

Final

Grays Harbor County Comprehensive Flood Hazard Management Plan

Prepared for

Grays Harbor County

Prepared by

CH2M HILL

June 2001

RESOLUTION #01-161

A RESOLUTION ADOPTING THE GRAYS HARBOR COUNTY COMPREHENSIVE FLOOD HAZARD MANAGEMENT PLAN

WHEREAS, Grays Harbor County received funds from the Department of Ecology's Flood Control Assistance Account Program to develop a series of Flood Hazard Management Plans; and,

WHEREAS, Grays Harbor County received funds from the Department of Emergency Management to develop a Flood Mitigation Plan; and,

WHEREAS, Grays Harbor County engaged in a comprehensive flood hazard management planning process that identified and characterized county-wide areas that experience chronic flooding and repetitive losses, and developed preliminary alternatives for future implementation; and,

WHEREAS, Grays Harbor County solicited public comments to develop the plans and provided the opportunity to comment on the draft plans by making the plans available for public review; and

WHEREAS, the Grays Harbor County Board of Commissioners extend their full support of the goals, strategies, and alternatives contained in the plan;

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS FOR GRAYS HARBOR that the Vance Creek Drainage Evaluation, the Grayland Flood Hazard Reduction Plan, the South Coastal Flood Hazard Reduction Plan, the North Beach Flood Hazard Management Plan, and the Grays Harbor County Comprehensive Flood Hazard Management Plans are hereby accepted and adopted this 17th day of December 2001.

BOARD OF COUNTY COMMISSIONERS
GRAYS HARBOR COUNTY, WASHINGTON



Bob Beerbower, Chairman

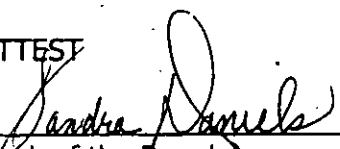


Dan Wood, Commissioner



Dennis Morrisette, Commissioner

ATTEST



Clerk of the Board

Contents

1	Executive Summary.....	1-1
	Introduction	1-1
	Problems, Issues, and Goals	1-1
	Preferred Alternatives	1-3
	Agency and Citizen Collaboration	1-3
	Localized Flood Hazard Management Plans	1-3
	Nonstructural Measures.....	1-4
	Structural Measures	1-5
	Funding.....	1-7
2	Introduction.....	2-1
	Legal Authority and Scope	2-1
	Ecology Flood Control Assistance Account Program.....	2-2
	FEMA Flood Mitigation Assistance Program	2-2
	Project Background	2-3
	Need for Plan.....	2-3
	Flood Control Assistance Account Program.....	2-4
	Project Goals	2-4
	Historical Background.....	2-5
	Fires.....	2-5
	Timber Harvest.....	2-5
	Splash Dams.....	2-5
	Road Network	2-5
	Gravel Mining.....	2-6
	Wynoochee Dam	2-7
	Planning Process.....	2-7
	Public and Agency Participation Process	2-8
	References.....	2-9
3	Description of Planning Area Characteristics.....	3-1
	Planning Area Boundaries	3-1
	Topography.....	3-1
	Climate.....	3-2
	Temperature.....	3-2
	Precipitation.....	3-2
	Relative Humidity.....	3-3
	Soils	3-4
	Ocosta	3-4
	Grehalem-Rennie	3-4
	Chehalis-Skamo-Spanaway	3-5
	Yaquina-Netarts-Dune Land	3-5

	Geology	3-6
	Hydrology and Watershed Characteristics	3-6
	Channel Morphology	3-6
	Tidal Flooding	3-6
	Riverine Flooding	3-7
	Water Quality	3-10
	Biological Resources	3-10
	Fisheries Resources	3-10
	Vegetation	3-16
	Wetland Resources	3-17
	Wildlife	3-21
	Other Ongoing Studies	3-23
	Chehalis Drainage Limiting Factors Report	3-23
	Chehalis River Basin Ecosystem Study	3-23
	Land Use	3-24
	Current Land Use	3-24
	Future Land Use	3-26
	Current Population	3-27
	Projected Population	3-27
	Cultural Resources	3-28
	References	3-28
4	Regulatory Overview	4-1
	Floodplain Management	4-3
	Federal Involvement	4-3
	State Involvement	4-3
	Local Involvement	4-4
	Resource Management	4-7
	Federal Involvement	4-8
	State Involvement	4-9
	Local Involvement	4-10
	Environmental Management	4-10
	Federal Involvement	4-10
	State Involvement	4-10
5	Flood Damage History	5-1
	Record of Historic Events	5-1
	Wynoochee River Basin	5-1
	Satsop River Basin	5-2
	Humptulips River Basin	5-3
	Damage Cost Estimates by Land Use Type	5-4
	Prior Flood Control Investigations	5-6
	List of Current and Past Problem Areas	5-6
	Projected Problems Due to Projected Land Development and Resource Utilization Trends	5-7

6	Evaluation of Alternative Flood Hazard Management Measures.....	6-1
	Nonstructural Management Measures.....	6-1
	Land Use Regulations/Permitting	6-2
	Accurate Floodplain Mapping	6-3
	Inter-Jurisdictional Coordination	6-4
	Floodplain Conservation Easements.....	6-4
	Educational Materials on Flood Hazard Management.....	6-5
	Flood Warning System.....	6-5
	New Standards for Design, Construction, and Maintenance	6-6
	National Flood Insurance Program Community Rating System Program.....	6-7
	Floodproofing.....	6-8
	Elevate Affected Structures	6-9
	Relocate Affected Structures.....	6-9
	Buyout/Demolition of Affected Structures.....	6-9
	Structural Management Measures.....	6-9
	Levees	6-10
	Setback Levees.....	6-13
	Floodplain Excavation.....	6-13
	Flood Control Reservoir.....	6-13
	Overflow Culvert/Channels	6-13
	Onsite Detention and Retention.....	6-13
	Biostabilization and Other Engineered Solutions	6-13
	Local Problem Areas.....	6-14
	Wynoochee Tracts.....	6-15
	Satsop Riviera	6-15
	Humptulips Dike Road	6-15
	Walker Bottom Area	6-16
	Environmental Impacts	6-16
	Funding.....	6-19
	Schedules and Terms of Benefits.....	6-25
	Conformance with Goals.....	6-25
7	Preferred Alternatives	7-1
	Agency and Citizen Collaboration	7-1
	Localized Flood Hazard Management Plans	7-2
	Nonstructural Measures.....	7-2
	Continue Enforcement of Existing Land Use Regulations and Permitting Processes.....	7-2
	Evaluate Revisions to FEMA Mapping.....	7-2
	Continue Inter-Jurisdictional Coordination	7-2
	Develop Floodplain Conservation Easement Program	7-2
	Provide Educational Materials on Flood Hazard Management.....	7-2
	Improve Flood Monitoring System	7-3
	Use New Design, Construction, and Maintenance Standards.....	7-3
	Join National Flood Insurance Program Community Rating System Program	7-3

Provide Flood-Proofing Guidance to Residents.....	7-3
Develop Home Elevation and Buyout Program	7-3
Structural Measures.....	7-3
Biostabilization and Other Engineered Solutions	7-3
Consider Capital Projects	7-4

Appendices

A	Public Meetings
B	Water Quality
C	Limiting Factors Standards
D	Permanent Flood Protection Measures
E	CRS Credit Program
F	Cost Estimates

Figures

2-1	Previous Flood Studies
2-2	Overview of Grays Harbor County
2-3	Overview of Study Area
3-1	Floodplain and Precipitation Gauges
3-2	Soils Map
3-3	Humptulips River Historic Meanders
3-4	Satsop River Historic Meanders
3-5	Wynoochee River Historic Meanders
3-6	Humptulips Basin
3-7	Peak Discharge, Humptulips River, 1933 to 1979
3-8	Wynoochee and Satsop Basins
3-9	Peak Discharge, Satsop River, 1929 to 1999
3-10	Peak Stage, Satsop River, 1929 to 1999
3-11	Peak Discharge, Wynoochee River, 1956 to 1999
3-12	Peak Stage, Wynoochee River, 1956 to 1999
3-13	Wetland Map
3-14	Zoning Map
5-1	Flood Problem Areas
5-2	Typical Road Closures Due to Flooding
5-3	Tsunami Evacuation Routes
6-1	Recommended Areas for Revising Floodplain Mapping
6-2	Wynoochee Tracts Conceptual Structural Recommendation
6-3	Satsop Riviera Conceptual Structural Recommendation
6-4	Humptulips Dike Road Conceptual Structural Recommendation
6-5	Walker Bottom Area Conceptual Structural Recommendation

Tables

- 3-1 Average Monthly Precipitation
- 3-2 Summary of Peak Discharge
- 3-3 Summary of Satsop Subbasin Limiting Factors Results
- 3-4 Summary of Humptulips River Subbasin Limiting Factors Results
- 3-5 Sensitive Plant Species in Grays Harbor County
- 3-6 Summary of Habitat Types in Grays Harbor County
- 3-7 Sensitive Species within Grays Harbor County
- 3-8 Estimated 2000 Population of Incorporated Cities of Grays Harbor County

- 4-1 Regulations Pertaining to Flood Hazard Management

- 5-1 Ten Largest Flood Events Recorded at USGS Gauge 12037400, Wynoochee River Upstream of Black Creek near Montesano – Pre Dam (1956 – 1973)
- 5-2 Ten Largest Flood Events Recorded at USGS Gauge 12037400, Wynoochee River Upstream of Black Creek near Montesano – Post Dam (1973 to Present)
- 5-3 Ten Largest Flood Events Recorded at USGS Gauge 12035000, Satsop River Near Satsop
- 5-4 Ten Largest Flood Events recorded at USGS Gauge 12039000, Humptulips River Near Humptulips
- 5-5 Preliminary Losses Due to March 1997 Flood Event (Grays Harbor Emergency Management Office)
- 5-6 Approximate Reported Losses Due to December 1999 Flood Event (Grays Harbor Emergency Management Office)
- 5-7 Insurance Statistics for Grays Harbor County (FEMA)

- 6-1 NFIP CRS Classification System
- 6-2 Advantages and Disadvantages of Various Structural Flood Mitigation Measures
- 6-3 Satsop Riviera Project Estimated Costs
- 6-4a SEPA-Related Environmental Impacts Associated with Structural Measures
- 6-4b General Environmental Impacts Associated with Structural Measures
- 6-5 Required Permits for Conceptual Projects
- 6-6 Funding Alternatives for Flood Hazard Management Measures