

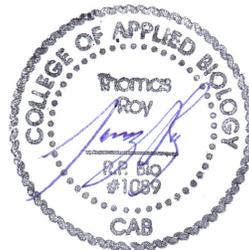


Construction and Environmental Management Plan (CEMP) – Schooner Cove Phase 1

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April 25th 2017





Construction & Environmental Management Plan – Schooner Cove

Phase 1

Fairwinds Development

The following construction & environmental management plan (CEMP) is for a Development located at the Fairwinds Development in Nanoose Bay BC. Specifically, it is for an area referred to as the Schooner Cove Development – Phase 1. The purpose of this document therefore is to provide the developer with a construction and environmental management plan for this phase of the development as the development and associated works fall within an environmentally sensitive development permit area as defined by the Regional District of Nanaimo (RDN). As a result and further to our development permit application, Cascadia Biological Services was tasked with developing a construction and environmental management plan (CEMP) document to ensure that the overall impacts associated with this development were minimized in terms of the environmental attributes found on this particular site. The study area is presented in Attachment I of this document. It was visited most recently in February of 2017 by Thomas Roy of Cascadia Biological Services. Mr Roy has extensive knowledge of the site and has been involved as the project biologist for well over ten years. A detailed environmental study of the Schooner Cove Development is presented in Attachment II and is dated February 2009. This document was verified for accuracy in the winter of 2016 and was found to be accurate as of the date of this document. Although the study area of that document encompasses far more than Phase 1 of this study, it can be used to determine environmental sensitivities on this particular phase of the development. From our most recent assessment of the study area in February of 2017, it was determined that the CEMP would be a small document as this phase of the development has been cleared extensively and that little remains in terms of intact ecosystems. The primary CEMP therefore will be the document dealing with stormwater as this has the biggest potential impact on neighboring properties and ecosystems. Please refer to Attachment III below for typical site photographs. The following CEMP's are intended to provide guidance for future planning and for mitigating construction activities both past and proposed. They



are supplemental to the original recommendations put forth in the Cascadia bio-inventory report dated February of 2009.

Breeding Bird and Raptor Management Plan

Passerine Management

To maintain the bird diversity in the area, the following general recommendations for the retention and development of passerine open and core forest habitat, not specific to any species, should include the following where possible:

- Reduce vegetation clearing along fringe (perimeter) forest edge habitat, primarily along the edges of the study area;
- Maintain habitat diversity including vegetation age/successional structure as much as possible;
- If replanting open areas will be considered, during replanting/revegetation, refrain from even-aged management and any single aged tree removal, encourage horizontal three dimensional successional planting of aged stands and utilize indigenous native plants to promote indigenous bird species and discourage exotic/invasive species as a result of urban encroachment; and
- During development retain coarse woody debris on forest floors (if available) for core forest nesters.
- Avoid or limit activities within the bird nesting window between January 1st and July 31st of each year. Permissions within this window may be attained with adequate assessments completed by an R.P. Bio.

Raptor Management

A general raptor management approach should include the following:



- Any wildlife trees should be maintained in relatively large reserve patches or areas of intact forest (if available);
- Retain a selection of stand structural elements, such as large green trees, snags, logs on the forest floor, and canopy gaps during tree removal for development (if available) Older green trees should have structural characteristics such as cracks, and holes in the bole where limbs have been shed. Snags should have cracks, bird holes and hollow interiors (if available); and
- Treed linkage corridors should be maintained as much as possible between the forested areas to ensure connectivity between roosting habitat and riparian foraging habitat. These linkage requirements should be considered and accommodated within any forest ecosystem networks that are established through any landscape unit plan (if possible);
- Avoid or limit activities within the bird nesting window between January 1st and July 31st of each year. Permissions within this window may be attained with adequate assessments completed by an R.P. Bio.

Amphibian Management Plan

The most significant habitat for local herpetifauna occurs outside of this phase of the development (refer to Cascadia report dated February of 2009). Although located outside of the footprint of this stage of the development, encroachment and degradation of water quality are the greatest issues associated with herpetifauna, especially for amphibians. In this particular development, the potential affects will be limited to the downstream marine environment as the area has been previously cleared.

The following mitigation measures should be implemented where possible to reduce potential impacts to herpetifauna from the proposed development.



Amphibians

Primary amphibian habitat close to the study site is associated with ephemeral ponds and small first order tributaries. As a result, the following general recommendations should be taken into consideration and implemented where possible during the construction phase of the development. They are as follows;

- Establish a minimum 1 metre buffer on wetlands/streams within 300m of this development (if possible). These areas contain key natal habitats for amphibians and frogs and have the following characteristics:
 - Year round water flow
 - Stable channel beds
 - Forest cover; and
 - Lack of fish.
- Any construction related runoff waters should be maintained sediment free, if discharged into the 1st order watercourse areas off-site. Water levels should be maintained no higher than the top of emergent vegetation;
- Where possible, maintain fringe (perimeter) habitats to retain microclimatic conditions for foraging adult herpetifauna;
- Any selective tree harvesting (if any) should be conducted to promote secondary or old growth forest characteristics such as the retention of large diameter trees, multilayered canopies, snags and coarse woody debris;
- Avoid the use of pesticides. Spot treatments with herbicides may be used in exceptional circumstances (e.g., noxious weeds) where it can be demonstrated that the herbicide will not be harmful to the natural environment or herpetifauna habitat being managed;

Stormwater Management

To protect water quality and quantity, the construction will be needed to include the following mitigation measures:



- The design of this stage of the development should incorporate sustainable design concepts, including stormwater best management practises and water conservation;
- Provision for environmental monitoring during the rainy season and any other construction activities that carry a risk of sedimentation or other impacts to water quality downstream;
- Assessment of water quality during construction by measuring turbidity and possibly making other *in situ* measurements such as pH of all outflow stormwater;
- Provision to maintain flows during the subdivision construction period to maintain off site flows through the use of dam and pump, flume techniques or temporary diversions; and
- The development plan should also include a Sediment and Erosion Control Plan developed by the QEP. This will entail a walk through prior to construction to determine the best places for an array of sediment controls including stormwater ponds (temporary), hay bales, sediment fences etc..

Land development activities associated with the clearing of the subdivision including, grading slopes, road building, excavation, grubbing and stockpiling of materials could result in the erosion of soils and input of sediments into local watercourses. Typical overland flow patterns for this Phase of the development are presented in Attachment IV. In order to minimize or eliminate sediment inputs, the following principles should also be incorporated into the design of a detailed “Sediment and Erosion Control Plan” for the project:

- The design and construction including access roads, utilities, and building sites, should be planned to fit the existing terrain and site conditions to avoid impacts to natural drainage patterns. The particular soil conditions and topography should be taken into account during site development and construction should be confined to the least critical areas (i.e. avoid areas with high erosion potential);
- The development should be scheduled to minimize the risk of erosion. When possible, construction activities should be planned for the dry months of the year



to avoid having large areas of exposed soils during significant rain events or snow melt. When possible the development should be staged/phased to allow for the re-establishment of vegetation to minimize erosion;

- All existing vegetation should be retained wherever possible. Clearing boundaries should be clearly marked to avoid unnecessary impacts;
- Runoff should be diverted from denuded areas by isolating cleared areas and building sites and avoiding steep slopes. Natural drainage devoid of excess sediment should be maintained wherever possible;
- The length and steepness of slopes should be minimized where possible;
- Runoff velocities and erosive energy should be reduced by maximizing the length of flow paths, constructing interceptor ditches and channels, and using filter fabric, rock or polyethylene lining in steep interceptor or conveyance ditches;
- Denuded areas and bare soils should be re-vegetated/protected. Cut and fill slopes and disturbed areas should be re-seeded or re-vegetated as soon as possible. Temporary stockpiles of soil and exposed slopes should be covered with polyethylene. To minimize erosion, mulches and other organic stabilizers should be used on cleared areas until vegetation is established. Seeding should be conducted prior to the end of the growing season to allow germination and establishment of roots;
- Eroded sediments should be retained on-site with erosion and sediment control structures such as sediment traps, silt fences, sediment control ponds;
- Sediment and erosion control materials should be stockpiled on site; suggested materials include filter cloth, hay bales, rip-rap, grass seed, drain rock, culverts, matting polyethylene, used tires, etc.;
- Erosion and sediment control measures should be inspected and maintained regularly; and
- The plan should also include a Spill Prevention and Spill Contingency Plan.



Small Mammal Management Plan

The following mitigation measures should be implemented where possible to reduce potential impacts to herpetifauna from the subdivision development.

- Restrict range of encroaching urbanized environment adjacent to the site;
- Allow for fringe habitat along edges to provide nutrients to small mammals. This means retaining treed areas (if fringe habitats remain) so that small microclimates can be sustained to favour foraging areas;
- Retain, where possible, the coniferous and mixed forest areas on site with well developed canopy cover and an abundance of coarse woody debris necessary for microclimate protection and cover;
- Retain in forested areas (if any) loose bark trees and coarse woody debris;
- Retain habitat requirements such as tall grasses, coarse woody debris and soil compaction along fringes of property;
- During construction refrain from regrading slopes to divert drainage into coarse woody debris areas of the woodlots to prevent habitat flooding;
- Where possible retain areas of dense herbaceous and/or shrub layers, and forest litter

Revegetation Management Plan

All disturbed common and public areas within each phase not required for site servicing should be revegetated with local plants and monitored until green-up is established. This includes any grass re-seeding with should be made up of a coastal mixture. The QEP will determine when green-up is established for all plantings. The QEP will also determine which native plants are best suited for those areas to be replanted. Trees used for the replant will maximize wildlife attributes historically present and for those expected to occur given the localized ecosystems which may have become fragmented. As there were no plant species at risk documented for this phase of the development, mitigation for sensitive species was not a requirement.



Spill Contingency Plan

The overall Spill Contingency Plan will include both spill prevention plans and spill response plans.

Spill Prevention Plans

Spill Prevention Plans will be site and/or activity specific. The Spill Prevention Plan will be based on the following guidelines:

1. The construction staging area should be located at least 30 m away from any waterbody;
2. Activities that carry a risk of materials spills should take place within a bermed staging area. These activities include mixing concrete or other materials and any vehicle fuelling and other maintenance that is done on site;
3. Any areas where vehicle fuels or other potentially deleterious substances are stored should be equipped with impervious containment berms. If fuel tanks larger than 250 L are present within a berm, the bermed area should have a holding capacity equal to 125% of the capacity of the largest tank;
4. Storage and maintenance facilities should have spill clean up and disposal equipment. They also should have Material Safety Data Sheets (MSDS) for any hazardous substances, a list of emergency contact names and telephone numbers, and a written list of emergency response and spill reporting procedures;
5. Mobile construction equipment should be fuelled, lubricated and serviced only at these approved locations;
6. Field servicing of equipment, particularly near waterbodies should not be permitted. In addition, equipment and machinery should not be washed near watercourses;
7. All hydraulic systems, fuel systems and lubricating systems should be in good repair;
8. Equipment should be inspected before commencing work. Equipment with fuel or fluid leaks should not be permitted to work within or above any watercourse. Any



equipment that develops a leak immediately should be removed from the watercourse and repaired;

9. Before commencing work, all equipment should be steam-cleaned to remove oil, grease and other substances deleterious to aquatic life; and,
10. Equipment to be used within the watercourse should use only biodegradable hydraulic fluid.

Spill Response Plans

The Spill Contingency Plan will contain a separate Spill Response Plan. The Plan will be kept in a binder at the appropriate location (e.g., construction office) where potentially deleterious materials are stored or used. All pages of the Spill Response Plan will be numbered and dated for referencing and updating. At a minimum, each binder will contain:

1. A copy of the Spill Reporting Regulation (which includes a list of substances and spill volumes that must be reported).
2. The 24-hour toll-free telephone number of the Provincial Emergency Program (1-800-663-3456) prominently displayed.
3. A list of the information that should be provided when reporting a spill to the Provincial Emergency Program: o Reporter's name and telephone number; o Name and telephone number of person who caused the spill; o Location and time of the spill; o Type and quantity of the substance spilled; o Cause and effect of the spill; o Details of action taken or proposed; o Description of the spill location and surrounding area; o Names of agencies on the scene; and, o Names of other persons or agencies advised concerning the spill.
4. A list of 24-hour emergency contacts for the project (e.g. golf course superintendent, site engineer, construction supervisor, environmental monitor): names, job titles and telephone numbers.
5. A list of other relevant 24-hour emergency contacts and a description of the circumstances under which they should be contacted.
6. A list of the substances most likely to be involved in a spill or incident;



7. The Material Safety Data Sheets (MSDS) for all potentially deleterious substances stored on site and cleanup instructions for each substance or class of substances.
8. A list of the spill response equipment on site along with a map of where it is stored;
9. A description of potential environmental impacts should a spill occur.
10. A detailed site map that identifies areas of particular concern with respect to environmental impacts, such as probable flow pathways to watercourses.
11. Detailed instructions for preventing/mitigating environmental impacts, such as containment measures for spills that have entered watercourses.

Demolition Management Plan

A detailed demolition management plan has been completed and forms Attachment V of this document (separate attachment). Further to this document, it is proposed that tarps be placed adjacent to the building footprint to ensure all material is captured. This is particularly important on overhanging areas of the building adjacent to the marine environment. The demolition phase of the project should be monitored by the environmental monitor on a weekly basis to ensure compliance to the CEMP as well as best management practices.

Attachment I – Overview Map





Attachment II – Detailed Biophysical Report – (separate attachment)

Cascadia Biological Services
Attachment III – Typical Site Pictures



Plate #1 – Typical view of previously disturbed areas



Plate #2 – View of paved parking area



Plate #3 – View of boat launch and proposed replanting area in background



Plate #4 – View of hotel in background and foreshore area

Attachment IV – Water Path Map





Attachment V – Demolition Management Plan - (separate attachment)

