

SECTION 2

Introduction

This section presents an overview of the reasons for development of the Grays Harbor County Comprehensive Flood Hazard Management Plan, the legal authorities that led to development of the plan, the processes used to develop the plan, and historical activities in the area that have affected the physical and cultural characteristics of Grays Harbor County.

Legal Authority and Scope

Chapter 86.26 of the Revised Code of Washington (RCW) requires that counties requesting financial and government participation for flood control assistance provide a flood hazard management plan (FHMP), approved by the Washington State Department of Ecology (Ecology) in consultation with the Department of Fish and Wildlife. RCW 86.26.105 states that a FHMP must be completed and adopted within 3 years of the award of a Flood Control Assistance Account Program (FCAAP) flood control maintenance grant. In the past, Grays Harbor County has been awarded FCAAP monies to address localized drainage issues and to develop small-scale flood hazard management plans for several areas. Flood Hazard Management plans were completed for Vance Creek in 1994, the Grayland area in 1995, the South Beach area in 1997, and the North Beach area in 1999. More recently, Grays Harbor County received funding for Comprehensive flood hazard management planning from Ecology's FCAAP grant program and FEMA's flood mitigation assistant (FMA) grant program administered by the State Emergency Management Department. This document is a presentation of the Comprehensive Flood Hazard Management Plan (CFHMP) covering a large portion of Grays Harbor County, with special focus on the Humptulips, Wynoochee, and Satsop Rivers.

As fully detailed in Chapter 173-145 of the Washington Administrative Code (WAC), the CFHMP must include several key elements, as follows:

- Determination of the need for flood control work.
- Watershed descriptions, including the identification of specific problem areas, historical and potential flood damage, the documentation of applicable regulations, and goals for the planning area.
- Alternative flood control work.
- Identification of potential impacts of instream flood control measures to instream uses and resources.
- Definitions for the coverage area of the comprehensive plan.
- Conclusions and proposed solution(s).

The CFHMP is also an element of Grays Harbor County's plan to meet the intent of the 1990 Growth Management Act (GMA). Under the GMA, all counties with a population of at least

50,000 people and a population increase of more than 17 percent in the last 10 years must adopt a Countywide comprehensive plan. Although Grays Harbor County does not fall into this category, it has chosen to initiate planning to achieve the intent of the GMA.

To initiate appropriate structural and nonstructural measures on a Countywide basis, the FCAAP was established under the authority of RCW 86.26 State Participation in Flood Control Maintenance. In accordance with the assistance program, a CFHMP is required if the County is to be eligible to receive matching funds for flood control maintenance projects. The CFHMP must be based on a plan that includes the entire watershed, followed by approval and adoption by Ecology.

Ecology Flood Control Assistance Account Program

This CFHMP was developed in accordance with Ecology's *Comprehensive Planning for Flood Hazard Management (CPFHM)* approach for a CFHMP. In that document, the following steps are outlined for successful completion of a plan:

1. Establish the citizen and agency participation process.
2. Set flood hazard management short- and long-term goals and objectives.
3. Inventory and analyze physical conditions.
4. Determine the need for flood hazard management measures.
5. Identify alternative flood hazard management measures.
6. Evaluate alternative measures.
7. Hold public alternative evaluation workshop(s).
8. Develop flood hazard management strategies.
9. Complete draft Comprehensive Flood Hazard Management Plan and State Environmental Policy Act (SEPA) documentation.
10. Submit the final Comprehensive Flood Hazard Management Plan to Ecology.
11. Hold a public hearing and pass the "intent to adopt" resolution.
12. Notify Ecology that the final plan is adopted.

FEMA Flood Mitigation Assistance Program

In Washington state, the State Emergency Management Department manages the Flood Mitigation Assistance program for FEMA. The County received flood mitigation assistance from the State Emergency Management Department to develop this CFHMP.

FEMA recommends the flood mitigation planning process include the following:

1. Public involvement.
2. Coordination with other agencies or organizations
3. Flood hazard area inventory.

4. Problem identification.
5. Review of possible mitigation actions
6. State or local adoption following a public hearing.

This CFHMP meets the criteria of both the FEMA and Ecology program, since these guidelines follow the same criteria as described previously in the Ecology's CPFHM.

Project Background

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 has placed increased emphasis on addressing localized drainage problems.

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 previous study areas are delineated in Figure 2-1. These studies are appended to the comprehensive plan in order to submit a complete plan.

As shown in Figure 2-2, 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 empty into 90 square miles of the Grays Harbor Estuary. Smaller rivers (including the North, Copalis, and Moclips Rivers), streams, and portions of streams are also 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 Figure 2-3.

Need for Plan

Rapid development and increasingly severe flooding in portions of the Pacific Northwest have made flood hazard management a priority for Washington's state and local governments. Citizens and public officials are increasingly aware of the interrelationship of comprehensive planning, stormwater management, resource preservation, and flood damage protection. It is also acknowledged that floods are natural events, and that often it is human activities that must be managed to minimize the watershed impacts that make flooding a serious hazard.

The State of Washington made grant funds available to help communities and local governments comply with state statutes calling for watershed-based flood protection activities. To qualify for these funds, a CFHMP must be developed to ensure that an overall watershed approach to flood hazard management is being taken. Because activities throughout the watershed can directly and indirectly impact localized flood control projects, a complete understanding of the drainage basin, including its soil types, land uses, and hydrology are imperative. Poor management in one part of the watershed can adversely affect drainage and result in flooding in another part.

This CFHMP addresses the watersheds contributing to Grays Harbor County and evaluates the potential for flooding and its impacts. It also proposes possible structural and alternative management solutions to reduce flood hazards.

Flood Control Assistance Account Program

The FCAAP provides matching reimbursable grants for county and local jurisdictions' planning and maintenance efforts to reduce flood hazards and damages.

Administered by Ecology's shoreland and coastal zone management program, FCAAP promotes a watershed approach to minimizing flood hazards. To be eligible for funding, jurisdictions must participate in the National Flood Insurance Program. The maximum amount of initial non-emergency funds available per county is \$500,000 per biennium, subject to availability. Grants for up to 75 percent for plans, studies, and projects are provided, subject to availability.

Project Goals

Project goals were identified during the planning process and identified as short or long term, which are defined as 0 to 5 years or 5 to 10 years, respectively. In addition to effectively addressing each CFHMP key element, as identified by WAC, 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

Historical Background

This section describes the historical activities in the area that have affected the physical and cultural characteristics of the County.

Fires

In the late 1200s, 1308, 1508, and 1699, major fires burned parts of the East and West Humptulips Watershed, although large stands of old-growth survived each burn period. More recent fires have been small and were largely associated with controlled slash burns within timber harvest units.

Timber Harvest

The timber industry in Grays Harbor County began in the 1880s, soon after the first steam-driven sawmills began operation in Cosmopolis, Aberdeen, and Hoquiam. At that time, timber stood along the banks of most rivers and streams, which allowed harvesting to occur within the tidal zone and along the banks of the lower 7 miles of the Humptulips River. Trees were felled directly into the river and transported easily to tidal water. Later, as timber harvesting shifted farther from the riverbank, bull team, horse logging, and donkey steam engines used skid trails constructed of logs half buried in the ground to transport the harvested timber.

Splash Dams

Beginning in the early 1900s, logs were transported to the bay using a series of splash dams, storing logs in temporary reservoirs along the river. When released, artificial floods would "splash" the logs downstream to the next dam, and, ultimately, transport them to tidal waters. Between 1910 and 1920, more than 30 splash dams were constructed along the Humptulips River and its tributaries, and were operated on average for a period of 20 years (Brown et al., 1982; Hiss and Knudsen, 1992; GHRPC, 1994). The use of splash dams likely affected the natural runoff patterns within the mainstem rivers and tributaries, and might have prevented upstream migration of fish to spawning and rearing habitat. Below the dams, scouring of the stream gravels to bedrock, the deposit of bark on stream bottoms, and the removal of large, woody debris by the splash dams would have caused reduction of spawning habitat (Murphy, 1995; Hiss and Knudsen, 1992).

Road Network

In the 1930s, roads and railroads began to replace river transport of harvested timber. However, despite the decreased use of splash dams during this period, transport of logs on timber roads did not reduce the impacts to salmon habitat. Road surfaces, cut banks, and fills readily allowed fine sediment to be deposited in the streams. In addition, most of the

splash dams were not removed until the 1940s, and many remained in place until the early 1950s, when they were either washed out or removed by the Washington Department of Fish and Wildlife (WDFW). Between 1930 and 1950, most old-growth timber on private land in the Humptulips River sub-basin was harvested, and in the Olympic National Forest (ONF), old-growth timber was harvested between the 1950s and 1980s (Peter, 1999). It was not until the 1980s that forest practice regulations attempted to reduce the timber industry's impacts to fish-bearing habitat. In 1987 and 1992, the Timber, Fish and Wildlife Agreements placed more restrictive standards on riparian harvest, on harvest on unstable slopes, and on road construction and maintenance on state and private lands.

Timber roads and the increase in the transportation road network have affected the hydrologic response and surface water runoff delivered to the Grays Harbor water channels (Jones and Grant, 1996). In a forested area, precipitation that falls on low-permeability road surfaces typically drains to ditches and is channeled to the stream system, resulting in interruption of shallow subsurface flow and increased delivery rates and volume (Stoddard). Additionally, historical ONF records indicate that runoff and erosion problems were directly related to the road network. In the early 1970s, ONF transportation plans documented streamside erosion and increased sediment delivery to numerous channels due to the road system in the upper portions of the East/West Humptulips Watershed.

Gravel Mining

Gravel mining increased in activity as road construction expanded, and stream gravel was the primary source of material for early road construction. By 1945, permits were required, and by 1955, gravel mining in wet channels was prohibited. Later, when it was discovered that juvenile salmon that entered pits (the result of gravel mining) during high flows were trapped when flows subsided, pits were no longer allowed; gravel bars could be mined only to a flat grade. However, in the mainstem Humptulips River, the amount of gravel harvested on at least 24 gravel bars exceeded the replenishment rate between 1955 and 1985 (Collins and Dunne, 1986). In 1986, in response to the results of the Collins and Dunne study, Grays Harbor County set gravel bar harvesting limits for the Humptulips River. Since 1990, the County has established the following volume limits on gravel harvesting:

- 3,250 cubic yards for the Humptulips River
- 5,000 cubic yards for the Satsop River
- 2,500 cubic yards for the Wynoochee River

Presently, gravel mining continues to offer a mix of potential benefits and problems. Most recently, the mining of gravel pits outside of the active channel in the floodplain has been encouraged by the WDFW. Based on observation of juvenile salmonid rearing habitat, WDFW recognized that gravel pits located in the floodplain might provide salmon with access to abandoned pools, resulting in an increase in spawning activity. Brian Erickson, of the Columbia Pacific RC&D, witnessed enhanced off-channel juvenile salmonid rearing habitat in two abandoned gravel pits in the floodplain that were improved with large woody debris.

Wynoochee Dam

Approximately 4.4 miles downstream of Wynoochee Lake lies the 177-foot-high Wynoochee Dam. At river mile 51.8 above the confluence of the Chehalis River, the dam is a central concrete-gravity structure containing two large sluices for flood-control releases (total discharge capacity of 9,240 cfs), six 24-inch conduits for low-flow releases (total discharge capacity of 1,290 cfs), and a two-bay controlled shute spillway (total discharge capacity of 43,500 cfs).

Wynoochee Dam began operation in spring 1973. Its construction and operation by the COE was authorized by the Flood Control Act of 1962 for the purpose of flood control, water supply, recreation, and fish enhancement. In September 1987, hydroelectric facilities were added to the dam as licensed by the Federal Energy Regulatory Commission. On September 20, 1993, operation, maintenance, rehabilitation, and repair of the Wynoochee Dam and hydroelectric facilities were transferred from the COE to the City of Aberdeen. The federal government authorized the City to purchase the dam under the Water Resources Development Act of 1988, provided the City continued to operate the dam in compliance with the COE's regulations and the dam's original project purpose. Today, Tacoma Power Utilities operates the dam and produces power, and the COE operates the dam during flood events. The Final Environmental Assessment (July 9, 1993), as written by the COE, concluded that the dam fee title transfer would not cause significant impacts to water quality, streamflow, vegetation, wildlife, or aquatic, cultural, and socioeconomic resources.

The dam drainage area is approximately 41 square miles (26,240 acres) which is approximately 20% of the area of the entire basin. The Wynoochee Reservoir receives a mean annual inflow of 535 cfs. The highest average monthly flow (1,023 cfs) occurs in December; the minimum average monthly flow (138 cfs) occurs in August. Monthly outflows from the dam average from 1,027 cfs in December to 199 cfs in August.

Wynoochee Lake, spanning 1,126 acres at full pool capacity (approximately 800 feet mean sea level), has a gross storage capacity of 69,405 acre-feet and was designed to control the 10-year flood event to 18,000 cfs and the 100-year flood event to 25,400 cfs at the Black Creek gage near Montesano. From approximately October 1 to March 1, the lake is drawn down to elevation 776.1 in order to provide 24,000 acre-feet for flood control. After March 1, the dam is gradually filled to elevation 800 feet.

Planning Process

As detailed in Ecology's *Comprehensive Planning for Flood Hazard Management*, public and agency participation is critical to the success of a flood hazard management plan. In Grays Harbor County, there are a number of factors in favor of public participation:

1. Proposed measures will affect many local property owners, and their support will be needed.
2. WAC 173-145-070 calls for the review of all FCAAP projects by associated state agencies and affected parties. Therefore, appropriate public agencies, such as the State Department of Fisheries and Wildlife, the Department of Natural Resources, affected Native

American tribes, and other public entities should be involved throughout the process for plan formulation and comments.

3. The plan must ultimately be adopted by the local government; therefore, it is important to build support among the local constituency.
4. The planning process offers public education on the issues, opportunities, and public responsibilities of flood hazard management.

Public and Agency Participation Process

In keeping with Ecology's guidance for flood hazard management planning, the County has worked actively to involve members of the community in identifying flooding problems and advising on potential recommendations. Six public meetings were held in the preparation of this plan. All meetings were advertised in the Aberdeen Daily World and the Vidette local newspapers. In addition, repetitive loss property owners were sent letters inviting them to attend these public meetings. The list of these property owners was obtained from the Grays Harbor County Emergency Manager, who maintains a database of citizens who contact the office when their property is flooded.

Initial meetings in Humptulips and Montesano were held on September 28 and October 2, 2000, respectively. Both meetings served to inform the local residents of the CFHMP project goals and objectives and included community identification of existing drainage problems. Approximately 20 residents attended the Humptulips meeting, and approximately 50 residents attended the Montesano meeting. Two COE representatives attended the Montesano meeting to inform the citizens of an upcoming Wynoochee Dam meeting. A representative from Ecology attended the Humptulips meeting.

The general context of the study was presented by Lee Hansmann, the County Deputy Director for Community Development. Representatives from CH2M HILL, the consulting firm conducting the study, explained the project scope, schedule, and the components of the comprehensive plan. Goals of the CFHMP were described and citizens were invited to comment.

General citizen comments included:

- Concerns about changes in zoning including more land use restrictions and potential devaluation of property
- Flood insurance is very expensive
- Questions regarding operation of the Wynoochee Dam for power generation
- Gravel removal should be allowed from the rivers for flood control

A more detailed list of citizen comments from these meetings is presented in Appendix A.

It was clarified that although this is a Countywide plan, the focus would be on the Wynoochee, Humptulips, and Satsop Rivers because previous flood hazard studies have been completed for North Beach, South Coastal, Grayland, and Vance Creeks. Lastly, various funding sources were discussed.

At the conclusion of the presentation, residents were asked to delineate areas of flooding on maps of their communities and to describe the dates and extent of flooding (i.e., depth).

These areas will be presented in Section 5, Figure 5-1. The audience was also asked to comment on the study and any drainage problems that should be addressed.

Additional public meetings in Montesano and Humptulips on January 29 and 30, 2001 included a presentation of flood hazard management recommendations for problem areas identified by residents in the initial meetings. These recommendations are included in Section 7.

General citizen comments at these meetings included:

- Concern that gravel removal was not presented as a recommendation for flood hazard management
- Current FEMA maps are outdated

For more detailed summaries of these meetings, refer to Appendix A.

The fifth public meeting was held in March 2001 in Montesano, consisting of members from WDFW, Ecology, County staff, commissioners, and a small group of citizens. The main agenda was to discuss small scale gravel removal. At the end of the meeting, the group decided on pursuing a pilot project along the lower portion of the Satsop River.

The last public meeting was held in March 2001 in Montesano. Prior to the meeting, residents were sent the executive summary of the draft plan and were asked to comment. Their comments are included in Appendix A. A brief summary of the planning process and the preferred alternative were presented.

At the conclusion of this process, the Grays Harbor County Commissioners will hold a public hearing prior to adopting the plan.

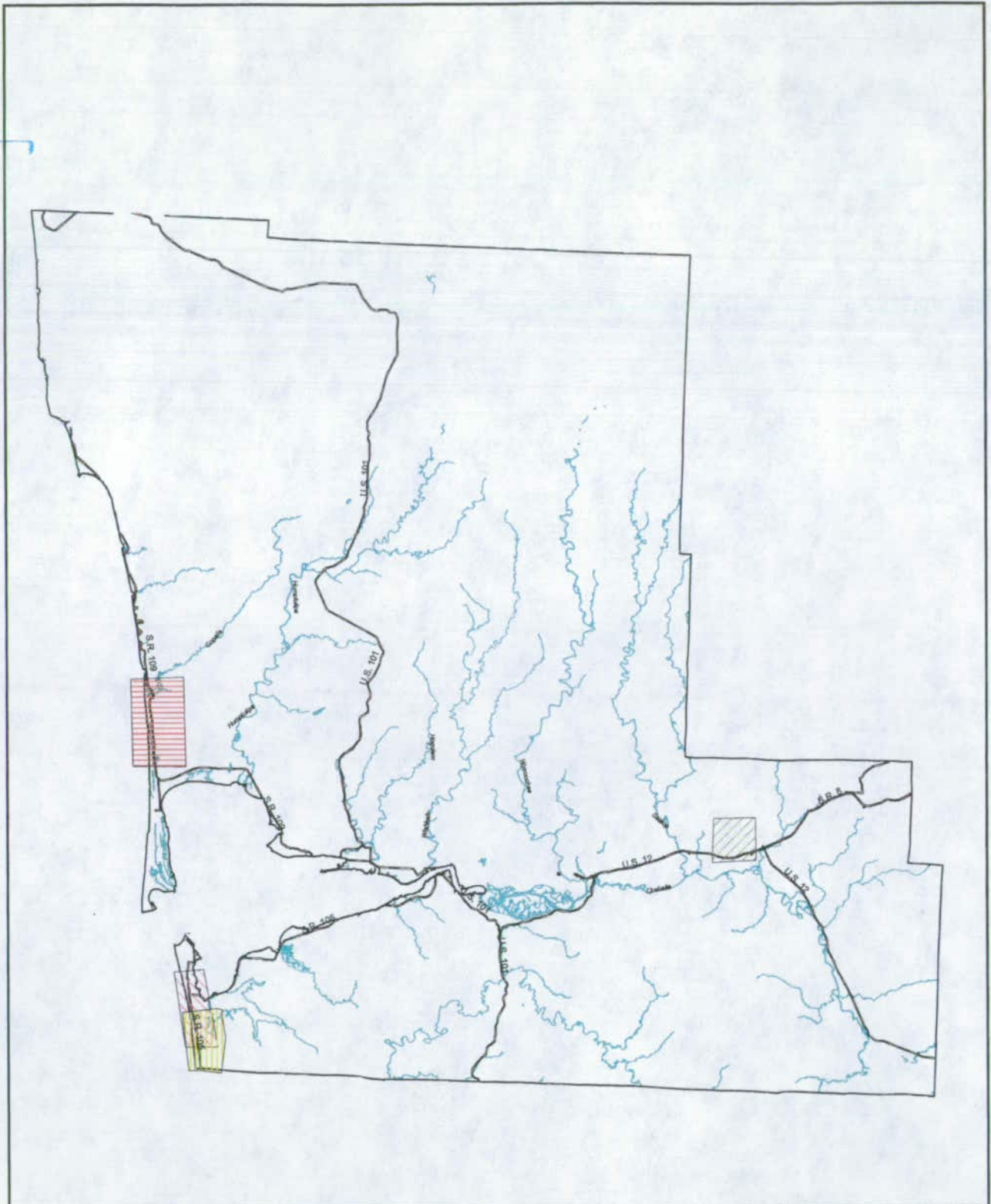
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(Jones and Grant, 1996)

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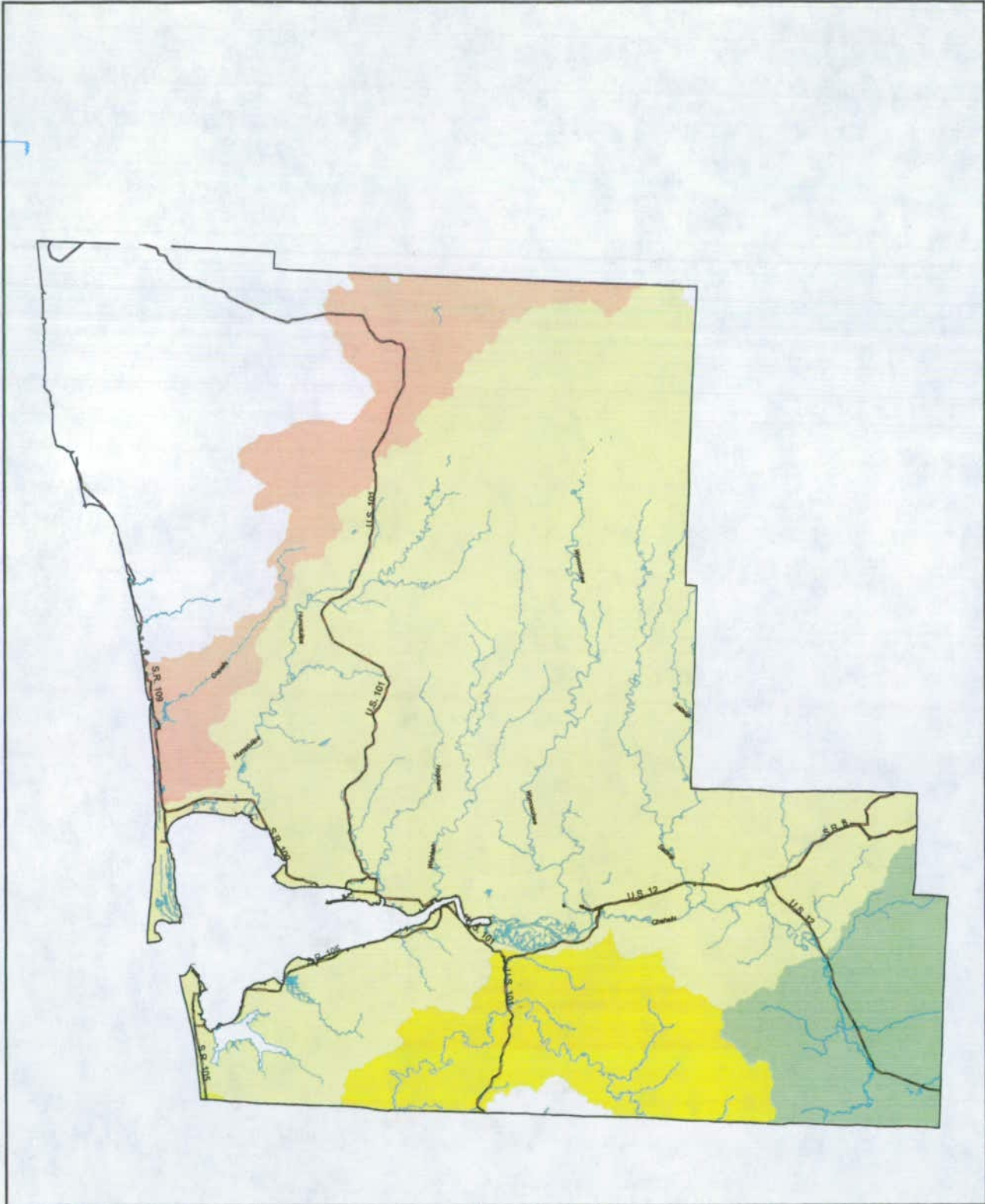


Comprehensive Flood Hazard Management Plan
Previous Flood Studies

Figure 2-1

- LEGEND**
 Previous Study
 Grayland Flood Hazard Reduction Plan
 North Beach Flood Hazard Management Plan
 South Coastal Flood Management Plan
 Vance Creek Drainage Evaluation
 Highway
 River





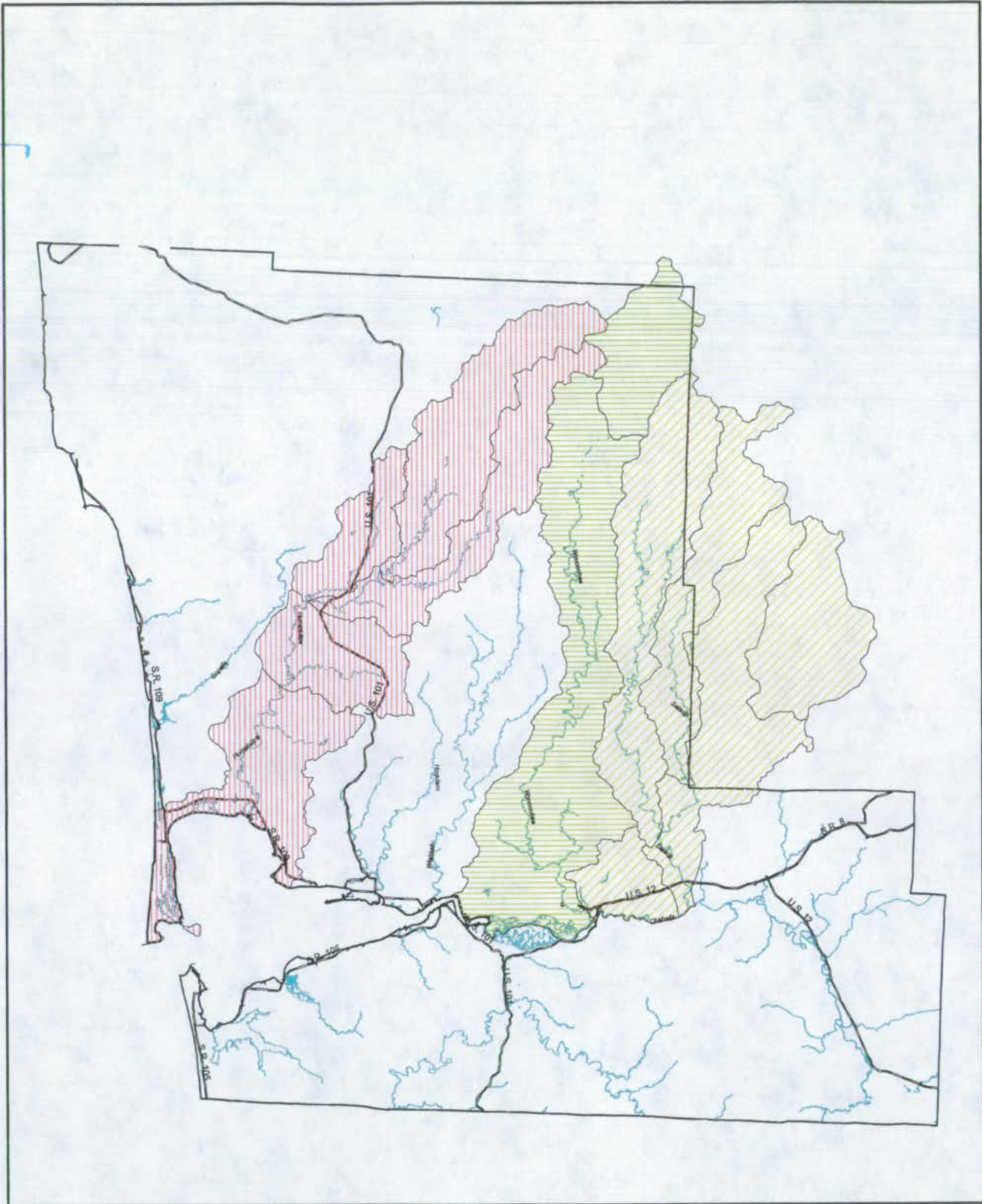
Comprehensive Flood Hazard Management Plan
 Overview of Grays Harbor County

Figure 2-2

- LEGEND**
- Highway
 - River
 - Watershed**
 - Lower Chehalis
 - Queets-Quinault
 - Upper Chehalis
 - Willapa



1" = 30,000'
 15000 0 15000 30000 Feet



Comprehensive Flood Hazard Management Plan
Overview of Study Area

Figure 2-3

- LEGEND**
- Basin
 - Humptulips
 - Satsop
 - Wynoochee
 - Highway
 - River



1" = 30,000'
15000 0 15000 30000 Feet