

# LEGISLATED RIPARIAN ASSESSMENTS IN BC

APEGBC/ABCFP/CAB PROFESSIONAL PRACTICE GUIDELINES

V1.1



Professional Engineers  
and Geoscientists of BC



COLLEGE OF  
APPLIED BIOLOGY



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## ■ PREFACE

*The Professional Practice Guidelines – Legislated Riparian Area Assessments in British Columbia* (the guidelines) were prepared by a team comprising members of the College of Applied Biology (CAB) and the Association of Professional Engineers and Geoscientists of BC (APEGBC), with input from the Association of BC Forest Professionals (ABCFP), the BC Institute of Agrologists (BCIA) and the Applied Science Technologists and Technicians of BC (ASTTBC). (In this document, these organizations are collectively referred to as the associations.) A review group included member practitioners and representatives of the British Columbia Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). Appendix A lists the authors and reviewers.

British Columbia's population continues to grow. There is increased pressure for various forms of development (e.g., residential, commercial or industrial activities) that can have a direct impact on riparian areas. In 2001, the Streamside Protection Regulation (B.C. Reg 10/2001) was enacted to protect riparian areas from impacts due to new development. In 2004, the regulation was repealed and replaced by the Riparian Areas Regulation. The Riparian Areas Regulation applies to the geographic areas of the provinces listed in an amendment to the regulation dated May 2006 and requires that a riparian assessment be completed by a Qualified Environmental Professional before a development permit can be issued for development within a riparian assessment area.

These guidelines were developed in response to issues raised with respect to the carrying out of riparian assessments, including matters related to the respective

roles and responsibilities of various registered professionals involved in a riparian assessment. Until now, while assessment methods have been appended to the regulation, professional practice guidelines for riparian assessments have not been available.

The need for professional guidelines was initially identified both by MFLNRO and by some practitioners soon after enactment of the Riparian Areas Regulation (2004), when riparian assessments became a requirement in the communities that had adopted riparian protection bylaws. In 2013, the CAB, APEGBC, ABCFP, BCIA and ASTTBC were contacted by the Office of the Ombudsperson, Province of British Columbia, to provide input on an investigation being carried out by that office, examining how the province has administered the Riparian Areas Regulation since it was enacted in 2005. One of the major areas of concern was the professional reliance model central to the Riparian Areas Regulation, and whether MFLNRO was providing adequate oversight. As part of the consultation process, the above-referenced professional regulatory bodies suggested that the Ombudsperson include as one of the recommendations that professional practice guidelines be developed to provide guidance on conducting professional assessments under the Riparian Areas Regulation in a manner that meets the Qualified Environmental Professional's professional obligations under the professional legislation.

Subsequently, in March 2014, the Office of the Ombudsperson, Province of British Columbia, issued a report entitled *Striking a Balance: The Challenges of Using a Professional Reliance Model in Environmental Protection – British Columbia's Riparian Areas Regulation*.

Recommendation 7 in the Ombudsperson's report states:

I recommended that the Ministry of Forests, Lands and Natural Resource Operations work with professional associations to draft professional guidelines for use by individuals who conduct assessments under the *Riparian Areas Regulation* that are designed to constitute an enforceable standard of professional conduct.

*The Ministry of Forests, Lands and Natural Resource Operations has accepted this recommendation.*

As a result of the Ombudsperson's recommendation, the associations worked together to develop a professional practice guideline modelled on others previously developed by the APEGBC and ABCFP for various professional activities. The MFLNRO provided additional technical assistance and funding.

These guidelines have been written with the intention of guiding professional practice when carrying out riparian assessments pursuant to the Riparian Areas Regulation. They provide the basis for meeting an appropriate professional standard of practice when carrying out riparian assessments that are consistent with the regulation. It should be noted that the specific assessment methodology employed for the Riparian Areas Regulation requires a specific approach that differs from broader evaluations of fisheries values required for other purposes.

While these guidelines were not intended to address riparian assessments carried out for purposes other than for the Riparian Areas Regulation, some of the information contained herein may be relevant to the preparation of riparian assessments for other purposes.



Appendix B outlines the legislative and regulatory framework relevant to carrying out such assessments. The objectives of the Riparian Areas Regulation, enacted under the *Riparian Areas Protection Act*, is to ensure that in the local governments where it applies, riparian areas are considered and protected as part of any development process that could impact them. Riparian areas include the stream banks and the trees and vegetation growing on the stream banks. These are essential to maintaining the health of streams and in turn the fish that live in them, such as salmonids.



## ■ DEFINITIONS

The definitions below are specific to these guidelines. Definitions for terms that also appear in the Riparian Areas Regulation align with the definitions used in the regulation. All of the terms defined below are italicized the first time they appear in the guidelines text.

**Active floodplain** (from Riparian Areas Regulation)

An area of land that supports floodplain plant species and is

- (a) adjacent to a *stream* that may be subject to temporary, frequent or seasonal inundation, or
- (b) within a boundary that is indicated by the visible high water mark.

**Agreement**

A contract or terms of engagement, whether formal (written) or informal (verbal or implied), between the client and the Qualified Environmental Professional, or his/her company, for conducting a riparian assessment.

**Approving authority**

Approving officer of a local, provincial or First Nation government with the authority to authorize development.

**Assessment methods**

The methods set out in the schedule appended to the Riparian Areas Regulation.

**Assessment report**

A report prepared in accordance with the *Riparian Areas Regulation Assessment Methods* (MWLAP 2006) to assess the potential impact of a proposed development in a riparian assessment area and establish the size of the streamside protection and enhancement area. The report is certified for the purposes of the

Riparian Areas Regulation by the Qualified Environmental Professional.

**Client**

A party who engages a member to conduct a riparian assessment. For the purpose of these guidelines this could include a local government, the land owner, or an individual or company retained by a land owner to plan and oversee development of a parcel of land or to look after the affairs of the land. For example, this individual or company may be an architect, a BC land surveyor, a civil (land development) engineer, a land use planner, a consultant, a contractor, a realtor or a family member.

**Covenant**

A registered agreement, established by the *Land Title Act* (Section 219), between a land owner and the local or provincial government that sets out certain conditions for a specific property with regard to building use, building location, land use, property subdivision and property sale.

**Development** (from Riparian Areas Regulation) (**Note:** Some local government bylaws for this regulation have a different definition.)

Any of the following associated with or resulting from the local government regulation or approval of residential, commercial or industrial activities or ancillary activities to the extent that they are subject to local government powers under Part 14 of the *Local Government Act*:

- (a) removal, alteration, disruption or destruction of vegetation;
- (b) disturbance of soils;
- (c) construction or erection of buildings and structures;

- (d) creation of non-structural impervious or semi-impervious surfaces;
- (e) flood protection works;
- (f) construction of roads, trails, docks, wharves and bridges;
- (g) provision and maintenance of sewer and water services;
- (h) development of drainage systems;
- (i) development of utility corridors;
- (j) subdivision as defined in section 872 of the *Local Government Act*.

**Development proposal** (from Riparian Areas Regulation)

Any development that is proposed in a riparian assessment area that is within or partly within the boundaries of an area administered by a local government.

**Environmental monitoring**

The service provided by a person or persons to confirm that construction activities comply with environmental management and protection provisions so that no HADD occurs during the site works or on completion of development. Environmental monitoring involves:

- (a) site visits during the work to check that worksite procedures are not adversely affecting fish or fish habitat, including killing or stranding fish, and introducing deleterious material such as spills, sediment, or muddy runoff to *streams*, with the authority to suspend work activities if work-site procedures, flow, water levels or weather conditions are such that these effects cannot be avoided;
- (b) systematic and purposeful observation and recording of construction activities related to project environmental management and all environmental activities.

**Field review**

Such reviews of the site works considered necessary in the member's opinion to ascertain whether the work is in general

compliance with the member's measures and recommendations, and to verify that the streamside protection and enhancement area has been physically marked onsite.

**Fish** (from Riparian Areas Regulation)

All life stages of

- (a) salmonids,
- (b) game fish, and
- (c) regionally significant fish.

**Floodplain plant species** (from Riparian Areas Regulation)

Plant species that are typical of an area of inundated or saturated soil conditions and that are distinct from plant species on freely drained adjacent upland sites.

**HADD** (described in 4(2) of Riparian Areas Regulation)

The "Harmful alteration, disruption, or destruction of natural features, functions, and conditions that support fish life processes in the riparian assessment area." (**Note:** This definition pertains to the Riparian Areas Regulation and is not the same as similar terms used in the federal *Fisheries Act* or policies under that Act.)

**High water mark** (from Riparian Areas Regulation)

The visible high water mark of a *stream* where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the *stream* a character distinct from that of its banks, in vegetation as well as in the nature of the soil itself, and includes the active floodplain.

**Land owner**

An individual or company identified as the owner on the title of the land registered in a Land Title Office.

**Local government**

Incorporated communities, regional districts or First Nation governments

that have enacted bylaws or policies to implement the Riparian Areas Regulation or bylaws or policies with similar riparian protection provisions. Includes the Islands Trust.

### **Measures**

A plan or course of action specified by a Qualified Registered Professional to protect the integrity of the streamside enhancement and protection area and prevent a HADD from occurring both at the time of development and afterwards—for example, requiring designated no-work zones, work procedures, physical works such as tree or other vegetation treatments, and sediment control and erosion protection.

### **Member**

A registered member or holder of limited licence in good standing with APEGBC, CAB, ABCFP, BCIA or ASTTBC.

### **Natural features, functions and conditions** (from Riparian Areas Regulation)

Include but are not limited to the following:

- (a) large organic debris that falls into the *stream* or streamside area, including logs, snags and root wads;
- (b) areas for channel migration, including active floodplains;
- (c) side channels, intermittent *streams*, seasonally wetted contiguous areas and floodplains;
- (d) the multi-canopied forest and ground cover adjacent to *streams* that
  - (i) moderates water temperatures,
  - (ii) provides a source of food, nutrients and organic matter to *streams*,
  - (iii) establishes root matrices that stabilize soils and *stream* banks, thereby minimizing erosion, and
  - (iv) buffers *streams* from sedimentation and pollution in surface runoff;

- (e) a natural source of stream bed substrates;
- (f) permeable surfaces that permit infiltration to moderate water volume, timing and velocity and maintain sustained water flows in streams, especially during low flow periods.

### **Permanent structure** (from Riparian Areas Regulation)

Any building or structure that was lawfully constructed, placed or erected on a secure and long-lasting foundation on land in accordance with any local government bylaw or approval condition in effect at the time of construction, placement or erection. For further clarification, see Appendix E.

### **Qualified Environmental Professional** (from Riparian Areas Regulation)

An applied scientist or technologist if:

- (a) the individual is registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association's code of ethics and subject to disciplinary action by that association, and
- (b) the individual's area of expertise is recognized in the assessment methods as one that is acceptable for the purpose of providing all or part of an assessment report in respect of that development proposal, and
- (c) is acting within that individual's area of expertise.

For the purpose of these guidelines, this definition applies to members.

### **Ravine** (from Riparian Areas Regulation, with addition for clarity)

A narrow, steep-sided valley that is commonly eroded by running water and has a slope grade greater than 3 (horizontal):1 (vertical).

### **Riparian assessment**

An assessment completed by or under the direction of a Qualified Environmental

Professional in accordance with these guidelines to assess the potential impact of proposed development in a riparian assessment area and to designate the width of the streamside protection and enhancement area.

**Riparian assessment area** (with reference to the Riparian Areas Regulation)

The zone adjacent to a *stream* that provides essential functions for natural hydrologic processes, channel stability, slope stability and erosion resistance of adjacent banks, supply of large woody debris, and vegetation contributing to fish life processes.

The Riparian Areas Regulation defines “riparian assessment area” as follows, but this may vary in local government bylaws:

- (a) for a *stream*, the 30-metre strip on both sides of the *stream*, measured from the high water mark,
- (b) for a ravine less than 60 metres wide, a strip on both sides of the *stream* measured from the high water mark to a point that is 30 metres beyond the top of ravine bank, and
- (c) for a ravine 60 metres wide or greater, a strip on both sides of the *stream* measured from the high water mark to a point that is 10 metres beyond the top of ravine bank.

For further clarification, see Appendix E.

**Serious harm to fish** (from *Fisheries Act*)

The death of fish or any permanent alteration to, or destruction of, fish habitat.

**Specialist**

An individual who has specialized training, certification and experience in a particular occupation, practice or branch of learning. Such individuals include, but are not limited to, other members with specialized expertise, such as windthrow, forest health, slope stability, fluvial geomorphology, aquatic or riparian terrestrial habitats,

erosion control, or hydrology; or non-members such as surveyors, individuals with certification in specific skills such as danger tree assessment, arborists or certified fallers with expertise in topping, pruning or tree removal.

Only members listed in Appendix 2 of the *Riparian Areas Regulation Assessment Methods* (MWLAP 2006) can be the primary Qualified Environmental Professional who takes responsibility for and submits the riparian assessment report. For further explanation, see Sections 2.5.1 and 3.7.1 of these guidelines.

**Stream** (from Riparian Areas Regulation)

Any of the following that provides fish habitat:

- (a) a watercourse, whether it usually contains water or not;
- (b) a pond, lake, river, creek or brook;
- (c) a ditch, spring or wetland that is connected by surface flow to something referred to in paragraph (a) or (b).

In these guidelines, where the term “*stream*” appears in italics, it refers to the Riparian Areas Regulation definition. Where the term “stream” does not appear in italics, it refers to the normal meaning of a stream as a watercourse.

For further clarification, see Appendix E.

**Streamside protection and enhancement area** (from Riparian Areas Regulation)

An area adjacent to a *stream* that links aquatic to terrestrial ecosystems and includes both existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts an influence on the *stream*; and the size of which is determined on the basis of an assessment report prepared by a qualified environmental professional in respect of a development proposal.

From Riparian Areas Regulation,  
Section 1(2):

For the purpose of defining the streamside protection and enhancement area, vegetation must be considered to be “potential” if there is a reasonable ability for regeneration either with assistance through enhancement or naturally, but an area covered by a permanent structure must be considered to be incapable of supporting potential vegetation.

**Top of the ravine bank** (from Riparian Areas Regulation, with minor addition for clarity)

The first significant break in a ravine slope where the break occurs such that the grade beyond the break is flatter than 3 (horizontal):1 (vertical) for a minimum distance of 15 metres measured perpendicularly from the break, and the break does not include a bench within the ravine that could be developed.

**Wetland** (from Riparian Areas Regulation)

Land that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal conditions does support, vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs, fens, estuaries and similar areas that are not part of the active floodplain of a *stream*. For further clarification, see Appendix E.

# ■ INTRODUCTION

Once the Riparian Areas Regulation is adopted in the form of policies or bylaws by a *local government*, a *riparian assessment* is required to be completed by a *Qualified Environmental Professional* and submitted to both MFLNRO and Fisheries and Oceans Canada (DFO) before a local government can approve a *development* project within a *riparian assessment area*. The qualified environmental professional assesses the site and determines the size of the *streamside protection and enhancement area* needed to protect *fish habitat*. In addition, the Qualified Environmental Professional prescribes *measures* to protect the streamside protection and enhancement area.

## 1.1 PURPOSE OF THE GUIDELINES

This document provides guidelines for professional practice of a Qualified Environmental Professional who carries out a riparian assessment in response to legislation in British Columbia. Appendix C to these guidelines provides an assurance statement that is to be submitted with a *riparian assessment report*, to a *client* and/or *approving authority* having jurisdiction in respect of permit conditions for various types of development activities regulated in BC (e.g., residential, commercial or industrial activities).

These guidelines address project organization and responsibilities of the various participants; professional practices that should be provided; quality assurance/quality control; and professional registration and education, training and experience.

The specific objectives of these guidelines are as follows:

1. Outline the professional services to be provided by Qualified Environmental Professionals conducting riparian assessments.
2. Describe the standards of practice to be expected of a Qualified Environmental Professional providing professional services under the Riparian Areas Regulation.
3. Specify the tasks to be performed by a Qualified Environmental Professional in order to meet an appropriate standard of care when carrying out riparian assessments and that fulfill the Qualified Environmental Professional's obligations under the self-governing legislation regulating his/her practice. These obligations include the Qualified Environmental Professional's primary duty to protect the safety, health and welfare of the public and the environment.
4. Describe the roles and responsibilities of the various participants and stakeholders involved in riparian assessments. The guidelines will assist in delineating the roles and responsibilities of the various participants and stakeholders.
5. Describe the quality management practices to be followed when carrying out riparian assessments so the Qualified Environmental Professional is meeting his/her respective professional obligations.
6. Provide consistency in riparian assessment reports and other documents prepared by Qualified Environmental Professionals when providing professional services in this field of practice.
7. Describe the appropriate knowledge, skill sets and experience that Qualified Environmental Professionals should have when providing professional services related to carrying out riparian assessments.



## 1.2 SCOPE OF THE GUIDELINES

These guidelines apply to riparian assessments prepared in response to the Riparian Areas Regulation. (For a summary of the legislative framework criteria, see Appendix B).

Although these guidelines are not intended for assessments other than those done under the Riparian Areas Regulation, *members* may find the information in the guidelines relevant when conducting riparian assessments for other purposes.

## 1.3 APPLICABILITY OF THE GUIDELINES

These guidelines establish a standard of care and level of due diligence recommended in order to meet the duty of care a professional has in law when carrying out riparian assessments. Notwithstanding the purpose and scope of these guidelines, a Qualified Environmental Professional's decision not to follow one or more aspects of these guidelines does not necessarily mean that he/she fails to meet his/her professional obligations. Such judgments and decisions depend upon weighing facts and circumstances to determine whether another reasonable and prudent Qualified Environmental Professional, in a similar situation, would have conducted himself/herself similarly.

A riparian assessment must be submitted to MFLNRO and DFO before an approving authority can allow or approve development in an area covered by the Riparian Areas Regulation. The Qualified Environmental Professional's client is most commonly a *land owner* or party acting on behalf of the land owner who retains the Qualified Environmental Professional to undertake the riparian assessment as a condition of applying for a development permit. Following these guidelines, however, does not ensure that the conclusions and recommendations

contained within the riparian assessment report will be accepted by the approving authority, or that the development permit will be granted.

These guidelines are influenced by current provincial legislation and its application by local government, provincial case law, advances in knowledge, and evolution of general professional practices in BC. As such, they may require updating from time to time.

## 1.4 LEGISLATIVE FRAMEWORK

At the federal level, the *Fisheries Act* is the overarching legislation for the protection of fish and fish habitat in Canada. Provincially, there are several statutes in BC with provisions relating to protection of *streams*; only the Riparian Areas Regulation enacted in 2004 under the *Fish Protection Act* (SBC 1997) specifically requires professional assessments.

The *Water Sustainability Act* renames the *Fish Protection Act* to the *Riparian Areas Protection Act* and subsumes several sections of the *Fish Protection Act*. As of January 2016, the Riparian Areas Regulation is now under the authority of the *Riparian Areas Protection Act*.

The *Water Sustainability Act* also renames parts of the *Water Act* to the *Water Users Communities Act* and repeals many sections of the *Water Act*, including those pertaining to changes in and about a stream. The *Water Sustainability Regulation*, enacted under the *Water Sustainability Act*, regulates activities for stream and aquatic ecosystem protection. The *Water Sustainability Act* allows persons to carry out activities in and about a stream under the authority of an authorization, change approval, order or authorized change under the *Water Sustainability Regulation*.

Other statutes with provisions pertaining to waterbodies or the adjacent riparian environment include:

- *Local Government Act* (RSBC 1996)
- *Water Act* (RSBC 1996) (replaced by the *Water Sustainability Act*)
- *Drinking Water Protection Act* (SBC 2001)
- *Land Title Act* (RSBC 1996)
- *Environmental Management Act* (SBC 2003)
- *Community Charter Act* (SBC 2003)

The framework is summarized in Appendix B. A Qualified Environmental Professional who either completes a riparian assessment or leads a team that completes a riparian assessment should be familiar with the relevant provisions of these statutes, and particularly with the Riparian Areas Regulation.

#### **1.4.1 Riparian Areas Regulation of the Riparian Areas Protection Act**

The Riparian Areas Regulation has two primary purposes: to protect riparian areas from the effects of development so these areas can continue to support fish life processes; and to facilitate intergovernmental co-operation between federal, provincial and local government agencies in implementation of the regulation.

The Riparian Areas Regulation applies to the geographic areas of the province listed in the amendment to the Riparian Areas Regulation dated May 19, 2006 (Order in Council No. 378). Local government enacts bylaws to apply the Riparian Areas Regulation under Part 14 of the *Local Government Act*. Such policies or bylaws may vary among local governments and/or include changes to certain provisions of the Riparian Areas Regulation as they apply in the local government's jurisdiction; but implementation by the local government must meet or exceed the provisions of the Riparian Areas Regulation.

The regulation defines a specific riparian assessment area encompassing zones on both sides of a *stream*, and requires that a Qualified Environmental Professional complete an assessment for any development proposed within the riparian assessment area. The Riparian Areas Regulation defines a Qualified Environmental Professional as a member of a professional association constituted under an act, acting under a code of ethics, and subject to disciplinary action by the professional association.

In the riparian assessment, the Qualified Environmental Professional is required to provide their professional opinion that either:

- (i) if the development is implemented as proposed there will be no harmful alteration, disruption or destruction of *natural features, functions and conditions* that support fish life processes [*HADD*] in the riparian assessment area, or
- (ii) if the streamside protection and enhancement areas identified in the report are protected from the development and the measures identified in the report as necessary to protect the integrity of those areas from the effects of the development are implemented by the developer, there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.

If either of the above two conditions are met, the local government may approve or allow development to proceed.

If neither of the above two conditions is met, the local government may allow development to proceed if the Minister of Fisheries and Oceans Canada or a regulation under the *Fisheries Act* (Canada) authorizes the harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian

assessment area that would result from the implementation of the *development proposal*.

Section 7 of the Riparian Areas Regulation also requires the Qualified Environmental Professional to provide an assessment report that reports on:

- (a) the width of the streamside protection and enhancement area that must be protected, and
- (b) the measures necessary to protect the integrity of the streamside protection and enhancement area.

Some local governments have streamside protection and enhancement areas that were put in place under and continue from the former Streamside Protection Regulation. Any variance to one of these streamside protection and enhancement areas requires a riparian assessment under the Riparian Areas Regulation. Some local governments do not allow any variances to the streamside protection and enhancement areas established under the Streamside Protection Regulation.

#### **1.4.2 Exemptions from the Riparian Areas Regulation**

Section 3(2) of the Riparian Areas Regulation provides the following exemption:

This regulation does not apply to a development permit or development variance permit issued only for the purpose of enabling reconstruction or repair of a permanent structure described in Section 911(8) of the *Local Government Act* if the structure remains on its existing foundation.

Section 532(1) of the *Local Government Act* allows for repair or reconstruction so long as damage or destruction to the building or other structure is less than 75% of its value above the foundation.

Where this is the case, no riparian assessment is required. However, some

local governments have enacted bylaws with different requirements for these grandparented structures; the Qualified Environmental Professional must therefore check local bylaws. The Qualified Environmental Professional should also be aware that some local governments have bylaws that are incomplete in their capture of requirements under the Riparian Areas Regulation. In all situations, the requirements of the Riparian Areas Regulation must still be met.

The Riparian Areas Regulation defines “*permanent structure*” as “any building or structure that was lawfully constructed, placed or erected on a secure and long lasting foundation on land in accordance with any local government bylaw or approval condition in effect at the time of construction, placement or erection.”

### **1.5 PROFESSIONAL CONDUCT**

These guidelines have been formally endorsed by the councils of ABCFP, APEGBC and CAB and form part of their ongoing commitment to maintaining the quality of services members provide to their clients and the general public. Members are professionally accountable for their work under the respective legislation regulating the professional work of the members belonging to the above-referenced professional associations.

A Qualified Environmental Professional must exercise professional judgment when providing professional services; as such, application of these guidelines will vary depending on the circumstances. ABCFP, APEGBC, BCIA, CAB and ASTTBC support the principle that a member should receive fair and adequate compensation for professional services, including services provided to comply with these guidelines. An insufficient fee does not justify services that do not meet the intent of these guidelines. These guidelines may be used to assist in establishing the objectives, scope of riparian assessment, level of service,

and terms of reference of a Qualified Environmental Professional's *agreement* with the client.

By following these guidelines a Qualified Environmental Professional will fulfill his/her professional obligations, especially with regard to the relevant code of ethics and duty to protect public safety and the environment. Failure of a Qualified Environmental Professional to meet the intent of these guidelines could be evidence of unprofessional conduct and lead to disciplinary proceedings by the relevant professional regulatory body.

### **1.6 ACKNOWLEDGMENTS**

These guidelines have been prepared by a working group of APEGBC and CAB, with reviews by ABCFP, BCIA, ASTTBC, MFLNRO staff and members of the associations who are practitioners in this field. The associations acknowledge the funding, support and technical reviews by MFLNRO staff; the efforts of the working group members; and the time and effort of those who provided review comments, including members of the associations.

## ■ ROLES AND RESPONSIBILITIES

This section describes some of the typical responsibilities of a client, Qualified Environmental Professional and approving authority. Section 2.3 describes some of the typical responsibilities of a Qualified Environmental Professional when asked by an approving authority or client to review a riparian assessment report prepared by another Qualified Environmental Professional.

The client should be aware that the findings of the Qualified Environmental Professional could possibly result in the development requiring modification, the approving authority requiring *covenants* or the development being turned down. In this regard, it is useful to have the riparian assessment carried out early in the development planning process. The Qualified Environmental Professional should be aware that his/her report will ultimately be submitted to, and likely reviewed by, the approving authority.

### 2.1 THE CLIENT

The client is typically the land owner or a person or company hired by the land owner, but could also be a local government, First Nation government or the provincial government.

Prior to a riparian assessment being carried out, it is helpful if the client is knowledgeable about, and can provide the Qualified Environmental Professional with, the following:

- process and procedures for subdivision approvals, development permits, building permits and floodplain bylaw variance or exemption, as applicable
- any approving authority requirements for *environmental monitoring* during construction or post-development monitoring
- legal description of the property, as registered with Land Titles and Survey

Authority, and a copy of the current land registration, including covenants

- for subdivision, a copy of the existing survey plan of the property, or the need for a survey plan, and the location of the legal property boundary markers on the ground (this may require a BC land surveyor)
- for subdivision, proposed subdivision plan
- for subdivision, in general terms, proposed and anticipated land use changes on and, if required, beyond the property
- for development, plans of existing buildings or structures, and location of the proposed development on the ground
- for development, proposed development drawings
- recognition that the riparian assessment is based on the proposed development as provided to the Qualified Environmental Professional and that changes to the development may require changes to, or invalidate, the riparian assessment
- relevant background information (written or otherwise) related to the property and the existing and proposed development, including previous reports conducted for the client or available to the client

In addition, the Qualified Environmental Professional should have unrestricted access to and, if required, beyond the property.

With assistance from the Qualified Environmental Professional, the client should complete an agreement with the Qualified Environmental Professional confirming scope, schedule and compensation for the riparian assessment; need and scope of specialty services;

and need for external peer review. It is recommended that such an agreement include a clause that deals with potential disclosure issues due to the Qualified Environmental Professional's obligation under the associations' respective codes of ethics that oblige members to protect the environment and the safety, health and welfare of the public. In certain circumstances the Qualified Environmental Professional may have to convey adverse findings to parties who may not be directly involved, but who have a compelling need to know (e.g., slope stability or flood hazard identified during the course of the riparian assessment, spills, contaminants).

Following is suggested wording for such a clause:

Subject to the following, the Qualified Environmental Professional will keep confidential all information, including documents, correspondence, reports and opinions, unless disclosure is authorized in writing by the client. However, in keeping with the [Association's respective Code of Ethics], if the Qualified Environmental Professional discovers or determines that there is a material risk to the environment, he/she shall notify the client as soon as practicable of this information and the need that it be disclosed to the appropriate parties. If the client does not take the necessary steps to notify the appropriate parties in a reasonable amount of time, the Qualified Environmental Professional shall have the right to disclose that information in order to fulfill his/her ethical duties and the client hereby agrees to that disclosure.

The client should be aware that the Qualified Environmental Professional's cost estimate may have to be amended during the assessment, as a result of the need to bring in appropriate *specialists* (who would be subject to the clause above), depending on the Qualified Environmental Professional's findings and analysis.

The cost estimate may need to include consideration of the approving authority requirements for site monitoring or post-development reporting, both of which are becoming increasingly common at the local government level. The client should also be aware that a riparian assessment does not guarantee that the results will be favourable for the proposed development. The cost estimate and likely results should be discussed with the client prior to the assignment.

During the riparian assessment, it is helpful if the client:

- shows the Qualified Environmental Professional the locations of legal property boundary markers on the ground and location of the proposed development
- allows the Qualified Environmental Professional unrestricted access to the property
- obtains access, if required, to areas beyond the property

After the riparian assessment, it is helpful if the client:

- reviews the riparian assessment report, and understands the limitations and qualifications that apply
- discusses the report with the Qualified Environmental Professional and, if necessary, seeks clarification
- confirms to the Qualified Environmental Professional that the streamside protection and enhancement area and prescribed measures are understood and will be implemented
- directs the Qualified Environmental Professional to complete a Riparian Assessment Assurance Statement (Appendix C), and provides the Statement and the riparian assessment report to the approving authority
- notifies the Qualified Environmental Professional if land use or site development changes or varies from those described in the report

- retains the Qualified Environmental Professional to carry out the necessary *field reviews* and/or environmental monitoring before any site works commence to confirm that the measures prescribed in the riparian assessment report have been followed, so that the Qualified Environmental Professional can sign a Conformance Statement (Appendix C) to that effect and, if needed, prepare a post-development report
- provides verification that the required permits are in place and timely notice of site works to the Qualified Environmental Professional so that field reviews and environmental monitoring can be undertaken at the appropriate times
- provides the client with relevant local bylaws pertaining to the Riparian Areas Regulation, and the jurisdiction's guidelines for carrying out a riparian assessment
- advises the client of any other bylaws regarding protection of trees, nests or other environmental features

After the riparian assessment, it is helpful if MFLNRO and the local government:

- review the Riparian Assessment Assurance statements and the riparian assessment report
- if necessary, discuss the statement and report with the Qualified Environmental Professional and seek clarification and amendment as required

It is important that the local government understands the content of the riparian assessment report and the measures prescribed in the riparian assessment report when allowing or approving development and when carrying out enforcement of the bylaw(s). If the local government does not find that the direction in the Qualified Environmental Professional's report is sufficiently clear to enable it to be incorporated into permit conditions, they should request clarification from the Qualified Environmental Professional, who has a duty to provide reports that are understandable to a non-specialist, as indicated in Section 2.5.

The Riparian Assessment Assurance Statement and the riparian assessment report are the property of the Qualified Environmental Professional until outstanding invoices of the Qualified Environmental Professional are fully paid by the client.

## 2.2 THE APPROVING AUTHORITY

MFLNRO and DFO are responsible for receiving riparian assessment reports, verifying that the regulatory requirements for training and registration of the Qualified Environmental Professional have been met, and for checking that the riparian assessment report is in conformance with the prescribed *assessment methods*.

Local government is the approving authority for approving or allowing development to proceed, after notification from MFLNRO and DFO that a riparian assessment report has been received and acknowledged to have covered the required content.

Before the riparian assessment is initiated, it is helpful if the local government:

- informs the client why a riparian assessment is required

## 2.3 REVIEWS OF RIPARIAN ASSESSMENT REPORTS

A Qualified Environmental Professional may be engaged by an approving authority (MFLNRO, DFO or a local government) to carry out an independent external peer review of a riparian assessment report and Riparian Assessment Assurance Statement prepared by another Qualified Environmental Professional. Less frequently, a client may ask for such a review. This type of review is not the same as an internal or external peer review

carried out at the request of the Qualified Environmental Professional prior to submitting the report to his/her client and/or the approving authority.

In order for the reviewing Qualified Environmental Professional to carry out an appropriate review, it is helpful if the requesting approving authority or client:

- recognizes that the associations' respective codes of ethics require that members follow respectful protocols when reviewing the work of other members and maintain confidentiality regarding other members' work
- provides the reviewing Qualified Environmental Professional with a copy of the riparian assessment report and Riparian Assessment Assurance Statement, necessary background information, and the reason for the review
- examines the review letter or report and, if necessary, discusses the review letter or report with the reviewing Qualified Environmental Professional to seek clarification

The reviewing Qualified Environmental Professional should consider whether there may be a conflict of interest and act accordingly, conduct himself/herself with fairness, courtesy and good faith toward colleagues, and provide honest and fair comment.

The reviewing Qualified Environmental Professional should:

- if authorized to do so, inform the Qualified Environmental Professional who prepared the riparian assessment report and Riparian Assessment Assurance Statement of the review, and the reasons for the review, and document in writing that the Qualified Environmental Professional was so informed
- in keeping with his/her association's code of ethics, maintain confidentiality regarding the other member's work

- ask the Qualified Environmental Professional who prepared the report if the reviewing Qualified Environmental Professional should know about unreported circumstances that may have limited or qualified the riparian assessment, the Riparian Assessment Assurance Statement and/or the report
- with the client's authorization, if the results of the review identify safety or environmental concerns, contact the Qualified Environmental Professional who prepared the report and Riparian Assessment Assurance Statement, in order to provide an opportunity for the Qualified Environmental Professional to comment prior to further action

The review should be appropriately documented in a letter or a report. The reviewing Qualified Environmental Professional should submit a signed, sealed and dated review letter or report including limitations and qualifications with regard to the review, and results and/or recommendations arising from the review.

The reviewing Qualified Environmental Professional should clarify any questions the approving authority or client may have with regard to the review letter or report.

Occasionally, a Qualified Environmental Professional is retained to provide a second opinion. This role goes beyond that of reviewing the work of the original Qualified Environmental Professional. The second Qualified Environmental Professional should carry out sufficient pre-field work, field work, assessment and comparisons, as required, to accept full responsibility for his/her second opinion findings.

## **2.4 TEAMWORK**

Depending on the complexity of a project, site characteristics and the required expertise, a riparian assessment may be completed by an individual Qualified Environmental Professional who has the necessary experience and expertise



to complete all aspects of the riparian assessment, or by a team. A team consists of a primary Qualified Environmental Professional who is qualified to take professional responsibility for professional practice associated with the riparian assessment, plus one or more other individuals who may be required, depending on the size and complexity of the project. The primary Qualified Environmental Professional would most commonly be a member of CAB, but could be a member of ABCFP, APEGBC, BCIA or ASTTBC. Only members meeting the requirements of Appendix 2 of the *Riparian Areas Regulation Assessment Methods* (MWLAP 2006) can have the role of primary Qualified Environmental Professional, taking overall responsibility for and submitting a riparian assessment report.

Other team members could include specialists that are members, or non-professionals such as field assistants, arborists, surveyors, experts in removal of danger trees, or individuals with expertise in carrying out specific kinds of site work (see Sections 2.5.1, 2.6 and 3.7.1).

## **2.5 RESPONSIBILITIES OF THE QUALIFIED ENVIRONMENTAL PROFESSIONAL**

The Qualified Environmental Professional is responsible for carrying out the riparian assessment, or taking responsibility for a riparian assessment done by a team, and, if required, making recommendations to avoid the occurrence of a HADD or for habitat protection and regeneration of potential vegetation.

Local governments have adopted the Riparian Areas Regulation into their bylaws in different ways. It is the responsibility of the Qualified Environmental Professional to know how to access these bylaws and to understand their application and how they will influence the proposed development and/or property. The Qualified

Environmental Professional often finds it necessary to explain these bylaws to clients, land owners or other involved parties. Some local governments have bylaws that are incomplete in their capture of requirements under the Riparian Areas Regulation; however, the requirements of the Riparian Areas Regulation must still be met.

The Qualified Environmental Professional should not assume that:

- the client is aware of restrictions imposed by local government bylaws
- the proposed development has been designed to take the requirements of the Riparian Areas Regulation into account
- the client has secured the appropriate permits for the proposed work

Prior to carrying out a riparian assessment, the Qualified Environmental Professional should:

- obtain the jurisdiction's current bylaws that apply to implementation of the Riparian Areas Regulation
- be knowledgeable about the development application, approval processes and timelines; procedures for subdivision approval, development permit, building permit and floodplain bylaw variance and exemption; and applicable legislation
- confirm that he/she has appropriate training and experience to carry out a riparian assessment for the specific site conditions, and, if not, involve the appropriate specialists
- obtain a copy of the approving jurisdiction's policies or bylaws for defining the riparian assessment area
- establish the scope of work with the client, including the need for and roles of specialists, if applicable
- confirm that the client has applied for or obtained the necessary development permits
- review the client's role and involvement, as described in Section 2.1

The Qualified Environmental Professional and the client should complete an agreement confirming scope, schedule and compensation for the riparian assessment; need for and scope of specialty services; and need for an external peer review if anticipated. The Qualified Environmental Professional's cost estimate should indicate what services are included, and what circumstances may cause a change to the scope of work and associated costs.

The associations encourage their members to disclose to the client whether professional liability insurance is held and covers the services to be undertaken by the member. In particular, a Qualified Environmental Professional who is a member of APEGBC must comply with the requirements of APEGBC Bylaw 17 regarding professional liability insurance.

During the riparian assessment, the Qualified Environmental Professional should:

- if necessary, assist the client in obtaining relevant information such as that listed in Section 2.1
- make reasonable attempts to obtain from the client and others all relevant information related to the *stream* and its catchment area
- prior to field work, review collected information
- conduct field work within the limits of and, if necessary, beyond the property at an intensity appropriate to the method and scope of riparian assessment and to meet the requirements of existing jurisdictional guidelines
- conduct the riparian assessment in compliance with the assessment methods
- consider the consequences of the development on the *stream* condition and the riparian environment on and, if required, adjacent to and beyond the property
- identify whether aspects of the proposed development will conflict with the

streamside protection and enhancement area and communicate in a timely fashion regarding redesign of the project

- notify the client as soon as reasonably possible of the need for specialty services or changes in the scope of work, and of associated changes to the original cost estimate
- communicate with representatives of the local government (e.g., planners), where appropriate
- write the report clearly, concisely and completely, and conform, where applicable, to jurisdictional guidelines for riparian assessment reports
- incorporate specialist recommendations into the riparian assessment
- ensure quality assurance and quality control of the assessment, including having a draft of the report appropriately peer reviewed
- submit to the client a signed, sealed and dated copy of the report, including the applicable completed Riparian Assessment Assurance statements, and, if directed by the client, provide the Riparian Assessment Assurance Statement and the riparian assessment report to the approving authorities

Qualified Environmental Professionals should make every effort to use simple language so that the direction provided in their reports is clear to a non-specialist, is understood by the client, and can be easily incorporated into a local government's permit conditions.

After the riparian assessment, the Qualified Environmental Professional should:

- clarify questions the client and/or approving authority may have with regard to the riparian assessment report, and/or Riparian Assessment Assurance Statement
- if MFLNRO found gaps in the report submission review, or if a peer review or second opinion found omissions

or deficiencies, the Qualified Environmental Professional must consider and address any omissions or deficiencies as required to meet these guidelines and the assessment methods

- carry out follow-up work if requested by the client or the approving authority, and if retained to do so
- conduct field reviews if these have been recommended and agreed to
- undertake environmental monitoring if required and agreed to
- prepare a Conformance Statement and/or a post-development report on the completed site works, if requested and agreed to

When hired to undertake field reviews and/or environmental monitoring, the Qualified Environmental Professional will need to verify that, if these duties are delegated to a subordinate, the person is qualified and is onsite in a timely fashion and during the required times. Before undertaking to supervise site works, or carry out field reviews or environmental monitoring, the Qualified Environmental Professional should confirm that the required permits for the work are in place.

If aspects of the riparian assessment are delegated to subordinates, they should be carried out only under direct supervision of the Qualified Environmental Professional. The Qualified Environmental Professional accepts full responsibility for all work delegated (see Section 4.2).

A member should clearly indicate to his/her client the possible consequences if recommendations are disregarded.

If a client fails or refuses to accept the conclusions and recommendations of the report, to fulfill a member's obligations under his/her code of ethics, the Qualified Environmental Professional should:

- advise the client in writing of the potential consequences of the client's actions or inactions

- if situation warrants notifying the member's professional association, the land owner (if different from the client) and/or the appropriate authorities, act accordingly

These actions should be taken particularly when workplace safety or the environment is potentially jeopardized.

During the assessment process, the Qualified Environmental Professional is encouraged to inform and educate his/her client with respect to fish habitat characteristics and the role of the riparian zone in maintaining healthy aquatic systems.

### **2.5.1 Use of Subordinates and Specialists**

The primary Qualified Environmental Professional may delegate tasks to others who work under his/her direct supervision (Section 4.2), or may rely on the work of other members or non-professionals who have the skill sets necessary to complete a task and take responsibility for it. The primary Qualified Environmental Professional should provide sufficient direction to specialists or other team members commensurate with their level of expertise and the working relationships.

When seeking advice from a specialist, the primary Qualified Environmental Professional is responsible for checking that the specialist is qualified and competent to give that advice and that the advice given makes sense based on the primary Qualified Environmental Professional's own personal knowledge.

The Qualified Environmental Professional should provide clear terms of reference to specialists as to the scope of the work; any insurance, certification or bonding requirements; the notes, reports, diagrams, documents or other records that the specialist is required to submit; the statement of assurance that is expected to be submitted; and the intended use of the specialist's information.

When incorporating the work of a subordinate or specialist, the primary Qualified Environmental Professional must check to see whether the individual is a recognized Qualified Environmental Professional as per Appendix 2 of the assessment methods (MWLAP 2006) and incorporate his/her work in the appropriate way. (See Section 3.7.1. of these guidelines.)

### 2.5.2 Retroactive Assessments

Occasionally, a Qualified Environmental Professional may be asked to carry out a riparian assessment retroactively after site works are done. This type of retrospective assessment is considered to be a condition and impact assessment and should follow these guidelines and the assessment methods (MWLAP 2006). However, the Qualified Environment Professional should be aware, and should advise the client, that a retroactive assessment is not a riparian assessment under the Riparian Areas Regulation because the Riparian Areas Regulation specifies a process to be followed, and a retroactive assessment is not consistent with that process.

## 2.6 RESPONSIBILITIES OF THE SPECIALIST

Specialists are required when aspects of a riparian assessment are beyond the expertise of the Qualified Environmental Professional who has overall responsibility for the riparian assessment. Specialists may provide important input into a specific element of a riparian assessment. The specialist is responsible for:

- clarifying the scope of the specialist's work with the lead Qualified Environmental Professional
- informing the Qualified Environmental Professional of the project information required by the specialist
- on completion of the specialist's work, signing a Riparian Assessment Assurance Statement - Supporting Specialist for work done by the

supporting specialist (Appendix C)

- where the specialist is a non-member:
  - verifying to the Qualified Environmental Professional that he/she has the necessary skills, training and experience to complete or contribute to the aspects of the riparian assessment being done, including providing evidence of technical or safety certifications, bonding and/or insurance, as applicable
  - providing records, notes, reports or other information on the aspect of the assessment completed as requested by the primary Qualified Environmental Professional
- where the specialist is a member:
  - verifying to the Qualified Environmental Professional that he/she has the necessary skills and professional qualifications to complete or contribute to the aspects of the riparian assessment that he/she is undertaking
  - conforming to all professional obligations associated with his/her work, including completing the work to an acceptable professional standard, and signing, sealing and taking responsibility for professional work completed by him/her

# PROFESSIONAL PRACTICE IN RIPARIAN ASSESSMENTS

**Note:** In the Riparian Areas Regulation, the term *stream* includes water bodies such as lakes, ponds, *wetlands*, ditches and springs, as well as linear watercourses that are commonly called *streams*. In this document, the term *stream* in italics refers to the Riparian Areas Regulation definition. Where the term stream is not in italics, it refers to the common meaning of a stream as a linear watercourse.

Members are expected to use their judgment in selecting appropriate methodologies, level of effort and scope of assessment. In these guidelines it is recognized that at this time the Qualified Environmental Professional must use the assessment methods appended to the Riparian Areas Regulation (MWLAP 2006). However, depending on the extent of the proposed development, site characteristics and local bylaw requirements, a higher level of effort may be required. The Qualified Environmental Professional should conduct such additional work as may be appropriate for the complexity of the site, which could include further assessments by other specialists, including assessments of conditions outside the streamside protection and enhancement area that could affect it, such as slope stability. For supplementary information on assessment methods, see Appendix E.

The Qualified Environmental Professional must conduct a sufficient site assessment to meet all of the criteria within the Riparian Areas Regulation and local government bylaws. This includes all natural features, functions and conditions (see Definitions) that support fish life processes, including potential vegetation, as they are relevant to the study area.

Qualified Environmental Professionals and specialists who are members are expected to be competent in field investigation and assessment techniques and to keep abreast of advancements in scientific knowledge applicable to their work. If the primary

Qualified Environmental Professional delegates aspects of the work, such as field investigation, to subordinates who are not members, the Qualified Environmental Professional must satisfy himself/herself of the subordinate's skill level and provide sufficient instruction so that the work is carried out competently. Refer also to the skill sets in Appendix 2 of the assessment methods (MWLAP 2006).

While riparian assessments completed under these guidelines may identify floodplain areas and potentially unstable slopes next to entrenched streams, and may make recommendations for those areas pertinent to stream protection, riparian assessments are not landslide hazard assessments or flood hazard assessments for residential development. There are specific statutory requirements and professional guidelines for landslide and flood hazard assessments; these do not fall under the Riparian Areas Regulation. Nor does a riparian assessment address other possible natural hazards that may affect development. If, in the course of a riparian assessment, a Qualified Environmental Professional identifies possible landslide, flood or other hazards that might affect the subject property or the property of others, the Qualified Environmental Professional has a professional responsibility to draw these hazards to the attention of the client and, if necessary, the authority having jurisdiction over land use, as noted in Section 2.1.

### 3.1 OBJECTIVES

A riparian assessment is triggered when a proponent proposes commercial, residential or industrial development that is within a riparian assessment area as defined in local bylaws. Local government bylaws can include categories of development additional to those defined within the Riparian Areas Regulation. Development can include different kinds of land clearing, such as tree removal, subdivision of a parcel, and variances to existing restrictions (zoning).

Riparian assessments under the Riparian Areas Regulation have the following objectives:

- to identify streamside protection and enhancement areas that must be protected from development
- to identify measures that prevent harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes (HADD) from occurring, including recognition of potential riparian vegetation at the subject site
- to determine whether a development proposal as submitted is likely to cause a HADD within the riparian assessment area

**Note:** The definition of a HADD is specific to the Riparian Areas Regulation and is not the same as for similar terms used in regulations and policies under the federal *Fisheries Act*.

### 3.2 COMPONENTS OF A RIPARIAN ASSESSMENT

A riparian assessment project typically has the following phases (see also the flow chart in Appendix D):

- initiation
- collection and review of background information
- field work

- identification of a streamside protection and enhancement area and measures to maintain or enhance its integrity, and avoid a HADD, if needed
- submission of a riparian assessment report and Riparian Assessment Assurance Statement
- field reviews and environmental monitoring of site procedures
- submission of a Conformance Statement for confirmation of completed works, and possibly a post-development report

### 3.3 INITIATION

Project initiation typically involves the following steps:

1. Reviewing with the client the nature of the proposed development and whether a riparian assessment is required under the Riparian Areas Regulation. Often the client will have been advised by an approving authority that under local bylaws a riparian assessment may be needed, but the need for an assessment under the Riparian Areas Regulation should be confirmed as to the specific details of the development proposal and proximity to the *stream*. This step should include a review of the development permitting process and how the riparian assessment fits into that process.
2. Identifying the extent of the study area and the scope of the project. These will depend on the particular circumstances of the development and the site. For example, the study area and scope will be very different for a development that is a small addition to an individual dwelling than for subdivision of a large tract of land that borders or encompasses a waterbody. Review with the client the possible need to extend the study area beyond the limits of the subject property. Consider also whether notifications or approvals may be needed under other legislation if, for example, instream works are proposed.

3. Arranging an agreement for services with the client with respect to scope of the assessment, schedule and fees, and the possible need and terms for specialty services and/or external peer review. For APEGBC members this step must include notifying the client of the Qualified Environmental Professional's liability insurance and whether that insurance is applicable to the professional services provided.
4. Informing the client of any particular limitations or special circumstances that may affect the riparian assessment results (e.g., site access, snow cover, reliability of background information).

### 3.3.1 Study Area and Scope of Assessment

The study area will depend on the nature and scale of the development proposal. The definition of "development" in the Riparian Areas Regulation covers a wide range of activities, and as such, development proposals can vary widely in scope and scale, from a small addition on an existing structure that does not require the removal of any trees, to subdivision development of large land tracts, or construction of buildings, structures, roads, flood protection works, utility corridors, municipal services, and so on. For larger projects, the proposed works may be separated into several components, each requiring separate permits. The Qualified Environmental Professional should ensure that he/she is aware of all aspects of the project that could have implications under the Riparian Areas Regulation.

The study area and scope of assessment should be appropriate for the nature of the development proposal and the potential scale of impacts to the *stream*. Note that local government bylaws may establish a riparian assessment area different from the riparian assessment area defined in the Riparian Areas Regulation.

## 3.4 BACKGROUND INFORMATION

Before undertaking field work, the Qualified Environmental Professional should compile and review available existing information associated with the study area. Typically, this could include, as available and relevant to the site:

- boundaries of watershed units
- *stream* and floodplain mapping
- information on fish populations and fish use of waterbodies associated with the riparian assessment area and waterbodies connected to them
- imagery, especially the most recent
- best available topographic mapping
- information from the client pertaining to the proposed development, as indicated in Section 2.1
- existing reports, such as fish studies or fish habitat assessments in the watershed, *stream* classification, riparian assessments for sites nearby, channel modifications, fish habitat enhancement, watershed assessments, hydrological assessments
- climate, precipitation and streamflow data, and flood hazard mapping, if available
- water licences in the watershed unit containing the subject waterbody

The Qualified Environmental Professional should consider the reliability and accuracy of the background information and the potential effects that unreliable or inaccurate information could have on the riparian assessment. If information is found to be unreliable or inaccurate, the Qualified Environmental Professional may have to complete further field work.

### 3.4.1 Hydrology of Watershed Units

The subject site should be put into the context of the watershed unit in which it is contained. Watershed hydrological

characteristics should be described, at least at an overview level. For example, regional climate and hydrological dynamics (high and low flows), biogeoclimatic zone, relief, and features that may influence *stream* flows (e.g., lakes, ponds, wetlands, artificial flow controls, diversions, stormwater systems or water extraction) should be noted. The extent of existing land use modification (residential, commercial, industrial, agricultural) throughout the watershed unit should be indicated, for example, on imagery. It is helpful to include a map delineating approximate boundaries of the watershed unit.

The intent of considering *stream* systems at the scale of the watershed unit is to understand the relative importance of the subject site, even if it is a small site, and to identify whether factors outside the riparian assessment area could have an impact on the streamside protection and enhancement area. For example, in a watershed unit that has been extensively modified by urban, industrial or residential development, small intact *stream* reaches may have a disproportionate importance for fish habitat.

For larger-scale or more complex projects, more in-depth discussion of watershed processes may be needed to properly assess the significance of potential impacts to the waterbodies of interest. These may not affect the determination of a streamside protection and enhancement area, but may affect the measures required to protect the integrity of the streamside protection and enhancement area. Further, large developments may span watershed divides, and the possibility of altering watershed drainage processes may need to be considered.

Developments occurring on large floodplains and alluvial fans can result in requests for diking, bank revetment and stream channelization, all of which can negatively affect the proper functioning condition of the riparian ecosystem. In assessing the potential

for a HADD and in identifying streamside protection and enhancement areas for these sites, the Qualified Environmental Professional should involve the appropriate specialists with expertise in river morphology and hydrology.

This part of a riparian assessment refers to the hydrological regime as it affects fish habitat. This is not a flood study for development. If the development could be affected by flooding, a separate assessment may be needed, done to the applicable professional standard and by the appropriate specialist.

### 3.4.2 Implications of Climate Change

Members are expected to keep themselves informed about the changing climate, and to consider the implications of climate change impacts in their professional assessments by referring to recent qualified reports on climate change or retaining a specialist to render an opinion on the matter. In addition, the member should refer to climate change position statements and climate change content made available by his/her regulatory body and established tools to assist the member in accessing information as it relates to his/her field of practice.

The Qualified Environmental Professional should consider the implications of current regional climate change projections<sup>1</sup>, as they could affect hydrological processes associated with the *streams* in the study area, and whether—and on what time scale—the streamside protection and enhancement area could be affected by the projected changes. For example, this could affect determination of the high water mark. For clarification on how this might be applied in a riparian assessment, see Appendix E.

The Qualified Environmental Professional should also indicate the uncertainties and unknowns associated with his/her judgment on this.

<sup>1</sup> Regional climate change projections are available on the Pacific Climate Impacts Consortium website.



### 3.5 ELEMENTS TO BE CONSIDERED AND LEVEL OF EFFORT OF FIELD INVESTIGATION

All waterbodies that contain fish or are connected to fish habitat contribute to the success and productivity of fish populations either directly or indirectly by providing habitat for various life cycles, sustaining water flows, providing nutrients, maintaining temperatures and other functions. Negative impacts to water quality, water quantity or riparian function may reduce the productivity of the waterbody and could ultimately impact fish populations (BC FLNRO *et al.* 2012). Not all streams under the Riparian Areas Regulation will be highly productive fish habitat or contain fish, but they may still contribute to the survival and productivity of fish populations.

#### 3.5.1 Characterizing the Riparian Environment

The elements listed below should be evaluated as appropriate for the nature of the waterbodies, the type of development and the scope of the riparian assessment. Not all elements may be relevant or applicable to all assessments. Other specialists may need to be involved in some cases to properly evaluate the elements.

For guidance on field assessments, see Appendix E.

The Qualified Registered Professional should consider and assess each of the following elements, as applicable or relevant to the site:

- characteristics of the waterbodies and connectivity or significance to fish habitat, including waterbodies that have the potential to become fish habitat; aspects to consider include:
  - types and sensitivities of stream channels and/or other aquatic habitat as applicable
  - stream energy and transport capability

- the role of large woody debris for habitat elements and/or channel morphology, and whether it is applicable in that biogeoclimatic zone and for that channel or waterbody type
- peak and low flow conditions
- the presence of an *active floodplain*, and if present, the flooding potential and ecological condition of the active floodplain

**(Note:** Some local government bylaws include waterbodies that are not included in the Riparian Areas Regulation [e.g., those that are non-fish habitat that are not connected to fish habitat, as well as those that are fish habitat].)

- stability of adjacent escarpments or of ravine slopes, if present, with respect to sediment introduction to the stream or as stability could be affected by development and consequently affect the stream condition. **(Note:** This is not a landslide hazard or risk assessment for the development proposal. If slope stability could affect or be affected by the development, a separate landslide risk assessment may be needed—completed to the applicable standard and by the appropriate professional.)
- soil erosion of channel banks or of adjacent terrain that could affect the waterbody, both during site works for the development and subsequent to the site works being completed
- existing type of riparian vegetation and its suitability for riparian and fish habitat functions
- windthrow and/or possible danger tree assessment, if large trees are present
- influences of land use outside the riparian assessment area that could impact the streamside protection and enhancement area, if prescribed
- requirements for maintenance of the streamside protection and enhancement area, if prescribed, over the longer term

after site works for development are completed

- aquatic habitat condition—the functions and values of the existing aquatic habitat as they pertain to fish and fish health:
  - Documenting the *stream* characteristics and condition of fish habitat prior to development provides a point of comparison for a post-development assessment, and to determine if a HADD has occurred as a consequence of the development.
  - It is also important to illustrate areas where fish habitat could be improved upon.
- terrestrial habitat condition—the health, composition and stability of the existing riparian community as it exerts an influence on the waterbody and supports aquatic habitat:
  - The Riparian Areas Regulation requires that the Qualified Environmental Professional consider both existing and potential riparian and upland vegetation, and whether there is a reasonable ability for regeneration either naturally or through enhancement. This leads to the evaluation of the functionality of the riparian area and its current and potential ability to provide quality fish habitat.
  - Consider ecological linkages between upland and riparian vegetation.

### 3.5.1.1 Dikes

Where the development is separated from a stream by a dike, there are a number of factors that the Qualified Environmental Professional must consider when determining a streamside protection and enhancement area or prescribing measures, including:

- whether riparian vegetation landward of the dike crest is contributing to

the natural features, functions and conditions of the *stream* (this will depend on the size and extent of the dike and its distance from the *stream*)

- whether the dike is owned by the land owner or by some other agency with responsibility for maintenance and operation of flood protection works
- whether there may be restrictions on vegetation or other measures that could compromise the integrity of the dike (e.g., tree roots)

If the dike is owned or operated by an agency other than the land owner, the Qualified Environmental Professional must contact the agency before prescribing measures that could potentially affect the function or integrity of the dike. The Qualified Environmental Professional should involve the appropriate specialist(s) to assess the effects of proposed measures on the dike's integrity, stability and hydrologic function.

### 3.5.2 Evaluating Whether the Development as Proposed Will Cause a HADD

Under the Riparian Areas Regulation, an assessment report must make one of two determinations:

1. If the development is implemented as proposed, there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area; or
2. If the streamside protection and enhancement areas identified in the report are protected from the development and the measures identified in the report as necessary to protect the integrity of those areas from the effects of the development are implemented by the developer, there will be no harmful alteration, disruption or destruction of natural

features, functions and conditions that support fish life processes in the riparian assessment area.

In evaluating whether the development as proposed is likely to cause a HADD (bearing in mind the meaning of HADD in the context of the Riparian Areas Regulation), the Qualified Environmental Professional should consider the following:

- Will the development prevent the recovery of potential vegetation in the streamside protection and enhancement area?
- What is the importance of the fish habitat at this site relative to the watershed as a whole (e.g., is it disproportionately important to fish populations)?
- What are the sources of food, water, shade, cover, and temperature control, and will the proposed development diminish any of these?
- Have the natural features, functions and conditions already been compromised by alteration, such that fish habitat conditions are already in decline and measures are needed to provide for rehabilitation of the functionality so that the streamside protection and enhancement area width will be sufficient to protect fish habitat?
- Has former fish access to the *stream* been prevented by introduced barriers?
- Will the development cause any alteration of a channel that will destroy or diminish important habitat features (e.g., sources of large woody debris, or bank vegetation important in limiting erosion or maintaining stability)?
- Could the development have long-term impacts that will cause deterioration of fish habitat quality over time?
- Could the development result in the introduction of deleterious material, spills or sediment into fish habitat, either directly or by subsequent seepage or fluvial transport?

- Could the development result in increased runoff or disturbances to hydrology that might damage the streamside protection and enhancement area or *stream* channel (e.g., by the connection of storm drainage to the *stream*)?
- Are there effects from upstream activities that cannot be managed at this site? If so, the Qualified Environmental Professional should document this and describe the effects that are being caused by upstream activities that are beyond the control of the client or developer.

### **3.5.3 Considerations in Determining Width of Streamside Protection and Enhancement Areas**

The intent of a streamside protection and enhancement area is to maintain a healthy functioning riparian area in order to prevent a HADD. The Qualified Environmental Professional assesses the current and potential functionality of the existing riparian area in order to establish the streamside protection and enhancement area within the subject property required to protect natural features, functions and conditions.

The spatial extent of a streamside protection and enhancement area may vary depending on the characteristics of the waterbody, topography of the adjacent terrain, the physical location of the subject property, and existing development adjacent to the subject property. Depending on the specific site considerations, a streamside protection and enhancement area could have a uniform width around or adjacent to the waterbody, or could vary. Examples are:

- increased width for portions of the waterbody that are on the south shoreline, where increased protection may be warranted for shade
- connectivity of streamside protection and enhancement areas for several

different types of waterbodies, such as a ditch connecting to a wetland

- encompassing local sensitive zones of different physical extents
- establishing a streamside protection and enhancement area width greater than the calculated width due to decreased existing functionality – The increased width allows for some flexibility in varying the width (as long as it is not less than the calculated streamside protection and enhancement area width) in order to prevent a HADD and to accommodate certain aspects of the development. When varying sections of a streamside protection and enhancement area in this manner, the Qualified Environmental Professional should be careful not to compromise the overall ability of the resulting area to provide for natural features, functions and conditions. Enhancement activities may also be recommended to increase riparian functionality of the reduced sections.

#### **3.5.4 Measures to Protect the Streamside Protection and Enhancement Area**

Under Section 7 of the Riparian Areas Regulation, the Qualified Environmental Professional must report on measures to protect the integrity of the streamside protection and enhancement area and to prevent a HADD. Some kinds of actions outside the streamside protection and enhancement area could threaten or diminish the potential functionality of the setback area. For this reason, measures may be recommended throughout the entire riparian assessment area within the subject property, and not confined to regions immediately adjacent to the streamside protection and enhancement area. The measures may include limitations, prohibitions or procedures that would apply before or during site works, or after the development is completed. The Qualified Environmental Professional must

be clear in his/her riparian assessment report with respect to measures that are essential for preventing a HADD and those that are recommended to improve and maintain long-term functionality of the riparian area. If a HADD is not preventable, the Qualified Environmental Professional's assessment report must state that, and either the appropriate authorizations must be sought or the development proposal must be revised.

The assessment report is intended to give direction to the client and should be clear and sufficiently detailed so that the measures can be implemented as intended.

Measures for all of the following categories must be evaluated:

- danger trees
- windthrow
- slope stability
- tree protection during construction
- encroachment (including restrictions on activities such as burn piles)
- stormwater management
- sediment and erosion control
- floodplain concerns

Depending on the individual site characteristics, the nature of the existing riparian vegetation and the nature of the proposed development, not all of these categories may be applicable. The Qualified Environmental Professional's report should note any that are not applicable to the site and provide a rationale for why they are not applicable.

The Qualified Environmental Professional's report should be clear and specific about measures that must be implemented to protect the streamside protection and enhancement area. It should also clearly distinguish between the measures that are essential and those that are desirable.

Measures may also address other site features that could negatively impact fish habitat; for example:

- prohibiting the planting of noxious weeds or invasive species in the streamside protection and enhancement area, and restricting planting to native species in that area
- restricting the dumping of compost, yard waste or lawn clippings in or adjacent to the streamside protection and enhancement area

Additionally, the Qualified Environmental Professional may prescribe protection from, restrictions on or modifications to activities, works or features adjacent to the streamside protection and enhancement area boundary or adjacent areas; for example:

- protection of aquatic habitat that is not included in the Riparian Areas Regulation definition of *stream* but that is integral to the system (e.g., springs or wetlands that connect by subsurface flow)
- a streamside protection and enhancement area that terminates mid-slope on a steep slope, where additional measures are prescribed to address erosion and slope stability, such as:
  - extending the streamside protection and enhancement area to or beyond the crest of the slope
  - restricting vegetation removal or requiring planting or seeding
  - restricting the type of construction on the slope or prohibiting any building on the slope to protect the integrity of the slope and ultimately the streamside protection and enhancement area
- for a proposed subdivision, limitations on placement of buildings, stormwater structures, trails or activities near the streamside protection and enhancement area boundary; for example:
  - location of associated structures that might influence the soils or

groundwater entering the streamside protection and enhancement area

- location of trails to avoid compressing tree and shrub roots within the streamside protection and enhancement area or along its boundary
- existing covenants on the property
- alteration of proposed lot boundaries, limitation of development types or limitation of activities along the streamside protection and enhancement area boundary to accommodate additional vegetation buffers (e.g., the establishment of a windfirm boundary outside the streamside protection and enhancement area to protect trees within the streamside protection and enhancement area that are susceptible to windthrow)
- for a riparian area that is not functioning (see definition of natural features, functions, and conditions), widening of the streamside protection and enhancement area, removal of invasive species and/or planting of native riparian species may be needed for it to become functional and support fish life processes (**Note:** Local governments have varying standards as to what is permitted for enhancement activities. This sometimes includes requiring supervision of the activities by a Qualified Environmental Professional. Qualified Environmental Professionals should check local government requirements when specifying measures of this type.)
- surface erosion and sediment management plans both during the site works and for the longer term, after the site works are completed

A stormwater management plan is often required as part of a subdivision development. It is not normally within the scope of a riparian assessment to provide design recommendations for site drainage

works such as ditches, stormwater systems or municipal drainage works; these are usually required as part of a subdivision plan prepared by the subdivision design firm. However, a riparian assessment may recommend limitations (e.g., for a subdivision) on placement of stormwater structures, surface drainage ditches, settling ponds, and so on, in order to avoid increased discharge, erosion or sediment introduction to *streams* or into the streamside protection and enhancement area. It is not generally permitted (and would require approval from regulatory authorities) to use a streamside protection and enhancement area for stormwater management, or to use a natural waterbody for storing or filtering stormwater.

For projects at the subdivision stage where detailed site plans do not yet exist, it may not be practicable to provide specific advice on measures. In these instances, the Qualified Environmental Professional should provide advice on what environmental monitoring and measures should be put in place during activities such as land clearing, road building or installation of infrastructure, and when another riparian assessment needs to be undertaken in a subsequent stage if development is proposed in the riparian assessment area. It should be recognized that the riparian assessment at the subdivision stage provides a streamside protection and enhancement area width and that the measures specified in this first riparian assessment may place additional restrictions on the development at the next approval stage (e.g., residential development). Measures put in place at the subdivision stage should not be compromised by later development applications.

### 3.6 SUPPORTING RATIONALE

Members must have documented rationale to support their professional assessments. The Qualified Environmental Professional

must provide a rationale to support his/her conclusions and recommendations, in particular for aspects of a riparian assessment that are qualitative or subjective based on observed conditions. The rationale explains the reasoning behind the professional judgment and recommendations. The rationale can include direct field observations (e.g., abundance of fish, physical condition of *stream* and riparian vegetation); references to findings in scientific literature, studies, research results, and so on, in relation to the condition of the subject site; putting the subject site into the context of the *stream* system as a whole with respect to type and scale of effects; the potential for harm to result from the proposed development, and the degree of harm; and other reasoning.

Examples of statements of supporting rationale are:

- It is my opinion that there will not be a HADD because the proposed development will not occur in the streamside protection and enhancement area, nor will there be any removal of existing or potential riparian vegetation that currently contributes to stream channel stability, water quality or temperature, or food sources that support fish life.
- Planting of native plant species as prescribed in the measures will compensate for vegetation removal that has occurred in the past within the streamside protection and enhancement area. If the prescribed measures are implemented, the condition of the riparian vegetation will over time be improved, creating shade and providing food to support fish life processes.
- The proposed development does not worsen the existing riparian condition, and the recommended measures provide for improvement in the riparian condition over the long term. As the existing riparian vegetation has poor

functionality, the measures prescribe a wider streamside protection and enhancement area in order to provide for increased water infiltration and sediment control within the riparian area.

- Due to the placement of a water main, the proposed development will remove riparian vegetation along some stream sections. This will be compensated for by wider streamside protection and enhancement areas along other stream sections, together with plantings and windthrow treatments (to minimize tree loss from windthrow), so that there will be no significant reduction in riparian functions that are essential to support fish life processes.

None of these rationales should be used to support any encroachment into a streamside protection and enhancement area.

### 3.7 RIPARIAN ASSESSMENT REPORTS

A riparian assessment report includes the following:

- summary of project information
- summary of the Qualified Environmental Professional's qualifications
- the Qualified Environmental Professional's Riparian Assessment Assurance Statement
- specialist assurance statements, if specialists have been involved in the assessment (one to be signed by each specialist)
- the professional assessment (see example report format, Appendix G) and its maps and appendices

**(Note:** Regardless of the submission requirements described in the assessment methods (MWLAP 2006), the Qualified Environmental Professional and any specialists

who are also members [described as secondary Qualified Environmental Professionals in the assessment methods] must meet professional standards for their work, including meeting the quality management standards of their association, and signing and sealing their own reports.)

The riparian assessment report content will vary depending on the objective, scope of assessment, complexity of the site and level of effort. Some local governments have specific requirements for riparian assessment reports. Where this is the case, the Qualified Environmental Professional must meet the local government requirements for the riparian assessment report as well as the requirements in these guidelines and its appendices. The member must address all aspects required for professional work. Adherence to a prescribed report format is not justification for inadequate report content. The Qualified Environmental Professional should consider reviewing the format and contents of the riparian assessment report with the client and the approving authority prior to finalizing the report.

A riparian assessment report normally includes the following:

- legal description of the property
- location map or description of property relative to well-known geographic features
- objectives, scope of study area, and level of effort
- list of background information available, collected and reviewed, and relevance
- physical description of the study area
- description of the existing and potential fisheries resources
- map or plan of the property including topography, natural features, existing structures, roads, infrastructure and surface drainage

- maps or images at an appropriate scale showing all *streams* that were included in the assessment and their associated riparian assessment areas
- description of proposed development
- methods and intensity of field work
- results of field assessment
- conclusions, accompanied by supporting rationale
- identification of the streamside protection and enhancement area
- recommendations and prescribed measures to protect and maintain the integrity of the streamside protection and enhancement area
- recommendations and prescribed measures, if required, to avoid the occurrence of a HADD
- if measures are recommended to avoid a HADD, recommendations for when field reviews and/or environmental monitoring should be done
- definitions of qualitative terms, technical terms and concepts
- other information as specified in the agreement with the client or as required in jurisdictional guidelines
- references, including maps and airphotos
- limitations and qualifications of the riparian assessment and report, assumptions, and uncertainties

If any of these elements are not applicable, the report should indicate why.

The report should clearly state the activity to which it applies and the condition of the site at the time of the field investigation.

All reports should be accompanied by drawings, figures, sketches, photographs and/or other supporting information suitable for the scale and scope of the assessment. Maps or plans should delineate the areas of streamside protection and

enhancement areas in relation to existing and proposed development. Maps should show the entire study area, connectivity to fish habitat, any zones of sensitivity, streamside protection and enhancement area(s), and specific features of interest (e.g., danger trees).

A good photographic record kept both during the assessment phase and after completion of the development works can be especially informative.

If measures for slope stabilization or bank erosion protection other than by vegetative means (e.g., armouring or engineered log jams) are proposed, the Qualified Environmental Professional should involve the appropriate specialist and incorporate his or her recommendations or reports as needed.

The report should be clearly written with sufficient detail to allow the client, approving authority and others reviewing the report to understand the methods, information used and supporting rationale for conclusions and recommendations, without necessarily visiting the property or site. Riparian assessment reports could be included as part of a covenant on the property title, and should be written accordingly.

Although words such as “certify” and “guarantee” are used in everyday language, they have specific legal meanings, and Qualified Environmental Professionals should avoid using them. When a Qualified Environmental Professional signs, seals and dates a document, the associations consider him/her to be certifying that document.

The associations strongly encourage peer reviews of riparian assessment reports prior to submission to the client and approving authority, as part of the quality assurance/quality control program (see Section 4), especially for large-scale developments or in complex or highly sensitive areas.



### **3.7.1 Incorporating the Work of Specialists into a Riparian Assessment Report**

A primary Qualified Environmental Professional would typically include a specialist's report and accompanying statement of assurance as an appendix to a riparian assessment report, and incorporate the specialist's information, appropriately referenced, in the Qualified Environmental Professional's findings and conclusions, prescribed measures, diagrams, and so on.

The Qualified Environmental Professional should be aware of, and make known in the riparian assessment report, any limitations that may have affected the specialist's scope of work or findings.

When using specialists who are Qualified Environmental Professionals (as per Appendix 2 of the assessment methods [MWLAP 2006]), the primary Qualified Environmental Professional can choose to incorporate content, appropriately referenced, from the specialist's report into the primary Qualified Environmental Professional's report, or reference it as a separate professional report that forms part of the riparian assessment; for example, "A geotechnical assessment of the slope stability of the stream escarpment has been carried out and is included in Appendix X. That report forms part of this riparian assessment." Specialists who are Qualified Environmental Professionals sign and seal their own work and are professionally accountable for it. When their work accompanies or forms part of the primary Qualified Environmental Professional's riparian assessment, they are listed as secondary Qualified Environmental Professionals in the riparian assessment report submission.

When using specialists who are not Qualified Environmental Professionals, the primary Qualified Environmental Professional incorporates the specialist's input directly into his/her riparian assessment, appropriately referenced and

with supporting information provided in an appendix, as applicable, including a statement of assurance from the specialist. The specialist's input thus informs the riparian assessment report that is signed and sealed by the primary Qualified Environmental Professional. The primary Qualified Environmental Professional's due diligence is met by the process described in Sections 2.5.1 and 2.6. Specialists who are not Qualified Environmental Professionals are typically identified as team members in the riparian assessment report but are not listed as secondary Qualified Environmental Professionals in the report submission.

### **3.8 LIMITATIONS AND QUALIFICATIONS OF A RIPARIAN ASSESSMENT**

The riparian assessment report should specify the limitations of both the riparian assessment and the report. Items typically addressed under limitations include:

- the standard of care followed while carrying out the riparian assessment
- factors that may have limited the assessment, such as restricted access, quality of background information, terrain or weather conditions at the time of the field work
- restriction of the use of the report to the client for its intended purpose

Some aspects of a riparian assessment are qualitative and subjective based on observed conditions. Conclusions and recommendations are based on the assumption that the measures prescribed will be implemented to an acceptable standard. Substandard practices may render the conclusions and recommendations invalid.

A riparian assessment cannot be relied on in perpetuity. Although the Qualified Environmental Professional should attempt to anticipate reasonable changes that could affect the results of the riparian assessment, the "shelf life" of the assessment depends on changes that could occur naturally with time, or on changes in adjacent land use or site development not anticipated in the

assessment. The Qualified Environmental Professional should indicate over what time frame and under what conditions the riparian assessment will apply.

The report should state that any changes to either the proposed activity or the site conditions may make the report not representative of the site condition, and that if the development proposal changes, the riparian assessment may need to be updated or reassessed.

The Qualified Environmental Professional should also note that, while the developer's start and end date are required to be reported when the riparian assessment report is submitted to MFLNRO, the Qualified Environmental Professional does not have control over either the project scheduling or whether the development will proceed.

### 3.9 FIELD REVIEWS, ENVIRONMENTAL MONITORING, AND POST-DEVELOPMENT ASSESSMENT

The associations consider field reviews and environmental monitoring to be important aspects of quality control of a member's practice. For example, as part of a professional engineer's, professional geoscientist's or license holder's quality assurance and due diligence, APEGBC's Quality Management Bylaw 14(b)(3) requires field reviews on projects that are implemented or constructed to verify that the implementation or construction is in general compliance with the professional documents prepared by the member. Under the *Forester's Act*, Section (c)(i), the definition of practice of professional forestry includes "assessing the impact of professional forestry activities to...verify that those activities have been carried out as planned, directed or advised." As directed by Principle 3 of the CAB Code of Ethics, CAB members must ensure a professional standard of care by practising

applied biology with attention, caution, prudence and due diligence. CAB members achieve and demonstrate the required rigor by being well organized, thorough and deliberate.

The purpose of field reviews is to verify conformance with the member's recommendations or prescribed measures. The purpose of environmental monitoring is to ensure that work procedures do not cause harmful effects on fish or fish habitat during or following the course of the site works.

Typical activities of an environmental monitor may include:

- catching and relocating fish to remove them from an active instream work area
- checking that construction procedures are appropriate to minimize the potential for stream disturbance or introduction of deleterious material into the channel
- checking the effectiveness of sediment control measures used to minimize muddy runoff entering the waterbody
- checking that construction activities follow appropriate shutdown procedures when weather or stream flow conditions are likely to result in sedimentation

Field reviews and environmental monitoring could be carried out by the same individual, if suitably qualified for both activities, or by different individuals. The Qualified Environmental Professional may delegate field reviews or environmental monitoring to another individual who acts under his/her direct supervision (Section 4.2). Field reviews and environmental monitoring should be documented, and if delegated to a subordinate, the Qualified Environmental Professional should provide direction to the subordinate for documentation content. The Qualified Environmental Professional should also establish a communication protocol with the subordinate for reporting during the site works.

The need for field reviews or environmental monitoring is based on the professional judgment of the Qualified Environmental Professional. The extent to which field reviews for conformance, or environmental monitoring during site activities, are recommended by the Qualified Environmental Professional depends on the complexity of the recommendations and the complexity or sensitivity of the site.

Where a field review has been recommended by the Qualified Environmental Professional, he/she should inform the client that in order to meet the intent of the requirements defined in professional legislation and for the Qualified Environmental Professional to be accountable for the completed work, the client needs to provide adequate opportunity for field reviews. The Qualified Environmental Professional should clarify the expectation around field reviews with the client, and make sure that the client understands that, if there is insufficient field review, the Qualified Environmental Professional may be unable to take responsibility for the outcome or to sign a Conformance Statement.

### 3.9.1 Post-Development Assessment

A post-development assessment could be required as a condition of a development permit, requested by a client to document compliance with conditions of a permit, initiated to check compliance under statutes such as the *Fisheries Act* or *Water Sustainability Act*, or requested for other reasons, such as:

- where an authorization was issued for the works, such as under the *Water Sustainability Act* (formerly the *Water Act*), and documentation of work site procedures, environmental monitoring, field reviews and completed works is required under the authorization
- to determine whether a HADD occurred during the site works, or has occurred or is likely to occur as a consequence of

development (e.g., where a Qualified Environmental Professional was not retained to carry out field reviews or environmental monitoring during the site works)

- to evaluate the performance of measures that were prescribed by a Qualified Environmental Professional or other specialist, such as:
  - windthrow treatments or danger tree threats
  - arborist treatments or tree protection
  - erosion and sediment control plans' effectiveness
  - vegetation treatments (e.g., planting, removal of invasives)
- to evaluate the possible effects of changes made to the development that were not contemplated at the time of the riparian assessment
- to check that stormwater management systems or other structures built for the development are not having a harmful effect on the streamside protection and enhancement area
- to check that permanent field markings are in place that define the limit of the streamside protection and enhancement area

The Qualified Environmental Professional for a post-development assessment may be the same Qualified Environmental Professional who completed the original riparian assessment or may be a different individual.

### 3.10 SPECIALTY SERVICES

For some riparian assessments, specialty services may be required. Specialists are required when aspects of a riparian assessment are beyond the expertise of the Qualified Environmental Professional responsible for the activity. A specialist may be a member in a specialized discipline or with special knowledge or expertise in a particular subject area (such as a terrain

specialist or windthrow specialist), or a non-member with special skills (such as an arborist).

Specialty services could include:

- arboriculture
- terrain stability assessments
- danger tree assessments
- windthrow assessments
- watershed assessment (hydrology, sediment routing, physical watershed processes)
- fluvial geomorphology
- biotechnical remediation
- assessments for erosion, scour and sediment management
- forest health
- surveying

# ■ QUALITY MANAGEMENT AND QUALITY ASSURANCE

Quality management for members requires the implementation of suitable protocols to ensure the completion of appropriate quality assurance and quality control reviews. The purpose of completing quality management is to ensure that the work completed is technically correct and complies with applicable codes, standards and regulatory requirements. Quality management is required on all professional work related to riparian assessments completed by members.

## 4.1 QUALITY MANAGEMENT REQUIREMENTS

The associations expect members to follow good quality management practices in undertaking riparian assessments. CAB's member's practice is directed by the code of ethics that states members must:

- provide objective, science-based opinion, advice and reports
- undertake assignments and offer opinions only in areas in which members are competent through training and experience
- provide services grounded in knowledge and objective professional judgment free of conflict of interest or bias
- identify limitations of data, concepts, conclusions, understandings and recommendations
- ensure that, where a member takes responsibility for the work of another, the work meets the appropriate standard
- ensure they practise due diligence by making certain that, at a minimum:
  - members retain or advise of the necessity to retain the services of others, where additional expertise is required

- background information is collected and incorporated
- data have been collected to ensure proper assessment of risks and outcomes
- conclusions, uncertainties and recommendations are stated in a clear, understandable manner
- all applicable legal requirements are met
- appropriate documents and files are maintained
- ensure that the client is aware of potentially adverse consequences if the member's professional recommendations are not followed
- uphold the principles of stewardship of aquatic and terrestrial ecosystems and biological resources

CAB protects the public interest by ensuring a high degree of competence and accountability of its members in the practice of applied biology. CAB professionals who work under the Riparian Areas Regulation must meet stringent entrance requirements and are held to a continued high standard through yearly professional development requirements to ensure continuing competence.

For APEGBC members and holders of non-resident or limited licences a quality assurance/quality control program must, as a minimum, satisfy the requirements of APEGBC Quality Management Bylaws 14(b) (1), (2), (3) and (4) with regard to:

- retention of complete project documentation for a minimum of 10 years
- documented checks of engineering and geoscience work

- documented independent reviews of the designs of structural protective works that require the engagement of a professional engineer having the appropriate training and experience
- documented field reviews of the constructed work at the riparian assessment project site considered necessary, in the member's opinion, to ascertain whether the significant aspects of the work are considered to be in general compliance with the plans and supporting documents

For ABCFP-registered members and special permit holders or certificate holders entitled to practise in this area, the standards of professional practice contain competence and due diligence direction to ensure quality of professional work. Competence requires professional practice to include three essential elements—knowledge, completeness and correctness—and professional care (ABCFP Bylaw 12.2). ABCFP members exercise due diligence in professional practice by being prudent and doing all work with constant and careful attention. An ABCFP member can exercise due diligence in professional practice by satisfying himself/herself of the following (ABCFP Bylaw 12.5):

- All relevant legal requirements have been met.
- The member has a clear understanding of client objectives and how they relate to other values or interests that are relevant to the work or may impact it.
- The member is personally familiar with all relevant characteristics of the area affected by the work.
- All appropriate background information has been gathered and incorporated.
- The member has consulted with all appropriate experts or specialists for those areas for which the member is not qualified to practise or express an opinion.

- When external advice is sought from a specialist, that specialist is qualified and competent to give that advice, and the advice given makes sense based on the member's own personal knowledge.
- When data are collected by another person, that person is qualified and competent to collect that data, and the data collected make sense based on the member's own personal knowledge.
- Sufficient data are collected as per required standards.
- The member has made a proper assessment of risks and outcomes.

#### 4.2 SUPERVISION OF SUBORDINATES AND FIELD REVIEWS

The associations expect members to provide direction to and take responsibility for the work of a subordinate. In particular, for APEGBC members, “direct supervision” means control and conduct of the work of a subordinate (*Engineers and Geoscientists Act*, Section 1.1). In providing direction to a subordinate, the Qualified Environmental Professional having overall responsibility should consider:

- complexity of the terrain and level of geomorphic hazards and risks (which can include hazards and risk associated with fluvial processes or terrain stability)
- scope of the development
- which aspects of the riparian assessment, and how much of those aspects, should be delegated
- training and experience of individuals to whom work is delegated
- amount of instruction, supervision and review required

Field work and its timing are critical aspects of a riparian assessment. Therefore, careful consideration must be given to delegating field work. Care must be taken to ensure that delegated work meets the standard

expected by the Qualified Environmental Professional. Such supervision could typically take the form of specific instructions on what to observe, check, confirm, test, record and report back to the Qualified Environmental Professional. The Qualified Environmental Professional should exercise judgment when relying on delegated field observations by conducting a sufficient level of review to be satisfied with the quality and accuracy of those field observations.

### **4.3 INTERNAL AND EXTERNAL PEER REVIEW**

The associations consider peer reviews to be an important part of quality management of professional practice. In particular, APEGBC bylaws require members to have regular documented checks of engineering and geoscience work.

Where the member considers it appropriate, the quality management program should include an independent peer review of those aspects of the riparian assessment that are considered complex and/or for sites of particular sensitivity. The peer review should occur before the final determination of the streamside protection and enhancement area and prescribed measures is made.

The reviewer should be independent of the project team, having not been involved in the development of any stages of the original assessment. Independent peer reviews can be performed by members within the firm that generated the original plan, provided that an independent perspective is maintained.

The level of peer review should be based on the professional judgment of the member. Considerations should include the stability and complexity of the terrain for ravine systems; sensitivity of the habitat elements; scope of the proposed development; availability, quality and reliability of background information and field data; and the member's training and experience.

The independent peer review process should be appropriately documented, and as a minimum, include a signed/sealed letter or report that includes:

- limitations and qualifications with regard to the review, and
- results of the review

For both internal and external peer reviews, the name of the reviewing member should be identified in his/her report.

# PROFESSIONAL REGISTRATION, EDUCATION, TRAINING, AND EXPERIENCE

## 5.1 PROFESSIONAL REGISTRATION

The following are the professional registration requirements for riparian assessments under the Riparian Areas Regulation:

“qualified environmental professional” means an applied scientist or technologist, if

- (a) the individual is registered and in good standing in British Columbia with an appropriate professional organization constituted under an Act, acting under that association’s code of ethics and subject to disciplinary action by that association, and
- (b) the individual’s area of expertise is recognized in the assessment methods as one that is acceptable for the purpose of providing all or part of an assessment report in respect of that development proposal, and
- (c) the individual is acting within that individual’s area of expertise.

**Note:** Members should not rely on the skill sets and designations indicated in Appendix 2 of the assessment methods (MWLAP 2006) for assurance that they would meet their association’s standards for competency. These are listed as “likely designations” but do not imply that all members necessarily will have the skills required to undertake the work.

## 5.2 EDUCATION, TRAINING, AND EXPERIENCE

The member must adhere to his/her association’s respective code of ethics and have appropriate education, training and experience consistent with the services provided. Members who undertake professional work without sufficient skills may be subject to their association’s disciplinary action.

Professional competence in a subject area is gained from:

- formal study, such as university courses, post-secondary training courses, or equivalent knowledge gained from short courses, workshops and self-study
- work experience, usually with mentoring by a senior professional with relevant expertise
- continuing professional development – keeping abreast of emerging literature, research and studies, attending conferences, workshops, seminars and technical talks, reading new texts and periodical, searching the web; and participating in field trips

A member undertaking a riparian assessment for the purpose of the Riparian Areas Regulation would be expected to have a professional level of knowledge of fish biology and habitats, aquatic and riparian terrestrial ecosystems, plant taxonomy and ecology, stream fluvial processes, airphoto interpretation, field investigation, field mapping and inventory techniques. In some cases, in-depth knowledge of watershed processes, fluvial geomorphology, hydrology, terrain stability, soil erosion, forest science or windthrow may be necessary. Where a higher level of



knowledge of these fields is required for a particular riparian assessment, members should retain specialty services through an appropriate registered professional to provide an opinion on the matter.

A professional level of knowledge means a combination of the equivalent of university-level courses plus sufficient work experience to have gained professional competence, as would be judged by other competent professionals undertaking the same work. This level of training can be acquired through formal university or college courses or through continuing professional development; and typically a minimum of three years of work experience in this field of practice working under the supervision or mentoring of a senior professional. With respect to formal education, there may be some overlap in courses, and specific courses may not correlate to specific skill sets.

Where a member in the role of a Qualified Environmental Professional does not have the full skill set for a particular riparian assessment, the required skills can be met through a team approach.

A member who offers specialty services requires specific education, training and experience in the area of specialty and must keep abreast of new knowledge and developments in his/her area of specialization.

## ■ REFERENCES AND ADDITIONAL RESOURCES

There is a large body of scientific literature, technical manuals and guidebooks on fish habitat and riparian ecology. The following are common references pertinent to these guidelines. (**Note:** This list is not meant to be a comprehensive bibliography of the subject matter.)

BC Fisheries Information Services Branch. 2001. *Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures*. Prepared for the Resources Inventory Committee. Available online at: [www.for.gov.bc.ca/hts/risc/pubs/aquatic/recon/index.htm](http://www.for.gov.bc.ca/hts/risc/pubs/aquatic/recon/index.htm) [accessed 12/2014]

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University of Victoria, Pacific Climate Impacts Consortium: [www.pacificclimate.org/](http://www.pacificclimate.org/) (Note: PCIC is a regional climate service centre that provides information on the physical impacts of climate variability and change in the Pacific and Yukon Region of Canada.)

**For further information on working near water, see:**

Fisheries and Oceans Canada, *Projects Near Water*:  
[www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html](http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html)

BC Ministry of Forests, Lands, and Natural Resources Operations, *Working Around Water*:  
[www.env.gov.bc.ca/wsd/water\\_rights/licence\\_application/section9/](http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/)

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## ■ APPENDIX B: LEGISLATIVE AND REGULATORY FRAMEWORKS

This appendix summarizes the legal framework; the actual legislation should be referred to for details. These guidelines were prepared between November 2014 and May 2016, and the statutes or policy statements discussed in this section may have changed since then. Relevant sections of the following legislation and regulation are noted below:

- *Riparian Areas Protection Act* (SBC 1997)
- *Riparian Areas Regulation* (OIC 837 2004)
- *Local Government Act* (RSBC 2015) Chapter 1
- *Fisheries Act*
- *Water Sustainability Act* (SBC 2014) Chapter 15
- *Drinking Water Protection Act* (SBC 2001)
- *Land Title Act* (RSBC 1996)
- *Environmental Management Act* (SBC 2003)
- *Community Charter Act* (SBC 2003)

### ***Riparian Areas Protection Act* (SBC 1997)**

The *Riparian Areas Regulation* was originally made under the authority of the *Fish Protection Act* (SBC 1997). The *Water Sustainability Act* (SBC 2014), brought into force on January 29, 2016, repealed several sections of the *Fish Protection Act* and renamed it the *Riparian Areas Protection Act*. The *Riparian Areas Regulation* continues under the *Riparian Areas Protection Act*.

The *Riparian Areas Protection Act* provides the following authorities:

### **Provincial directives on streamside protection**

12 (1) Subject to subsection (2), the Lieutenant Governor in Council may, by regulation, establish directives regarding the protection and enhancement of riparian areas that the Lieutenant Governor in Council considers may be subject to residential, commercial or industrial development.

(2) Directives under subsection (1) may only be established after consultation by the minister with representatives of the Union of British Columbia Municipalities.

(3) Directives under subsection (1) may be different for different parts of British Columbia and in relation to different local government powers and different circumstances as established by the directives.

(4) If a directive under subsection (1) applies, a local government must

(a) include in its zoning and land use bylaws riparian area protection provisions in accordance with the directive, or

(b) ensure that its bylaws and permits under Part 14 of the *Local Government Act* or Part XXVII of the *Vancouver Charter*, as applicable, provide a level of protection that, in the opinion of the local government, is comparable to or exceeds that established by the directive.

(5) For the purpose of transition, a directive under subsection (1) may establish a time period during which a local government to which the directive applies must review and, if necessary,

amend its bylaws in order that they meet the requirements of subsection (4) by the end of the period.

(6) On request by a local government, the minister may extend a time period under subsection (5).

### **Regulation-making authority**

13 (1) The Lieutenant Governor in Council may make regulations referred to in section 41 of the *Interpretation Act*.

(2) Without limiting subsection (1), the Lieutenant Governor in Council may make regulations respecting the directives established under section 12, including, without limitation, the following regulations:

- (a) providing that a local government must not approve or allow a residential, commercial or industrial development to proceed in an area wholly or partially within all or a prescribed portion of a riparian area unless the prescribed requirements are met;
- (b) providing that a prescribed requirement referred to in paragraph (a) may include either or both of the following:
  - (i) that the government of British Columbia or Canada has been notified of the development and provided with studies, assessments, reports or opinions regarding the impact of the proposed development on the natural features, functions and conditions that support fish life processes in the riparian area;
  - (ii) that any *serious harm to fish*, as described in section 2(2) of the *Fisheries Act* (Canada), that results from the proposed development is authorized under that Act;

(c) requiring a local government to impose as a condition of an approval of a development that the developer comply with any measures recommended in a report or opinion of a person with prescribed qualifications;

(d) requiring the engagement of a person with prescribed qualifications to perform studies and assessments, make reports and provide opinions in relation to a prescribed requirement referred to in paragraph (a);

(e) establishing criteria for the studies, assessments including methods of assessment, reports and opinions referred to in paragraph (d);

(f) authorizing a prescribed person, on application in a particular case, to vary criteria established under paragraph (e) on prescribed conditions or in prescribed circumstances;

(g) requiring a local government to cooperate in developing strategies with the government of British Columbia or Canada in relation to

(i) monitoring and reporting on the effect of developments on riparian areas,

(ii) public education respecting protection of riparian areas, and

(iii) implementation and compliance with recommendations in a report or opinion of a person with prescribed qualifications;

(h) defining words or phrases used but not defined in this Act.

### **Riparian Areas Regulation (OIC 837 2004)**

This regulation applies to the exercise of local government powers. It has two primary purposes: to protect riparian areas from development so these areas can



continue to support fish life processes, and to facilitate intergovernmental co-operation between federal, provincial and local government agencies in implementation of the regulation.

The regulation defines a specific riparian assessment area encompassing zones on both sides of a *stream*, and requires that a Qualified Environmental Professional complete an assessment for any development proposed within the assessment area. A Qualified Environmental Professional is defined as a member of a professional association constituted under an act, acting under a code of ethics, and subject to disciplinary action by the professional association.

In the riparian assessment, the Qualified Environmental Professional is required to provide their professional opinion that either:

- (i) if the development is implemented as proposed there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes [HADD] in the riparian assessment area, or
- (ii) if the streamside protection and enhancement areas identified in the report are protected from the development and the measures identified in the report as necessary to protect the integrity of those areas from the effects of the development are implemented by the developer, there will be no harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes in the riparian assessment area.

A local government may allow development to proceed if either of the above two conditions are met, or if neither is met, if Fisheries and Oceans Canada authorizes a HADD.

## **Local Government Act (RSBC 2015) Chapter 1**

Part 14 of the *Local Government Act* pertains to authorities with respect to planning and land use management. Several divisions under this part have requirements and provisions for protection of the natural environment, including requirements for information prior to development, and conditions pertaining to development permits. Division 4 of Part 14 describes the purpose, specifies required content and gives authority for bylaws pertaining to Official Community Plans. Division 6 gives requirements for development approval information, and Division 7 gives requirements and exemptions for development permits.

Under Division 4:

### **Policy statements that may be included**

**474** (1) An official community plan may include the following:

- (d) policies of the local government relating to the preservation, protection, restoration and enhancement of the natural environment, its ecosystems and biological diversity.

Under Division 6:

### **Development Approval Information**

**484** For the purposes of this Division, “**development approval information**” means information on the anticipated impact of a proposed activity or development on the community, including, without limiting this, information regarding impact on such matters as the following:

- (e) the natural environment of the area affected.

Development approval information areas or circumstances

**485** (1) An official community plan may do one or more of the following for the purposes of this Division:

- (a) specify circumstances in which development approval information may be required under this Division;
- (b) designate areas for which development approval information may be required under this Division;
- (c) designate areas for which, in specified circumstances, development approval information may be required under this Division.

Under Division 7:

#### **Designation of development permit areas**

**488** (1) An official community plan may designate development permit areas for one or more of the following purposes:

- (a) protection of the natural environment, its ecosystems and biological diversity

#### **Activities that require a development permit**

**489** If an official community plan designates areas under section 488 (1), the following prohibitions apply unless an exemption under section 488 (4) applies or the owner first obtains a development permit under this Division:

- (a) land within the area must not be subdivided;
- (b) construction of, addition to or alteration of a building or other structure must not be started;
- (c) land within an area designated under section 488(1)(a) or (b) [*natural environment, hazardous conditions*] must not be altered

#### **Development permits: specific authorities**

**491** (1) For land within a development permit area designated under section

**488** (1) (a) [*protection of natural environment*], a development permit may do one or more of the following:

- (a) specify areas of land that must remain free of development, except in accordance with any conditions contained in the permit;
- (b) require specified natural features or areas to be preserved, protected, restored or enhanced in accordance with the permit;
- (c) require natural water courses to be dedicated;
- (d) require works to be constructed to preserve, protect, restore or enhance natural water courses or other specified natural features of the environment;
- (e) require protection measures, including that vegetation or trees be planted or retained in order to
  - (i) preserve, protect, restore or enhance fish habitat or riparian areas,
  - (ii) control drainage, or
  - (iii) control erosion or protect banks.

#### **Fisheries Act**

The federal *Fisheries Act* prohibits “any work, undertaking or activity that results in serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or to fish that support such a fishery.” Fisheries and Oceans Canada’s October 2013 policy statement interprets “serious harm” to include the death of fish, permanent alteration to fish habitat or the destruction of fish habitat, and provides guidance as to how this should be considered in practice.

**Water Sustainability Act (SBC 2014)  
Chapter 15**

Authorizations for changes in and about a stream (formerly issued under Section 9 of the *Water Act*) are issued under Section 11 of the *Water Sustainability Act* by the Comptroller of Water Rights, or by persons designated by the minister as a water manager or an engineer for the purposes of the act. A person designated as an engineer for the purposes of the act must be a member of APEGBC or holder of a limited licence.

The *Water Sustainability Act* defines “changes in and about a stream” to mean:

- (a) any modification to the nature of a stream, including any modification to the land, vegetation and natural environment of a stream or the flow of water in a stream, or
- (b) any activity or construction within a stream channel that has or may have an impact on a stream or a stream channel

**Drinking Water Protection Act  
(SBC 2001)**

This act and its regulations apply to waterbodies that are drinking water sources. Part 4, Section 23(1) prohibits the introduction of anything that could be a drinking water health hazard into a waterbody used for domestic water supply.

**Land Title Act (RSBC 1996)**

Section 86(1)(c)(vi) of this act gives an approving officer the authority to refuse approval of a subdivision plan if, after due consideration of all available environmental impact and planning studies, the approving officer considers that anticipated development of the subdivision would adversely affect the natural environment to an unacceptable level. An approving officer under the *Land Title Act* could be an officer of provincial, local or First Nation government.

**Environmental Management Act  
(SBC 2003)**

This act is mainly concerned with pollution prevention and mitigation. Section 85 provides general authority to the minister:

85(1) The Minister may declare that an existing or proposed work, undertaking, product use or resource use has, or potentially has, a detrimental environmental impact.

Under this act, the minister may issue orders directing that mitigative actions be taken or that environmental management plans be prepared.

**Community Charter Act (SBC 2003)**

Section 8(1)(c) of this act gives municipalities the authority to regulate the protection of trees.



## ■ APPENDIX C: ASSURANCE AND CONFORMANCE STATEMENTS

**This appendix contains the following documents:**

- Riparian Assessment Assurance Statement – Qualified Environmental Professional
- Riparian Assessment Assurance Statement – Supporting Specialist – Registered Professional
- Riparian Assessment Assurance Statement – Supporting Specialist other than Registered Professional
- Conformance Statement – Qualified Environmental Professional

## Riparian Assessment Assurance Statement – Qualified Environmental Professional

**Note:** This Statement is to be read and completed in conjunction with the *Professional Practice Guidelines – Legislated Riparian Assessments* and the Riparian Areas Regulation 2004 OIC 837 and is to be provided for *riparian assessments* (not landslides, floods or flood controls) for the purposes of the Riparian Areas Regulation. Italicized words are defined in the guidelines.

To: The Approving Authority

Date: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
Jurisdiction and address

With reference to the Riparian Areas Regulation for the property:

\_\_\_\_\_  
Legal description or PID and civic address of the property

The undersigned hereby gives assurance that he/she is a *Qualified Environmental Professional*:

Name of *Qualified Environmental Professional*: \_\_\_\_\_

Professional designation: \_\_\_\_\_

Professional association: \_\_\_\_\_

I have signed, sealed and dated, and thereby certified, the attached riparian assessment report on the property in accordance with the *Professional Practice Guidelines – Legislated Riparian Assessments* and with the *assessment methods*. That report must be read in conjunction with this statement. In preparing that report I have:

Check to the left of applicable items. If any items are not checked, the reasons should be explained in the *Qualified Environmental Professional's* riparian assessment report.

- 1. Collected and reviewed appropriate background information
- 2. Reviewed the *development proposal* on the property
- 3. Conducted field work on and, if required, beyond the property
- 4. Reported on the results of the field work on and, if required, beyond the property
- 5. Incorporated recommendations or assessment results from other *specialists*
- 6. Prescribed *measures* to protect and maintain the integrity of the streamside protection and enhancement area
- 7. Prescribed *measures* to avoid the occurrence of a HADD\*
- 8. Reported on the requirements for *field reviews* or *environmental monitoring* of the property during or following site works for the proposed *development* and recommended who should conduct those *field reviews* or *environmental monitoring*
- 9. Reviewed the *riparian assessment* report with the *client* and explained the content and the *measures* required to be implemented.

\*HADD – harmful alteration, disruption or destruction of natural features, functions and conditions that support fish life processes

I hereby confirm that in my professional opinion, based on the conditions contained in the attached *riparian assessment report*, as required by the Riparian Areas Regulation (Section 4):

**Check one:**

- If the *development* is implemented as proposed there will be no harmful alteration, disruption or destruction of *natural features, functions and conditions* that support fish life processes in the *riparian assessment area*.
- If the *streamside protection and enhancement areas* identified in the report are protected from the *development* and the *measures* prescribed in the report as necessary to protect the integrity of those areas from the effects of the *development* are implemented by the *developer*, there will be no harmful alteration, disruption or destruction of *natural features, functions and conditions* that support fish life processes in the *riparian assessment area*, and

**Check one:**

- with one or more recommended registered covenants
- without any registered covenant.

Signature, seal and date

**Riparian Assessment Assurance Statement – Supporting Specialist – Registered Professional**

**Note:** This statement is to be read and completed in conjunction with the *Professional Practice Guidelines – Legislated Riparian Assessments* and the Riparian Areas Regulation 2004 OIC 837 and is to be provided for *riparian assessments* (not landslides, floods or flood controls) for the purposes of the Riparian Areas Regulation. Italicized words are defined in the guidelines.

To: The *Qualified Environmental Professional*

Date: \_\_\_\_\_

\_\_\_\_\_

Name and professional designation

With reference to the *riparian assessment* for the property:

\_\_\_\_\_

Legal description or PID and civic address of the property

The undersigned hereby gives assurance that he/she is a Registered Professional:

Name of specialist: \_\_\_\_\_

Professional designation: \_\_\_\_\_

Professional association: \_\_\_\_\_

This is to advise that I have completed the following work in support of the *riparian assessment* noted above, and have submitted signed and sealed documents to the *Qualified Environmental Professional* in respect of the work completed by me:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I confirm that I have liaised as required with the *Qualified Environmental Professional* for the purposes of my services.

I hereby give my assurance that I am a Registered Professional and that the work undertaken on this project by me falls within my area of professional expertise.

Signature, seal and date



**Riparian Assessment Assurance Statement – Supporting Specialist other than Registered Professional**

**Note:** This statement is to be read and completed in conjunction with the *Professional Practice Guidelines – Legislated Riparian Assessments* and the Riparian Areas Regulation 2004 OIC 837 and is to be provided for *riparian assessments* (not landslides, floods or flood controls) for the purposes of the Riparian Areas Regulation. Italicized words are defined in the guidelines.

To: The *Qualified Environmental Professional*

Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Name and professional designation

With reference to the *riparian assessment* for the property:

\_\_\_\_\_  
Legal description or PID and civic address of the property

The undersigned hereby gives assurance that he/she has the following qualifications for the work undertaken:

Name of specialist: \_\_\_\_\_

Area of specialization: \_\_\_\_\_

Qualifications: \_\_\_\_\_

*Include relevant certifications or technical memberships, if applicable. Attach additional documents if needed.*

This is to advise that I have completed the following work in support of the *riparian assessment* noted above, and have submitted such records to the *Qualified Environmental Professional* as he/she requested in respect of the work completed by me:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

I confirm that I have liaised as required with the *Qualified Environmental Professional* for the purposes of my services.

I hereby give my assurance that I am qualified and competent to carry out the work I have undertaken on this project.

Signature and date

### Conformance Statement – Qualified Environmental Professional

To be completed by the *Qualified Environmental Professional* on completion of site works for the development, where the *Qualified Environmental Professional* has prescribed measures to avoid harmful alteration, disruption or destruction of *natural features, functions and conditions* that support fish life processes in the *riparian assessment area*, and/or measures to protect the integrity of the *streamside protection and enhancement area*.

To: The Approving Authority

Date: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Jurisdiction and address

With reference to the Riparian Areas Regulation for the property:

\_\_\_\_\_

Legal description or PID and civic address of the property

I confirm that:

- *field reviews*\* of this *development* have been conducted by me or under my direct supervision, AND
- the completed works are in general conformance with

the *measures* prescribed in the report dated \_\_\_\_\_ OR

the *measures* with amendments approved by me and described in Schedule A, attached; AND

- the limits of the *streamside protection and enhancement area* have been marked on site.

Name of *Qualified Environmental Professional*: \_\_\_\_\_

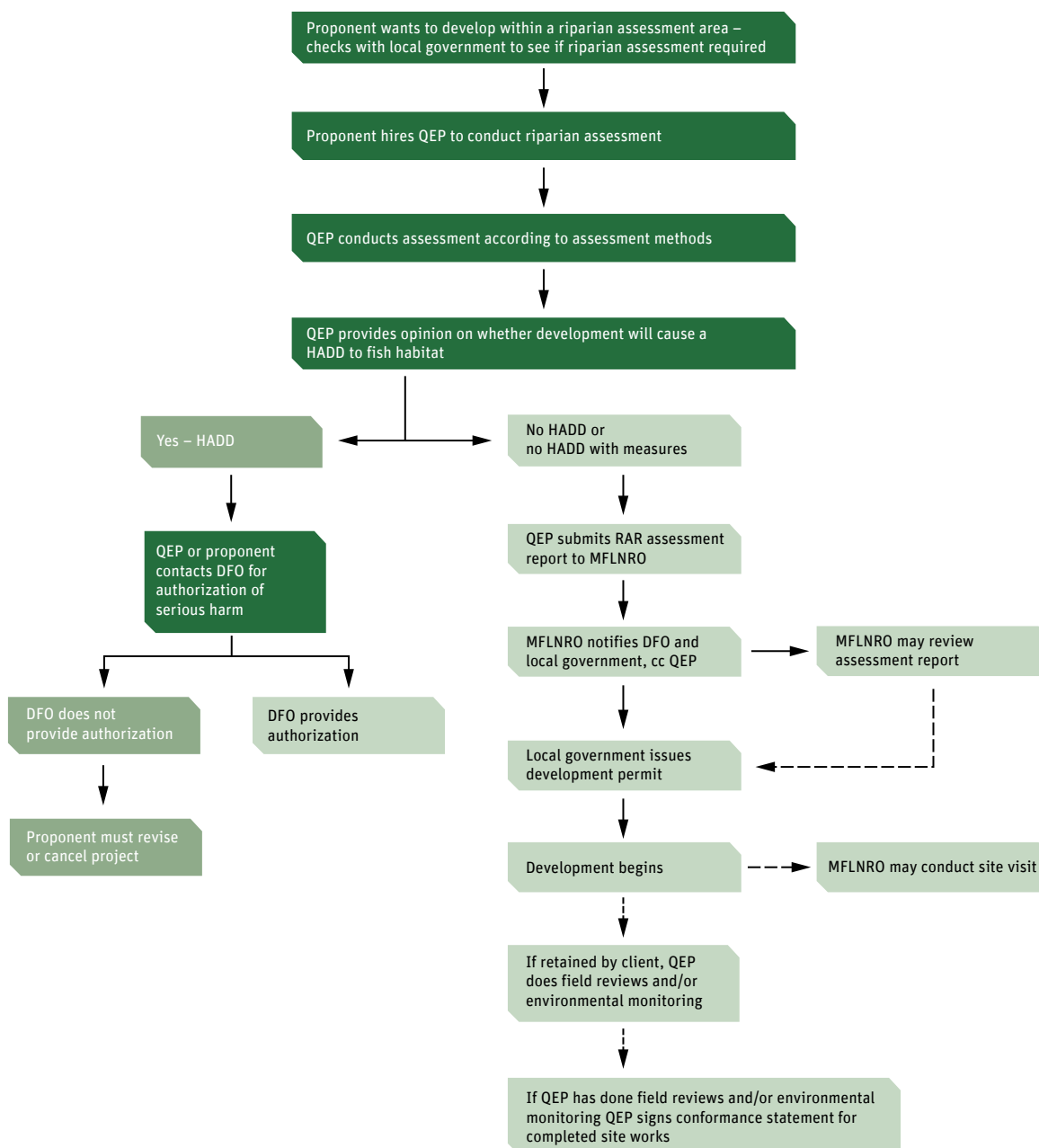
Professional designation: \_\_\_\_\_

Signature, seal and date

\**Field reviews* means such reviews of the *development*, in the member's opinion, to ascertain whether or not the significant aspects of the works are considered in general compliance with the measures recommended by the member.

# APPENDIX D: DEVELOPMENT PROCESS UNDER RIPARIAN AREAS REGULATION

Adapted from Appendix 1 of Office of the Ombudsperson’s report, *Striking a Balance: The Challenges of Using a Professional Reliance Model in Environmental Protection – British Columbia’s Riparian Areas Regulation*, Public Report No. 50, British Columbia: Legislative Assembly, March 2014. Used with permission. “QEP” is “Qualified Environmental Professional”.





# ■ APPENDIX E: GUIDANCE ON FIELD PROCEDURES

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## ■ OVERVIEW

This appendix provides guidance on the field assessment methods typically used for riparian assessments conducted for the purpose of the Riparian Areas Regulation. It draws on the *Riparian Areas Regulation Assessment Methods* (MWLAP 2006), on other scientific references, and on experience gained from conducting riparian assessments under the Riparian Areas Regulation. **This appendix must be read and followed in conjunction with the full text of the guidelines.**

The Qualified Environmental Professional should record how all measurements are taken (e.g., by tape measure, hip chain, range finder, GPS waypoints, handheld inclinometer) and describe any uncertainties or limitations in the field investigations. Field measurements should be of sufficient number and accuracy that another Qualified Environmental

Professional independently investigating the same site would come up with a substantially similar result.

The streamside protection and enhancement area is established within the subject property, although the riparian assessment area and study area often extend beyond the limits of the subject property. After the riparian assessment is done, the streamside protection and enhancement area is marked on the ground before site works commence to allow for protection and monitoring during the site works and to prevent future encroachments into the streamside protection and enhancement area after the site works are finished. The approving authority may require the limits of streamside protection and enhancement areas to be marked by a BC land surveyor.

## ■ ASSESSMENT OPTIONS

Two assessment options are presented here. Note that local governments may have bylaws that specify or limit the assessment method to be used and/or minimum streamside protection and enhancement area widths; the Qualified Environmental Professional must check local bylaws before proceeding with a riparian assessment.

It is acknowledged that these are prescriptive methodologies and that they assume commonly encountered conditions. The purpose of these methodologies is to provide sufficient detail and direction so that the Qualified Environmental Professional understands what is expected with respect to the level of effort intended by the Riparian Areas Regulation. The premise of these methods is that, in most cases, the streamside protection and enhancement areas delineated by these procedures will provide an essential level of protection for fish habitat. The Qualified Environmental Professional is expected to judge whether these methods are sufficient to achieve the protection intended by the Riparian Areas Regulation and, if they are not, to do such additional work and prescribe such further measures as may be needed.

### 2.1 SIMPLE ASSESSMENT METHOD

The simple assessment is best used for large parcels, subdivisions, rezoning, or properties in the planning stages of development. This method considers the following factors in determining the streamside protection and enhancement area width:

- the width of existing and potential streamside vegetation

- whether the *stream* is fish-bearing
- the duration of *stream* flows for *streams* where fish absence is confirmed but the *streams* are connected to fish habitat

The simple assessment typically results in more conservative streamside protection and enhancement area widths; measures to protect the streamside protection and enhancement area determined by this method are therefore usually simpler.

In this method, a *stream* with confirmed fish absence is distinguished from fish-bearing *streams*. If the fish-absent *stream* is connected to fish habitat, both are considered *streams* under the Riparian Areas Regulation. However, the fish-absent *stream* has less value for fish and therefore results in a narrower streamside protection and enhancement area. For fish-absent *streams*, the duration of flow is considered in determining the streamside protection and enhancement area. An example of where this might apply would be a road ditch that intermittently flows into a fish *stream* but has a barrier, such as an extremely long culvert (e.g., 100 m), discharging into the fish *stream* that prevents fish access into the ditch.

**Field checks:** Field checking the full extent of the riparian assessment area is particularly important where imagery or maps may be out of date because land uses have changed or where structures and clearings are difficult to interpret.

## 2.2 DETAILED ASSESSMENT METHOD

The detailed assessment is best used for individual lots, brownfield sites or small parcels. This method determines the following in order to identify zones of sensitivity:

- reach breaks
- *stream* width
- *stream* gradient
- channel type
- potential vegetation type

The minimum streamside protection and enhancement area width is determined from the outer limits of the greatest zone of sensitivity. This method also assesses measures to protect the integrity of the streamside protection and enhancement area.

For all riparian assessments, any potential safety concerns identified must be indicated in the assessment report and must be drawn to the attention of the client.



# ■ DETERMINING THE STUDY AREA AND THE RIPARIAN ASSESSMENT AREA

## 3.1 STUDY AREA

The extent of the study area should be selected so as to adequately assess the elements listed in Section 3.5.1 of the guidelines, and will often be significantly larger than the riparian assessment area defined in the Riparian Areas Regulation. The study area should be large enough to determine connectivity of the *stream* at the subject site to fish habitat, including potentially unmapped *streams* that may connect to the subject site. Be aware that local mapping is frequently out of date or missing small tributaries, wetlands and ditches.

The study area should be of sufficient extent to determine the current and potential functionality of the riparian area, the current and potential associated fish habitat, and the effects of both existing modification and the proposed development on fish habitat.

The subject site should be put into context in the watershed unit that contains it, at least at an overview level, in order to evaluate its relative importance as **existing or potential fish habitat**.

## 3.2 RIPARIAN ASSESSMENT AREA

The riparian assessment area is defined in the Riparian Areas Regulation as follows:

- For a *stream* that is not in a ravine: a 30-m strip on both sides of the *stream*, measured from the high water mark on each side
- For a ravine less than 60 m wide: a strip on both sides of the *stream* measured from the high water mark to a point that is 30 m beyond the *top of the ravine bank*

- For a ravine 60 m wide or greater: a strip on both sides of the *stream* measured from the high water mark to a point that is 10 m beyond the top of the ravine bank

All distances indicated are measured as horizontal distances, not slope distances, and are made perpendicularly from the shoreline of the *stream*.

The following describes and illustrates each of these settings.

### 3.2.1 Riparian Assessment Areas for Streams Not in a Ravine

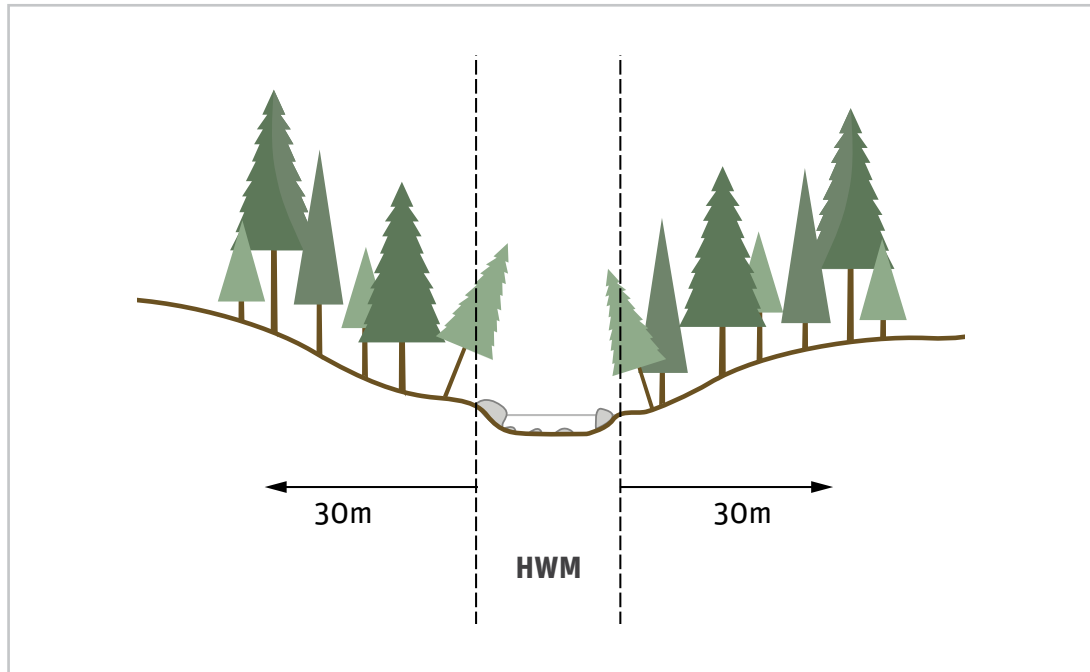
For *streams* with flanking floodplains, the high water mark on each side of the *stream* is at the outer edge of the active floodplain (see Section 3.7.1 in this appendix).

For *streams* with no flanking floodplain—that is, where the *stream* banks are not in alluvial deposits (material deposited by the *stream*)—the high water mark is the visible edge of the seasonally flooded channel, often referred to as the bankfull channel (see Section 3.3.1 in this appendix).

Where the margins of *streams* are distinct, identifying the high water mark may be fairly easy. In flatter terrain, the edge of an active floodplain may be subtle or may have been obscured by land use alterations. If the edge of the active floodplain cannot be identified with confidence, the high water mark can be established using the point closest to the edge of the main *stream* shoreline where the slope of the land breaks to steeper than 33% for a minimum horizontal distance of 15 m measured perpendicularly from the shoreline.

**Case 1** (Figure E-1): *Stream* not in a ravine (MWLAP 2006). The width of the riparian assessment area is a strip 30 m (horizontal distance) on each side of the *stream*, measured from the high water mark.

**Figure E-1. Riparian assessment area for stream not in a ravine**



### 3.2.2 Riparian Assessment Areas for Streams Within Ravines

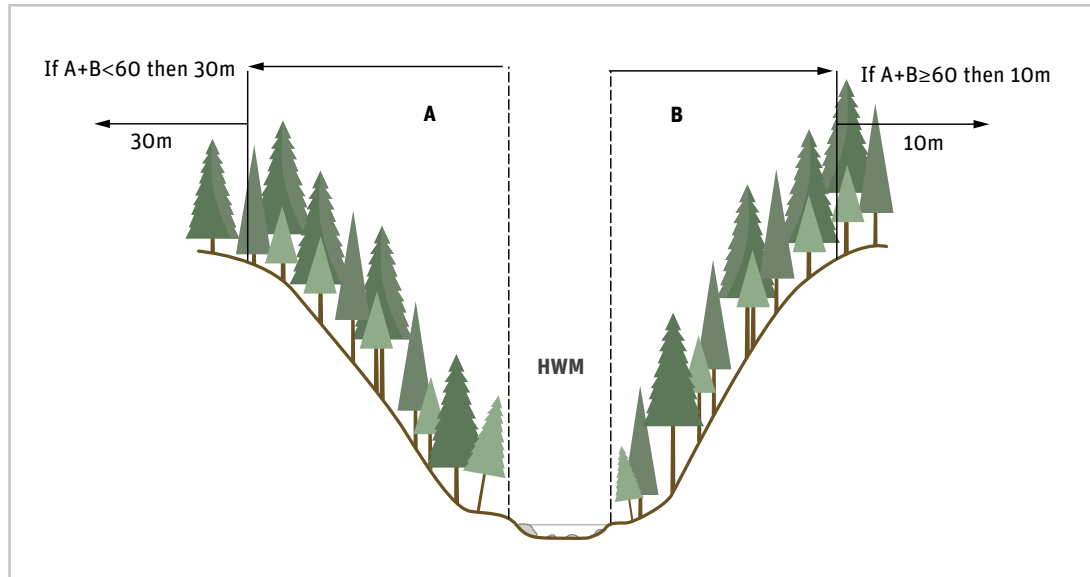
A “ravine” is a narrow steep-sided valley with sideslopes greater than 3H:1V (horizontal:vertical). The “top of ravine bank” is the point at which the ravine sideslope becomes flatter than 3H:1V for a distance of at least 15 m. Note that 3H:1V is a slope of 33%.

Thus, the riparian assessment area in a ravine is the region that includes the *stream* width between the high water marks, the sideslopes of the ravine, and the 30 m or 10 m additional horizontal width beyond the top of the ravine bank on each side.

**Case 2** (Figure E-2): *Stream* (most commonly a linear watercourse) in a ravine (MWLAP 2006).

- For a ravine less than 60 m wide, the riparian assessment area is a strip on each side of the *stream*, measured from the high water mark to a point 30 m (horizontal distance) beyond the top of the ravine bank.
- For a ravine 60 m wide or greater, the riparian assessment area is a strip on each side of the *stream*, measured from the high water mark to a point 10 m beyond the top of the ravine bank.

**Figure E-2. Riparian assessment area for stream in a ravine**



### 3.2.3 Riparian Assessment Areas for Streams with One Steep Slope

The Riparian Areas Regulation does not speak to the situation where only one side of the stream has a slope steeper than 3H:1V. In areas with only one steep side, the following riparian assessment area would be consistent with the intent of the regulation:

- On the side steeper than 3H:1V: width of riparian assessment area to extend 30 m (horizontal distance) beyond the top of bank.
- On the side flatter than 3H:1V: width of riparian assessment area to extend 30 m (horizontal distance) beyond the high water mark of the stream.

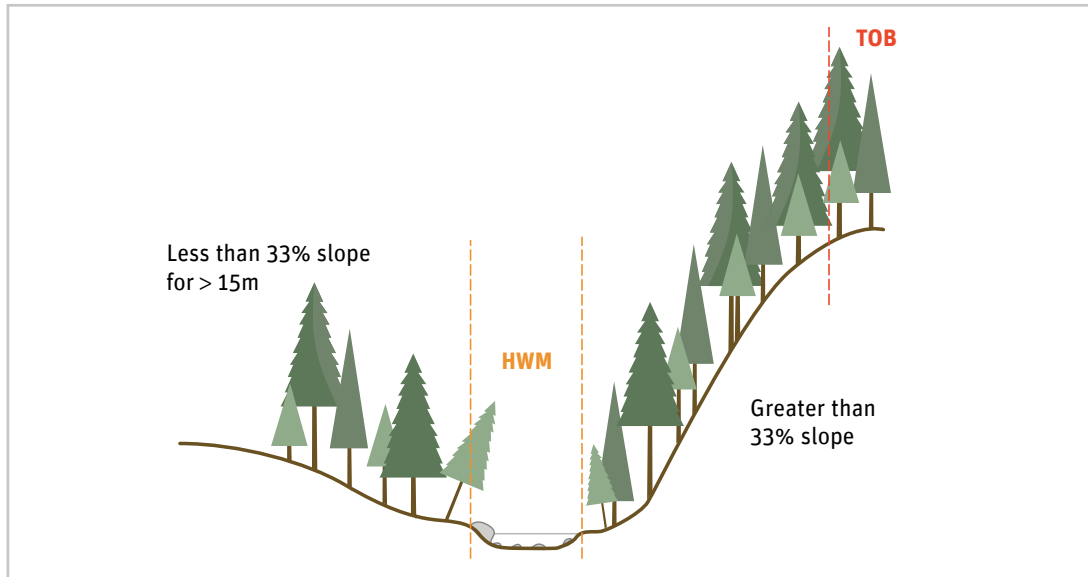
### Case 3 (Figure E-3-new)

This case is not defined in the Riparian Areas Regulation but is considered to meet the intent of the regulation for the purpose of this assessment methodology.

- Where the terrain is variable such that one side of the stream has a slope steeper than 3H:1V and the other side has a slope less than 3H:1V.
- Measurements on the steep side should be as for a ravine, and measurements on the flatter side should be as for a stream not in a ravine.

For the purpose of this assessment methodology, in this Case 3 situation, these positions are referred to as “top of bank.” That is, on the side with the steep slope, the “top of bank” is the point at which the slope breaks to flatter than 3H:1V for a minimum horizontal distance of 15 m, and on the side with the flatter slope, the “top of bank” is the high water mark.

**Figure E-3. Riparian assessment area for stream with one steep bank and one gentle bank**



### 3.2.4 Riparian Assessment Areas in Variable Terrain

Where landforms are variable, the width of the riparian assessment area may also vary. For example, the practitioner may be using high water mark, then top of bank, then high water mark to determine the assessment area boundaries as the adjacent slopes vary from low gradients to steeper gradients to lower gradients. Locations determined in the field should also be accurately shown on a map in order to avoid confusion when delineating the streamside protection and enhancement area both onsite and in the Qualified Environmental Professional's report.

### 3.2.5 Riparian Assessment Area Lengths

The length of the riparian assessment area differs for each assessment methodology (simple or detailed). For the simple assessment, the potential and existing vegetation type is assessed the length of the riparian assessment area is a minimum of 400 m total length or the full length of the subject property along the channel bank or shoreline, whichever is greater. If the subject site is less than 400 m in

total length, this zone is measured 200 m upstream and downstream from the midpoint of the stream within the subject property.

For the detailed assessment, the riparian assessment area is a minimum of 100 m total length or the full length of the subject property along the channel bank or shoreline, whichever is greater. The intent is that the *stream* assessment will be done along the full length of the *stream* along the property but for a distance not less than 100 m. On a large property, this may extend for a length considerably greater than 100 m. On a small property, which may be only a few tens of metres in width, the *stream* assessment may extend well beyond the limits of the property.

## 3.3 FIELD MEASUREMENTS

The Qualified Environmental Professional should ensure that sufficient field measurements of channel widths, *stream* gradients, riparian communities, bank slopes and lengths, channel bed material, vegetation communities, tree sizes and other data required to support

the assessment and, conclusions are obtained and carried out to an appropriate professional standard. If additional methods beyond the Riparian Areas Regulation methods are used, the Qualified Environmental Professional should indicate the specific methodologies or references that were followed, the field procedures, and the means of measurement (e.g., hand-held inclinometer, range-finder, tape measure). In particular, points and measurements referred to in the Riparian Areas Regulation should be recorded, depicted on maps of suitable scales, and flagged in the field as applicable to and suitable for the site. These include:

- high water mark
- limits of active floodplain, if present
- widths, side slopes and top of ravine bank for ravines or gullies, if present
- limits of the streamside protection and enhancement area delineated in the riparian assessment

### **3.3.1 Bankfull Channel Width (Detailed Assessment Methodology)**

Within the detailed assessment methodology, the “average channel width” is determined for *streams* but not for lakes and wetlands. It must be determined for all reaches within the subject parcel.

For the purpose of consistency in carrying out field assessments for this assessment methodology, measurement of the “average channel width” should follow accepted methods of measurement for “channel bankfull width.” Bankfull width is not defined in the Riparian Areas Regulation but is widely used in channel assessments, fish *stream* inventories and fish habitat assessments, and is considered to meet the intention of the Riparian Areas Regulation for conducting riparian assessments.

The method for measuring bankfull channel width is described in *Reconnaissance (1:20,000) Fish and Fish*

*Habitat Inventory: Standards and Procedures* (BC Fisheries Information Services Branch 2001) and in various other manuals and guidebooks. The Qualified Environmental Professional should document the references and methods used for conducting field measurements and determining bankfull width.

The average width of the *stream* reach is usually calculated by taking measurements spaced 10 m apart. For a 100 m reach, this is a total of 11 separate width measurements. The starting point for the measurements is the centre of the reach within the subject parcel. For small lots, the 100 m *stream* section is likely to extend beyond the property boundaries. In larger parcels, spacing of the bankfull channel widths should be spread out to assess the entire *stream* within the subject property. (See Section 3.2.5 in this appendix on length of assessment.)

### **3.3.2 High Water Mark Along Wetlands**

High water mark for wetlands is not as easily determined as for *streams*. Not all wetland classes (MacKenzie and Moran 2004) are *streams* under the Riparian Areas Regulation, as some wetlands may not have surface water long enough to support fish habitat within the wetland or contain surface water to contribute to connected fish habitat. The nature of wetlands, their hydrology, their connectivity to fish habitat and their contributions to fish habitat will need to be understood during riparian assessments. The high water mark for wetlands will need to be determined using the Riparian Areas Regulation definition for the purpose of establishing streamside protection and enhancement areas bordering these waterbodies.

## **3.4 STREAM REACHES**

If the *streams* that are the subject of the riparian assessment area include linear watercourses (as distinct from lakes or wetlands), channel types and relative

sensitivity would typically be described for the reaches within the riparian assessment area and, depending on the scope of the riparian assessment, within the possibly larger study area.

The Qualified Environmental Professional will need to define the reaches within the riparian assessment area. Guidance for defining reaches and establishing reach breaks can be found in several references, including the *Fish-Stream Identification Guidebook* (BC Ministry of Forests 1998) and the *Riparian Management Area Guidebook* (BC Ministry of Forests 1995) (see Section 6, References, in the guidelines for additional sources). Qualified Environmental Professionals should note that culverts and other artificial features that have become barriers to fish passage are not necessarily reach breaks; it is important to consider whether the channel features change upstream and downstream of the feature. Each reach must be given a unique number on the site plan. Within the detailed assessment methodology, the minimum reach length is 100 m or the full length of the subject property, whichever is longer, as described in Section 3.2.5 in this appendix.

Streamside protection and enhancement area widths are typically determined for each stream reach in the riparian assessment area. Thus, some components of a riparian assessment are completed for each reach.

### 3.5 CHARACTERISTICS OF FISH HABITAT

Field work would typically investigate and describe the following:

- types of fish habitat present (e.g., spawning, rearing, over-wintering, or migration) and the fish species and life stages they support
- connectivity to downstream habitats
- physical features of the *stream*, including:
  - physical size: width, depth, wetted area, and gradient
  - if linear, direction and flow, including peak and low flow descriptions
  - if linear, stream transport energy (e.g., using Millard [2000], Millard [2001])
  - if linear, bed morphology (e.g., riffle-pool, cascade-pool, step-pool)
  - substrate (e.g., bedrock controlled, uniform sand/silt/clay bed)
  - streambed material (e.g., fines, gravels, cobbles, boulders)
- channel description (i.e., slope, depth, stability, meandering/channelized), including:
  - whether the *stream* is confined by non-alluvial banks, entrenched (as in a gully or ravine), or has a flanking floodplain in alluvial deposits
  - if alluvial, where on the floodplain the active channel is located (e.g., mid-floodplain with both banks in alluvial deposits, or on one side or the other with one bank in non-alluvial deposits)
  - current condition of the channel (i.e., disturbance or modification, such as straightening, armouring, ditching, diversion, loss or removal of large wood debris, loss of sources of substrate material, culverting through storm drains for long distances, etc.)
- bank descriptions and evidence of erosion, undercutting or slope instability
- sources of shade
- cover, including:
  - large woody debris, aquatic vegetation and instream habitat:
  - for that *stream*, size and biogeoclimatic zone, whether large woody debris would normally (in a pre-disturbance condition) have a function in channel morphology
- structures such as pipes/effluent, culverts, weirs, bank armouring, retaining walls, channel diversions or realignments

- any off-channel habitat
- any barriers (natural or artificial) to fish movement
- values of areas tenuously connected to fish habitat, including times when connections are limited
- value for fish of food and nutrients derived from the *stream*

### 3.6 CHARACTERISTICS OF THE RIPARIAN AREA

A riparian assessment is required to consider both the present vegetation and the vegetation that could be established on the site over the longer term to contribute to the quality of fish habitat (potential vegetation). The Qualified Environmental Professional is responsible for assessing the existing functionality and its potential to support fish habitat.

Field work in the riparian area would typically investigate and describe the following:

- width of the current riparian area
- types of vegetation present, including native, exotic or invasive plant species
- age of trees and general health of vegetation
- sources of large woody debris
- general topography of the site
- general soil description
- any artificial modifications, such as retaining walls, landscaping features or trails (especially for vehicle access)

### 3.7 IDENTIFYING SENSITIVE ZONES

Typically, sites that encompass natural features, functions and conditions (see Definitions in the guidelines) would be identified as zones of sensitivity in the field. Depending on the site, these could include:

- active floodplains, including side channels and channel migration zones

- connected wetlands, intermittent streams or springs
- sources of large woody debris
- riparian vegetation that filters sediment; provides shade, cover, food, nutrients or organic matter to *streams*; and/or has root matrices that resist erosion and bank instability
- natural sources of *stream* bed substrates
- permeable surfaces that permit infiltration and may contribute to moderating flows or sustaining low flows
- potentially unstable gully or ravine sidewalls

#### 3.7.1 The active floodplain

The Riparian Areas Regulation defines the high water mark as including the active floodplain, where one is present. The active floodplain defined in the Riparian Areas Regulation is further explained as that part of the contemporary floodplain subject to occupation by standing or flowing water more frequently than once in five years, on average (Church and Eaton 2001). Practically speaking, it is usually the area where visible evidence of flooding or water flows can be found (e.g., eroded side channels or overflow channels, rafted debris, water or sediment lines on trees, fine silt caught in bark or moss on trees or stumps, fresh sediment on the ground surface, thin duff of less than a few inches over mineral soil). Note that evidence of this kind reflects the last flood event and might not reflect a low return period (five years or less) if there has been a recent extreme flood. In previously harvested forests, stumps may be absent (indicating that they have been eroded away) or confined to locally higher microsites (indicating that the floodplain has eroded around them), or there may be old cutbanks with undercut leaning trees (indicating that the channel has shifted away from that position).

When the Qualified Environmental Professional is determining the outer limits of the active floodplain and the position of the high water mark, he/she should consider local climate change projections and whether predicted increased peak flows and flood levels would affect the position of the high water mark.

*Floodplain plant species* typical of inundated or saturated soil conditions can include water-tolerant species, such as cottonwood trees, salmonberry, red-osier dogwood or willow, or predominantly alder stands, indicating past site disturbance. Vegetation may be variable, possibly containing facultative or obligate wetland species or plants tolerant of lengthy dry periods.

While there is uncertainty in estimating a low return period using the physical evidence described above, it is usually the best means of identifying the active floodplain unless flood stages have been determined by survey and analysis. Moreover, physical evidence is often sought as a means of validating flood frequency analyses.

The presence of a flanking floodplain is characteristic of alluvial *streams*. Other streams, those with confining banks in non-alluvial deposits, do not have a floodplain beyond the seasonally flooded channel.

### 3.7.2 Slope or Bank Stability

Slope and bank stability in the riparian assessment is assessed with respect to its influence on the *stream*. This is not a landslide hazard or risk assessment for the proposed development. Appropriate slope stability measures should be prescribed so that the development does not destabilize the slope and put the integrity of the streamside protection and enhancement area at risk. If slope stability could affect or be affected by the development, a separate landslide risk assessment may be needed, completed to the applicable standard and by the appropriate professional.

If the *stream* is entrenched in a gully or ravine, or if the riparian assessment area includes a slope adjacent to a *stream*, the condition of the slopes would typically be described with respect to slope stability; for example:

- bank material, slope angle and slope height
- whether the slopes are in a natural condition or have been modified by excavation, fill placement, site grading, retaining structures, and so on
- whether the banks are undercut by stream erosion or by excavation
- whether there is evidence of instability, which may be introducing sediment to the *stream*
- what the current vegetation condition on the slope is and whether it is adequate for maintaining slope stability
- whether there is drainage onto the slope from adjacent development that could affect stability (e.g., roof drains, septic fields, storm drains, ponds or pools at the slope crest)

The Qualified Environmental Professional may need to involve a terrain specialist to evaluate stability considerations with gully or ravine sidewalls.

In flat or very low gradient systems, specialists may not be required onsite (e.g., a residential lot with a groomed lawn and 2% slope does not require a specialist). This will be at the discretion of the primary Qualified Environmental Professional.

### 3.7.3 Soil Erosion of Banks and Adjacent Terrain

The material type and relative erodibility of banks or slopes adjacent to streams should be described in relation to the potential erosive energy, and any active erosion noted. Examples might include *stream* bank



erosion or wave erosion on a lakeshore. Current vegetation type and extent should be described and, where stream banks are in erodible deposits relative to the stream energy, the effectiveness of existing vegetation to control bank erosion should be noted.

The Qualified Environmental Professional may need to involve additional specialists to assess erosion potential or to recommend suitable erosion and sediment control measures, both during the site works and for the longer-term development, to avoid causing erosion or introducing sediment to *streams* or to the streamside protection and enhancement area.

#### **3.7.4 Windthrow and Danger Trees In and Adjacent to the Streamside Protection and Enhancement Area**

For treed areas within and/or adjacent to the streamside protection and enhancement area, the Qualified Environmental Professional should consider whether windthrow could pose a hazard for people or structures as a result of the development or from other site modification nearby. Removal of trees or erection of new structures can alter wind patterns and expose trees to wind forces that they have not previously experienced. The Qualified Environmental Professional may need to involve a specialist to evaluate the windthrow hazard and to recommend windthrow treatments, or alternatively may recommend in the riparian assessment report that the client retain a windthrow specialist when implementing the recommended measures. A disadvantage of leaving it to the client to arrange at a later date is that windthrow management strategies recommended by the windthrow specialist may require changes to the measures recommended in the riparian assessment report.

Similarly, a Qualified Environmental Professional may need to involve a

specialist to assess potential danger trees and recommend safe modification or removal measures, or to recommend to the client that a danger tree specialist be retained closer to the time of development or after each winter season. If trees are felled, the tree should be left in the streamside protection and enhancement area as coarse woody debris and another tree should be planted to replace the fallen one.

### **3.8 STORMWATER MANAGEMENT**

The Qualified Environmental Professional should take note of existing stormwater management systems in the study area and whether there is discharge toward the riparian assessment area or a *stream*. For subdivisions, the development plans should be reviewed to determine whether there is likely to be any effect on waterbodies or the riparian assessment area from proposed stormwater systems. It should be noted whether existing stormwater management systems divert water into or out of watersheds and whether this has affected waterbodies at the subject site. In watershed boundary sites, development should avoid changing hydrology patterns as much as possible and drainage into the respective watersheds should be maintained.

### **3.9 OTHER CONSIDERATIONS**

The Qualified Environmental Professional should investigate aspects of the development or other alterations in the watershed unit that may or may not be within the riparian assessment area but could affect habitat within the streamside protection and enhancement area (e.g., windthrow from nearby land clearing, sediment from gravel roads, increased surface runoff, increased flows from drainage control systems entering the watercourse upstream).

There are several resources that can provide information and direction, including:

- Fisheries and Oceans Canada, Measures to Avoid Causing Harm to Fish and Fish Habitat: [www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html](http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/measures-mesures-eng.html) [accessed 02/2017]
- BC Ministry of Environment, *Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia*: [www.env.gov.bc.ca/wld/documents/bmp/devwithcare/](http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/) [accessed 02/2017]

### 3.10 DETERMINING THE STREAMSIDE PROTECTION AND ENHANCEMENT AREA

The streamside protection and enhancement area is determined differently in the two assessment methods. However, both methods will result in meeting the intent of the regulation—protecting and preventing any harm to areas that provide fish habitat. Points that should be considered when determining a streamside protection and enhancement area include the following.

#### 3.10.1 Streamside Protection and Enhancement Area Determination Using the Simple Assessment Method

The simple assessment method uses two definitions of “permanent structure.” The first definition is used to determine the status of the existing and potential vegetation. The second definition is used for streamside protection and enhancement area determination when prior development has occurred within the assessment area.

##### 3.10.1.1 Existing and Potential Vegetation

The status of the existing and potential vegetation is determined by creating

30-m-long transects within the riparian assessment area. An air photo can be used to undertake this task, provided that it is of a scale and resolution sufficient to determine the type of structures present and that the Qualified Environmental Professional confirms by a site visit that no changes have occurred in the area since the air photo was taken. Most commonly, a suitable scale to use is 1:3,000. Where adequate air photo coverage is unavailable, another base map supplemented with photographs could be used, or the assessment could be accomplished from ground transects if permission to access upstream and downstream properties can be obtained.

For each transect, measure the distance from the high water mark, the top of ravine bank, or the “top of bank” to the “permanent structure.” For this exercise, “permanent structure” is defined as the first **building with foundation** encountered along the transect. Measurements must be taken at right angles from the high water mark, the top of ravine bank or the “top of bank,” and all distances are measured horizontally.

**Field checks:** Field checking the full extent of the riparian assessment area is particularly important where imagery or maps may be out of date because land uses have changed, or where structures and clearings are difficult to interpret.

##### 3.10.1.2 Adjusting for Permanent Structures in Streamside Protection and Enhancement Areas

The definition of streamside protection and enhancement areas in the Riparian Areas Regulation includes “existing and potential riparian vegetation and existing and potential adjacent upland vegetation that exerts an influence on the *stream*.”

Section 1(2) of the Riparian Areas Regulation provides further clarity:

For the purposes of the definition of “streamside protection and enhancement area,” vegetation must be considered to be “potential” if there is a reasonable ability for regeneration either with assistance through enhancement or naturally, but an area covered by a permanent structure must be considered to be incapable of supporting potential vegetation.

For the purpose of applying Section 1(2) of the regulation, “permanent structures” in the simple assessment are considered to include other facilities and infrastructure that are not necessarily “constructed, placed or erected on a secure and long lasting foundation” but that reason would dictate are not expected to be removed or substantially altered in order to re-establish riparian vegetation. Table 2-3 in the *Riparian Areas Regulation Assessment Methods* (MWLAP 2006) provides guidance on what structures, facilities or infrastructure are considered “permanent” for the purpose of determining streamside protection and enhancement area widths and prescribing riparian vegetation measures for vegetation potential.

### **3.10.2 Streamside Protection and Enhancement Area Determination Using the Detailed Assessment Method**

The width of the streamside protection and enhancement area calculated by this method is a minimum. The Qualified Environmental Professional should evaluate whether the calculated width is sufficient to provide for the natural features, functions and conditions or whether additional width is needed. This might be the case, for example, where the existing riparian vegetation is not functioning and additional width is advisable in order to develop functioning riparian vegetation over time.

## **3.11 ESTABLISHING AND DELINEATING THE STREAMSIDE PROTECTION AND ENHANCEMENT AREA**

Streamside protection and enhancement areas are delineated to encompass the sensitive zones identified in the riparian assessment area, and to accommodate other considerations as described above and in Section 3.5.1 of the guidelines.

The streamside protection and enhancement area is defined in the Riparian Areas Regulation as an area that is “adjacent to a *stream* that links aquatic to terrestrial ecosystems and includes both existing and **potential** riparian vegetation and existing and **potential** adjacent upland vegetation that exerts an influence on the *stream*.” Therefore, vegetation must be considered to be “**potential**” if there is a reasonable ability for regeneration either with assistance through enhancement or naturally. An area covered by a permanent structure is considered incapable of supporting potential vegetation.

The streamside protection and enhancement area is measured as horizontal distance as follows (see Section 3.2 in this appendix for definition and illustration of the three cases):

- Case 1: measured from high water mark
- Case 2: measured from top of ravine bank
- Case 3: measured from top of bank

The Qualified Environmental Professional determines how well the site functions with respect to supporting fish habitat. The minimum streamside protection and enhancement area width is determined using either the detailed or simple assessment methodology. However, it is up to the Qualified Environmental Professional to judge if the streamside protection and enhancement area is sufficient based on the intention of the regulation and to support that judgment with a rationale. There may

be instances where a calculated streamside protection and enhancement area will need to be increased in size based on the judgment of the Qualified Environmental Professional.

If the riparian area is not functioning, the Qualified Environmental Professional should consider both the extent of a streamside protection and enhancement area that is needed to provide for functional riparian vegetation in future, the measures that are needed to achieve functional riparian vegetation, and the expected time frame required to achieve improved riparian function. For example, such measures could include vegetation treatments to remove invasive or foreign species and plant native riparian species, erosion and sediment control, or placement of large wood pieces to straddle *stream* banks.

Lastly, a local government may have bylaws specifying minimum streamside protection and enhancement areas that exceed the calculated or minimum widths given in the *Riparian Areas Regulation Assessment Methods* (MWLAP 2006). The Qualified Environmental Professional should check for specific requirements in local government bylaws.

The limits of the final streamside protection and enhancement area should be marked in the field. Depending on the requirements

of the local government, the streamside protection and enhancement area may be established in the field by a qualified BC land surveyor or by the Qualified Environmental Professional. Additional field marking, such as the high water mark, top of bank, or top of ravine bank, may also be required by local government or other government agencies.

### **3.11.1 Encroachment**

The streamside protection and enhancement area should be marked in the field prior to any land-disturbing activities to prevent encroachment into the streamside protection and enhancement area during development. The markings should be rechecked during field reviews and replaced if needed.

By the end of development, the streamside protection and enhancement area should be permanently marked in the field in some way to prevent encroachment over time. The Qualified Environmental Professional should discuss with the client the best means of doing this. Some local governments have requirements as to the types of structures, plantings, or fencing that should occur along the streamside protection and enhancement area boundary.

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## ■ APPENDIX F: RIPARIAN ASSESSMENT REPORT SUBMISSION REVIEW

**Note:** This checklist is for the purpose of identifying whether a Qualified Environmental Professional (QEP) has addressed the required content of a riparian assessment report, and to identify any items needing clarification. It does not constitute a peer review. If a peer review of a QEP's report is intended, the peer review must be carried out by a QEP who meets the qualification requirements in Section 5 of the guidelines, and must follow the protocols of the guidelines and of the applicable professional association.

RAR assessment no.	MFLNRO or DFO reference no.	Date received	Date here		
MFLNRO review	Name of reviewer				
	Date of review				
DFO review	Name of reviewer				
	Date of review				
Report title	Title of QEP report				
Report author (Primary QEP)	Name	Report date	Date here		
Initial report			Y/N		
Amendment or revision			Y/N		
Re-evaluation of revised development proposal			Y/N		
<i>Report components (a complete assessment report should include all of the following)</i>			Yes	No	n/a
Summary of project information (MFLNRO form) <b>Note:</b> Some information on this form is beyond the control of the QEP (e.g., the start and end date of the proposed development site works). Its accuracy and reliability therefore cannot be assured by the QEP.					
QEP qualifications summary sheet					
QEP assurance statement					
Specialist assurance statements (if specialists other than primary QEP involved in assessment)					
QEP assessment (main body of assessment report with appendices and attachments)					
<i>Assessment (individual QEP reports may present the information under different headings or in a different order)</i>			Yes	No	n/a
<i>Introduction</i>			Yes	No	n/a
QEP's client (who commissioned the assessment)					
Physical property location and legal description					
Names of waterbodies and watershed units					
Local government that is the approving authority for development					
Purpose and scope of assessment					

<b>Proposed development</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
Size of subject property			
Length of frontage along waterbody			
Physical description of subject property, surrounding area, existing land uses			
Nature and physical extent of proposed development			
Extent of study area and assessment area			
<b>Assessment team</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
Primary author and signing QEP			
Other team members and their roles			
List of specialist reports, if prepared			
Peer reviewers if applicable			
<b>Information used in the assessment</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
List (e.g., imagery, spatial data, climate/hydromet information, fish data, topographic mapping, relevant inventories, previous reports or studies, surveys by others)			
Information provided by client about details of proposed development			
Source, data and scale of information provided, especially for information pertaining to proposed development			
<b>Methods</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
Simple method			
Detailed method			
Modified or other method with justification			
Other guidelines, handbooks, technical bulletins, etc., followed for specific aspects of the assessment			
Methods of analysis, if undertaken			
Limitations affecting the assessment (e.g., access to private property of others, physical barriers, snow cover, high stream flows)			
<b>Watershed overview</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
General description (e.g., size, topography, relief)			
General climatic/hydrologic environment			
Major waterbodies (lakes, streams, etc.)			
Artificial flow controls or diversions, water extraction, intakes			
Existing land uses			
Indicate subject site in context of watershed			
<b>Fish resources – watershed</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
Fish species present in watershed			
Fish distribution in watershed			
Known barriers			
<b>Study area at subject site</b>	<b>Yes</b>	<b>No</b>	<b>n/a</b>
Riparian assessment area and broader study area, if applicable			
Topography			
Nature of waterbodies – ponds, streams, lake, wetlands, floodplains, channels			
Fish bearing			
Fish species present at the subject site (known or assumed)			
Non-fish bearing			
Connectivity of waterbodies to downstream fish-bearing waterbodies			



Summary of field assessment (field data may work best in a tabular presentation)	Yes	No	n/a
Date of field work and conditions at time of assessment			
Verification of waterbodies and identification of any unmapped waterbodies			
Current vegetation condition – length and width			
Channel type, width, gradient and condition by reach			
Other conditions potentially affecting fish habitat (e.g., existing channel or floodplain alteration, armouring, diversions, channel constrictions, instream structures, pipes/effluent, culverts, weirs)			
Barriers to fish movement within study area			
Conclusions	Yes	No	n/a
Existing condition of waterbody and riparian vegetation with respect to features, functions and conditions supporting fish life processes			
Has a HADD already occurred from previous land use activities? (if applicable to site)			
Will there be a need for DFO authorization for a HADD to occur as a result of the proposed development?			
Will there be a need for notification and/or authorization under the <i>Water Act/Water Sustainability Act</i> ?			
What existing or potential impacts can be addressed with measures at the subject property?			
What existing or potential impacts are not possible to address with measures at the subject property? (e.g., those that may be originating outside the subject property)			
Streamside Protection and Enhancement Area (SPEA)	Yes	No	n/a
Physical limits of SPEA			
Measures to protect and maintain SPEA			
Danger trees			
Windthrow			
Slope stability			
Protection of trees			
Encroachment			
Sediment and erosion control			
Stormwater management			
Floodplain concerns			
Potential vegetation			
Special techniques or conditions needed to implement measures			
Field markings needed to delineate SPEA and/or to implement measures			
Safety	Yes	No	n/a
Safety concerns identified			
Means of addressing safety concerns			
Rationales	Yes	No	n/a
Rationales for judgments, conclusions and recommendations may be in the report sections where these statements are made or may be in a separate report section.			
Field reviews and environmental monitoring	Yes	No	n/a
Field reviews recommended			
Environmental monitoring recommended			
Timing and notice required for field reviews and/or environmental monitoring			
Consequences if client does not retain QEP for field reviews/environmental monitoring			

Statement of limitations	Yes	No	n/a
Restriction of report to client for its intended purpose			
Factors which may have limited the assessment			
Conditions relied upon for success of measures (e.g., diligent work practices and construction methods)			
Over what time frame and under what conditions the assessment report will apply and under what circumstances will it no longer be valid			
Possible existing or future impacts on fish that cannot be addressed by measures at the subject property			
Figures, maps and tables (These will vary depending on the type of development, the method chosen, nature of the site and measures prescribed. The following are examples; not all may be applicable in all assessments.)	Yes	No	n/a
Maps			
Location map showing subject property relative to watershed boundaries and other important features			
Field maps or images			
Extent of study area, if different from riparian assessment area			
Points referenced in the Riparian Areas Regulation			
Limits of riparian assessment area			
Width, side slopes and top of ravine bank for ravines or gullies, if present*			
Limits of the active floodplain*			
High water mark*			
Boundaries of the SPEA			
Extent of proposed development			
Waterbodies and confirmed or inferred connectivity to fish-bearing waterbodies			
Stream reaches			
Locations of field measurements*			
Vegetation polygons			
Zones of sensitivity			
Tables summarizing field data for stream reaches, vegetation types, zones of sensitivity (may be included in an appendix)			
Drawings, sketches or images detailing measures			
Photographs (may be included in an appendix)			
*It may not be practical to display some items on maps or figures, depending on the size of the site and scale of the figures. Some may be better described in report text.)			
Appendices (could include the following)	Yes	No	n/a
Photographs			
Field data and maps			
Reports by specialists carrying out a specific aspect of the assessment			
Supplementary information for measures (e.g., suggested planting lists, detailed plans)			
Notifications, authorization applications, relevant correspondence			
Reviewer comments (e.g., any aspects of QEP report that require clarification?)			

# ■ APPENDIX G: SAMPLE FORMAT FOR RIPARIAN ASSESSMENT REPORTS

**Note:** This is a summary outline only; in preparing a riparian assessment report, the Qualified Environmental Professional (QEP) must consider the full scope of the guidelines. As well, consulting firms may choose to include standard report sections specific to their organization.

## EXECUTIVE SUMMARY

- Key findings of riparian assessment
- Summary of streamside protection and enhancement area extent
- Summary of measures prescribed to protect streamside protection and enhancement area
- Summary of recommended field reviews and environmental monitoring during site work

## INTRODUCTION

- QEP's client (who commissioned the assessment)
- Physical property location and legal description
- Names of *streams* and watershed units
- Local government that is the approving authority for development
- Purpose and scope of assessment

## PROPOSED DEVELOPMENT

- Size of subject property and length of frontage along *stream*
- Physical description of subject property, surrounding area, existing land uses
- Nature and physical extent of proposed development
- Extent of study area and riparian assessment area

## ASSESSMENT TEAM

- Primary author and signing QEP
- Other team members and their roles, including a list of other specialist reports, if prepared (e.g., surveyor, hydrologist, forester, terrain specialist, fluvial geomorphologist, arborist, field assistants, as applicable)
- Peer reviewers (if applicable)

## INFORMATION USED IN THE ASSESSMENT

- Imagery, spatial data, climate/hydromet information, fish data, topographic mapping, inventories (watersheds/*streams*/soils/vegetation/terrain/fish/etc.), previous reports or studies, surveys by others, etc.
- Include source, date and scale of information
- Information provided by client as to details of proposed development (include date of information)

## METHODS

- Assessment method used – simple or detailed
- Consistency with riparian assessment guidelines and any additions to assessment methods
- Other guidelines, handbooks, technical bulletins, standards or protocols that were followed with respect to specific aspects of the assessment
- Methods of field measurements and field mapping of *streams*, extent of field investigation, dates of field work
- Methods of analysis, if undertaken

- Any limitations that affected the assessment (e.g., access to private property of others, physical barriers, snow cover, high stream flows)

### WATERSHED OVERVIEW

- Size, topography, relief, general climatic/hydrologic environment, existing land uses, waterbodies (streams, lakes, wetlands, ponds), artificial flow controls or diversions, water extraction (wells), etc.
- Indicate subject site in context of watershed

### FISH RESOURCES

- Fish species present, fish distribution in watershed, known barriers

### STUDY AREA AT SUBJECT SITE

- Riparian assessment area and broader study area, if applicable
- Physical character – topography; nature of streams, floodplains, channels; vegetation
- Fish species at subject site; spatial and temporal connectivity of *streams* to downstream fish-bearing *streams*

### SUMMARY OF FIELD ASSESSMENT

**Note:** Field data may work best in a tabular presentation in conjunction with maps showing locations of key features and measurements.

- Date of field work and conditions at time of assessment
- Verification of streams and identification of any unmapped streams
- Current vegetation condition, including length and width within riparian assessment area
- Channel type and condition by reach
- Other conditions potentially affecting fish habitat (e.g., existing channel

or floodplain alteration, armouring, diversions, channel constrictions, instream structures, pipes/effluent, culverts/weirs, etc.)

- Barriers to fish movements and whether these might reasonably be removed (e.g., culvert replacement)

### CONCLUSIONS

- Existing condition of *stream* and riparian vegetation with respect to natural features, functions and conditions supporting fish life processes
- Whether a HADD has already occurred from previous land use activities, or is likely to occur as a result of the proposed development
- What existing or potential impacts/modifications are possible to address with appropriate measures at the subject property, including potential vegetation
- What existing or potential impacts/modifications are not possible to address with measures at the subject property (e.g., those that may be originating outside the subject property)

### STREAMSIDE PROTECTION AND ENHANCEMENT AREA

- Extent of the streamside protection and enhancement areas within the subject property arising out of the field assessments for each *stream*
- Whether field markings have been set out on the site, and what field markings should be put in place on completion of the site works to prevent future encroachment into the streamside protection and enhancement areas

### MEASURES TO PROTECT STREAMSIDE PROTECTION AND ENHANCEMENT AREA

- Measures necessary to protect and/or maintain the streamside protection and enhancement area (e.g., danger trees,

windthrow, slope stability, protection of trees, encroachment, sediment and erosion control, stormwater management, floodplain concerns, potential vegetation)

- Any special techniques or conditions needed to implement the measures
- Any field markings that should be put in place in order to implement the measures

### SAFETY

- Any safety issues noted during the assessment and indicate how they are to be addressed both during and following the site works
- **Note:** If addressing the safety concern is beyond the expertise of the QEP, recommend to the client that the appropriate specialist be retained to address it

### RATIONALE

- Rationales for judgments, conclusions and recommendations may be included in the report sections where these statements are made, or may be provided in a separate report section

### FIELD REVIEWS AND ENVIRONMENTAL MONITORING

- At what times during the site works field reviews and/or environmental monitoring should be done in order to check that site works are completed as prescribed, that field markings are replaced as needed, and that work procedures do not cause a HADD
- Notice required in order for the QEP or his/her delegate to be able to carry out field reviews and/or environmental monitoring at the appropriate times
- Consequences of the client choosing not to retain a QEP for these functions

### STATEMENT OF LIMITATIONS

- Standard of care followed while carrying out the riparian assessment
- Factors that may have limited the assessment
- Success of the measures prescribed—assumes diligent work practices and construction methods during the site work
- The caveat that if the QEP is not retained to carry out field reviews and environmental monitoring, the QEP may not be able to provide assurance that the work-site procedures were followed appropriately or the work completed to an acceptable standard, or to sign a conformance statement
- Possible existing or future impacts to fish in the subject *streams* that cannot be addressed by measures at the subject property
- Restriction of the use of the report to the client for its intended purpose
- Over what time frame and under what the conditions the riparian assessment will apply, and under what circumstances it may no longer be valid

### FIGURES, MAPS AND TABLES

Typically include:

- A location map showing the subject property relative to watershed boundaries and other important features
- Tables summarizing field data for stream reaches, vegetation types, zones of sensitivity
- Field maps indicating the extent of the study area and riparian assessment area; *streams* and confirmed or inferred connectivity to fish-bearing *streams*; stream reaches; the locations of field measurements; and zones of sensitivity (if applicable)

- Detailed images or maps of the study area and riparian assessment area, supplemented with photographs and sketches as needed to clearly indicate the proposed development, the extent of the streamside protection and enhancement areas, and any measures prescribed to protect or maintain the streamside protection and enhancement area

### APPENDICES

Could include:

- Reports by specialists carrying out a specific aspect of the riparian assessment
- Field data and maps
- Photographs
- Supplementary information for measures prescribed, such as suggested planting lists or detailed plans
- Notifications, authorization applications or relevant correspondence
- Other relevant information

### ATTACHMENTS

The riparian assessment report must be accompanied by the following:

- Summary of project information (MFLNRO form)
- QEP qualifications – summary sheet (this is for the lead author responsible for the assessment)
- Qualified Environmental Professional Riparian Assessment Assurance Statement
- Specialist Assurance Statements if specialists have been involved in the assessment (one to be signed by each specialist)

## APPENDIX H: SUMMARY OF QUALIFICATIONS – QUALIFIED ENVIRONMENTAL PROFESSIONAL, RIPARIAN ASSESSMENTS FOR THE RIPARIAN AREAS REGULATION

Date:	
Name of Qualified Environmental Professional (QEP):	In the Riparian Areas Regulation Assessment Methods (see Section 6.0, MWLAP 2006) this is the primary or lead QEP, who is submitting the riparian assessment report.
Professional designation:	
Professional association:	
Registration number:	
Training in Riparian Areas Regulation assessment methods	
Organization or agency delivery training:	
Name of trainer:	
Date of training session:	
Certificate number:	
Other relevant education, training or experience	Professional development training relevant to riparian assessments beyond the QEP's education that qualified the QEP for professional registration (e.g., seminars, workshops, short courses, certifications).
Riparian assessments completed or contributed to (add lines or pages as needed)	A QEP may choose to use this form to maintain an ongoing log of his/her riparian assessments by adding pages as needed. The QEP should always list the most recent riparian assessment.
Report title:	
Report date:	
As lead Qualified Environmental Professional (Y/N)	
As supporting specialist (Y/N)	Secondary QEP under the Riparian Areas Regulation Assessment Methods.
Report title:	
Report date:	
As lead Qualified Environmental Professional (Y/N)	
As supporting specialist (Y/N)	
Report title:	
Report date:	
As lead Qualified Environmental Professional (Y/N)	
As supporting specialist (Y/N)	
Report title:	
Report date:	
As lead Qualified Environmental Professional (Y/N)	
As supporting specialist (Y/N)	
Report title:	
Report date:	
As lead Qualified Environmental Professional (Y/N)	
As supporting specialist (Y/N)	

\_\_\_\_\_  
Qualified Environmental Professional Signature

\_\_\_\_\_  
Date





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