizations into water use licences, and site-specific authorizations to be used when terms and conditions of the standard authorizations cannot be met.

These features were reviewed to assess how well implementation has gone and it was found that in general, the key features were captured by the authorizations, but some specific issues remain. For example, it was found that applicants often misunderstand or misinterpret the pre-determined standards. As well, the interim sediment discharge standards specified in some

Watershed Authorizations have yet to be changed or considered through the adaptive management process.

Ongoing work will be required to ensure the Watershed Authorizations remain relevant and useful over time. The review makes several recommendations to assist in the effective administration of the authorizations, including clarifying the pre-determined standards, and continuing to use site-specific authorizations in the Liard River and Alsek River watersheds while exploring the feasibility of other regulatory options under the *Fisheries Act*. Items 10 to 14 in the attached table describe these recommendations.

Watershed Sensitivity and Fish Habitat Suitability

The Management System uses a risk-based approach. More risk (e.g., more intensive work) is tolerated in areas that are more resilient, where the fish species and fish habitat are less sensitive to the effects of placer mining. There are more restrictions in areas where the fisheries resources are more sensitive and the habitats are highly-productive or rare.

A Fish Habitat Suitability Model was developed, using scientific and traditional/local knowledge, to classify watersheds and fish habitat areas by evaluating physical, biological, environmental and cultural values. In most watercourses, the model relied on Chinook salmon as the valued ecosystem component to predict fish habitat suitability. A combination of predictive analysis (e.g., habitat predicted to be suitable for rearing juvenile Chinook salmon based on the distance from spawning areas, stream gradient and water quality) and existing data (e.g., known salmon spawning areas and migration routes, lakes containing lake trout, areas that are inaccessible to fish) was used. The strength of the model to predict habitat suitability was validated on the ground by DFO and YG through extensive field monitoring over four years. The result was a set of Fish Habitat Suitability Maps, which use colours to represent the various fish habitat suitabilities of streams.

The maps were originally issued in 2008 and included 15 of the watersheds. A target was set to complete the maps for the remaining three watersheds (Mayo River, Liard River and Alsek River) by the end of 2009. These three watersheds contain unique fish distribution and/or species and as such additional time was required to obtain the information necessary to develop watershed maps. In the Mayo River watershed, Chinook salmon are not present upstream of the hydro-electric facility, so lake trout were selected as a valued ecosystem component instead. A system was developed to classify and manage this watershed using lake trout lakes as the basis for fish habitat suitability values. In September 2010, the Mayo River Watershed Fish Habitat Suitability Maps were finalized. As well, the Fish Habitat Suitability Model was updated in November 2010 to include the Mayo River watershed. This new classification system was applied to all watersheds where a lake trout lake is located beyond the distribution of Chinook salmon.

The Liard River Fish Habitat Suitability Model has been developed and consultation occurred from 2010 to 2012. This model uses bull trout as the valued ecosystem component, since

Chinook salmon do not naturally occur in this watershed. Currently, the one placer mining operation in this watershed is managed by a site-specific authorization. Further work to finalize the fish habitat suitability maps is on hold while the regulatory options for managing placer mining under the *Fisheries Act* in the Liard River watershed are being explored.

In the case of Alsek River, a model has not been completed due to the biological complexity and limited fish distribution data available in this watershed. Champagne and Aishihik First Nations and Environment Yukon have compiled fisheries information that may contribute to the development of an Alsek River fish habitat suitability model. This project is on hold while regulatory options for managing placer mining under the *Fisheries Act* in the Alsek River watershed are being explored.

Several changes have been made to the Fish Habitat Suitability Maps since they were first issued. Most have been due to new or more accurate data being incorporated into the model. Examples include new information regarding the extent of Chinook salmon spawning within a watercourse or a lake that was incorrectly identified as containing lake trout. The majority of these changes have been consistent with the Management System's methodology. Future amendments to the maps are expected as new information arises or errors are identified in the existing information used by the model. For that reason, a decision-making process for considering map changes has been developed and is being used. Although DFO is the decision authority for changes to the maps, this process establishes a mechanism for input by affected parties through IMG.

The Management System does not currently classify small isolated lakes, ponds, or placer dredge ponds, and so proposals for mining them are reviewed on a case-by-case basis.

The review's recommendations address how to consider changes to the Fish Habitat Suitability Maps in a manner that will ensure all corrections to the maps are consistent with the Management System's methodology. Items 15 to 20 in the attached table describe these recommendations.

Compliance Monitoring and Inspections

Compliance monitoring and inspection programs are designed to ensure that regulated activities such as placer mining are conducted in accordance with the authorizations and any applicable legislation. The programs consist of periodic visits to mine sites, ideally when activity is occurring, by officials with inspection authorities. In the case of the Management System, these inspectors are Natural Resource Officers and Senior Natural Resource Officers employed by Compliance Monitoring and Inspections (CMI) in the Department of Energy, Mines & Resources (EMR) at YG.

A proactive inspection program and reliable field presence helps to ensure that placer miners understand the rules and it increases the likelihood of achieving voluntary compliance. It also

creates the opportunity to address emerging issues or non-compliance in a timely way, through recommendations or inspector's directions. A key part of the inspection planning process is a strict Risk Assessment methodology, which allows inspectors to devote attention and resources to projects according to their relative risks, which are reviewed on an annual basis.

When the Management System was implemented in 2008, the new, more restrictive sediment discharge standards were phased in over time. By 2012 all placer mining operations had to adhere to the new more stringent discharge standards. The Management System recognizes that sediment discharges vary throughout the life of the mine so it sets out Action Levels and Compliance Levels as well as new Design Targets for settling ponds. The Action Level, which is more stringent than the Compliance Level, encourages operators to ensure that sediment discharges are lower than the Action Level under normal operations in order to minimize the risk that the Compliance Level will be reached or exceeded. Improvements to CMI's database are required to incorporate a system to collect, store and analyze data on effectiveness of the Action Level approach.

Another element of the Management System was new design and engineering standards for temporary stream channel diversions. The previous system described standards for final restoration channels, but provided limited standards for temporary channels. A challenge to implementation was the lack of an effective mechanism to incorporate the new standards into hundreds of existing water use licences which reflected the previous, less rigorous standards. The new design standards are being phased in as water use licences are amended or renewed. The number of water use licences reflecting the previous standards has been steadily declining, and will reach zero by April 2018.

A 2005 intergovernmental agreement between DFO and EMR designates the inspectors noted above as the lead enforcement officers responsible for monitoring and ensuring compliance with the watershed authorizations. Inspectors are designated under the *Fisheries Act* and DFO provides training to support these designations. The intergovernmental agreement is being revised to reflect the Management System, as well as organizational and legislative changes within DFO. Although this work was delayed because of changes to the *Fisheries Act*, which came into force in November 2013, and because of the need to engage Environment and Climate Change Canada due to its lead role under section 36 of the *Fisheries Act*, dialogue between the three parties continues To ensure effective enforcement, access to timely *Fisheries Act* training for new inspectors must be a priority for both DFO and EMR.

The review recommends several initiatives to increase industry awareness and adherence to the Action Level and the enhanced requirements for temporary diversion channels. In addition, the review recommends revisions and improvements to databases, the intergovernmental agreement and training arrangements. Items 21 to 29 in the attached table describe these recommendations.

Operational Standards

Four general categories of placer mining activity require authorizations under the *Fisheries Act*: water acquisition, sediment discharges, stream channel diversion, and other instream works. A Workbook developed as part of the Management System describes the Operational Standards for each type of activity in each habitat suitability type. In general, there are more stringent standards in habitats of higher sensitivity and more relaxed standards in less sensitive habitats. The Workbook is used by placer miners to develop their mining plans and complete their applications to work under the watershed authorizations. It is also used by regulators and inspectors to ensure that proposed and operating placer mines conform to the requirements of the Management System.

In areas where placer mining has never occurred, the Operational Standards are the same as the Reclamation Standards (see next section). Areas where placer mining had already taken place were given a "previous development" designation. This recognizes that areas that were mined in the past and were not restored to modern day standards typically have lower habitat suitability due to their impacted state. Operators are therefore permitted to mine in these previously developed areas under the standard associated with a lower habitat suitability. The "previous development" designation also recognized areas economically important to the industry.

The Operational Standards are administered through the YWB. Terms and conditions of all placer mining water use licences reference the Management System's Operational Standards established by the Watershed Authorizations and Workbook. Placer miners referring to these standards can request advice and assistance from both YWB and YPS.

The Operational Standards came into effect and have been incorporated into all new placer mining licences as well as all licence renewals and amendments issued since April 2008. Phasing in of the new sediment discharge standards for placer mining operations with existing licences was completed by the 2010 operating season, with the exception of the Mayo watershed, which was completed by 2012. The last water use licence reflecting the old Operational Standards will expire or be replaced through renewal or amendment by April 2018.

For the most part, implementation of Operational Standards has conformed to the guidance provided by the Workbook for new water use licences. However, there have been challenges tracking implementation on the ground. In addition, because some water use licences do not include all the specific Operational Standards, but instead reference the appropriate section of the Workbook, it can be challenging for inspectors to identify the standards for each mine site.

The Workbook was intended to serve as a user-friendly guide to help placer miners understand the Operational Standards and complete their licence applications. In spite of revisions made in 2016, this document is still relatively complicated.

The phased approach to implementing the Operational Standards has resulted in challenges in tracking locations where the standards apply and determining the effectiveness of the

enhanced standards. This information is essential to support an assessment of the effectiveness of the Management System.

Several recommendations have been made to assist in determining whether the Operational Standards are being effectively applied on the ground. This includes developing a process to ensure inspectors and operators have a clear understanding of the standards that apply, and developing a systematic approach to tracking and reporting adherence to the standards. Items 30 and 31 in the attached table describe these recommendations.

Reclamation Standards

Reclamation Standards are required to offset the impacts on fish and fish habitat resulting from placer mining operations. The standards for all habitat suitability types are described in the Workbook. As well, the YWB has discretion to require additional reclamation.

The “previous development” designation (discussed in the previous section), does not influence the Reclamation Standards. Reclamation Standards will always be based on the fish habitat suitability that is predicted by the Fish Habitat Suitability Model, regardless of whether or not the stream was mined in the past.

In many cases, water use licences refer to the Workbook rather than specifying reclamation requirements. As such, licencees and inspectors must refer to the Workbook to understand specific restoration requirements.

As in the case of Operational Standards, Reclamation Standards came into effect and have been incorporated into all new placer mining licences as well as all licence renewals and amendments issued since April 2008. The new design standards are being phased in as water use licences are amended or renewed. The number of water use licences reflecting the previous standards has been steadily declining, and will reach zero by April 2018.

A comprehensive analysis of whether or not activities on the ground conform to the new Reclamation Standards was not completed for this review as the inspection database does not support this type of query. For example, the mining inspection database does not currently track, store or facilitate the analysis of reclamation data, nor is there the ability to provide this information for display through the Yukon Placer Watershed Atlas.

The review recommends that CMI should improve several aspects of its inspection database and procedures to support capturing and presenting information on reclamation data, including details on permanent diversion channels. In the case of areas of “previous development”, where reclamation has resulted in the restoration of historically mined areas, these records will help track what could be regarded as net gain in fish habitat. It will also support decisions to remove the “previous development” designation, where reclamation work meets the required standard. Items 32 and 33 in the attached table describe these recommendations.

Traditional and Local Knowledge

Traditional Knowledge refers to the unique knowledge held by First Nations and First Nation people because of their traditional use of and familiarity with the land, water, wildlife and environment. It is an essential part of the Management System because Traditional Knowledge holders have provided information that was not obtainable through scientific inquiry. This knowledge also helps ensure culturally or traditionally important areas are recognized by the Management System.

The Management System has been informed by Traditional Knowledge despite challenges in obtaining it. Prior to the completion of the Management System, CYFN organized a workshop where both Federal and Territorial government officials met with representatives of most Yukon First Nations to learn about the sources, complexities and sensitivities related to the ownership, gathering, storage and use of Traditional Knowledge.

YPS built on this experience by holding "pre-consultation" meetings with all fourteen Yukon First Nations. The meetings were designed to establish how each First Nation government preferred to be engaged in the YPS consultation program, especially with regard to sharing Traditional Knowledge.

In addition, CYFN and YPS co-applied for Northern Strategy Trust funding for a project to solicit Traditional Knowledge from First Nations. However, a competing application to the Northern Strategy Trust had come from CYFN's heritage group to develop guidelines for the ownership, collection, storage and use of Traditional Knowledge. The group advised First Nations not to cooperate with initiatives such as the one YPS was proposing until the guidelines were in place. For this reason, the CYFN/YPS project did not proceed. This experience illustrates the challenges related to collecting and using Traditional Knowledge.

Ultimately, eight First Nation governments held Traditional Knowledge workshops in their communities. Six submitted written reports and annotated maps; two informed YPS they would not submit a report unless it was necessary due to activities within their traditional territory.

The sensitive nature of Traditional Knowledge was addressed in the Watershed Authorizations and Fish Habitat Suitability Maps by designating specific stream areas as Areas of Special Consideration (ASC), even when the identified value was located in only one part of the area. First Nation governments were assured that the detailed knowledge underlying this designation would not be voluntarily revealed. Instead, Traditional Knowledge will only be used for the purposes agreed to with the First Nation. That said, YPS informed all First Nations that the Yukon and federal governments must comply with federal and territorial access to information legislation.

The Watershed Authorizations give each ASC a sediment discharge standard and allow only a very limited amount of work around an ASC.

The *Adaptive Management Framework* (discussed further in the last section of this summary) describes how Traditional Knowledge will be considered annually along with the results of effects monitoring. Each autumn the YPS writes to all Yukon First Nation governments with placer mining in their traditional territory to request Traditional Knowledge that may inform the management of placer mining in their traditional territory. First Nation representatives have participated in the annual Adaptive Management meetings but to date no additional Traditional Knowledge has been shared as a result of the annual request.

The review makes recommendations that address the collection of Traditional Knowledge. In general, in consultation with First Nation governments, YPS will consider more effective means to seeking traditional knowledge on an annual basis. Items 34 and 35 in the attached table describe these recommendations.

Harmonized Approach to Assessment and Licensing

The *Record of Agreement* that guided development of the Management System stated that a "harmonized, efficient and timely approach to regulation of placer mining including licensing, application, inspection and monitoring" would be a feature of the new system. This meant it must be compatible with several pieces of legislation, including the *Waters Act*, the *Placer Mining Act* and the *Yukon Environmental and Socio-economic Assessment Act* (YESAA).

This was accomplished by consulting with the YESAB while its process was being developed and implemented, and by consulting with the YWB and securing support for continuing and adapting partnerships established under previous placer management regimes. However, challenges remain in terms of resolving confusion over some issues.

Environmental and socio-economic assessments make recommendations and are usually conducted by one of six Designated Offices under YESAB, with the final decision made by a Decision Body, generally the regulator. In the case of a placer operation requiring a water use licence and a mining land use approval, EMR is the Decision Body, but the YWB issues water use licences and approves placer mining land use operating plans.

YPS worked with YESAB to make it possible for the water use licence applications and placer mining land use operating plans to be submitted as part of a YESAA project proposal. The YWB also agreed to ensure that the Management System's standards are included in the terms and conditions of water use licences.

These arrangements work well when a placer mining project fits within one of the 16 Watershed Authorizations, but are more challenging when a site-specific review is required. Revisions to the *Fisheries Act* in 2013 resulted in changes to terminology and procedures, which applicants must take into account in a site-specific review. DFO and YPS developed guidance to assist applicants in this situation.

After the implementation of the Management System in 2008, DFO and YG were to develop a "conformity check" process by 2009, to ensure project proposals conform to the applicable watershed authorization. A draft process was developed in 2008 but was never implemented. Several conformity check processes have been tried, with work being done by DFO, CMI and/or YPS. The conformity checks are currently being completed by the YPS and are time-consuming and have sometimes resulted in challenges meeting YESAB's timelines. It may be possible for some elements of the conformity checks to be done through an automated process that would flag issues and speed up the process.

An audit of the conformity check process, completed by DFO in 2015, concluded that the current process successfully meets the goal of identifying projects for which DFO should be a Decision Body (i.e. projects that do not conform to Watershed Authorizations). However, another goal (to identify and correct mistakes, misunderstandings and misinterpretations in licence applications to ensure all parties clearly understand the operational and reclamation requirements at each mine site) was not being achieved approximately 70 % of the time. DFO recommended CMI incorporate several actions to remedy this problem. The conformity check audit will continue on an annual basis to verify that the problem is addressed.

During the review process for placer mining proposals, the Management System's Workbook is used by multiple parties, such as YESAB, First Nation governments, the YWB, and industry. There have been many examples where the Workbook has been misinterpreted and has led to the kind of confusion noted in the DFO audit described above.

Water use licences no longer include detailed requirements from the Workbook such as dimensions for diversion channels, fish habitat features or riparian setback distances. Instead they state that the project must comply with the Workbook. As a result, inspectors and licencees must consult the Workbook to determine what is allowed at a particular mine.

A number of recommendations were made to reduce confusion amongst the various parties involved in the review process for placer mining proposals. These include clarifying processes, introducing a digitized tracking system for proposed projects, and exploring automation to assist in conformity checks. In addition, since all governments and agencies in Yukon experience staff turnover, it is recommended that YPS and its partners maintain efforts to keep relevant parties informed about the Management System. Items 36 to 40 in the attached table describe these recommendations.

Adaptive Management

Adaptive Management is a systematic approach for continually improving management policies and practices by learning from experience. In the context of the Management System, Adaptive Management involves the monitoring of water quality objectives, aquatic health, and economic health. The results are used to assess how the Management System is performing and inform changes over time.

The Management System's *Adaptive Management Framework* was finalized in 2008. It sets out how information from the three monitoring programs and Traditional Knowledge will be reviewed and considered. It also guides the development of recommendations for changes that may be required.

YPS coordinates the adaptive management process and facilitates economic health monitoring with participation from EMR. DFO and Environment Yukon conduct aquatic health monitoring, and CMI conducts water quality monitoring. All three monitoring programs report annually.

The review showed that the Adaptive Management Framework (AMF) fully encompasses direction given when the Management System was being developed. The AMF references elements such as compliance and effectiveness monitoring, what the monitoring programs should include, and when the need for change should be considered. The review also identifies the challenges encountered. These include the lack of a process to consider the results of all three monitoring programs together, as well as the lack of a performance evaluation after 3 to 5 years of monitoring. The latter has not been done because placer mine licences currently include a mix of pre and post-Management System standards, and it will be a number of years before enough data is available to assess the effectiveness of the new standards. Finally, a process for tracking development and restoration activities has not been completed and is necessary to inform Adaptive Management.

The AMF sets out eleven questions that the monitoring programs are designed to answer. The review found that only six have been answered on an annual basis. Information gaps exist to fully answer questions from the results of water quality and aquatic health monitoring. More information about the extent and type of placer mining activities taking place must be incorporated into the analysis in order to relate the results to the effectiveness of the Management System. Some required information may be available from existing sources, while some information may require additional resources to collect. This should be considered in CMI's enhancements to their data management systems.

The longer the Management System is in place, the more comprehensive and complex the monitoring data set will become. Effective Adaptive Management will require YPS to provide strong leadership, coordination and data management. IMG partners can also expect increased workload to carry out monitoring, compilation and analysis of data.

The three monitoring programs are guided by monitoring protocols, which were reviewed and analyzed for this report.

The Aquatic Health Monitoring Protocol, which guides the collection of field data to assess the condition of watercourses exposed to placer mining, was generally found to be followed consistently each year. However, the review has identified the need for additional methodology and data to enable monitors to determine relationships between the level of placer activity and the condition of watercourses. Because these improvements may require significant increases

in monitoring, the feasibility of this will need to be carefully considered. A revised draft of the protocol was produced to address all other minor editorial and process issues found in the review.

The Water Quality Objectives Monitoring Protocol was generally followed consistently each year. However, it was found that there were fewer habitat suitabilities throughout some main stems and tributary streams than anticipated when the protocol was being developed. Monitoring sites were established to coincide with any habitat suitability change point but also spatially distributed along the watercourse to better characterize the stream and capture any noticeable variations occurring in the water quality. Overall, departures from the protocol tended to be enhancements, such as the deployment of portable weather stations for atmospheric rain and temperature monitoring at sampling sites, flow and water level monitoring at sampling sites and the use of additional automated sampling equipment whenever practical or possible.

A somewhat different practice was established rather than what was set out in the Economic Health Monitoring Protocol. Following consultation, a decision was made to do a panel survey of industry every year. As well, membership of the survey panel was different from that suggested in the protocol. In practice, membership was dictated by who was available and willing to take part, rather than size of operation, location, stream classification or number of years in the industry.

Adaptive Management requires a long-term commitment to monitoring and reporting. All relevant agencies must be engaged and committed to delivering it effectively.

The delayed performance evaluation is the most notable departure from the AMF. Provided the data needed to facilitate performance evaluations is obtained, and all parties remain committed to the process, Adaptive Management should be an effective way to make adjustments to the Management System.

The review recommended many actions necessary to facilitate adaptive management. Implementing these recommendations will require the YPS to collaboratively develop and enhance databases and systems to manage, integrate and analyze complex and growing data sets. As such, a critical recommendation is that the current structure and duties of the YPS be considered to determine if it has the capacity to effectively coordinate adaptive management. Items 41 and 54 in the attached table describe the recommendations related to adaptive management.

In Conclusion

The Fish Habitat Management System for Yukon Placer Mining was designed to be an integrated regulatory process to manage the effects of placer mining on fish and fish habitat in

Yukon watersheds, and was developed in partnership by Fisheries and Oceans Canada, the Yukon government, and the Council of Yukon First Nations. This review found that some outstanding work and challenges remain to achieve full implementation. To address these, a series of recommendations are suggested for each main element of the Management System.

The recommendations can be found in the attached table, along with an indication of each recommendation's priority, lead agency and status.

For more detailed information, please contact the Yukon Placer Secretariat:

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Web Links

Below is a list of web links found throughout this summary:

Adaptive Management Framework:
http://www.yukonplacersecretariat.ca/pdf/adaptive_mgmt_framework_nov08.pdf

Aquatic Health Monitoring Protocol: http://www.yukonplacersecretariat.ca/infocentre.html

Compliance Monitoring and Inspections: http://www.emr.gov.yk.ca/cmi/

Council of Yukon First Nations: www.cyfn.ca

Fisheries and Oceans Canada: www.dfo-mpo.gc.ca

Economic Health Monitoring Protocol: http://www.yukonplacersecretariat.ca/infocentre.html

Final Report to the Minister of Fisheries and Oceans:
http://www.yukonplacersecretariat.ca/pdf/yukon_placer_regime_final_report(1).pdf

Fish Habitat Management System for Yukon Placer Mining:
http://www.yukonplacersecretariat.ca/infocentre.html

Fish Habitat Suitability Maps: http://www.yukonplacersecretariat.ca/maps.html

Fish Habitat Suitability Model: http://www.yukonplacersecretariat.ca/maps.html

Government of Yukon: www.gov.yk.ca

Fisheries Act: http://laws-lois.justice.gc.ca/eng/acts/f-14/

Klondike Placer Miners' Association: www.kpma.ca

Placer Mining Act: http://www.gov.yk.ca/legislation/acts/plmi_c.pdf

Yukon Salmon Sub-committee: http://www.yssc.ca/

Traditional Knowledge: http://www.yukonplacersecretariat.ca/traditionalknowledge.html

Water Quality Objectives Monitoring Protocol:
http://www.yukonplacersecretariat.ca/infocentre.html

Waters Act: http://www.gov.yk.ca/legislation/acts/waters.pdf

Watershed Authorizations: http://www.yukonplacersecretariat.ca/placer_authorizations.html

Watershed Authorizations and Workbook:
http://www.yukonplacersecretariat.ca/infocentre.html

Yukon Environmental and Socio-economic Assessment Act: http://laws-lois.justice.gc.ca/eng/acts/Y-2.2/

Yukon Environmental and Socio-economic Assessment Board: www.yesab.ca

Yukon Fish and Wildlife Management Board: http://yfwmb.ca/

Yukon Placer Secretariat: www.yukonplacersecretariat.ca

Yukon Placer Watershed Atlas: http://www.yukonplacersecretariat.ca/placer_atlas.html

Yukon Renewable Resource Councils: http://yfwmb.ca/renewable-resource-councils/

Yukon Water Board: www.yukonwaterboard.ca

Acronyms

Below is a list of acronyms use throughout this summary and in the attached table of recommendations:

AMF Adaptive Management Framework
CMI Compliance Monitoring and Inspections Branch
CYFN Council of Yukon First Nations

DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EMR	Energy, Mines and Resources, Yukon Government
ENV	Environment Yukon, Fish and Wildlife Branch, Yukon Government
IMG	Intergovernmental Management Group
JPIC	Joint Placer Implementation Committee
NRO	Natural Resource Officer
YESAB	Yukon Environmental and Socio-economic Assessment Board
YG	Yukon Government
YPAC	Yukon Placer Advisory Council
YPS	Yukon Placer Secretariat
YWB	Yukon Water Board

Implementation Status Review of the Fish Habitat Management System for Yukon Placer Mining – Recommendations

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
Governance					
1)	YPS will adopt and continually update the draft *Governance Structure for the Fish Habitat Management System for Yukon Placer Mining.*	Medium	YPS	IMG	Ongoing
2)	YPS to ensure effective briefings for JPIC including provision of the draft *Governance Structure for the Fish Habitat Management System for Yukon Placer Mining* to newly appointed JPIC members.	High	YPS	N/A	As required
3)	Create Terms of Reference for JPIC and IMG.	High	YPS	JPIC	In progress
4)	YPS will continue to develop and maintain the SharePoint site for use by the IMG.	Low	YPS	IMG	Complete and ongoing
5)	Get JPIC approval to remove signature block from YPAC Terms of Reference.	Low	YPS	JPIC	In progress
6)	Establish YPAC as an active party to the Management System.	Low	YPS	JPIC	Pending Awaiting finalization of Terms of Reference for YPAC
7)	Maintain the current governance structure and sustain level of engagement by all parties to minimize impact on effective and timely decision-making from	Medium	JPIC (IMG)	JPIC	Ongoing

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
	challenges arising from changes in organizational priorities, structure, resources, and staff.				
8)	Member groups ensure JPIC representatives are at a senior level (at least one level above IMG representative) and can make decisions on behalf of their organizations.	High	JPIC	JPIC	Ongoing
9)	Explore options for sufficient consistent funding for YPS.	Medium	YG	JPIC	Ongoing
Watershed Authorizations					
10)	The interim sediment discharge standards included in the watershed authorizations must be considered in the context of adaptive management, as subject to the results of monitoring, especially water quality monitoring.	High	CMI (IMG)	JPIC / DFO	In progress CMI Water Quality staff are reviewing and analysing the effluent discharge sample results to inform a decision on the interim sediment discharge standards.
11)	Ongoing work is necessary to ensure understanding of the standards in the watershed authorizations, which may include improvements to existing tools and guidance documents, and direct communication with operators in relation to specific applications.	Medium	YPS (DFO/CMI)	IMG	In progress A new version of the workbook was published in 2016. See also recommendation 30 and 40.

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
12)	YPS, DFO and CMI should meet annually, or as required, with the various parties involved in the YESAB and YWB processes to discuss what is working well and identify areas for improvement, including reviewing terms and conditions which should be included in water use licences.	High	YPS (DFO/CMI)	N/A	Ongoing
13)	The draft guidance for requesting a site-specific review or authorization in the Liard River and Alsek River watersheds should be implemented and updated over time as efficiencies and improvements are identified.	Medium	YPS	DFO	Complete and ongoing
14)	IMG should consider the feasibility of all regulatory options when exploring the most effective regulatory process for managing placer mining under the *Fisheries Act* in the Liard River and Alsek River watersheds.	Medium	YPS	DFO	In progress
Watershed Sensitivity and Fish Habitat Suitability					
15)	Further work to develop and or implement the Liard River and Alsek River classification systems should not be undertaken until the regulatory process for managing placer mining in these watersheds has been identified.	Medium	DFO / ENV	IMG	Not initiated Pending the outcome of recommendation 14.

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
16)	Prior to designating Lynx Creek as an area of special consideration, JPIC should be provided with an updated briefing, due to length of time since original recommendation.	High	YPS	JPIC	In progress
17)	IMG should consider incorporating a classification system for small isolated lakes, ponds and placer dredge ponds into the methodology.	Low	DFO	IMG	Not initiated
18)	CMI and DFO need to maintain an in-depth understanding of the classification Methodology, Model and Maps; the Geomatics Specialist at CMI currently manages the Model but DFO has to be prepared to provide financial support for maintenance and upgrades to the Model.	High	CMI / DFO	YG / DFO	Ongoing
19)	IMG must maintain a thorough understanding of the Methodology, Model and Maps to ensure all corrections to the maps are consistent with the Methodology.	High	DFO (IMG)	N/A	Ongoing
20)	The Methodology should be updated to reflect the new system for classifying tributaries to lake trout lakes.	High	DFO	IMG	Complete Pending approval of updated Methodology by IMG
Compliance Monitoring and Inspections					

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
21)	CMI should improve reporting on adherence to the Action Level by ensuring that water samples are taken and tested on site every time settling facilities are discharging during an inspection.	High	CMI	N/A	Ongoing
22)	In order to evaluate adherence to the Action Level, CMI should continue to educate operators on the importance of completing and submitting annual reports that contain accurate information.	High	CMI	N/A	Ongoing
23)	CMI should continue to modify the database designed to record and report on placer mining inspections in order to track the establishment and required replacement of seasonal and temporary diversion channels.	High	CMI	N/A	Ongoing Work is underway to plan and implement enhancements to the existing database as an interim measure until the old system can be replaced with a needed up-to- date system. In addition, an enhanced inspection form for permanent diversion channels will be field tested in the 2017 field season. Work was delayed in 2016/2017 due to limited qualified database development / maintenance technical support.

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
					See also recommendations 29, 31, 32, 33 and 43
24)	Efforts should continue to revise the intergovernmental agreement so that it properly describes the roles and responsibilities following revisions to the *Fisheries Act*, changes to DFO's organizational structure and implementation of the Management System, and should reflect modern developments in the context of records management and reporting.	High	DFO/CMI (ECCC)	DFO & EMR	Ongoing
25)	Environment and Climate Change Canada (ECCC) should be included in the revised intergovernmental agreement to ensure that NROs can address issues related to the deposit of deleterious substances.	High	DFO/CMI (ECCC)	DFO & EMR	Ongoing CMI NROs who had section 36 designations (deleterious substances) prior to 2014 continue to exercise this authority.
26)	EMR and DFO should ensure timely access to training necessary to qualify NROs for inspector designations pursuant to the *Fisheries Act*.	Medium	DFO/EMR	DFO	Ongoing
27)	Consideration should also be given to designating NROs as a class under the *Fisheries Act* and agreeing by policy or in the revisions to the intergovernmental	Low	DFO	DFO	Not initiated Current process for designations is functional. This recommendation

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
	agreement that inspection powers are not exercised until the respective training courses are successfully completed.				would ease administrative process but is not critical to delivering service.
28)	Ensure sufficient resources are in place to adequately monitor and inspect placer mining sites with attention to the requirements of the Management System.	High	CMI	YG	Ongoing
29)	Resource CMI with an appropriate level of data management capacity in order to manage, assess and report on compliance of individual operators and industry, based on the Management System. E.g. Action level and standards for diversion channels (i.e. length, duration of use, design standards and location).	High	EMR	YG	Ongoing Work was delayed in 2016/2017 due to limited qualified database development / maintenance technical support. See also recommendations 23, 31, 32, 33 and 43
Operational Standards					
30)	CMI should develop a process to ensure the NROs and operators have a clear and common understanding of all the Operational Standards described in the Workbook which are applicable to the placer mining operation.	Medium	CMI (DFO/YPS)	N/A	Ongoing See also recommendation 11 and 40.

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
31)	CMI should also implement a systematic approach to tracking and reporting adherence to the Operational Standards, including: ○ The status of diversion channels to ensure that seasonal diversions are replaced before the end of an operating season, and temporary diversions are replaced within five years; ○ The size and status of vegetation clearing and subsurface works completed within the riparian zones; ○ Verification that the use of instream settling and the use of the stream channel as a conduit is limited to those areas where the valley width constraints provide no other alternative.	High	CMI	N/A	Ongoing Work on enhancements to inspection forms and database is underway. Work was delayed in 2016/2017 due to limited qualified database development / maintenance technical support. See also recommendations 23 , 29, 32, 33 and 43
Reclamation Standards					
32)	CMI should continue to modify its inspection database so that information related to the achievement of Reclamation Standards is entered into fields that can be queried; this would allow CMI to report on specific	High	CMI	N/A	Ongoing Work was delayed in 2016/2017 due to limited qualified database

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
	categories of inspection results (e.g. industry-wide compliance with Reclamation Standards).				development / maintenance technical support. See also recommendations 23, 29, 31, 33 and 43
33)	CMI should develop procedures for capturing and presenting specific information related to the construction of permanent diversion channels.	High	CMI		Ongoing Inspection report form gathering enhanced information for permanent diversion channels developed and to be field tested in the 2017 season Training to be provided early in the 2017 field season See also recommendations 23, 29, 31, 32 and 43
Traditional and Local Knowledge					
34)	YPS should review its process of annually seeking "new" traditional knowledge; it should also poll First Nation governments to learn why there has been no response to the annual letter requesting new	Medium	YPS (IMG)	IMG	Not initiated

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
	traditional knowledge and what alternatives might be more efficient.				
35)	Following these steps IMG may consider adopting a new approach to seeking traditional knowledge (e.g. working more closely with the Heritage section of each First Nation government, or holding periodic workshops with either individual or multiple First Nations).	Medium	YPS (IMG)	IMG	Not initiated
Harmonized Approach to Assessment and Licensing					
36)	The draft process for requesting a site-specific review should be implemented and made available upon request to the YPS.	High	DFO	DFO	Complete
37)	To ensure a clear understanding of the requirements for a project, all efforts should be made to identify any misclassifications of habitat type, missing information and/or non-conforming activities during the application review process.	High	YPS/CMI/ DFO	DFO	Complete and ongoing A conformity check process has been developed and implemented. DFO completes an annual conformity check audit to assess the effectiveness of the conformity checks and provide

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
					recommendations for improvements where necessary.
38)	CMI should develop a digitized system to assist the YPS in tracking projects from the proposal stage through licensing; programming will also automate the delivery of messages to NROs at relevant stages of the process.	High	CMI	CMI	Not initiated
39)	DFO and CMI should explore the development of an automated process to assist in conformity checks, which could flag elements that do not conform and/or would allow resources to be focused on addressing those elements of a project proposal or application.	Low	DFO/CMI	DFO/ CMI	Not initiated
40)	YPS should maintain efforts to inform relevant parties about the Management System by making presentations on a frequent basis.	High	YPS(IMG)	N/A	Ongoing See also recommendation 11 and 30.
Adaptive Management					
41)	Consider the current structure and duties of the YPS to determine if it has the capacity to effectively coordinate adaptive management, including compiling and analyzing monitoring data.	HIGH	CMI	YG	Ongoing

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
42)	Consideration should be given to the merit and feasibility of adjusting the aquatic health monitoring program as recommended by the scientific consultants who reviewed the aquatic health monitoring data in 2015.	High	DFO/ ENV (IMG)	IMG	In progress Implementation of consultant's recommendations will require significant additional time and funds to deliver. JPIC approval would be necessary.
43)	Develop a system to integrate information regarding all placer mining activity with monitoring data to inform interpretation of monitoring results.	High	YPS (IMG)	IMG	Not initiated See also recommendation 23, 29, 31, 32, and 33
44)	Develop a method for tracking restored areas and removal of Previous Development designation.	High	YPS (CMI)	IMG	Not initiated
45)	Develop a definition for historically mined streams in the context of adaptive management.	Low	YPS (IMG)	IMG	Not initiated
46)	Consider monitoring options to identify and quantify non-point source contributions of sediment from placer mines to inform appropriate action.	High	CMI (IMG)	CMI	In progress A comprehensive review of water quality monitoring data from intensively mined areas has been initiated to inform monitoring options.
47)	Develop methods to carry out follow-up assessments for sites that have been found to be out of reference.	High	DFO (ENV)	IMG	Not initiated

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
					See also recommendation 42.
48)	Consider methods to assess the aquatic health in large rivers.	Low	DFO (ENV)	IMG	Not initiated
49)	Consider methods to assess aquatic health in lakes supporting lake trout.	Medium	ENV (DFO)	IMG	In progress
50)	Establish criteria to make conclusions as to whether or not monitoring results can be attributed to placer mining.	High	IMG	IMG	Not initiated
51)	Determine if criteria can be developed to draw conclusions about aquatic health at the watershed scale using the reference condition approach.	High	IMG (DFO/ENV)	IMG	Not initiated See also recommendation 42.
52)	A performance evaluation should be completed after all the new standards have been fully implemented and there is sufficient data available to support an evaluation.	High	IMG/YPS	IMG	Not initiated All licences will reflect the Management System's standards after April 2018.
53)	Revisit the Step 1 indicators in the *Economic Health Monitoring Protocol* to examine the rationale for utilizing both the number of mines in production and the number of mines with active water use licences; consideration may be given to replacing one indicator.	Low	YPS (IMG)	IMG	Not initiated
54)	Determine whether to continue proceeding automatically to Step 2 of the *Economic Health*	Low	YPS (IMG)	IMG	Not initiated

Item #	Recommendation	Priority (low, medium, high)	Lead (Support)	Decision Authority	Status (e.g. in progress, complete)
	Monitoring Protocol (i.e. a Panel Survey of operators) regardless of the outcome of Step 1.				