

## CHAPTER 8: SERVICE LEVEL 2 RECOMMENDATIONS

This chapter describes specific recommendations intended to meet the service level 2 goals described in chapter 6. The recommendations are listed in the order of the problem descriptions in chapter 4. The recommendations include nonstructural measures such as regulatory programs and public education, and structural measures such as stormwater detention ponds.

Service level 2 would implement all the recommendations of service level 1 described in the previous chapter, including the regional nonstructural management program (see appendix G), as well as the additional recommendations described in this chapter.

### 8.1 WOODLAND BASIN LEVEL 2 FLOODING RECOMMENDATIONS

Service level 2 proposes to implement all the Woodland basin flooding recommendations described in chapter 7, which include:

- WL1 - Forest Glen infiltration system
- WL3 - Steilacoom Road/School Street ponds
- WL4 - Tanglewilde Division 9 drainage system
- WL5A & B - Tanglewilde Husky Way drainage improvements
- WL6 - Tanglewilde East infiltration facilities
- WL7 - 15th Avenue NE swale
- WL9 - 35th Ave SE & 36th Ave SE infiltration systems
- WL10 - Homann Drive infiltration facility maintenance
- WL11 - Alder Street SE dry well maintenance
- WL12 - 49th Ave SE/Lakemont Drive infiltration system

In addition, service level 2 would replace recommendation WL13A with the following measure to further reduce local flooding problems:

**Recommendation WL13B** Conduct engineering studies to identify and propose solutions for repairing or replacing failing public drainage systems throughout Woodland basin in order to meet service level 2 standards

**Description:** Conduct engineering studies to identify and propose solutions for repairing or replacing the failing public drainage systems in Woodland basin which do not meet service level 2 standards, described in chapter 6. Emphasize increased maintenance of existing systems rather than new facilities whenever possible. Prioritize failing systems and develop a schedule so that all failing systems are eventually brought up to current standards for new facilities.

## Service Level 2 Recommendations

**Benefit:** Local flooding problems throughout the basin would be eliminated, and direct overflows of untreated stormwater runoff to surface water bodies would be eliminated for all but the most extreme storm events.

**Estimated Project Cost:** Unknown

Engineering studies will determine the cost of the needed improvements.

**Participating jurisdictions:** Lacey, Thurston County

## 8.2 WOODLAND BASIN LEVEL 2 WATER QUALITY RECOMMENDATIONS

Service level 2 proposes to implement the following Woodland basin water quality recommendations described in chapter 7:

- WL14 - Ruddell Road/Hicks Lake constructed wetland treatment system
- WL15A-C - Woodland Creek Martin Way stormwater treatment system
- WL16 - College Creek St. Martins constructed wetland treatment system
- WL17A - College Creek Martin Way treatment facilities
- WL17B - College Creek I-5 treatment facilities
- WL17C - Woodland Creek Martin Way West swales
- WL17D - Woodland Creek I-5 treatment facilities

In addition, the following recommendation would replace recommendation WL17E:

**Recommendation WL17E** Install treatment or mitigation measures for all stormwater discharges in Woodland basin that discharge directly to a surface water body

**Description:** Install treatment or mitigation measures for all stormwater discharges in Woodland basin which discharge directly to surface water. Design treatment facilities to treat the 2-year storm, and use all known and available technologies to improve pollutant removal efficiencies.

**Benefit:** The water quality of Woodland Creek would improve.

**Estimated Cost:** Unknown

**Participating jurisdictions:** Lacey, Olympia, Thurston County

### 8.3 WOODLAND BASIN LEVEL 2 FISH HABITAT RECOMMENDATIONS

Service level 2 proposes to implement the following Woodland basin fish habitat recommendations described in chapter 7:

- WL18 - Pleasant Glade culvert replacement
- WL19A - Woodland Creek citizen stream watch program
- WL23 - Martin Way fish passage improvements
- WL25 - Interstate 5 fish passage improvements
- WL26A - College Creek Martin Way stormwater detention
- WL26B - College Creek St. Placid's stormwater detention
- WL26C - College Creek Interstate 5 stormwater detention
- WL26D - Eagle Creek stormwater detention
- WL26E - Palm Creek stormwater detention
- WL26F - Fox Creek stormwater detention
- WL26G - Jorgensen Creek stormwater detention
- WL26H - Woodland Creek fish habitat monitoring

Service level 2 would replace recommendation WL19B with the following recommendation, which would provide a higher level of habitat restoration:

**Recommendation WL19C** Develop and implement a comprehensive fish habitat restoration and management plan for Woodland Creek

**Description:** The county would assemble a watershed restoration team consisting of streamside landowners, volunteers, the Conservation District and federal, state and local agencies. The team would develop a comprehensive plan to systematically restore fish habitat and reduce erosion along Woodland Creek. Project sites would be prioritized according to the severity of the problem. The plan would address the problem of accommodating the projected future flows. The goal would be to restore the natural functions of the riparian corridor to the entire length of the stream.

**Benefit:** Fish habitat in Woodland Creek would be restored, providing economic and environmental benefits. Erosion would decrease, benefiting fish habitat and preventing property damage, which would reduce long-term costs to county residents.

**Estimated Cost:** \$145,600

## **Service Level 2 Recommendations**

In addition, service level 2 proposes measures designed to reduce future peak stream flows to a level below current peak flows in order to attain the service level 2 habitat goals described in chapter 6. Several alternatives were investigated and modelled in an attempt to restore more natural stream flows. The basin does not contain enough additional undeveloped sites in appropriate locations to detain even more runoff. Instead, the following recommendations were developed to reduce the amount of runoff from new developments. Figures 8-1 and 8-2 show the impact of the proposed measures.

### **Recommendation WD26I Double the Drainage Manual requirements for stormwater detention in Woodland basin**

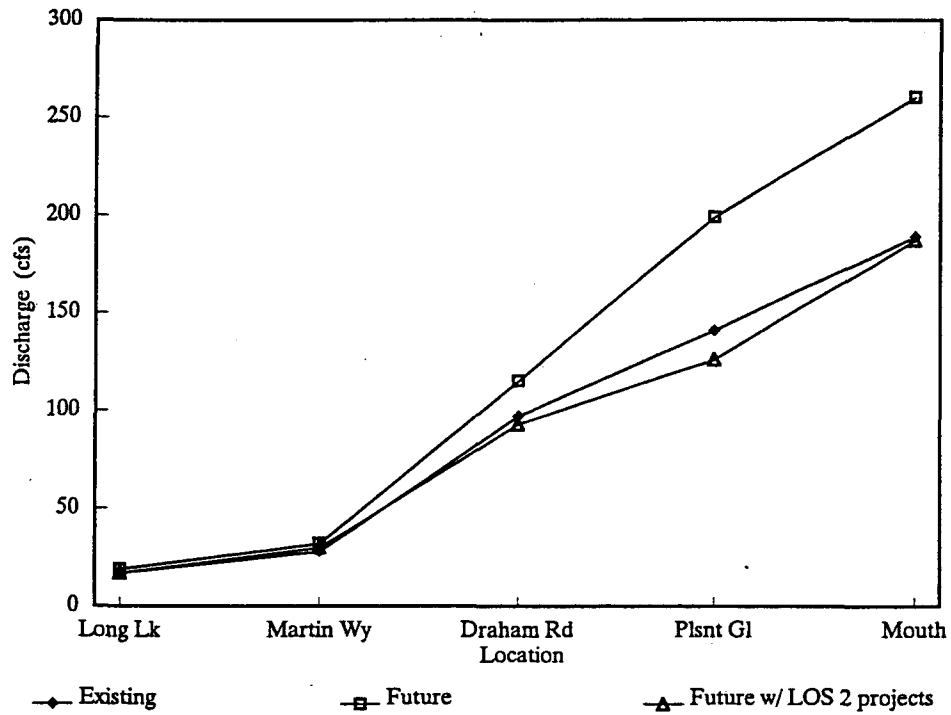
**Description:** Double the stormwater detention capacity required by the Drainage Design Manual for hydrologic Class C and D soils in the Woodland basin.

**Benefit:** Future peak stream flows would be reduced to slightly below current levels, primarily at downstream locations, when this recommendation is combined with the storage projects described in service level 1.

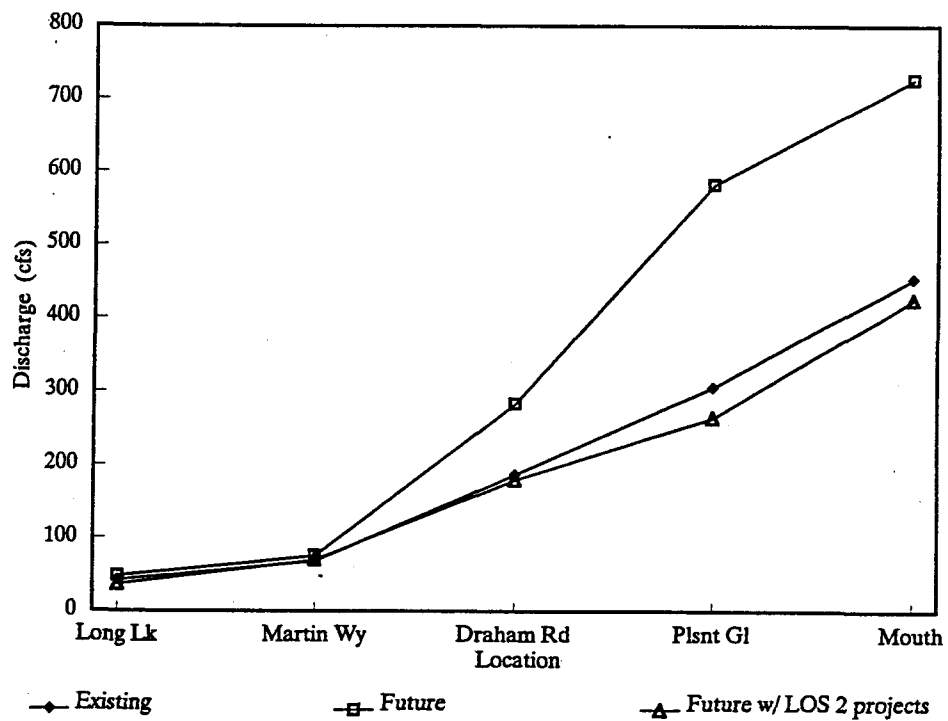
**Estimated cost:** \$5,000

**Participating jurisdictions:** Lacey, Olympia, Thurston County

**Figure 8-1: Impact of service level 2 measures on Woodland Creek 2-year peak flows**



**Figure 8-2: Impact of service level 2 measures on Woodland Creek 100-year peak flows**



**Recommendation WL26I** Require mandatory clustering of developments outside the Urban Growth Management Area, or other measures which preserve at least 70% of undeveloped lands in a forested condition

**Description:** Amend the zoning ordinance or other appropriate ordinances to require developers to preserve at least 70% of currently undeveloped lands in a forested condition.

**Benefit:** Future peak stream flows would be reduced to slightly below current levels, primarily at downstream locations, when this recommendation is combined with the storage projects described in service level 1.

**Estimated cost:** \$5,000

**Participating jurisdictions:** Thurston County

#### 8.4 WOODARD BASIN LEVEL 2 FLOODING RECOMMENDATIONS

Service level 2 proposes to implement the following Woodard basin flooding recommendation described in chapter 7:

- WD1 - 12th Avenue SE and Boone Street drainage system maintenance

In addition, service level 2 proposes to replace recommendation WD2A with the following recommendation to reduce local flooding:

**Recommendation WD2B** Conduct engineering studies to identify and propose solutions for repairing or replacing failing public drainage systems throughout Woodard basin in order to meet Service Level 2 standards

**Description:** Conduct engineering studies to identify and propose solutions for repairing or replacing the failing public drainage systems in Woodard basin which do not meet service level 2 standards, described in chapter 6. Emphasize increased maintenance of existing systems rather than new facilities whenever possible. Prioritize failing systems and develop a schedule so that all failing systems are eventually brought up to current standards for new facilities.

**Benefit:** Local flooding problems throughout the basin would be eliminated, and direct overflows of untreated stormwater runoff to surface water bodies would be eliminated for all but the most extreme storm events.

**Estimated Project Cost:** Unknown

**Participating jurisdictions:** Lacey, Olympia, Thurston County

## 8.5 WOODARD BASIN LEVEL 2 WATER QUALITY RECOMMENDATIONS

Service level 2 proposes to implement all the Woodard basin water quality recommendations described in chapter 7, service level 1, which include:

- WD3 - Woodard Creek Fones Road Ditch treatment facility
- WD4 - Woodard Creek Martin Way treatment facility
- WD5A - Woodard Creek Pacific Avenue treatment facilities

In addition, the following recommendation would replace recommendation WD5B:

**Recommendation WD5C** Install treatment or mitigation measures for all stormwater discharges in Woodard basin that discharge directly to a surface water body

**Description:** Install treatment or mitigation measures for all stormwater discharges in Woodard basin which discharge directly to surface water. Design treatment facilities to treat the 2-year storm, and use all known and available technologies to improve pollutant removal efficiencies.

**Benefit:** The water quality of Woodard Creek would improve.

**Estimated Cost:** Unknown

**Participating jurisdictions:** Lacey, Olympia, Thurston County

## 8.6 WOODARD BASIN LEVEL 2 FISH HABITAT RECOMMENDATIONS

Service level 2 proposes to implement the following Woodard basin fish habitat recommendations described in chapter 7:

- WD6A - Woodard Creek citizen stream patrol

## Service Level 2 Recommendations

- WD8 - 36th Avenue NE culvert replacement
- WD9 - South Bay Road culvert replacement
- WD10 - Woodard Creek Pacific Avenue fish stranding solution
- WD11 - Pacific Avenue/I-5 culverts fish passage improvements
- WD12A - Woodard headwater wetland stormwater detention
- WD12B - Woodard Creek South Bay Road stormwater detention
- WD12C - Woodard Creek fish habitat monitoring

Service level 2 would replace recommendation WD6B with the following recommendation, which would provide a higher level of habitat restoration:

**Recommendation WD6C** Develop and implement a comprehensive fish habitat restoration and management plan for Woodard Creek

**Description:** The county would assemble a watershed restoration team consisting of streamside landowners, volunteers, the Conservation District and federal, state and local agencies. The team would develop a comprehensive plan to systematically restore fish habitat and reduce erosion along Woodard Creek. Project sites would be prioritized according to the severity of the problem. The plan would address the problem of accommodating the projected future flows. The goal would be to restore the natural functions of the riparian corridor to the entire length of the stream.

**Benefit:** Fish habitat in Woodard Creek would be restored and erosion would decrease, which would benefit the economy and the environment, prevent property damage and reduce long-term costs to county residents.

**Estimated Cost:** \$84,500

**Participating jurisdictions:** Lacey, Olympia, Thurston County, Conservation District

In addition, service level 2 proposes measures designed to reduce future peak stream flows to a level below current peak flows in order to comply with the service level 2 habitat standards described in chapter 6. Several alternatives were investigated and modelled in an attempt to restore more natural stream flows. Only one more site was found with enough additional undeveloped land in an appropriate location to detain more runoff. Therefore, additional nonstructural measures are proposed in order to attain service level 2 goals. Figures 8-3 and 8-4 show the effect of the proposed measures.



**Recommendation WD12D** Install a stormwater detention structure on the Woodard Creek culvert under Martin Way

**Description:** Construct a control structure on the Woodard Creek culvert under Martin Way that acts as a fish ladder and stores runoff up to 150' elevation in the wetland between Martin Way and Pacific Avenue during extreme rain storms.

**Benefit:** The facility would reduce future increases in peak stream flows to below current levels from Ensign Road to the mouth of the creek when this project is combined with the detention projects described in Service level 1, preventing additional erosion and habitat damage. The effect of the project would be most pronounced on the segment of creek below Ensign Road, where flows would approach the natural condition, but the project would also help reduce flows at the mouth.

**Estimated cost:** \$571,000

**Participating jurisdictions:** Olympia

**Recommendation WD12E** Require mandatory clustering of developments outside the Urban Growth Management Area, or other measures which preserve at least 70% of undeveloped lands in a forested condition

**Description:** Amend the zoning ordinance or other appropriate ordinances to require developers to preserve at least 70% of currently undeveloped lands in a forested condition.

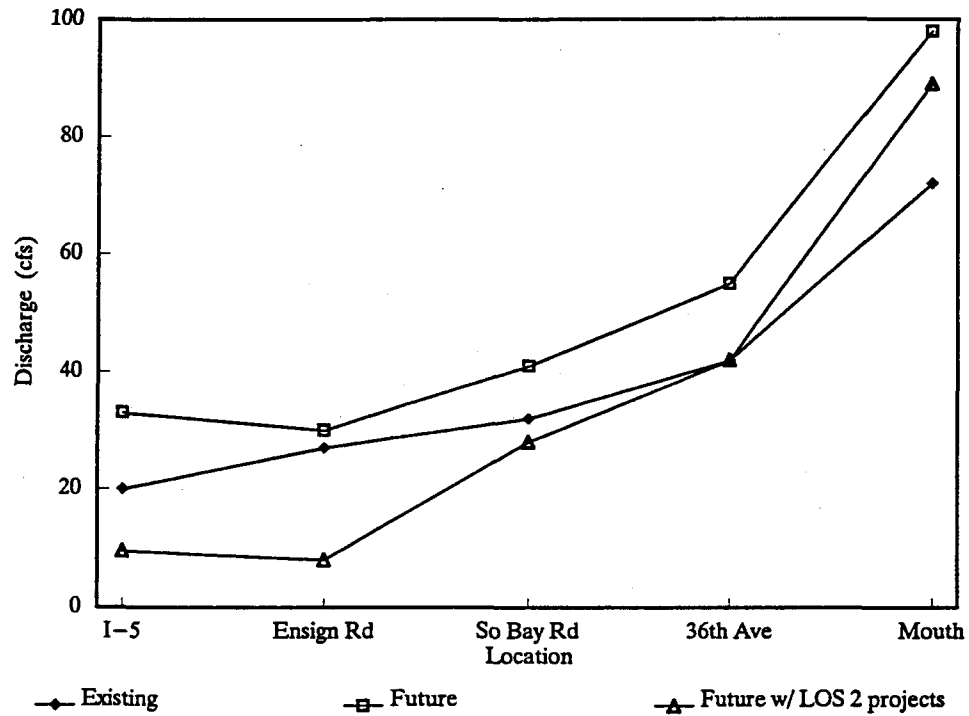
**Benefit:** Future peak stream flows would be reduced further below current levels at locations downstream of 36th Avenue NE, when this recommendation is combined with the detention projects described in service level 1.

**Estimated cost:** \$5,000

**Participating jurisdictions:** Thurston County

## Service Level 2 Recommendations

**Figure 8-3: Impact of service level 2 measures on Woodard Creek 2-year peak flows**



**Figure 8-4: Impact of service level 2 measures on Woodard Creek 2-year peak flows**

