MEADOWLANDS STORMWATER FILTRATION SYSTEM

DRAFT DESCRIPTION OF PROPOSED PROJECT

FOR PRE-APPLICATION DISCUSSION

WITH THE CITY OF CAMAS

Project: The Lacamas Shores Homeowners' Association ("LS HOA") seeks to perform maintenance to the Meadowlands Stormwater Filtration System (AKA Clark County Tax Lot 84839000, "Lacamas Shores HOA Common Area", and "Meadowlands Park"), consisting of 5.92 acres of property wholly owned and managed by the LS HOA. Maintenance will be in conformance with the permit granted in 1988 and the 2011 maintenance guidelines by the Stormwaters Partners of SW Washington called "Managing Stormwater". Years of inattention have allowed much of the Project Area to convert from the original herbaceous-covered meadow designed to filter stormwater to a channelized forested area that allows the majority of water to pass through without filtration. We would like to return parts of the system to a healthy well-vegetated widespread wetland buffer habitat with grasses, and other wetland plants for proper bio-filtration. This will also allow for over one-third of the LS HOA members to have a better view(s) of Lacamas Lake, the Pittock-Leadbetter House, and/or Mt. Hood and thereby help to improve both the individual lot and subdivision property values and home enjoyment. All work will be completed in consultation with wetland biologists and a ISP certified arborist in an environmentally conscientious and efficient manner and in compliance with the LSHOA's CC&Rs, as referenced in the Deed of Dedication for the neighboring Conservancy Zone owned by the City of Camas.

Delivery Date: As soon as is practical.

Project Area: **The area of the tax lot northwest of the Athletic Field bordered by the rectangular Meadowlands trail on three sides and the Athletic Field on the south**. The northern two-thirds of the tax lot is in use as a stormwater treatment facility. The southern portion of the lot is in use as an athletic field with a boat launch facility, boat and maintenance storage, and a picnic area. These uses have been in place since their permitted construction around 1990. **No change in use is proposed.** See Appendix A to the previously submitted "Wetland Delineation & Proposed Vegetation Plan" ("ETC

Report"), noted on the "Vegetation Management Plan" map in blue, and the Project rendering below.

General Description:

The Meadowlands Stormwater Filtration system has been minimally maintained though it was improved in 1996 (see Appendix G6 to the ETC report - "Lacamas Shores Modification to Stormwater Disposal System"). **The LSHOA wishes to properly manage the vegetation of the Project Area for more efficient functioning. To improve biofiltration, the vegetation would be restored to the original widespread grassy wetland plants from the current forested channeled runoff.** Doing so will achieve the goals of:

- Improving water quality through more the efficient stormwater biofiltration;
- Improve wildlife habitat by providing a healthier habitat for hummingbirds, song birds, bees, frogs, salamanders, bats, etc.;
- Controlling unwanted and invasive species;
- Decrease stagnant water and mosquito breeding;
- Creating a healthy and aesthetically pleasing ecosystem for the community's enjoyment;
- Restore the views and panoramas over the Project Area (an accepted recreational use); and
- Complying with the LS HOA's CC&R requirements
    - to preserve and maintain the area as a stormwater filtration system, and
    - "to preserve, protect and improve the quality and character" of Lacamas Shores.

Any of the Project Area that is not able to function as part of the biofilter will be planted with **Camas Lily** seeds and/or bulbs as a tribute to our Camas community.

Maintenance Proposed:

To return the biofiltration areas to the original meadowland, we plan to:

1. Remove deciduous trees and invasive species and replace them with wetland grasses, sedges, rushes, wildflowers and/or other shorter grasses as recommended. We will replace with Camas Lily and complimentary seed where not wet. Removing the overstory will allow for grasses and other high-efficiency filtering plants to grow.
2. Inspect evergreens and remove if diseased; trim/limb as necessary for the health, safety, and enjoyment of users of the Heritage trail and the trail through the Meadowlands.
3. Clear all inlets and outlets of debris.
4. Maintain grasses and wildflowers on a regular basis going forward for the continued efficient biofiltration function and a healthy habitat.

Procedures:

All procedures are planned for lowest environmental impact and high cost-efficiency. Any contractors used will be proficient in technologies that are most environmentally and eco-system friendly, and properly licensed and bonded. Such procedures include:

- Erosion control, such as a silt fence will be used.
- Any trees to be preserved shall be marked. Any such trees must be healthy and not standing in flooding areas.
- Trees shall be limbed, cut, or topped as indicated.

- All organic material shall be masticated and reused or removed using special equipment based on new technology. Care must be used to ensure no oversaturation of nitrates into the Lake.
- Disturbed areas shall be replanted with grass/meadow seed mix. Native seed mix will be sought.
- Straw will be spread over the seeded area.

Approx. Costs: Costs for a complete clearing of the land with the above procedures are quoted as $30,000-$31,000 plus seeding. Any changes to the process will change that cost.

Other Details: The Meadowlands Stormwater Filtration System serves both the LS HOA, portions of NW Lake Road, and possibly portions of the subdivisions of Lake Heights and Lake Hills. The details of the plumbing and permitting of Lake Heights waters to LSHOA's treatment facility require some additional investigation.

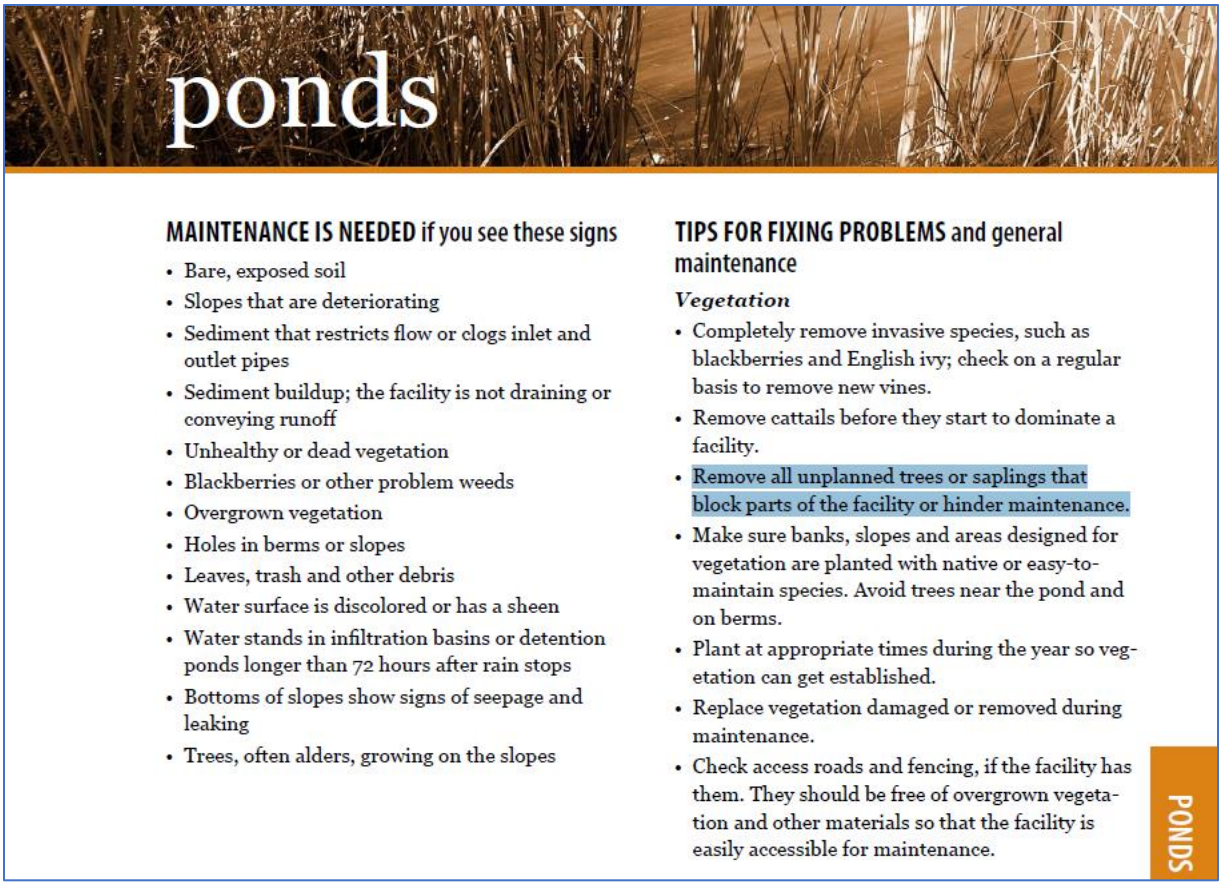
After construction, stormwater effluents were monitored for 5 years ending in 1993 to determine if the facility was functioning as designed. In 1996 the SE portion was redesigned and upgraded to accommodate additional flows from the expanded service area. See "Modifications to Lacamas Shores Stormwater Disposal System" by MacKay & Sposito, 1996, included as Appendix G6 in the ETC report.

Applicable Documents: The following is a list of documents that have information that is relevant to this project. Any of them can be made available as needed.

1. The "Lacamas Shores HOA Meadowlands Park Wetland Delineation & Proposed Vegetation Plan" was submitted by ETC in March 2017. Called the "ETC Report". **(Attached, minus Appendices)**
2. Appendix A to the ETC Report, which includes 5 maps of the Project Area. These are site maps drawn to scale with details of existing and permitted conditions, including structures, streets, sensitive areas and natural features. **(Attached)**
3. The 1988 Conditional Use Permit. Shows that the Meadowlands area was planned, approved, and created as a stormwater biofiltration system. **(Attached)**
4. The 1988 Deed of Dedication for the Conservancy Zone. Shows the agreement of the City to allow the LSHOA to maintain the Project Area:

   > "Grantor hereby expressly reserves in itself, its successors and assigns, including but not limited to Lacamas Shores Homeowners Association, the right to enter upon the conservancy zone to construct and maintain a biofilter storm drainage system;" paragraph 1.

5. "Managing Stormwater: an introduction to maintaining stormwater facilities – for private property owner and HOAs", manual by Stormwater Partners of SW Washington (including Clark County and City of Camas). Outlines the steps for maintenance of stormwater treatment systems by element. The Meadowlands systems has the following listed elements with their own required maintenances steps: inlets, outlets, filtering vegetation, and sediment ponds. Appendix G3 of the ETC Report.



ponds

MAINTENANCE IS NEEDED if you see these signs

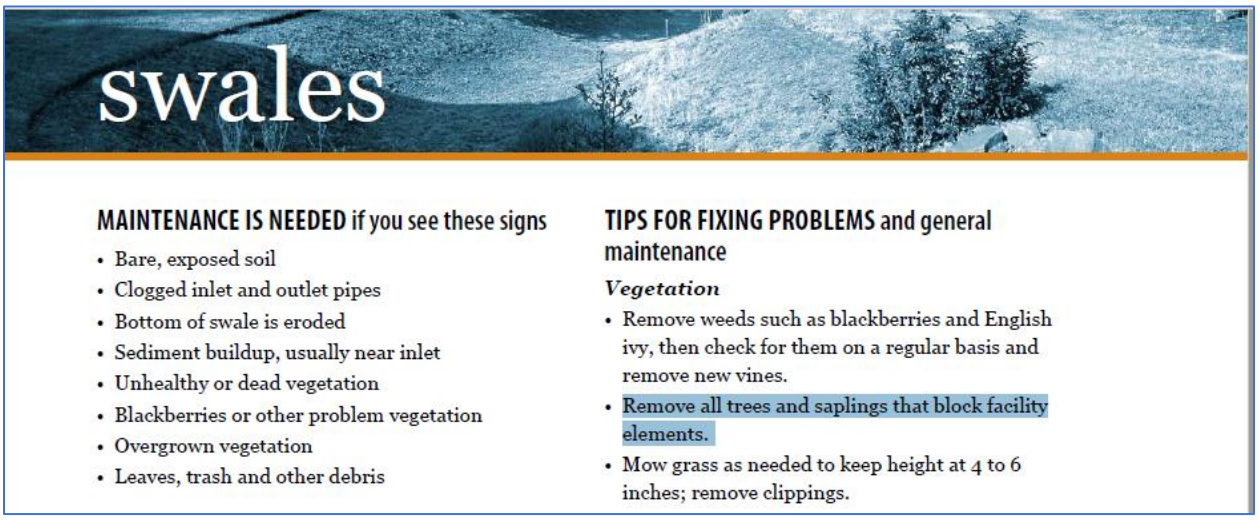
- Bare, exposed soil
- Slopes that are deteriorating
- Sediment that restricts flow or clogs inlet and outlet pipes
- Sediment buildup; the facility is not draining or conveying runoff
- Unhealthy or dead vegetation
- Blackberries or other problem weeds
- Overgrown vegetation
- Holes in berms or slopes
- Leaves, trash and other debris
- Water surface is discolored or has a sheen
- Water stands in infiltration basins or detention ponds longer than 72 hours after rain stops
- Bottoms of slopes show signs of seepage and leaking
- Trees, often alders, growing on the slopes

TIPS FOR FIXING PROBLEMS and general maintenance

Vegetation

- Completely remove invasive species, such as blackberries and English ivy; check on a regular basis to remove new vines.
- Remove cattails before they start to dominate a facility.
- Remove all unplanned trees or saplings that block parts of the facility or hinder maintenance.
- Make sure banks, slopes and areas designed for vegetation are planted with native or easy-to-maintain species. Avoid trees near the pond and on berms.
- Plant at appropriate times during the year so vegetation can get established.
- Replace vegetation damaged or removed during maintenance.
- Check access roads and fencing, if the facility has them. They should be free of overgrown vegetation and other materials so that the facility is easily accessible for maintenance.

PONDS



swales

MAINTENANCE IS NEEDED if you see these signs

- Bare, exposed soil
- Clogged inlet and outlet pipes
- Bottom of swale is eroded
- Sediment buildup, usually near inlet
- Unhealthy or dead vegetation
- Blackberries or other problem vegetation
- Overgrown vegetation
- Leaves, trash and other debris

TIPS FOR FIXING PROBLEMS and general maintenance

Vegetation

- Remove weeds such as blackberries and English ivy, then check for them on a regular basis and remove new vines.
- Remove all trees and saplings that block facility elements.
- Mow grass as needed to keep height at 4 to 6 inches; remove clippings.

6. Clark County Stormwater Manual 2015, Book 4 "Stormwater Facility Operation and Maintenance," by Clark County. States that:
   i. Key maintenance considerations for "filter strips" include to "Control trees, brush and noxious weeds in the filter using either mechanical means or approved IPM practices." p.57.
   ii. Bioretention facilities need maintenance when "Less than 75% of planted vegetation is healthy with a generally good appearance" P. 94. Also notes that

"Any conditions found that were deleterious to plant health" should be corrected where possible.

7. 2013 Update on Wetland Buffers by the Dept. of Ecology. States that:
   i. "Buffers may lose their effectiveness to disperse surface flows over time as flows create rills and channels, causing erosion within the buffer.", p. 28.
   ii. Also notes that "The use of buffers to protect and maintain water quality in wetlands (removing sediments, nutrients, and toxicants) is best accomplished by ensuring sheet flow across a well-vegetated buffer with a flat slope (less than 5%)." p. 15. The two factors indicated were updated to be two of 6 or more key factors, including "soil infiltration, surface roughness (partially caused by vegetation), slope length, and adjacent land use practices", "soil type, subsurface water regime (e.g. soil saturation, groundwater flow paths) and subsurface biogeochemistry", and "interactions between groundwater and surface water" and water pathways.
8. "Wetlands for Stormwater Treatment", July 1993 article by Mark F. Bautista and N. Stan Geiger, Water Environment & Technology magazine. Specifically describes our system's design and 3-year test plan with the results. Appendix G5 to the ETC Report.
9. The CMC 16.53.010 C2b states that – Property is exempt from the City's critical area reporting requirements if they are

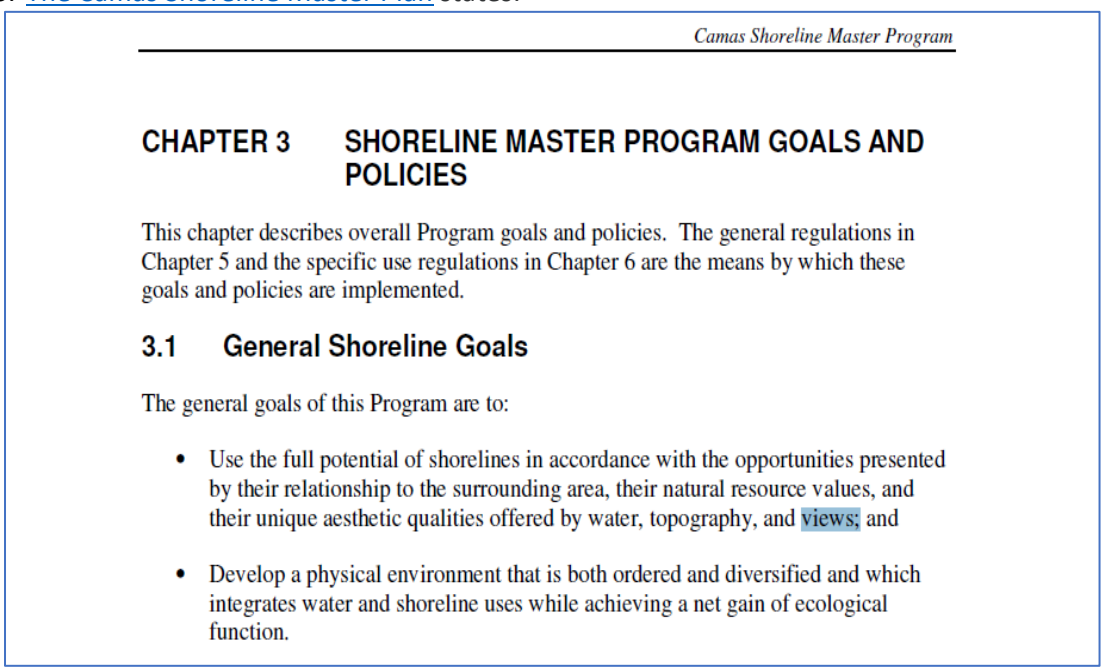
   "Artificial. Wetlands created from nonwetland sites including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, stormwater facilities, farm ponds, and landscape amenities; provided, that wetlands created as mitigation shall not be exempted;" [emphasis mine].

10. The CMC 16.53.010 B3b states that – Property is exempt from the City's critical areas reporting if all reasonable economic use of the property is denied:

    "The standards of this chapter shall not be used to deny all reasonable economic use of private property. The following criteria must be met to verify that all reasonable economic use of the property has been denied:
    i. The application of this chapter would deny all reasonable economic use of the property,
    ii. No other reasonable economic use of the property has less impact on the wetland and buffer area,
    iii. Any wetland or buffer alteration is the minimum necessary to allow for reasonable economic use of the property, and
    iv. The inability of the applicant to derive reasonable economic use of the property is not the result of actions by the applicant after the date of adoption of the ordinance codified in this chapter;"

11. The Lacamas Shores CC&Rs, Section 2.7.1. mandate that the LS HOA properly maintain the system. "The owners, by and through the Homeowners Association, are responsible for maintaining the wetlands of the Lacamas Shores Development, . . ." and "the expenses of maintenance, repair and/or restoration of the wetlands. . . "

12. Shoreline Hearing Board Case No. SHB 88-33 Agreed Order – Mandated the agreement between the City of Camas and the Lacamas Shores Developer to dedicate "a portion of the property now reserved for wetland use to be developed immediately as part of the man-made wetlands created as part of the biofilter storm drainage system on the project."
13. The Camas Shoreline Master Plan states:



Camas Shoreline Master Program

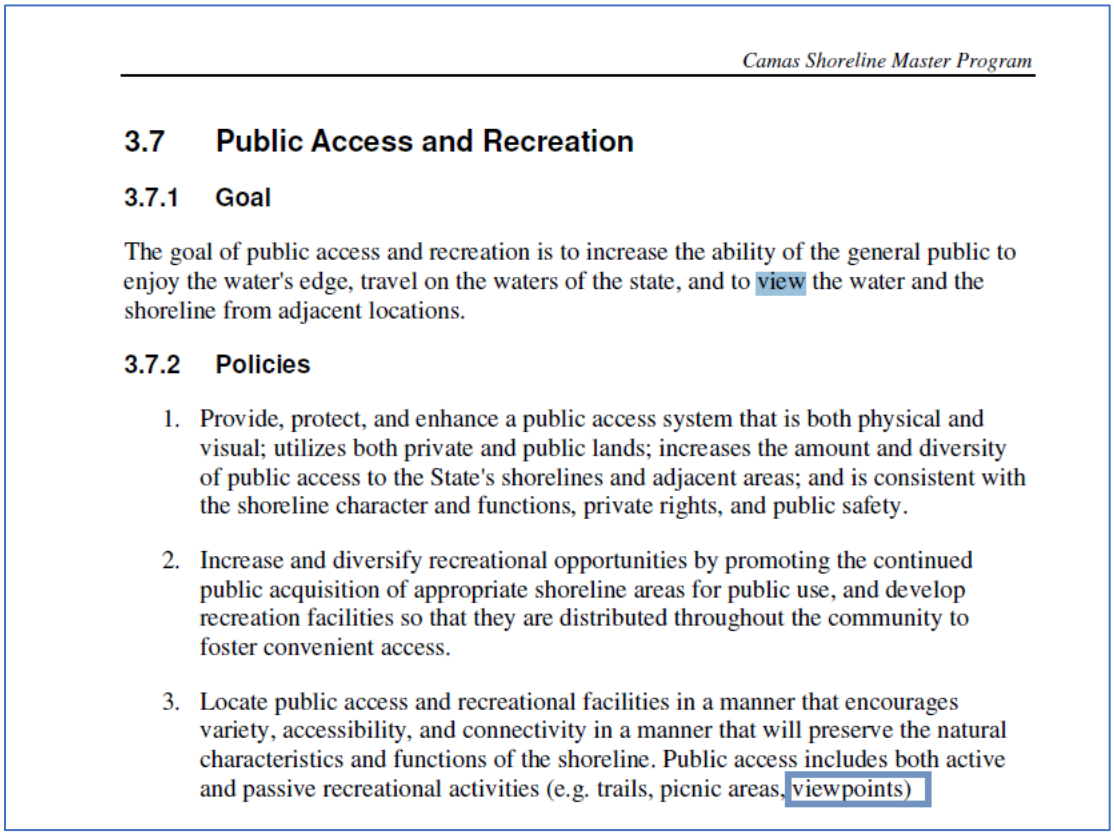
CHAPTER 3 SHORELINE MASTER PROGRAM GOALS AND POLICIES

This chapter describes overall Program goals and policies. The general regulations in Chapter 5 and the specific use regulations in Chapter 6 are the means by which these goals and policies are implemented.

3.1 General Shoreline Goals

The general goals of this Program are to:

- Use the full potential of shorelines in accordance with the opportunities presented by their relationship to the surrounding area, their natural resource values, and their unique aesthetic qualities offered by water, topography, and views; and
- Develop a physical environment that is both ordered and diversified and which integrates water and shoreline uses while achieving a net gain of ecological function.



Camas Shoreline Master Program

3.7 Public Access and Recreation

3.7.1 Goal

The goal of public access and recreation is to increase the ability of the general public to enjoy the water's edge, travel on the waters of the state, and to view the water and the shoreline from adjacent locations.

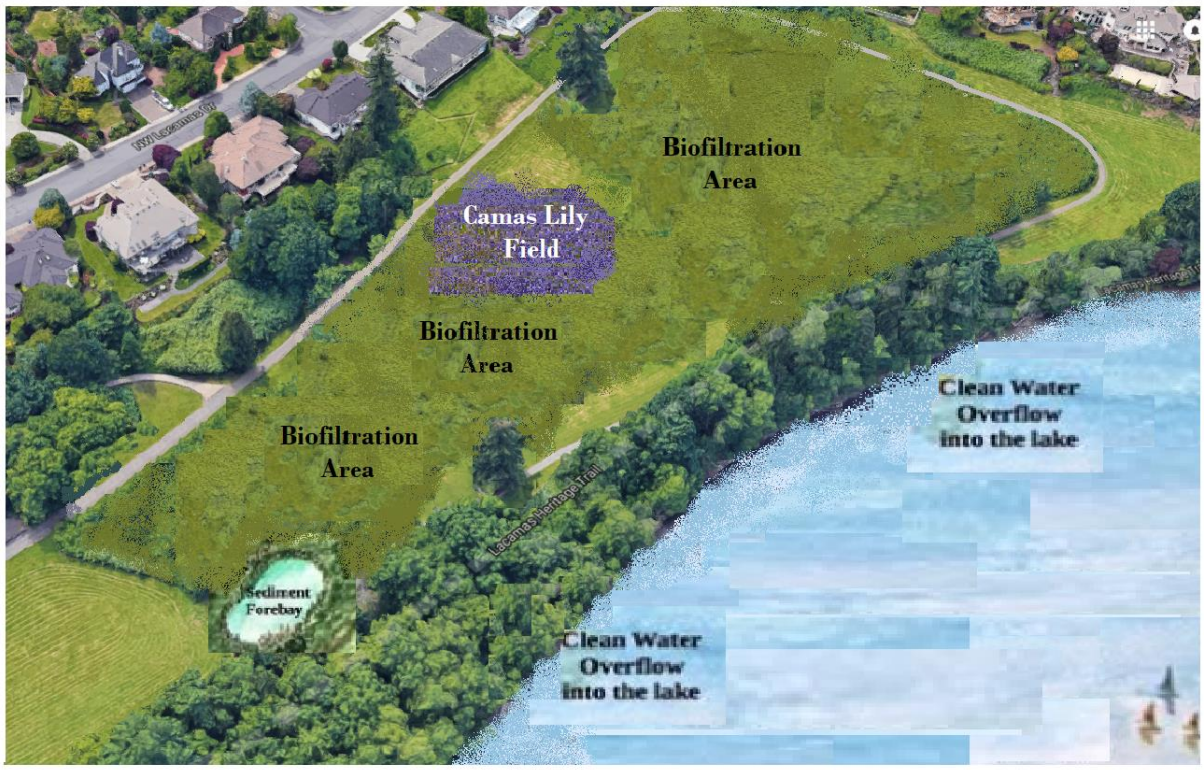
3.7.2 Policies

1. Provide, protect, and enhance a public access system that is both physical and visual; utilizes both private and public lands; increases the amount and diversity of public access to the State's shorelines and adjacent areas; and is consistent with the shoreline character and functions, private rights, and public safety.
2. Increase and diversify recreational opportunities by promoting the continued public acquisition of appropriate shoreline areas for public use, and develop recreation facilities so that they are distributed throughout the community to foster convenient access.
3. Locate public access and recreational facilities in a manner that encourages variety, accessibility, and connectivity in a manner that will preserve the natural characteristics and functions of the shoreline. Public access includes both active and passive recreational activities (e.g. trails, picnic areas, viewpoints)

Pictures: **1. Project Draft Rendering**

Current

Proposed

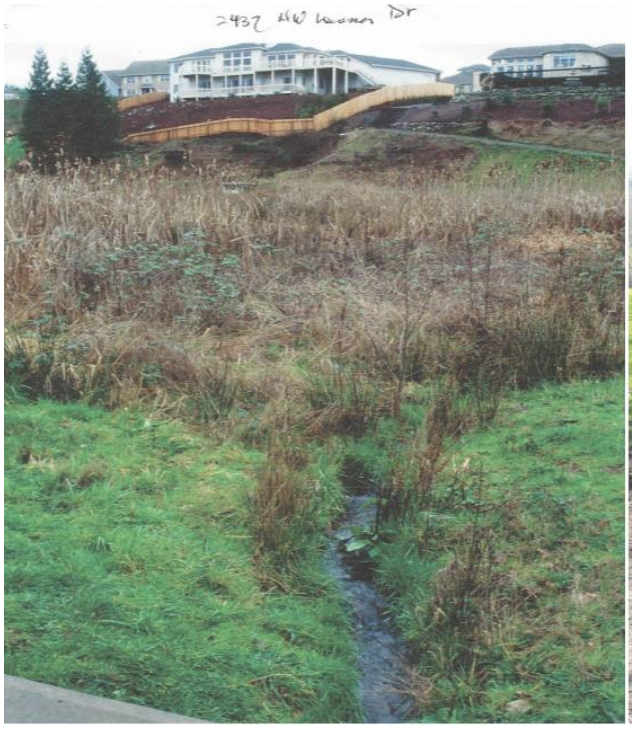


2. Before and After Pictures

Meadowlands Stormwater Filtration System in 1992

Meadowlands Stormwater Filtration System in 2017

In the 1990's:



In 2017

Our Storm water Biofiltration System

We can't begin to function at an optimal level!!

3. Vision Pictures

At Mill Plain and 177th, Vancouver, WA, July 2017

Camas Lily Fields

Southwest Washington:

In the San Bernardino Mountains

Another constructed biosystem: