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PRACTITIONERS GUIDE

TO THE RISK MANAGEMENT FRAMEWORK FOR DFO HABITAT MANAGEMENT STAFF

VERSION 1.0

HABITAT MANAGEMENT PROGRAM

FISHERIES AND OCEANS CANADA

Canada

The intent of this Practitioners Guide is to provide guidance to Fisheries and Oceans Canada (DFO) Habitat Management Program (HMP) staff. This Guide is part of a series of Practitioners Guides that support the Habitat Management Program in making transparent and consistent decisions during the regulatory review of works or undertakings that affect fish and fish habitat across Canada. These Guides are intended for internal use by HMP staff. If you have any concerns, omissions, corrections or comments on this Guide or any Practitioner Guide, please refer them to your regional representative of the national Habitat Protection and Sustainable Development (HPSD) Working Group. To access the membership of the Habitat Protection and Sustainable Development (HPSD) Working Group, please visit the Habitat Management Intranet site at: http://oceans.ncr.dfo-mpo.gc.ca/habitat/home_e.asp We invite your feedback: please refer any comments on this and other guides to *your regional representative on the national Habitat Protection and Sustainable Development Sub-Committee.*

Cette publication est également disponible en français.

When changes or updates are made to this Practitioners Guide, a new version of the guide (with an updated version number) will be placed on the Habitat Management intranet site. This newer version should be downloaded to replace the previous printed version. Therefore, when there is a difference in the text between a version posted on the Habitat Management intranet site and the version found in printed copies, the newest version on the Intranet site will stand as the officially accepted policy. This Practitioners Guide and other documents of the Standard Operating Policies Manual can be accessed on the Intranet via the following link, http://oceans.ncr.dfo-mpo.gc.ca/habitat/home_e.asp.

2.2 Purpose

The purpose of this document is to provide guidance to Habitat Management practitioners (Practitioners) within the Habitat Management Program in applying a risk management approach to decision-making under the habitat protection provisions of the *Fisheries Act*. For the purposes of this framework, risk is a term used to represent the expected impact of a development proposal on the productive capacity of fish habitat.

The Risk Management Framework is intended to provide a structured approach to decision-making that takes into account the concepts of risk, uncertainty and precaution. Practitioners can use this approach to:

- analyze development proposals and apply mitigation to minimize residual effects;
- assess residual effects and characterize the risk they pose to fish and fish habitat;
- use the risk characterization process to support management deci sions; and
- communicate the rationale for their decisions.

The framework provides a foundation for discussions with proponents and partners. By outlining the decision-making process and the potential outcomes of the department's review, the goal is to have higher quality development proposals submitted to the department that address the habitat requirements of fish and ultimately lead to a more effective and efficient review process. For those routine development proposals where the effects are well understood and readily mitigable using standard measures, the framework also supports the development of streamlining tools such as Operational Statements or standardized advice on approved work practices.

Risk management is not a new concept to the HMP. Practitioners routinely take into consideration such things as the sensitivity of fish and fish habitats and the effectiveness of mitigation measures, when determining the significance of impacts on fish and fish habitat. The framework described in this document formalizes the steps involved and provides a more transparent structure for communicating how decisions are made.

2.3 Legal and Policy Context

The habitat protection provisions of the *Fisheries Act* form the regulatory context in which Practitioners review development proposals. Section 35(1), which prohibits the "harmful alteration, disruption or destruction of fish habitat", tends to have the broadest application; however, the concepts contained in this guide can also be applied to decision-making under other habitat protection provisions of the *Fisheries Act* as well. Other relevant issues addressed by the habitat protection provisions include: fish passage around obstructions (Section 20), flow requirements below obstructions (Section 22), screening of intakes (Section 30) and killing of fish by means other than fishing (Section 32).

Additional guidance should be sought on applying other legislation and/or regulatory requirements, such as the *Canadian Environmental Assessment Act* (CEAA) and the *Species at Risk Act* (SARA).

3.0 RISK MANAGEMENT FRAMEWORK

The Risk Management Framework is made up of three components which include Aquatic Effects Assessment (Section 3.1) Risk Assessment (Section 3.2) and Risk Management (Section 3.3). These components can be represented as a series of discreet steps embedded into the overall process applied by Practitioners to review development proposals (see Figure 1). An overarching principle which applies to all components of the Risk Management Framework is **risk communication**. Effective communication enables proponents and other stakeholders to understand the potential risks development activities pose to fish and fish habitat and the methods to avoid or minimize the risk to acceptable levels.

The initial steps to be considered before the Risk Management Framework can be applied include:

- Operational Statement: Operational Statements define specific criteria and mitigation measures required to ensure development proposals can proceed without resulting in the harmful alteration, disruption or destruction (HADD) of fish habitat. Where necessary, Operational Statements have been regionalized to account for local environmental conditions and regulatory requirements. Where an Operational Statement can be applied, no further assessment is required.

- Sufficient Information: There must be sufficient information to understand the nature of the development proposal in order to determine whether the habitat protection provisions of the *Fisheries Act* apply. Identification of information gaps early in the design and planning stages helps to ensure appropriate studies are conducted that ultimately support a well informed decision.

- Fish Habitat Present: Under the *Fisheries Act*, "fish" includes parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals. The *Fisheries Act* defines 'fish habitat' as spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes. If there is no fish habitat present within the area of the develop proposal then no assessment is required.

Based on the analysis presented in Table 3, the potential residual effects could be reported as follows:

- Removal of instream woody material, streambank vegetation and allochthanous inputs within the footprint of the new culvert. (i.e. 15 meters).
- Potential increase in solar inputs and loss of allochthanous inputs along 40 meters of stream. This will be partially offset as vegetation re-colonizes.
- Change in streambank composition from vegetation to rock rip rap along 40 metres of stream.

Additional mitigation measures can reduce the residual effects even further:

- The re-colonization of vegetation could be expedited through seeding or planting of shrubs.
- Solar inputs could be reduced by retaining vegetation on the shade producing side of the stream.
- The impact to streambank vegetation could be reduced by limiting the amount of rip rap, or preventing vegetation removal at the waters edge.

It is important to recognize that all residual effects are not necessarily negative. In this example, increased solar radiation could increase primary production.

While this example looked at the activity of vegetation clearing, a complete assessment would be required for all the activities identified in Table 2.

The analysis of potential residual effects is an important step in the assessment of a development proposal, but it is not until the residual effects are put into context (Section 3.2) that a level of risk can be determined.

Sources of uncertainty[1]

There is always some level of uncertainty associated with predicting the residual effects that may result from a proposed development. Uncertainty can arise due to a lack of information, or in predicting the effectiveness of new or innovative mitigation measures. In addition, there may be synergistic effects whereby two or more effects in combination express an effect greater than they would have been expressed individually. These are difficult to identify and hence have the potential of being overlooked or underestimated.

The application of the precautionary principle within the federal government is described in detail in the document entitled *A Framework for the Application of Precaution in Science-based Decision Making about Risk* .[2]

1 Uncertainty relative to this Risk Management Framework should not be considered to be the same as the term "uncertain" used under Section 20 of the *Canadian Environmental Assessment Act* (CEAA). Uncertainty under CEAA relates to uncertainty surrounding the determination of the significance of adverse environmental effects, after the consideration of appropriate mitigation measures. Uncertainty under this Risk Management Framework is considered more broadly.

2 Privy Council Office (Canada). 2003. A Framework for the Application of Precaution in Science-based Decision Making about Risk. Privy Council Office (Canada). Ottawa. 13 p.

The application of the precautionary principle is widely accepted and applied within the federal government. Emphasis is placed on providing a sound and credible case that a risk exists, hence the need to refer to the Pathways of Effect as a source of information on the type of effects that commonly occur as a result of a development activity.

Acknowledging uncertainty does not preclude making sound management decisions, the uncertainty simply needs to be described and taken into consideration at the risk assessment stage.

3.2 Risk Assessment

Risk Assessment is the process used by Practitioners to determine the level of risk that residual effects pose to fish and fish habitat. To assess risk, one must consider the outcome of the aquatic effects assessment (i.e. the **Scale of Negative Effect**) in the context of the fish and fish habitat being effected (i.e. the **Sensitivity of Fish and Fish Habitat**). The Risk Assessment Matrix incorporates these two factors in order to characterize the level of risk the development proposal poses to the productive capacity of fish habitat. The rationale used to locate the residual effects on the matrix forms the basis for decision-making.

3.2.1 Determine Scale of Negative Effect

Attributes are used to scale residual effects on the y-axis of the risk assessment matrix. General qualifiers used to describe the attributes are described in Table 4.

Table 4: Attributes used to describe the scale of negative effects

Attribute	Description	Examples of scales used qualify the attributes (in increasing order)
1. Extent	Refers to the direct "footprint" of the development proposal, as well as areas indirectly affected, such as downstream or down-current areas.	Site or segment - localized effect Channel reach or lake region Entire watershed or lake
2. Duration	The amount of time that a residual effect will persist.	Short term (days) Medium term (weeks-months) Long term (multiple years - permanent)
3. Intensity	The expected amount of change from the baseline condition. Intensity is a way of describing the degree of change, such as changes in water temperature, salinity, flow, suspended sediment etc. The timing of works may have a major influence on intensity. Effects such as sediment release occurring during critical spawning periods will have a higher intensity.	Habitat still suitable but not as productive Habitat quality significantly reduced Habitat quality unusable

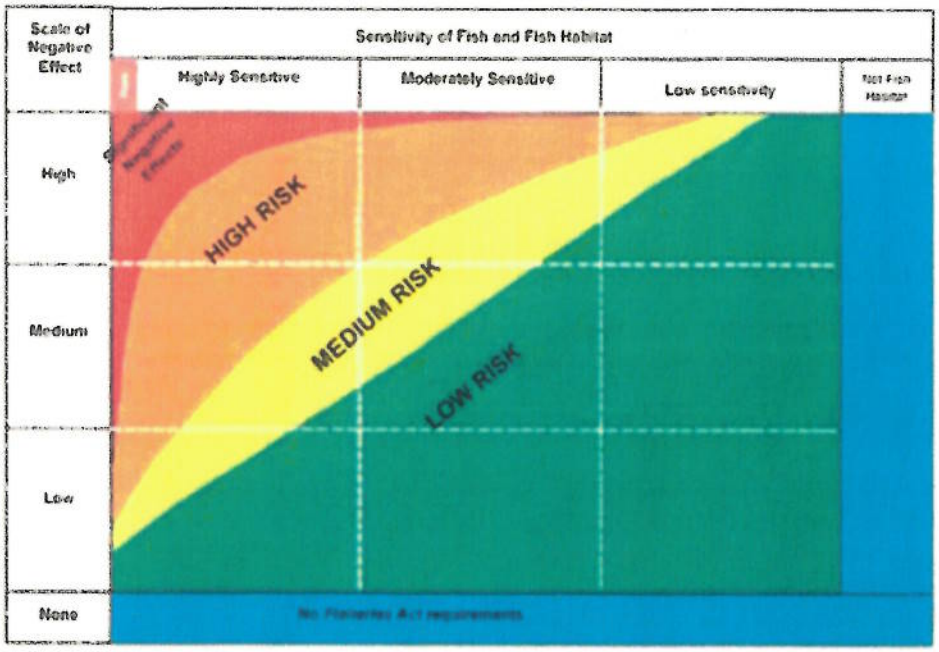

Figure 3: Risk Assessment Matrix Used to Illustrate Various Categories of Risk

Sources of Uncertainty

It is important again to acknowledge the various sources of uncertainty that may be associated with predicting both the Scale of Negative Effect and the Sensitivity of Fish and Fish Habitat. Figure 4 shows how uncertainty could be illustrated on the Risk Assessment Matrix and how it might alter management decisions. Scenario A is represented as a tight circle to illustrate a relatively low level of uncertainty associated with both the Scale of Negative Effect and the Sensitivity of Fish and Fish Habitat. Despite some uncertainty, it does not influence the risk ranking or the resulting management decision. Scenario B represents the same development proposal located in Highly Sensitive habitat. With the limited information provided in Table 2 there was a high level of uncertainty predicting the Scale of Negative Effect. This uncertainty is represented as an oval which overlaps several risk categories. The level of uncertainty was reduced through additional information relating to the development proposal and the mitigation being proposed.