

## SECTION 4 – NATURAL RESOURCES AND VEGETATED BUFFERS

The provisions of this section are intended to prevent and reduce adverse impacts and to enhance drainageways and natural resources. These requirements are intended to protect the beneficial uses of drainageways and water resources within the District in combination with other State, Federal, County and Local laws and ordinances.

### 4.1 INTRODUCTION

Vegetated Buffers are protected areas that are located along the edge or perimeter of natural resources such as streams, lakes, ponds, reservoirs, and wetlands that are defined as Sensitive Areas within the District. Vegetated Buffers provide for water quality treatment and habitat protection. The District's stormwater standards require Vegetated Buffers for all new developments and redevelopments that are bounded by or contain Sensitive Areas.

- A properly functioning buffer will slow and spread-out stormwater runoff and may filter some sediment and pollutants.
- Trees and other vegetation in a buffer provide shade, as well as slow, store, and evaporate stormwater runoff.

#### 4.1.1 Purpose

The purpose of this section is to assist applicants, developers, and property owners to plan and design their projects in compliance with District Vegetated Buffer requirements. The Vegetated Buffer requirements shall be incorporated into the preliminary site plan.

The District requires Vegetated Buffers to protect the water quality of natural resource areas, which include perennial and intermittent streams and wetlands. The width of the Vegetated Buffer is determined based on the type of Sensitive Area, land slope and contributing drainage area, which can vary the required Buffer width from 25 to 200 feet from the edge of the Sensitive Area.

#### 4.1.2 Applicability within the District

The provisions of this chapter shall apply to all development or redevelopment of property within the District as defined in Section 5.1. Interpretations of such provisions and their application in specific circumstances shall be made by the District. No person shall undertake development activities within the District's jurisdiction without first submitting a Sensitive Area Certification form to the District for review and approval.

#### 4.1.3 Applicability with other Agency Requirements

The applicant shall, at a minimum meet the District Vegetated Buffer requirements. However, the local planning authority may require additional Buffers which may be more or less restrictive than the District requirements. Local, State or Federal agencies may have similar requirements that may or may not align with the District's requirements and policies for Vegetated Buffers.

## 4.2 NATURAL RESOURCE PROTECTION

### 4.2.1 Study

The District shall require the applicant to provide a study identifying areas on the parcel which are or may be sensitive areas when, in the opinion of the District:

- 4.2.1.1 An area or areas on a parcel may be classified as a sensitive area;
- 4.2.1.2 The parcel has been included in an inventory of sensitive areas adopted by the District and more site specific identification of the boundaries is needed.
- 4.2.1.3 A natural resource is located within 200-ft of the property to be developed. Sensitive areas generally do not follow property boundaries. To ensure sensitive areas are provided with proper protections, the assessment requires investigation extending up to 200-ft on to the adjoining properties. The assessment required to determine sensitive areas on adjoining properties may be limited to the best available knowledge and is not subject to a detailed analysis.

### 4.2.2 Undisturbed Buffer Required

New development or a division of land adjacent to sensitive areas shall preserve and maintain an undisturbed Buffer wide enough to protect the water quality functions of the sensitive area. The undisturbed Buffer is a facility required to prevent damage to the sensitive area caused by the development. The width of the undisturbed Buffer shall be as specified in Table 4.1.

Undisturbed Buffers shall be protected, maintained, enhanced or restored as follows: Vegetative cover native to the region shall be maintained, enhanced, or restored, if disturbed in the Buffer. Invasive non-native vegetation may be removed from the Buffer and replaced with native vegetation. Only native vegetation shall be used to enhance or restore the Buffer. This shall not preclude construction of energy dissipaters at outfalls consistent with watershed enhancement, and as approved by the District. Any disturbance of the Buffer requires prior written District approval.

Starting point for measurements from the Sensitive Area begin at:

- Either the edge of bank full stage or 2-year storm elevation for streams; and
- An Oregon Department of State Lands approved delineation marking the edge of the wetland area.

- 4.2.2.1 Where no reasonable and feasible option exists for not encroaching within the minimum undisturbed Buffer, such as at a road crossing or where topography limits options, then onsite mitigation on the intrusion of the Buffer will be at a ratio of 1.5 to 1. All encroachments into the Buffer, except those listed in Section 4.2.3, require an approved variance from the District in writing.

Note: See Section 4.4 - Sensitive Area Buffer Variance Process.

Table 4.1 – Undisturbed Buffers

Sensitive Area	Upstream Drainage Area	Slope Adjacent to Sensitive Area	Width of Undisturbed Buffer
Intermittent Creeks, Rivers, Streams	Less than 50 acres	Any slope	25 feet
Intermittent Creeks, Rivers, Streams	50 to 100 acres	<25%	25 feet
Intermittent Creeks, Rivers, Streams	50 to 100 acres	≥25%	50 feet
Intermittent Creeks, Rivers, Streams	Greater than 100 acres	<25%	50 feet
Intermittent Creeks, Rivers, Streams	Greater than 100 acres	≥25%	100 to 200 feet
Perennial Creeks, Rivers, Streams	Any upstream area	<25%	50 feet
Perennial Creeks, Rivers, Streams	Any upstream area	≥25%	100 to 200 feet
Wetlands, lakes (natural), and springs.	Any drainage	<25%	50 feet
Wetlands lakes (natural), and springs.	Any drainage	≥25%	100 to 200 feet

4.2.3 Permitted Uses within the Undisturbed Buffer

No future structures, development, or other activities shall be allowed which otherwise detract from the water quality protection provided by the buffer, as required by State and Federal regulations, except as allowed below:

- 4.2.3.1 A road crossing the undisturbed Buffer to provide access to the sensitive area or across the sensitive area.
- 4.2.3.2 Utility construction or approved plans by a governmental agency or public utility subject to Public Utility Commission regulation, providing the Buffer is restored and a restoration plan approved by the District.
- 4.2.3.3 A walkway or bike path not exceeding eight feet in width, only if it is part of a regional system of walkways and trails managed or adopted by a public agency.

- 4.2.3.4 A pervious walkway or bike path, not exceeding eight feet in width that does not provide access to the sensitive areas or across the sensitive areas. If the walkway or bike path is impervious, then the Buffer must be widened by the width of the path. The average distance from the path to the sensitive area must be at least 60% of the total Buffer width. At no point shall a path be constructed closer than ten feet from the boundary of the sensitive area, unless approved by the District.
- 4.2.3.5 Measures to remove or abate hazards, nuisances, or fire and life safety violations.
- 4.2.3.6 Homeowners are allowed to take measures to protect property from erosion, such as protecting river banks from erosion, within limits allowed by State and Federal regulations.
- 4.2.3.7 The undisturbed Buffer shall be left in a natural state. Gardens, lawns, or other landscaping shall not be allowed except with a plan approved by the District. The proposal shall include information to demonstrate that improvement and maintenance of improvements will not be detrimental to water quality.
- 4.2.3.8 Fences: The District may require that the Buffer be fenced, signed, delineated, or otherwise physically set apart from parcels that will be developed.
- 4.2.3.9 Stormwater facilities such as water quality swales are not generally allowed in Buffers and will be considered solely at the discretion of the District on case by case basis.
- 4.2.4 Location of Undisturbed Buffer
 

In any new development the undisturbed Buffer may require a separate tract, conservation easement or some other mechanism to ensure protection of the undisturbed Buffer. Restrictions may include permanent signage, fencing, documentation with the title of the property, or other acceptable methods. All methods shall be approved by the District and, when applicable, the City of Happy Valley.
- 4.2.5 Construction in Undisturbed Buffer
  - 4.2.5.1 With approval of the District and an approved plan, noxious vegetation may be removed and replaced with native vegetation.
  - 4.2.5.2 Any disturbance of the Buffer shall be replaced with native vegetation and with the approval of the District.

**4.3 SENSITIVE AREA NATURAL RESOURCE ASSESSMENT**

- 4.3.1 Introduction
 

This Section presents methodologies for determining the location, size, and condition of sensitive areas, undisturbed Buffers, and steep slopes in project areas, as well as the definitions and data required for these determinations.
- 4.3.2 Qualifications
  - 4.3.2.1 The Sensitive Area Certification form may be completed by the property owner or by an authorized representative of the property owner.

- 4.3.2.2 The assessment should be conducted by a professional familiar with wetland and other natural resource assessments.

#### 4.3.3 Scope of Assessment

- 4.3.3.1 Sensitive areas and their undisturbed Buffers generally do not follow property boundaries. To ensure that the sensitive areas are provided with proper protections, the assessment requires investigation extending to 200' on to the adjoining properties. The assessment required to determine sensitive areas on adjoining properties may be limited to the best available knowledge and is not subject to a detailed analysis.

- 4.3.3.2 The applicant shall attempt to gain site access to adjacent properties from the property owner or an authorized representative of the property owner. If property owner/authorized representative denies access, the applicant shall use off-site delineation methods including use of mapping information, aerial photographs for the area, and visual observation from the property boundary to perform the assessment.

#### 4.3.4 Assessment Method

- 4.3.4.1 Step 1: Conduct a reconnaissance of the project area and complete the sensitive area certification form.

- a) Determine the presence or absence of water quality sensitive areas on site or within 200' on adjacent property.
- b) If no water quality sensitive areas are discovered, then complete the Sensitive Areas Certification Form.
- c) If sensitive areas are found continue to Step 2.

- 4.3.4.2 Step 2: Delineate the boundaries of the sensitive area.

##### 4.3.4.2.1 Lakes, Springs, and Wetlands:

- a) Delineate boundaries using the methods described in the 1987 US Army Corps of Engineers Wetland Delineation Manual (<http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf>).
- b) Survey and map all wetland boundaries on the site base map.

##### 4.3.4.2.2 Perennial and/or Intermittent Streams:

- 1) Identify whether the stream is perennial or intermittent. Streams are considered perennial until proven intermittent with adequate field documentation (photos, field data), or determination by Oregon Department of State Lands.
- 2) For all perennial and/or intermittent streams, delineate sensitive area boundaries by identifying the top of bank of the defined channel, or the surface elevation of a 2-year, 24-hour storm event. If determining the surface elevation of a 2-year, 24-hour storm event is not possible, then the outside edge of the stream sensitive area is determined by identifying the areal extent of:
  - a) Water marks on fixed objects (vegetation, buildings, etc.);
  - b) Drift lines (deposited waterborne twigs, litter, etc.); or

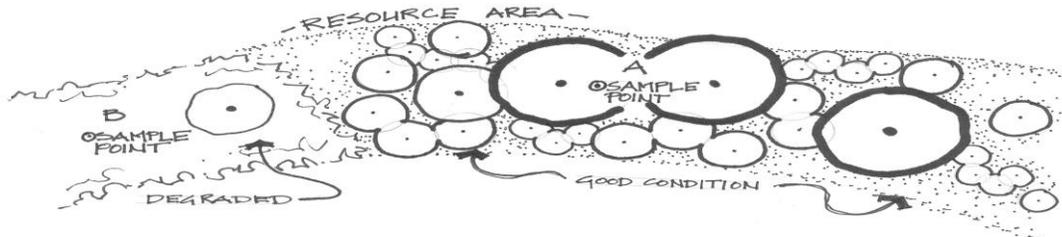
- c) Waterborne sediment deposits on the soil surface or fixed objects (vegetation, buildings, etc.) ; or
  - d) Use the indicator that provides the greatest areal cover.
- 4.3.4.3 Step 3: Determine the undisturbed Buffer width for each sensitive area identified.
  - 4.3.4.3.1 Follow procedures outlined in Section 4.3.5 for determining undisturbed Buffer width.
  - 4.3.4.3.2 Stake, survey, and map the boundaries of the sensitive areas and the undisturbed Buffers on the project site and adjacent properties within 200' of the property line on the base map and flag them on the project site.
- 4.3.4.4 Step 4: Determine the existing undisturbed Buffer condition.
  - 4.3.4.4.1 Identify the plant community types present in undisturbed Buffer.
    - a) Traverse the undisturbed Buffer in order to determine the number and area covered by each plant community present. A plant community is defined as a grouping of plants that often occur together growing in a uniform habitat.
    - b) Sketch the location of each plant community on a base map.
  - 4.3.4.4.2 Select representative sample points.
    - a) A representative sample point is an area within a plant community in which the visually determined characteristics best represent the plant community as a whole.
    - b) Mark the location of the sample point(s) on the base map.
    - c) Establish at least one sample point per acre per community type. All communities must be sampled.
  - 4.3.4.4.3 Characterize each plant community type.
    - a) At the sample point, visually determine and document the area covered by all species providing greater than 5 percent cover within the plot boundary.
    - b) Use a 10-foot radius plot for herbs (non-woody vegetation) and a 30-foot radius plot for woody vegetation.
    - c) Plot boundaries may be adjusted to ensure that only one plant community is represented in a plot.
  - 4.3.4.4.4 Determine cover by native species, invasive species, and noxious species.
    - a) For each community type determine the cover provided by both native species and by invasive species and noxious weeds.
    - b) Average the cover estimates for communities with more than one sample plot.

- c) Native species as listed in the most current version of Portland Native Plant List.
- d) Noxious species are those found in the most current version of Oregon Department of Agriculture Noxious Weed List at <http://www.oregon.gov/ODA/PLANT/WEEDS/Pages/lists.aspx>.
- e) Invasive species include Himalayan blackberry (*Rubus discolor*), reed canarygrass (*Phalaris arundinacea*), Scotch broom (*Cytisus scoparius*), teasel (*Dipsacus fullonum*), English ivy (*Hedra helix*), nightshade (*Solanum* sp.), and clematis (*Clematis ligusticifolia* and *C. vitabla*).

4.3.4.4.5 Transfer results to base map.

4.3.4.5 Step 5: Prepare the Natural Resources Assessment Report

- 1) Draft a report documenting the site and adjacent property sensitive area(s), undisturbed Buffer condition, and slope.
- 2) Include a description of each plant community.
- 3) Include copies of written data assessment forms from any wetland delineation and undisturbed Buffer analysis, and show on the base map.
- 4) Include a copy of the site base map in the report and photos of representative features on the site and adjacent property.
- 5) If encroachment in the undisturbed Buffer is proposed, complete and submit a Wetland and Stream Buffer Variance Application along with the Natural Resource Assessment.



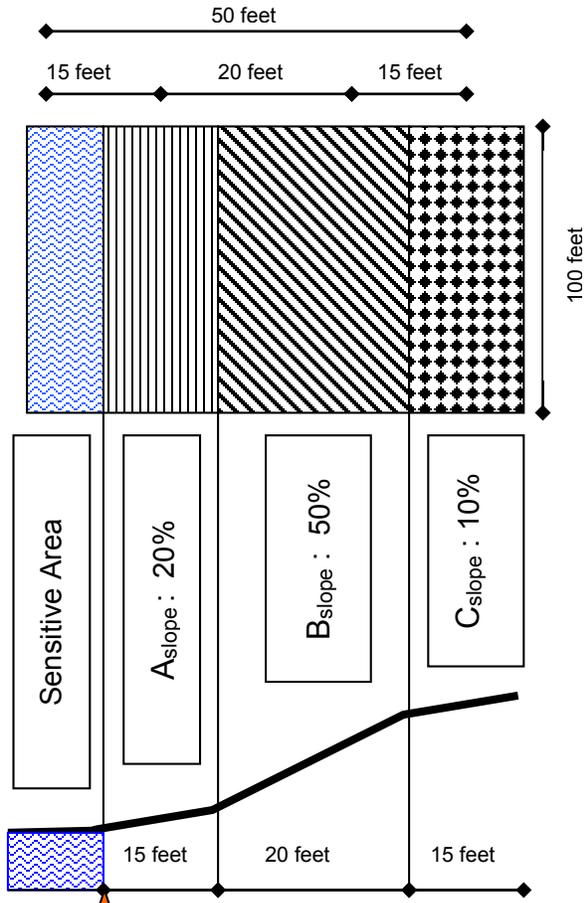
4.3.5 Application of Undisturbed Buffer Requirements

4.3.5.1 Per these Standards:

- 1) The Buffer width is to be set based on the horizontal distance measured perpendicular to the sensitive area boundary, not based on the slope distance from the sensitive area.
- 2) The Buffer width is determined based on the slope of the land adjacent to the sensitive area in 25 or 50 foot increments (see Tables). The District recognizes that the slope of the land may vary within the measurement area and an Area Weighted Average slope must be calculated for situations where this variation exists.

- 3) The calculation for the Area Weighted Average slope is as follows; note that A, B, and C indicate different slope areas, measured horizontally.

$$\frac{(A_{\text{slope}} \times A_{\text{area}}) + (B_{\text{slope}} \times B_{\text{area}}) + (C_{\text{slope}} \times C_{\text{area}})}{(A_{\text{area}} + B_{\text{area}} + C_{\text{area}})}$$



Area A = 15' x 100' = 1500 SF  
 Area B = 20' x 100' = 2000 SF  
 Area C = 15' x 100' = 1500 SF

Slope A = 20%  
 Slope B = 50%  
 Slope C = 10%

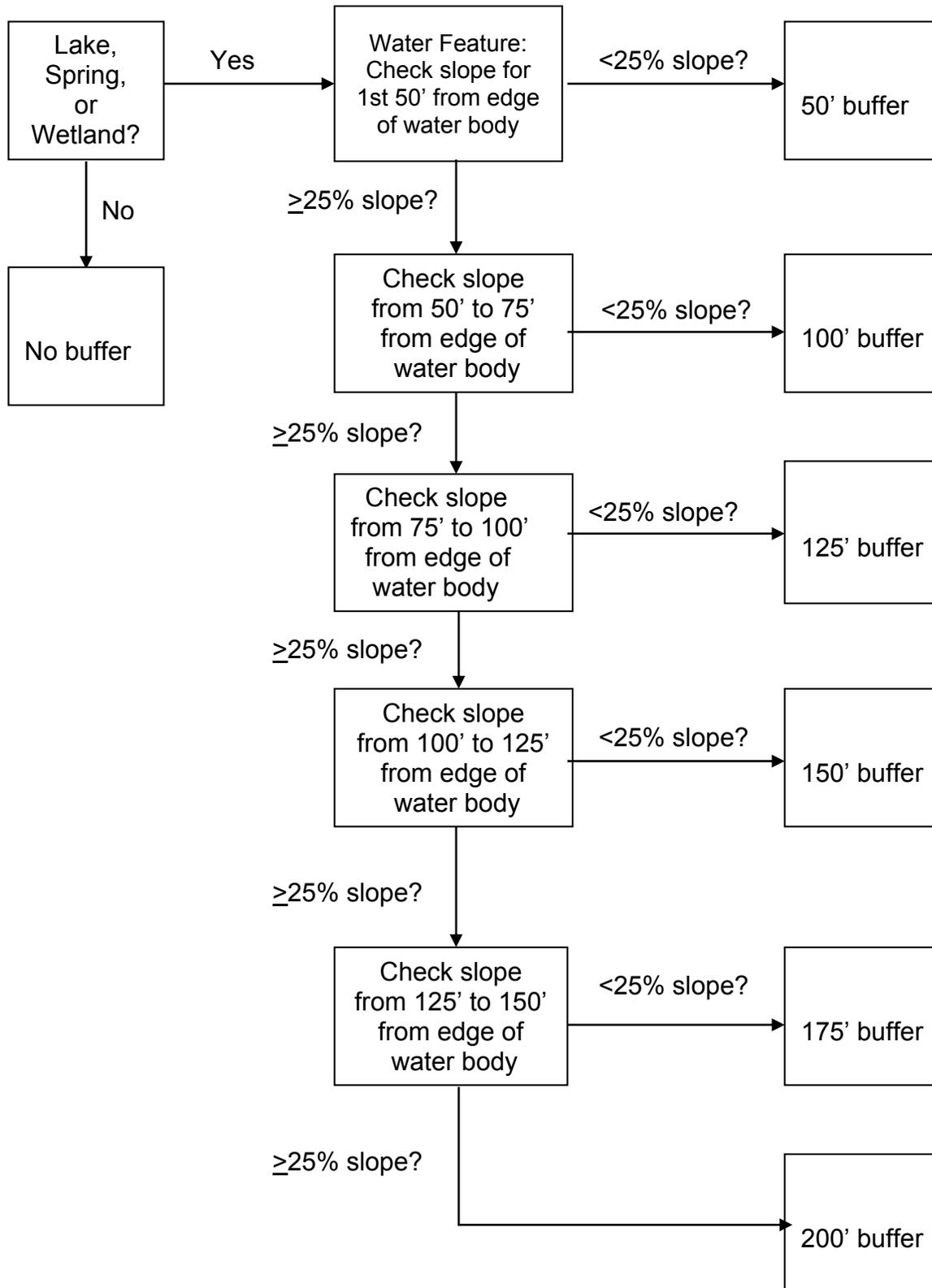
Avg. slope =  $\frac{(1500 \times .20) + (2000 \times .50) + (1500 \times .10)}{(1500 + 2000 + 1500)}$

= .29 (29% slope)

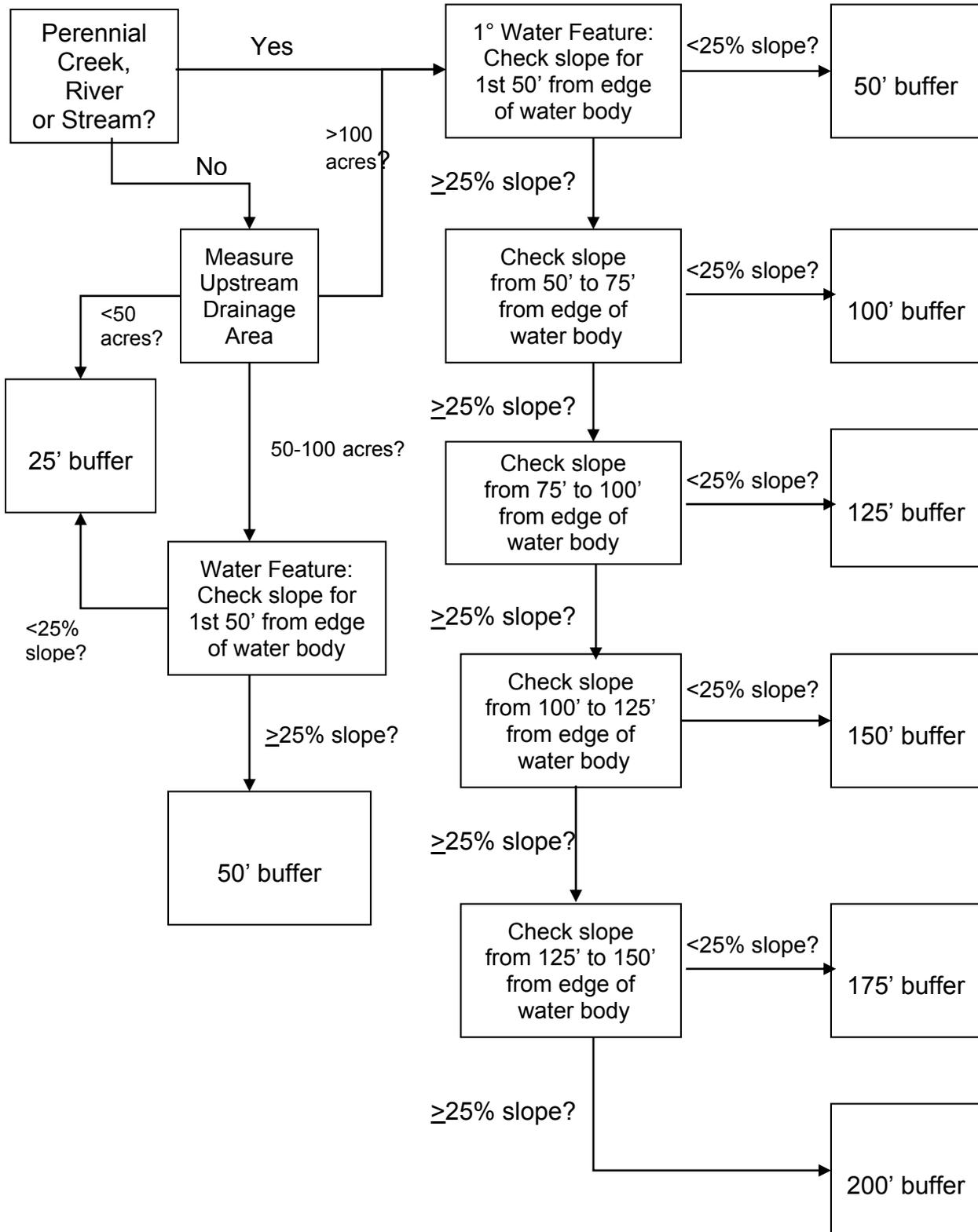
29% > 25%  
 ∴ measure the next 25' buffer width

Point to begin measuring slope; Wetland = delineated wetland boundary;  
 Stream = Bank full Width or 2 year Storm

Buffers for Lakes, Springs, & Wetlands



Buffers for Rivers, Creeks, & Intermittent Streams



#### 4.4 SENSITIVE AREA BUFFER VARIANCE PROCESS

##### 4.4.1 Goal

The goal of the Buffer regulations is to protect the ecological benefit and water quality benefit to sensitive areas by maintaining a healthy riparian zone.

##### 4.4.2 Function

Buffers function by utilizing certain vegetation species to filter pollutants (including fine sediment, nitrates, phosphates, bacteria, and heavy metals) from surface water and by providing shade, large woody debris, and migration area for sensitive areas, thereby preserving their ecological integrity.

##### 4.4.3 Sensitive Area

Generally defined as a wetland, lake, spring, or stream.

##### 4.4.4 Buffer Width

As per the District Regulations, the buffer around wetlands and perennial streams is 50-200 feet, (25-200 feet for intermittent streams) depending on site slope and upstream drainage area. (See Sections 4.3.5 flowcharts for detailed methodology for determining the required Buffer width based on sensitive area characteristics).

##### 4.4.5 Activities Allowed in the Buffer Area

Removal of invasive vegetative species (see Natural Resource Assessment section) – ALL REMOVAL must be accompanied by a replanting plan and an erosion control plan for the time between when invasives are removed and replanting occurs.

##### 4.4.6 Erosion Control Plan

The plan should indicate erosion control materials/methods appropriate for the level of removal of vegetation in the Buffer. If all vegetation is to be removed, lay straw and native grass seed over all exposed soil. If vegetation is removed on the water's edge, hay bales or an equivalent measure needs to be staked to reduce scour resulting from water runoff velocities.

##### 4.4.7 Replanting Plan

The plan should include appropriate plants selected from the Portland Native Plant List (available at the Planning Division), including trees (Douglas fir, cedar, alder, maple, etc.), shrubs (native roses, salmonberry, etc.), and ground cover (native grass mix, sedges, rushes, native wildflowers, etc.). A plan needs to be submitted to the District and approved by District SWM staff.

##### 4.4.8 Activities Prohibited in the Buffer Area

- 1) Construction of structures (buildings of any kind).
- 2) Grading of any kind (including swales, ponds, etc.).
- 3) Impervious Surface (parking lots, gravel, etc.).
- 4) Tree Removal (dead or alive) unless approved by the District.
- 5) Herbicide/Pesticide use in and around sensitive areas and Buffers must be approved by the District.
- 6) Ornamental Vegetation (lawns, non native shrubs, bark dust, etc.).

4.4.9 Procedure for Buffer Variances

As a general rule, Buffer variances are not encouraged and a variance request should only be considered if no alternative exists to meeting the intent of the Rules. The District must uphold the Buffer requirements to ensure compliance with the Endangered Species Act, the Clean Water Act, and METRO regional planning requirements.

To request a Buffer variance, the developer must write a letter to the District stating the reason that the development cannot meet the required Buffer width, and must propose a different Buffer width and mitigation plan that preserves the essential functions of the Buffer as described above.

4.4.10 Application of Undisturbed Buffer Requirements

The Buffer variance must be requested as part of the Land Use or Design Review application process of a development plan, in order to enable the District to make the necessary recommendations to the County Planning Department. A Natural Resource Assessment must be submitted to both the District and the Oregon Department of State Lands (DSL) before a variance request will be considered. Final variance approval will not be granted until DSL concurs with the Natural Resource Assessment.

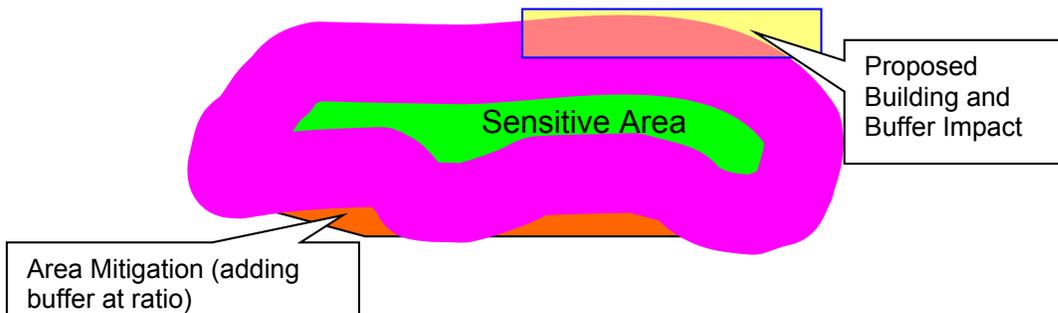
4.4.11 Restoration of Buffer Area

As sites are redeveloped, Buffer areas which are currently or have previously been impacted (i.e. impervious surface/structures in the Buffer) will need to be restored into Buffers that provide water quality benefit and function as a filter for pollutants. This may include situations where gravel is removed and the area is replanted with the above-mentioned vegetation.

The District recognizes the effort to restore Buffer areas. As a result, depending on the level of restoration effort for the Buffer, the full Buffer width required by the Rules may be modified. However, this depends completely on the level of restoration that the applicant proposes for the Buffer. For example, for a site with a 50 foot Buffer requirement, of which 45 of the 50 feet of Buffer is currently gravel, a variance request that might be considered would be for an intensive, highly vegetated 25-foot Buffer to be created and a variance made to allow development on the upper 25 feet. Due to the level of effort required to remove the gravel, placement of native soils, purchase and planting native vegetation, and follow up with appropriate monitoring, in the end, the 25 foot, highly vegetated Buffer would be of greater water quality benefit than a 45-foot undisturbed gravel buffer.

4.4.12 Allowable Mitigation for Variance Acceptance

**AREA MITIGATION.** At a ratio of 1.5:1, the developer must provide a map and calculations indicating that the ratio has been met. Note that if a developer can meet the 1.5:1 ratio fully, then no enhancement of the Buffers would be necessary, provided that the essential functions of the Buffer are preserved.



**ENHANCEMENT MITIGATION.**

**WES Buffer**

A developer may choose to mitigate Buffer impacts by enhancing all remaining Buffer areas. This could include planting native plants in the Buffer, removing impervious surfaces in the remaining Buffer, and/or placing native, organic soils in the remaining Buffer (to enhance soils to support plants). Note that detention ponds and water quality swales are not generally allowed in Buffers and will be considered solely at the discretion of the District on a case by case basis.

All plants must be selected from the Portland Native Plant List.

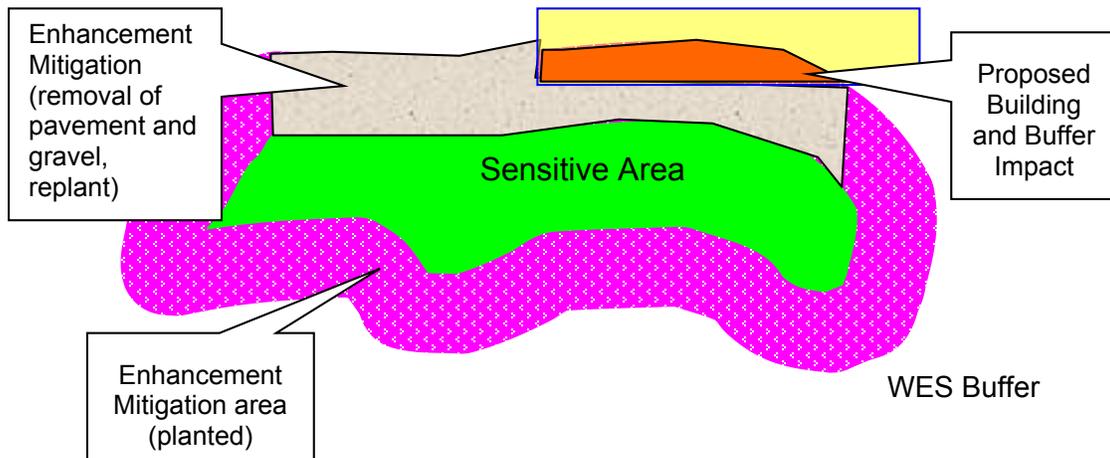
Plants should meet a minimum 3' OC (on center) density.

Developer must show a map of all enhancement activities in the Buffer area, and a complete species list and number of species proposed.

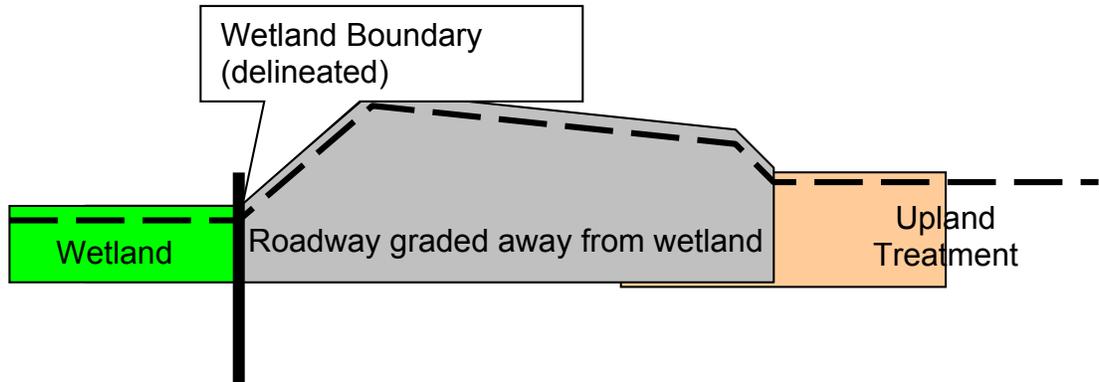
Developer must provide 100% success in the planting. Assuming a 30% mortality rate of the plants, the developer can choose to plant 130% of the site (allowing 30% to die, and not replanting), or at the end of three years must replant any dead plants up to the 100% success.

DSL and COE mitigation requirements do not satisfy the District's Buffer variance requirements. If a DSL/COE mitigation plan includes activity in the Buffer area, additional Buffer mitigation may still be needed to satisfy the District's requirements.

Developer must provide a minimum of 3 years of monitoring and maintenance (which includes removal of invasive species). All such maintenance must be documented and reported annually.



**ROADWAY BUFFER MITIGATION.** Commonly, a developer will obtain a permit from State and Federal agencies to fill a wetland and construct roadways on a wetland. In scenarios where a roadway is proposed in the location where a Buffer is required, the developer needs to mitigate for the area of the Buffer elsewhere on the development site, AND construct the roadway in a manner to prevent any untreated runoff from directly entering the wetland. One example of appropriate roadway construction for this scenario would include grading the road in a manner that all runoff would drain toward upland treatment prior to discharging to the wetland.



DSL/COE permitted stream crossings (culverts, bridges, etc.) do not require Buffer mitigation.

4.4.13 Acceptance of Buffer Variance:

It is the decision of the District to approve or deny variance applications. All variance requests must be addressed to the District at the time of Land Use application. The District is required to notify property owners within 250 feet of the proposed variance of the decision to either grant or deny the variance. The District's variance application final decision may be appealed to the District Director within 14 days of the notification of the final decision.

If, after a developer submits a variance request and provides a plan that meets the function (defined above) of the Buffer, and a variance request is accepted by the District, an approval letter will be sent to the developer. The letter will summarize the plan and indicate the procedure for District staff to inspect the Buffer during and after implementation of the approved plan.