Environmental Best Management Practices for Urban and Rural Land Development

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June 2004

Appendix C
TERMS OF REFERENCE FOR BIO-INVENTORY

BRITISH COLUMBIA
Ministry of Water, Land and Air Protection
Ecosystem Standards and Planning
Biodiversity Branch

APPENDIX C: Terms of Reference for Bio-inventory

C.1 Introduction

The Ministry of Water, Land and Air Protection recommends a bio-inventory assessment of a site when there is insufficient information to make appropriate recommendations:

- for lot layout design and prescriptions to best protect fish and wildlife habitat and environmentally sensitive areas; and/or
- for compensation for permanent habitat loss or degradation associated with, or adjacent to, a proposed development.

The bio-inventory should document plant communities, aquatic and wildlife habitat values, aquatic and wildlife species presence, environmentally sensitive areas, sensitive ecosystems and rare species, adjacent land uses and threats, site stability and flood issues or other factors affecting lot layout and, where appropriate, potential habitat enhancement/protection opportunities.

To minimise controversy related to the biases and/or accuracy of the report produced, the Ministry recommends that the local government hire the consultant(s) and oversee the inventory work, but that the proponent pay the cost of this service.

Two levels of bio-inventory should be considered based on setting (rural or urban) and parcel size:

- Site Quality Survey; and
- Detailed Bio-inventory.

C.2 Site Quality Survey

A Site Quality Survey is intended for all sites over two hectares but under ten hectares OR on smaller sites where the potential exists for the proposed development to destroy a sensitive ecosystem. In any of these situations, the Site Quality Survey is a tool to determine whether a more detailed bio-inventory is appropriate.

The first stage is to review all existing information for the area, including historical and current aerial photographs and reported occurrences of rare species/plant communities/ecosystems. Check existing inventory data sources for any available information about the property and surrounding area. The Land Information website (http://www.gov.bc.ca/bvprd/bc/keyInitiativeHome.do?action=landInfoBCUser&navId=NAV_ID_province) provides access to a number of inventory data sources from the Ministry of Water, Land and Air Protection and Ministry of Sustainable Resource Management. Local governments and environmental organisations may also have inventory information such as habitat atlases.

Step One - What is the quality of the upland habitat?

- A site that has been extensively modified (e.g. recently logged or cleared) may only need limited field assessments. However, any remnant patches of relatively undisturbed natural vegetation (e.g. older forests, remnant veteran trees, wetlands, rocky outcroppings) may provide habitat for rare animals, plants and plant communities and should be inventoried.
- A site that was originally farmed but has been fallow for many years may have patches or extensive areas of old-field habitat such as native hawthorn and similar shrub species, as well as the potential for the presence of rare and endangered species and communities. Seasonally flooded fields, ditches and channelised watercourses may have re-established important habitat features that should be inventoried for fish, wildlife and rare plants.
- If the site is a re-development, the environmental values may vary from extremely compromised in the case of paved and/or manicured properties, to high values on old estates with relatively undisturbed plant communities or wildlife habitat patches. Proponents are encouraged to design the inventory process accordingly.
- If the identified environmental features will be protected pursuant to a return to Crown or equivalent protection, and human disturbance prevented during and after site development, a detailed bio-inventory of that area may not be necessary. However, if the final lot layout is uncertain or sensitive habitats may be adversely impacted during development, we recommend that a Detailed Bio-inventory be undertaken so that future conflict or loss of valuable habitat features can be avoided or minimised.

Step Two - Look for the presence of watercourses

All watercourses, including ephemeral channels, should be noted and considered in aquatic and riparian habitat and stormwater assessments. Changing natural drainage patterns may adversely affect adjacent plant communities and fish habitat.

- If existing inventories indicate the presence of fish in nearby reaches of the watercourse, no fish inventory may be necessary. However, aquatic and stream reach information may still need to be collected if changes (e.g. relocation or bridge construction) are being considered to the existing watercourse.
- If fish presence in the watercourse is unconfirmed and a developer wishes to have the site designated as non-fish-bearing, a detailed inventory, conducted over an extended period of time, will be needed to conclusively prove that the watercourse is non-fish-bearing. Refer to the "Terms of Reference for a Watercourse Bio-Inventory" (http://srmwww.gov.bc.ca/sry/csd/downloads/forms/environmentalmonitoring_assessments/watercoursebio-invtor-i.pdf).
- In addition to fish presence, wetlands should be inventoried for all values including amphibians, plant communities, invertebrates, and rare species. Any proposals to alter wetlands to enhance fish habitat or for stormwater management should consider all other values and the implications on those resources (such as turtle breeding sites, amphibian habitat, etc.).

Step Three – Assess Wildlife Utilisation

- If high wildlife values are associated with the site (such as ungulate wintering ranges, wildlife trees, raptor nests, wildlife travel corridors, or prime predator feeding areas), these features should be assessed in the field.
- Consider how changes to soil moisture, caused by roads and servicing, may affect sensitive vegetation.

Step Four – Field Work and Report Out

- All field work should be carried out by one or more appropriately qualified professionals.
- The field review should reference and locate all dominant plant communities, significant features such as veteran trees, raptor and heron nests, areas used by large predators, sensitive ecosystems and areas potentially containing rare species on a map of a scale of 1:5,000 or larger. This information should be used to determine appropriate lot layouts that will minimize loss of ecosystem function or productivity.
- The Site Quality Survey should be reviewed by local government staff to help determine if the development proposal (layout, density, land use) is suitable for the proposed site. This includes an assessment of the risks associated with allowing development adjacent to or within prime predator habitats or travel corridors that may result in conflicts with humans after the site is developed.

C.3 Detailed Bio-inventory

The detailed bio-inventory should document plant communities, aquatic and wildlife habitat values, aquatic and wildlife species presence, sensitive ecosystems and rare species, site stability and flood issues, other environmental features affecting lot layout and development potential. Where appropriate, potential habitat enhancement and mitigation opportunities should also be identified.

A bio-inventory should be carried out by one or more appropriately qualified professionals depending on the specific features being assessed and the qualifications of the professionals involved.

C.3.1 Terrestrial Habitats and Species

Plant Communities:

One of the first steps in the bio-inventory is to map the various plant communities on site. This will allow the consulting team to focus their attention on those areas most likely to support wildlife or rare/uncommon species.

Wildlife:

- A presence/not detected survey should be carried out to identify vertebrate species on the site.

- A survey should be conducted to locate all raptor or heron nest sites on or adjacent to the property. Location and date-stamped photo-documentation should be detailed for each nest site. Once identified, nesting sites should not be disturbed during the nesting season. Herons are particularly susceptible to disturbance during that time and have been known to permanently abandon a colony that has been established for many years.
- Conduct an inventory for other wildlife species (including large predators, reptiles and amphibians) that could be reasonably expected to occur on the site.

C.3.2 Rare and Endangered Species and Plant Communities

Many aquatic and terrestrial habitats in British Columbia support threatened, rare or endangered (red-listed), and vulnerable (blue-listed) species and ecosystems. Areas with the potential to support red- and/or blue-listed mammal, bird, or invertebrate species should be assessed for the presence of those species in the appropriate seasons. Every effort should be made to identify the species in the field. If voucher specimens are needed for identification or confirmation of a species in an area, please follow the Resource Inventory Standards Committee (RISC) standards for Voucher Specimen Collection in "Standards for Components for BC's Biodiversity No. 4a and 4b" (http://srmwww.gov.bc.ca/risc/standards.htm). Complete the Conservation Data Centres Rare Element Observation Forms (http://srmwww.gov.bc.ca/cdc/contribute.html) when rare species and/or plant communities are detected.

Where Sensitive Ecosystem Inventories (SEIs) have been carried out (East Coast Vancouver Island and Gulf Islands; Sunshine Coast, and Central Okanagan) (http://srmwww.gov.bc.ca/sei/index.html), these ecosystems should also be identified. Sensitive ecosystems not mapped during the Sensitive Ecosystems Inventories due to their small size (under 0.5 ha) should also be identified.

C.3.3 Aquatic Habitats and Species

FRESHWATER RESOURCES:

All aquatic systems have biological values: from lakes to ephemeral streams, storm ditches to dug ponds and winter wetlands. The assessment needs to start out by mapping all channels, wet or dry, which are components of the local drainage system if not already correctly located on large scale maps. Even isolated winter wetlands are components in the hydrologic regime of a site, as well as potentially supporting ecologically valuable species. Map the normal seasonally high water levels as well as flood levels for development layout considerations.

WETLANDS:

Detailed information on the various components of a wetland are needed, especially if the proposal involves draining, filling, changing the natural water levels for use as an

aesthetic feature or for stormwater retention, or affecting the flow regime due to stormflow patterns and water quality changes. The first stage is a detailed mapping and analysis of the watershed affecting the wetland, plus its peak water level and areal extent at peak storms (topographical mapping is useful here). The bio-inventory should consider water quality for all seasons, flow regimes, aquatic organisms (from fish to amphibians to Daphnia), plants and plant communities (submergent, emergent, ephemeral and riparian communities), and soils.

NOTE REGARDING INSTREAM WORKS:

Any proposed changes to any watercourse, including road or pipeline crossings, water storage structures, dredging, or instream works, are covered by the *Water Act*. Acceptance of this bio-inventory or other aspects of the development proposal does not preclude the need to apply for the appropriate *Water Act* approval. (Nor does an approval under the *Water Act* constitute an acceptance of other aspects of a development, such as lot layout.) If the watercourse is fish-bearing or fish resources are present downstream, also contact Fisheries and Oceans Canada to ensure compliance with the *Fisheries Act.*

MARINE COASTAL SITES:

Proposals involving potential changes below the high tide line need to be referred to Fisheries and Oceans Canada, as well as Land and Water BC. Proposed changes to the nearshore habitats, or within 100 m of an estuary, should be included in this bio-inventory, as part of the "Terrestrial Habitats and Species" component.

C.3.4 Development Impact Assessment

The development impact assessment should identify flood and terrain hazard issues, potential hydrologic changes, any risks from the proposed layout or from the cumulative effects of this development combined with other developments in the watershed, and how the environmental features will be protected.

An analysis of the impact of the proposed development upon the habitats present on the site should include (but not necessarily be limited to) the following points:

AREA:

- Is this site in a natural state (naturally vegetated vs. cleared)? Are there significant trees or treed areas?
- Are there signs of instability (steep slopes, landslides, windthrow) that could be aggravated by the development?
- Is there land outside of the identified biological features for a reasonable building envelope on each proposed lot? ("Reasonable" as determined by site constraints, average size/footprint of buildings and setbacks, with room for normal "yard" activities)?

- Do the species at risk require a buffer to maintain their use of a site; and if so, how large? Is the site large enough to accommodate the recommended buffers with the development as proposed?

SITE CONSTRAINTS:

- Are there significant constraints posed by topography, other environmental features or rights-of- way on the developable portion of the site?
- Have options been explored that would locate proposed structure(s) away from the sensitive areas or provide for alternative layout options and /or design structures that adapt to the need for habitat protection?
- If development is proposed to the edge of the recommended buffer, has fencing or another exclusion technique been employed?

C.3.5 Report Composition

The report should include maps at two scales:

- **Location Map** (e.g. 1:10,000 scale)—shows the property in relationship to easily identifiable landmarks and roads.
- **Specific Maps** (1:5,000 scale or larger)—shows the property's environmental features overlaid on the most current cadastral map. To keep the map from being too 'busy', additional digital layers or Mylars should be provided. The map legend should show clear descriptions of all symbols used on the map (e.g. reach break symbol) as per RISC standards.

The following information should be included:

1. Contours at 1 metre intervals or as appropriate for the size of the development;
2. Survey data collection points and transects;
3. Dominant and rare plant communities and sensitive ecosystem polygons;
4. Raptor/heron nest/roost sites and other important wildlife features;
5. Wildlife species capture or identification sites (including major use areas for nesting, bedding, migration routes, etc.);
6. Threatened, rare or endangered species capture or observation sites;
7. Wetlands and watercourses including ditches and ephemeral streams;
8. Aquatic habitat features including fish distribution and obstructions;
9. 'Top of bank', and/or distance from the 'natural boundary', for the portions of the development that would be affected by setbacks and buffers; and
10. Potential or known threat sources (e.g. adjacent logging or property slated for intensive housing project).

C.4 Selecting Environmental Contractors

MWLAP cannot recommend specific environmental consultants and monitors. This is not our role. It is the responsibility of the developer and/or land development approving agency or authority to assess the qualifications of consultants.

Visit the Association of Registered Professional Biologists website for further information regarding registered biologists standards and qualifications: http://www.apbbc.bc.ca/. Please also note links concerning the College of Applied Biology at http://www.cab-bc.org/.