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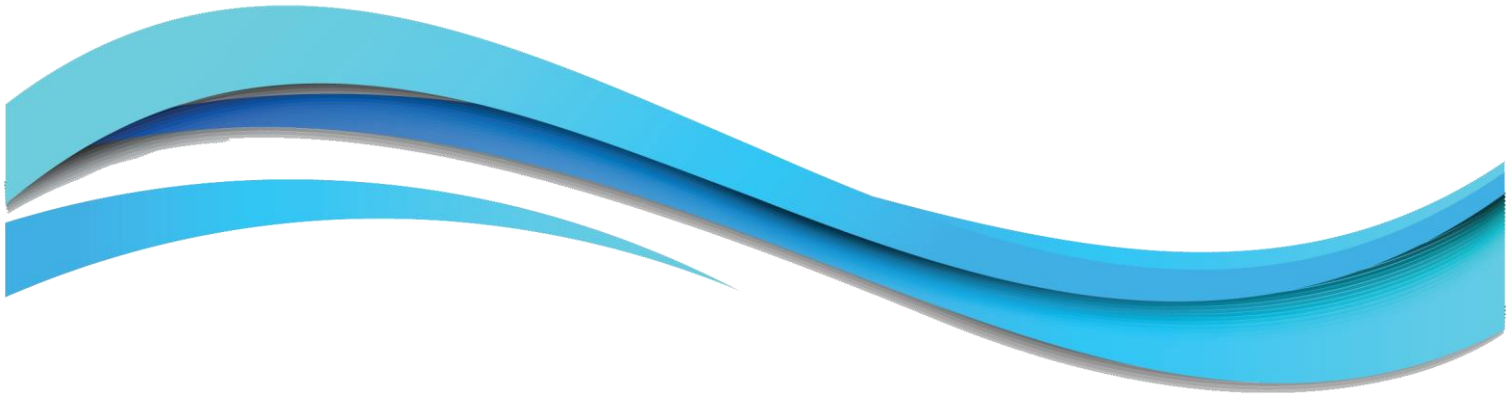

RISK MANAGEMENT FRAMEWORK

Overview

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Risk Management Framework Overview

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OBJECTIVE AND SCOPE OF THIS DOCUMENT

This overview is intended to describe the Fish and Fish Habitat Protection Program (FFHPP)'s Risk Management Framework (RMF) and to:

- Confirm Fisheries and Oceans Canada (DFO)'s continued reliance on evidence-based risk management to make decisions related to the administration of the fish and fish habitat protection provisions of the *Fisheries Act*, and to related provisions of the *Species at Risk Act*.
- Refresh the way that terminology and process steps in the RMF are described based on experience in managing risk related to the conservation and protection of fish and fish habitat, and international standards for risk management.
- Set the foundation for further conversations and additional departmental guidance on managing risk, standardizing decision-making processes, and using risk management to inform program activities to conserve, protect and restore fish and fish habitat in regulatory and non-regulatory contexts and to contribute to the survival and recovery of aquatic species at risk.

INTRODUCTION

The Fish and Fish Habitat Protection Program (previously known as the Fish Habitat Management Program and the Fisheries Protection Program) has been applying a risk-based approach when reviewing proposed development projects in or near water for over two decades. Over that time, much has been learned about how to better apply risk management concepts to the protection and management of aquatic ecosystems. The RMF has evolved by combining the successful elements of past approaches with modern, internationally recognized risk management principles and practices.

The changes made to the *Fisheries Act* in 2019 were designed to ensure long-term sustainability of Canada's aquatic resources and to provide certainty for Indigenous Peoples, partners, and stakeholders. The Fish and Fish Habitat Protection Policy Statement (August 2019) signaled that the Department would continue to apply a risk-based approach when managing its regulatory responsibilities related to works, undertaking and activities (herein referred to as "projects") in or near water. The FFHPP RMF provides a structure from which to determine what regulatory or non-regulatory instrument to apply to individual project proposals, as well as a structure from which to develop guidance, instruments and tools for managing risk. In general, FFHPP applies a risk-based approach when :

- administering responsibilities under the fish and fish habitat protection provisions of the *Fisheries Act*;
- protecting and providing for the survival and recovery of aquatic species at risk listed as endangered, threatened or extirpated on Schedule 1 of the *Species at Risk Act* (with the exception of individuals in or on federal lands administered by the Parks Canada Agency) by applying its prohibitions against: killing, harming, harassing, capturing or taking listed aquatic species at risk; damaging or destroying

their residences; or, destroying their critical habitat, and the issuance of permits; and
- preventing the spread or introduction of aquatic invasive species in collaboration with the National Aquatic Invasive Species Program through the administration of the *Aquatic Invasive Species Regulations*.

The FFHPP continues to update its RMF to integrate international best practices, address feedback received from Indigenous Peoples, partners and stakeholders, and incorporate lessons learned through the ongoing implementation of the fish and fish habitat protection provisions of the *Fisheries Act,* as amended in 2019. This work contributes to meeting DFO's commitments to the protection of fish and fish habitat, the continuous improvement of regulatory and non-regulatory processes, and governing with openness, effectiveness, and transparency[1].

It is important to note that FFHPP cannot manage all risk to fish and fish habitat as they are threatened by multiple and interrelated factors such as habitat degradation and modification, aquatic invasive species, overexploitation of fish, pollution, and climate change. These threats are beyond the control of any single regulatory body and can accumulate and have unforeseen or unpredictable consequences to fish and fish habitat. Therefore the program's objective to conserve, protect, and restore fish and fish habitat can only be achieved by working with various partners dedicated to the conservation, protection, and restoration of fish and fish habitat, including provincial and territorial partners, other federal departments, Indigenous Peoples, wildlife management boards, industry, stakeholders, and Canadians at large. The sharing of knowledge and tools through area-based planning initiatives is instrumental to the management of cumulative pressures and making informed, risk-based decisions guided by the RMF.

Actively seeking the perspectives and knowledge of Indigenous Peoples is critical to ensure that rights are protected as the framework is applied and related guidance, instruments and tools are developed and implemented. This involves engaging with Indigenous communities to understand their traditional knowledge, which provides valuable insights into fish behaviour, habitat conditions, and historical changes that may not be captured by conventional scientific methods. By engaging and consulting with Indigenous Peoples, the RMF can be a strong tool to make evidence-based decisions related to the administration of the fish and fish habitat protection provisions and to the survival and recovery of aquatic species at risk. The RMF supports a Two-Eyed Seeing approach, which means seeing from one eye with the strength of Indigenous knowledge and ways of knowing, and from the other eye with the strengths of Western knowledge and science. Advancing reconciliation with Indigenous Peoples through renewed, nation-to-nation, government-to-government, and Inuit-Crown relationships based on recognition of rights, respect, co-operation, and partnership is the foundation for transformative change.

RISK MANAGEMENT FRAMEWORK

What is risk management for fish and fish habitat protection?

Risk management defined

Risk management is a systematic approach to setting the best course of action when the end result is uncertain or unknown by identifying, analyzing, evaluating, treating, and communicating risk issues. Risk can be expressed as the likelihood and consequence of an event with the potential to affect the achievement of a specific objective[2]. Through the process of reviewing proposed development projects in or near water (known as the regulatory review process), FFHPP identifies pressures on fish and fish habitat that are likely to result from works, undertakings and activities in or near water, and assesses the severity and likelihood (or probability) of their consequences as they relate to the program's ability to meet its objective to **conserve, protect and restore fish and fish habitat.**

The RMF (Figure 1) outlines a structured approach to managing risk to fish and fish habitat that is informed by science and Indigenous knowledge, while integrating internationally recognized risk management practices and principles. It is also embedded within a continuous improvement process. The ongoing improvement of this systematic and standardized approach to managing risk is expected to improve the predictability and efficiency of the decision-making process, while respecting the rights of Indigenous Peoples.

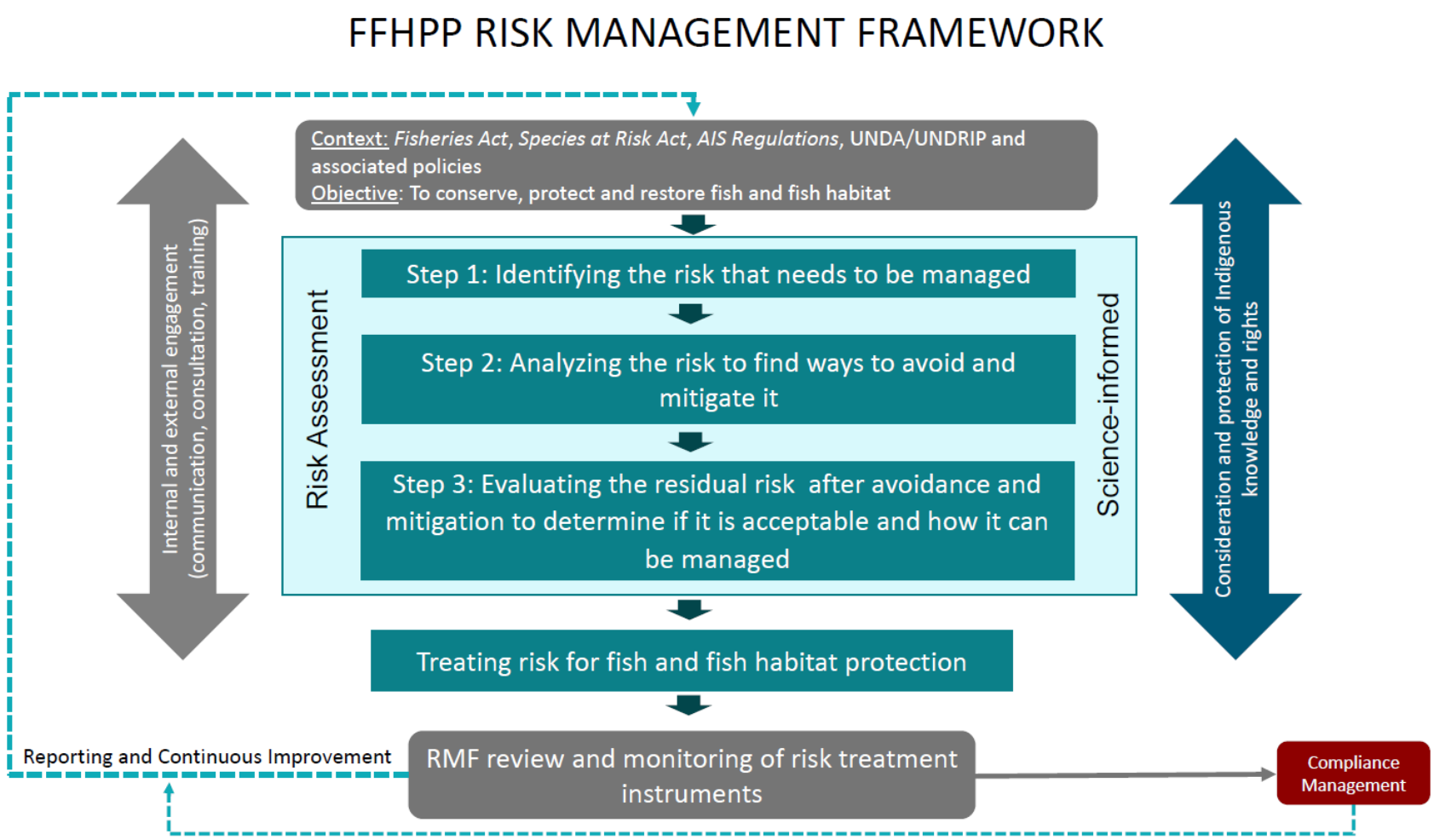

Figure 1: FFHPP Risk Management Framework.

The diagram in Figure 1 illustrates a continuous life-cycle approach to risk management which begins with a clear articulation of the context within which risk is being managed and the objective that the FFHPP is trying to achieve. The context and objective inform the risk assessment, which includes the identification, analysis, and evaluation of risk. These steps are informed by relevant evidence, including both science and Indigenous knowledge, when provided. Indigenous engagement begins as early in the risk assessment as possible and continues throughout the entire assessment, so that Indigenous knowledge and perspectives can be meaningfully considered, when they are provided. This approach ensures that Indigenous rights are upheld by integrating their perspectives from the very beginning and fostering a collaborative process that respects their traditional knowledge. Once the risk assessment is complete, risk is treated through the application of management measures (i.e., avoidance and mitigation). A monitoring program is used to verify conformity and compliance with program instruments (e.g., *Fisheries Act* authorizations). This information also enables transparent public reporting and ensures the continuous improvement of program performance and tools. Internal and external engagement activities will continue to inform the implementation of the RMF through all parts of the process, and Indigenous knowledge and rights will be considered and protected throughout the process.

Scope of application of the Risk Management Framework

The scope of application of the RMF stems from various pieces of legislation and related policies. Specifically, the:

- Department's policy interpretation of the *Fisheries Act* prohibition against the "harmful alteration, disruption or destruction" of fish habitat as *"any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish"*[3];
- *Fisheries Act* prohibition that *No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish;*
- Ministerial powers to ensure the free passage of fish or the protection of fish or fish habitat with respect to existing obstructions;
- *Species at Risk Act* prohibitions against killing, harming, harassing, capturing or taking of listed aquatic species at risk; damaging or destroying their residences; or, destroying their critical; and
- Aquatic Invasive Species Regulations prohibitions against the importation, possession, transport and release of members of certain aquatic invasive species and the introduction of non-indigenous aquatic species into particular regions and bodies of water.

The application of the RMF will be guided and informed by Indigenous knowledge and perspectives obtained through engagement, consultation, and collaboration between FFHPP and Indigenous Peoples.

How is risk assessed for fish and fish habitat protection?

The RMF provides a structure to better align process requirements, program intervention and oversight, and proponent guidance, with the likelihood and severity of consequences on fish and fish habitat resulting from works, undertakings and activities in or near water. This

structure breaks down the risk assessment process into three steps: risk identification, risk analysis, and risk evaluation.

STEP 1: RISK IDENTIFICATION: Identifying the risk that needs to be managed

Considering Indigenous knowledge

Indigenous knowledge plays an important role in identifying risks that need to be managed for the protection of fish and fish habitat. Indigenous knowledge enriches the risk identification process by providing a comprehensive understanding of ecosystems, historic context, and cultural significance ensuring that risk management strategies are more effective and culturally relevant. Additionally, involving Indigenous Peoples in the risk identification step can be extremely important, as their unique knowledge and perspectives can help uncover potential risks that might otherwise be overlooked, ensuring a more comprehensive and inclusive approach to avoiding harm. Guidance will be developed on how to meaningfully integrate Indigenous Knowledge into the risk assessment process.

Applying pathways of effects

Pathways of effects (PoE) diagrams are a common tool used to illustrate the interactions between human activities and the pressures they may have on specific biological endpoints. These endpoints (round boxes in the PoE diagrams themselves) are an explicit expression of the biological features (or components) that are to be protected. Also known as Cause-and-Effect Analyses[4] in a risk management context, PoE diagrams form the basis for identifying and assessing risk to fish and fish habitat by describing the chain of events that takes place in the aquatic environment when projects take place in or near water.

Proponents and FFHPP risk assessors have been using PoE diagrams as part of the Request for Review process since the early 2000s. The Program's PoE diagrams have been updated to better communicate how management measures are applied to specific pressures on fish and fish habitat. Each diagram (nine in total) corresponds to one of the most common causes of pressures on fish and fish habitat (e.g., use of machinery in water) associated with projects in or near water. By identifying the causes of pressures associated with a project, or class of projects, proponents and FFHPP can identify the pressures that need to be addressed using the PoE diagrams.

The redesigned and standardized PoE diagrams have been validated through a Canadian Science Advisory Secretariat scientific peer review process[5], and clearly identify the pressures managed by FFHPP in the majority of cases.

It is important to note that the use of PoE diagrams can introduce uncertainty in the decision-making process due to the generalized nature of the diagrams. It is therefore important to consider the local context within which they are being used, and other sources of information (e.g., scientific studies, species life histories, local and Indigenous knowledge) when making use of this risk management tool.

PoE diagrams are intended to support risk identification for common types of projects and allow for a standardized approach to applying avoidance and mitigation measures as illustrated in Figure 2. Large scale, complex, or unique projects, however, may require the development of project or industry-specific pathways.

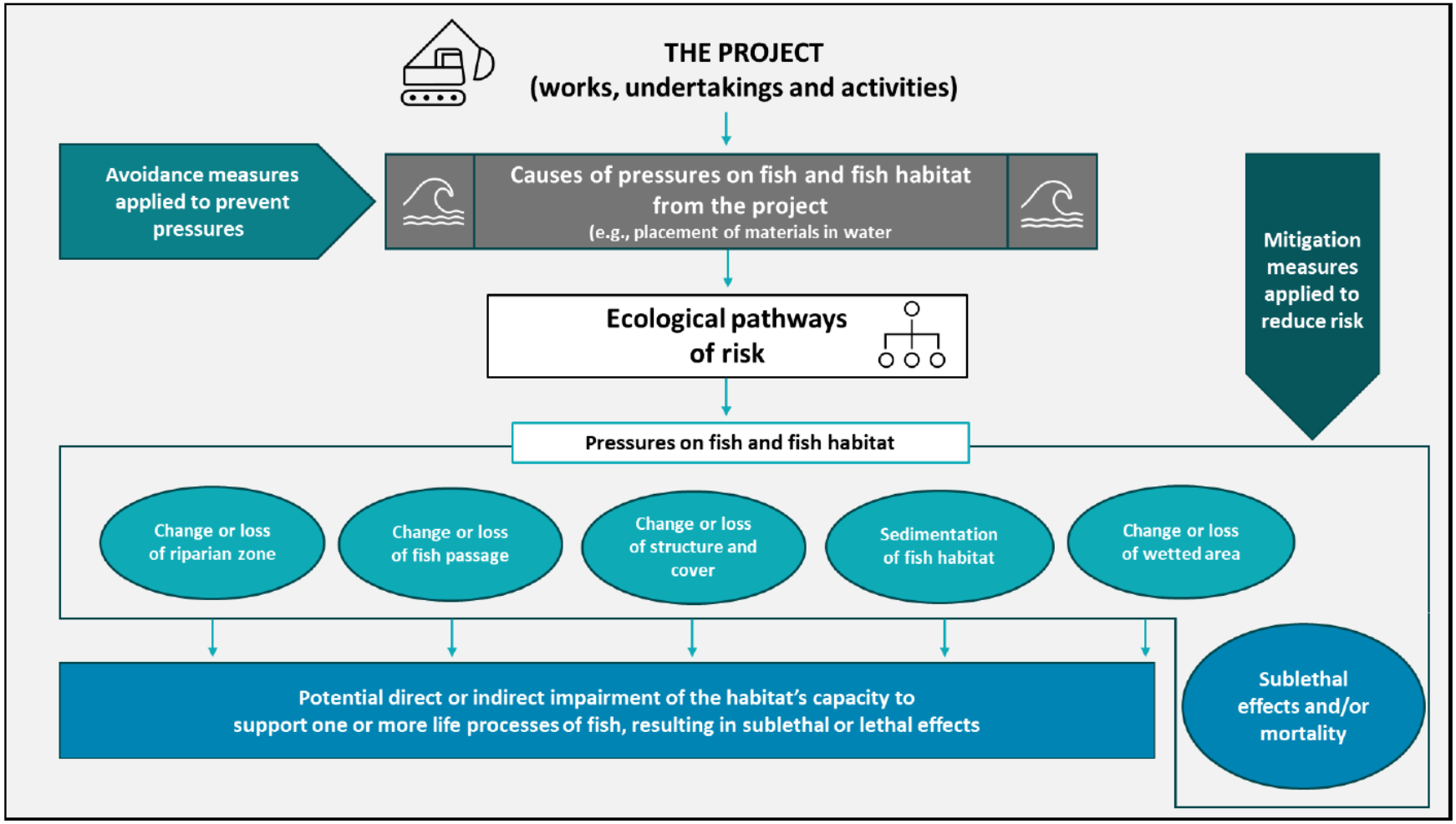

Figure 2: Standardized structure used to develop Pathways of Effects diagrams.

The diagram in Figure 2 illustrates the standardized structure used to develop FFHPP's updated Pathways of Effects diagrams. Projects in or near water that cause pressures on fish and fish habitat can result in multiple ecological pathways. Avoidance measures can be applied to these causes to prevent pressures from occurring. Mitigation measures can be applied to the pressures themselves to reduce their spatial scale, duration, and/or intensity, and minimize the potential for the direct or indirect impairment of the habitat's capacity to support one or more life processes of fish, the destruction of critical habitat or residences of aquatic species at risk, sublethal effects on fish, and fish mortality.

STEP 2: RISK ANALYSIS: Analyzing avoidance and mitigation measures to determine if there is residual risk

Risk analysis involves a detailed consideration of uncertainties, risk sources (i.e., works, undertakings and activities), risk events (i.e., pressures), mitigation measures and their effectiveness[6]. These are determined based on the information provided by the proponent in a request for project review or application for authorization, and any other available evidence relevant to the project.

Avoiding pressures on fish and fish habitat and early planning

Finding ways to avoid causing temporary or permanent changes to fish and fish habitat (and therefore avoid the potential for harmful impacts) is the first and most important step when planning a project in or near water. By discussing the project with Indigenous communities and local agencies, and accessing online geospatial tools and area-based management plans, proponents can identify where sensitive species and significant habitats are located and endeavor to avoid them at the project planning stage. This is also the stage at which information gaps are identified.

Guidance on early planning and avoidance can be found on the Projects Near Water website. Involving Indigenous Peoples during the planning process is important because their traditional knowledge and lived experiences offer valuable insights that can help to ensure that concerns for fish and their habitats, and recommended avoidance measures, are identified at the onset.

When all pressures can be avoided, proponents do not need to notify FFHPP.

Mitigating risk

Risk is never zero when temporary or permanent changes to fish and fish habitat cannot be fully avoided. Any work, undertaking or activity taking place in or near water will result in some kind of disturbance to the ecosystem which inherently creates risk.

In cases where pressures on fish and fish habitat cannot be avoided, FFHPP will require that mitigation measures be applied to the project to reduce the spatial scale, duration, and/or intensity of any pressures on fish and fish habitat. Specific mitigation strategies will depend on the type of project being proposed and the environment in which it is taking place. Examples of standardized mitigation strategies for common types of projects include standards and codes of practice (described below).

Standardized general mitigation measures
Standardized, general mitigation measures can assist proponents in the completion of their requests for FFHPP review and applications for authorization or permit. When categorized by pressure, these measures can facilitate the analysis of risk using the PoE diagrams. In other words, each of the most common pressures on fish and fish habitat that can result from projects in or near water is associated with a suite of general mitigation measures. Measures that are considered critical for achieving the program's objective to conserve, protect, and restore fish and fish habitat can also be highlighted.

Standardized, general mitigation measures can be built upon in proponent submissions to FFHPP by adding any project-specific mitigation measures needed to manage risk. In many cases, the careful application of a full suite of mitigation measures will suffice to manage the risk associated with a project. If proponents are uncertain about whether they can avoid or mitigate risk when carrying out their project, it is recommended that they contact a qualified environmental professional such as an aquatic or fisheries biologist, fluvial geomorphologist, fisheries technician or environmental consultant for advice.

Standards for critical mitigation measures
Specific mitigation measures have been identified by FFHPP as being critical for managing risk and achieving FFHPP's objective to conserve, protect and restore fish and fish habitat. Evidence-based standards continue to be developed to provide clear guidance on how to implement these mitigation measures to maximize their effectiveness and achieve their expected outcome. For example, FFHPP developed an interim Standard for in-water site isolation, which clarifies for proponents what is expected when using site isolation methods for managing sediment in water.

Codes of practice for routine projects
FFHPP has developed, published and engaged externally with Indigenous Peoples, partners, and stakeholders on several codes of practice, with the goal of improving process efficiency for routine projects for which risk can be managed using standardized mitigation measures and best practices. These tools combine the relevant standardized general mitigation measures (described above) with additional mitigation measures that are specific to the project type for which the code of practice is developed.

A request for project review is not required when all conditions (including the condition to submit a notification form) and measures in a code of practice are followed.

Sources of uncertainty
The risk posed by any project stems from the uncertainty associated with conducting the activity itself, and uncertainties in the effectiveness of any mitigation measures[7]. In fact, risk is commonly defined as the effect of uncertainty on objectives[6]. Sources of uncertainty are an important consideration when analyzing risk. Examples of uncertainty can include: insufficient biological data, untested project designs, unknown effectiveness and reliability of mitigation measures, variability in ecosystem responses, changes in environmental conditions, an absence of local or Indigenous knowledge or understanding of how to apply

it, and an absence of scientific knowledge. Any of these sources of uncertainty can influence risk management outcomes.

The level of detail and quality of information provided by the proponent as part of a request for review or application for authorization or permit is perhaps the most significant source of uncertainty for FFHPP risk assessors. Ensuring that all required information is provided will reduce uncertainty in the risk assessment, allowing for a smoother, more timely review process.

For some projects there will be multiple sources of uncertainty, whereas for others, such as routine maintenance and repair activities for example, risk is easier to predict because there are fewer sources of uncertainty and the nature and likelihood of the consequences for fish and fish habitat are better understood. Repeated experience, refined practices, technical expertise, training, local knowledge, and existing scientific literature are all instrumental in reducing sources of uncertainty and managing risk.

STEP 3: RISK EVALUATION: Evaluating risk to determine how it should be managed

Through the RMF, risk is evaluated by comparing the results of the risk analysis with pre-established biological risk criteria to determine how the risk should be managed.

Dialogue with Indigenous Peoples about risk evaluation and risk management ensures that Indigenous perspectives are actively heard and incorporated meaningfully into the process. The engagement should focus on understanding and integrating the unique concerns and values of Indigenous communities. Risk evaluation and risk management will consider, protect, and respect Indigenous knowledge and Indigenous rights as pertains to the FFHPP's mandate and responsibilities.

Likelihood and severity of consequences to fish and fish habitat

When pressures on fish and fish habitat cannot be fully avoided or mitigated, there is a likelihood that this will result in the direct or indirect impairment of the habitat's capacity to support one or more life processes of fish, the destruction of critical habitat or residences of aquatic species at risk, sublethal effects to fish, or fish mortality. The likelihood of these consequences can range from unlikely to likely, while the severity of the consequences can range from low to high.

Determining and communicating the program's risk tolerance

Risk tolerance is the program's readiness to accept or reject a level of residual risk after avoidance and mitigation measures are considered. It is determined using pre-established risk criteria (e.g., level of uncertainty, magnitude of changes to habitat features and functions, ecological characteristics present, etc.) in the context of the FFHPP's mandate and legislative responsibilities. Indigenous knowledge and impacts to the rights of Indigenous Peoples are also important considerations in determining risk tolerance.

A clear expression of risk tolerance is paramount for a functional and efficient regulatory process. Figure 3 provides a **conceptual** representation of FFHPP's **relative** risk tolerance in relation to four categories of project: 1) projects in significant or critical habitat, 2) projects affecting sensitive fish species or aquatic species at risk, 3) projects taking place in habitat that is not significant or critical; and 4) projects affecting fish species that are not sensitive or at risk. The four **conceptual** matrices allow risk levels to be categorized based on the likelihood and severity of consequences to fish and fish habitat, and guide the determination of specific risk tolerances for different pressures, species, habitats and project types. Risk management actions and treatment options are determined or developed based on the specified risk tolerance.

For higher risk projects where regulatory intervention is required, management actions (e.g., *Fisheries Act* para. 34.4(2)(b) and 35(2)(b) authorizations, either stand-alone or acting as *Species at Risk* Act permits) will depend on additional factors outlined in subsection 34.1(1) of the *Fisheries Act* (i.e., fisheries productivity, fisheries management objectives, available offsetting measures, cumulative effects, affected habitat banks, restoration priorities, and Indigenous knowledge, and any other factor that the Minister considers relevant) and subsections 73 (2) to (7) of the *Species at Risk Act* (e.g., the activity will not jeopardize the survival or recovery of a species at risk).

As risk tolerance is calibrated for different pressures, project types, fish species and habitats, consideration will be given to:

- the likelihood that the habitat's capacity to support the life processes of fish will be impaired;
- the likelihood that the critical habitat or residences of aquatic species at risk will be affected;
- the likelihood of sublethal effects to fish and fish mortality; and,
- the severity of these consequences.

Note: The conceptual risk levels, as they are shown in Figure 3, are not linked to specific management actions or decisions. FFHPP uses this conceptual model to communicate a clear rule base through the implementation of specific instruments, tools and guidance for project proponents.

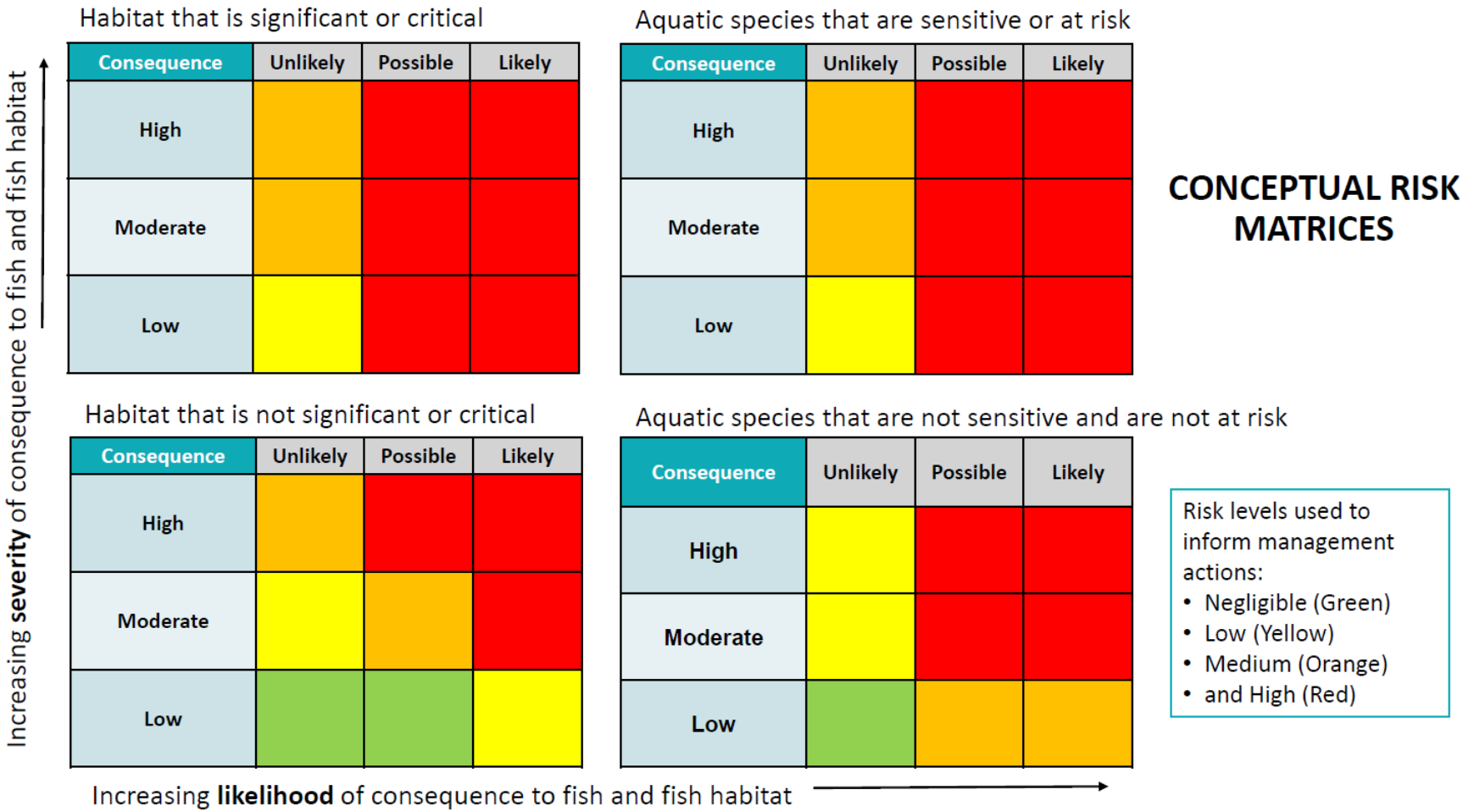

Figure 3: Conceptual representation of FFHPP risk tolerance . **Note: The conceptual risk levels, as they are shown in this figure, are not linked to specific management actions or decisions.** FFHPP uses this conceptual model to communicate a clear rule base through the implementation of specific instruments, tools, and guidance for project proponents.

Figure 3 illustrates four distinct matrices illustrating the program's relative risk tolerance, at a conceptual level for: habitat that is critical or significant; habitat that is not critical or significant, aquatic species that are sensitive or at risk; and aquatic species that are not sensitive or are not at risk. The colour distribution of green (negligeable risk), yellow (low risk), orange (medium risk) and red (high risk) varies by matrix. Coloured boxes are distributed across an x-axis showing an increasing likelihood of a consequence to fish and fish habitat, and a y-axis showing an increasing severity of a consequence to fish and fish habitat. The two matrices for significant or critical habitat and sensitive fish species or aquatic species at risk do not have any green (negligible risk) boxes, have fewer yellow (low risk) boxes and the majority of the boxes are red (high risk), reflecting a decreased tolerance to risk.

Tolerance to risk will vary depending on the sensitivity of the species, the significance of the habitat, and the type of project being proposed and the resulting pressures on fish and fish habitat. It is to be expected that the program will be less tolerant to risk when a proposed project imposes pressures on the features, attributes and functions of critical or significant habitats, or in cases where sensitive species or species at risk are present. Additionally, the perspectives and concerns of Indigenous Peoples about potential impacts to their rights, which would be identified through engagement and dialogue with them, are vitally important considerations in determining risk tolerance. Tolerance may also decrease in situations where there are high levels, or multiple sources, of uncertainty as described above. This uncertainty may be a result of novel construction techniques or procedures for which the PoEs are poorly understood, a lack of detail about the final design of the project, or a lack of baseline information about the affected fish or fish habitat.

FFHPP's risk tolerance with respect to specific pressures, habitats, species and project types is communicated through the measures and conditions outlined in the program's various instruments, guidance and tools. While some instruments, guidance and tools already exist, such as codes of practice and authorizations under the *Fisheries Act*, others continue to be developed, published and updated over time taking into account Indigenous knowledge, the best available science, input from engagement processes and other relevant information.

Treating risk for fish and fish habitat protection

The treatment of risk consists of determining and implementing one or more options for managing the risk posed by a project. Also referred to as implementing management actions, treating risk can include communicating avoidance, mitigation and offsetting measures as conditions in regulatory or non- regulatory instruments, or through other mechanisms such as the development and implementation of regulatory and non-regulatory partnership agreements, funding programs, and integrated management planning processes.

FFHPP develops and implements instruments, guidance, processes and tools to communicate conditions and measures designed to treat and manage the risk resulting from projects in or near water.

In some cases it may be determined that the available measures are insufficient and that the risk is too high to proceed as proposed. In this situation, FFHPP could reject a project proposal, or request that the project be relocated or redesigned to prevent or reduce the risk. When projects can proceed, the level of regulatory intervention, and the relative strength of the instruments and tools used by FFHPP to treat the risk will increase with the likelihood and severity of consequences to fish and fish habitat and the level of uncertainty. In other words, where risks are low, FFHPP involvement can be lower. Where risk is higher, caution is needed and FFHPP intervention may be necessary along a spectrum of increasing involvement and oversight.

FFHPP may provide general guidance and advice on broad project types (e.g., codes of practice, standards) and provide more detailed, site-specific advice for projects that are less routine in nature. Similarly, the program may develop regulatory tools and instruments of general application to treat certain risks (e.g., prescribed works and waters regulations), or conduct project-specific risk assessments that lead to detailed and tailored regulatory approvals. Ultimately, the risk treatment is linked to the program's risk tolerance such that FFHPP expertise and effort is brought to bear on the projects that need the greatest intervention to meet the key objective of conserving, protecting and restoring fish and fish habitat.

Monitoring and continuous improvement of the RMF and program instruments
Sound risk management not only ensures effort in the upfront assessment and treatment of risk, but also ensures that resources are available for robust monitoring of the implementation of the RMF and related program instruments and tools.

The periodic review of the RMF and ongoing monitoring of associated measures, tools, instruments and processes are essential to ensure their effectiveness, efficiency and relevance in meeting the objective[7] to conserve, protect and restore fish and fish habitat. This is done through the implementation of a national Monitoring Program and collaboration with DFO's Science sector to undertake scientific studies.

As part of the Monitoring Program, FFHPP conducts site visits and/or reviews post-construction reports and notification forms from proponents to determine conformity with, and/or effectiveness of, management measures.

Monitoring may identify potential non-compliance with regulatory requirements, in which case an evaluation of risk is used to determine the appropriate action to address it. In addition to informing continuous improvement and verifying compliance, monitoring outcomes are an important element of transparent public reporting on FFHPP program delivery and achievements against program objectives. As risk management practices continue to be improved, and program instruments and tools are developed and refined, FFHPP continues to report on the achievement of program objectives through the Departmental Results Report.

Next Steps

This overview document outlines the approach taken by DFO's FFHPP to identify, analyze, evaluate and treat risk for projects in or near water. This overview is intended to enhance transparent decision-making by confirming and refreshing the elements of this approach, and to act as a starting point for further engagement and discussion with a broad range of partners and stakeholders as FFHPP continues to develop policies, practices and tools for the conservation, protection and restoration of fish and fish habitat. In addition, this overview is intended to inform meaningful engagement and consultation with Indigenous Peoples with respect to actions and decisions that may affect their rights and the integrity of their traditional lands and water.

The program continues to develop and improve the risk approach and develop instruments and tools to make the FFHPP decision-making process more efficient and predictable. In addition, ways of applying these risk management steps to other program activities such as policy development, planning, monitoring and reporting continue to be developed and implemented. As risk management tools, program instruments and approaches are developed and improved, they will continue to be added to the Projects Near Water website.

Glossary

Avoidance: Action taken to prevent pressures on fish and fish habitat.

Consequence: The outcome of a pressure on fish and fish habitat after avoidance and mitigation measures are applied. For the purposes of the RMF, the consequences being evaluated are: the direct or indirect impairment of the habitat's capacity to support one or more life processes of fish; the critical habitat or residences of aquatic species at risk; sublethal effects to fish; and fish mortality.

Control: A measure used to manage risk (i.e., avoidance or mitigation measure).

Mitigation: Action taken to reduce the spatial scale, duration, or intensity of a pressure on fish or fish habitat.

Pressure: A pressure is defined as the manner in which a human activity changes the state of a habitat component. They include sublethal and lethal effects to fish, and temporary or permanent changes to fish habitat that have the potential to result in a direct or indirect impairment of the habitat's capacity to support one or more life processes of fish. They are the PoE endpoints.

Qualified environmental professional (QEP): A person who is experienced in identifying and assessing risks to fish and fish habitat generated from various works, undertakings or activities conducted in or near water, and implementing management measures to avoid and mitigate them. QEPs possess a post-secondary degree or diploma in biological, geophysical or environmental sciences and are often referred to as:

- aquatic biologist
- fisheries biologist
- fluvial geomorphologist
- applied scientist
- fisheries technician
- environmental consultant or
- natural resource consultant

Risk: The effect of uncertainty on program objectives.

Risk source: Element which alone or in combination has the potential to give rise to risk. For the purposes of the RMF, the risk sources are the works, undertakings and activities proposed to take place in or near water.

Risk event: The occurrence or change of a particular set of circumstances. For the purposes of the RMF, the pressures on fish and fish habitat (or PoE endpoints) are the risk events (i.e., it is any temporary or permanent change to fish and fish habitat).

Risk management: A systematic approach to setting the best course of action when the end result is uncertain or unknown by identifying, analyzing, evaluating, treating and communicating risk issues.

Sublethal effects: Refers to biological, physiological, or behavioural effects on an individual or population that survives exposure to an anthropogenic event (e.g., turbines, underwater noise or water intakes) or a substance at a sublethal concentration. Sublethal effects may affect, among others, life span, development, population growth, fertility and behaviours, such as feeding, foraging and migration.

Two-eyed seeing: Means seeing from one eye with the strength of Indigenous knowledge and ways of knowing, and from the other eye with the strengths of Western knowledge and science.

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