STREAMS

WETLANDS

SHORELINES

GEOLOGICAL
HAZARD AREAS

CRITICAL AREAS HANDBOOK

Restoring, Enhancing, and Preserving

CITY OF BELLEVUE WASHINGTON

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INTRODUCTION

Under the guidelines of the City of Bellevue's **Critical Areas Ordinance**, the **Critical Areas Handbook** has been designed as a detailed, step-by-step guide to aid property owners in the development, installation, monitoring, and maintenance of small-scale environmental enhancement and restoration projects. The Handbook will guide you through the processes involved to design, implement, and maintain sites with **critical areas** consisting of or adjacent to **streams**, **wetlands**, **shorelines**, **geological hazard areas**, and the **buffers** around these features. By the end of this handbook, you will be able to design and install your simple restoration plan for your particular situation. The five sequential chapters provided will help you to:

1. **Define your critical area**
2. **Evaluate your site**
3. **Design a plan**
4. **Install your plans**
5. **Maintain and monitor your project**

Throughout this Handbook, words in **bold** are defined in the *Glossary* (see *Appendix A*) at the end of the document.

WHO SHOULD USE THIS HANDBOOK?

- Those who want to voluntarily promote environmental **stewardship** through the removal of **invasive** weeds and/ or planting of native species;

- Those required to **remediate** a **critical areas** violation, by restoring or replacing the affected area to equal or better environmental function than what was lost, and;

- Those required to **mitigate** for critical areas impacts in anticipation of a loss of critical area square footage or environmental function as a result of a proposed development project.

Remember, property owners must obtain a permit or other official exemption prior to breaking ground on a project.

WHY IS CRITICAL AREA RESTORATION IMPORTANT?

The City of Bellevue is committed to preserving and enhancing its **critical areas** as a means of maintaining the high quality of life we all enjoy. The City's Comprehensive Plan spells this out clearly with this goal:

"To integrate the natural and developed environment to create a sustainable urban habitat with clean air and water, habitat for fish and wildlife, and comfortable and secure places for people to live and work."

Protection and restoration of critical areas are essential as the City continues to grow. These areas serve as biological filters of air and water, provide havens for wildlife, and allow citizens to experience nature. One of the key components of a healthy natural area is a diverse native plant community. Since most of the City's critical areas occur on single-family residential lots, the ability for homeowners and the City to work together to restore these areas with native plants has become increasingly important.

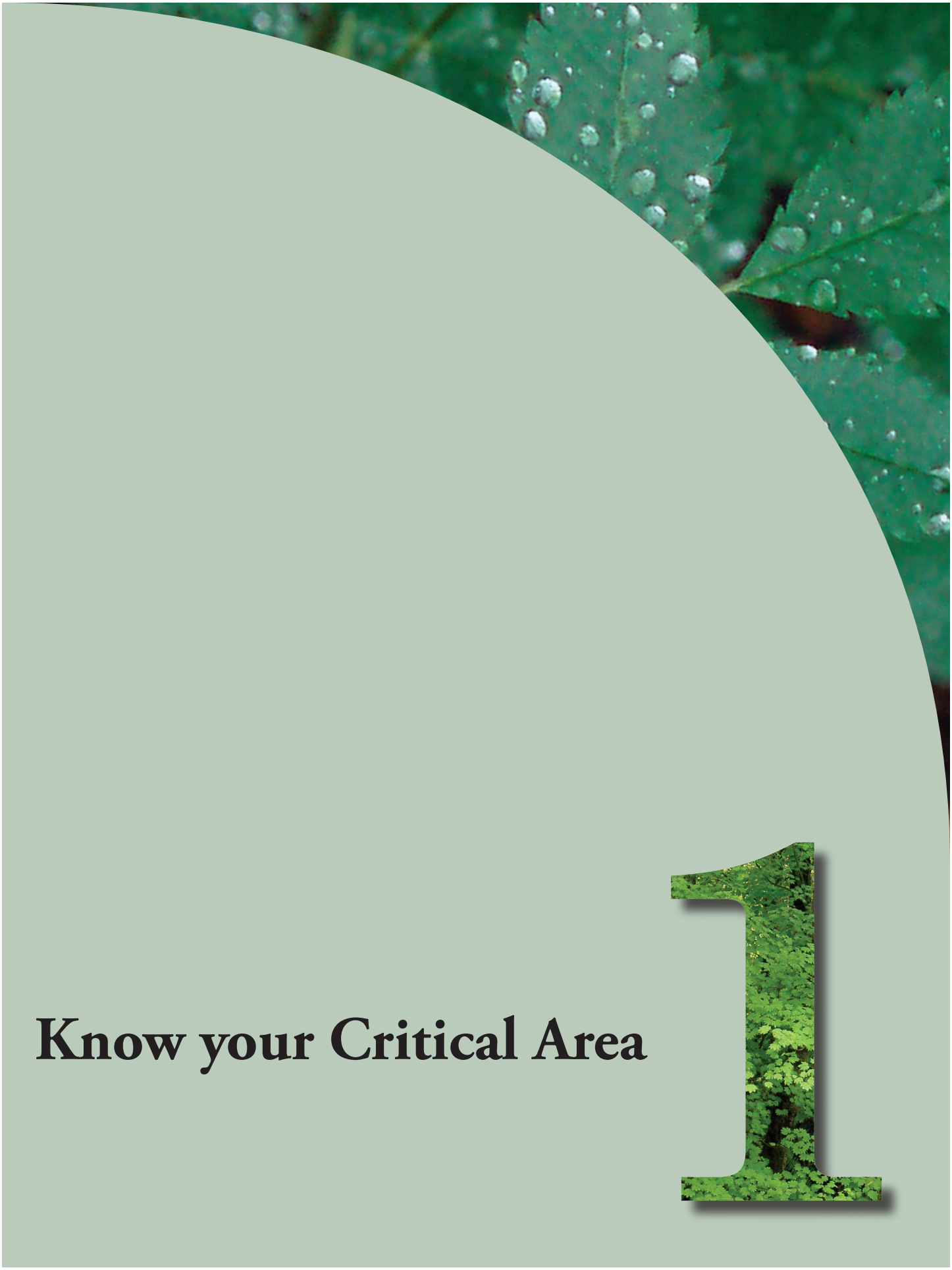
As the City grows, more pressure will be put on critical areas. It is important to set these areas aside, protect them from degradation, and preserve and enhance them for future generations to enjoy.

HOW IS NATIVE RESTORATION PROJECT DIFFERENT FROM AN ORDINARY LANDSCAPE PROJECT?

A native restoration project is designed to replicate nature. This means that the types of plants that are selected and the way they are placed and spaced is typically different than an ordinary landscape project.

Native landscapes have a more diverse, naturalistic **spacing** and grouping of vegetation. These natural landscapes are very different from the systematic design of a formal garden.

Plants selected for a native project are ones that grew in the Puget Sound area before it was settled; they are not imported from other areas like traditional nursery plants (usually called ornamentals). They must also be placed in conditions that meet their physiological needs. For instance, certain native plants like wet soil, so you might find them in a **wetland**, but not at the top of a **slope**. You will find more details on plants and their needs throughout this manual. A list of native plants appropriate for small-scale restoration, as well as a list of nurseries where they are available for sale, can be found in the *References* (see *Appendix D*) at the end of this handbook.



Know your Critical Area

1

KNOW YOUR CRITICAL AREA

Tip:
The City has handouts on critical areas. Check with the Planning and Community Development Staff and check the City's website for additional information at: www.bellevuewa.gov

GOAL: In this chapter you will learn to recognize and understand **Critical Areas**.

How do you plan a restoration or an enhancement project on a critical area? The first step is to know the type of critical area you intend to restore or enhance. For the purpose of this Handbook, "**critical area**" refers to **wetlands**, **streams**, **geological hazard areas/steep slopes**, **shorelines**, and the immediate zone around a critical area, called a **buffer**. All critical areas and buffers are regulated by the City. The width of a buffer varies depending on the quality or type of the critical area in question.

Defining critical areas is often a job for a professional and the City's knowledge of what might be present on your **site** is limited. In some cases, critical areas in Bellevue have been mapped. Check with the Department of Planning and Community Development Staff for any information they might have on your site. Even if no critical areas are known, one may still exist. This manual can help you identify potential critical areas. However, the City may ask you to provide detailed mapping of a critical area that is most likely beyond your ability. When this happens, you need an **assessment** or **delineation** prepared by an **environmental consultant**.

STREAMS

SHORELINES

WETLANDS

BUFFERS

GEOLOGICAL HAZARD AREAS

WETLANDS

There are several different types of **wetlands**- forested, ponded, **slope**, etc. Most people can recognize ponded wetlands, but other wetland areas can be very dry during the summer and early fall. To identify whether a wetland exists on your **site**, here are some rules of thumb:

- **Does the ground feel soft, spongy or springy underfoot?**
- **Can you easily squeeze water out of a sample of the soil?**
- **Do you smell rotten eggs or sulfur in the soil?**
- **Do you see plants such as skunk cabbage, cattails or sedges?**
- **Is the soil wet in spring?**

If any of the above are true, there is a good chance you are in a regulated wetland area. Sometimes after a long, hot summer without rain, even ponded wetland areas become dry. In this case it's best to contact an **environmental consultant** who can determine wetland presence even under extremely dry conditions.

Finding the exact edge of the wetland is a technical exercise that is beyond the scope of this Handbook. If a **delineation** is required, there are many environmental consulting firms that can help you. The boundary of a wetland is often important in determining plant placement; only certain plants will survive in a fluctuating dry-wet soil condition. However, for simple restoration or enhancement projects, knowing the exact wetland boundary is not necessary.

STREAMS

Permanently flowing **streams** with gravel beds are easy to identify. However, many regulated streams look like small trickles or may have been rechanneled into ditches. A small or seasonally dry stream can be hard to identify and may require field analysis by a biologist. Even small, intermittently flowing trickles are considered streams if they flow with enough force to produce a channel or "bed."

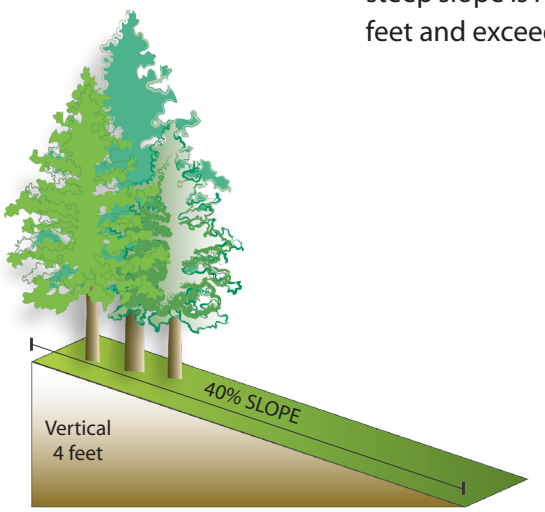
While most ditches are not considered streams, if they carry the flow of a historic stream or if they provide habitat for salmon and trout, then they provide valuable ecological function. Therefore, these ditches are regulated as streams by the City of Bellevue, the State, and the Federal Government. Some general criteria for stream classification include:

- Consistency/ frequency of flow
- Habitat for or presence of fish
- A defined channel or bed

The federal Government may also have jurisdiction over non-stream ditches in certain circumstances.

GEOLOGICAL HAZARD AREAS

Areas of landslide hazards, **steep slopes,** and coal mine hazards are all considered **geological hazard areas**. These areas are regulated mainly for safety, but they also provide habitat values. In this Handbook, we will address simple restoration steps for steep slopes ONLY. A steep slope is regulated as a critical area if its gradient is 40% or more, has a rise of at least 10 feet and exceeds 1,000 square feet in area.



Is your slope stable?

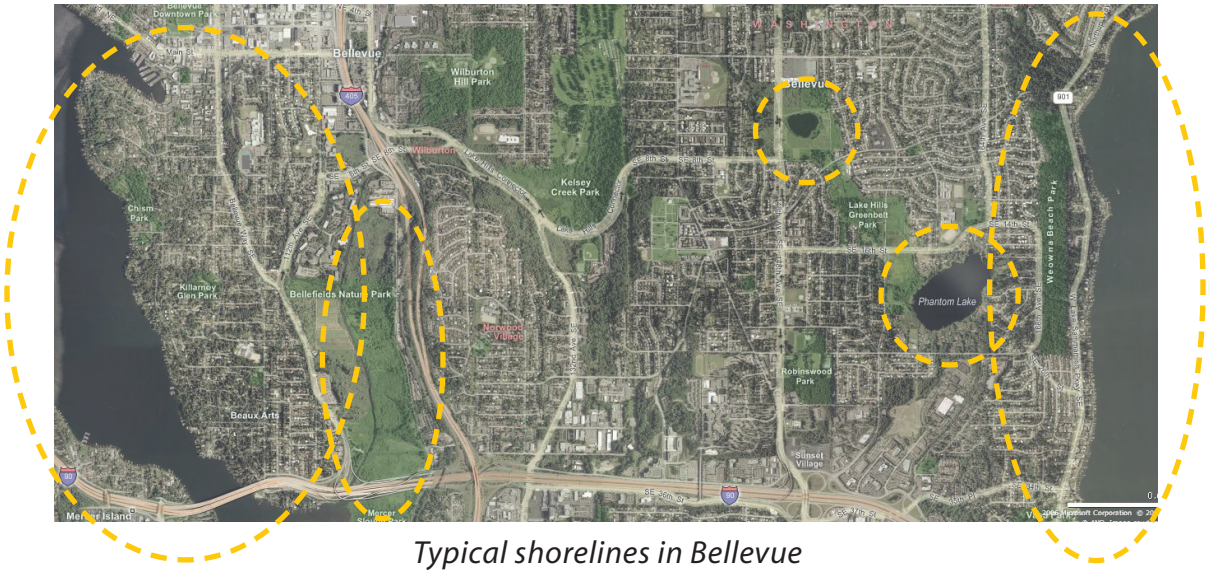
Clues that slopes are prone to failure include the obvious signs of landslide such as slumped, cracked or cleaved soil. Other more subtle signs include trees with bent trunks which are called "pistol-butted." These trees fell over when soil shifted in the past. After falling, the plant continued to grow upward resulting in a sharply curved trunk near the ground.

Unstable slopes may be difficult to identify. If you are unsure or if you see any of the warning signs noted above, **DO NOT** work on the slope. Consult the City, a geologist or geotechnical engineer to help with these dangerous areas. This Handbook is not intended to diagnose, stabilize or repair hazardous slopes.

For more information on unstable slopes, visit the Department of Ecology website:
http://www.ecy.wa.gov/programs/sea/pubs/93-30/intro.html

SHORELINES

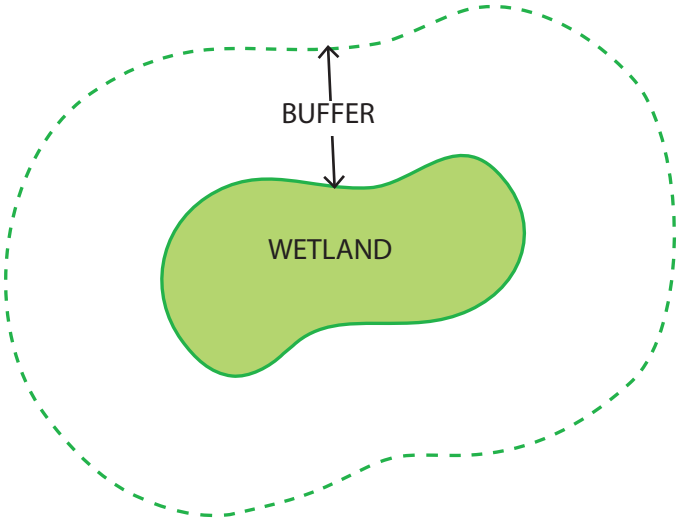
Shorelines are specifically designated water bodies termed "shorelines of the state." In the City of Bellevue, regulated shorelines encompass Lake Washington, Lake Sammamish, Mercer Slough, Larsen Lake, and Phantom Lake. Shorelines include the waterbody, a minimum distance of 200 feet from the water's edge, and any associated floodways, floodplains and **wetlands**. Consult with the City for specific regulations that may or may not affect the use of your property. These water bodies are also regulated under the City's **Critical Areas Ordinance** and may have buffers of up to 50 feet. Although they often overlap, FEMA floodplains are also regulated differently than shorelines and have different regulatory requirements.

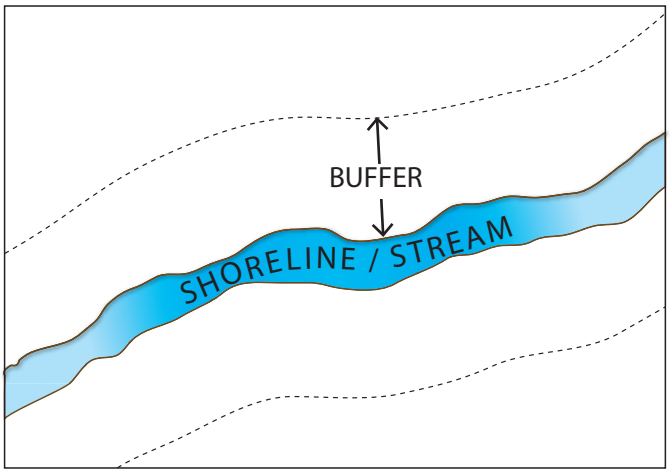


Typical shorelines in Bellevue

CRITICAL AREA BUFFERS

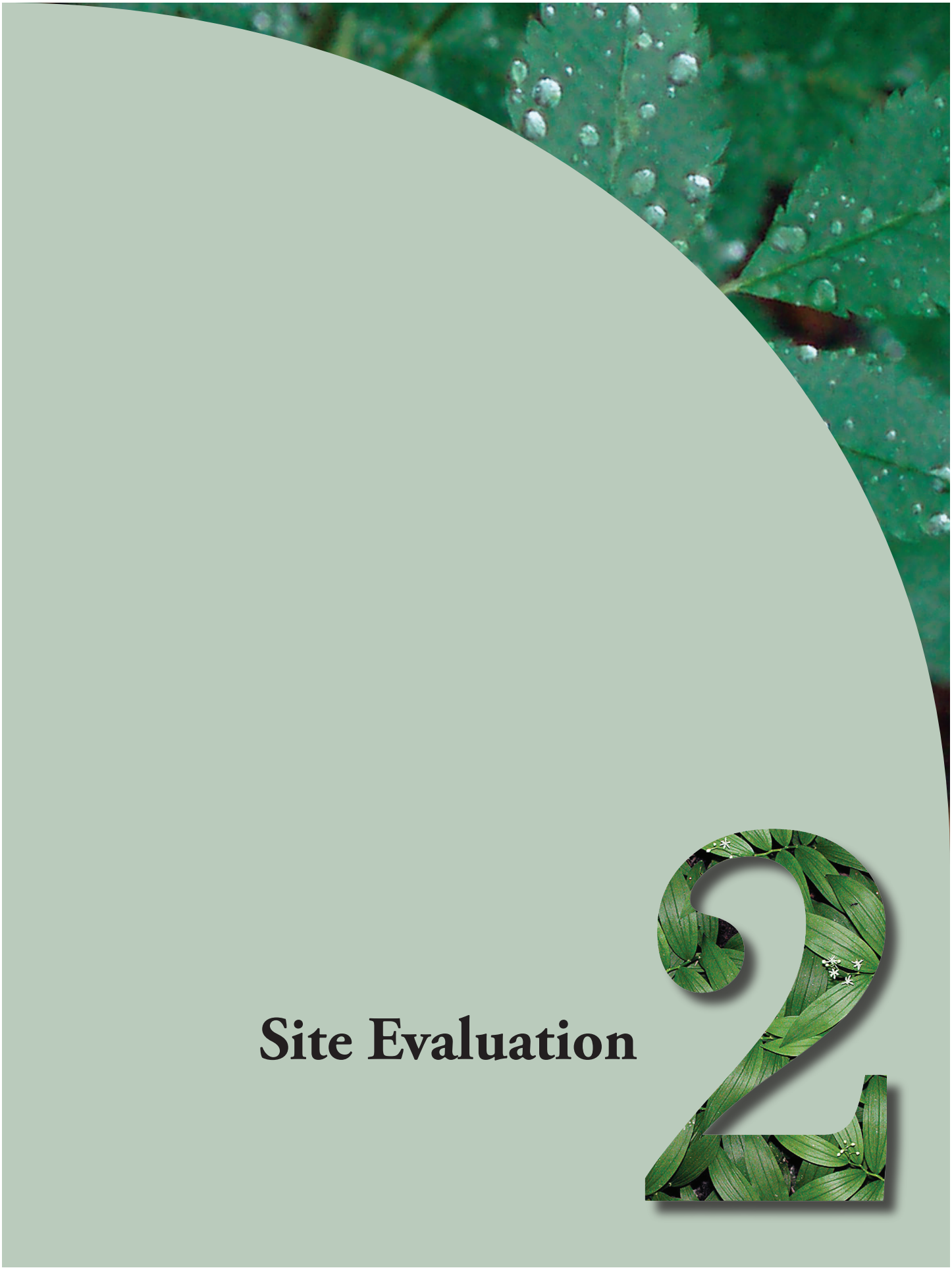
Buffers in Bellevue are usually **upland** areas that are preserved in order to provide protection to a critical area. Buffers provide wildlife habitat, filter noise and water pollution and, in the case of **streams**, **wetlands**, and **shorelines**, insulate the critical area from development and human activities.





- Wetland buffers vary in width from as little as 25 feet on some existing developed lots, to as much as 225 feet for the highest quality wetland on an undeveloped lot. Determination of wetland buffer width is usually done by experts in consultation with the City.
- Stream buffers also vary in width from 25 to 100 feet. As with wetlands, stream buffers are determined by experts in consultation with the City.
- **Steep slopes** have a buffer of 50 feet measured from the top-of-slope
- Shoreline buffers vary according to the **site**, but are generally 25 to 50 feet.

Upland sites that are outside of critical area buffers are generally not regulated under Bellevue's **Critical Areas Ordinance**. However, these sites are still very valuable. Restoring or enhancing **upland** areas can provide valuable wildlife habitat, improve water quality, and improve stormwater runoff rates.



2 Site Evaluation

GOAL: After you have determined the type of critical area that exists on your property, it is important to perform a **site evaluation**. This evaluation process will generate site-specific information that will aid in the development of your planting plan. By the end of the chapter you will be ready beginning planning your project.

This chapter is divided into four steps to complete:

1	2	3	4
COLLECT INFORMATION ABOUT YOUR SITE	COMPLETE THE SITE PLAN WORKSHEET	COMPLETE THE SITE EVALUATION WORKSHEET	SELECT YOUR PLANTING TEMPLATE

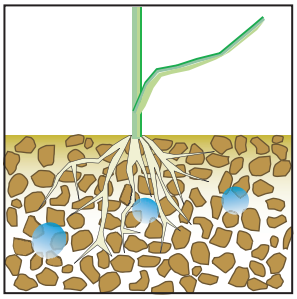
STEP 1. COLLECTING INFORMATION ABOUT YOUR SITE

Collecting information about **site conditions** is critical to the success of any planting plan. For instance, is the restoration area in full sun? What is the soil like? Answers to these types of questions will affect the outcome of your project. In this step, we will review the five most important attributes that you will need to consider and take note of:

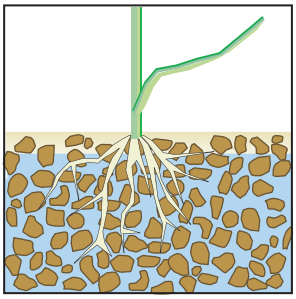
- Hydrology
- Light
- Topography and **aspect**
- Existing vegetation
- Soil conditions

HYDROLOGY

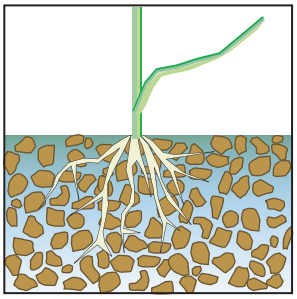
Hydrology has a significant influence on the plant species that would be appropriate for a given area. Since hydrology is so important, a hydrological assessment should be performed. The assessment should take place in different parts of the **site** you wish to restore to determine if conditions change as you move around the site. A hydrological assessment is best done in the spring. If you cannot make your assessment in the spring, try to remember what it is like in the spring or ask neighbors or previous property owners for help. Ask your **environmental consultant**, if you have one.



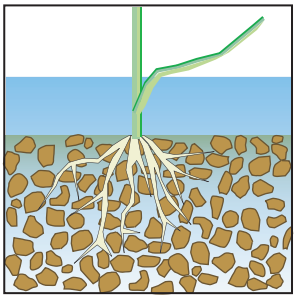
Dry or damp



Saturated



Inundated



Flooded

Dry or damp means that little or no water is detectable in the soil. **Saturated** soil means that all or most of the open spaces within the soil are filled with water. **Inundated** soil means there is a thin layer of water on the ground, shallow puddles, or water is seeping directly out of the soil. **Flooded** means the soil surface is beneath at least 6 inches of standing water. Slowly flowing water found in a wetland can also be considered flooded. However, flowing streams should not be planted – concentrate on the streambank and **buffer** instead.

Hydrology assessment: take a golf ball–sized soil sample at 4 to 6 inches below the surface. Soil is dry/damp if you can't squeeze water out of sample. If water can be squeezed out, it is **saturated**. See *Appendix D* for more details.

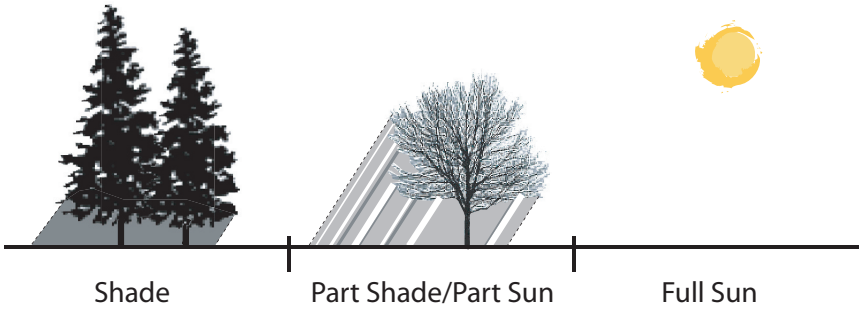
Dry or damp

Saturated

LIGHT

Most plants have specific **light** requirements. Light needs can be placed in three categories: sun dependent, shade dependent and part sun/part shade. Here are some questions to answer when looking at the ground of the **site** where restoration is to take place.

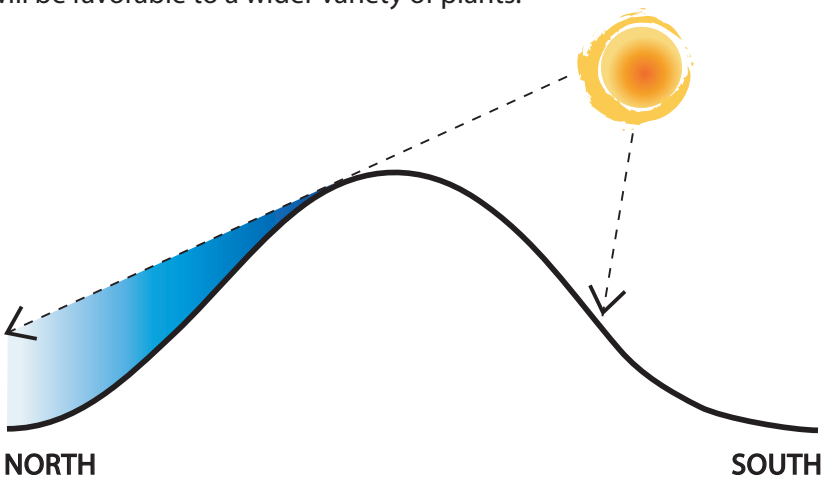
- **Is the light hitting the ground obstructed by trees, a building, fence or other tall object?**
- **If so, is the shade in the morning or afternoon?**
- **Is the light filtered through a sparse canopy of trees or is it the deep, all day shade of dense conifers or mature deciduous trees?**



TOPOGRAPHY AND ASPECT

Topography can be broken up into three categories: flat, moderately sloped, and steep. The steeper the topography, the more stabilization measures are needed in order to control soil erosion of the **site**. Difference in soil moisture also increases between the top and bottom of a slope depending on its steepness. Correct choice and placement of plants are therefore essential to a successful restoration project.

Aspect is the direction a slope is facing. Topography and aspect can become a limiting factor for some plants. Consider a steep, south-facing slope; it is often hot and dry. In contrast, a north-facing slope is often cooler and moist. A moderate slope facing any direction or a flat site will be favorable to a wider variety of plants.



Aspect - Difference between warmer, south-facing slope and cooler, north-facing slope

EXISTING VEGETATION

Existing vegetation is important for both initial plant installation considerations and ongoing maintenance. Plants are easier to install and maintain on a bare **site** than in an existing tangle of 8-foot-tall blackberry vines. Commonly found **invasive** species in the City of Bellevue are listed in *Appendix C*. For further information on how to identify these species, refer to the King County Noxious Weed Control Program website listed in *Appendix D*.

Potential streambank restoration sites: *presence of invasive species (ivy and Japanese knotweed) on the right increases complexity of restoration project compared to the site on the left.*

Sites with invasive weeds need special consideration when it comes to planning and maintaining your project. See *Chapters 4* and *5* for information on how to deal with sites where invasive species are present.

In addition to noting presence of invasive species, look for existing native plants that are thriving on or near your site. What condition are they growing in? Taking into consideration what works well in your area will help the success of your project. Reference these plants in the *Master Plant List* in *Appendix C*. Look at what conditions these plants like; it will help you to understand the ecology of your site.

SOIL CONDITIONS

Soil conditions determine installation methods and potential **soil amendment** needs. Your site may not have the best soil for planting native plants. You can usually tell the quality of your soil by the color: darker is better. Good **topsoil** is medium brown to black with plenty of **organic** material. If it is lighter than a medium brown, it probably needs some amendments.

You should also make sure soil is not overly compacted. One way to tell if too dense is to dig a small hole as if you were planting a 1-gallon-sized plant. If it is very difficult to dig, the site may need preparation by rototilling. Contact the City's Land Use Desk for guidance prior to rototilling in a **critical area**. If rototilling is not feasible, hand cultivation may be necessary over a limited area. **Mulch** can also help improve the soil. See the *Site Preparation* section in *Chapter 4* for more information on the application of mulch and amending your soil.

While on-site, record the conditions you have found and move on to step 2.

STEP 2. COMPLETE THE SITE PLAN WORKSHEET

Tip:
Aerial photographs are available at the City's Permit Center. These can assist you in drawing your site.

As part of your **site evaluation**, you should draw an existing **site plan**. A site plan is an important planning tool for your restoration project. It is the blueprint that maps out and documents the location and extent of all the permanent elements outside of your home. These include dimensions of your property, house, yard, lawn, planting beds, pond/swimming pool and all other hard surfaces such as patio, deck, rockery, retaining wall and driveway, and which direction is north. Once the site plan is completed, you can better analyze the existing opportunities and constraints on your site.

On the next page you will find *Existing Site Plan Worksheet* (See *Worksheet SP-1*). The worksheet includes an example of a site plan drawing which illustrates the **scale** and site elements to include.

Complete the site plan worksheet and move on to step 3.

STEP 3. COMPLETE THE SITE EVALUATION WORKSHEET

After you have completed your site plan, use the *Site Evaluation Worksheet* (See *Worksheet SE-1* immediately following the *Site Plan Worksheet*) to document the various conditions you observed on-site. This is the next to last step in the site evaluation process. At the end of the worksheet, you will move on to Step 4 and be able to select a planting template according to your **site conditions**.

Complete the site evaluation worksheet and move on to step 4.

STEP 4. SELECT YOUR TEMPLATE

The final step in the Site Evaluation process is to select the appropriate template for your site. On the back side of the *Site Evaluation Worksheet* (*Worksheet SE-1*) you will find a table that will guide you in the selection of your template. In some cases, more than one template may apply. *Chapter 3* provides instructions on the use of *Planting Templates* (*Appendix B*) and the steps to create a planting plan for your restoration project.

Select your template from worksheet SE2

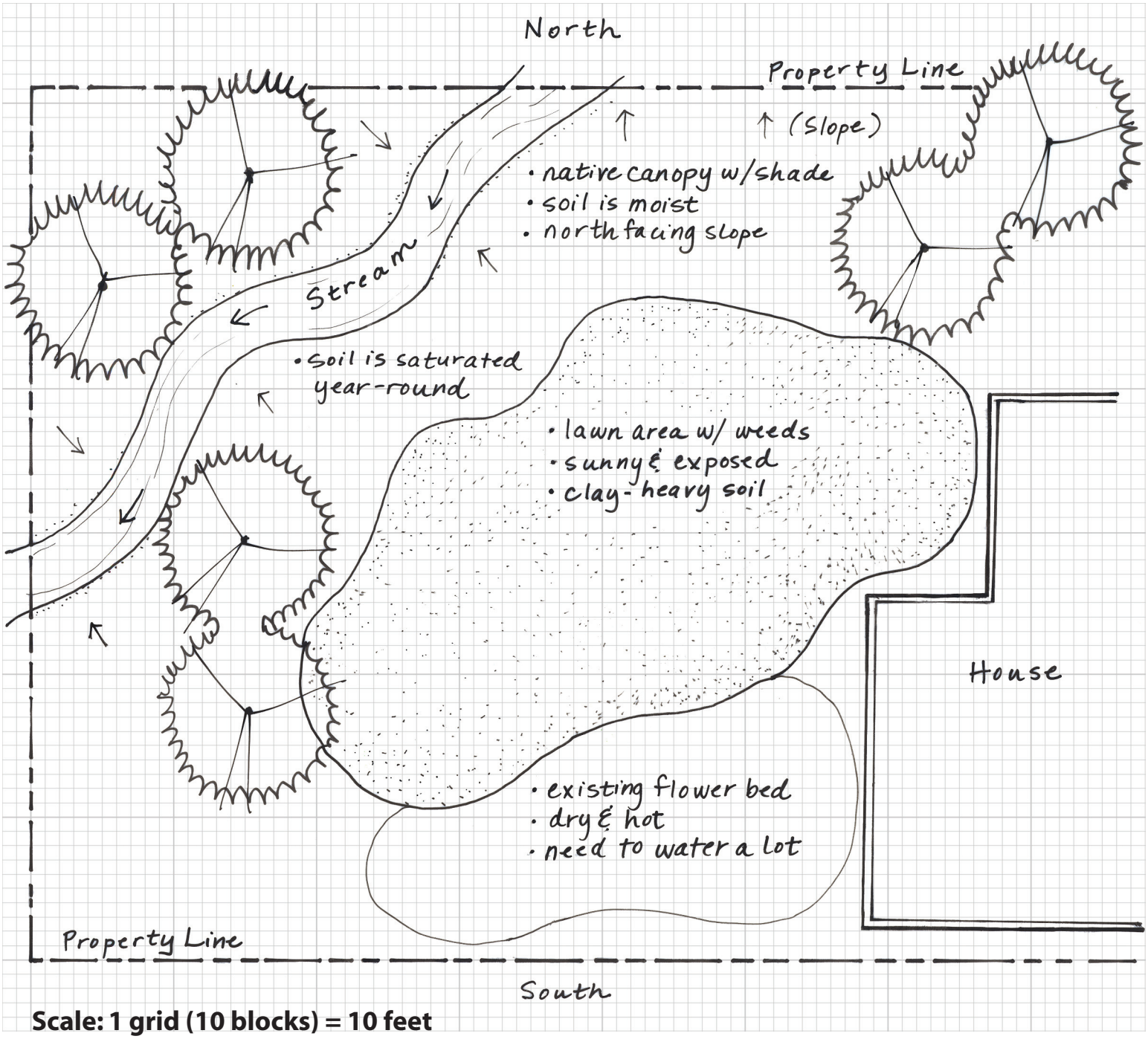
EXISTING SITE PLAN WORKSHEET

Using Scale: Use the graph paper provided to produce one sketch of your property. The drawing **scale** should be somewhat precise as you will use it for reference later. For smaller **sites**, use one grid square per foot. For larger areas, use one grid square for 2 feet, 5 feet or 10 feet depending on the size of the site. Record the scale that you are using on the worksheet and provide at least one written dimension on the plan to verify the scale.

Let's draw your site plan:

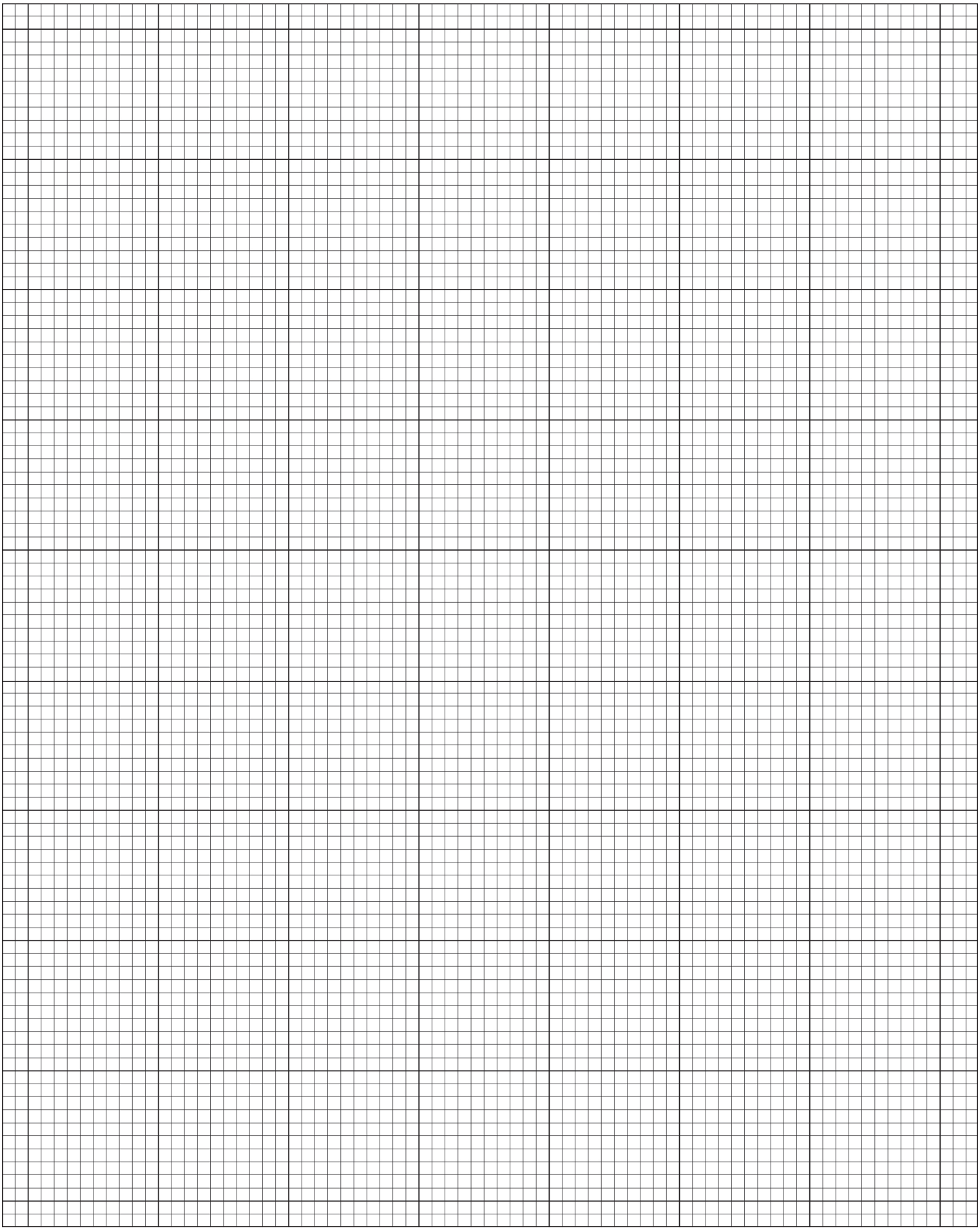
- Start by drawing permanent structures such as the house/building footprint, driveway, walkways, etc. As needed, measure these to the nearest foot and draw them on the worksheet.
- Add existing vegetation such as lawn areas, large trees, and shrubs that will remain on the site.

EXAMPLE OF EXISTING SITE PLAN:



Scale: 1 grid (10 blocks) = 10 feet

EXISTING SITE PLAN WORKSHEET



Notes: _____ **Scale:** _____

SITE EVALUATION WORKSHEET

This worksheet is designed to record site information. Using your **existing site plan** as a guide, record **site conditions** according to your observations and keep an account of all seasonal and daily changes that you have noticed.

STEP 1: Complete Table 1 below by checking the boxes that best describe the conditions on your site.

TABLE 1. SITE ASSESSMENT TABLE

HYDROLOGY	☐ Dry	☐ Wet	
LIGHT	☐ Sun	☐ Shade	
TOPOGRAPHY	☐ Flat	☐ Slope	☐ Steep Slope
ASPECT	☐ South-facing	☐ North-facing	
EXISTING VEGETATION	☐ None (bare ground)	☐ Lawn	☐ Ornamental/ formal landscape
	☐ Invasive weeds*	☐ Existing native plants	

* Refer to *Chapter 2: Existing Vegetation* for more information

STEP 2: Fill out the project information below.

Using the check boxes above, circle your **Site Conditions** and **Critical Area**. If you are restoring more than one site, use a separate worksheet for each site. Larger sites may need more than one **assessment**. You may select more than one condition and/or critical area type below.

Then, combine your answer in **Critical Area** and **Site Conditions** - this is your **Overall Site Assessment**. Now you know which planting template best fits your site! Refer to the Table of Templates on the reverse side of this worksheet.

Project Contact:_____ Phone number:_____

Project Location:_____

Permit Number (if any):_____ Date:_____

Critical Area Type (circle): Geological Hazard (Steep Slope)/ Shoreline / Wetland and Wetland Buffer/ Stream Buffer

Site Conditions (circle all that apply): Sun/ Shade/ Invasives on a wet site/ Invasives on a dry site

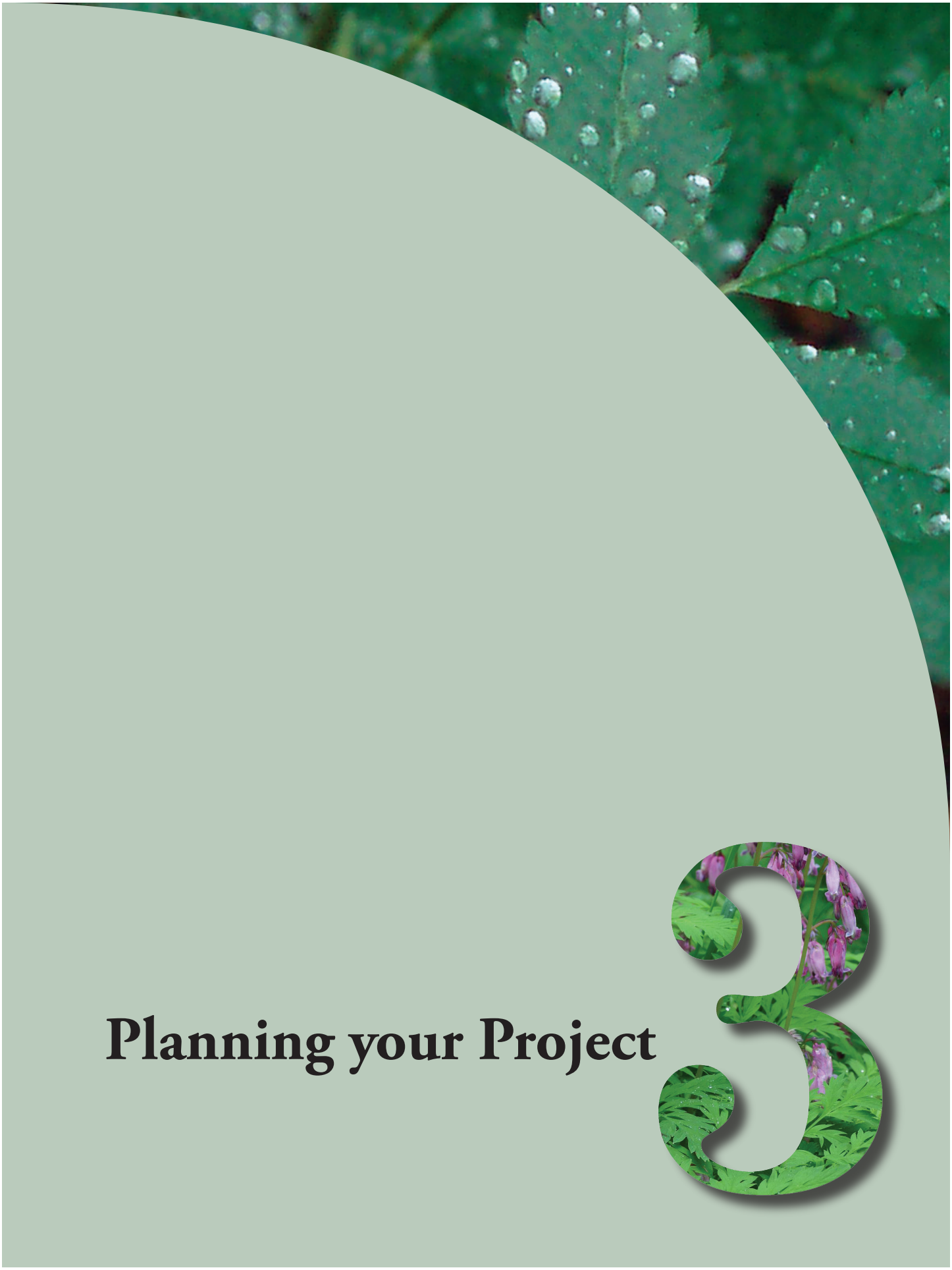
Overall Site Assessment:_____ + _____
(Critical Area Type) (Site Conditions)

Use your **Overall Site Assessment** from the previous page to pick your template:

TABLE OF TEMPLATES					
		SITE CONDITIONS			
		Main Template		Supplemental Templates**	
	CRITICAL AREA	Sun	Shade	Invasive Weeds (Dry Sites)	Invasive Weeds (Dry Sites)
CRITICAL AREA	A. Geological Hazard	A1	A1*	E1	E2
	B. Shorelines 1. Naturalistic 2. View Sensitive	 B1 B2	 B1* B2*	E1	E2
	C. Wetlands 1. Naturalistic 2. View Sensitive	 C1 C2	 C1* C2*	E1	E2
	D. Stream and Stream Buffer 1. Gentle Slope 2. Gradual Slope 3. Steep Slope 4. Terraced	 D1 D2 D3 D4	 D1* D2* D3* D4*	E1	E2

* Each Template is designed for sun and shade. Use the shade legend provided on the reverse side of the sun legend.

**Templates have been created for sites with invasive species. These templates include plants that will establish quickly in order to provide shade that will help inhibit invasive species reestablishment. These templates are intended to be used in conjunction with the main template for your critical area for areas where invasive species are present.

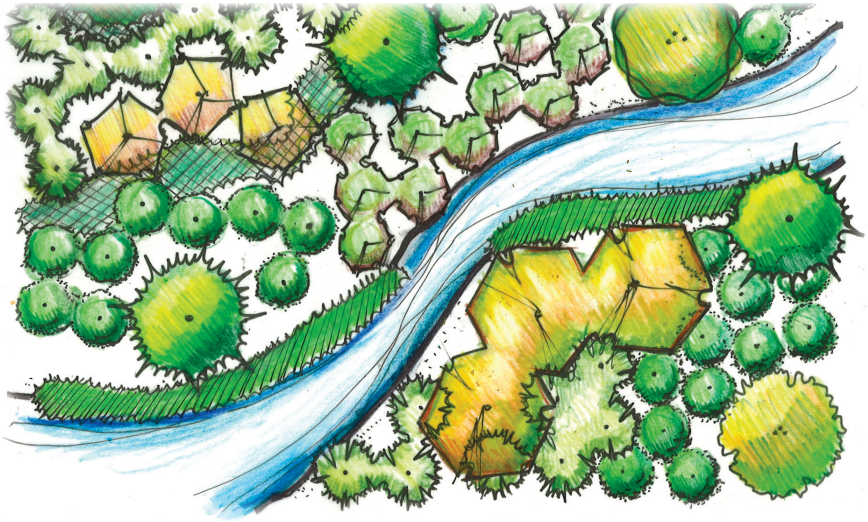


Planning your Project

PLANNING YOUR PROJECT

GOAL: In this chapter, you will create a customized planting plan for your **site** based on the planting template you selected in *Chapter 2*.

Your *Site Evaluation Worksheet* will lead you to a particular template for your site (See *Worksheet SE*). However, each site is different and no template will work perfectly for each site. Use the template as a guide to plant arrangement, **spacing**, and **density** for your planting plan. Begin by tearing out or copying the worksheet attached at the end of this chapter. Draw your project site (planting area) on the graph paper similar to your *Existing Site Plan Worksheet*.



Here is what the site plan templates look like.

Some layout adjustments will need to be made in order to suit your needs. For example, you may need to increase the number of plants in order to cover a larger area. Before you finalize your choice of plant species, keep the following in mind:

SPECIES SELECTION

Most plans will use a mixture of trees and shrubs for best establishment of cover and to improve the function of the critical area. However, many wetland areas will need to be planted with **emergent** species, especially if you are interested in providing amphibian habitat. Emergent plants are most often planted in a situation where, for some reason, the wetland is not vegetated. Possibly it was just cleared of **invasive** weeds, or dirt or fill material was just removed from the **wetland**. Soil conditions, such as compaction, may prevent growth of emergent vegetation. All of these scenarios require careful planning and maintenance of the project. Therefore, most of the time, use of emergent plants is best done by experienced gardeners or under the direction of a qualified **environmental consultant**.

PLANT AVAILABILITY

All of the native plants listed in the *Master Plant List* in *Appendix C* at the end of this Handbook should be commercially available. You will find a list of nurseries that specialize in native plants in the *References* section (*Appendix D*) as well. Similar to ornamental plants, you may want to shop early to put plants on hold, or call ahead to find out nursery inventory, pricing, and sale events.

PLANT SUBSTITUTION FOR ADVANCED USERS

After learning about the plants on your template, you may want to add different species of plants. But remember, the plants in a template's legend were chosen to work specifically with your template's set of ecological conditions.

Using the *Master Plant List* (*Appendix C*), you can compare your plant's characteristics with other plants that you are thinking of using. The most critical features to consider are light needs and **site** placement. The *Master Plant List* contains information about each plants ecological specifics, as well as aesthetic and practical considerations.

DRAWING THE PLANTING PLAN

Using your **site plan** and planting template, it is time to combine them into what you want your site to become- your planting plan. There are a few things to keep in mind as you begin to choose plants and place them in the landscape.

SIZE

Every plant gets larger and changes shape as it gets older. Realizing this can help you map out where larger plants and smaller plants should be installed. *Master Plant List* (see *Appendix C*) includes a column showing average size. This information is especially useful for **spacing** plants from each other and from buildings, fences etc.

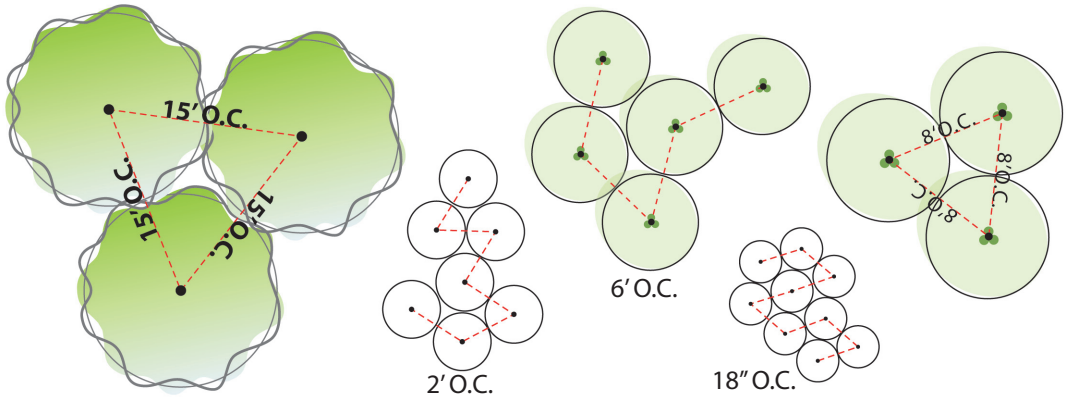
Tip:
Don't plant trees too close to buildings, retaining walls, or driveways; they can cause damage as they grow.

SPACING

Each plant will need enough space to grow without being crowded out by other plants. Although small when installed, plants will eventually compete with each other for **light**, water and nutrients. The project will be more successful if plants are spaced properly. Here are some good rules of thumb for spacing:

TYPE OF PLANT	AVERAGE SPACING
Trees	9' to 20' on-center
Shrubs	3.5' to 6' on-center
Groundcover/Perennials	2' on-center (can vary depending on goals*)
Emergents	1' on-center

** Depending on your goals (or the goals required by the City of Bellevue) you may want to space your plants together very densely at first, and then thin them out later. Also, planting densely insures that if some of the plants die, you will still have enough plants to fill in the space.*



This is how on-center spacing is generally calculated.

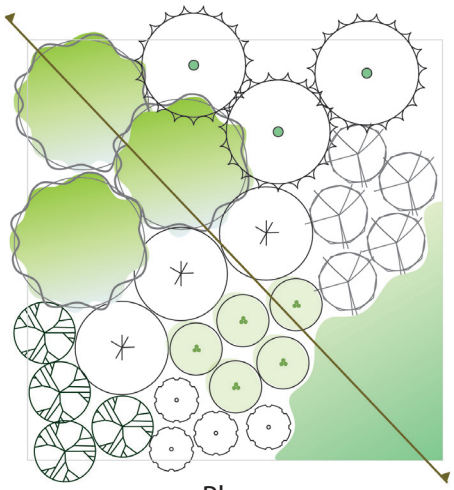
DENSITY

Density describes how many plants are in a given area. A dense planting area is best for wildlife; but when it is too dense, some plants will begin to suffer for lack of **light**, water and nutrients. A good balance can be achieved with proper planning and maintenance.

PLANT ARRANGEMENT

Remember that trees, though small when planted, grow quickly and will at some point begin to shade other plants. Consider the plant's mature size when planting. Place larger shrubs in groups farther away and small ones closer to where the project will be viewed from. This will give the planting area more visual interest.

Tall plants in the back, small ones in the front, just like a school photo. See the illustration at right.



Plan

Section

COST

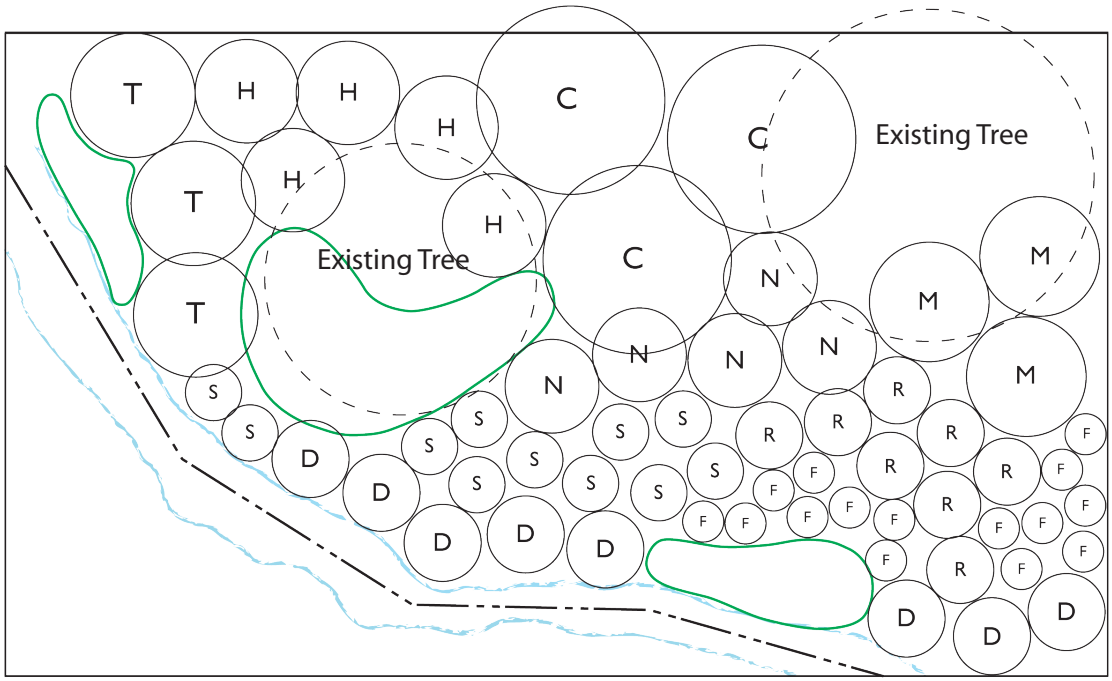
Cost can become a critical factor on some larger projects. To help keep costs down, use plants in smaller container sizes (1 gal., 2 gal., 5 gal.). Although they have less visual impact immediately after installation, smaller plants adapt more quickly to their environment and grow more vigorously as a result. A $10 shrub that comes in a 1-gallon pot will likely be the same size as a $50 2-gallon or $100 5-gallon shrub after five years.

Another way to keep costs down is to decrease **density**. In some situations where there is existing native vegetation or the growing conditions are very favorable, the density of plants can be reduced. However, there may also be several reasons not to lower density: **invasive** species competition, mitigation requirements, the need to achieve performance goals quickly, and others. Work with the City of Bellevue or a qualified **environmental consultant** to achieve a good balance when necessary.

After finalizing your plant list, you can start recording the list on the Plant Legend of the *Planting Plan Worksheet* at the end of this chapter. Using your knowledge of **scale** (*See Worksheet SP*), decide how big your plan will be on paper. Here is what a plan might look like using easy-to-draw symbols.

PLANT LEGEND

- **C** Cedar
- **M** Mock orange
- **T** Twinberry
- **H** Hazelnut
- **N** Ninebark
- **D** Dogwood
- **R** Rose
- **S** Salal
- **F** Fern
- Groundcover

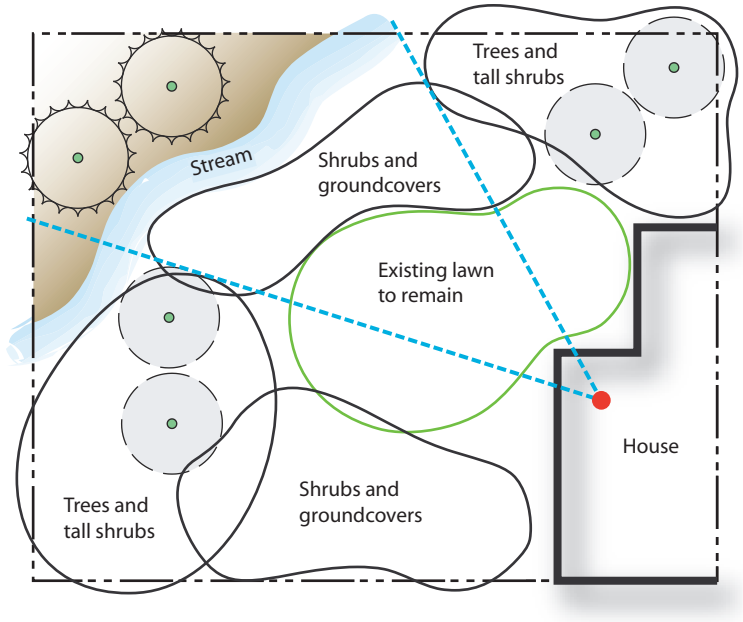


Example/sample planting plan

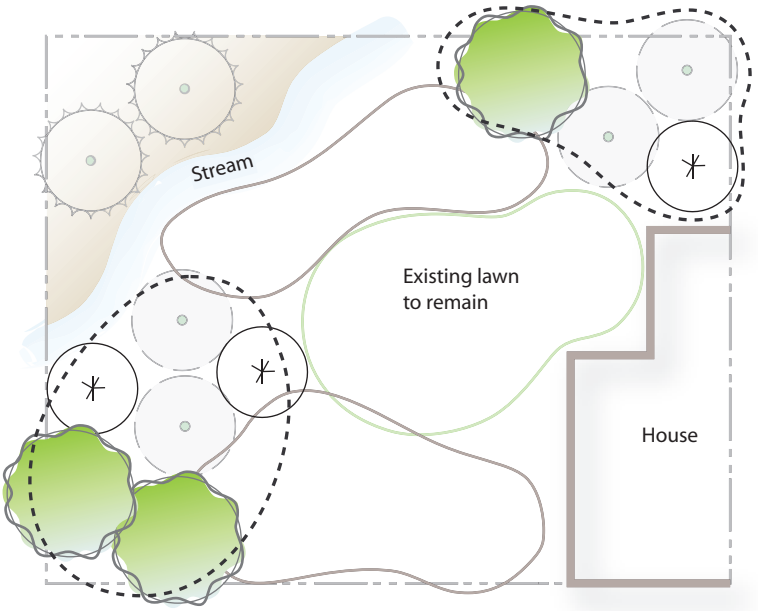
Draw the tree circle 9 feet in diameter at your plan's **scale** and the shrub circle 3.5' to 6' feet in diameter. This will give them enough room to grow.

Think about the different types of plants you will be planting: trees, shrubs, perennials and groundcovers, and perhaps emergents. A mature forest in Bellevue should have at least three distinct layers when mature; a tree canopy layer that is well above eye level, a shrub and small tree layer that is at eye level, and a groundcover layer that covers the soil or may reach knee-height. In open water areas, emergent plants are often found that help to stabilize the soil around these areas.

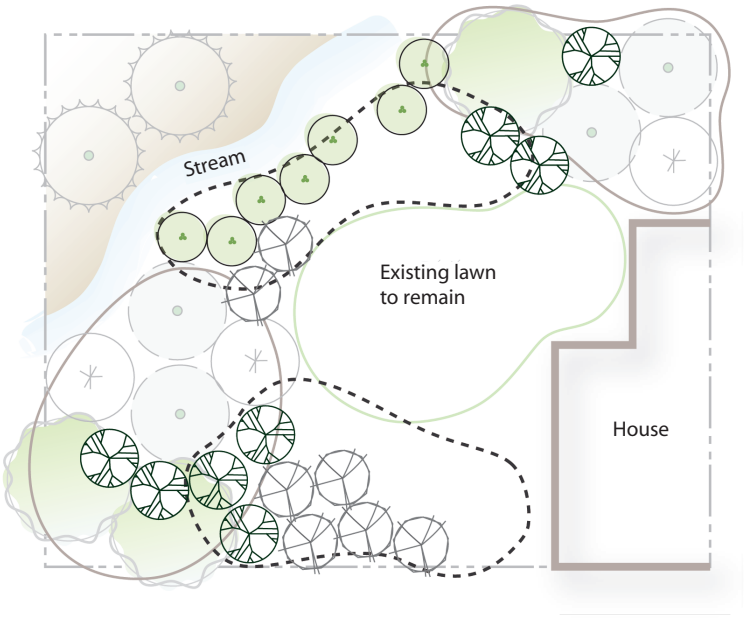
PLANTING PLAN 101



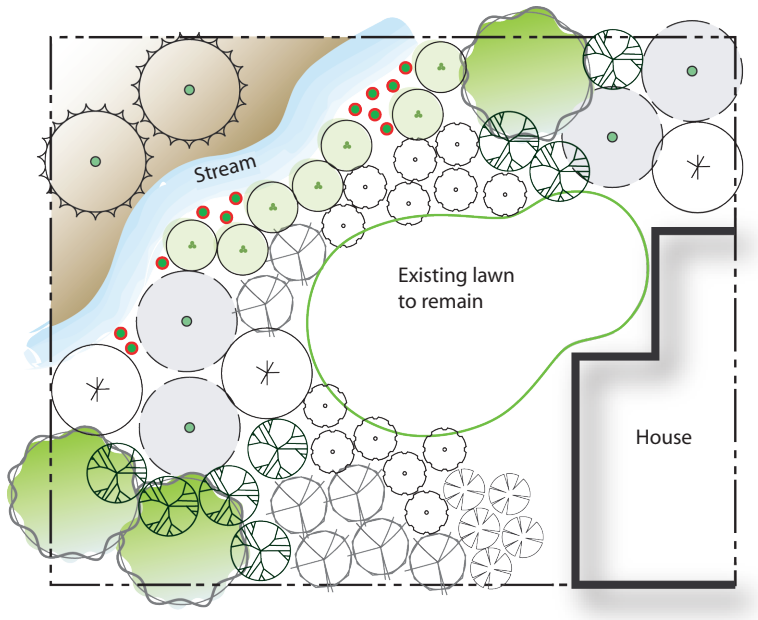
1. Sketch out the planting area. Think of your site limitations and arrange planting groups around them. For example, defining a view corridor from your house helps to avoid incorrect placement of large trees or tall shrubs.



2. Draw the new trees first.



3. Fill in the shrub area. Remember to arrange them as if you are taking a school photo - tall at the back and short in the front. You can infill shrubs or groundcovers underneath tree canopies as well.



4. Once you have filled in all the groundcovers, your planting plan is completed! Check the **density** of plants, and record numbers of plants on the Plant Legend (*See Worksheet PP*).

PLANT LEGEND & PLANTING PLAN WORKSHEET

How to draw your planting plan and legend:

Step 1: Sketch your restoration area on the grid paper on the back of this page.

Step 2: Determine which plants you are going to use. Use the template you have picked out as a guide and add your own from the *Master Plant List* in *Appendix C* if you feel comfortable.

Step 3: Draw a simple symbol for each plant, such as a circle with a letter in the middle. Put each symbol in the legend table below. Write down the name of each plant.

Step 4: Return to your new knowledge of mature plant size, spacing, density and cost. Use these criteria to help layout your plants.

Step 5: Lay out the trees first. Make sure to give them enough space.

Step 6: Now lay out the shrubs. Group them together in clusters according to species. Remember the school photo rule - Tall plants in the back, short plants in the front.

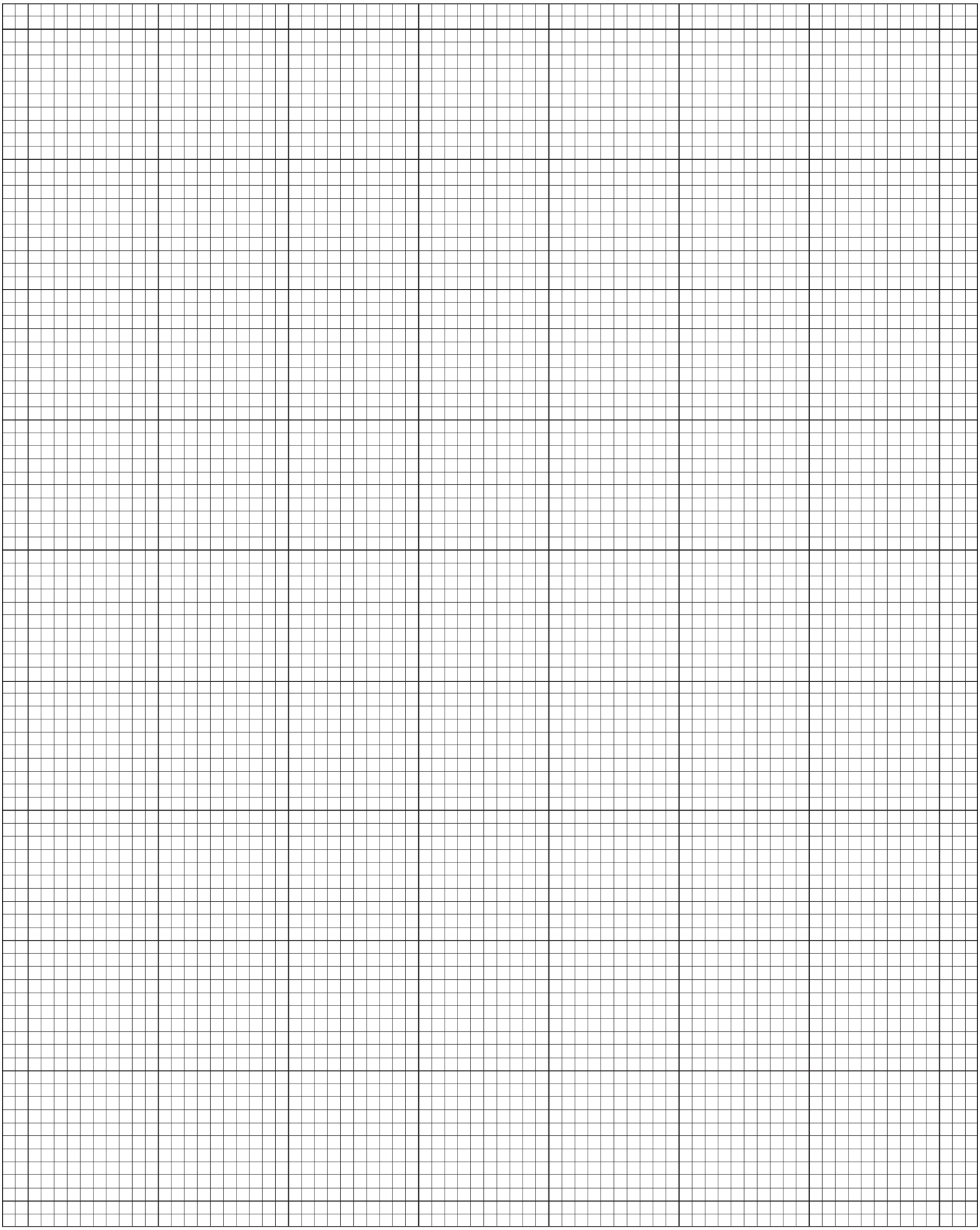
Step 7: Now add in the groundcover and perennials. Use these to fill in around the trees and shrubs.

Step 8: Count up the number of plants and put a total in the Qty. (Quantity) column for each plant species.

Symbol	Name	Size	Qty.

Symbol	Name	Size	Qty.

PLANT LEGEND & PLANTING PLAN WORKSHEET



Notes: _____ **Scale:** _____

Installing your Project


Devil's Club / *Oplopanax horridus*

INSTALLING YOUR PROJECT

GOAL: In this chapter you will prepare your **site** for planting and learn how to properly install plants.

Getting plants to grow and thrive can be a bit of an art. This section will guide you through the plant installation process with tips, details and guidelines. Since plants cost money and installation takes time, you want to get this step right the first time.

SITE PREPARATION

Converting a landscape to native plantings, or controlling the spread of **invasive** species both require some level of vegetation removal. To maximize improvement of wildlife habitat and other functions, inter-planting to diversify existing native plants can be your approach. The goals of each restoration project may be radically different, but site preparation and various installation considerations remain similar. Is the ground ready for planting? Keep in mind the following:

- Is the area clear of invasive weeds (see *Worksheet SE*)? If not, you will need to remove these invasive species by the roots before you attempt to establish native plants.
- Is the soil workable and easy to dig in? If not, you may need to amend the soil or break it up with a roto-tiller. See the **Soil Amendment** & **Mulches** section below.
- Will the area be irrigated? Irrigation is always helpful when establishing plantings.
- Is the planting area in the sun or in the shade?
- If you are restoring a sloping site, is it stable enough to work on?

TIMING

The best time to plant native plants is in the fall, from October to March 15th. This will give the plants enough time to adjust to their new location and allows roots to start growing before the rain stops in June. This establishment period before the summer months is critical for plant viability, especially in areas where irrigation is infrequent or absent.

Tip:
The best time to plant native plants is often during the most uncomfortable weather: 40 degrees and light rain!!! Any cool weather between October 15th and March 15th will work, however.

It is also important to only install plants when temperatures are well above freezing. Though less of a problem in the Northwest than in other climates, this insures that plants do not freeze in their pots while waiting for installation and enables the installer to dig in unfrozen soil. Additionally, backfilling a planting pit with frozen soil can leave air pockets in the pit that can dry out plant roots during warmer weather.

Did you know:
Most people think ***pesticide*** *refers to only "insecticide," but it also refers to herbicide, fungicide, and various other substances used to control pests.*

INVASIVE REMOVAL

Before installing plantings for restoration areas, take note of any **invasive** weed species found on-site. Control of these species is very important in restoration areas in order to allow for the successful establishment of plantings that might otherwise have difficulty competing with these aggressive plants.

Invasive weeds, such as Himalayan blackberry, should be disposed of immediately after removal.

Tip:
For additional information on removing commonly found invasive weeds go to King County's Noxious Weeds Website at: www.dnr.metrokc.go/wlr/lands/weeds/brochures.htm

Where encountered, invasive weeds should be removed manually without the use of **pesticide** (includes herbicide), except in rare cases when applied by a State licensed pesticide applicator and approved by the City. Manual removal can be accomplished by **grubbing** out plants and roots entirely (including seed pods, fruits, and leaves) without simultaneously spreading more seeds . The ideal time for removal is prior to flowering in spring or summer. If removal is to occur after flowering, it is recommended that flowers be cut off and disposed of prior to grubbing. Grubbed out materials should be disposed of off-site *immediately*, since many of these species are still capable of propagating post-removal. Do not use weed materials for mulch and do not put into compost or yard waste bins.

Once the invasive species have been removed, you can assess site soil quality. Certain invasive species such as Scotch broom disperses thousands of seeds per plant. In extreme cases, **topsoil** removal may be necessary to evacuate the invasive seed bank. Dense native planting is recommended and has proven successful at preventing weedy and/or invasive species from reemerging.

Tip:
While breaking up compacted soils, be sure to avoid damage to the roots of existing native plants. Most of a plant's roots are in the top 12" of the soil, so it's best to work around them. Stay out of the ***drip-line*** *of trees and shrubs as much as possible.*

SOIL AMENDMENTS & MULCHES

Soil amendments are materials that are mixed into the **topsoil**. These can be worked in by hand or rototilled. Before using a rototiller in a **critical area**, contact the Land Use Desk for guidance. By contrast, **mulches** are materials that are placed on top of the soil surface. Mulch is always needed unless you are planting in standing water, within the **ordinary high water mark (OHWM)** or on extreme slopes. Both treatments can improve soil nutrients, texture, water-holding capacity, and overall fertility. Soils can lose nutrients over time if they are not replenished. Depending on **site conditions**, planting in full sun may require more mulch to help retain soil moisture. If your soil is low in nutrients or compacted, it will benefit from amendments and mulches.

STOP...

Some amendments and mulches can contain weed seeds or small weeds. These weeds can infest your planting area and cause problems for your new plantings. Make sure you verify that your amendments and mulches are weed-free.

Did you know:
Property owners can call Bellevue Utilities at (425)452-6932 for tips on watering, water conservation, and natural lawn and garden care.

WATERING

Providing adequate water to newly installed plants as they establish their root systems is vital to their survival and should be provided on a temporary basis only until the plants become established, generally three to five years. Once established, properly selected native plants usually do not require a permanent irrigation system. In fact, permanent systems will not be allowed in most critical area mitigation sites.

Temporary irrigation systems that save water include soaker hoses and drip irrigation. Larger areas may need impact-heads or other broadcast watering sprinklers set up with an above-ground PVC (white plastic) pipe network. These are difficult to remove, so consider all other options and check with the City of Bellevue before installing a plastic-pipe system. In some areas municipal water may not be available and hand watering will be necessary if temperatures are very high during the summer.

Correct water placement is important. Ensuring that water is reaching the roots and surrounding soil without running off is the key. To gauge the effectiveness of your watering method, dig a small hole next to some of the plants you are watering. Check the moisture of the soil at a depth of 3 to 6 inches. The soil should be damp, but not sodden. Be careful not to damage or disturb plant roots. Inexpensive timers that attach to your spigot are available. Experiment with the time in 10 minute increments until the plants are getting the right amount of water.

In our climate, there are usually two hot months in the summer without rain. For a plant with an under-developed root system, this usually spells trouble. The following chart will help you provide enough water during dry months.

TIME OF YEAR	June 1st to July 15th	July 15th - October 1st	October - May
IRRIGATION AMOUNT	1 inch per week	2 inches per week	None needed

It is much better to apply 2 inches of water during one morning of the week than to do ¼ inch every few days.

If using a timer, set it to water from one hour before sunrise to two hours after. The next best time to water is in the evening, two hours before sunset. The worst times to water are during the hottest part of the day because you will lose up to half the water by evaporation. **Watering** at night can cause some plant diseases such as powdery mildew.

Tip:
*Healthy soils grow healthy plants. Build healthy soil with **compost** and **mulch** instead of **fertilizer**. You can reuse yard waste and other **organic** materials, and save money at the same time!*

FERTILIZER

There are many types of **fertilizer**, but for native trees and shrubs, fertilizer with relatively low numbers of **magnesium**, **phosphorus** and **nitrogen** works well. Slow-release, **organic** fertilizer is recommended. Fertilizer should not be applied within fifteen feet **streams**, **lakes** or **wetlands**, because the extra nutrients are not beneficial to aquatic environments.

Fertilizer should not be used at the time of installation. Research has shown that for the first year newly installed plants have undeveloped root systems which will not utilize fertilizer. If fertilizer is used, it will benefit weeds instead of your new plants. It is best to apply fertilizer one year after initial planting. Fertilizer should be covered with mulch or scratched into the soil surface to limit nutrient-laden runoff.

Did you know? *"Emergent" simply refers to a class of plants that grow in aquatic environments, not a type of container stock. Emergents are generally sold in long, skinny containers called tubes. Tubes are considered container stock.*

PLANT MATERIAL

There are four common types of planting stock:

Container stock: Plants that come in plastic pots and flats

Cuttings: Live stakes or live stems of plants that have no roots (willow, dogwood and cottonwood only). Cuttings can only be planted when dormant, October through February. They will not establish at any other time of the year.

B&B: Balled in burlap, usually larger trees and shrubs. (B&B is not recommended as they are often too big to transplant successfully in a restoration setting. Use B&B only if size and aesthetics are important to your particular site.)

Bareroot: Very small planting stock, usually one- or two-year-old plants that come without soil.

Different **sites** can use different kinds of planting stock. For example, planting along a stream or lake can utilize cuttings because the soils will be moist enough to keep the cutting alive while it establishes roots. Container stock is the simplest to use for most sites and is the easiest to find at a local nursery. Bareroot stock works well for larger projects where hundreds or thousands of plants are installed and where cost is a factor. Bareroot stock has a lower survival rate than container stock. B&B stock should only be used if you are planting very large plants. This is the most expensive and least successful option in restoration areas. Smaller plants establish more quickly and grow faster. B&B stock has a tiny root mass for a massive plant size and is nearly impossible to establish without irrigation.

PLANT INSPECTION

Plants should be inspected prior to purchasing to insure that they are healthy. Does the plant look vigorous or is it drooping? Are the leaves or needles robust and well-represented? Do they have insects on them? Then, move onto the roots: after removing the pot, look for a moderate to dense network of roots that are not slimy or mushy. You should be able to see some soil and the "ball" should be firm, but not so dense that it is hard to pry apart. Plants with too few roots will be apparent, as the soil will fall off the soil ball. These should be rejected. If you can't pull the pot off because there are too many roots or because roots are coming out of the bottom or the roots are circling around inside the pot, these plants should also be rejected. Bare root stock should also have a healthy mass of both large and fine roots. The roots should be proportionate to the above-ground plant size. Bare root plants that have roots not wrapped in plastic or stored in sawdust should not be purchased. These plants will die with only a few hours exposure to dry air.

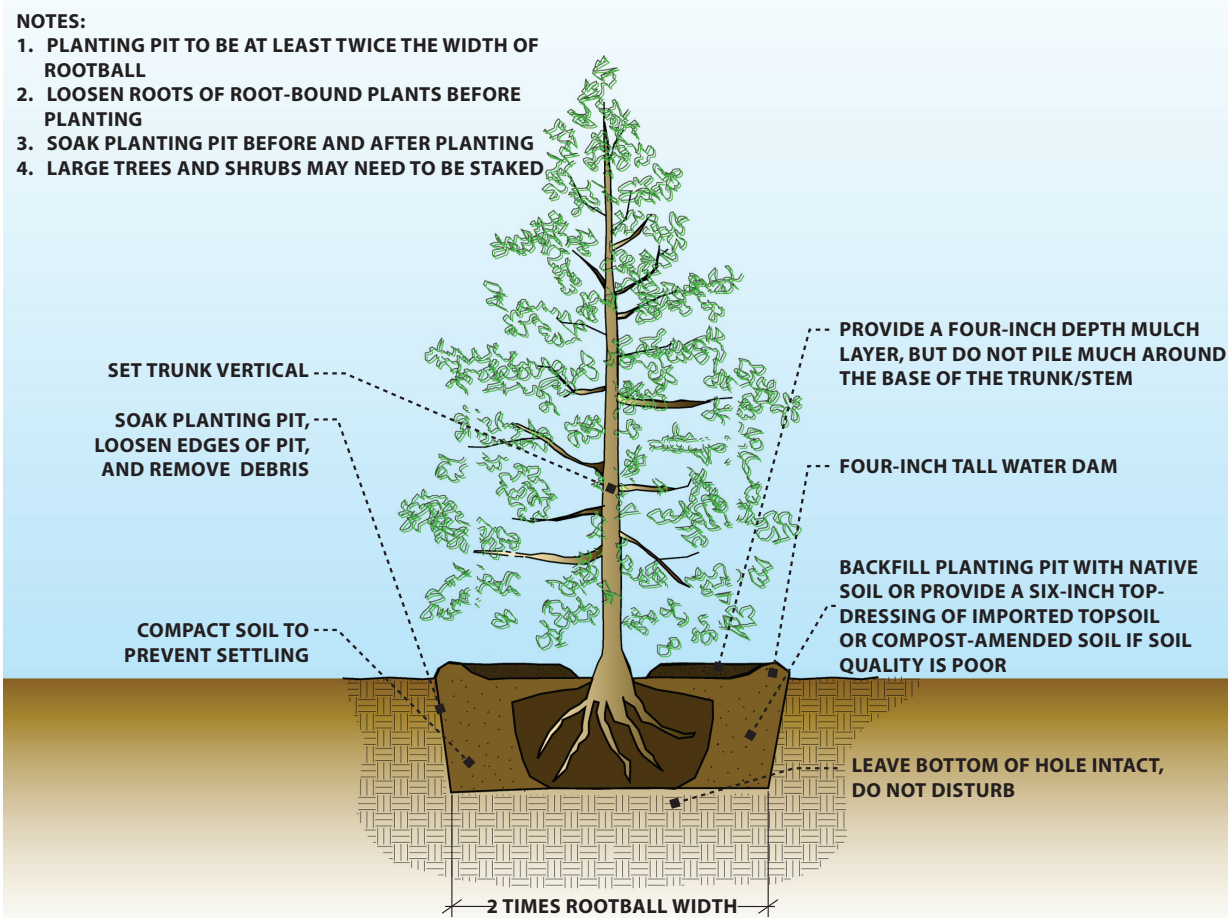
OTHER MATERIALS

Make sure you have the following items on hand before you begin:

Mulch	Coarse wood chip **mulch** is the best. It can usually be purchased from any supplier of **topsoil** and **compost**. "Beauty bark" or other shredded bark products make a poor mulch substitute. Shredded bark does not retain moisture as well and will NOT prevent weed seeds from germinating around your newly installed plant.
Compost	**Soil amendment** might be necessary if soils have low **organic** content.
Water	Each plant will need to be watered immediately after planting to remove air pockets and moisten all of the soil around the root ball.
Tools	Shovel, wheel barrow, gloves, work boots, work clothes, hat, rock bar, etc.
Plants	Have ALL of your plants on hand so you only have to do this once.

Others to consider: Woody debris such as downed logs or brush piles to provide specialized habitat for wildlife such as birds, amphibians and reptiles.

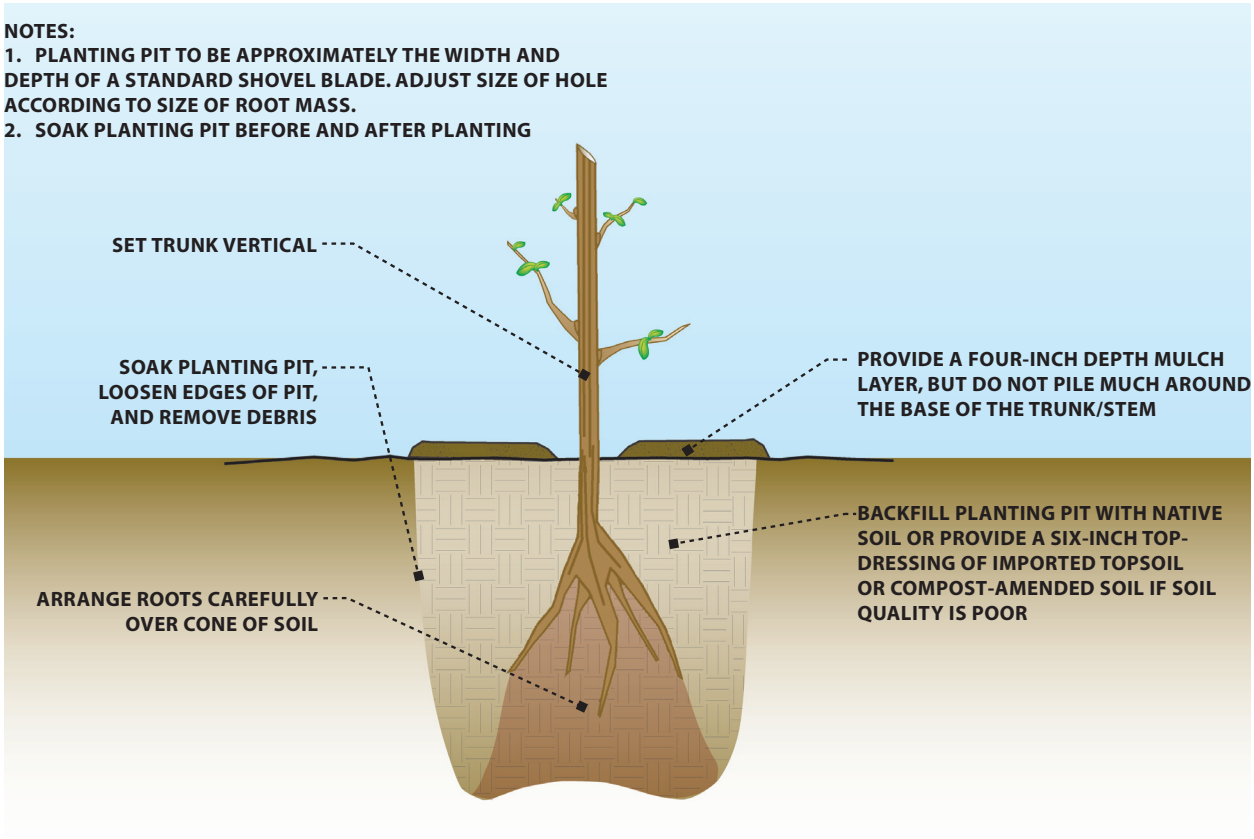
TREE AND SHRUB PLANTING DETAIL



TREE AND SHRUB PLANTING SEQUENCE

1) Evaluate the soil conditions. If the soil is too compacted to easily dig, consider options for decompacting and amending the soil with **compost**. Amend the entire restoration area when possible.
2) Lay out plants or use flags to mark the location of each plant.
3) Dig a pit for each plant that is twice the size of the rootball or plant container.
4) Remove large rocks and other debris from the pit.
5) Soak the pit with water by filling it at least half-way. Allow the water to drain before installing plant. Note that some pits may not fill if the soil is very sandy.
6) "Rough up" the roots of the plants, pruning or straightening circling roots. Roots that circle the bottom and sides of the rootball can later girdle the tree as the trunk attempts to grow outward.
7) Install the plant in the pit, backfilling as necessary such that soil surface matches the surrounding ground level. Make sure stem of the plant is at the same ground level that it was in the nursery pot.
8) Form a basin to hold water around the plant using remaining soil.
9) **Mulch** each plant with 4 inches of coarse wood chip mulch (preferred) or raked leaves. Do not bury the stem in mulch – mulch should be kept a few inches away from the stem.
10) Water the plant again, filling up the small basin formed in step 8.

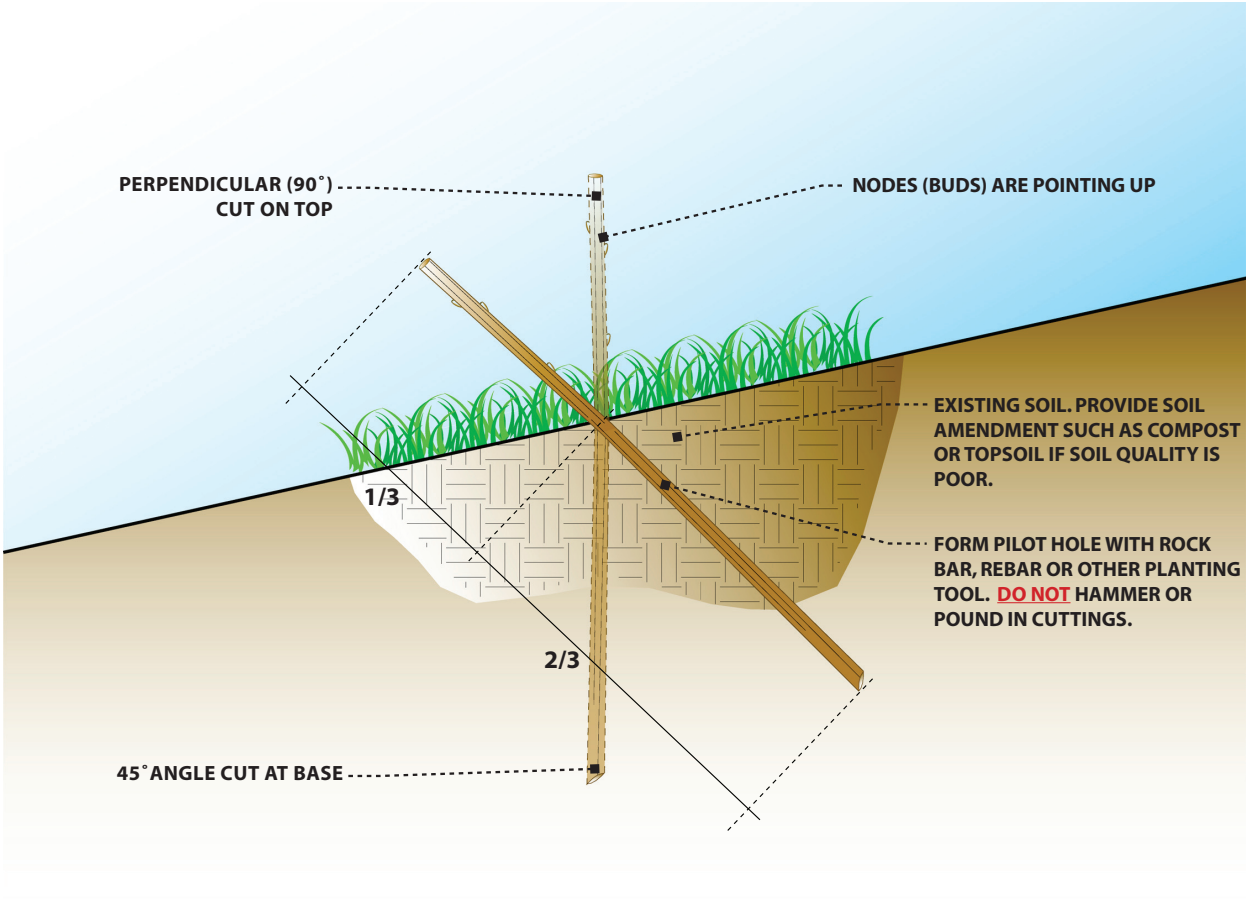
BAREROOT PLANTING DETAIL



BAREROOT PLANTING SEQUENCE

1) Evaluate the soil conditions and amend as necessary.
2) Keep plants in their packaging or in piles of wet sawdust, woodchips, etc. until just before planting.
3) Use flags or other markers to indicate the location of each plant.
4) Dig a pit for each plant the diameter and depth of which approximately matches the size of a common shovel blade or the length of the roots – whichever is longer.
5) Remove large rocks and other debris from the pit.
6) Soak the pit with water by filling it at least half-way. Note that some holes may not fill if the soil is very sandy.
7) Form a small cone of soil at the bottom of the planting pit.
8) Arrange the roots of the plant such that they drape over the cone.
9) Carefully backfill the hole while holding the plant upright and at the correct depth that the plant grew at the nursery; do not backfill with rocks or debris.
10) Form a basin to hold water around the plant using remaining soil.
11) **Mulch** each plant with 4 inches of wood chip mulch (preferred) or raked leaves. Do not bury the stem in mulch – mulch should be kept away from the stem.
12) Water the plant again, filling up the small basin formed in step 10.

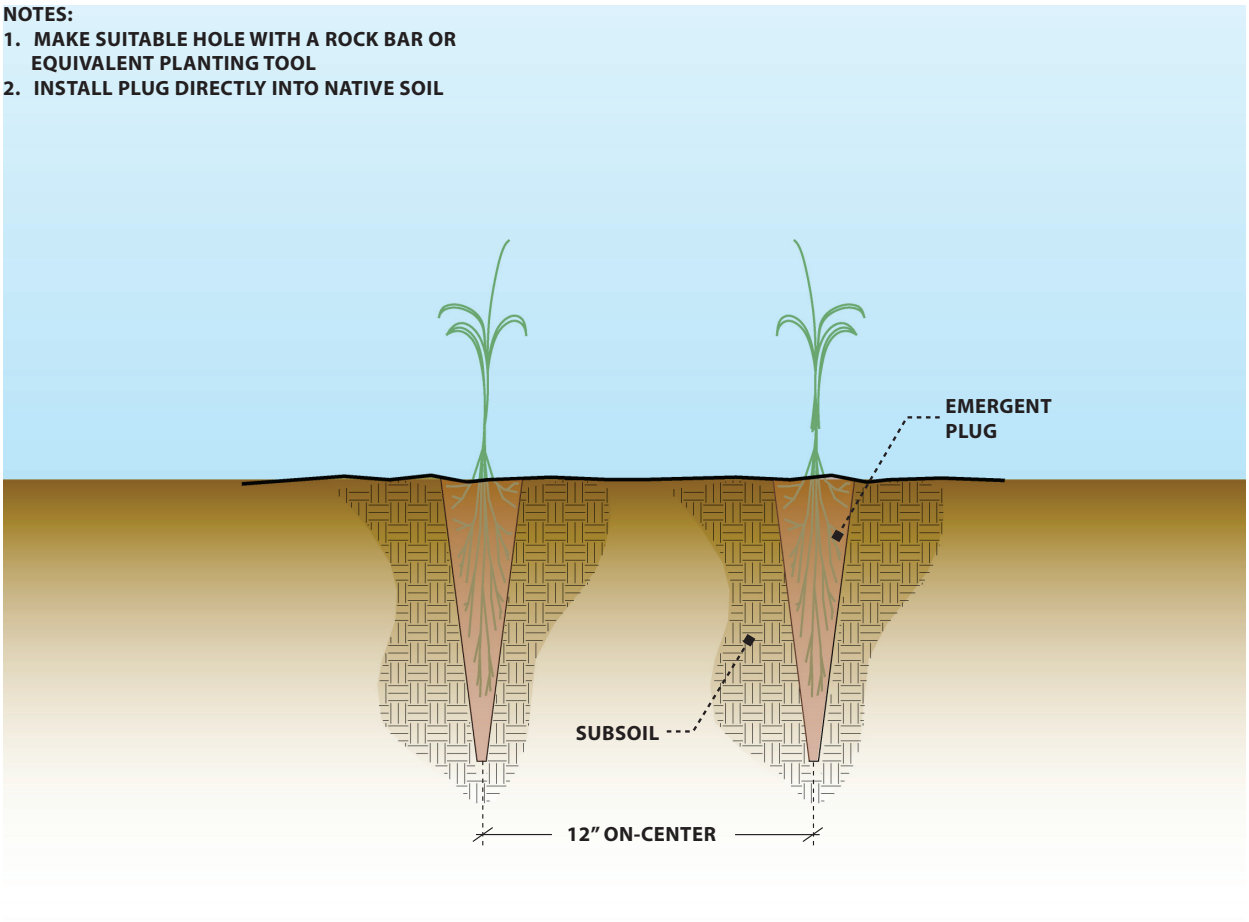
CUTTING INSTALLATION DETAIL



CUTTINGS / LIVE STAKE PLANTING SEQUENCE

1) Cuttings should be angle cut (45 degree) at the base and perpendicular cut just above a node (bud).
2) Keep stakes in their packaging or in piles of wet sawdust, woodchips, buckets of water, etc. until just before planting.
3) Using a narrow-bladed shovel, make a deep slit in the soil, levering back and forth to open the slit to fit the stake. Alternatively, make a pilot hole with a rock bar or a piece of rebar that is larger than the diameter of the live stake.
4) Some soils are soft enough to push cuttings into without the use of a tool. This is the best condition for installing cuttings.
5) Do not hammer stakes in; if the soil is too dense to push a stake into, it is better to make a pilot hole.
6) Determine which end of the cutting is the top. Buds point upwards.
7) Place the stake in the pilot hole with the buds pointing up.
8) The stake must be at least 2/3rd buried such that a maximum of 1/3rd of its length is above the soil level. At least two buds should be above ground.
9) If the cutting protrudes beyond 1/3rd of its length, remove it and make the hole deeper.
10) Once properly inserted into the soil, tamp the soil around the cutting to eliminate large gaps. Do not over-compact the soil.
11) Soak planing out before and after planting.

EMERGENT PLANTING DETAIL



EMERGENTS

1) Keep plugs in their packaging until just before planting.
2) Using a narrow-bladed shovel, make a slit in the soil, levering back and forth to open the slit to fit the plug. Alternatively, make a pilot hole with a rock bar or a piece of re-bar that is larger than the diameter of the plug.
3) Once properly inserted into the soil, tamp the soil around the cutting to eliminate large gaps. Do not over-compact the soil.

Maintenance & Monitoring

5

Ninebark / *Physocarpus capitatus*

MAINTENANCE & MONITORING

GOAL: In this chapter you will learn how to take care and keep track of your restoration area.

MAINTENANCE

To ensure all of your hard work and the expense of installing a restoration project results in success, you will need to take care of it. Maintenance management is very important during the first three to five years following planting. The keys to restoration success are the 2 W's:

Watering and **Weeding**

Tip:
If irrigation fails, mulch can save the day! Mulch limits drought stress by retaining soil moisture. Over time, it also improves soil fertility and texture. Mulch can also keep weed seeds from germinating.

WATERING

To successfully establish plants, summer irrigation is essential in nearly every case. Drought stress is usually the number one cause of plant mortality in restoration projects. In most cases, irrigation is required. Check with the City's Land Use Desk at (425) 452-4188 to see if you have this requirement. Once established, most native plants should not need supplemental water, however.

Most native plants in Bellevue are well-suited to heavy applications of **mulch**, while most weeds are not. Native plants in this region are mainly adapted to forested areas that supply a constant rain of **organic** debris. Grasses and other herbaceous weeds typically cannot survive under canopies and heavy mulch, but native tree saplings and shrubs can! Wood chip mulch, sometimes available for free from arborists, best mimics this natural forest mulch. When used in combination with layers of newspaper or cardboard, even the most **invasive** weeds can be controlled or even eradicated. (See *watering chart* on *page 31*)

Did you know:
For additional information on removing commonly found invasive weeds go to King County's Noxious Weeds Website at: www.dnr.metrokc.go/wlr/lands/weeds/brochures.htm

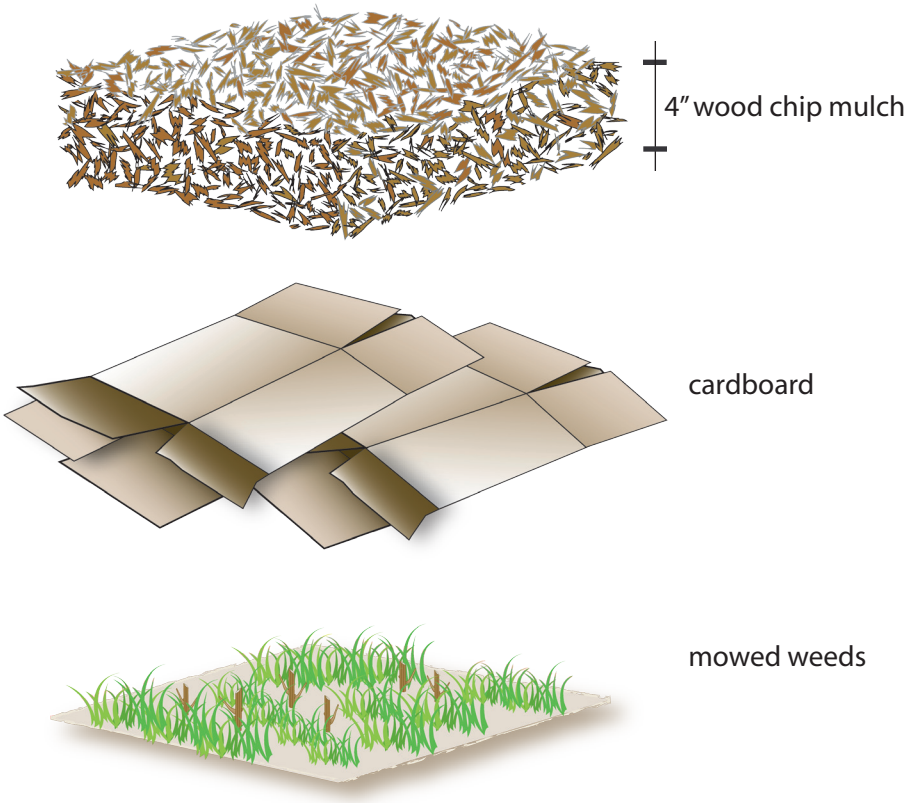
WEEDING

Root competition from other plants and weeds is the second leading cause of plant mortality in habitat restoration areas. Plants MUST BE WEEDED to survive and flourish. Common weeds include reed canarygrass, Himalayan blackberry, field bindweed, and many more. Check out the **invasives** pictures in *Appendix C* for common weeds found in our area.

Each installed plant should be kept free of weeds and grasses in a 24-inch-diameter circle around the stem. Weeds should be pulled by hand because a line trimmer or "weed wacker" can easily damage or kill a native plant.

Pesticide (includes herbicide) should never be used in a critical area or a critical area **buffer** except under rare circumstances and only by a State of Washington-licensed pesticide applicator and authorized by the City of Bellevue. Contact the City of Bellevue for more information.

Tip:
Really bad weeds? Thoroughly remove the weed prior to planting or try using layers of cardboard beneath the mulch. Place one layer of cardboard over freshly cut or mowed weeds. Then pile wood chip mulch over the cardboard to a depth of 4 inches.



Basic Maintenance Steps

In the spring:

1. Evaluate the need for maintenance. Look for any of the following:
   - encroaching Himalayan blackberry vines, grub out blackberry roots
   - morning glory from the stem's point of origin
   - sprouting Scotch broom
   - reed canarygrass sprouts (fields of grass need a different method)
2. Remove **invasive** weeds and weed roots from the planted area to the maximum extent practical. In some instances, complete weed removal is not possible.
3. Check the **mulch** ring to make sure it is still adequate; add more mulch if needed.
4. Check the plants for signs of specific stress: drought, disease, pests, etc.

Twice each spring and once in the summer:
Remove all weeds from a 24-inch-diameter circle around each plant OR from the entire project area if possible

Properly remove any other **invasive** weed that is a problem on your site. See the *Master Plant List* (*Appendix C*) for a directory of weeds.

MONITORING YOUR PROJECT

All restoration projects should be monitored over time to verify that installed plants survive and that the goals of the project are achieved. If the goals are not being achieved, monitoring is a good tool to guide maintenance or repair of the area such that the goals are achieved.

Except for restoration-only projects, the City of Bellevue requires that monitoring take place for a period of five years. Three years is the minimum recommended monitoring duration for projects involving restoration only.

Native plants are hearty and need very little care once established. However, for the first three to five years, most plants need care to ensure adequate survival and growth. (See the BMS table on the previous page for tips on how to improve plant survival and encourage fast growth)

Monitoring typically tracks:

1) Survival of planted vegetation
2) Percent cover of planted vegetation
3) Diversity of planted vegetation
4) Percent cover of non-native/**invasive** weeds

CREATING PERFORMANCE STANDARDS

If you know that performance standards are not required for your plan, you can skip this section. Check with City of Bellevue Land Use Desk (425-452-4188) for specific information on your project.

Each restoration plan should have performance standards by which the success of the plan is judged over time. If your restoration is the result of an approved development or a violation, performance standards are likely required. Check with the City of Bellevue. This section explains how to develop performance standards for your plan.

The performance standards outlined in this Handbook are related to the health and growth of the installed or volunteer vegetation.

Survival- One way to assess whether an implemented restoration plan is functioning is to assess survival of the installed vegetation. For most plans, a standard of 80 percent survival throughout the life of the monitoring period (about 3 to 5 years) is adequate. If your plan is such that survival is anticipated to be low, a survival standard of 50 percent may be more realistic.

Percent Cover- Good plant cover is important for wildlife habitat, water quality, reducing erosion, and slowing runoff rates. In general, the more cover a restoration area has, the better it functions. Cover for woody vegetation (trees and shrubs) should be at least 60 percent by year three and 85% by year five.

Native Plant Diversity- Diversity is a measure of how many different plant types (species) are found in a given area. Higher diversity allows for a complex habitat that is used by many species. Small planted areas (500 ft^2 to 1,000 ft^2) should have a diversity of at least four native tree species, six native shrub species, and four native groundcover or low cover

species. Very small areas may not need a diversity standard, while large areas that have complex or lengthy species lists should have higher diversity standards. If the planted area covers different habitat types (**wetland**, **stream** bank, **buffer**, shady, open, etc.) then each habitat type should have a different set of diversity standards.

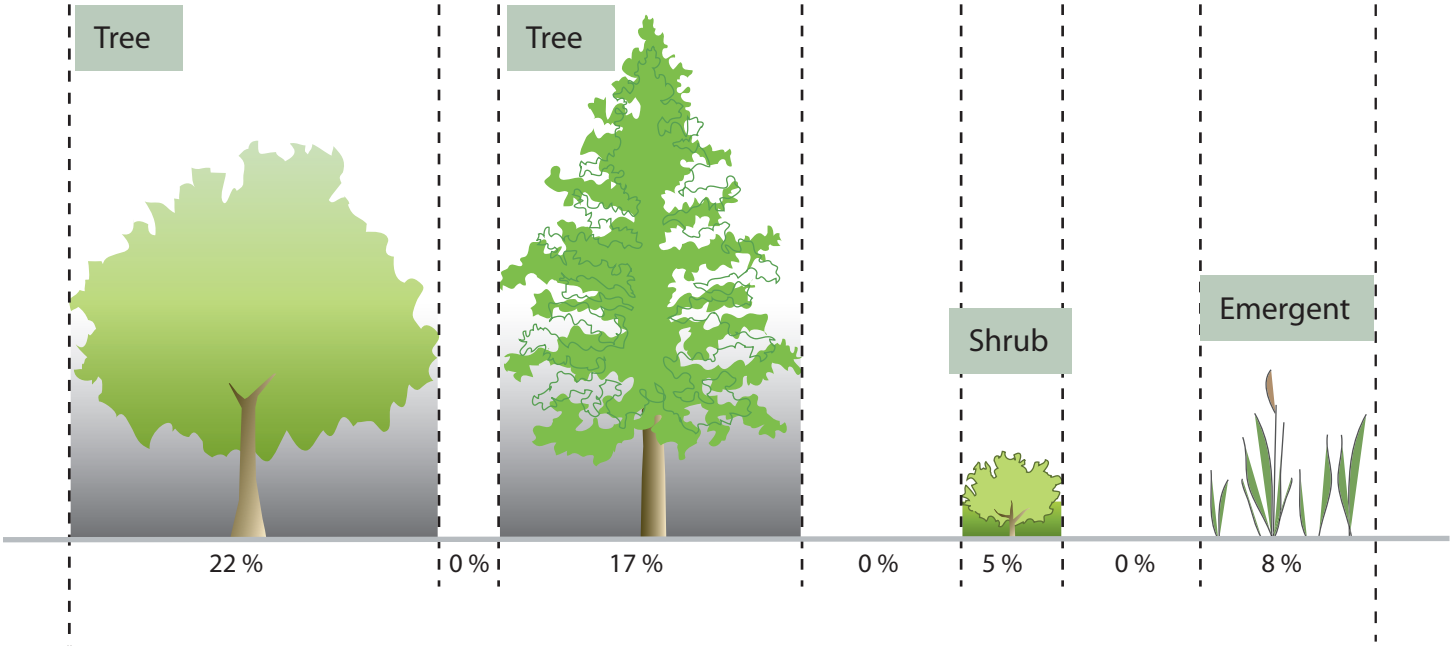
SURVIVAL

This performance attribute tells you how many of the plants you installed have survived and how many have died. Survival is calculated by counting each individual plant by species and comparing the results to the original planting plan. For example, if 83 western red cedar trees were found alive and 100 were originally planted, the survival is 83 percent.

PERCENT COVER

This performance attribute demonstrates how fast plants are growing and the **density** of the plants on a site. Cover can be calculated using a visual estimation. Higher coverage in general translates into a better functioning ecosystem.

Technically speaking, percent cover is the amount of ground that is covered by vegetation divided by the planted area. Imagine that the sun was directly above a single tree. The area of the shadow cast by that tree is the area the tree covers on the ground. As in the example below, if the shadow covers 22 feet and the total planted area is 100 feet, then the study area has a 22 percent cover by trees.



Planted areas can be visually examined and placed into one of six cover class ranges (see chart on next page). If the planted area is large or if there are several different areas with different vegetation types (e.g. trees, shrubs and emergent plants), then an assessment is needed for each of the different areas.

Look at the planted area and assess how much area is covered by the plants you have planted. If you are assessing the cover of shrubs and small trees, then compare the area of those plants to the area without plants. This will tell you the amount of tree and shrub coverage. Do the same for other types of planting (groundcover, emergent, etc. if planted).

Using these cover class ranges will make it easier to estimate the coverage.

PERCENTAGE OF COVER	COVER CLASS NUMBERS
0.5% - 5%	1
6% - 25%	2
26% - 50%	3
51% - 75%	4
76% - 95%	5
95%+	6

Table of Class Ranges.

DIVERSITY

Diversity of vegetation is a measure of the different types of plants that are growing on the site. The goal of this measure is to track whether several species are present (high diversity), or whether only one or two species have taken over (low diversity). For instance, an area that was planted with five different trees and shrubs, but is now vegetated exclusively with young alder trees, may meet the performance standard for native cover, but has low wildlife value as it is comprised of only one type of plant.

OTHER RELEVANT INFORMATION

The following conditions should also be inspected.

1) Are the leaves turning yellow? This could occur for several reasons.
   a. It could be an indication of a lack of **nitrogen**. In this case, application of a granular, **slow-release fertilizer** is recommended.
   b. It could be caused by over-fertilzing. Did you fertilize recently? If so, look at the leaves. Do they look burned?
   c. It could be an indication of overwatering. Are the leaves falling off? Are there brown spots within the discolored leaves? These are signs of overwatering. Reduce the quantity of water or check for irrigation problems.
   d. It could be caused by watering during the heat of the day. Are you watering the leaves while the sun is out? Look for black or brown scorch scorch marks on the leaves. Try to water during early morning hours.
2) Are the plants wilting, drooping or showing other signs of a lack of water?
3) Are weeds crowding out the base of the plant? **Weeding** and **mulching** may be necessary to provide relief from root competition.
4) Have larger trees been staked and do the stakes need to be adjusted or removed? Staking materials can damage the trunk if they are too tight.
5) Is there trash/plastic/garbage in the planting area?
6) Is there evidence of wildlife use? This is not vital to the success of the planting and you do not have to be an expert in detecting wildlife evidence, but anecdotal evidence of use is a good thing to incorporate into a monitoring report.

MAINTENANCE AND MONITORING THROUGH THE SEASONS

SPRING	SUMMER	FALL	WINTER
PLANTING			
It is okay to plant through March 15, but it is better to plant in the fall.	Avoid planting in the summer months, since young plants do not have developed root systems and easily succomb to drought.	Rainy season is the best time to plant! This give the plants time to begin to grow roots and adapt to their new home.	Although the weather is rotten for working outside, plants do not mind. Unless we are experiencing freezing temperatures, it is alright to plant.
WEEDING			
As soon as weeds start to emerge, start fighting back by removing the whole plant, including roots. No weed killers should be used without contacting the City's Land Use Desk first.	Check for weeds at least twice during the summer. Remove any new invaders and re-sprouts and pull the weeds before they go to seed.	Weeds can still emerge in the fall. Grab them now before they develop deep roots over winter.	Check once for weeds and pull them out.
WATERING			
Plan for summer watering now. Test the system and replace worn items, check for leaks, and check for efficiency. Make sure the system delivers adequate coverage for the whole planting area without wasting water.	Start watering June 1st or sooner if we are experiencing a dry spring. Make sure to avoid water runoff. Are plants drooping? If so, they are stressed. Periodically check the system to insure proper functioning and test the soil for moisture. Increase as needed.	Water plants until steady rain starts, occasionally as late as October 1. Winterize the system by blowing water out of the lines to prevent freezing.	Plan ahead, it is going to be another long summer without rain!
OTHER MAINTENANCE			
Check mulch depth and coverage. Replace mulch as needed to maintain a protective layer to hold in soil moisture to keep down weeds. Make sure not to bury the crown of the plant. If plants are in their second season, fertilize with a slow-release product.	Mulch plants as needed to keep moisture in the soil through the dry summer.	Check mulch depth and coverage. Replace mulch as needed to maintain a protective layer to protect roots and keep down weeds. Make sure not to bury the crown of the plant. Pruning of native plants is usually not necessary; however, the best time to prune is after all the leaves have dropped.	Pruning, as mentioned in the fall, can be done in winter, too. Winter is the time to plan for spring. Think about replanting if you did not finish in the fall, and getting control of weeds.
MONITORING			
Perform any maintenance recommendations that were laid out in the monitoring report (if required) including plant replacements or substitutions, weeding, mulching, etc.	Start planning for your Performance Monitoring if it is required by the City of Bellevue or other agency.	Do your performance monitoring per the plan that you have agreed upon with the City or other agency. Make sure you do your monitoring before the leaves drop or it will be difficult to identify plants and assess survival and cover.	Perform any maintenance recommendations that were laid out in the monitoring report (if required).

Appendix A

GLOSSARY

Amendment – See "soil amendment."

Aspect – The direction a slope is facing in relation to the sun.

Assessment – An evaluation of the condition of a critical area, usually describing attributes pertaining to water quality, water capacity or habitat functions. May also include the jurisdictional classification or rating of the area.

Bareroot – Very small planting stock, usually one or two year old plants that come without soil.

Buffer – An area surrounding a critical area that is kept in or restored to a natural state to minimize impacts of adjacent land use.

B&B – Balled in burlap, usually larger trees and shrubs (usually too big unless aesthetics are important).

Compost – Decomposed organic matter that is used to add nutrients and organic material to soils.

Container stock – Plants that come in plastic pots and flats

Critical areas – Areas that are either hazardous or environmentally sensitive. Critical areas in Bellevue include wetlands, streams, lake shorelines, geologic hazard areas, habitats associated with a species of importance, and flood hazard areas.

Critical Areas Handbook – A manual with user-friendly instructions and examples of how to design a project in a critical area.

Critical Areas Ordinance – A body of law enacted by the City government that defines how critical areas are managed.

Cuttings – A branch or cutting from a plant with no roots that can form roots and grow when installed appropriately in soil. Cottonwood, willows and dogwoods are examples; not all plants can reproduce via cuttings.

Delineation (wetland) – A study undertaken to determine and mark the boundary of a wetland.

Delineation (stream) – A study undertaken to determine and mark the ordinary high water mark of a stream or river.

Density – The amount of coverage for a given area, such as plants per square foot.

Dripline –The imaginary line on the ground under the tips of the canopy of a tree or shrub.

Density – The amount of coverage for a given area, such as plants per square foot.

Emergent – A term that refers to a class of plants that grow in aquatic environments.

Environmental consultant – A trained professional in the environmental sciences who offers consultation regarding environmental challenges and land use regulations regarding critical areas.

Existing site plan – See "site plan."

Fertilizer – A mixture of materials such as nitrogen, phosphorus and potassium compounds that are added to soil enhance plant growth.

Flooded – A soil condition in which the surface of the soil is under at least 6" of water.

Geo-hazard areas – In Bellevue, geologic hazard areas are landslide hazards, steep slopes and coal mine hazard areas.

Grub (grubbing) – The act of clearing land free of vegetation, associated roots and debris.

Hydrology – This term is used to describe how water cycles through a specific location. For example the hydrology of an area may be wet or dry.

Inundated – A soil condition in which there is a thin later of water or shallow puddles at the ground surface.

Invasive vegetation – Non-native woody plants that are adapted to a wide range of environmental conditions. Invasive vegetation typically out-competes native vegetation and forms single-species stands, resulting in less plant diversity.

Invasive weeds – Invasive herbaceous material that is growing where it is not wanted. Invasive weeds can out-compete existing native vegetation. Invasive weeds are usually listed by a government agency as problem plants.

Light – The duration and intensity of sunlight that falls on a planted area.

Light needs – Different plants require different amounts of light. A specific plant may require full shade, partial shade or full sunlight.

Magnesium – A mineral plants need for photosynthesis or energy production. Plants obtain magnesium from salts in the soil.

Maintenance – Scheduled activities that are required to ensure project goals and performance standards such as plant survival, are met.

Mitigate – To lessen the impact of an action. For example, impacts to critical areas must be mitigated through restoration or enhancement.

Mulch – A mixture of organic matter, usually wood chips or dead leaves, that is put on the soil surface around a plant to protect the roots from freezing, prevent weed growth, and hold in soil moisture.

Nitrogen – An element required by plants for photosynthesis and growth. Nitrogen levels are typically low after winter rains and high in the summer.

Ordinary high water mark (OHWM) –The OHWM is generally interpreted as the line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil destruction on terrestrial vegetation, or the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding area. It is usually marked as the lowest limit of perennial vegetation. The ordinary high water mark is often difficult for most people to determine and is best located by a professional environmental consultant.

Organic – Material derived from partially or completely decomposed plant parts.

Overall site assessment – An evaluation of the site conditions and critical area type. This allows you to make informed decisions about land use and suitable plantings for that site.

Pesticide – Any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any pest. Pests can be insects, mice or other unwanted animals, unwanted plants, fungi, microorganisms like bacteria and viruses. Though often misunderstood to refer only to insecticides, the term also applies to herbicides, fungicides, and various other substances used to control pests.

Phosphorus – An element plants require for growth of root tips and shoots.

Remediate – To repair a damaged or degraded area.

Saturated – A soil condition in which most of the air pockets are filled with water.

Scale – A graduated line on a map representing proportionate size. It is a ratio used to create a small illustration of a larger area that maintains the correct proportions.

Shorelines – Shorelines are defined by the Washington State Legislature as all of the water areas of the state, including reservoirs, and their associated shorelands, together with the lands underlying them; except (i) shorelines of statewide significance; (ii) shorelines on segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments; and (iii) shorelines on lakes less than twenty acres in size and wetlands associated with such small lakes.

Site – the area where a mitigation or enhancement plan is, has been or is to be located.

Site conditions – There are two aspects of site conditions: 1) current plantings and land use, and 2) position in the landscape. Landscape position affects the amount of natural water and light. Site conditions may be shown on a **scale** drawing of the plants and land features or it can be described in text.

Site evaluation – An evaluation of the current conditions at a site that includes hydrology, topography, aspect and existing vegetation.

Site plan – A graphical depiction or drawing of current land features, including buildings, slopes, plants,

water regime and light conditions. It is useful to summarize these details in a scaled drawing for the purposes of planning.

Slope – An inclined surface; slope can be measured as rise over run.

Slow-release fertilizer – A water-insoluble fertilizer, usually pellets, that releases nutrients throughout the season. Slow-release fertilizers last longer than traditional water-soluble fertilizers.

Soil amendments – New material, such as compost or fertilizer incorporated into the soil to make the soil more suitable for plant growth.

Spacing – The distance between plants. Each plant type has an average spacing that is recommended to allow room for growth.

Steep slope – Slopes of 40 percent or more that have a rise of at least 10 feet and exceed 1,000 square feet in area.

Stewardship – To manage or be the caretaker for a property. Stewardship often involves removing invasive vegetation and/or planting native vegetation.

Streams – An aquatic area where flowing surface water produces a defined channel or bed, not including a wholly artificial channel, unless the artificial channel is: 1) used by salmonids; or 2) used to convey a stream that occurred naturally before construction of the artificial channel.

Topography – Hills, slopes, valleys and depressions on a given area; the change in elevation over the surface of the earth.

Topsoil – The top 6-8 inches of soil usually having the highest concentration of organic matter and nutrients.

Upland – A general term pertaining to all land areas outside of marine waters, lakes, ponds, streams, and wetlands.

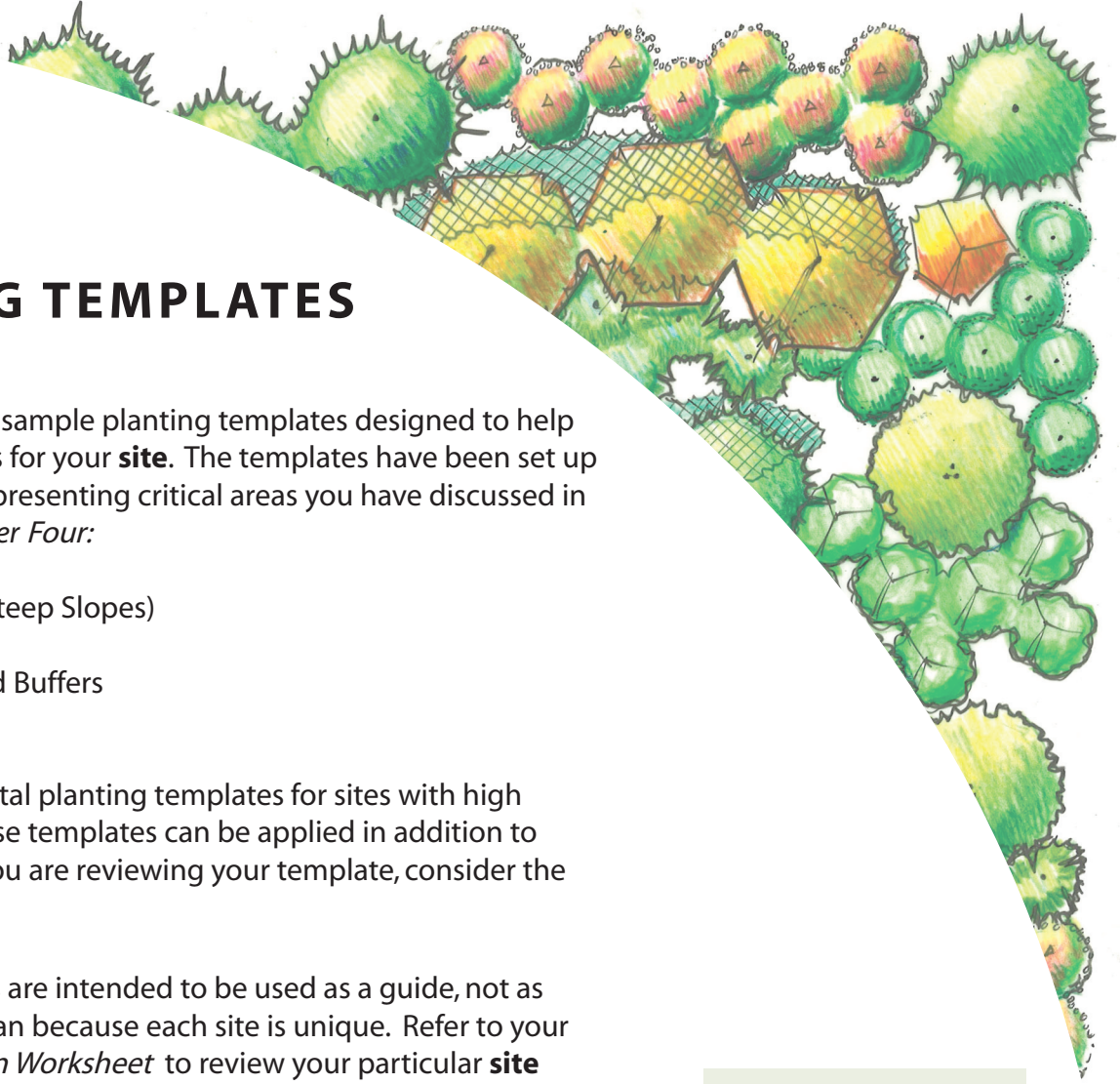
Watering – A scheduled application of water to vegetation for the purpose of supporting growth during dry periods.

Weeding – Removing invasive weeds or other unwanted plants, such as competing weeds at the base of other plants, usually by hand.

Wetlands – Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions.

Appendix B

PLANTING TEMPLATES



THE PLANTING TEMPLATES

In this appendix you will find sample planting templates designed to help you select and arrange plants for your **site**. The templates have been set up on a sixty foot square grid representing critical areas you have discussed in *Chapters One* through *Chapter Four:*

Geological Hazards (Steep Slopes)
Shorelines
Wetlands and Wetland Buffers
Stream Buffers

Also included are supplemental planting templates for sites with high invasive weed coverage. These templates can be applied in addition to your main template. While you are reviewing your template, consider the following:

◊ Remember, the templates are intended to be used as a guide, not as a stand-alone planting plan because each site is unique. Refer to your completed *Site Evaluation Worksheet* to review your particular **site conditions** before completing your planting plan.

◊ Look at the way the plants are arranged on the template. Do you find certain plant species closer to the water's edge and other plant species farther away? The planting templates have been designed to keep in mind each plant's preference for wetter or drier conditions. Some plants are find in both circumstances, as these plants are considered highly adaptable. Try to mimic the relationships shown as much as possible in your planting plans and refer to the *Master Plant List* in *Appendix C* for additional information about each plant species.

◊ Is your site sunny or shady? Most templates have a *sun legend* and a *shade legend*. Be sure to choose the appropriate legend for your site.

◊ Are you an experienced plant professional? Refer to the *Master Plant List* in *Appendix C* for possible plant substitutions. If substituting, make sure the ecology is the same for the plant template choice and the substitution (a column in the *Master Plant List*).

On the next page you will find a list of the templates included in this appendix.

How many plants do I need?

As a general rule, when planting 1,000 square feet, you will need an average of :

- ***8 trees** at 12-foot on center spacing,*
- ***30 shrubs** at 6-foot on center spacing, and*
- ***285 groundcovers or perennials** at 2-foot on center spacing.*

Adjust numbers of planting according to your site conditions.

MAIN TEMPLATES

TEMPLATE A **Geological Hazards**

1. *(Steep Slope) Planting Template for Sunny & Shady sites*

TEMPLATE B **Shorelines**

1. *Naturalistic Planting Template for Sunny & Shady sites*
2. *View Sensitive Template for Sunny & Shady sites*

TEMPLATE C **Wetlands and Wetland Buffers**

1. *Naturalistic Planting Template for Sunny & Shady sites*
2. *View Sensitive Template for Sunny & Shady sites*

TEMPLATE D **Stream Buffers**

1. *Gentle Slope Planting Template (Sunny sites)*
2. *Gradual Slope Planting Template for Sunny & Shady sites*
3. *Steep Slope Planting Template for Sunny & Shady sites*
4. *Terraced Planting Template for Sunny & Shady sites*

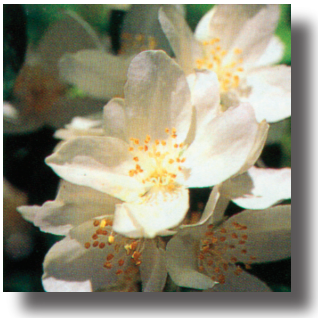
SUPPLEMENTAL TEMPLATES

TEMPLATE E **Invasive Weeds**

1. *Wet Sites with invasive weeds Planting Template for Sunny & Shady sites*
2. *Dry Sites with invasive weeds Planting Template for Sunny & Shady sites*

Oceanspray

Thimbleberry



Mock Orange

Douglas-fir

Geological Hazards

Steep Slope Planting Template

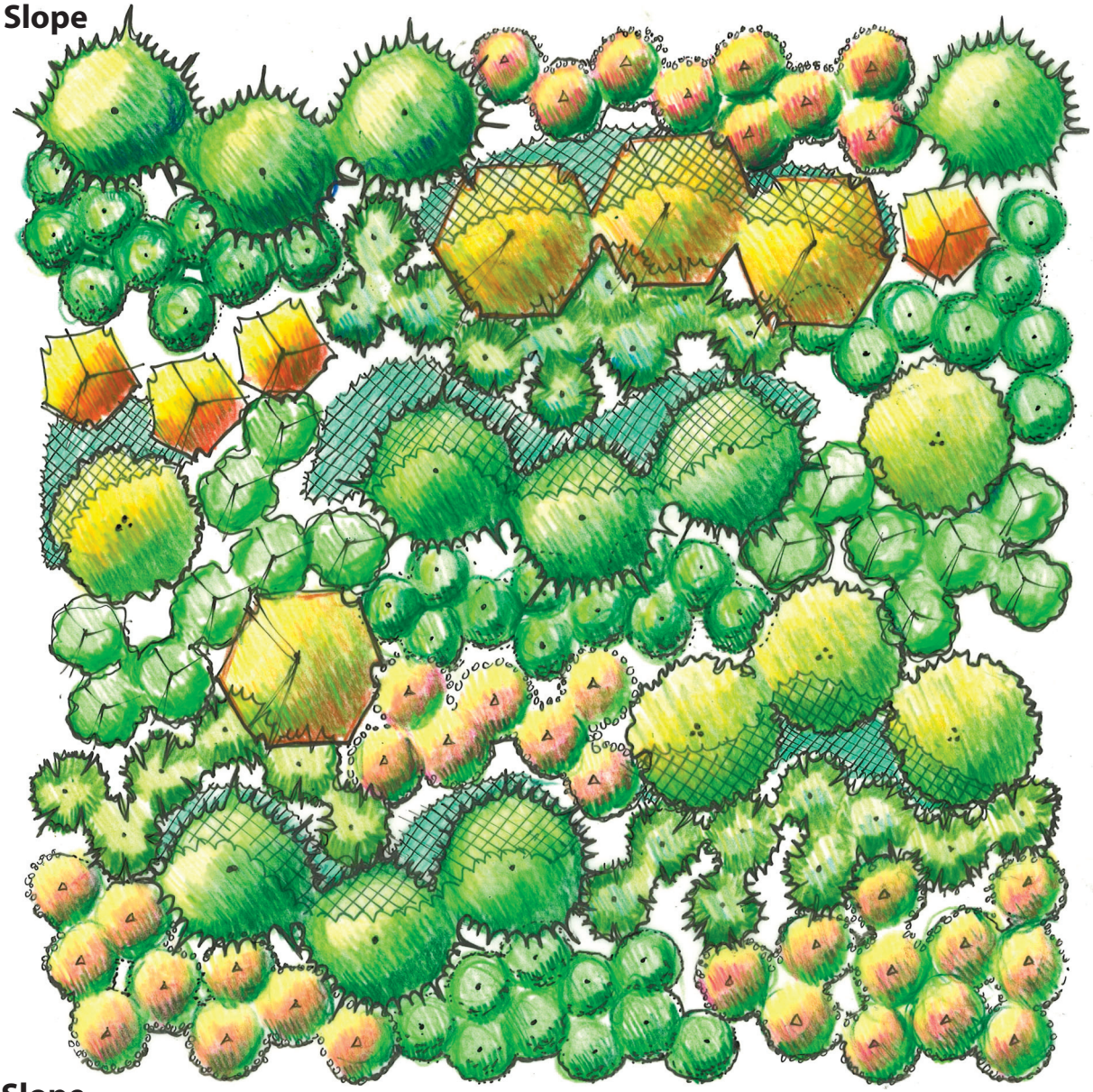
for ***Sunny*** and ***Shady*** Sites

A1

GEOLOGICAL HAZARDS (STEEP SLOPE) PLANTING TEMPLATE

60' X 60' TYPICAL PLANTING

Top of Slope



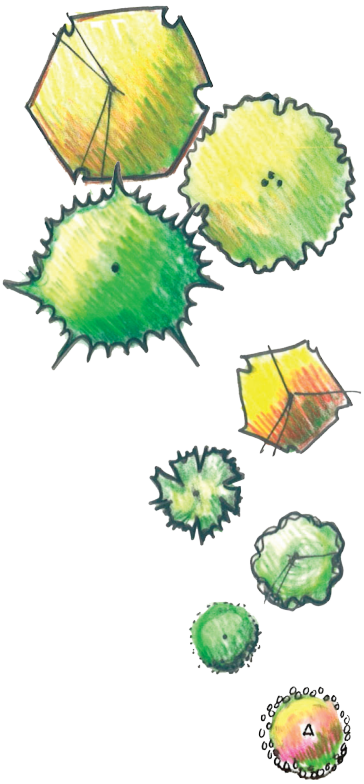
Toe of Slope

SCALE 1"=10'

0 5 10

Steep slopes commonly have fragile, erodible soils. Planting can be difficult to establish in these areas as gravity, wind, and rain have a tendency to pull nutrient-rich soil down the slope. In addition, sunny sites require drought-tolerant plants, while both sunny and shady sites require plants with strong, root systems to keep soil intact. On the next two pages you will find one legend designed for sunny, steep sites and one designed for shady, steep sites. The plants chosen for these templates are known for drought tolerance and soil-binding characteristics. With the successful establishment of plants on steep slopes, the potential for erosion decreases. For additional information on Steep Slopes, refer to the section on *Geological Hazard Areas* in *Chapter One* and the City's Critical Areas Ordinance. Note, these templates are to be used for stable and undisturbed sloping sites. If your site has experienced a landslide or substantial erosion, do not use this template; consult a professional.

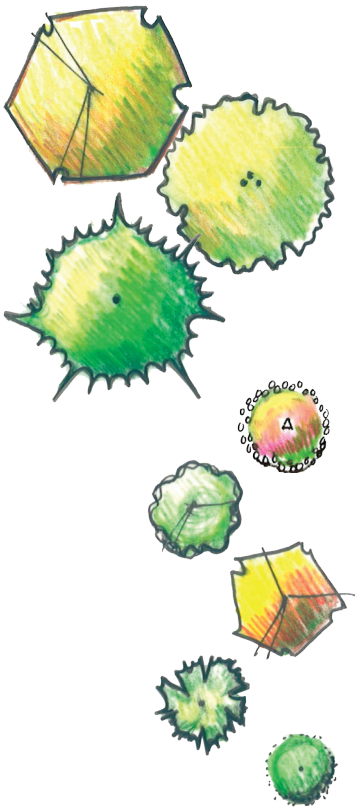
PLANT LEGEND FOR SUNNY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Acer macrophyllum/ Big-leaf maple	9 feet on center/ 75 feet	Yellow fall color, provides understory shade, largest leaf of all maples
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Pseudotsuga menziesii/ Douglas-fir	9 feet on center/ 100 feet	Highly adaptable, fast grower
SHRUBS		
Corylus cornuta/ Beaked hazelnut	6 feet on center/ 11 feet	Edible acorn, wildlife food. Small understory tree, yellowish fall color
Holodiscus discolor/ Oceanspray	4.5 feet on center/ 7 feet	Spectacular blossom; attracts hummingbirds and butterflies
Philadelphus lewisii/ Mock orange	4.5 feet on center/ 8 feet	Fragrant white blossom
Rubus parviflorus/ Thimbleberry	4 feet on center/ 8 feet	Delicious edible berries, fast grower, likes sun
Symphoricarpos albus/ Snowberry	4.5 feet on center/ 5 feet	White berries, proven performer in tough conditions
GROUNDCOVERS & PERENNIALS		
Arctostaphylos uva-ursi/ Kinnikinnick	*24 in. on center/ 6-8 in.	Evergreen groundcover, great for rockeries and full sun areas
Fragaria chiloensis/ Coastal strawberry	*24 in. on center/ 4-6 in.	Tough, highly adaptable groundcover w/ red stems and edible berries
Festuca idahoensis/ Idaho fescue	*24 in. on center/ 2.5 feet	Bluish leaves, clumping
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable
Epilobium angustifolium/ Fireweed	*24 in. on center/ 1.5-2 feet	Big purple flowers on a tall stem

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Acer macrophyllum/ Big-leaf maple	9 feet on center/ 75 feet	Yellow fall color, provides understory shade, largest leaf of all maples
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Thuja plicata/ Western red cedar	9 feet on center/ 150 feet	Fragrant, adaptable to many sites
SHRUBS		
Acer circinatum/ Vine maple	4.5 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Amelanchier alnifolia/ Western serviceberry	4.5 feet on center/ 20 feet	Fragrant flowers, edible red to purple berries
Corylus cornuta/ Beaked hazelnut	6 feet on center/ 11 feet	Edible acorn, wildlife food, small understory tree, yellowish fall color
Oemleria cerasiformis/ Osoberry	4.5 feet on center/ 10 feet	Berries attract birds, first shrub to leaf out in spring
Sambucus racemosa/ Red elderberry	4 feet on center/ 15 feet	Edible berries, fast grower, graceful form with age
GROUNDCOVERS & PERENNIALS		
Arctostaphylos uva-ursi/ Kinnikinnick	*24 in. on center/ 6-8 in.	Evergreen groundcover, great for rockeries and full sun areas
Asarum caudatum/ Wild ginger	*24 in. on center/ 6-8 in.	Tough groundcover, great for planting under shrubs and trees
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

A1-Shade

Baldhip Rose

Bitter Cherry

Lady Fern

Hairgrass

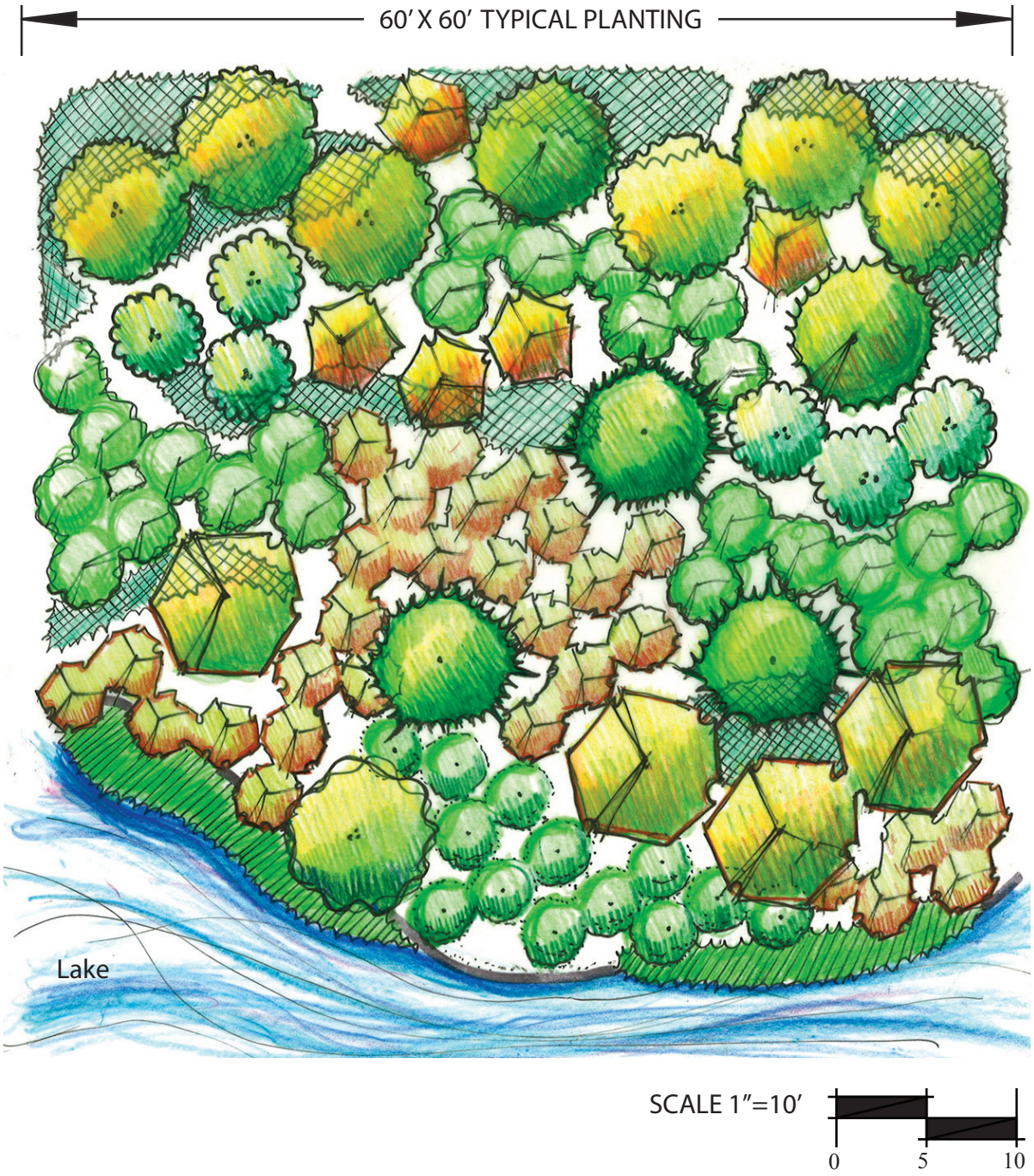
Shoreline

Naturalistic Planting Template

for ***Sunny*** and ***Shady*** Sites

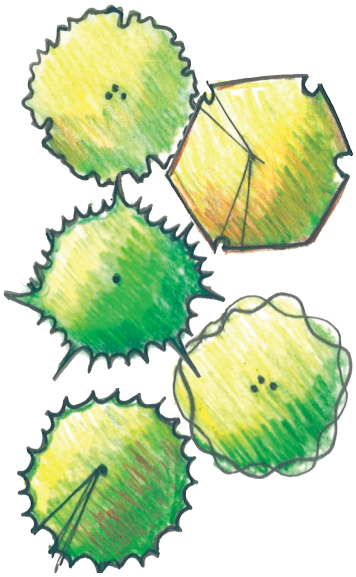
B1

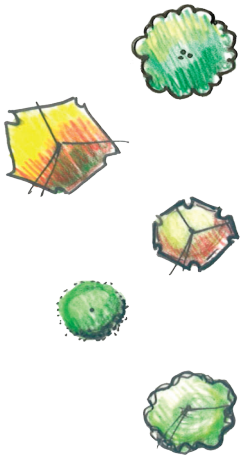
SHORELINE NATURALISTIC PLANTING TEMPLATE

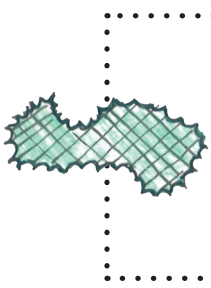


Shorelines in the City of Bellevue present a unique ecology due to behavior of lakes (for stream shorelines, refer to the *Stream Buffer Planting Templates* later in this appendix). In order for plants to thrive in these areas, they must be adapted to the rise and fall of lake water level, high groundwater table, wave action, and lake wind. For most sites, the soil moisture content dries out quickly as you move away from the lake, so plants farther from the shore should be adapted to drier conditions. It is in these unique ecologic zones that shore birds and fish thrive by utilizing the protection and food sources that shoreline vegetation provides (see the section on *Shorelines* in *Chapter One* and the City's Critical Areas Ordinance for additional information). The plants chosen for this template have been selected due to their ability to survive fluctuating water levels and provide habitat for wildlife.

PLANT LEGEND FOR SUNNY SITES





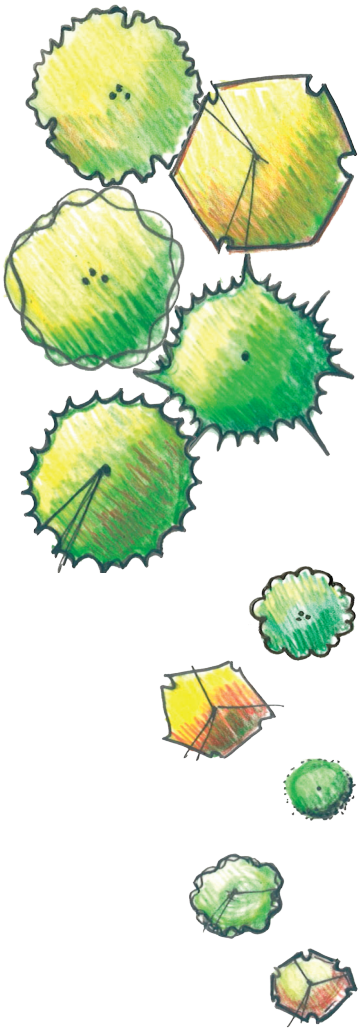


LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Betula papyrifera/ Paper birch	9 feet on center/ 6 feet	Beautiful white peeling bark, bright yellow fall color, catkins
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Picea sitchensis / Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round
Salix lasiandra/ Pacific willow	9 feet on center/ 30 feet	Catkins, fast grower, stabilizes banks, large mature form
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Amelanchier alnifolia/ Serviceberry	6 feet on center/ 20 feet	Fragrant flowers, edible red to purple berries
Crataegus douglasii/ Black hawthorn	6 feet on center/ 20 feet	Wildlife food, small tree
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring, berries in summer
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Rosa pisocarpa/ Clustered rose	4.5 feet on center/ 5 feet	Wild rose, pink flowers, bright red rosehips
GROUNDCOVERS & PERENNIALS		
Aquilegia formosa/ Western columbine	*18 in. on center/ 12 in.	Delicate pendulous flowers, like sun
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Deschampsia caespitosa/ Tufted hairgrass	*24 in. on center/ 2 feet	Ornamental-like clumping grass
Lupinus polyphyllus/ Large-leaved lupine	*18 in. on center/ 18 in. tall	Showy lupine, tolerates sun and dry soils
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown.*
See page 23 for triangular spacing.

B1-Sun

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Betula papyrifera/ Paper birch	9 feet on center/ 6 feet	Beautiful white peeling bark, bright yellow fall color, catkins
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Malus fusca/ Pacific crabapple	9 feet on center/ 50 feet	Blossoms in spring, early bloomer, fragrant, wildlife food
Picea sitchensis / Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Acer circinatum/ Vine maple	6 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Oemleria cerasiformis/ Osoberry	6 feet on center/ 10 feet	Berries attract birds, first shrub to leaf out in spring
Ribes bracteosum/ Stink currant	4 feet on center/ 8 feet	Clusters of purple fruit, spicy scented leaves, loves moist shade
Rosa nutkana/ Nootka rose	4.5 feet on center/ 8 feet	Wild rose, pink flowers, bright red rosehips
Rubus spectabilis/ Salmonberry	4 feet on center/ 11 feet	Edible berries, orange stems, fast grower, can form thickets
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Deschampsia caespitosa/ Tufted hairgrass	*24 in. on center/ 2 feet	Ornamental-like clumping grass
Gaultheria shallon/ Salal	*24 in. on center/ 5 feet if not trimmed	Glossy foliage year-round, bell-shaped pinkish white flowers
Oxalis oregana/ Redwood sorrel	*24 in. on center/ 1 foot	Great shade-loving ground cover, clover-shaped leaves, white flowers
EMERGENTS		
Carex obnupta/ Slough sedge	12 in. on center/ 4.5 feet	Ornamental quality, wide dark green leaves
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

B1-Shade

Red-osier Dogwood

Western Serviceberry

Dull Oregon Grape

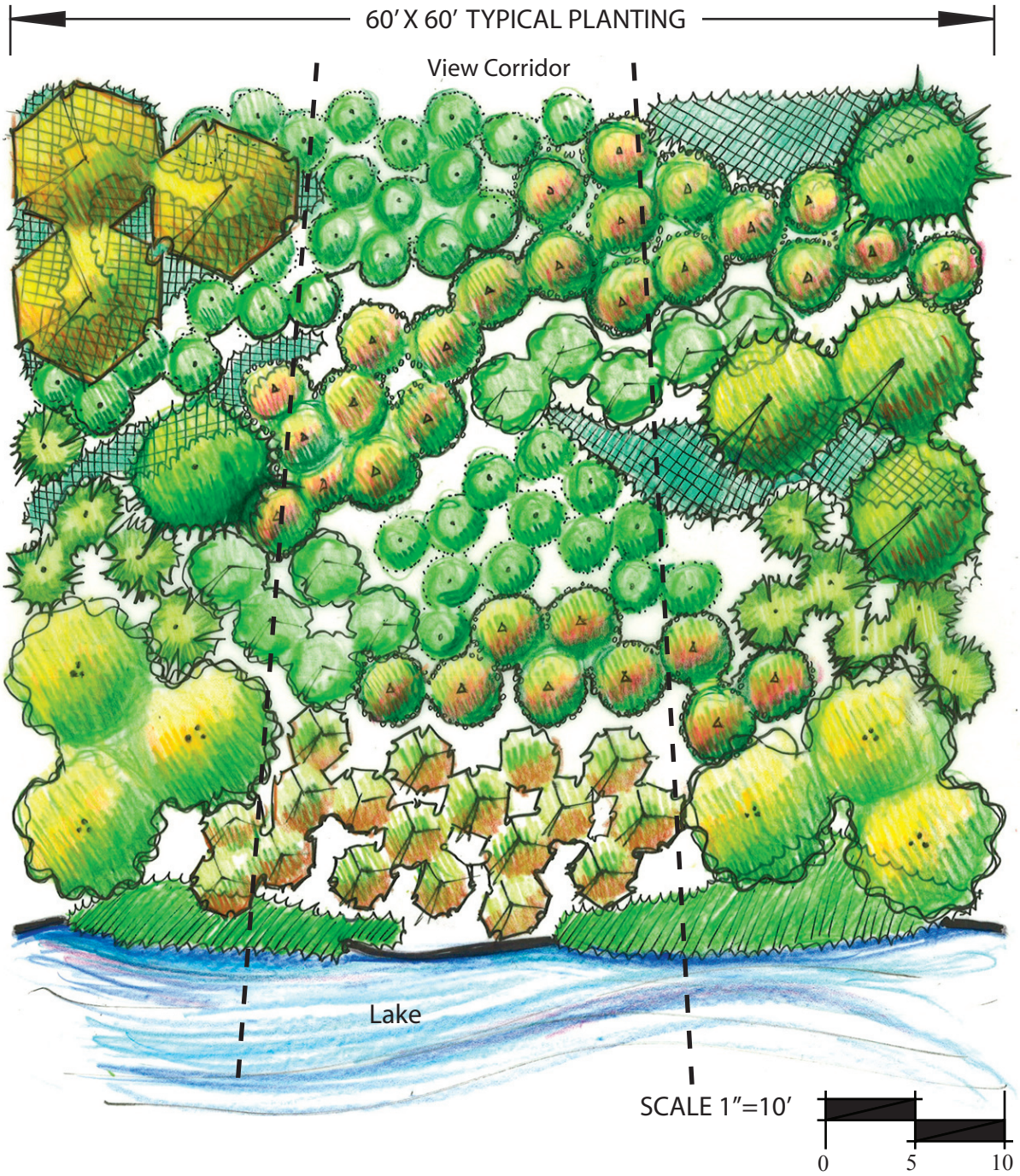
Lady Fern

Shoreline

View Sensitive Planting Template
for ***Sunny*** and ***Shady*** Sites

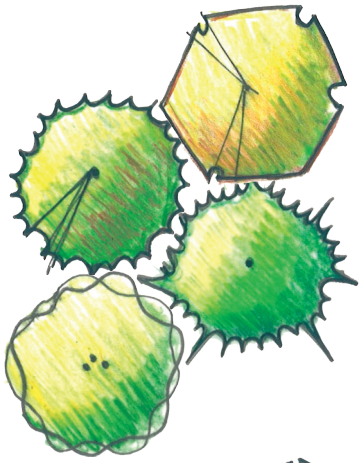
B2

SHORELINE VIEW SENSITIVE PLANTING TEMPLATE



While many of the design constraints presented in *Template B1 (Shoreline, Natural)* still apply, such as fluctuating lake water levels, wave action, and lake winds, the design of planting in these areas might differ if maintaining view corridors is important. Areas that are view sensitive are often more steep, so the plants need not be as moisture-adapted except in flatter areas along the shoreline. The plants in this template have been selected specifically for these conditions and have been arranged with large trees and shrubs clustered towards outer edges, outside of the view corridor. Note, this planting template assumes the site is sloping and some of the larger shrubs would still allow for views due to topography. If your site is not sloping, you may need to select shorter plants. For more information about shorelines, refer to the section on *Shorelines* in *Chapter One* and the City's Critical Areas Ordinance.

PLANT LEGEND FOR SUNNY SITES

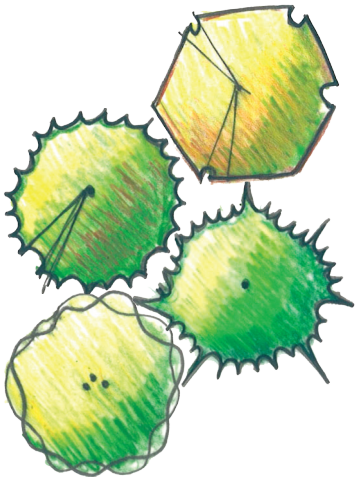


LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Pinus contorta var. contorta/ Shore pine	9 feet on center/ 45 feet	Interesting form on lakeshores, wildlife food
Pseudotsuga menziesii/ Douglas-fir	9 feet on center 150 feet	Highly adaptable, fast grower
Salix scouleriana/ Scouler's willow	9 feet on center/ 30 feet	Highly adaptable, wet or seasonally dry sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring berries in summer
Holodiscus discolor/ Oceanspray	4.5 feet on center/ 7 feet	Spectacular blossom; attracts hummingbirds and butterflies
Philadelphus lewisii/ Mock orange	4.5 feet on center/ 8 feet	Fragrant white blossom
Rubus parviflorus/ Thimbleberry	3.5 feet on center/ 8 feet	Delicious edible berries, fast grower, likes sun
Symphoricarpos albus/ Snowberry	4.5 feet on center/ 5 feet	White inedible berries, proven performer in tough conditions
GROUNDCOVERS & PERENNIALS		
Arctostaphylos uva-ursi/ Kinnikinnick	*24 in. on center/ 6-8 in.	Evergreen groundcover, great for rockeries and full sun areas
Deschampsia caespitosa/ Tufted hairgrass	*24 in. on center/ 2 feet	Ornamental-like clumping grass
Fragaria chiloensis/ Coastal strawberry	*24 in. on center 4-6 in.	Tough, highly adaptable groundcover w/ red stems
Festuca idahoensis/ Idaho fescue	*24 in. on center 2.5 feet	Bluish leaves, clumping
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

B2-Sun

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Picea sitchensis / Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
Rhamnus purshiana/ Cascara	9 feet on center/ 20 feet	Fall color, small understory tree, horizontal branching
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Acer circinatum/ Vine maple	6 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Amelanchier alnifolia/ Western serviceberry	4.5 feet on center/ 20 feet	Fragrant flowers, edible red to purple berries
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring, berries in summer
Mahonia nervosa/ Dull Oregon grape	3.5 feet on center/ 5 feet	Cluster of edible dark purple berries, bright yellow spring flowers
Symphoricarpos albus/ Snowberry	4.5 feet on center/ 5 feet	White berries, proven performer in tough conditions
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Caltha palustris/ Yellow marsh-marigold	*18 in. on center/ 1.5 feet	Good aquatic plant, big yellow flowers
Epilobium ciliatum/ Watson's willowherb	*24 in. on center/ 2 feet	Similar in form to fireweed, but with hairy flowers
Maianthemum dilatatum/ Lily-of-the-valley	*18 in. on center/ 1 foot	Groundcover, small white False flowers, late to emerge in spring
EMERGENTS		
Carex obnupta/ Slough sedge	12 in. on center/ 4.5 feet	Ornamental quality, wide dark green leaves
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

B2-Shade

Pacific Ninebark

Hardstem Bulrush

Sitka Spruce

Highbush Cranberry

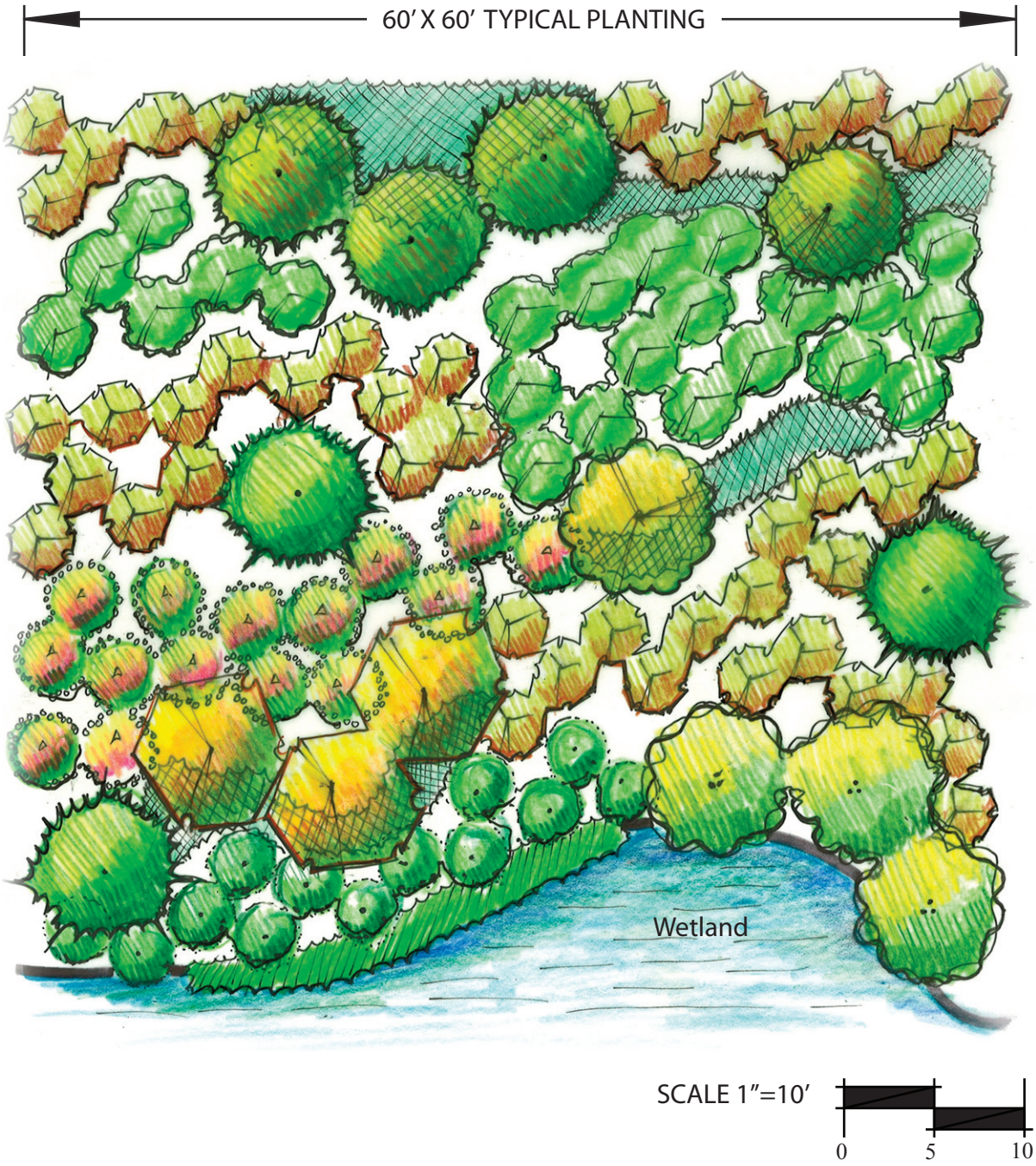
Wetland & Wetland Buffer

Naturalistic Planting Template

for ***Sunny*** and ***Shady*** Sites

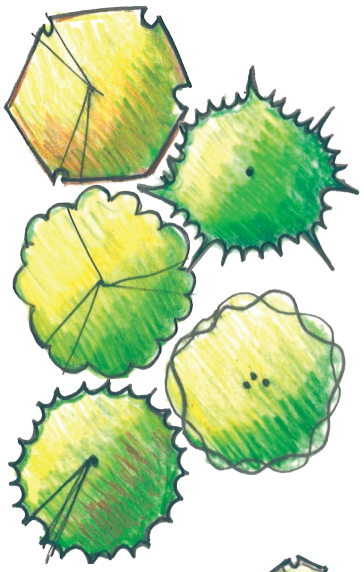
C1

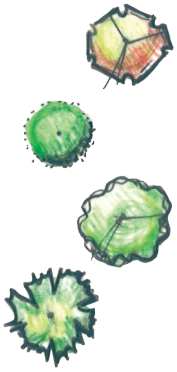
WETLAND & WETLAND BUFFER NATURALISTIC PLANTING TEMPLATE

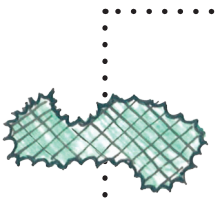


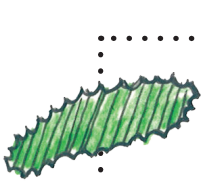
Similar to shorelines, wetland areas can be subject to fluctuating water levels and provide habitat for wildlife. Refer to the section on *Wetlands* in *Chapter One* and the City's Critical Areas Ordinance for more information. Planting in wetlands or in areas adjacent to wetland boundaries must be tolerant of inundation and soil saturation. However, the further you get from the wetland boundary, the more drought-adapted the species must be. Plants in this template that are found closer to the wetland boundary are able to handle inundation and wet soil, while plants farther away from the boundary (shown) are suited to drier conditions.

PLANT LEGEND FOR SUNNY SITES







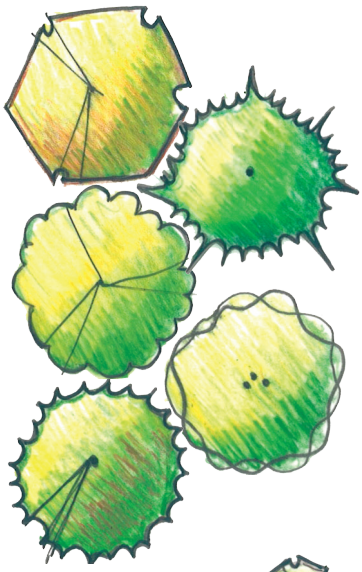


LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Picea sitchensis/ Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round wildlife food
Populus trichocarpa/ Black cottonwood	9 feet on center/ 150 feet	Fast grower, provides cover for other plants
Salix lasiandra/ Pacific willow	9 feet on center/ 30 feet	Catkins, fast grower, stabilizes banks, large mature form
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring berries in summer
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Rosa pisocarpa/ Clustered rose	4.5 feet on center/ 5 feet	Wild rose, pink flowers, bright red rosehips
Spiraea douglasii/ Hardhack	4.5 feet on center/ 6 feet	Vigorous grower in wet places, pink flowers
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Lupinus polyphyllus/ Large-leaved lupine	*18 in. on center/ 18 in.	Showy lupine, tolerates sun and dry soils
Mimulus guttatus/ Yellow monkey-flower	*18 in. on center/ 18 in.	Trumpet-shaped bright yellow flowers
Stachys cooleyae/ Cooley's hedge nettle	*24 in. on center/ 5 feet	Looks like nettle, but no stinging, red flowers on an erect stalk
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

C1-Sun

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Malus fusca/ Pacific crabapple	9 feet on center/ 50 feet	Blossoms in spring, early bloomer, fragrance, wildlife food
Picea sitchensis/ Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round wildlife food
Salix lasiandra/ Pacific willow	9 feet on center/ 30 feet	Catkins, fast grower, stabilizes banks, large mature form
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring berries in summer
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Rosa nutkana/ Nootka rose	4.5 feet on center/ 8 feet	Wild rose, pink flowers, bright red rosehips
Viburnum edule/ Highbush cranberry	4.5 feet on center/ 9 feet	Vigorous grower in wet places, great fall color, red cherry-like fruits
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Caltha palustris/ Yellow marsh-marigold	*18 in. on center/ 1.5 feet	Good aquatic plant, big yellow flowers
Lysichiton americanum/ Skunk cabbage	*24 in. on center/ 3 feet	Huge yellow flower, showy, needs permanently wet soils
Viola glabella/ Stream violet	*18 in. on center/ 8 in.	Yellow flowers, grows in wet soils
EMERGENTS		
Carex obnupta/ Slough sedge	12 in. on center/ 4.5 feet	Ornamental quality, wide dark green leaves
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

C1-Shade

Western Red Cedar

False Lily-of-the-Valley

Twinberry

Vine Maple

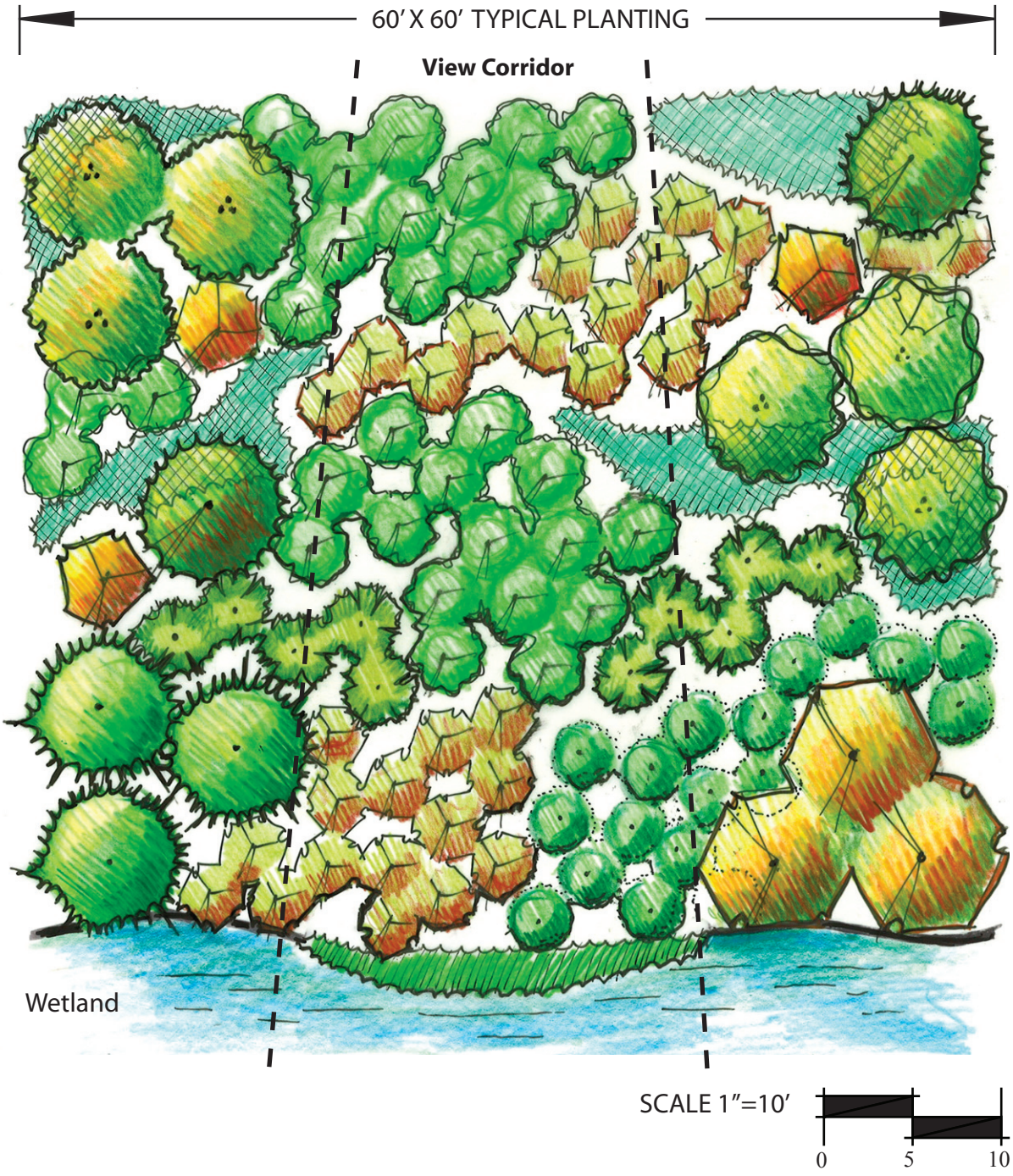
Wetland & Wetland Buffer

View Sensitive Planting Template

for ***Sunny*** and ***Shady*** Sites

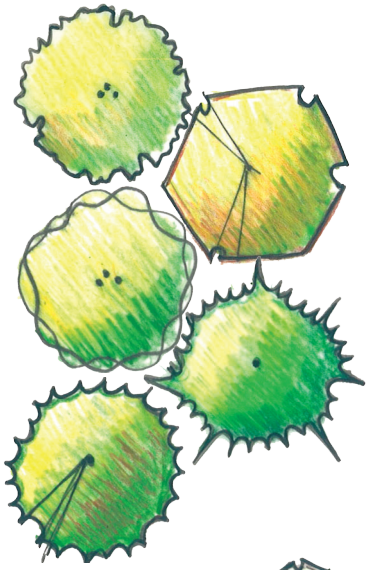
C2

WETLAND & WETLAND BUFFER VIEW SENSITIVE PLANTING TEMPLATE



Like *Template C1, Wetland and Wetland Buffer, Natural*, planting in wetlands or adjacent to wetland boundaries must be tolerant of inundation and soil saturation. For this template, plants are arranged to maintain the view corridor. Note, this planting template assumes the site is sloping and some of the larger shrubs would still allow for views due to topography. If your site is not sloping, you may need to select shorter plants. For additional information on wetlands, refer to the section on *Wetlands* in *Chapter One* and the City's Critical Areas Ordinance.

PLANT LEGEND FOR SUNNY SITES

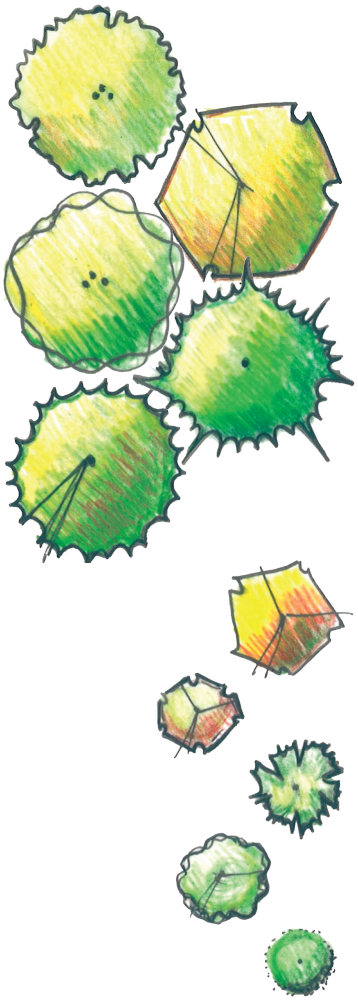


LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Malus fusca/ Pacific crabapple	9 feet on center/ 50 feet	Blossoms in spring, early bloomer, fragrant, wildlife food
Picea sitchensis/ Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round wildlife food
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring berries in summer
Crataegus douglasii/ Black hawthorn	6 feet on center/ 20 feet	Wildlife food, small tree
Lonicera involucrata/ Black twinberry	4.5 feet on center/ 8 feet	Attractive yellow/red flowers with dark twinberries
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Rosa pisocarpa/ Clustered rose	4.5 feet on center/ 5 feet	Wild rose, pink flowers, bright red rosehips
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Geum macrophyllum/ Large-leaved avens	*24 in. on center/ 18 in.	Saucer-shaped yellow flowers on tall stems, up to 42"
Lupinus polyphyllus/ Large-leaved lupine	*18 in. on center/ 18 in.	Showy lupine, tolerates sun and dry soils
Stachys cooleyae/ Cooley's hedge nettle	*24 in. on center/ 5 feet	Looks like nettle, but no stinging, red flowers on an erect stalk
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

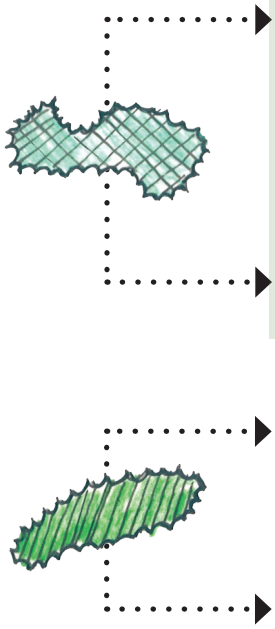
* *Indicates plants are to be triangularly spaced for the area shown.*
See page 23 for triangular spacing.

C2-Sun

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Malus fusca/ Pacific crabapple	9 feet on center/ 50 feet	Blossoms in spring, early bloomer, fragrant, wildlife food
Prunus emarginata/ Bitter cherry	9 feet on center/ 40 feet	Blossoms in spring, red edible berries in summer, wildlife food
Salix sitchensis/ Sitka willow	9 feet on center/ 20 feet	Large oval leaves
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Acer circinatum/ Vine maple	6 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring berries in summer
Lonicera involucrata/ Black twinberry	4.5 feet on center/ 8 feet	Attractive yellow/red flowers with dark twinberries
Rosa nutkana/ Nootka rose	4.5 feet on center/ 8 feet	Wild rose, pink flowers, bright red rosehips
Ribes bracteosum/ Stink currant	4 feet on center/ 8 feet	Clusters of purple fruit, spicy-scented leaves, loves moist shade
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Caltha palustris/ Yellow marsh-marigold	*18 in. on center/ 1.5 feet	Good aquatic plant, big yellow flowers
Epilobium ciliatum/ Watson's willowherb	*24 in. on center/ 2 feet	Similar in form to fireweed, but with hairy flowers
Maianthemum dilatatum/ False lily-of-the-valley	*18 in. on center/ 1 foot	Groundcover, small white flowers, late to emerge in spring
EMERGENTS		
Carex obnupta/ Slough sedge	12 in. on center/ 4.5 feet	Ornamental quality, wide dark green leaves
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom



* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

C2-Shade

Paper Birch

Western Iris

Small-fruited Bulrush

Western Red Cedar

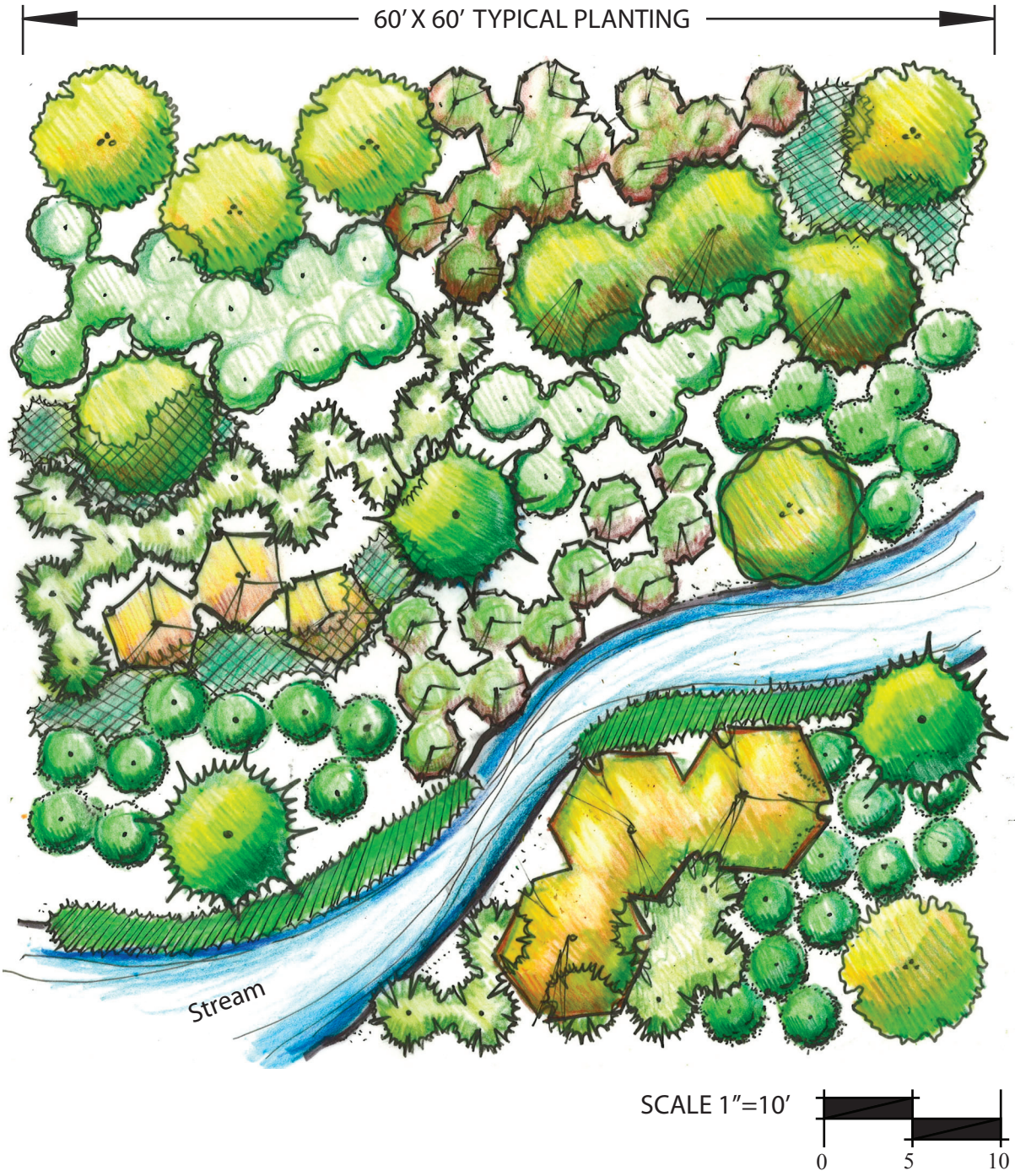
Stream Buffer

Gentle Slope Planting Template

for ***Sunny*** Sites

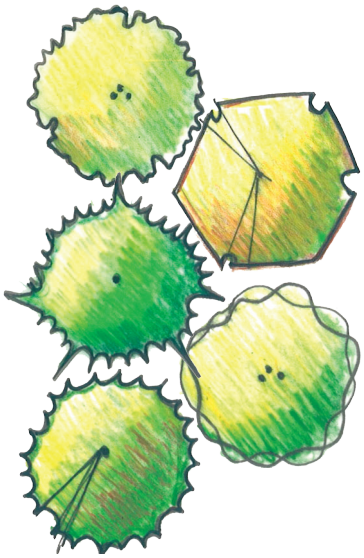
D1

STREAM BUFFER GENTLE SLOPE PLANTING TEMPLATE FOR SUNNY SITES



Streams with relatively flat side slopes are more susceptible to stream migration and adjacent areas are often subject to flooding. As the stream adjusts to varying sediment loads, storms, and flood events, over time it will vary its course to find the path of least resistance. See the Section on *Streams* in *Chapter One* and the City's Critical Areas Ordinance for additional information. Therefore, plants adjacent to the stream must be able to tolerate fluctuating water levels and must be adapted to periods of inundation. These areas are often sunny, so the plants chosen for this template are tolerant of full sun and moisture.

PLANT LEGEND



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Betula papyrifera/ Paper birch	9 feet on center/ 6 feet	Beautiful white peeling bark, bright yellow fall color, catkins
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Picea sitchensis/ Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round wildlife food
Salix lasiandra/ Pacific willow	9 feet on center/ 30 feet	Catkins, fast grower, stabilizes banks, large mature form
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flower in spring berries in summer
Crataegus douglasii/ Black hawthorn	6 feet on center/ 20 feet	Wildlife food, small tree
Lonicera involucrata/ Black twinberry	4.5 feet on center/ 8 feet	Attractive yellow/red flowers with dark twinberries
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Rosa pisocarpa/ Clustered rose	4.5 feet on center/ 5 feet	Wild rose, pink flowers, bright red rosehips
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Iris tenax/ Western iris	*24 in. on center/ 1 foot	Big blue/purple and yellow flowers, tolerates wet soils, sun
Aster subspicatus/ Douglas aster	*24 in. on center/ 2.5 feet	Blue to purple ray-type flowers
Stachys cooleyae/ Cooley's hedge nettle	*24 in. on center/ 5 feet	Looks like nettle, but no stinging, red flowers on an erect stalk
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown.*
See page 23 for triangular spacing.

D1

Sword Fern

Dagger-leaf Rush

Elderberry

Wild Ginger

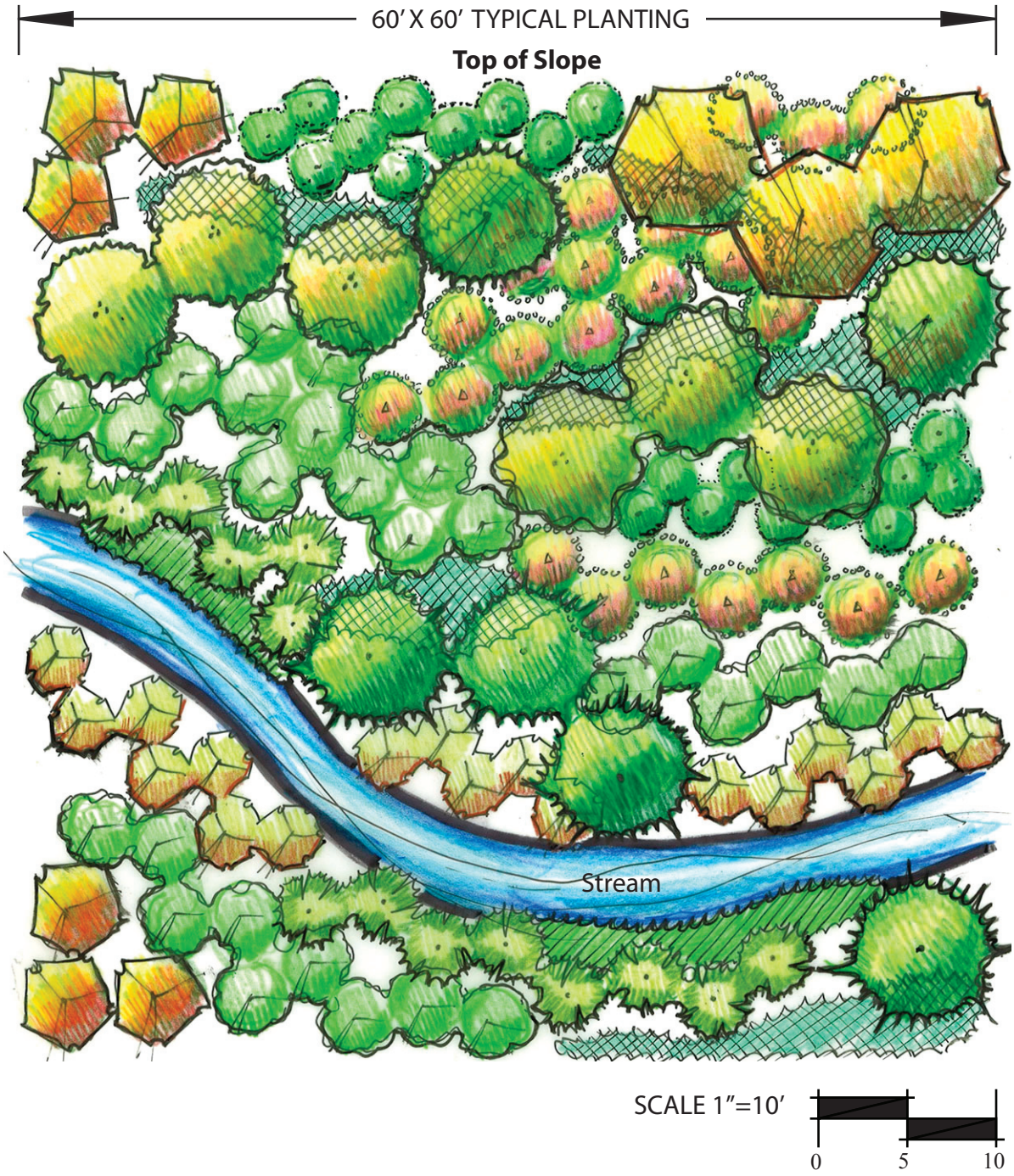
Stream Buffer

Gradual Slope Planting Template

for ***Sunny*** and ***Shady*** Sites

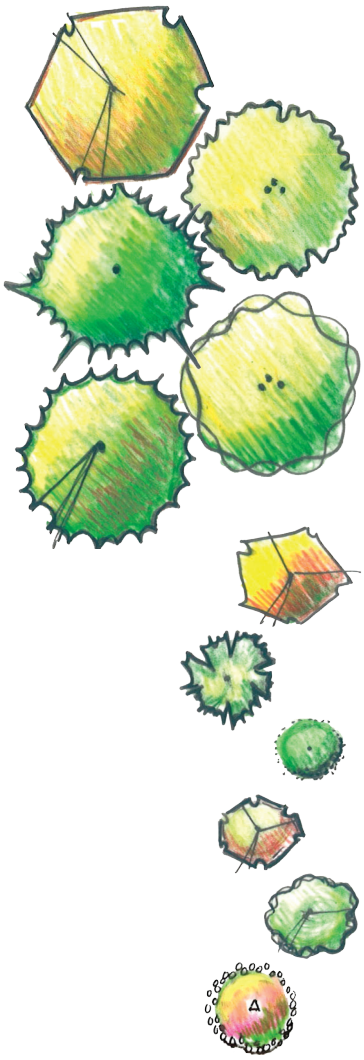
D2

STREAM BUFFER GENTLE SLOPE PLANTING TEMPLATE



Unlike flat stream banks, areas adjacent to streams that are gradually sloping are less susceptible to inundation or flooding. During high flood events, streams may "jump" their banks, so the plants directly adjacent to the stream must be adapted to handle flash flood events, while the plants farther away from stream need to be more tolerant of drier conditions. See the Section on *Streams* in *Chapter One* and the City's Critical Areas Ordinance for additional information.

PLANT LEGEND FOR SUNNY SITES

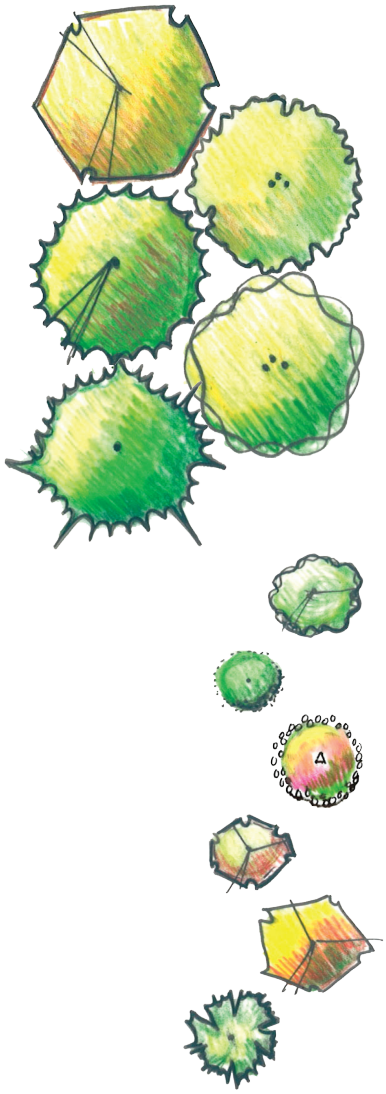


LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Acer macrophyllum/ Big-leaf maple	9 feet on center/ 75 feet	Yellow fall color. Provides understory shade, largest leaf of all maples
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Picea sitchensis/ Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round wildlife food
Prunus emarginata/ Bitter cherry	9 feet on center/ 40 feet	Blossoms in spring, red edible berries in summer, wildlife food
Pseudotsuga menziesii/ Douglas-fir	9 feet on center/ 150 feet	Highly adaptable, fast grower
SHRUBS		
Corylus cornuta/ Beaked hazelnut	6 feet on center/ 11 feet	Edible acorn, wildlife food. Small understory tree, yellowish fall color
Lonicera involucrata/ Black twinberry	4.5 feet on center/ 8 feet	Attractive yellow/red flowers with dark twinberries
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Rubus parviflorus/ Thimbleberry	4 feet on center/ 8 feet	Delicious edible berries, fast grower, likes sun
Rosa nutkana/ Nootka rose	4.5 feet on center/ 8 feet	Wild rose, pink flowers, bright red rosehips
Symphoricarpos albus/ Snowberry	4.5 feet on center/ 5 feet	White inedible berries, proven performer in tough conditions
GROUNDCOVERS & PERENNIALS		
Arctostaphylos uva-ursi/ Kinnikinnick	*24 in. on center/ 6-8 in.	Evergreen groundcover, great for rockeries and full sun areas
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable
Epilobium angustifolium/ Fireweed	*24 in. on center/ 1.5-2 feet	Big purple flowers on a tall stem
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown.*
See page 23 for triangular spacing.

D2-Sun

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Acer macrophyllum/ Big-leaf maple	9 feet on center/ 75 feet	Yellow fall color. Provides understory shade, largest leaf of all maples
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Rhamnus purshiana/ Cascara	9 feet on center/ 20 feet	Fall color, small understory tree, horizontal branching
Thuja plicata/ Western red cedar	9 feet on center/ 150 feet	Fragrant, adaptable to many sites
Tsuga heterophylla/ Western hemlock	9 feet on center/ 125 feet	Fairly dry to wet sites, shade tolerant
SHRUBS		
Cornus sericea/ Red-osier dogwood	4.5 feet on center/ 15 feet	Stem provides red color, white flower in spring ,berries in summer
Mahonia aquifolium/ Tall Oregon grape	3.5 feet on center/ 5 feet	Yellow flowers in Spring; edible dark purple berries
Oemleria cerasiformis/ Osoberry	4.5 feet on center/ 10 feet	Berries attract birds, first shrub to leaf out in spring
Ribes bracteosum/ Stink currant	3.5 feet on center/ 8 feet	Clusters of purple fruit, spicy-scented leaves, loves moist shade
Sambucus racemosa/ Red elderberry	6 feet on center/ 15 feet	Edible berries, fast grower, graceful form with age
Viburnum edule/ Highbush cranberry	4.5 feet on center/ 9 feet	Vigorous grower in wet places, great fall color, red cherry-like fruits
GROUNDCOVERS & PERENNIALS		
Arctostaphylos uva-ursi/ Kinnikinnick	*24 in. on center/ 6-8 in.	Evergreen groundcover, great for rockeries and full sun areas
Asarum caudatum/ Wild ginger	*24 in. on center/ 6-8 in.	Tough groundcover, great for planting under shrubs and trees
Oxalis oregana/ Redwood sorrel	*24 in. on center/ 1 foot	Great shade-loving groundcover, clover-shaped leaves, white flowers
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

D2-Shade

Red Alder

Pacific Bleeding Heart

Tall Oregon Grape

Snowberry

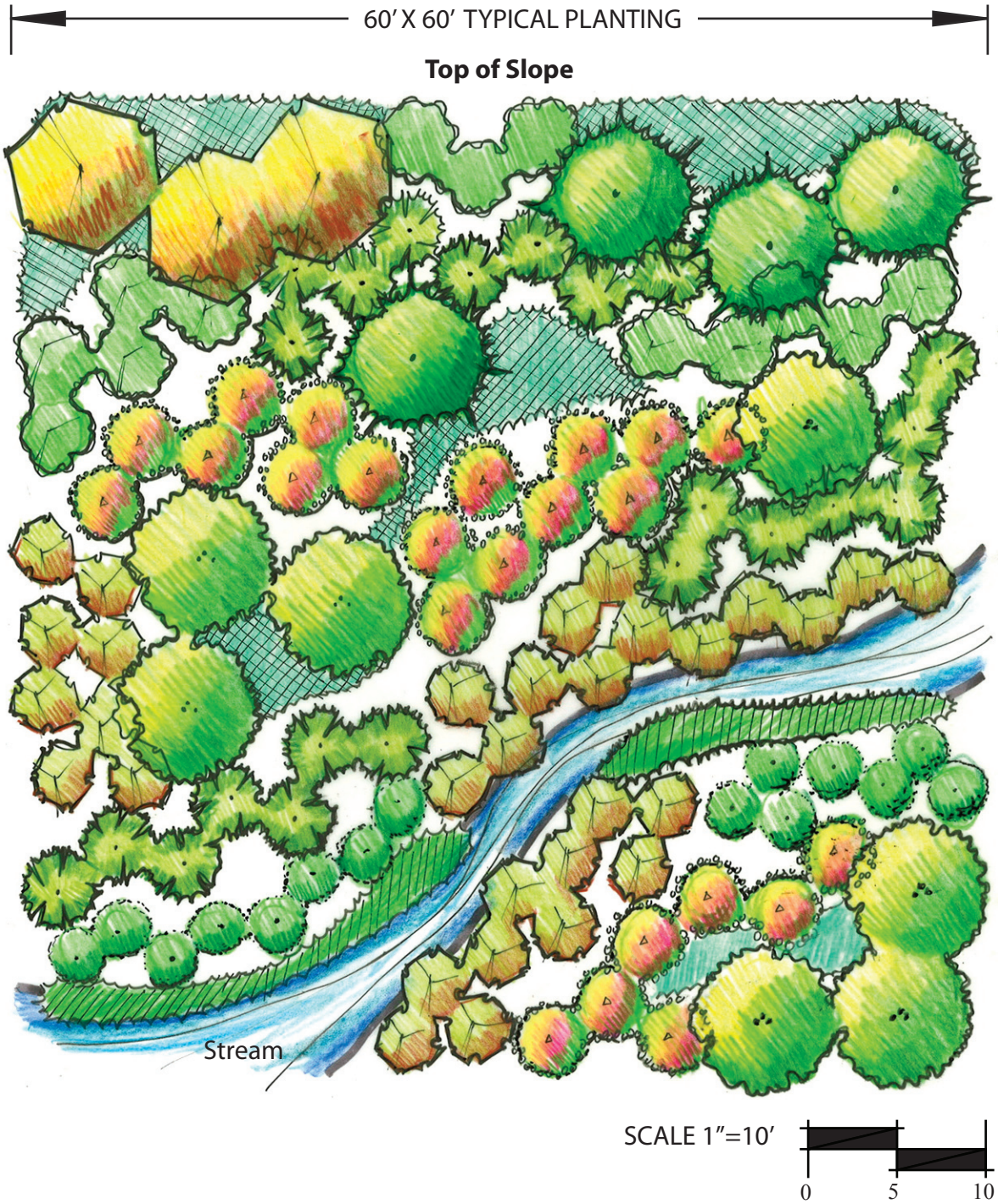
Stream Buffer

Steep Slope Planting Template

for ***Sunny*** and ***Shady*** Sites

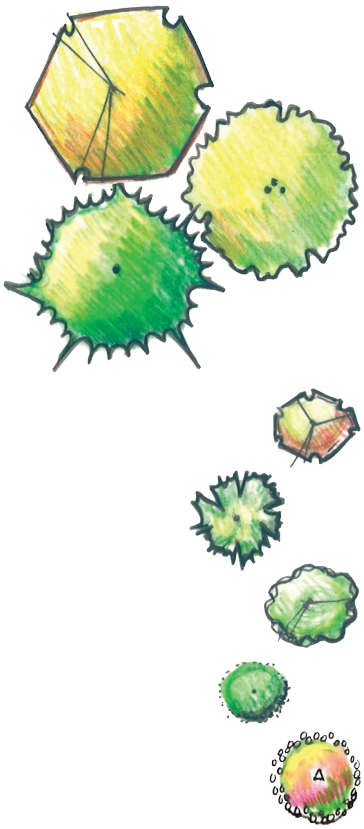
D3

STREAM BUFFER STEEP SLOPE PLANTING TEMPLATE



Streams with steep side slopes often have deeply incised channels. The likelihood of adjacent areas becoming inundated with water is low. (See the Section on *Streams* and *Steep Slopes* in *Chapter One* and the City's Critical Areas Ordinance for additional information. Thus the plants needed for these areas must be tolerant of dry conditions, and like the steep slope templates, must have soil-binding characteristics to help stabilize the stream's side slopes. The plants chosen for this template are known to be tolerant of these conditions.

PLANT LEGEND FOR SUNNY SITES

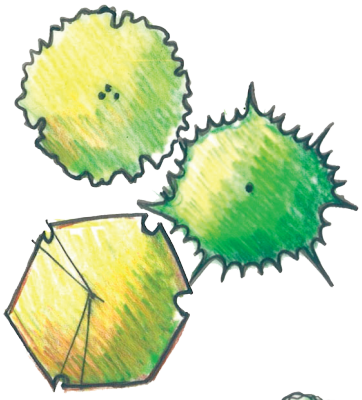


LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Acer macrophyllum/ Big-leaf maple	9 feet on center/ 75 feet	Yellow fall color. Provides understory shade, largest leaf of all maples
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Pseudotsuga menziesii/ Douglas-fir	9 feet on center/ 150 feet	Highly adaptable, fast grower
SHRUBS		
Cornus sericea/ Red-osier dogwood	4.5 feet on center/ 15 feet	Stem provides red color, white flower in spring, berries in summer
Holodiscus discolor/ Oceanspray	4.5 feet on center/ 7 feet	Spectacular blossom; attracts hummingbirds and butterflies
Philadelphus lewisii/ Mock orange	4.5 feet on center/ 8 feet	Fragrant white blossom
Rubus parviflorus/ Thimbleberry	4 feet on center/ 8 feet	Delicious edible berries, fast grower, likes sun
Symphoricarpos albus/ Snowberry	4.5 feet on center/ 5 feet	White inedible berries, proven performer in tough conditions
GROUNDCOVERS & PERENNIALS		
Asarum caudatum/ Wild ginger	*24 in. on center/ 6-8 in.	Tough groundcover, great for planting under shrubs and trees
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Dicentra formosa/ Pacific bleeding heart	*18 in. on center/ 1 foot	Delicate, fern-like foliage, pink pendulous flowers
Viola glabella/ Stream Violet	*18 in. on center/ 1.5-2 feet	Yellow flowers, grows in wet soils
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

D3-Sun

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center 60 feet	Vigorous grower, provides cover quickly for other plants
Thuja plicata/ Western red cedar	9 feet on center/ 150 feet	Fragrance, adaptable to many sites
Tsuga heterophylla/ Western hemlock	9 feet on center/ 125 feet	Fairly dry to wet sites, shade tolerant
SHRUBS		
Acer circinatum/ Vine maple	4.5 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Mahonia aquifolium/ Tall Oregon grape	3.5 feet on center/ 5 feet	Yellow flowers in Spring; edible dark purple berries
Oemleria cerasiformis/ Osoberry	4.5 feet on center/ 10 feet	Berries attract birds, first shrub to leaf out in spring
Rubus spectablis/ Salmonberry	4 feet on center/ 11 feet	Edible berries, orange stems, fast grower, can form thickets
Sambucus racemosa/ Red Elderberry	4.5 feet on center/ 15 feet	Edible berries, fast grower, graceful form with age
GROUNDCOVERS & PERENNIALS		
Arctostaphylos uva-ursi/ Kinnikinnick	*24 in. on center/ 6-8 in.	Evergreen groundcover, great for rockeries and full sun areas
Asarum caudatum/ Wild ginger	*24 in. on center/ 6-8 in.	Tough groundcover, great for planting under shrubs and trees
Polystichum munitum/ Sword fern	*24 in. on center 5 feet once mature	Semi-evergreen fern, highly adaptable
EMERGENTS		
Carex obnupta/ Slough sedge	12 in. on center/ 4.5 feet	Ornamental quality, wide dark Green leaves
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

D3-Shade

Red-flowering Currant

Coastal Strawberry

Piggyback Plant

Twinberry

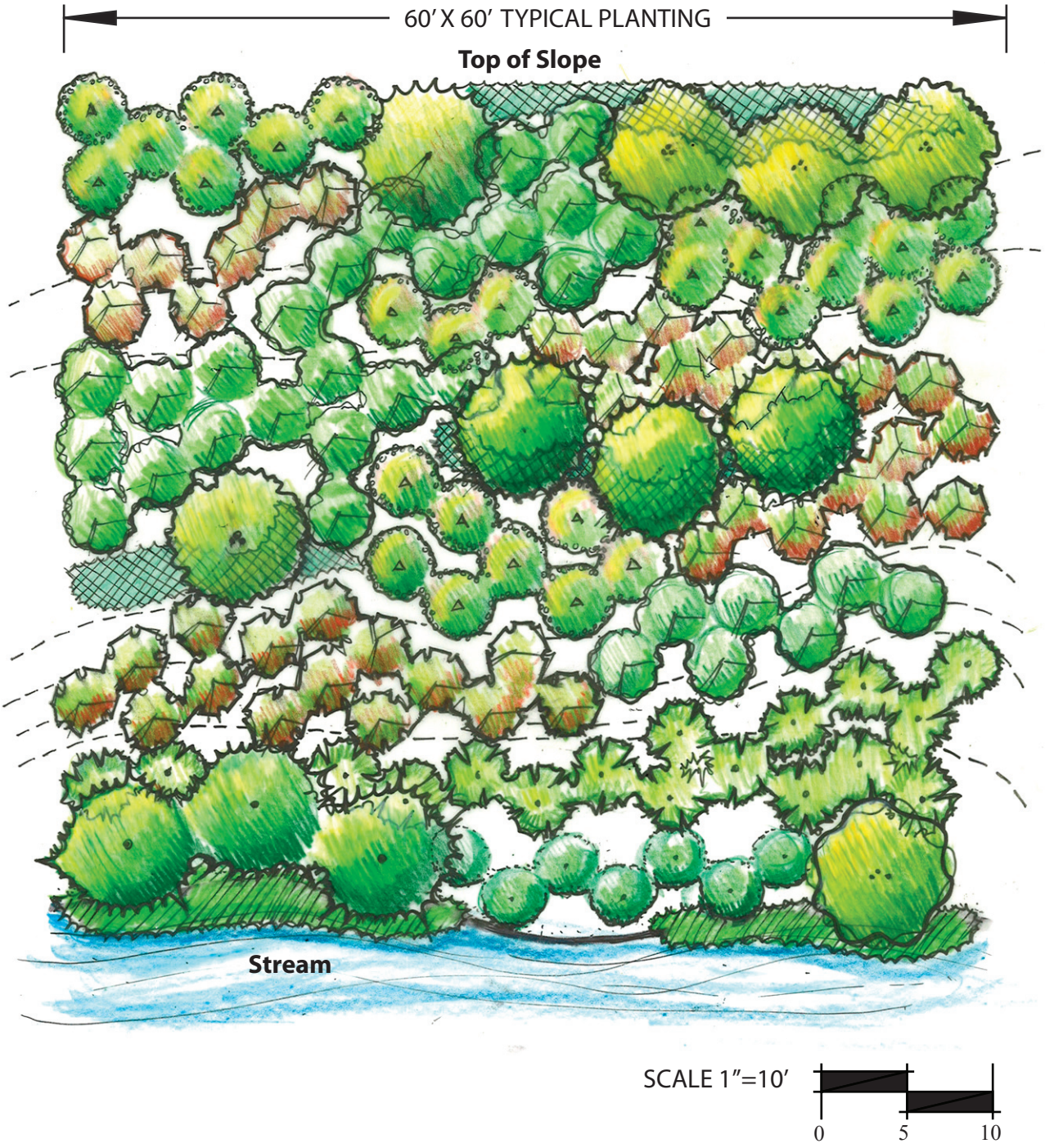
Stream Buffer

Terraced Planting Template

for ***Sunny*** and ***Shady*** Sites

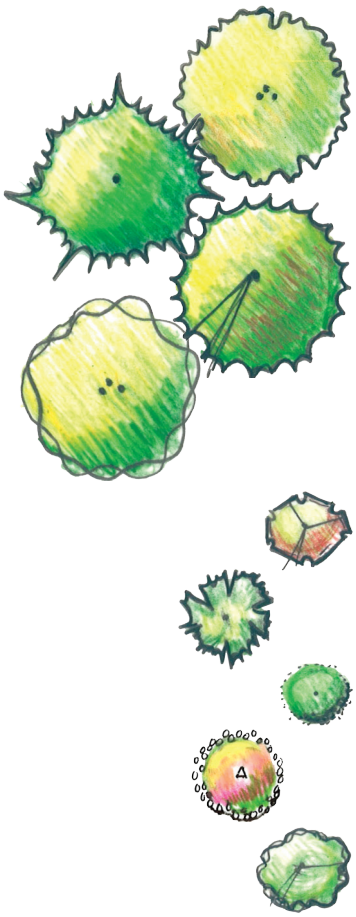
D4

STREAM BUFFER TERRACED PLANTING TEMPLATE



Terraced stream floodplains often have flat areas adjacent to the stream which are subject to inundation. See the Section on *Streams* in Chapter One and the City's Critical Areas Ordinance for additional information. Plants next to the stream need to be tolerant of fluctuating water levels. The remaining side slope is often terraced, meaning that it is steep in some areas and flat in others as you move up the slope. Like steep slopes, the steeper portions of these areas have thinner, rockier soil. Therefore, plants along the slopes need to be more drought tolerant, have strong root systems, and should be planted densely to help maintain the slope. Flatter areas need not be as dense or drought tolerant.

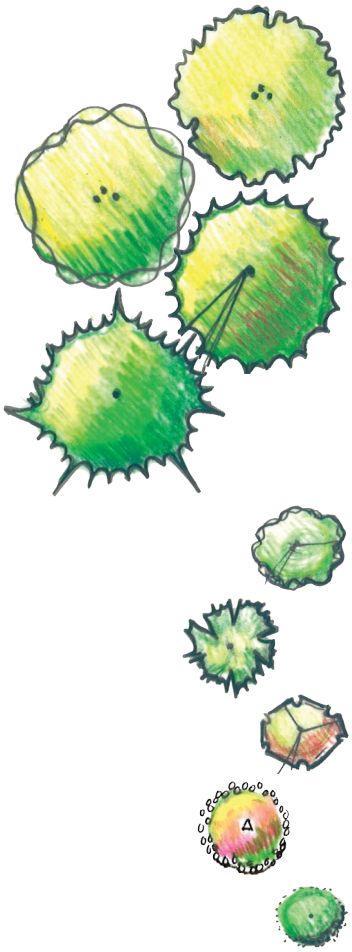
PLANT LEGEND FOR SUNNY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Picea sitchensis / Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round
Salix lasiandra/ Pacific willow	9 feet on center/ 30 feet	Catkins, fast grower, stabilizes banks, large mature form
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flowers in spring, berries in summer
Lonicera involucrata/ Black twinberry	4.5 feet on center/ 8 feet	Attractive yellow/red flowers with dark twinberries
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Ribes sanguineum/ Red-flowering currant	4.5 feet on center/ 6 feet	Big reddish-pink blossoms in spring, bluish-black berries
Rosa gymnocarpa/ Baldhip rose	4.5 feet on center/ 5 feet	Wild rose pink flowers, bright red rosehips
GROUNDCOVERS & PERENNIALS		
Fragaria chiloensis/ Coastal strawberry	*24 in. on center/ 4-6 in.	Tough, highly adaptable groundcover w/ red stems
Maianthemum dilatatum/ Lily-of-the-valley	*18 in. on center/ 1 foot	Groundcover, small white False flowers, late to emerge in spring
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable
EMERGENTS		
Juncus ensifolius/ Dagger-leaf rush	12 in. on center/ 2 feet	Dagger shaped leaves, flat iris-like
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center 60 feet	Vigorous grower, provides cover quickly for other plants
Salix scouleriana/ Scouler's willow	9 feet on center/ 30 feet	Highly adaptable, wet or seasonally dry sites
Thuja plicata/ Western red cedar	9 feet on center/ 150 feet	Fragrance, adaptable to many sites
Tsuga heterophylla/ Western hemlock	9 feet on center/ 125 feet	Fairly dry to wet sites, shade tolerant
SHRUBS		
Acer circinatum/ Vine maple	4.5 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Ribes bracteosum/ Stink currant	4.5 feet on center/ 8 feet	Clusters of purple fruit, spicy scented leaves, loves moist shade
Rubus spectabilis/ Salmonberry	4 feet on center/ 11 feet	Edible berries, orange stems, fast grower, can form thickets
Sambucus racemosa/ Red elderberry	4.5 feet on center/ 15 feet	Edible berries, fast grower, graceful form with age
Viburnum edule/ Highbush cranberry	4 feet on center/ 9 feet	Vigorous grower in wet places, great fall color, red cherry-like fruits
GROUNDCOVERS & PERENNIALS		
Athyrium filix-femina/ Lady fern	*24 in. on center/ 3 feet	Often large fern, dies back in winter, tolerates very wet sites
Caltha palustris/ Yellow marsh-marigold	*18 in. on center/ 1.5 feet	Good aquatic plant, big yellow flowers
Tolmiea menziesii/ Piggyback plant	*24 in. on center/ 1.5 feet	Leaves form on top of older leaves, piggy-backing
Viola glabella/ Stream violet	*18 in. on center/ 1.5 feet	Yellow flowers, grows in wet soils
EMERGENTS		
Carex obnupta/ Slough sedge	12 in. on center/ 4.5 feet	Ornamental quality, wide dark Green leaves
Scirpus acutus/ Hardstem bulrush	12 in. on center/ 6 feet	Important food and habitat for waterfowl and aquatic mammals
Scirpus microcarpus/ Small-fruited bulrush	12 in. on center/ 4.5 feet	Interesting ornamental quality and bloom

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

D4-Shade

Red Alder

Cottonwood

Hardhack

Red-osier Dogwood

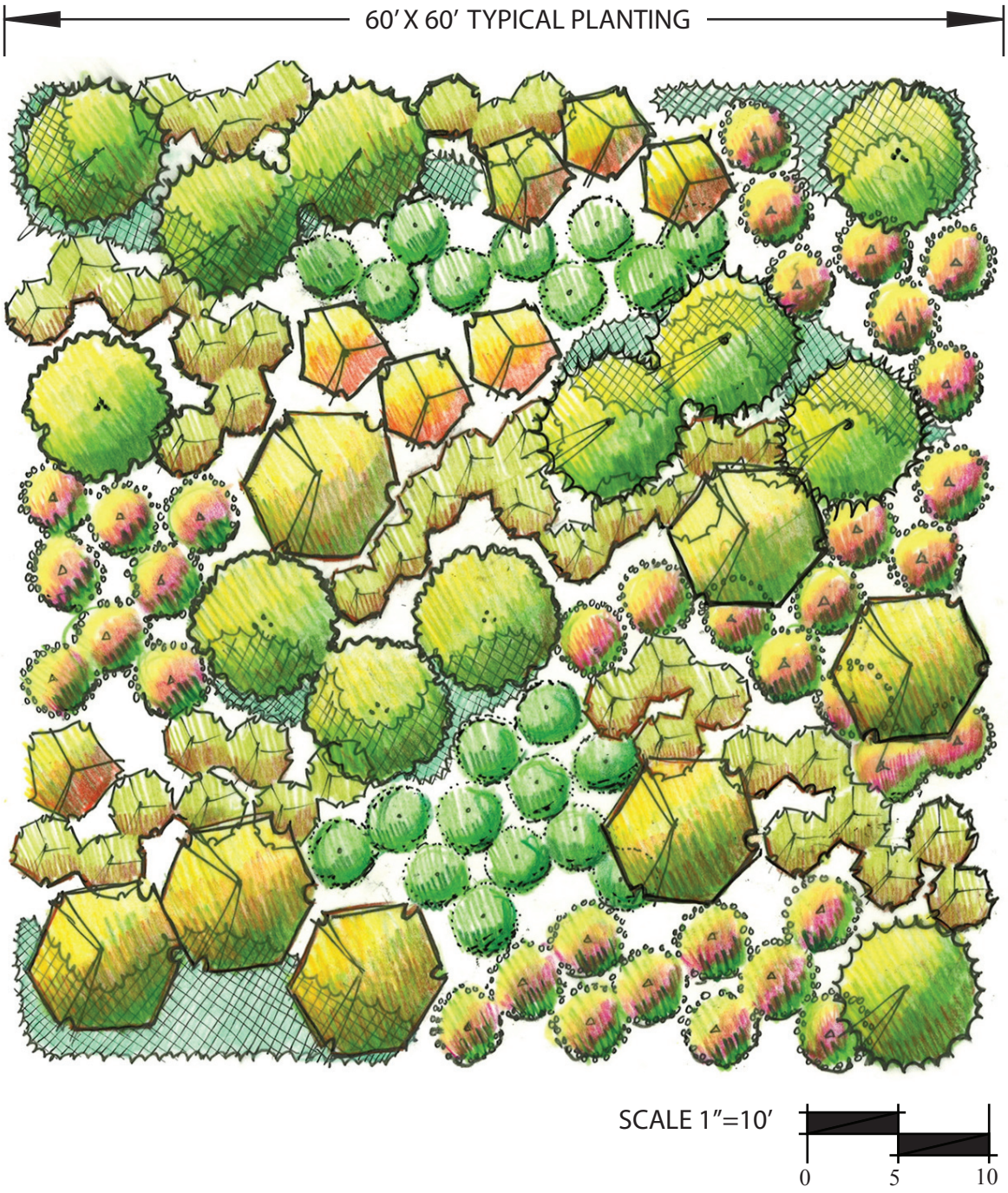
Wet Sites

With Invasive Weeds Planting Template

for ***Sunny*** and ***Shady*** Sites

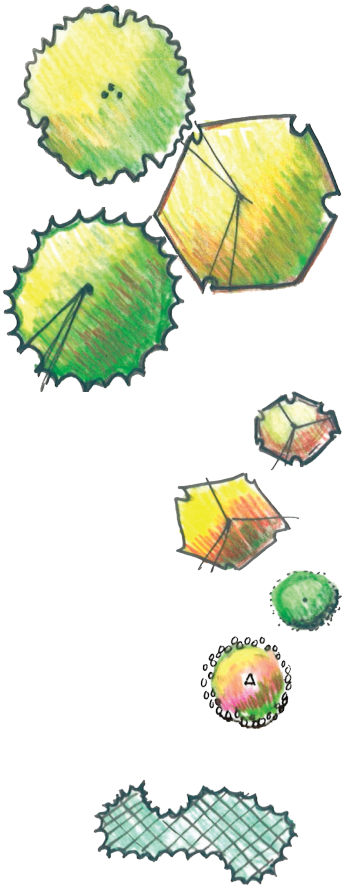
E1

WET SITES WITH INVASIVE WEEDS PLANTING TEMPLATE



Invasive weeds such as reed canarygrass, field bindweed, knotweed, and purple loosestrife are no strangers to moist open sites. Even more dry-adapted species such as Himalayan blackberry are adaptable to moist sites. After you have removed the invasive species (see *Chapter Four* for further information), the best way to prevent weed reemergence is through a dense planting that will shade out the invasive species. While shade cover is being established, invasive weeds will need ongoing maintenance (See *Chapter Five*, *Maintenance and Monitoring*). The plants chosen for this template have been selected for their tolerance of wet soil and their ability to establish quickly, providing necessary shade cover.

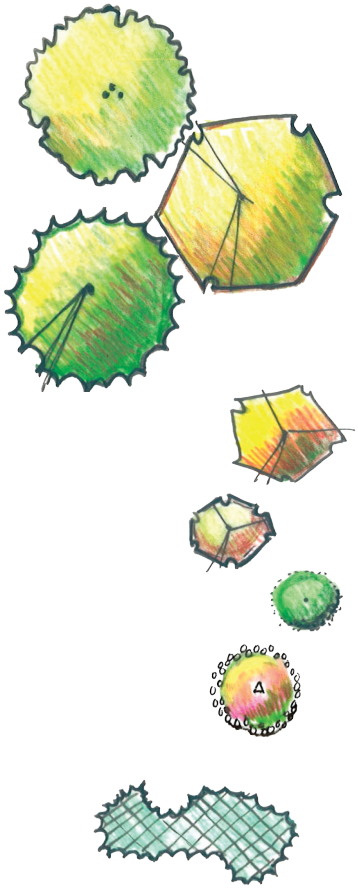
PLANT LEGEND FOR SUNNY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Populus trichocarpa/ Black cottonwood	9 feet on center/ 150 feet	Fast grower, provides cover for other plants
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flowers in spring, berries in summer
Crataegus douglasii/ Black hawthorn	6 feet on center/ 20 feet	Wildlife food, small tree
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
Spiraea douglasii/ Hardhack	4.5 feet on center/ 6 feet	Vigorous grower in wet places, pink flowers
GROUNDCOVERS & PERENNIALS		
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Fraxinus latifolia/ Oregon ash	9 feet on center/ 50 feet	Fall color, our only native ash
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Acer circinatum/ Vine maple	5 feet on center/ 20 feet	Bright red fall color, small understory tree, grows well in shade
Cornus sericea/ Red-osier dogwood	4 feet on center/ 15 feet	Stem provides red color, white flowers in spring, berries in summer
Rubus spectabilis/ Salmonberry	4 feet on center/ 11 feet	Edible berries, orange stems, fast grower, can form thickets
Physocarpus capitatus/ Pacific ninebark	4 feet on center/ 11 feet	Orange shredded bark, big white blossoms
GROUNDCOVERS & PERENNIALS		
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

E1-Shade

Red Alder

Thimbleberry

Sword Fern

Baldhip Rose

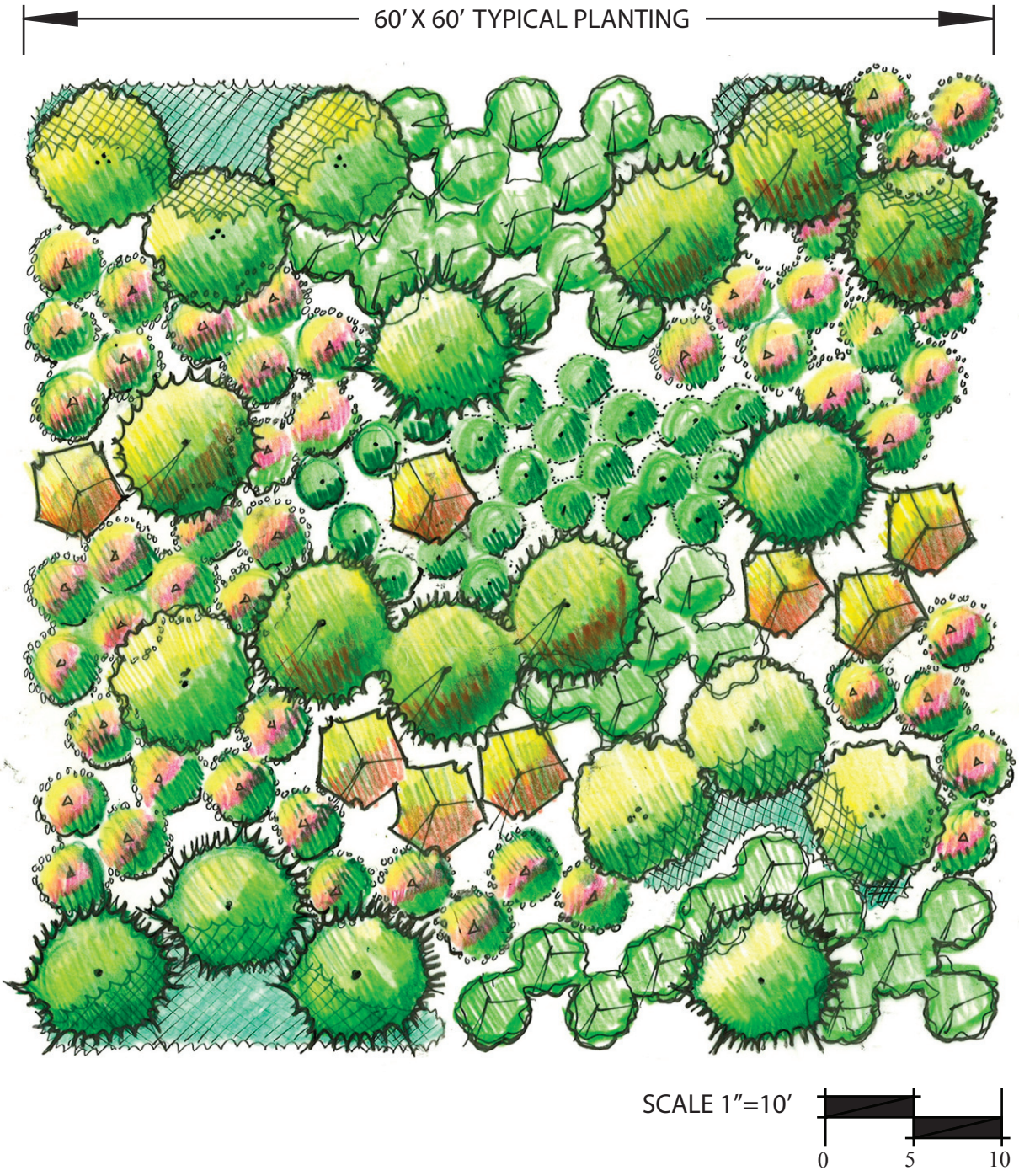
Dry Sites

With Invasive Weeds Planting Template

for ***Sunny*** and ***Shady*** Sites

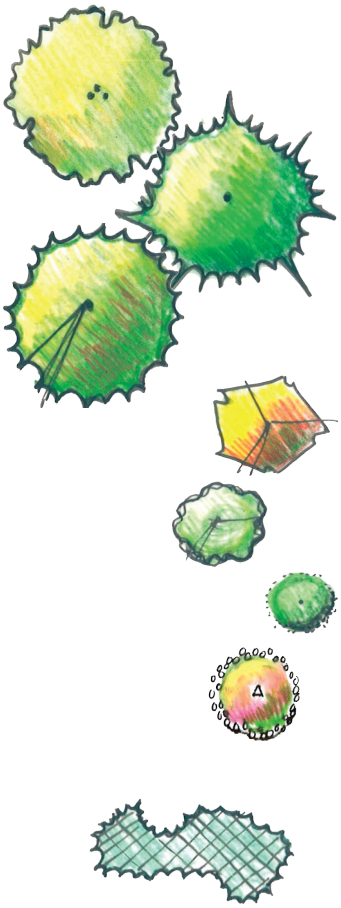
E2

DRY SITES WITH INVASIVE WEEDS PLANTING TEMPLATE



Like wet sites, invasive weeds can be found on dry sites, too. Common invaders include Himalayan blackberry, English ivy, Scotch broom, Japanese knotweed, and birdsfoot trefoil to name a few. As mentioned in the previous template, once you have removed the invasive species (see *Chapters Two* and *Four* for further information), the best way to prevent reoccurrence is through a dense planting that will shade out the invasives. While shade cover is being established, invasives will need ongoing maintenance (See *Chapter Five*, *Maintenance and Monitoring*). The plants chosen for this template have been selected for their tolerance of dry sites and their ability to establish quickly, providing necessary shade cover.

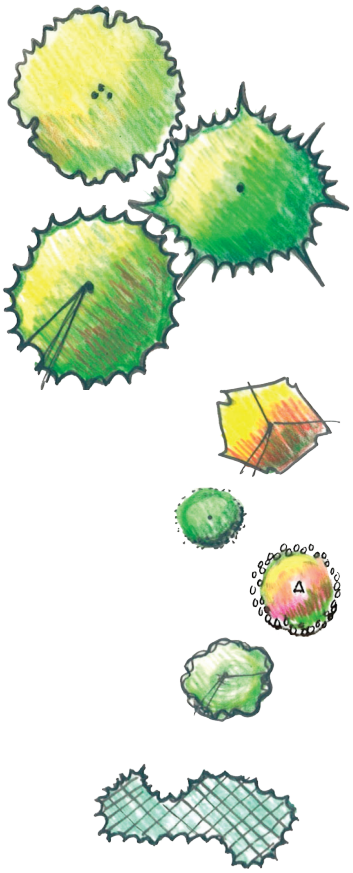
PLANT LEGEND FOR SUNNY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Picea sitchensis/ Sitka spruce	9 feet on center/ 125 feet	Bluish-green foliage year round
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Corylus cornuta/ Beaked hazelnut	6 feet on center/ 11 feet	Edible acorn, wildlife food. Small understory tree, yellowish fall color
Rosa gymnocarpa/ Baldhip rose	4.5 feet on center/ 5 feet	Wild rose, pink flowers, bright red rosehips
Rubus parviflorus/ Thimbleberry	4 feet on center/ 8 feet	Delicious edible berries, fast grower, likes sun
Symphoricarpos albus/ Snowberry	4.5 feet on center/ 5 feet	White berries, proven performer in tough conditions
GROUNDCOVERS & PERENNIALS		
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

PLANT LEGEND FOR SHADY SITES



LATIN NAME/ COMMON NAME	TYPICAL SPACING/ AVERAGE HEIGHT	CHARACTERISTICS
TREES		
Alnus rubra/ Red alder	9 feet on center/ 60 feet	Vigorous grower, provides cover quickly for other plants
Pseudotsuga menziesii/ Douglas-fir	9 feet on center/ 150 feet	Highly adaptable, fast grower
Thuja plicata/ Western red cedar	9 feet on center/ 125 feet	Fragrant, adaptable to many sites
SHRUBS		
Oemleria cerasiformis/ Osoberry	4.5 feet on center/ 10 feet	Berries attract birds, first shrub to leaf out in spring
Mahonia aquifolium/ Tall Oregon grape	3.5 feet on center/ 5 feet	Yellow flowers in Spring; edible dark purple berries
Ribes sanguineum/ Red-flowering currant	4.5 feet on center/ 6 feet	Big reddish pink blossom in spring, bluish-black berries
Sambucus racemosa/ Red elderberry	4.5 feet on center/ 15 feet	Edible berries, fast grower, graceful form with age
GROUNDCOVERS & PERENNIALS		
Polystichum munitum/ Sword fern	*24 in. on center/ 5 feet once mature	Semi-evergreen fern, highly adaptable

* *Indicates plants are to be triangularly spaced for the area shown. See page 23 for triangular spacing.*

E2-Shade

Appendix C

MASTER PLANT LIST

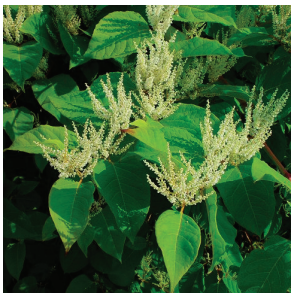
Scientific Name	Common Name	Plant Type
Buddleia davidii	butterfly bush	SHRUB
Calystegia sepium	hedge bindweed	PERENNIAL
Centaurea species	common knapweed	PERENNIAL
Cerastium arvense	field chickweed	PERENNIAL
Cirsium arvense	Canada thistle	PERENNIAL
Convolvulus sp.	morning-glory	PERENNIAL
Crataegus monogyna	common hawthorn	SHRUB
Cytisus scoparius	Scotch broom	SHRUB
Dipsacus fullonum	common teasel	PERENNIAL
Dipsacus sylvestris	teasel	PERENNIAL
Geranium robertianum	Robert's geranium	PERENNIAL
Hedera helix	English ivy	VINE
Hypericum perforatum	St. John's-wort	PERENNIAL
Ilex aquifolium	English holly	TREE
Iris pseudacorus	yellow iris	PERENNIAL
Lamiastrum galeobdolon	yellow archangel	PERENNIAL
Lotus corniculatus	birds-foot trefoil	PERENNIAL
Lysimachia vulgaris	garden loosestrife	PERENNIAL
Lythrum salicaria	purple loosestrife	PERENNIAL
Matricaria matricarioides	pineapple weed	PERENNIAL
Medicago lupulina	black medic	PERENNIAL
Phalaris arundinacea	reed canarygrass	GRASS
Polygonum persicaria	common smartweed	PERENNIAL
Polygonum spp.	knotweed	PERENNIAL
Populus deltoides	Lombardy poplar	TREE
Prunus laurocerasus	English laurel	SHRUB
Ranunculus acris	tall buttercup	PERENNIAL
Ranunculus repens	creeping buttercup	PERENNIAL
Robinia pseudoacacia	black locust	TREE
Rubus armeniacus (discolor)	Himalayan blackberry	VINE
Rubus laciniatus	evergreen blackberry	VINE
Salix babylonica	weeping willow	TREE
Senecio jacobaea	tansy ragwort	PERENNIAL
Solanum dulcamara	bittersweet nightshade	PERENNIAL
Tanacetum bipinnatum	common tansy	PERENNIAL
Ulex europaeus	gorse	SHRUB

Note: A more comprehensive invasive plant list can be found at: http://dnr.metrokc.gov/wlr/lands/weeds/weedid.htm

Some common invasive weeds:

Purple loosestrife
Lythrum salicaria

Reed canarygrass
Phalaris arundinacea



Japanese knotweed
Polygonum cuspidatum

Scotch broom
Cytisus scoparius

Yellow flex iris
Iris pseudacorus

English ivy
Herdara helix

Butterfly bush
Buddleia davidii

Himalayan blackberry
Rubus armeniacus (discolor)

English holly
Ilex aquifolium

			Light Needs					Site Placement				
Category	Common Name	Scientific Name	Full Sun	Part Shade	Full Shade	Highly Adaptable	Average Height	Drier Buffer	Wetter Buffer	Water's Edge	Saturated Soils	Shallow Water
TREE	Alaska Yellow Cedar*	Chamaecyparis Nootkatensis*	x	x			100'	x				
TREE	Bigleaf Maple	Acer macrophyllum	x	x		x	75'	x	x			
TREE	Bitter Cherry	Prunus emarginata	x				40'	x				
TREE	Black Cottonwood	Populus trichocarpa	x	x		x	100'		x	x	x	
TREE	Cascara	Rhamnus purshiana		x			20'	x	x			
TREE	Douglas-fir	Pseudotsuga menziesii	x	x	x	x	125'	x	x			
TREE	Garry Oak	Quercus garryana*	x				55'	x				
TREE	Geyer's willow	Salix geyeriana	x	x			10'		x	x	x	x
TREE	Grand Fir*	Abies grandis*	x	x			90'	x	x			
TREE	Hooker's Willow	Salix hookeriana	x	x			15'		x	x	x	x
TREE	Madrone	Arbutus menziesii	x				60'	x				
TREE	Noble Fir*	Abies procera*	x	x			150'	x				
TREE	Oregon Ash	Fraxinus latifolia	x	x			50'	x	x	x		
TREE	Pacific Crabapple	Malus fusca	x	x			30'		x	x		
TREE	Pacific Willow	Salix lucida ssp lasiandra	x	x			30'		x	x	x	x
TREE	Pacific Yew	Taxus brevifolia	x	x			60'		x			
TREE	Paper Birch*	Betula papyrifera*	x				60'		x	x	x	
TREE	Quaking Aspen*	Populus tremuloides*	x				55'		x	x	x	
TREE	Red Alder	Alnus rubra	x	x		x	60'	x	x			
TREE	Scouler's Willow	Salix scouleriana	x	x		x	30'		x	x	x	x
TREE	Shore Pine*	Pinus contorta var. contorta*	x			x	45'	x	x	x		
TREE	Sitka Spruce	Picea sitchensis	x				125'			x	x	
TREE	Sitka Willow	Salix sitchensis	x	x			20'		x	x	x	x
TREE	Western Hemlock	Tsuga heterophylla		x	x		125'	x	x			
TREE	Western Red Cedar	Thuja plicata		x		x	125'	x	x	x	x	
SHRUB	Baldhip Rose	Rosa gymnocarpa	x	x	x		6'		x	x	x	x
SHRUB	Beaked Hazelnut	Corylus cornuta		x			11'	x	x			
SHRUB	Black Hawthorn	Crataegus douglasii	x	x			20'	x	x			
SHRUB	Black Swamp Gooseberry	Ribes lacustre	x	x			6'		x	x	x	
SHRUB	Cinquefoil	Potentilla fruticosa	x						x	x		
SHRUB	Cluster Rose	Rosa pisocarpa	x				5'		x	x	x	
SHRUB	Low (dull) Oregon Grape	Berberis nervosa (Mahonia)		x	x		4'	x	x			
SHRUB	Evergreen Huckleberry*	Vaccinium ovatum*		x			4'	x	x			
SHRUB	Hardhack	Spiraea douglasii	x				6'		x	x	x	x
SHRUB	High bush-Cranberry	Viburnum edule		x			9'			x	x	
SHRUB	Indian Plum	Oemleria cerasiformis		x	x		10'	x	x			
SHRUB	Mock-Orange	Philadelphus lewisii	x	x			8'	x	x			
SHRUB	Mountain-ash*	Sorbus sitchensis*		x			22'					
SHRUB	Nootka Rose	Rosa nutkana	x	x		x	8'	x	x	x	x	
SHRUB	Oceanspray	Holodiscus discolor	x	x			7'	x	x			
SHRUB	Orange Honeysuckle	Lonicera ciliosa		x			15'	x	x			
SHRUB	Pacific Ninebark	Physocarpus capitatus	x	x			11'		x	x	x	
SHRUB	Pacific Rhododendron*	Rhododendron macrophyllum*		x	x		20'	x	x			
SHRUB	Pacific Wax Myrtle*	Myrica californica*	x				20'	x	x			
SHRUB	Red Elderberry	Sambucus racemosa	x	x			15'	x	x			
SHRUB	Red Huckleberry	Vaccinium parvifolium		x	x		10'		x	x		
SHRUB	Red-flowering Currant	Ribes sanguineum	x	x			6'	x	x			
SHRUB	Red-osier Dogwood	Cornus sericea (stolonifera)	x	x		x	15'		x	x	x	
SHRUB	Salal	Gaultheria shallon		x	x		9'	x	x			
SHRUB	Salmonberry	Rubus spectabilis		x			11'		x	x	x	
SHRUB	Snowberry	Symphoricarpos albus	x	x		x	5'	x	x			
SHRUB	Stink currant	Ribes bracteosum		x	x		8'		x	x	x	
SHRUB	Sweet Gale*	Myrica gale*		x			5'		x	x	x	x
SHRUB	Tall Oregon Grape	Berberis aquifolium (Mahonia)	x	x	x	x	5'	x	x			
SHRUB	Thimbleberry	Rubus parviflorus	x	x			8'		x	x	x	
SHRUB	Twinberry	Lonicera involucrata	x	x			8'		x	x	x	
SHRUB	Vine Maple	Acer circinatum		x	x	x	20'	x	x			
SHRUB	Western Serviceberry	Amelanchier alnifolia	x	x			20'	x	x			

(H) Hard to Establish (P) Proven Performer	Soil Moisture	Wildlife Food Source	Deciduous or Evergreen	Vigorous Roots (Erosion Control)	Landscape/Seasonal Interest
	Moist		E		Foliage emits fragrance, graceful weeping branches, thinner canopy than western red cedar
	Dry		D	x	Fall color, provides understory shade in spring and summer, largest leaf of all maples, large flowers, large seeds
H	Moist	x	D	x	Blossoms in spring; red edible berries in summer, wildlife food
P	Moist	x	D	x	Fast grower, provides cover for other plants
H	Either		D		Fall color, small understory tree, horizontal branching
P	Either	x	E	x	Highly adaptable, fast grower
	Dry		D		Glossy Oak foliage, striking mature form, wildlife food (acorns)
	Moist		D	x	Catkins, fast grower, stabilizes banks
		x	E	x	Interesting cone, stunning mature form, unique conifer foliage, can easily live 200+ years
P	Moist		D	x	Big fuzzy catkins, fuzzy leaves
H	Dry		E		Orange peeling bark; glossy evergreen foliage; bell-shaped flowers, interesting form, broadleaf evergreen
	Moist	x	E	x	Largest of all fir species, oldest known fir tree 321 years, bluish-green foliage year round
	Moist		D	x	Fall color, our only native ash
	Either	x	D		Blossoms in spring, early bloomer, fragrance, wildlife food
P	Moist		D	x	Catkins, fast grower, stabilizes banks, large mature form
H	Moist		E	x	Rare forest understory tree, only yew native to the NW, architectural branching
	Moist		D	x	Beautiful white peeling bark, bright yellow fall color, catkins
	Moist		D	x	Bark, fall color, leaves make sound in the wind
P	Either		D	x	Vigorous grower, provides cover quickly for other plants
P	Either		D	x	Highly adaptable, wet or seasonly dry sites
	Either	x	E		Interesting form on lakeshores, wildlife food
	Moist	x	E	x	Bluish-green foliage year round
P	Moist		D	x	Large oval leaves, highly adaptable
H	Either		E	x	Stately tree, grows well in shade, delicate needles, oldest known hemlock: 1238 years
P	Either		E	x	Fragrance, adaptable to many sites
	Either	x	D	x	Wild rose pink flowers, bright red hips
P	Dry	x	D	x	Edible acorn , wildlife food. Small understory tree, similar to witch hazel. Fall color
P	Either	x	D		Wildlife food, small tree
	Moist	x	D		Black berries, delicate hanging flowers, many orange spines on stems
	Moist		E		Great small shrub for sunny, dry sites. Yellow flowers
P	Moist	x	D	x	Wild rose pink flowers, bright red hips
	Either	x	E	x	Cluster of edible dark purple berries, bright yellow panicle of spring flowers
	Dry	x	E	x	Likes shade, small leaves can be reddish to green, edible berries
P	Moist		D	x	Vigorous grower in wet places, pink flowers
	Moist	x	D		Great fall color, red cherry-like fruits, fast grower
H	Dry	x	D	x	Cucumber scented-leaves; berries attract birds, first shrub to leaf out in spring
	Dry		D		Fragrant white blossom
	Moist		D		Bright orange fruits, ash-like leaves
P	Either	x	D	x	Wild rose pink flowers, bright red hips
	Either		D	x	Spectacular blossom; attracts hummingbird and butterflies
	Either	x	D		Vine, bright orange flowers; attracts hummingbirds, bees and butterflies
P	Moist		D	x	Orange shredded bark, big white blossoms
H	Dry		E	x	Large pink blossoms
	Dry		E		Glossy, evergreen foliage
P	Moist	x	D	x	Edible berries, fast grower, graceful form with age - straggly in youth
H	Dry	x	D		Berries in summer, likes to grow on old stumps and logs
H	Either	x	D	x	Big reddish pink blossom in spring, bluish-black berries
P	Moist		D	x	Stem provides bright red color to winter garden; white flower in spring and cluster berries in summer
	Either	x	E	x	Glossy foliage year-round; bell-shaped pinkish white flowers with edible dark berries
P	Moist	x	D	x	Edible berries, orange stems, fast grower, can form thickets
P	Either	x	D	x	White berries, proven performer in tough conditions
	Moist	x	D		Long clusters of large purple fruit, spicy scented leaves, loves moist shade
	Moist	x	D		Glossy foliage
P	Either	x	E	x	Yellow flowers in Spring; edible dark purple berries
P	Dry	x	D	x	Delicious edible berries, fast grower, likes sun
	Moist	x	D	x	Attractive yellow/red flowers with dark twinberries
P	Either		D	x	Bright red fall color, small understory tree, grows well in shade
	Either	x	D	x	Fragrant flowers; edible red to purple berries

			Light Needs					Site Placement				
Category	*Common Name*	*Scientific Name*	*Full Sun*	*Part Shade*	*Full Shade*	*Highly Adaptable*	*Average Height*	*Drier Buffer*	*Wetter Buffer*	*Water's Edge*	*Saturated Soils*	*Shallow Water*
SEDGE/RUSH	Black-spiked Wool Grass	Scirpus atrocinctus (cyperinus)	x				4.5'			x	x	x
SEDGE/RUSH	Common Spikerush	Eleocharis palustris	x				0.5'			x	x	x
SEDGE/RUSH	Dagger-leaved Rush	Juncus ensifolius	x				2'			x	x	x
SEDGE/RUSH	Hardstem Bulrush	Scirpus acutus	x				6'			x	x	x
SEDGE/RUSH	Narrow-leaved Bur-reed	Sparganium emersum ssp. emersum		x			2'					x
SEDGE/RUSH	Sawbeak Sedge	Carex stipata	x	x			3'			x	x	x
SEDGE/RUSH	Slough Sedge	Carex obnupta	x	x			4.5'			x	x	x
SEDGE/RUSH	Small-fruited Bulrush	Scirpus microcarpus	x	x			4.5'			x	x	x
SEDGE/RUSH	Softrush	Juncus effusus	x	x			3'			x	x	x
SEDGE/RUSH	Tapertip Rush	Juncus acuminatus	x				2'			x	x	x
SEDGE/RUSH	Wooly Sedge	Carex lanuginosa	x				3'			x	x	x
PERENNIAL	American Brooklime	Veronica americana		x						x	x	x
PERENNIAL	Beach Strawberry	Fragaria chiloensis	x	x				x				
PERENNIAL	Bunchberry	Cornus canadensis		x	x			x	x			
PERENNIAL	Clasping twisted stalk	Streptopus amplexifolius		x	x				x			
PERENNIAL	Coast penstemon	Penstemon serrulatus	x					x	x			
PERENNIAL	Common Camas*	Camassia quamash*	x	x					x	x		
PERENNIAL	Cooley's Hedge Nettle	Stachys cooleyae	x	x					x	x		
PERENNIAL	Devil's Club	Oplopanax horridum		x			8'		x	x	x	
PERENNIAL	Douglas' Aster	Aster subspicatus	x						x	x		
PERENNIAL	False Lily-of-the-valley	Maianthemum dilatatum		x	x				x			
PERENNIAL	False Solomon's-seal	Smilacina racemosa		x	x				x	x		
PERENNIAL	Fendler's waterleaf	Hydrophyllum fendleri	x						x			
PERENNIAL	Fireweed	Epilobium angustifolium	x	x				x	x			
PERENNIAL	Foamflower	Tiarella trifoliata		x					x	x		
PERENNIAL	Fringecup	Tellima grandiflora		x					x			
PERENNIAL	Goat's Beard	Aruncus dioicus	x	x				x	x	x		
PERENNIAL	Henderson's Checker Mallow*	Sidalacea hendersonii*	x						x	x	x	
PERENNIAL	Hooker's Fairybells	Disporum hookeri		x	x				x			
PERENNIAL	Inside-out Flower	Vancouveria hexandra		x	x				x			
PERENNIAL	Kinnikinnick	Arctostaphylos uva-ursi	x	x		x		x	x			
PERENNIAL	Large-leaved avens	Geum macrophyllum	x	x				x	x			
PERENNIAL	Large-leaved Lupine	Lupinus polyphyllus	x						x	x		
PERENNIAL	Many-flowered Woodrush	Luzula campestris	x	x		x		x	x			
PERENNIAL	Pacific bleeding heart	Dicentra formosa		x	x				x			
PERENNIAL	Pacific waterleaf	Hydrophyllum tenuipes		x	x				x			
PERENNIAL	Pacific Water-parsley	Oenanthe sarmentosa		x							x	x
PERENNIAL	Pearly Everlasting	Anaphalis margaritacea	x	x				x				
PERENNIAL	Piggy-back plant	Tolmiea menziesii		x	x			x	x			
PERENNIAL	Redwood Sorrel	Oxalis oregana		x	x				x			
PERENNIAL	Rosy twisted stalk	Streptopus roseus		x	x				x			
PERENNIAL	Scouler's Corydalis	Corydalis scouleri		x	x				x	x		
PERENNIAL	Silverweed	Potentilla anserina		x						x	x	
PERENNIAL	Skunk Cabbage	Lysichiton americanum		x	x					x	x	
PERENNIAL	Small-flowered Woodrush	Luzula parviflora	x	x					x	x		
PERENNIAL	Starflower	Trientalis latifolia	x	x				x	x			
PERENNIAL	Star-flowered Solomon's Seal	Smilacina stellata	x	x				x	x	x		
PERENNIAL	Stream Violet	Viola glabella		x					x	x		
PERENNIAL	Sweet Coltsfoot	Petasites frigidus var. palmatus		x					x	x	x	
PERENNIAL	Twinflower	Linnaea borealis		x	x			x	x			
PERENNIAL	Vanilla-leaf	Achlys triphylla		x	x				x	x		
PERENNIAL	Wapato, Arrowhead	Sagittaria latifolia		x						x	x	x
PERENNIAL	Water Plantain	Alisma plantago-aquatica	x							x	x	x
PERENNIAL	Watson's Willowherb	Epilobium ciliatum	x	x					x	x		
PERENNIAL	Western Columbine	Aquilegia formosa	x	x					x			
PERENNIAL	Western Iris*	Iris tenax*	x	x				x				
PERENNIAL	Western White Trillium	Trillium ovatum		x	x			x	x			
PERENNIAL	White Fawn Lily*	Erythronium oregonum*		x					x			
PERENNIAL	Wild Ginger	Asarum caudatum		x	x			x	x			
PERENNIAL	Wild Strawberry*	Fragaria virginiana*	x	x				x	x			
PERENNIAL	Wintergreen	Gaultheria ovatifolia		x	x				x	x		
PERENNIAL	Yarrow	Achillea millefolium	x	x		x		x	x			
PERENNIAL	Yellow Marsh-marigold	Caltha palustris		x	x					x	x	x
PERENNIAL	Yellow Monkey-flower	Mimulus guttatus	x	x						x	x	
PERENNIAL	Yellow Pond-lily	Nuphar polysepalum	x	x							x	x
GRASS	Blue Wildrye	Elymus glaucus	x				2'	x				
GRASS	Idaho Fescue	Festuca idahoensis	x				2.5'	x				
GRASS	Northern Mannagrass	Glyceria borealis		x			4'			x	x	
GRASS	Tall Mannagrass	Glyceria elata			x		4.5'		x	x	x	
GRASS	Tufted Hairgrass	Deschampsia caespitosa	x				2'		x	x	x	
GRASS	Wood Reed	Cinna latifolia		x			5'		x	x	x	
FERN	Deer Fern	Blechnum spicant		x	x		2'		x			
FERN	Lady Fern	Athyrium filix-femina		x			3'		x	x		
FERN	Maidenhair Fern	Adiantum pedatum			x		2'		x	x	x	
FERN	Oak Fern	Gymnocarpium dryopteris		x	x		1.5'		x	x	x	
FERN	Spiny Wood Fern	Dryopteris expansa		x			2'		x	x	x	
FERN	Sword Fern	Polystichum munitum	x	x	x	x	5'	x				

Key: * Semi-native: Plants that are regionally native, but not specifically native to the City of Bellevue
D = Deciduous; E = Evergreen; H = Hard to establish; P = Proven performer

Hard to Establish Proven Performer	*Soil Moisture*	*Wildlife Food Source*	*Deciduous or Evergreen*	*Vigorous Roots (Erosion Control)*	*Landscape/Seasonal Interest*
	Moist				Large plumes of wooly flowers
	Wet				Thin-stemmed emergent, dark green shafts w/ compact seed heads at the tip. Good for amphibian breeding
P	Wet				Dagger shaped leaves, flat iris-like
	Wet				Tall hollow stems with flowers on top
P	Wet				Ribbon-like green floating leaves in spring. Small yellowish-white flowers emerge on slender stalks.
	Moist				Densely tufted appearance
P	Wet				Ornamental quality, wide dark green leaves
P	Wet				Interesting ornamental quality, interesting bloom
	Either			x	Highly adaptable, round leaves, ornamental grass-like
	Wet				Thin-stemmed emergent, dark green shafts w/ reddish tufted seed heads. Good amphibian breeding habitat.
P	Moist				Dark green grass-like blades, good amphibian habitat.
	Wet				Blue flowers
	Dry	x	E		Tough, highly adaptable groundcover w/ red stems. Grows quickly
	Moist	x			Delicate groundcover, need lots of organics in the soil to grow. Shade loving, big red berries
	Moist				White flowers from under the leaf, then forms a purple berry
	Moist				Showy deep blue to dark purple fox-glove like flowers from an often tall, woody stem
H	Moist	x			Blue prairie flower, grows from a tuber
	Moist				Looks like nettle, but no stinging. Red flowers from an erect stalk
H	Moist	x	D		Tall, extremely spiny large-leaved plant, big showy red berries. Needs permanently wet soil, but not inundated
	Either			x	Blue to purple ray-type flowers
H	Moist	x			Groundcover, small white flowers, late to emerge in spring
	Moist				Like Solomon's seal in form, but flowers from the end of the stem then forms large salmon-colored berries
H	Moist				White to purplish bell-shaped flowers, grows well in very wet soil
P	Either			x	Big purple flowers on a tall stem
H	Moist				Delicate perennial, tiny white flowers
H	Moist				Delicate perennial with tiny teacup-like flowers with fringe on the rim
	Moist			x	Big, bold perennial, while inflorescence
	Moist				Deep pink hollyhock-like flowers on tall stems, tolerates standing water
	Moist				Pendulous white flowers form under the leaves, red berries
	Moist				Unique-shaped flowers, appears inside-out
P	Dry	x	E		Evergreen groundcover, great for rockeries and full sun areas
H	Moist				Saucer-shaped yellow flowers on tall stems, up to 42"
P	Moist				Showy lupine, tolerates sun and dry soils
	Moist				Densely tufted perennial w/ multiple flowers, nodding
H	Moist				Delicate, fern-like foliage, pink pendulous flowers. Easy to grow from seed
H	Moist				White to purplish bell-shaped flowers, grows well in very wet soil
	Moist				Pinately divided leaves on tall stems, white flowers
	Dry	x		x	Big white flowers
H	Either				Leaves form on top of older leaves, piggy-backing
	Moist				Great shade-loving groundcover, clover shaped leaves. White flowers
	Moist				Pink flowers from under the leaf, then forms an oblong red berry
H	Moist				Showy pink spike-like flowers
	Moist				Straggly groundcover, yellow flowers, likes sun
H	Wet				Hugh yellow flower, showy. Needs permanently wet soils
	Moist				Tufted perennial, nodding seedheads
	Either				Six-petaled star-shaped white flower
	Moist				Stalk twists back and forth with each leaf, flowers look like tiny white stars
	Moist				Yellow flowers, grows in wet soils
	Moist				Triangular or heart-shaped deeply toothed dark green leaves, white ray flowers
H	Moist				Tiny-leaved woodland groundcover
H	Moist				Shade-loving forest forb, unique leaves
	Wet				Arrowhead leaves, grows in standing calm water
	Wet				Aquatic plantain
P	Moist				Similar in form to fireweed, but with hairy flowers
	Moist				Delicate pendulous flowers, like sun
	Either				Big blue/purple and yellow flowers, tolerates wet soils, sun
H	Moist				Famous Puget Sound perennial, somewhat rare with three leaves below a three-petaled flower
	Moist		E		Bent and nodding flowers, petals bent back, white
P	Moist		E		Tough groundcover, great for planting under shrubs and trees
	Moist	x	E		Tough, highly adaptable groundcover w/ red stems. Grows quickly
	Moist		E		Shade loving groundcover, big red berries, evergreen
P	Either				Fern-like leaves, big white flowers
	Wet				Good aquatic plant, big yellow flowers
	Moist				Annual, trumpet shaped bright yellow flowers
H	Wet				Standing calm water only, great for ponded areas
	Dry				Clumping, wide bladed grass
	Dry		E		Bluish leaves, clumping
	Either				Tall grass, tolerates standing water
	Either				Tall grass, tolerates standing water
	Dry				Ornamental-like clumping grass
	Moist				Clumping grass w/ nodding seedhead
H	Moist		D		Glossy green leaves, adaptable
	Moist		D		Often large fern, dies completely back in winter. Tolerates very wet sites
	Moist		D		Delicate fern w/ black stems, often seen clinging to rocks near waterfalls
	Moist		D		Pleasingly delicate fern
	Moist		D		Shade-loving large fern, adaptable
P	Either		E		Common, semi-evergreen fern, highly adaptable, forms a large clump with age

Appendix D

REFERENCES

BOOKS

Brenzel, K. N., eds. 2001. Sunset Western Garden Book, Seventh Edition. Sunset Publishing Corporations. Menlo Park, CA.

Cooke, S. S., eds. 1997. A Field Guide to the Common Wetland Plants of Western Washington & Northwestern Oregon. Seattle Audubon Society, Seattle, WA.

Franklin, J. F. and Dyrness, C. T., eds. 1988. Natural Vegetation of Oregon and Washington. Oregon State University Press.

Guard, J. B. 1995. Wetland Plants of Oregon and Washington. Lone Pine Publishing, Alberta, Canada.

Hitchcock, C. L. and Cronquist, A. 1973. Flora of the Pacific Northwest. Eighth printing. University of Washington Press, Seattle and London.

Jacobson, L. 2001. Wild Plants of Greater Seattle. Arthur Lee Jacobson, Seattle, WA.

Kruckeberg, A. R. 1982. Gardening with Native Plants of the Pacific Northwest. Second Edition, third printing, University of Washington Press, Seattle and London.

Larrison, E.J. et al. 1974. Washington Wildflowers. Seattle Audubon Society, Durham & Downey, Inc., Portland, OR.

Link, R. 1999. Landscaping for Wildlife in the Pacific Northwest. Third printing, University of Washington Press in association with the Washington Department of Fish and Wildlife, Seattle and London.

Pojar, J. and MacKinnon, A. 1994. Plants of the Pacific Northwest coast- Washington, Oregon, British Columbia & Alaska. Ministry of Forests and Lone Pine Publishing, British Columbia, Canada.

Reed, P. B. 1997. Revision of The National List of Plant Species That Occur in Wetlands. Fish and Wildlife Services and the National Wetlands Inventory, St. Petersburg, FL.

ADMINISTRATIVE CODE RESOURCES

Ordinance No. 5680. Amending the Bellevue Land Use Code to update critical areas regulations considering best available science. City of Bellevue, Washington; June 2006.

Ordinance No. 5681. Amending the Bellevue Land Use Code to amend the Shoreline Overlay District to recognize shorelines and critical areas and amend certain provisions to protect those critical areas. City of Bellevue, Washington; June 2006.

ONLINE RESOURCES

City of Bellevue	http://www.bellevuewa.gov/
Critical Areas Land Use Code	http://www.bellevuewa.gov/bellcode/Bluc2025H.html
Natural Yard Care	http://www.bellevuewa.gov/natural_lawn_care.htm
King conservation District	http://kingcd.org
King County iMAP	http://www.metrokc.gov/gis/Mapportal/iMAP_main.htm
King County Native Plant Guide	http://dnr.metrokc.gov/wlr/pi/Go-Native/
King County Noxious Weeds	http://dnr.metrokc.gov/wlr/lands/weeds/weedid.htm
Northwest Maps	http://www.nwmaps.com/
Sound Native Plants	http://www.soundnativeplants.com/
Washington Native Plant Society	http://www.wnps.org/
WSU Native Plant Database	http://gardening.wsu.edu/Nwnative

NURSERIES THAT CARRY NATIVE PLANTS

BELLEVUE:

The Greenery – Lynn Watts; 14450 NE 16th Place, Bellevue, WA 98007; (425) 641-1458; watts-greenery@msn.com

KING COUNTY:

Alpine Nursery – Brad or Bill Spiry; 16023 SE 144th St., Renton, WA 98059; (425) 255-1598; Fax: (425)-255-0709

Big Dipper Fam – Deidre Finley; 26130 SW Green Valley Rd., Black Diamond, WA 98010; (360) 886-8133; www.bigdipperfarm.com

Campbell Nursery – 17524 Issaquah Hobart Rd., Issaquah, WA 98027 (425) 392-7114

City People's Garden Store – 2939 E. Madison Seattle, WA (206) 324-0737

Classic Nursery & Landscape Co. – Megan Fletcher; 12526 Avondale Rd. NE, Redmond, WA 98052; (425) 885-5678

Colvos Creek Nursery – Shelly Dillon; PO Box 1512, Vashon, WA 98070; (206) 749-9508; Fax: (206) 463-3917

Direct Seed Sales – Phil Marks; PO Box 1281, Issaquah, WA 98027 (425) 831-2076; email: pmarksdss@aol.com

Fiddlehead Farms – Earl Clay; PO Box 13149, Burton, WA 98103 (Vashon); (206) 463-9232; email: fiddleheadfarms@hotmail.com

Flowers-N-Friends – Fred Brooks;14614 262 Ave S.E. ; Issaquah, WA 98027; (425) 391-0201

Furney's – Ken Smith; 21215 Pacific Highway S. , Des Moines, WA 98198; (360) 624-0634; Fax: (206) 878-0673

Gray Barn Nursery & Landscape Center – Deb Burns; 8040 Avondale Way NE, Redmond 98052; (425) 868-5757; email: info@greybarn.com

GE & B – 24004 SE 400th, Enumclaw, WA 98022; (360) 825-5506

Green Man Gardens – Brett Johnson; (206) 232-5734; By appointment please; email: bnbjohns@attbi.com

Julius Rosso Nursery – Gene Rosso; PO Box 80345, Seattle, WA 98108; (206) 763-1888; email: antonyrosso@msn.com

Judd Creek Nursery – Vicki and John Browne; 20929 111st Ave. SW, Vashon, WA 98070; (206) 463-9641 Fax:(206) 463-9641

Maritime Nursery – 23930 Wax Orchard Rd. SW, Vashon, WA 98070; (206) 463-2971; Fax:(206) 463-2930

Madrona Nursery – Ann Bucher; 815 38th Ave, Seattle, WA 98122; (206) 323-8325

Mintrs Earlington Greenhouse & Nursery – 13043 Renton Ave S, Renton, WA 98178;
email: mintersnursery@cs.com

Molbak's – Al Dodson; 13625 NE 175th, Woodinville, WA 98072; (425)483-5000; www.molbaks.com

MSK Nursery – 20066 15th Ave. NW, Seattle WA 98177 (206)546-1281; By appointment please

Munro's Nursery – 7622 Simonds Rd NE, Kenmore, WA 98028 – 3924 (425) 488-1141

Olympic Nursery – 16507 - 140th Pl. NE, Woodinville, WA (425)483-9254
email - sales@olympicnursery.com Web site - www.olympicnursery.com

Pacific Natives & Ornamentals – Rob Karp; PO Box 23, Bothell, WA 98041 (425) 483-8108 Fax: (425) 487-6198

Sky Nursery – 18528 Aurora Ave. N, Shoreline, WA (206) 546-4851

T and L Nursery, Inc. – 13245 Wood-Red Rd. , Redmond, WA 98052; (425) 885-5050; www.tandlnursery.com

Tadpole Haven Native Plants (Located in Woodinville), Shirley Egerdahl; PO Box 1702, Edmonds, WA 98020; (425) 788-6100, Fax: (425) 844-2824, tadpole.haven@verizon.net

Thorsett Landscaping Nursery – 13501 SE 226th Place, Kent, WA 98042; (253) 631-5838; Fax: (253) 630-7244

Wabash Farms – Sandy Miller; 19390 SE 400th St. , Enumclaw, WA 98022; (360) 825-7051; Fax: (360) 825-1949

Weyerhauser – Revegetation Greenhouse; 33405 8th Avenue, South Federal Way, WA 98003;
(800) 732-4769

Wilkins Nursery – 21711 131st Pl. SW; Vashon, WA 98070; (206) 463-3050; Fax: (206) 463-3554

Woods Creek Wholesale Sharon Ronsse – 21008 Woods Creek Rd. , Monroe, WA 98272; (360) 794-6823
email: sharon@woodscreeknursery.com

OTHER PUGET SOUND SOURCES:

Bush's – 13419 208th St. NE, Arlington, WA 98223; (360) 435-4987; Fax: (360) 435-7009;
email: ianbush@earthlink.net

Emery's Garden – Debra Jordan-Smith; 2829 164th St. SW, Lynwood, WA 98037; (425) 743-4555

Fancy Fronds – PO Box 1090, Gold Bar, WA 98251; (360) 793-1472

Fairmeadow Nursery – 3110 Libby Road NE, Olympia, WA 98506; (360) 352-5790
Email: nwnatives@reachone.com; www.fairmeadownursery.com

Far Pastures Nursery – 26929 - 115th Ave NE, Arlington, WA 98223-8638; (360) 435-4300 or (800) 663-4304

Fir Run Nursery – Mike and Gayle Fenimore; 15102 91st Ave. Ct, East Puyallup, WA 98875; (253) 848-4731

Fourth Corner Nurseries – 3057 East Bakerview Rd. , Bellingham, WA 98226; (360) 734-0079;
Fax: (360) 734-7919

Frosty Hollow Ecological Restoration – PO Box 53 Langley, WA 98260; (360) 579-2332

Heathwood Cottage Nursery – 18540 26th Ave NE, Lake Forest Park, WA 98155, (206) 363-3189

Inside Passage – Forrest Shomer, PO Box 639, Port Townsend, WA 98368; (360) 385-6114;
www.insidepassageseeds.com

Madronamai Nursery Co – 3923 Mt. Baker Highway; Everson, WA 98247; (360) 592-2200

Native Origins Nursery – 1129 Water St Raymond, WA 98577; (360) 942-0027; Fax: (360) 942 6060

Pacific Wetland Nursery – 7035 Crawford Dr., Kingston, WA 98346

Shore Road Nursery – 616 Shore Road, Port Angeles, WA 98362; (206) 457-1536

SKY Nursery – 14713 Riverbend Rd. , Mount Vernon, WA 98273

Sound Native Plants – P.O. Box 7505, Olympia, WA 98507; (360) 352-4122; Fax: (360) 943-7026;
www.soundnativeplants.com

Storm Lake Growers – 21809 89th St. SE, Snohomish, WA 98290; (360) 794-4842; Fax: (360) 794-8323

Sunbreak Nursery – Bellingham, WA 98226; (360) 384-3763; Fax: (360) 384-5030

Warm Beach Nursery – 8525 176th St. NW, Stanwood, WA 98292; (360) 652-5833

Wetlands and Woodlands – 12800 35th Ave. SE, Everett, WA 98208; (425) 338-9218; Fax: (425) 337-4985

Wildside Growers – 6360 Hannegan Road Lynden, WA 98264; (360) 671-3891; wildsidegrowers@attbi.com

Woodbrook Nursery – 1620 - 59th Ave. NW (mail) Gig Harbor, WA 98335 (253) 265-6271