Appendix 4

Approach to the Assessment of Risk to Fish Habitat for Bipole III Project Components

Where Bipole III project components were assessed as having the potential to cause a Harmful Alteration, Disruption, or Destruction (HADD) of fish habitat, the component's Environmentally Sensitive Sites (ESSs) were assessed in the context of the "Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff" (DFO 2010). Where an operational statement is in place for a specific activity (e.g., Overhead Line Construction), the operational statement's specific mitigation must be adhered to and was considered sufficient to offset any significant residual adverse effect to fish habitat and is,therefore, in compliance with the *Fisheries Act.*

In cases where an operational statement does not exist for the specific activity, the project activity was assessed in the context of the "Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff" (DFO 2010), as described below.

Sensitivity of Fish and Fish Habitat

The Sensitivity of Fish and Fish Habitat rating is a method to classify or rate the fish and fish habitat at a specific site. DFO (2010) lists four criteria for assigning a fish and fish habitat sensitivity rating. To more accurately reflect the Bipole III study area aquatic environments, slight modifications were made to the descriptions of the four criteria. Detailed physical and biological data gathered through field studies, as well as existing information on fish and fish habitat, were used to rate the Sensitivity of Fish and Fish Habitat.

Attribute:

1. Species Sensitivity

Description: Sensitivity of fish species/community to changes in environmental conditions (e.g., suspended sediments, water temperature, and oxygen).

Scale: Low – No "moderately or highly sensitive" species expected to be present.

Moderate – No "highly sensitive" species expected to be present.

High – At least one "highly sensitive" species expected to be present.

Comments: Species were rated according to the described criteria and the ratings are presented in Table A4-1.

2. Species' Dependence on Habitat

Description: Use of habitat by fish species. Some species may have very specific habitat requirements.

Scale: Low – Habitat is common and used for a range of life requisites by species that are present; not critical.

Moderate – Habitat is important and is used for a specific life function by species, but is not critical habitat.

High – Habitat is critical to the survival of the species in the area; example critical spawning habitat.

3. Rarity

Description: The relative strength of a fish population or prevalence of a specific habitat type.

Scale: Low – Habitat and/or species are prevalent.

Moderate – Habitat and/or species have a limited distribution or confined to small areas.

High – Habitat and/or species are rare. This would include SARA listed species and their habitats.

4. Habitat Resiliency

Description: The ability of an aquatic ecosystem to recover from changes in environmental conditions.

Scale: Low – Low gradient wetland streams with limited flow and abundant instream vegetation. These and other physical characteristic make the system stable and resilient to change and perturbation. Flow regime is typically ephemeral.

Moderate – Cool water thermal regime that can buffer a temperature change; physical conditions that make system moderately stable and resilient and flow regime is intermittent to perennial. This would include most moderate to large streams.

High – Cold water thermal regime that cannot easily buffer temperature changes; physical conditions make system unable to change, and flow regime is permanent. Features such as

gravel/cobble riffles that, once disturbed or removed, may not recover naturally would fit into this category.

Scale of Negative Effect

Following the three attributes presented in DFO (2010), the project component potentially affecting the ESSs were ranked according to the scale of the potential negative effect. The three ranking attributes used were:

Attribute:

1. Extent

Description: The direct footprint of the development as well as indirectly affected areas, such as downstream areas.

Scale: Low – Site or segment (localized).

Medium – Channel reach or lake region.

High – Entire watershed or lake (high).

2. Duration

Description: The amount of time that a residual effect will persist.

Scale: Low – Short term (days).

Medium – Medium term (weeks – months).

High – Long term (years – permanent).

3. Intensity

Description: The expected amount of change from baseline condition.

Scale: Low – Habitat is still suitable but not as productive.

Medium – Habitat quality is significantly reduced.

High – Habitat is unusable.

Categorization of Risk

Risk was assigned to by plotting the Sensitivity of Fish and Fish Habitat rating against the Scale of Negative Effect score to a risk assessment matrix (Figure A4-2). In this matrix, risk is categorized as:

Low -	HADD unlikely.
Medium -	HADD likely; small-scale and/or temporary duration.
High -	HADD likely; broad-scale and/or long term and/or high sensitivity habitat present.

Significant Negative Effects -	Effects too large and/or habitat too important that it cannot be adequately compensated.

The risk assessment matrix graph is relatively coarse and each risk assessment therefore requires interpretation. This is provided through a written qualification of the risk assessment for each site.

References

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Table A4-1. Sensitivity ratings for fish species found in the Bipole III transmission project study area.

Abbreviation	Common Name	Scientific Name	Sensitivity Rating [1]
ARCH	arctic char	*Salvelinus alpinus*	high
BNKL	banded killifish	*Fundulus diaphanus*	moderate
BGBF	bigmouth buffalo	*Ictiobus cyprinellus*	moderate
BGSH	bigmouth shiner	*Notropis dorsalis*	low
BLBL	black bullhead	*Ameiurus melas*	low
BLCR	black crappie	*Pomoxis nigromaculatus*	moderate
BCSH	blackchin shiner	*Notropis heterodon*	moderate
BLSH	blacknose shiner	*Notropis heterolepis*	low
BLDR	blackside darter	*Percina maculata*	moderate
BLUE	bluegill	*Lepomis macrochirus*	moderate
BLMN	bluntnose minnow	*Pimephales notatus*	low
BRMN	brassy minnow	*Hybognathus hankinsoni*	moderate
BRST	brook stickleback	*Culea inconstans*	low
BRTR	brook trout	*Salvelinus fontinalis*	high
BRBL	brown bullhead	*Ameiurus nebulosus*	low
BWTR	brown trout	*Salmo trutta*	high
BURB	burbot	*Lota lota*	moderate
CNMD	central mudminnow	*Umbra limi*	low
CHCT	channel catfish	*Ictalurus punctatus*	low
CHLM	chestnut lamprey	*Ichthyomyzon castaneus*	moderate
CISC	cisco	*Coregonus artedi*	high
CARP	common carp	*Cyprinus carpio*	low
CMSH	common shiner	*Luxilus cornutus*	moderate
CRCH	creek chub	*Semotilus atromaculatus*	moderate
DPSC	deepwater sculpin	*Myoxocephalus thompsoni*	high
EMSH	emerald shiner	*Notropis atherinoides*	moderate
FTMN	fathead minnow	*Pimephales promelas*	low
FNDC	finescale dace	*Phoxinus neogaeus*	low
FLCH	flathead chub	*Platygobio gracilis*	moderate

Abbreviation	Common Name	Scientific Name	Sensitivity Rating [1]
FRDR	freshwater drum	*Aplodinotus grunniens*	moderate
GLRD	golden redhorse	*Moxostoma erythrurum*	moderate
GLSH	golden shiner	*Notemigonus chrysoleucas*	low
GOLD	goldeye	*Hiodon alosoides*	moderate
GLFS	goldfish	*Carassius auratus*	low
HRCH	hornyhead chub	*Nocomis biguttatus*	moderate
IWDR	Iowa darter	*Etheostoma exile*	moderate
JHDR	johnny darter	*Etheostoma nigrum*	low
LKCH	lake chub	*Couesius plumbeus*	low
LKST	lake sturgeon	*Acipenser fulvescens*	moderate
LKTR	lake trout	*Salvelinus namaycush*	high
LKWH	lake whitefish	*Coregonus clupeaformis*	high
LRBS	largemouth bass	*Micropterus salmoides*	moderate
LGPR	logperch	*Percina caprodes*	low
LNDC	longnose dace	*Rhinichthys cataractae*	low
LNSC	longnose sucker	*Catostomus catostomus*	moderate
MMSH	mimic shiner	*Notropis volucellus*	moderate
MOON	mooneye	*Hiodon tergisus*	moderate
MTSC	mottled sculpin	*Cottus bairdi*	moderate
MUSK	muskellunge	*Esox masquinongy*	moderate
NNST	ninespine stickleback	*Pungitius pungitius*	moderate
NRPK	northern pike	*Esox lucius*	moderate
NRDC	northern redbelly dace	*Phoxinus eos*	low
PRDC	pearl dace	*Margariscus margarita*	low
PUMP	pumpkinseed	*Lepomis gibbosus*	moderate
QLBC	quillback	*Carpiodes cyprinus*	moderate
RNSM	rainbow smelt	*Osmerus mordax*	low
RNTR	rainbow trout	*Oncorhynchus mykiss*	high
RVDR	river darter	*Percina shumardi*	low
RVSH	river shiner	*Notropis blennius*	moderate
RCBS	rock bass	*Ambloplites rupestris*	moderate

Abbreviation	Common Name	Scientific Name	Sensitivity Rating [1]
SNSH	sand shiner	*Notropis stramineus*	moderate
SAUG	sauger	*Sander canadensis*	moderate
SHRD	shorthead redhorse	*Moxostoma macrolepidotum*	low
SHCS	shortjaw cisco	*Coregonus zenithicus*	high
SLCH	silver chub	*Macrhybopsis storeriana*	low
SLLM	silver lamprey	*Ichthyomyzon unicuspis*	moderate
SLRD	silver redhorse	*Moxostoma anisurum*	low
SLSC	slimy sculpin	*Cottus cognatus*	low
SMBS	smallmouth bass	*Micropterus dolomieu*	high
SPSC	spoonhead sculpin	*Cottus ricei*	moderate
SFSH	spotfin shiner	*Cyprinella spiloptera*	moderate
SPSH	spottail shiner	*Notropis hudsonius*	low
STON	stonecat	*Noturus flavus*	low
TDMD	tadpole madtom	*Noturus gyrinus*	moderate
TRPR	troutperch	*Percopsis omiscomaycus*	low
WALL	walleye	*Sander vitreus*	moderate
WDSH	weed shiner	*Notropis texanus*	moderate
BLDC	western blacknose dace	*Rhinichthys obtusus*	low
WHBS	white bass	*Morone chrysops*	moderate
WHCR	white crappie	*Pomoxis annularis*	moderate
WHSC	white sucker	*Catostomus commersonii*	low
YLPR	yellow perch	*Perca flavescens*	moderate

1 – ratings are based on Barbour et al. (1999), Franzin et al. (2003), Porter et al. (2000), and professional judgement

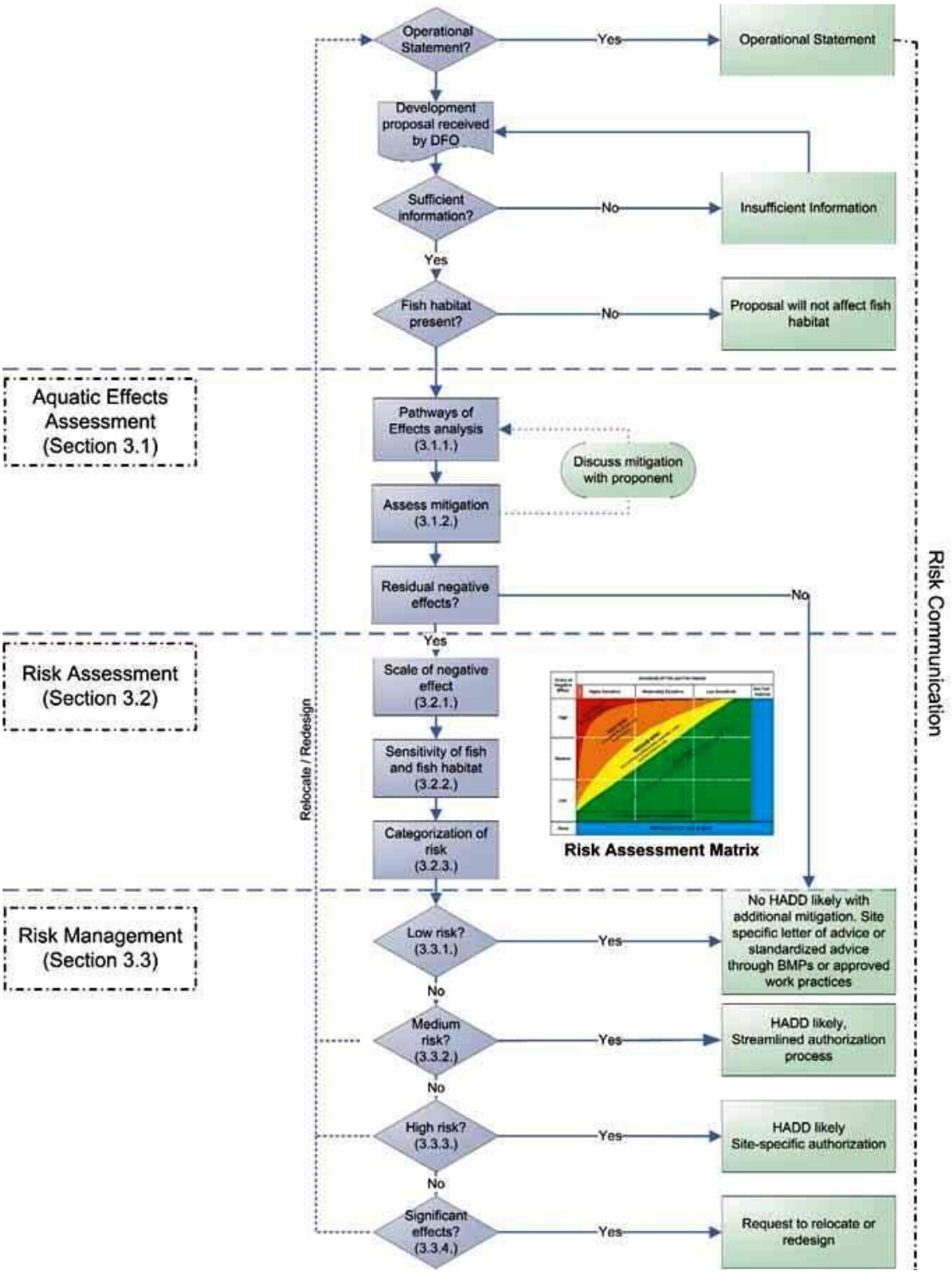

Figure A4-1. Applying the risk management framework to decision-making under the habitat protection provisions of the *Fisheries Act* (DFO 2010).

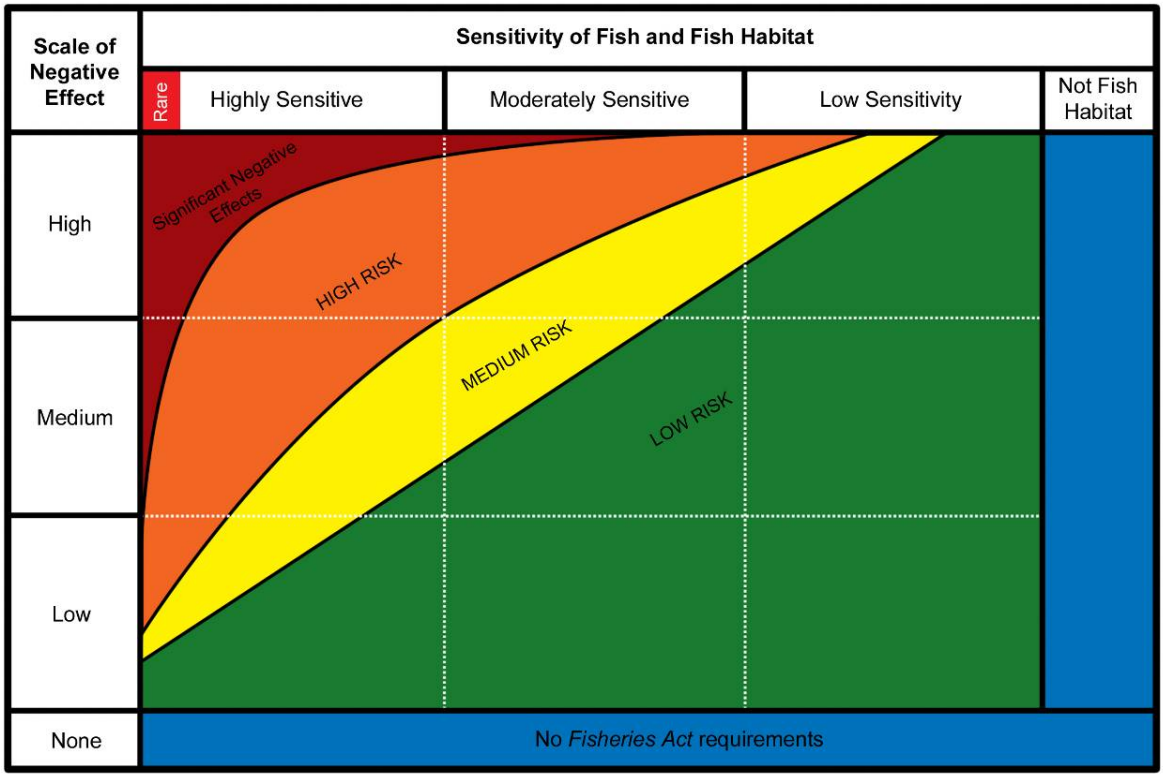

Figure A4-2. Risk assessment matrix used to illustrate various categories of risk (DFO 2010).