

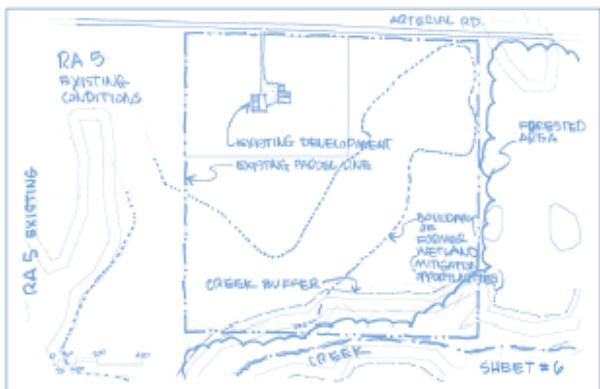
Summary of Manual  
November 2010



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# BIRCH BAY Low Impact Development MANUAL

Whatcom County Planning & Development Services  
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*Note: These are chapters and sections for the full upcoming manual, not for this summary document*

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## **Summary of Birch Bay Low Impact Development Manual**

A Low Impact Development (LID) manual is being developed for the Birch Bay watershed. LID refers to a range of practices designed to reduce the environmental and aesthetic harm caused by conventional land development activities. The primary principles of LID are:

- Assess and understand the unique features of a site, and use this information to guide site development planning
- Manage stormwater to match historic, forested conditions, over a range of rainfall intensities and durations
- Protect and/or restore native vegetation and soils, which helps to maintain wildlife habitat, minimize runoff, absorb and filter out pollutants, and maintain aesthetic qualities



**LID techniques, such as raingardens and tree protection, help maintain the environmental and aesthetic qualities of a developing area.**

Along with environmental benefits, utilizing LID practices for new construction can also have significant economic benefits. LID can reduce development costs by:

- Reducing impervious surfaces such as roadways, curbs and gutters, thus minimizing paving costs
- Decreasing the use of storm drain piping and inlet structures, and eliminating or decreasing the size of large, expensive stormwater ponds
- Reducing the amount of site clearing and grading

### **Purpose and Implementation of the Manual**

The purpose of the Birch Bay LID manual is to provide property owners, planners, builders, developers, and the citizens at large with guidance on how to reduce the impacts of development activities on the environment in an economically feasible way. The LID practices listed in the manual will not replace existing development regulations, but will be an incentive-based optional program. An applicant will receive incentives on a sliding scale, based upon how their proposed development “scores” according to set criteria. Applicants that earn enough points may be eligible for:

- 1) Dedicated Planning Department Point-of-Contact. A dedicated Whatcom County staff member will coordinate the permitting of the developed project. The staff member will be available to directly assist the proponent with their project.
- 2) Fast-Tracked Permit Process. The proposed project will be fast-tracked through the permitting process.
- 3) Relaxation of the Agricultural Protection Overlay (APO) Zone Requirements. Whatcom County has a zoning overlay that imposes certain restrictions for rural lands that contain soils suitable for agriculture (which are prevalent in the Birch Bay watershed). These restrictions include placing the development on lower-quality soils (if present), minimum 100-foot setbacks from other agricultural parcels, and a minimum 500-foot setback between dwelling clusters. Use of the LID manual would contain similar open space ratios to the APO requirements, but offer more flexibility on how to achieve them.
- 4) Use of Birch Bay Habitat Management Fund. Whatcom County Code requires mitigation (generally environmental restoration) for wetland and stream buffer impacts. This mitigation is typically performed onsite, and requires the project proponent to post a performance bond and monitor the mitigation project for several years. The Birch Bay Habitat Management Fund would allow a permittee to pay a fee for buffer impacts, which would be used by a third party to restore habitat elsewhere. The project proponent would then be released from the performance bond and monitoring requirements.
- 5) Not Limited to 2,500 SF Building Envelope. Whatcom County currently limits new structures to a 2,500 square-foot building envelope when buffer impacts are proposed. If LID techniques are utilized, the building envelope limit could be increased.

### **LID Practices and Scoring System**

The specific LID practices in the manual were chosen based upon the environmental characteristics of the Birch Bay watershed and a review of existing LID manuals from around the country. The specific practices are divided into three primary categories:

- Low Impact Site Design;
- Stormwater Management; and
- Fish and Wildlife Enhancement.

Each category has a corresponding list of applicable practices, as shown in the scorecard below. Some of the listed practices are required prerequisites for the program, such as “Avoid Floodplains,” while others are scored. The total LID score for a proposed development determines the amount and types of incentives available, as shown in the chart below.

**Low Impact Site Design 20**

Prereq	<b>Avoid Floodplains and Geologically Hazardous Areas</b>	Required
Credit A	<b>Protect Wetlands, Streams, and Buffers</b>	4
Credit B	<b>Open Space Development</b>	6
Credit C	<b>Preserve Trees and Forest Land</b>	4
Credit D	<b>Minimize Impervious Surface Coverage</b>	4
Credit E	<b>Native Landscaping</b>	2

**Stormwater Management 9**

Prereq	<b>Amend Soils</b>	Required
Prereq	<b>Manage Stormwater Onsite (at least 91% of annual runoff volume)</b>	Required
Prereq	<b>Disconnected Stormwater Treatment</b>	Required
Credit A	<b>Manage Stormwater Onsite</b>	6
Credit B	<b>Limit Construction Disturbance</b>	3

**Fish and Wildlife Enhancement 12**

Credit A	<b>Reforestation</b>	4
Credit B	<b>Enhance Wetlands, Streams, and Buffers</b>	4
Credit C	<b>Wildlife Corridor Preservation</b>	4

Birch Bay LID Scorecard (Draft)

**Incentive Minimum LID Points Required**

Use of Birch Bay Habitat Management Fund	10
Dedicated Planning Dept. Point-of-Contact	14
Fast-Tracked Permit Process	18
Relaxation of Ag. Overlay Requirements	22
Not Limited to 2,500 SF Building Envelope	26

LID Incentives Point Requirements (Draft)

## **LID Best Management Practices**

The manual will describe and illustrate the various techniques (also called ‘Best Management Practices’ [BMPs]) that can be used to reduce the impacts of a proposed development. The BMPs most appropriate for the Birch Bay watershed were identified based upon a detailed evaluation of the watershed conditions. The BMPs and their primary components are listed below.

### Low Impact Site Design

- *Site Survey*: Using a combination of existing information and field surveys, identify and map important areas such as floodplains, streams, wetlands, and mature forests. Design development to avoid impacts to these habitats.
- *Conservation Easements*: Designate protected lands as Conservation Easements, so they are protected in perpetuity. Officially designating lands for conservation can help reduce property tax burdens.
- *Compact Development*: Carefully design lot layouts to reduce the overall development footprint.
- *Minimize Impervious Surfaces*: Utilize pervious materials for driveways and parking areas, reduce roadway widths, and narrower lot frontages to minimize the amount of new impervious surfaces for a development. This helps reduce the need for more expensive engineered stormwater management infrastructure.
- *Native Plantings*: The use of native plants for landscaping helps reduce the need for irrigation, pesticides, and fertilizers. Plantings also add aesthetic value.



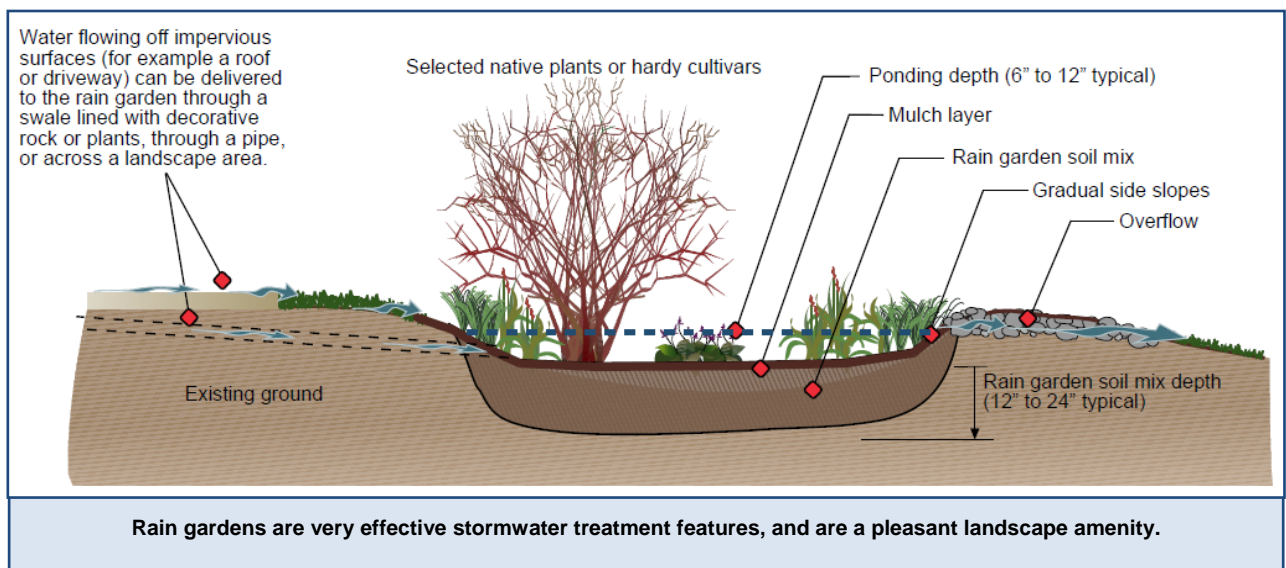
A compact development footprint allows for the protection of high-quality open space

### Stormwater Management

- *Dispersion*: Discharging stormwater from impervious surfaces to existing vegetated area onsite, where the water can naturally infiltrate into the soil.
- *Rainwater Cisterns*: Large containers that store runoff from impervious surfaces. The collected water can be used later for beneficial purposes, such as landscape irrigation.
- *Vegetated Swales (Bioswales)*: Gently-sloping vegetated channels used to receive and treat stormwater runoff from rooftops and road surfaces. As the stormwater flows

through a swale, the velocity is slowed by vegetation which helps the water to infiltrate into the ground.

- *Trees*: Tree canopies intercept and capture rainfall, reducing the amount that reaches the ground. They also consume stormwater through a process called “evapotranspiration.”
- *Soil Amendment*: The process of improving soils that have been impacted by construction activities. Adding compost and tilling compacted soils helps restore soil infiltration capacity, which reduces stormwater runoff and improves the health of landscaping.
- *Rain Gardens*: Shallow depressions that consist of a conditioned soil bed and native plantings, which are used to treat stormwater runoff from rooftops, streets, and parking lots.



### Fish and Wildlife Enhancement

- *Wetland and Stream Restoration*: Restoring degraded wetlands, streams, and their buffers improves the quality of these critical habitats.
- *Reforestation*: Historically, the Birch Bay watershed was covered almost entirely by forests. Where practical, replanting trees helps improve wildlife habitat, and well as provide significant water quality benefits.
- *Habitat Connectivity*: Healthy and diverse wildlife populations require large habitat patches. Where possible, development should be designed to maintain connections between existing habitat patches.

## Example LID Practice from Manual

The section below describes the scoring criteria, applicable BMPs, and permit submittal requirements for the “Preserve Trees and Forest Land” LID practice from the upcoming development manual. This is an example of how the individual LID measures will be addressed in the manual. Notes that there are different standards depending on whether the proposed development project is located within the Urban Growth Area (UGA) or outside the UGA.

# Preserve Trees and Forests

## Intent Statement

Design development to preserve the existing trees and forests in Birch Bay. The LID point score is determined based upon how much tree cover is preserved on the project property. If the project property contains little to no existing tree cover, LID points can be earned by applying the Reforestation BMP (see pg. 56).

## Point Requirements

- **0 points:**
  - Within Birch Bay UGA: The project site contains greater than 10% tree/forest cover prior to development, but less than 10% will remain after the proposed development
  - Outside of Birch Bay UGA: The project site contains greater than 35% tree/forest cover prior to development, but less than 35% will remain after the proposed development.
  
- **2 points:**
  - Within Birch Bay UGA: The project site will contain at least 10% cover of existing trees/forest after development OR the project site contains less than 10% tree/forest coverage prior to development.
  - Outside of Birch Bay UGA: The project site will contain at least 35% cover of existing trees/forest after development OR the project site contains less than 35% tree/forest coverage prior to development.
  
- **4 points:**
  - Within Birch Bay UGA: The project site will contain at least 20% cover of existing trees/forest after development.
  - Outside of Birch Bay UGA: The project site will contain at least 70% cover of existing trees/forest after development.

### Why Preserve Forest Land?

Preserving existing forest habitat is important for a variety of reasons. Trees intercept precipitation and aid in soil infiltration, thus regulating stream flow and protecting downstream resources from flooding. Mature forests also provide important wildlife habitat and help minimize erosion.

Preserving forest land adjacent to development also provides aesthetic and recreational benefits, and helps maintain the rural character of a developing area.

## BMPs

### Site Evaluation

The first step in preserving trees and forests is to inventory and map the existing trees/forested areas. Forest land and individual trees are easily mapped using recent air photos, in combination with a site visit. Air photo coverage is widely available through web applications, such as Google™ Earth. The existing tree and forest areal cover percentage can be calculated using air photos with a graph paper overlay, or by using mapping software.

The location of trees and forests should be taken into account during initial site planning. For residential developments, protecting these areas is often performed in conjunction with open space development (see pg. 46).



Trees with low live crown ratios  
Source: Puget Sound Action Team (2005)

### Preserve Forest Tracts and Individual Trees

Forest should be retained in larger tracts, if feasible. Larger forest patches tend to be less susceptible to disease and windthrow, and provide higher quality wildlife habitat. As a rule of thumb, trees with live crown ratios of less than 30 percent of the total tree height tend to break during wind storms, with crown ratios greater than 50 percent tend to be more stable (Matheny and Clark, 1998).

Protection of dispersed, individual trees may be necessary to meet forest retention objectives. Specific trees selected for protection should have developed as individual trees (a single tree in a clearing, for example), and have live crown ratios greater than 30 percent.

### Tree Protection During Construction

Most tree roots are located within 3 feet of the ground surface, and can extend 2 to 3 times beyond the dripline. Construction equipment can severely compact soil, which limits the roots ability to absorb water and nutrients. As a

result, the compaction of soils in the rooting zone can lead to tree disease and death.

Construction impacts to trees can be minimized by using the following steps:

- The landowner/developer should show the tree/forest protection zones on the project plans.
- Fence off the protection zones prior to construction activities. Fencing should be located at a minimum of 3 feet beyond the existing tree canopy. Fencing should consist of high-visibility material.
- Avoid disturbing soils within the fenced-off areas(s).
- Do not stockpile or store construction materials within the fenced-off area(s).

## Submittal Requirements

- Using recent (less than 5 years old) aerial photography, calculate the combined areal coverage of existing trees and forest. Areal cover can be calculated electronically (using design/mapping software such as AutoCAD or ArcGIS), or by using graph paper. Prior to determining the areal cover calculation, conduct a site visit to the project property to determine that the trees and forest shown on the aerial photo are still present.
- Show the location(s) of individual trees and forest areas to be protected on the site plans, and calculate the combined areal coverage of existing tree and forest cover that will be retained after development. Forest cover within protected sensitive areas and buffers may be counted towards the protection area total.
- Using the before- and after-development tree/forest cover calculations, determine the Tree and Forest LID points received. Submit these calculations, along with the areal photos, for review.
- If trees/forested areas will be retained, describe how tree/forest protection areas will be marked off and protected during construction.

## Definitions

**Areal Cover:** A percentage, calculated by dividing total tree/forest canopy area coverage by the total area of the site (Puget Sound LID Manual, 2005).

**Crown Length:** The vertical distance from the lowest live branch to the top of the tree (Puget Sound LID Manual, 2005).

**Dripline:** The area directly located under the outer circumference of the tree branches (Puget Sound LID Manual, 2005).

**Forest Land:** A dense growth of trees, plants, and underbrush (Merriam-Webster Dictionary).

**Live Crown Ratio:** The ratio of crown length to total tree length (i.e., [crown length] / [total tree length]) (Puget Sound LID Manual, 2005).