SECTION 7

Preferred Alternatives

Section 6 described the various flood hazard management alternatives in detail. The feasible measures were evaluated with respect to cost, environmental impacts, funding, schedules, benefits, and plan goals.

Section 7 presents the preferred alternatives to meet the goals of this flood hazard management plan. The measures presented in this section 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 parties for implementation. The preferred alternatives have the following features:

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

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' would like the dam to hold back more water than it currently does for flood control. 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 the preferred alternatives presented in this comprehensive plan. 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 the existing FEMA mapping to the extent practicable. Accurate floodplain rate 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 the 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 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. Contact Rob Flaner, CRS Specialist, at 208-929-4432 to obtain more information.

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 buy out 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, citizens, 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