

## Resource Ordinance **APPENDIX C:**

### **BEST MANAGEMENT PRACTICES FOR HABITAT MANAGEMENT PLANS**

#### During Construction

---

- Perform any excavation and grading work during dry weather
- Install silt fencing around the work area to prevent erosion and siltation of marine and riverine waters.
- Minimize amount of erodible soils at any given time to the maximum extent feasible.
- Check all equipment daily for leaks. Refueling and lubrication of equipment should occur offsite. Don't store any fuel, lubricants, chemicals, or hazardous substances overnight within the project area.
- Do not apply any chemicals when there is a possibility of rain.
- Comply with all permits and requirements of the government authority or agency,

#### **Stream Buffer Protection**

Existing trees and other native vegetation within the stream buffer should again be left undisturbed in areas outside of the proposed construction zone. Any storage or stockpiling of construction materials associated with construction or ensuing occupancy of the residence should take place within a designated construction zone in order to limit impacts to the buffer. The banks and channel of the stream should not be used for foot traffic since this would damage vegetation and increase erosion along the stream channel. Logs that currently exist within the stream channel should not be removed or disturbed and future downed woody debris should be encouraged.

#### **Nurse Log Placement**

Overstory trees at least 4 inches diameter at breast height removed from the reduced buffer should be placed within the protected buffer to provide nurse log habitat. The logs could be segmented into 10-15 foot pieces to facilitate transport but would best be left as long as possible. It is recommended that these logs be placed randomly throughout the buffer to mimic natural distribution.

#### **Construction Phase Best Management Practices**

An increase in the amount of impervious surface is a concern whenever new buildings are constructed. Impermeable surfaces, such as roads, rooftops and drive ways, cause more rain to run off at accelerated rates and less water to infiltrate back into the soil (Leedy and Adams 1984). To prevent increased erosion and impacts to water quality, runoff from the building and other impervious surfaces may require a storm water management plan that diverts this runoff away from the ground surface and back into the ground. Other good examples of Low Impact Development techniques are provided in the "Low Impact Development Technical Guidance Manual for Puget Sound" prepared by Puget Sound Action Team and WSU Extension 2005.

Best Management Practices (BMPs) need to be adhered to throughout the construction phase.

- Appropriate erosion control devices, such as silt fencing, mulch berms, and erosion control matting should again be used if needed during all aspects of the construction phase to mitigate potential erosion and runoff into the stream.

- The most important goal during the construction phase is to consolidate the time period in which heavy earthmoving machinery is used. Earthwork activities should be implemented during the driest season of the year to minimize the risk of erosion-related impacts to the stream. Any work requiring use of this type of equipment (such as site grading, road building, grubbing, cutting and filling) should also be implemented over short periods or events. This should avoid continued and prolonged disturbance of the environment with heavy equipment, as would be the case if the work occurred over multiple and/or unconsolidated events.
- Construction activities should be confined to discrete areas of the site to minimize disturbance to native vegetation in the buffer.
- No construction debris or supplies should be placed in existing forested areas or anywhere along the stream bank.
- Coinciding with, or immediately subsequent to the completion of the construction work, the restoration and stabilization of bare ground should occur. Restoration and stabilization phases include the application of a native seed mix and landscape stabilization of any cut and filled areas. Native species of plants should be used in transition zones between the construction area and undisturbed native vegetation.

The suggested BMP's focus on reducing increases in impervious surfaces, preserving hydrologic functions, and controlling potential adverse impacts to water quality.

- Clearly mark clearing limits with orange construction fencing;
- Install silt fencing at the clearing limits to prevent surface runoff, erosion, and water quality degradation;
- Cover or mulch bare areas to prevent surface erosion
- Hydroseed disturbed areas with a slurry of native grass seed, mulch, and tackifier as soon as possible following completion of construction and at a minimum before the onset of fall rains;

## Re-vegetation and planting

---

### **Earthwork**

No machinery earthwork will be necessary to implement this restoration plan; planting holes for specified vegetation installation will be hand dug. No additional clearing or grading should be required for site restoration.

### **Native Plantings**

It is recommended that native plantings be installed within 10 foot wide restoration zones in linear strips extending across the site parallel to the edge of the buffer to achieve the following densities:

Trees – 10' on center

Shrubs – 5' on center

Ferns – 4' on center

The general plan calls for installing single trees, or clusters of three shrubs, on approximate 10-foot centers. Each row will alternate between 5 trees + 3 shrub clusters or 4 trees + 4 shrub clusters starting from the edge closest to the identified critical area proceeding to the edge of the buffer. Specifically for stream ravine replanting, cedar will be the first type of tree installed within the first row at the top of the ravine, and then incrementally changing one cedar tree to a fir through the first six rows, with all fir trees thereafter or to the edge of the buffer whichever comes first. Exact placement of installed materials will be up to the landscape installer, following the basic 10-foot spacing pattern prescribed. Finally, a native ground cover planting or sword fern will be randomly installed

throughout the planting row on average four-foot centers. These densities have been selected to provide a moderately dense, structurally diverse plant community within the restoration area. Volunteer native vegetation can be counted towards the target densities of restoration plants. Typical native plant species that may be used with the restoration zone include:

- Trees:    Western red cedar (*Thuja plicata*) – 2 or 3 gallon  
             Douglas fir (*Pseudotsuga menziesii*) – 2 or 3 gallon  
             Western hemlock (*Tsuga heterophylla*) - 2 or 3 gallon  
             Grand fir (*Abies grandis*) – 2 or 3 gallon  
             Cascara (*Rhamnus purshiana*) – 2 or 3 gallon  
             Cottonwood (*Populus balsamifera*) – 2 or 3 gallon
- Shrubs:    nootka rose (*Rosa nutkana*) – 1 gallon  
             salmonberry (*Rubus spectabilis*) – 1 gallon  
             salal (*Gaultheria shallon*) – 1 gallon  
             evergreen huckleberry (*Vaccinium ovatum*) – 1 gallon  
             twinberry (*Lonicera involucrata*) – 1 gallon  
             snowberry (*Symphoricarpos albus*) – 1 gallon  
             elderberry (*Sambucus racemosa*) – 1 gallon  
             red osier dogwood (*Cornus stolonifera*) – 1 gallon
- Ferns:     sword fern (*Polystichum munitum*) – 1 gallon

All planting should occur during winter dormancy. The optimum time for planting is from February to March.

### **Installation**

Installation of the prescribed vegetation will be performed by qualified landscapers familiar with planting of native vegetation in natural settings. Installation will be performed only after home construction on the property is completed to avoid damage to the plantings from construction activities. All installed vegetation shall be marked with colored flagging to facilitate monitoring inspections. A separate “as-built” plan will be provided by the landscaper if the planting pattern or schedule deviates from that listed within this document.

### **Fertilizing**

Artificial fertilizer may be applied to each planting hole in the form of “slow-release” tablets or some other similar material. However, general broadcast fertilization MAY Not be used within the landscape planting area.

### **Maintenance**

Maintenance of the installations will be the responsibility of the landscape installer. Maintenance is to include and weeding or watering necessary to ensure plant survival for up to one year after the date of installation.

### **Habitat Conservation Measures**

In general, proposed measures to protect habitat focus on promoting natural succession of native plant communities and increasing structural diversity and complexity.

- Minimize clearing and conversion of forest habitats to other uses, particularly within the stream and lake buffers;
- Retain larger conifers wherever possible; if trees are removed, use/retain large woody debris (LWD) in native plant communities to be retained. Retained LWD can be installed vertically or horizontally to provide habitat for woodpeckers, including pileated woodpecker.
- Retain and/or salvage downed large woody debris and western red cedar stumps;

- Thin dense, immature (sapling) red alder and underplant with native conifers to promote more rapid natural succession to later serial phase forest types;
- Enhance native plant communities by removing invasive and non-native species, such as Himalayan blackberry, and planting native trees and shrubs;
- Plant native shrubs and trees in the stream buffer, such as willows (*Salix* sp.), re-osier dogwood (*Cornus sericea*); and black twinberry (*Lonicera involucrata*). These will increase structural diversity and buffer functions, such as retention of organic matter and increasing shade and thermal protection.

## Monitoring the success of the planting

---

Monitoring of the installed vegetation will be performed annually for three years following installation. Monitoring will entail inspection of each planted specimen for survival and vigor, and will be performed in August or September of each monitoring year. In addition, two photo points will be established that portray the planting area from each side of the property. A brief letter report summarizing monitoring findings will be submitted to Mason County Planning by 1 October of each monitoring year.

### Contingency

If mortality of the installed vegetation exceeds 10% for trees, 20% for shrubs and ferns, all dead materials will be replaced a 1:1 ratio. If mortality is related to an inappropriate species for the site conditions, adjustments to the Plant Schedule may be made to replant with a species more like to survive.

Monitoring of the site will begin the first fall following tree planting and maintained on a seasonal basis. The information gathered will provide the following:

- 1) condition of reintroduced plant species;
- 2) the use of the site by wildlife species;
- 3) any disturbance caused by the development and its effect on protected zones and associated aquatic habitat;
- 4) any occurrence of exotic species within the restoration zones;
- 5) any corrective measures that may be deemed necessary to provide desired conditions. This monitoring will be in effect for the duration of three years. The information gathered will be provided in an annual report and submitted to the Director of Mason County Department of Community Development.

## On-going homeowner responsibilities

---

Suggested BMP focus on reducing increases in impervious surfaces, preserving hydrologic functions, and controlling potential adverse impacts to water quality.

- Infiltrate clean runoff from impervious surfaces such as roofs using infiltration trenches to maximize groundwater recharge. Avoid using roofing materials, such as zinc-coated products, that could contribute metals to surface waters;
- Properly maintain septic system to avoid septic system failure;
- Landscape with native plants and use mulch and drip irrigation to reduce water consumption, conserve water, and reduce cumulative help maintain instream flows in downstream surface waters;
- Use low flow toilets and shower heads to conserve water and reduce water consumption;

- Avoid use of herbicides and pesticides, which may adversely affect native flora and fauna, as well as pest species;
- Use porous pavement or gravel instead of asphalt or concrete for the driveway to reduce stormwater runoff; use biofiltration swales or infiltration trenches to promote removal of pollutants and promote groundwater recharge.

### **Home Owners Best Management Practices**

Residents living by the unique stream environments have a continuing responsibility for maintaining the conditions that provide the function of the stream.

- Soil or yard waste must not be dumped anywhere within the buffer so that it may enter the stream.
- Runoff from the building and other impervious surfaces should be directed to sub-surface trenching that diverts runoff away from the ground surface and back into the ground, or according to the stormwater management plan that has been approved for the site. The erosion of soil or the forming of channels should be prevented. These efforts will prevent increased erosion and impacts to water quality.
- The occupants of the residence should also promote landscaping with native species.
- Landscaping around the construction zone should be compatible and blend with the native buffer.
- Bird boxes should be built or purchased and placed on the property to promote avian wildlife. Bird boxes can be built and placed on snags or live trees according to the bird species requirements that may be most likely to utilize habitat at the site. Guidance on bird boxes is available from the Mason Conservation District.

### **Stream Buffer Protection**

- Existing trees and other native vegetation within the stream buffer should again be left undisturbed.
- Any storage or stockpiling of materials should take place outside of the buffer in order to limit impacts to the buffer.
- The banks and channel of the stream should not be used for foot traffic since this would damage vegetation and increase erosion along the stream channel.
- Logs that currently exist within the stream channel should not be removed or disturbed and future downed woody debris should be encouraged.

Functions and values of the forested area between the proposed residence and the marine shoreline should be maintained through the following measures.

- Do not remove overstory trees (view corridors can be established or maintained by limbing the trees to the minimum extent necessary)
- Shoreline access should be limited to a 3-foot wide path, with stairs when necessary, to concentrate all foot traffic through a single corridor.
- Species such as English Ivy and Himalayan blackberry should be removed and prevented from further invading the site. This can be accomplished through persistent cuttings during the growing season.
- Sites where invasive species are removed should be replanted using native species.