



WASHINGTON STATE  
DEPARTMENT OF  
E C O L O G Y

# Chehalis Best Management Practices Evaluation Project

## 1995-96 Annual Report

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### **Abstract**

This is the second annual progress report for a six-year monitoring project being conducted by the Washington State Department of Ecology. The purpose of this project is to determine the effectiveness of best management practices (BMPs) installed in the Chehalis River basin to improve water quality and fish habitat. Accomplishments this year include: updating the quality assurance project plan for the project; conducting water quality monitoring in the Bunker/Deep Creek basin, Beaver/Allen Creek basin, and the mainstem Chehalis River; conducting temperature monitoring in the Mill Creek basin, North Lincoln Creek basin, and the Mohny Creek basin; and conducting macroinvertebrate sampling on North Lincoln Creek and Deep Creek. Reports completed this year include a final report on the Black River project area; and interim reports on Bunker/Deep Creek, Beaver/Allen Creek, and the Chehalis River project area.

### **Introduction**

In the Chehalis River basin, poor water quality has been identified as a threat to the fisheries resource. In an effort to protect and restore the fisheries, the U.S. Fish and Wildlife Service (USFWS) set up the Chehalis Fisheries Restoration Program (CFRP), which provides funds for projects to restore anadromous fish to the Chehalis basin. Types of projects funded by the CFRP include habitat restoration and installation of best management practices (BMPs) to improve or protect water quality.

Water quality monitoring is essential for determining the effectiveness of BMPs, and can be used to adjust and refine land treatment practices designed to control nonpoint source pollution. This was one of the conclusions of the Rural Clean Water Program (RCWP), a federally-sponsored nonpoint source control program that studied the effectiveness of BMPs to control pollution. The Chehalis BMP Evaluation Project is funded by the CFRP, and its purpose is to monitor the effectiveness of the BMPs installed and to document improvements in water quality. This report describes progress made during the second year of the proposed six year monitoring project.

Project monitoring areas were selected in consultation with USFWS. Only a few CFRP project areas were selected to demonstrate results, since trying to monitor all areas would result in too dispersed an effort. The RCWP found that detection of water quality improvements is more effective if monitoring focuses on collecting samples at a relatively high frequency and analyzing them for a small number of relevant variables. Project

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monitoring areas for 1996-97 will be scoped by summer 1996. An addendum to the current Quality Assurance Project Plan will be developed to describe 1996-97 monitoring activities. The addendum will be available in the fall of 1996.

Additional elements of this project are monthly ambient water quality monitoring at four stations in the Chehalis basin, and providing coordination and technical assistance.

### **Completed Reports**

Water quality reports and quality assurance project plans completed this year are listed in Table 1. Findings of reports are briefly summarized below. Reports and plans can be obtained by calling either Debby Sargeant at (360) 407-6684 or Barbara Tovrea at (360) 407-6696.

Table 1. Reports and Plans Completed in 1994-95.

<b>Title</b>	<b>Date Complete</b>
Temperature Evaluation Project Quality Assurance Project Plan	May 1995
1995-96 Addendum to the QAPP for Chehalis River Basin Best Management Practices Evaluation Project	September 1995
Interim Report on the Chehalis River Project Area	September 1995
Bunker/Deep Creek Water Quality Data Report, 1994-1995	March 1996
Beaver/Allen Creek Water Quality Data Report, 1994-1995	March 1996
Report on the Black River Project Area	March 1996

### **Water Quality and Biological Monitoring**

In July 1994, USFWS and the Washington State Department of Ecology (Ecology) chose four project areas to survey water quality for BMP effectiveness: the Beaver/Allen Creek sub-basin; the Bunker/Deep Creek sub-basin; the Black River adjacent to a dairy at river mile (RM) 12.2; and the mainstem Chehalis River at RM 70, also adjacent to a dairy operation. A quality assurance project plan (QAPP) was completed in 1994. The QAPP describes in detail the monitoring plan for each project area, and includes a basin map and maps of the project sites. An addendum to the QAPP was developed for changes to the 1995-96 work including the addition of macroinvertebrate sampling.

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### **Bunker/Deep Creek Sub-basin**

This is the second year of monitoring for Bunker and Deep Creek. This year's monitoring included both pre- and post-BMP monitoring. This area was chosen because several CFRP fencing and riparian restoration projects took place in the Deep Creek basin in 1995, with more CFRP work planned for 1996. Also the site at the mouth of Bunker Creek is a follow-up on Ecology's Upper Chehalis Total Maximum Daily Load (TMDL) Study.

In the Bunker/Deep Creek drainage five sites are sampled for water quality. Monitoring included three summer and will include ten winter sampling events. Sampling for 1995 has occurred on July 12, August 14, September 14, November 7, December 4, and December 11. Sampling for 1996 has occurred on January 3, and January 22, and will continue twice a month through March 1996.

Erosion and sedimentation appear to be the major problem during the winter months on Deep Creek. During summer monitoring of Deep Creek, high bacterial levels were found at one site just downstream of an animal access area. After summer monitoring was completed, fences were installed to prohibit animal access. If this area was the major source of pollutants, then future monitoring should show an improvement in summer bacterial levels.

A water quality data report describes the complete results for 1994-95 (Table 1).

Pre-BMP sampling for benthic macroinvertebrates was done on two sites in the Deep Creek basin. Sampling was done on April 24, 1995. Laboratory analysis of the samples was completed in September 1995. An interim report on the data collected in 1995 will be released in summer 1996.

Sampling recommendations for 1996-97 are as follows:

- continue winter and summer pre and post-BMP water quality monitoring;
- continue macroinvertebrate sampling; and
- in summer 1996, investigate the feasibility of performing sediment-related surveys (such as residual pool depth or estimates of substrate size).

### **Beaver/Allen Creek Sub-basin**

This year wet season post-BMP monitoring was done on Allen Creek a tributary to Beaver Creek, and wet season pre-BMP monitoring was completed on Beaver Creek. The Beaver Creek sites were chosen for evaluation because of a critical pollutant source identified in the Black River TMDL studies, as well as several proposed restoration projects. The Allen Creek site was chosen to follow up on fencing and riparian restoration work completed upstream in 1993 and 1994. A water quality data report describes the results for 1994-95 (Table 1).

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Four sites in the Beaver/Allen Creek drainage were monitored. Monitoring included five winter sampling events. Sampling dates were: November 8, 1995; November 28, 1995; December 10, 1995; December 19, 1995; December 19, 1995; and February 6, 1996. Pre-BMP sampling continues to show elevated nitrogen and bacterial levels downstream of the BMP site and at the mouth of Beaver Creek.

Sampling recommendation for 1996-97: commence wet season post-BMP monitoring at all sites when BMP implementation is complete.

### **Mainstem Chehalis River**

The Chehalis River sites were chosen to obtain pre-BMP monitoring data on a high priority agricultural pollutant source identified in the Upper Chehalis TMDL study. An interim report was developed that described results from 1994-95 water quality monitoring (Table 1).

Wet season pre-BMP monitoring is being done for three sites, two sites on the Chehalis mainstem, and one tributary site. Ten wet season sampling events will be conducted. Sampling for 1995 has occurred on: November 8, November 28, December 10, and December 19. Sampling for 1996 has occurred on January 9, and January 24, and will continue twice a month through March 1996. Pre-BMP monitoring continues to show elevated turbidity, nutrient, and bacterial levels in the tributary. All three sampling stations exceeded fecal coliform standards during the wet season.

Sampling recommendations for 1996-97: continue limited pre-BMP wet season monitoring.

### **Black River**

A final technical report compares pre- and post-BMP water quality results (Table 1). Dry season monitoring at the deep water downstream station continued to show a significant improvement in water quality over 1991 conditions, confirming improvements seen in 1992. Improvements were seen in turbidity, conductivity, and nutrients. During the wet season, a tributary that flows through the BMP site still showed water quality violations for fecal coliform and ammonia. This could be because all BMPs were not fully functioning until January 1995, or it could be a residual effect of historical poor waste management practices.

### **North Fork Lincoln Creek**

Benthic macroinvertebrate samples were collected upstream and downstream of a riparian restoration site on April 21, 1995. Laboratory analysis of samples was completed in September 1995. An interim report on the data collected in 1995 will be released by summer 1996.

### **Temperature Monitoring**

In addition to the four water quality monitoring sites and the macroinvertebrate sampling sites, USFWS requested temperature monitoring on a number of CFRP riparian restoration sites in the Chehalis basin and at the mouths of some of the larger tributaries. A QAPP for the temperature monitoring was completed in May 1995 (Table 1).

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Hourly temperature data on the larger tributaries was collected from June 9 through October 4, 1995 at the following sites: South Fork Chehalis River; Newaukum River; Chehalis River upstream of the Newaukum; Lincoln Creek; and the Black River.

At two of the CFRP BMP sites, Lincoln Creek and Mill Creek, temperature monitoring was done from early July to the end of September 1995. The third BMP site was a tributary to Mohny Creek; monitoring there occurred from mid-August to the end of September 1995. For the BMP sites, upstream and downstream temperature probes were installed. In August 1995, an evaluation of streamside shading was conducted, which included photo points and densiometer readings taken every 50 meters along the creeks.

An interim report on summer 1995 monitoring will be released in spring 1996.

### **Ambient Monitoring**

The goal of Ecology's Ambient Monitoring Program is to provide water quality data to evaluate water quality trends for the state's major waterbodies. Monthly ambient water quality monitoring was done at four stations in the Chehalis basin: the Chehalis River at Dryad, at Porter, and near Grand Mound; and the Black River at Moon Road. Data collected this year can be obtained by calling Brad Hopkins from Ecology's Ambient Monitoring Section, at (360) 407-6686. Ambient monitoring at all four stations will continue in 1996-97.

### **Technical Assistance and Coordination**

This year project staff met with Greg Edwards (Ecosystems Consulting) to discuss macroinvertebrate sampling at two BMP projects Greg completed on Deep and North Fork Lincoln Creek. Project staff also sent Greg a copy of the Temperature QAPP as requested.

Project staff met with USFWS staff Mike Kelly and Bob Wunderlich to brief them on the Chehalis monitoring project and to show them some of the monitoring sites. Site visits were made to Deep Creek, Mill Creek, and a site on the Chehalis River near the Newaukum River.

Public outreach included an article for the Fish Ladder and the Chehalis River Council newsletter about 1994-95 project activities, and a presentation to the USFWS Chehalis Fisheries Restoration Program Steering Committee on project monitoring activities and sites. When reports or plans were completed, interested parties were mailed copies.

Project staff coordinated with Thurston, Lewis, and Mason Conservation District staff in selecting sites for monitoring and in gathering information on the status of BMP implementation. Completed reports and plans were sent to District staff if pertinent.

Staff from Ecology met with staff from the Chehalis Tribe to discuss the best ways to analyze and present the Chehalis River monitoring data that the Tribe has collected. Relevant reports and plans were also sent to Tribal staff.

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Technical assistance and coordination recommendations for 1996-97:

- continue outreach and technical assistance;
- develop a data directory for Chehalis basin water quality monitoring activities; and
- continue giving project updates by writing articles for Chehalis basin newsletters and presentations to interested groups.

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If you have special accommodation needs, please contact Barbara Tovrea (360) 407-6696 (voice). Ecology's telecommunication device for the deaf (TDD) number at Ecology Headquarters is (360) 407-6006.