



# Executive Summary

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## Introduction

This Comprehensive Flood Hazard Management Plan (CFHMP) documents the planning process, planning area characteristics, regulatory overview, flood damage history, alternative flood hazard management measures, and preferred alternatives to reduce flood hazards in Grays Harbor County.

In 1990, Grays Harbor County initiated a process to prepare a comprehensive utilities plan for water supply, sewers, and drainage. As part of this process, the County conducted a series of public meetings in April 1991. The meetings were held not long after the serious floods of late 1990, and discussions of drainage and flooding issues dominated the meetings. In response, the County placed increased emphasis on addressing localized drainage problems.

This document is the fifth phase of a planning effort undertaken by Grays Harbor County. Several flood hazard management plans have been developed for localized areas throughout the County (see Section 2, Figure 2-1). The Vance Creek, Grayland, South Beach, and North Beach areas were assessed for local flood damage. The Vance Creek area includes the area in and around the City of Elma. The Grayland and South Beach areas are located in the south coastal area of the County. The assessment of the North Beach area, which is located in a coastal strip between Conner Creek on the south and Copalis Beach on the north, was a continuation of the systematic review of coastal flooding and drainage problems. These studies have previously been submitted to the Washington State Department of Ecology (Ecology). In the interest of completeness, these studies should be considered as appendices to this CFHMP.

Most of the County is located in the Lower Chehalis River Basin, where major rivers such as the Humptulips, Hoquiam, Wishkah, Wynoochee, Satsop, Elk, Johns, and Chehalis Rivers empty into 90 square miles of the Grays Harbor Estuary. Other smaller rivers (including the North, Copalis, and Moclips Rivers), streams, and portions of streams also lie within Grays Harbor County.

Due to the limited scope and funding for this project, this CFHMP focuses on the areas most frequently subject to flooding, the Humptulips, Wynoochee, and Satsop River Basins. The Chehalis River is not included in this plan because it is currently being investigated by the Army Corps of Engineers (COE) in the Chehalis River Basin Ecosystem Study Project. The study areas incorporated into this plan are shown in Section 2, Figure 2-3.

## Problems, Issues, and Goals

Grays Harbor County is subject to chronic flooding. Floods that caused significant damage occurred in November 1949, February 1951, November 1954, November 1955, October 1962,

December 1964, January 1968, January 1971, January 1972, December 1975, December 1977, December 1979, January 1990, November 1990, October-December 1994, November-December 1995, January-February 1996, December 1996-February 1997, March 1997, and December 1999. Two of the highest recorded peak flow events occurred during the 1990s.

Many residential properties, commercial and industrial properties, and roadways in Grays Harbor County are chronically flooded during large storm events. The following sources were used to identify the extent of flooding within Grays Harbor County, with emphasis on the Wynoochee, Satsop, and Humptulips River Basins:

- FEMA flood insurance rate maps
- FEMA repetitive loss list
- Grays Harbor County Emergency Management repetitive loss list
- Community input from public meetings
- Grays Harbor County Public Works Road maintenance staff

There are numerous areas throughout the County that are subject to flooding. Problem areas were identified in the other flood hazard management plans mentioned previously. This plan focuses on the Wynoochee, Satsop, and Humptulips River Basins. The following areas within these basins were identified as subject to chronic flooding:

- Repetitive loss properties
- Wynoochee Tracts
- Geissler Road
- Satsop Riviera
- Monte-Elma Road near Brady
- Humptulips Dike Road
- Walker Bottom

Comprehensive goals were developed to provide an organized framework to guide the planning process. The CFHMP includes the following goals:

- Improve the protection of public health and safety from flooding events-short and long term goal
- Provide practical, cost-effective solutions that will result in measurable reductions in flood frequency, flood duration, and the amount of damage that occurs in frequently flooded areas-short and long term goal
- Identify and assess countywide problem areas through public meetings and existing FEMA mapping-short term goal
- Develop a community-driven plan with positive working relationships among the community and governmental agencies-short term goal
- Ensure that all parties are aware of the issues, processes, and implications of a CFHMP, and reach public and agency consensus on solutions and funding options-short term goal
- Document recommendations consistent with Ecology's FCAAP to permit further grant funding opportunities for plan implementation-short term goal

- Develop a plan consistent with FEMA Flood Hazard Mitigation Planning so that the County can be eligible for flood hazard mitigation assistance for the projects detailed in the plan-short term goal

## Preferred Alternatives

The public participation process identified several flood hazard reduction measures that meet the goals of this flood hazard management plan. The measures presented could be performed by the County, citizens, or other interested parties if time and funding were available. The measures presented are preferred alternatives only and would need to be prioritized by the interested party for implementation. Flood hazard management measures can be categorized as nonstructural or structural. Nonstructural measures refer to land use regulations and policies. Structural measures usually involve the construction of facilities in the channel or floodplain.

The preferred alternatives have the following features:

- Reasonable certainty of improving the targeted flooding or erosion issue
- Cost effective and have realistic funding sources
- Maximum beneficial environmental impacts and minimum adverse environmental impacts
- Implementable in a timely manner
- Long-term benefits
- Address anticipated future growth in the County

## Agency and Citizen Collaboration

Collaboration among stakeholders is an important part of developing acceptable flood mitigation plans. The U.S. Army Corps of Engineers (COE) Seattle District facilitated a meeting January 23, 2001, to discuss the Chehalis Basin Ecosystem Restoration project. At the meeting, numerous citizens expressed concern about the management of the Wynoochee Dam during flood events. The citizens want the COE to hold back more water behind the dam during flood events than it currently does to reduce flooding. It is recommended that a citizens' group continue these discussions with the COE.

Another meeting, facilitated by a consultant, was held in March 2001 to discuss small-scale gravel removal as a measure to reduce erosion and flooding in localized areas. Attendees included representatives from WDFW, Ecology, Grays Harbor County (including County commissioners), and a group of citizens involved in the planning process for this flood management plan. The participants agreed to continue discussions to evaluate experimental projects. Such projects would likely be a mix of engineered solutions (e.g., biostabilization and woody debris placement) and small-scale gravel removal from selected locations. It is recommended that the group form an advisory committee that will help ensure a collaborative effort in reducing flooding and erosion problems.

## Localized Flood Hazard Management Plans

Grays Harbor County previously developed several flood hazard plans for localized areas. It is intended that the recommendations identified in those plans be included as an

extension to these preferred alternatives. These localized areas include Vance Creek near the City of Elma. The assessments of the Grayland and South Beach areas are located in the south coastal area of the County. The assessment of the North Beach area is located in a coastal strip between Conner Creek on the south and Copalis Beach on the north.

### **Nonstructural Measures**

Nonstructural measures that can be taken by the County, citizens, or interested parties to improve its flood management capabilities are described below.

#### **Continue Enforcement of Existing Land Use Regulations and Permitting Processes**

This alternative includes ensuring that existing land use regulations and permitting processes continue to be strictly enforced. Floodplain management regulations, land use regulations, and subsequent permitting processes can be used to ensure that development occurs in a manner that not only protects citizens and property from flood damages, but also does not contribute to increased flooding.

#### **Evaluate Revisions to FEMA Mapping**

This alternative includes revising existing FEMA mapping to the extent practicable. Accurate floodplain maps allow the County to regulate new development in flood-prone areas and assist landowners in assessing the risk of flooding to their property and the need for flood insurance.

#### **Continue Inter-Jurisdictional Coordination**

This alternative includes coordinating inter-jurisdictional efforts to ensure consistent implementation of regulations and flood hazard management programs. For effective flood hazard management, it is important to coordinate flood hazard planning and regulatory enforcement efforts with other jurisdictions and agencies within the same watershed.

#### **Develop Floodplain Conservation Easement Program**

This alternative involves developing a conservation easement program for interested property owners. Floodplain conservation easements are a cost-effective means of protecting land within the floodplain from property losses and damages.

#### **Provide Educational Materials on Flood Hazard Management**

This alternative includes developing educational posters, maps, pamphlets, and other materials to inform residents of flooding issues throughout the County, help property owners understand land use regulations, and facilitate the permitting processes for development activities within the floodplain.

#### **Improve Flood Monitoring System**

This alternative includes improving the river monitoring system that notifies the National Weather Service and Northwest River Forecast Center of impending flood waters on major rivers by installing new gauges. Specifically, it is recommended that as many as four of the existing flow gauges be upgraded with high-rate transmitters, that a flow gauge be installed

on the Humptulips River, and that stage gauges be installed on the Satsop River, Chehalis River at the mouth of the Harbor, and the Upper Humptulips River.

### **Use New Design, Construction, and Maintenance Standards**

This alternative includes incorporating environmentally sensitive design elements in river repair projects (e.g., bank stabilization projects and construction of flood control facilities) to minimize the impacts to salmonid habitat. These projects will reduce flooding and erosion while minimizing the impacts to fisheries resources. Such environmentally sensitive design practices and elements are presented in *Guidelines for Bank Stabilization Projects* (King County, 1993). In addition, WDFW is developing a manual that incorporates environmentally sensitive design for similar projects.

### **Join National Flood Insurance Program (NFIP) Community Rating System Program**

This alternative involves the County becoming a member of the NFIP Community Rating System Program in an effort to reduce flood insurance rates in the County. This would make it possible for more homeowners and renters in flood-prone areas to purchase flood insurance. Flood insurance rates are based on a community's classification, and a change in classification can reduce the cost of flood insurance by 5 to 45 percent.

### **Provide Flood-Proofing Guidance to Residents**

This alternative includes obtaining flood-proofing guidance documentation from FEMA and distributing it to community members.

### **Develop Home Elevation and Buyout Program**

This alternative includes developing a home elevation and buyout program. Elevation and buyout and relocation projects provide a permanent, cost-effective alternative to repetitive maintenance. The properties can be improved for environmental enhancement and can reduce the danger of flooding of homes and businesses downstream. Properties that are bought out can be left as permanent open space.

### **Structural Measures**

Structural measures that the County, a citizen, or other interested parties could take to improve the County's flood management capabilities are described below.

### **Biostabilization and Other Engineered Solutions**

This alternative includes using existing manuals for guidance for using biostabilization techniques to stabilize embankments. Since Grays Harbor County has not developed a manual, then they could use King County's *Guidelines for Bank Stabilization Projects* or WDFW's guidance manual for these types of projects. In addition, the County, agencies, citizens, or other interested parties could stockpile wood from projects and place it as woody debris in rivers. Woody debris helps stabilize gravel upstream and provides "roughness" to the river, which reduces the velocity of the water. This debris can also be used with rock to direct the flow to the center of the channel and away from the banks. Citizens should work with the advisory committee described above to determine where these techniques can best be used. Some projects that have been identified for

biostabilization include (source: Section 905b Analysis, General Investigation Reconnaissance Study, Chehalis River Basin, WA, ACOE, Seattle District 2001):

- Chehalis River Bank Restoration near Oakville
- Chehalis River Bank Restoration near Porter
- Satsop River Bank Stabilization near Satsop
- Satsop River Bank Stabilization near Satsop Riviera
- Keys Road Chehalis River Bank at Boat Launch near Satsop River
- West Satsop River Bank Restoration at Boat Launch

### **Consider Capital Projects**

Four sites were selected for further analysis from the problem areas identified in Section 5:

- Wynoochee Tracts
- Humptulips Dike Road
- Walker Bottom Area
- Satsop Riviera

Figures 6-2 through 6-5 show conceptual diagrams of these projects. These projects were evaluated with respect to cost, environmental impacts, funding, schedules, benefits, and plan goals in Section 6. It is recommended that the County, citizens, or other interested parties thoroughly investigate and evaluate implementation of nonstructural management measures before pursuing structural solutions to floodplain management. Nonstructural measures are generally more cost-effective and environmentally advantageous than structural measures. Floodproofing, elevation, or relocation of the existing homes in these areas should be considered as an alternative to the measures described below. It is also important to highly scrutinize any further development in these areas. In addition, each of the capital projects will require further analysis to determine the size of the facilities and to quantify the potential offsite impacts.

The main purpose of including these projects are for comparison purposes. Most of these problem areas have a limited number of homes affected by flooding and a cost to benefit analysis would not likely support structural projects for these areas.

The Satsop Riviera project selected for analysis was not included in the list of capital projects because the costs far outweigh the benefits. Instead, it is recommended that nonstructural management measures be implemented in this area.

### **Wynoochee Tracts**

Wynoochee Tracts is located in the Wynoochee River Valley west of Wynoochee Valley Road and about 1,000 feet north of U.S. Route 12. This project consists of an earthen berm constructed on the western and northern sides of the development. The berm would need to be approximately 2,000 feet-long and 5 feet-high. Total estimated cost for this project is \$350,000.

It is important to note that this project includes installation of a berm, which reduces existing floodplain storage and could intensify flooding at other nearby properties.

### **Humptulips Dike Road**

The Humptulips Dike Road area is located in the Humptulips River basin where Humptulips Dike Road crosses the Humptulips River. This project restores the integrity of the dike by repairing it where breaching has occurred. This project also includes installing three 24-inch-diameter culverts with flap gates through the dike. Total estimated cost for this project is \$51,000.

### **Walker Bottom Area**

This area is located in the Humptulips River basin in the vicinity of Walker Bottom Road. This project includes construction of an earthen berm that generally follows the floodplain boundary. The berm would need to be between 800 to 2,600 feet long and 5 feet high. Additional analysis might show that the berm should be longer than 2,600 feet. Total estimated cost for this project is between \$160,000 and \$490,000.

It is important to note that this project includes installation of a berm, which reduces existing floodplain storage and could intensify flooding at other nearby properties

## **Funding**

There are several potential sources of funding, which are summarized in Section 6, that can be considered for the various projects. Because some of the flood hazard management measures affect private property, a potential source of funds for improvements is through the formation of Local Improvement Districts (LIDs). Such funding would involve assessments made against the properties that benefit from the improvements.

Because funding for projects within Grays Harbor County is limited, it is recommended that the County continue to obtain grant funding when possible. Two important sources of grant funding include the Flood Control Assistance Account Program (FCAAP) and the Flood Mitigation Assistance and Hazard Mitigation Grant Program:

- **Flood Control Assistance Account Program.** Matching grants ranging from 50 percent to 75 percent of the project cost are available through Ecology to help local jurisdictions reduce flood hazards and flood damages. The grants can be used for comprehensive flood hazard management planning and flood damage reduction (construction) projects. The latest grant round for 2001-2003 included funding for mapping, flood warning systems, biotechnical bank stabilization projects, public awareness programs, and acquisition projects. These grants are competitive and available on a biennium basis.
- **Flood Mitigation Assistance and Hazard Mitigation Grant Program.** FEMA provides limited funds for flood hazard mitigation annually. The grants can be used for assistance in developing and updating Flood Mitigation Plans. This program is administered by the State Division of Emergency Management.

Two other funding sources are available after an area is declared a disaster area by the federal government:

- **FEMA Hazard Mitigation Grant Program.** The State Division of Emergency Management administers this program. This competitive grant becomes available after a flooding event is declared a federal disaster. FEMA pays 75 percent of the project costs

and there is a 25 percent local match, which may be shared between State and Local agencies. The State's participation in the local match is based on appropriation approval by the State Legislature and their percentage can vary.

- **FEMA Public Assistance Program for Repair or Restoration of Damaged Facilities.** The State Division of Emergency Management administers this program. Assistance becomes available after a flooding event is declared a federal disaster. FEMA pays 75 percent of the project costs and there is a 25 percent local match, which may be shared between State and Local agencies. The State's participation in the local match is based on appropriation approval by the State Legislature and their percentage can vary. Communities must prepare damage survey reports to qualify for financial assistance to make repairs. Alternative projects (e.g., buyouts) might be requested in a case where an applicant determines that the public welfare would not be served by restoring a public facility. Funds for alternative projects can be used to repair or expand other selected public facilities, to construct new public facilities, or to fund hazard mitigation measures.