

**WETLAND MITIGATION PLAN
LAWRENCE PARK**

Proposed Development

It is proposed to develop the subject property for construction of a 7 lot residential subdivision as shown on project design plans by Pacific Engineering, Inc. Access to the building lots will be provided by construction of a roadway from SE 88th Street. The northern 16,400sq ft is being set aside as a sensitive area tract. The tract includes the portion of the wetland on the property and the upland buffer. Stormwater treatment is being provided in a detention pond tract which discharges by way of an infiltration trench, into the outer limits of the Sensitive Area Tract. No new construction is being proposed within the wetland or within the designated Sensitive Area tract. The wetland report dated March 22, 2007, by AlderNW identified and described the wetland area at the north end of the project area.

Buffer Averaging

The standard buffer assigned to the Category 3 Wetland is 60ft. This standard buffer may be modified with buffer averaging. Conditions for approving a modification of the buffer width are outlined in the City of Newcastle CAO which read as follows:

"The department may approve a modification of the minimum buffer width required by this section by averaging the buffer width if:

1. The department determines that:
 - a. The ecological structure and function of the buffer after averaging is greater than the structure and function before averaging; or
 - b. Averaging includes connecting the corridors of a wetland complex; and
2. The resulting buffer meets the following standards:
 - a. The total area of the buffer after averaging is equivalent to or greater than the area of the buffer before averaging; and
 - b. The additional buffer is contiguous with the standard buffer.
 - c. No feasible alternative to the site design could be accomplished without buffer averaging; and
 - d. The buffer width may be reduced by no more than 25% of the standard width at any point, down to a minimum of 35 feet.

Buffer averaging is being applied across the north end of the project between the detention pond tract and building Lot 7, and the wetland. The buffer is being reduced by 25% from the standard 60ft, to a minimum of 45ft. for construction of the stormwater treatment facilities within the Detention Tract. The extent of the grading required for construction of the pond facilities and berm is being reduced by the inclusion of a low retaining wall around the east and south side of the pond.

Construction of the storm water treatment facility as designed will affect 1,649sq.ft of the outer 15ft of the 60ft wide wetland buffer. This reduction in buffer area is being replaced by increasing the buffer width between proposed Lot 7 and the wetland by 1,649sq.ft.

In its predevelopment condition, the wetland buffer area being included in the Sensitive Area tract is occupied by scattered large trees including big leaf maple (*Acer macrophyllum*), a few domestic fruit trees, and larger willows. There are patches of dense Himalayan blackberry (*Rubus discolor*), and some open areas of creeping buttercup (*Ranunculus repens*), and grasses, including reed canarygrass (*Phalaris arundinacea*).

As an element of the buffer averaging plan, portions of the wetland buffer will be enhanced through measures to control the growth of non native shrub species and replanting the area with native trees and shrubs. We have identified an area of approximately 8,200 sq.ft. to be included in the buffer enhancement plan. Vegetation within the northeast corner of the buffer, not included in the buffer enhancement planting plan includes sword fern, and salmonberry among other native species as understory and herbaceous groundcover below the taller willows.

This Buffer Enhancement Plan provides for enhancement of the preserved wetland buffer area within across the north end of the project area. This plan includes provides for the planting of native trees and shrubs, and the control of non native trees and shrubs on approximately 8,200sq.ft of the wetland buffer.

Wetland Buffer Enhancement Plan Goals and Objectives

The overall goal of the Buffer Enhancement Plan is to enhance the habitat quality of the area included within the buffer enhancement area. This goal will be achieved by controlling the growth of non native invasive species and by planting native trees and shrubs.

The wetland/buffer enhancement plan involves three objectives:

1. Control the growth of non native invasive shrubs including Himalayan blackberry and Scot's broom (*Cytisus scoparius*).
2. Increase the overall cover of native trees and shrubs.
3. Increase the native plant species diversity.

Standards of Success

A determination of the success in achieving the buffer enhancement goals and objectives will be based on the following standards:

1. A minimum 80-percent average native vegetative cover of trees and shrubs at the end of the minimum five year monitoring period. Plant species composition shall meet the intent of the mitigation goals.
2. 100-percent survival of planted trees and shrubs at the end of the first year after completion of mitigation work.
3. A minimum of 80- percent survival of planted trees and shrubs at the end of each of the minimum five years of the monitoring period. This survival rate is established as a goal and may be adjusted where natural regeneration and growth has resulted in minimum plant cover, as defined in Item 1. Weedy and invasive species, such as reed canarygrass and Himalayan blackberry, will not be considered suitable substitutes for the planted species.
4. Less than ten percent cover by invasive weedy species at the end of each growing season during the five year monitoring period.
5. A minimum of four native shrub species and two native trees species within the Buffer Enhancement area.

These standards are to be met within the area included in the buffer enhancement planting area, covering approximately 8,200sq.ft.

Sampling Methods

Vegetative cover will be sampled by measurements along a 50-foot long permanently established transect. Data to be collected on the transect include surviving plant numbers and aerial coverage by species. Permanent stakes will identify the end points of the transect.

In addition to the sample transect, permanent photo points will be established from which the buffer enhancement area can be photographed. These photos will provide a pictorial record of the development of the area over time and will be used to supplement the quantitative sample transects.

Monitoring Schedule

The project biologist shall provide construction inspection services during implementation of the buffer enhancement plan to ensure that mitigation design objectives are being met. It is important that wetland biologist provide observation and consultation services when work is underway within mitigation areas. This is to assure that the mitigation design is being appropriately interpreted and to be available to provide consultation and make adjustments in the event changed conditions are encountered and to identify the specific limits of work.

An initial report describing the as-built conditions will be prepared for submittal to City of Newcastle when construction work has been completed. This report will be prepared upon completion of the plantings for the project and will identify the work completed and document the baseline conditions for defining the success of the project in subsequent monitoring reports.

Following completion of the project the mitigation areas will be monitored on the following schedule.

1. As-built monitoring to be completed within 30 days after completion. Mitigation grading and plant materials have been installed.
2. During June or July of the second, third, fourth and fifth years after installation.
3. Final inspection of the mitigation project, five years after the mitigation plantings were installed and the mitigation work accepted as complete.

The wetland biologist will monitor the project on the above schedule and prepare written reports addressing the survivability and growth of plant materials, as well as any recommendations for maintenance or remediation. These reports will be submitted to City of Newcastle within three weeks of completing each monitoring visit. The wetland biologist will prepare a final report at the end of the minimum five year monitoring period to be submitted within thirty days of completing the final mitigation inspection. This final report will address the success of the project in meeting the project objectives.

Care and Maintenance

The mitigation areas shall be examined periodically to determine the possible invasion of weedy pest species such as Scot's broom, reed canarygrass, English ivy, and Himalayan blackberry, which compete with more desirable native species. These pest species shall be controlled as they appear on the buffer enhancement area. Reed canarygrass can be periodically cut to control its growth, and blackberry can be physically pulled out or cut down. Red alder and black cottonwood, or other tree seedlings which may become established shall be thinned to 8 ft. to 12 ft. centers.

Irrigation will likely be required during the first summer and possibly during the second summer after installation. Water shall be applied as necessary depending on rainfall and soil moisture conditions. Irrigation may be provided by installation of temporary irrigation pipes or by water trucks.

Requirements for replacement of dead plant materials shall be identified during the monitoring inspections. Replanting as necessary will be carried out during the dormant season. Trash and effects of vandalism shall be removed as soon as possible after appearance in the area.

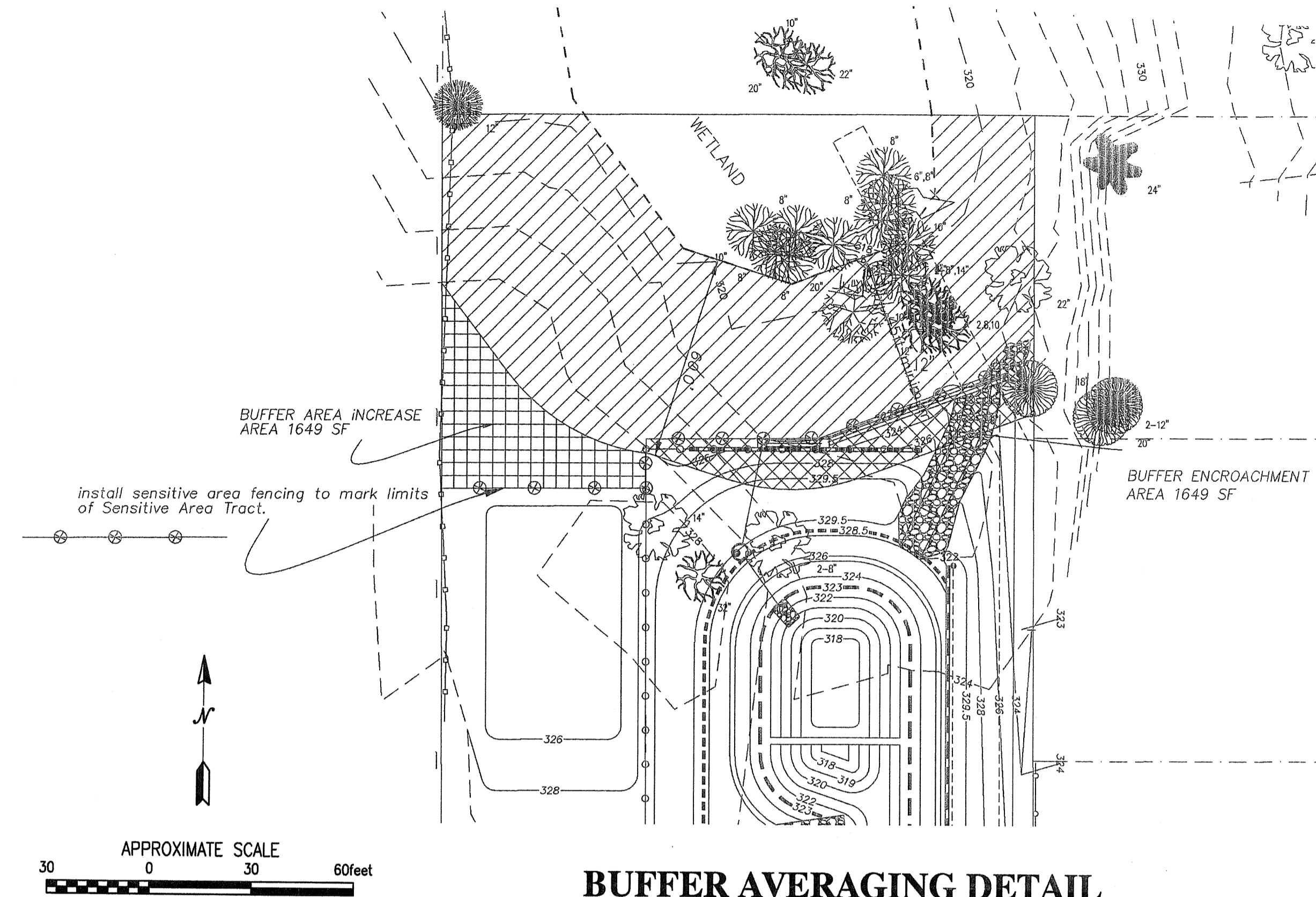
Himalayan Blackberry Control

A primary element of the buffer restoration plan is the control of Himalayan blackberry and other non native woody shrub species. Steps to control the growth of Himalayan blackberry include the initial cutting to remove as much as possible of the blackberry growth, and then maintenance over the monitoring period to limit the regrowth of the blackberry. During the initial cutting of the blackberry it is important that native trees and shrubs be identified and protected. Measures adopted for the initial cutting and subsequent maintenance shall include provisions for protecting any existing native trees and shrubs, and the planted materials.

1. Prior to beginning any work within the buffer restoration area, the contractor shall meet with project biologist to review procedures to be used. At this time project biologist will identify and mark native vegetation to be preserved. On sections of the buffer restoration area, where there are very few or widely spaced native shrubs and trees, it may be possible to use larger equipment to "rake" the area to remove the blackberry. In other locations it will be necessary to use hand held equipment. Weed-eater type cutters may be utilized but with care not to damage preserved vegetation. The objective of this initial stage of the work is to reduce the above ground growth of the blackberry, while preserving existing native plants within the area. This work can be carried out at any season.
2. Following the initial cutting, control activities will be required during the five year monitoring period. Blackberry is difficult to control and will continue to sprout and grow from the underground roots which cannot be completely removed during the initial cutting. Maintenance to control blackberry growth should be carried out twice during each year, in late April or May, and again in late July or August. Preferred method for controlling the new growth is by cutting using hand held equipment. Alternatively an approved herbicide such as Rodeo may be used by a licensed contractor and following all manufacturers recommendations. Brush on type applicator shall be used. Objective of this maintenance work is to limit the growth of non native shrub species while preserving native plant cover.
3. If available from the clearing work for the development, wood chips may be applied over the buffer enhancement area. Application of the chips can be used to control and limit the growth of the Himalayan blackberry and reed canary grass over the buffer enhancement area. Annual maintenance to control sprouting through the chips layer will be required.

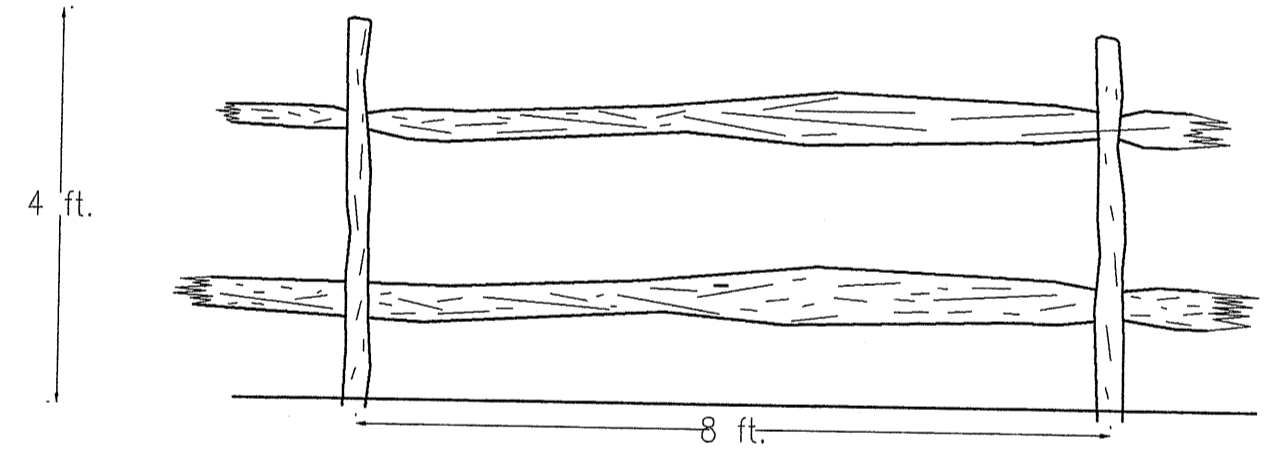
Contingency Plan

The proposed restoration planting plan has a high probability of success. If it becomes apparent from the monitoring program that the restoration objectives are not being met, a joint determination by the project applicant, the wetland biologist, and the City of Newcastle will be made to implement a contingency plan. The contingency plan can include measures such as replacing plants that have not survived and removing competing weedy species.



BUFFER AVERAGING DETAIL

**SENSITIVE AREA FENCE
Split Rail Fence**



Fence to be installed marking boundary of Sensitive Area Tract
Fence to be constructed of cedar materials
Posts shall be imbedded minimum of 2ft. in soil.

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**WETLAND BUFFER ENHANCEMENT PLAN
LAWRENCE PARK SUBDIVISION**
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