

**Appendix J: Summary of Environmental  
Impact Statement**

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## **Appendix J**

### **SUMMARY OF ENVIRONMENTAL IMPACT STATEMENT**

The Final Environmental Statement on this Plan was issued in September 1990. This appendix presents the summary for that FEIS, which addressed the effects of the proposed alternatives from the draft Plan issued in March 1990.

## **NEED FOR THE PROPOSAL**

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The adopted Snohomish/Lake Stevens Area Comprehensive Plan recommends that a master levee program or coordinated levee plan be developed to evaluate the effect proposed levee improvements have on other levees, to identify the potential impacts on unprotected land, and to analyze total flood damages, before approval of any additional levees.

The existing flood protection system consists of a series of levees built and maintained by independent diking and drainage districts. There are nine organized districts and several private dike systems in the valley. Differences in dike height create unequal flood protection among the districts. In addition, many levees are structurally weak which has resulted in numerous past levee breaches.

The purpose of the Snohomish River Comprehensive Flood Control Management Plan is to establish County policies which will guide future construction and maintenance of levees and which consider overall flood protection needs of the valley, including cities. A major objective of the Plan is to define realistic goals for future levee heights (level of protection) which will be equitable for all diking districts. A parallel objective is to establish design and maintenance standards for levees which meet flood control and structural maintenance needs, yet give high priority to protecting fish and wildlife habitat.

Funds from the Washington State Flood Control Assistance Account Program will not be available for the Snohomish River unless a Comprehensive Flood Control Management Plan is approved by the Department of Ecology in consultation with Departments of Fisheries and Wildlife and adopted by Snohomish County.

Individual levees will not be eligible for post-flood rehabilitation assistance from the United States Army Corps of Engineers in accordance with Public Law 84-99 until minimum vegetation management and structural standards are in effect. Normally the Corps requires that the levees provide protection against the 5-year flood with 1 foot of freeboard.

Finally, until now there has been no consensus on what the coordinated level of protection should be throughout the system or on what design and maintenance standards should be used.

## **PROPOSAL'S OBJECTIVE**

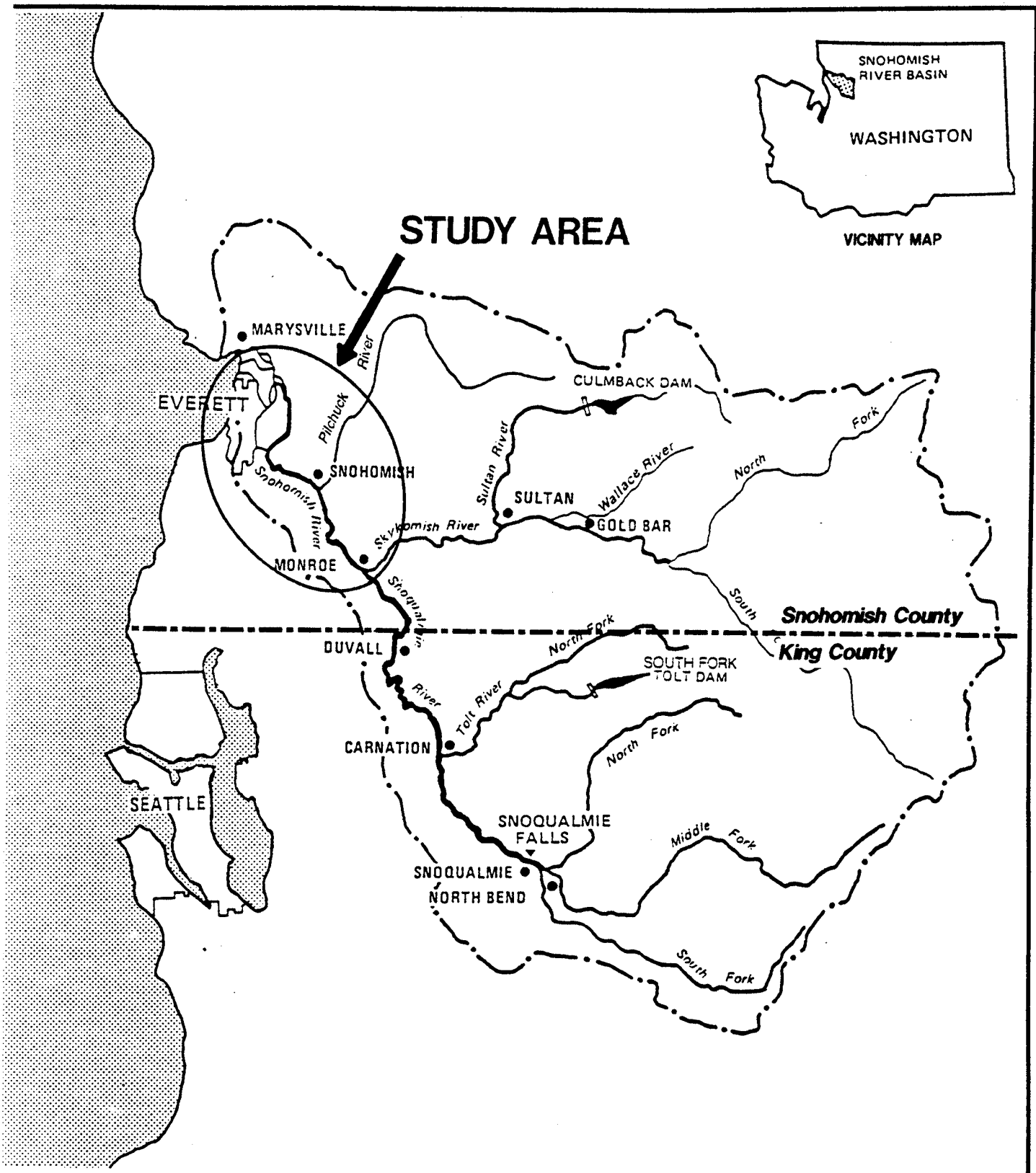
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The primary objective of the proposed Comprehensive Flood Control Management Plan is to identify, by consensus, a long-term flood control management strategy which will reduce flood damage and be sensitive to fish and wildlife. Other objectives are to identify alternatives to levee construction which reduce flood damage and to meet State and federal requirements for levee maintenance and rehabilitation funds. The comprehensive plan objectives include coordinating the levee system for all diking districts.

## **STUDY AREA**

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The Snohomish River is formed by the merging of two large rivers, the Skykomish and the Snoqualmie, near Monroe. The entire Snohomish River basin covers about 1900 square miles in Snohomish and King counties (see Figure 1).



Source: Snohomish Basin Mediated Agreement  
 Flood Damage Reduction Study  
 (U.S. Army Corps of Engineers, September, 1982)



**FIGURE J-1 Snohomish River Basin**

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The Snohomish River Comprehensive Flood Control Management Plan and this environmental impact statement deal with the floodplain downriver from Monroe. Figure 2 shows the approximate levee locations and drainage, diking, and flood control districts.

## THE 5-YEAR FLOOD ELEVATION

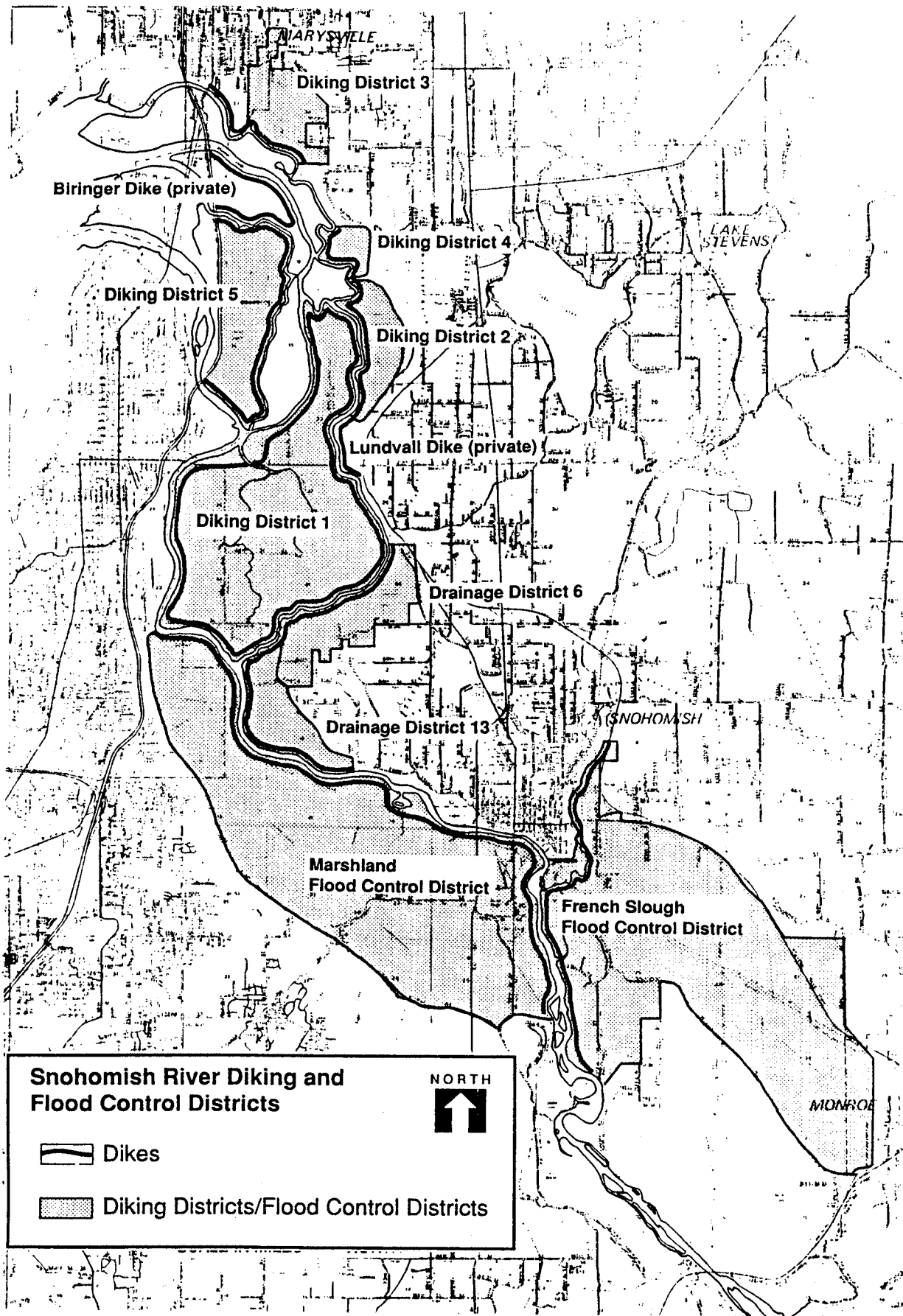
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The Corps of Engineers has determined 5-year flood elevations throughout the valley. These elevations were generated by a "steady-state" computer model which could not account for factors such as variable tides, overtopping levees, and the complex network of sloughs and islands.

In developing this plan, Snohomish County Department of Public Works has used a more complex, "unsteady-state" flood routing model to project various 5-year flood elevations. The new 5-year flood elevations are generally estimated to be up to two feet lower than the levels determined by the Corps. For parts of the lower delta area, on Ebey Slough, the new elevations are higher than the Corps' estimates.

The new elevations, the model, and the methodology have been submitted to the Corps with a formal request that they accept the newer, more realistic, 5-year flood elevations. The Corps' decision is not expected until late 1990.

All flood elevations stated in this EIS were calculated using the Snohomish County flood routing model.



**FIGURE J-2 Diking and Flood Control Districts**

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## THE PROPOSED ACTION

### Alternative 2: Controlled Overtopping

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#### Level of Protection: Completed

Most of the levee system will be allowed to be one foot higher than the 5-year flood elevation. However, within each district, overtopping reaches will remain at the 5-year flood elevation and will be built to overtopping standards. Generally, the segments built one foot above the 5-year flood elevation will be adjacent to homes and the upstream end of districts. The intent is to allow controlled overtopping at the 5-year flood elevation with no additional height.

#### Level of Protection: Interim

It is unlikely that all levees could be improved simultaneously. Therefore, the following "worst-case" interim scenario has been developed:

Marshland Flood Control District is the first to improve their levees to the ultimate height allowed. All other levees remain at their present height. This scenario was used for analysis of how levee improvements may affect other districts.

#### Design Standards

Design standards for levees were developed to provide the minimum structural standards and to be sensitive to environmental issues. All riverward side slopes will be 2H:1V. The landward side slope of sections designed to overtop will be minimum 5H:1V. Sections that will not be overtopped will be allowed to have landward side slopes of 2.5H:1V. Levee tops will be 12 feet wide. Levee segments shall be set back as far as possible from the natural river banks. Plant species are recommended for use on levees for habitat enhancement.

New levees will generally be constructed with well graded, well compacted soil. In specific areas impermeable clay may be required. River sands and silts may be used if adequate filter blankets and/or seepage controls are used and side slopes are modified. Solid waste, junk vehicles, and demolition debris will not be allowed.

Typically, levees will be covered with sod. Levees along the river channel can be planted with a mix of riparian species. When access is required, levee tops may be surfaced with rock.

#### Maintenance Standards

To the extent possible, repair and improvements will be made on the land side of levees to maintain the maximum setback. When borrow areas are used for construction materials they should be left open for wildlife habitat and designed so that there are areas of mildly sloping banks and adequate vegetative buffer.

Vegetation management will normally be accomplished by mowing or brush cutting. The use of herbicides will be discouraged. All trees and shrubs larger than 2 inches in diameter will be removed, except in areas of low or intermediate potential damage. Corps standards require that all trees and shrubs on the levee top and landward side shall be removed.

Vegetation will be the primary method of bank stabilization. When riprap is necessary it should be used in conjunction with vegetation.

All new tide gates will be designed to allow fish passage.

## POTENTIAL IMPACTS OF THE PROPOSED ACTION

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### **Flooding**

Once all levees have been improved to their ultimate elevation no areas will be flooded during a 5-year flood. During a 20-year flood, all areas except District 6 and French Slough will flood less severely than they do presently. Flood waters in District 6 and French Slough are projected to be 1.3 and 0.8 feet deeper, respectively. Because the recommended dike improvements are not designed to control larger flood events, there will be no additional impacts associated with the 100-year flood.

Under the worst-case interim scenario, (i.e. Marshland completing their levee improvements first) additional flooding impacts will be realized by several areas. The Lundvall area plus Districts 1, 2, 4, 6, 13, and French Slough will experience slightly more flooding (less than 1 foot increases) during a 5-year flood. If a 20-year flood occurs during the interim, the Lundvall area and Districts 2 and 4 will have flood waters about 1.8 feet deeper than under existing levee conditions. At the same time, additional flooding in Districts 6, 13, and French Slough will be minor (less than half a foot increase).

### **Water Quality**

There will be greater protection against smaller floods, therefore, less soil erosion and less movement of any manure, or residual herbicides and pesticides. When overtopping floods occur, pollutants will wash off the agricultural lands and may enter the Snohomish River and tributary creeks, as is presently the case.

### **Wetlands**

There may be localized impacts to wetlands on the landward side of existing levees when levees are widened and moved away from the river. Some wetland filling may occur. Riverine wetlands may increase slightly if and when any levees are moved away from the river channel.

No existing wetlands will be separated from the river by levee construction; no new sections of dikes are planned. Completion of the recommended dike improvements will result in an incremental alteration of the hydrology of the floodplain by providing more comprehensive protection for the 5-year flood. This may have some minor unquantifiable impact on wetland areas behind the dikes where floodwaters play a role in wetland recharge. However, the major factor controlling the formation and condition of wetlands behind the dikes is interior runoff and groundwater.

### **Fish**

Levee improvements will have no impact to fish during normal river flows. As levees are improved, tide gates should be installed or replaced with gates that provide fish passage. When construction activities are occurring, localized impacts to water quality through sediment carried in runoff, could effect nearby fish populations.

Raising levees to their ultimate level will prevent flooding and overtopping during 5-year floods. As more floodwaters stay in the main channel, the potential for fish stranding is reduced.

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## Wildlife

For those areas of prime wildlife habitat located on the riverward side of the levee system, wildlife impacts will be similar to those of present floods. As levees are moved landward during repair and routine maintenance, the amount of riverine and/or riparian habitat will increase slightly. However, many important wildlife habitat features occur on the existing dike systems. Maintenance or construction activities would continue to eliminate special habitat features such as cover thickets and snags and live trees used for nesting, feeding and perching. Two federally listed endangered species utilize these features on the existing dikes; bald eagles and peregrine falcons. The bald eagles are present throughout the estuary for the entire year. Peregrine falcons are frequent winter visitors. Other species of hawks, owls and cavity nesters would also be affected. When vegetation is removed from dike segments during construction and maintenance, the wildlife species present will be displaced. This would result in temporary or in some instances, permanent loss of those species from those particular locations.

## Riparian Vegetation

Assuming all districts manage their vegetation to meet the Corps standards, there will be an overall reduction in larger overstory riparian vegetation. If the Corps standards are strictly adhered to, there will be no trees or shrubs larger than two inches in diameter growing on the levees. Grass and native vegetation will be encouraged. Whenever borrow areas are expanded for dike improvements, planting of wetland and riparian vegetation is recommended to enhance wildlife habitat.

## Comprehensive Plan Land Use Designations

The levee improvements allowed by the proposed action will have no direct impacts on existing comprehensive plans. Providing adequate level of protection necessary for existing agricultural uses in the floodplain should encourage the perpetuation of farming and discourage conversion of the floodplain to other uses, in conformance with existing County policies.

## Present Land Use

During the interim the lower districts, particularly the Lundvall area, Districts 2, 4, 6, 13, and French Slough, will experience small increases in flooding. However, most existing residences and industrial facilities are situated above the frequent flood water elevations so no damage to structures is expected. For minor floods, residents and employees of the study area can expect that some roads will be closed due to high water. Threats to homes in District 13 will continue as a result of direct over-bank flows. Larger floods will continue to threaten structures.

## Agricultural Lands

Better flood protection will be beneficial for pasture and crop lands. Soils will normally be dry earlier in the growing season, there will be less soil erosion, and less deposition of flood debris. Greater assurance that dikes will not fail and adequate flood protection exists, will be beneficial for farm productivity.

## Public Services and Utilities

Emergency vehicles and personnel will have normal access to all areas protected by the levee system during a 5-year flood because no roads will be flooded. Roads may be overtopped if there is a break in the levee system. However, with improved vegetation management and better design/repair standards, there will be fewer levee failures.

The sewage lagoons will not be affected by 5 and 20-year floods.

## **Private Roads**

Each district will continue to decide whether levee access roads are required.

## **Public Roads**

If Marshland and District 13 implement major levee improvement programs Lowell-Snohomish River Road and River View Road (a.k.a. River Shore Road) may be relocated. No realignment has been selected, therefore impacts from relocation of the road will need to be assessed at the time such improvements are made. An alternative solution considered in the Plan is to abandon the public road and provide a private or one-way access road to those farms located along the river.

## **SIGNIFICANT ADVERSE IMPACTS THAT CAN'T BE MITIGATED**

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The complete implementation of the proposed action, Alternative 2, will cause no significant adverse impacts for which mitigation cannot be provided.

## **OTHER ALTERNATIVES CONSIDERED**

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The following alternatives were considered in the draft plan. Other alternatives were considered during plan development. These include buyout of larger areas of floodplain. They were not developed into formal alternatives because the flood plain areas considered for purchase are viable agricultural lands.

### **Alternative 1: No Action**

Under the no action alternative the individual districts would continue to function without a comprehensive flood control plan. All existing regulations and policies would remain in effect. Levees could only be raised after extensive system-wide analysis of the potential impacts. No common design standards would be adopted. No consistent maintenance standards would be adopted.

### **Alternative 3: All Levees at 5-Year Flood + 1 Foot**

All levees, including the lower Marshland system, would be allowed to raise to one foot above the 5-year flood elevation.

### **Options:**

The plan also analyzed the effect of following four options. These options can be added to either action alternative.

#### **Option A: District 13 Floodway**

One or more floodways would be designed to convey floodwaters through District 13.

#### **Option B: Acquire District 6**

Most of District 6 would be purchased. Small portions of the existing District 6 levee would be dismantled. The remainder would not be maintained. A new levee would be built to prevent flooding in District 13.

#### **Option C: Maintain Existing Levee Height In District 6**

The District 6 levees would not be raised.

**Option D: District 1 Floodway (Department of Wildlife Parcel)**

Small portions of the levee protecting the Washington State Department of Wildlife parcel would be dismantled, the remainder would not be maintained. A new levee would be built behind the Department of Wildlife parcel to protect the rest of District 1 from flooding.

**MAJOR CONCLUSIONS**

The proposed levee system will not protect against all floods. However, implementation of the proposed plan will lead to greater equity between districts, fewer levee failures, and greater predictability of overtopping locations.

It will likely take several years or even decades to fully implement the proposed action. The sequence of levee improvements will not be controlled by this proposal. The "worst-case" will occur if the Marshland District raises its levee first. If this scenario develops, the Lundvall area and Districts 1, 2, 4, 6, 13, and French Slough will flood to a slightly greater degree than they do presently (assuming a similar 5-year flood). Once all levees have been raised to their allowed height there will be no flooding during a 5-year event.

Assuming a worst-case levee improvement pattern, the degree of flooding in Marshland during a 20-year flood would be much reduced while French Slough and Districts 6, and 13 will flood about the same. The Lundvall area and Districts 2 and 4 will have about 1.8 feet more water.

**AREAS OF UNCERTAINTY OR CONTROVERSY**

Q: Do the individual diking districts and the Coordinated Diking Council support the proposal?

A: Yes, the general concepts of the plan were developed from several discussions with the workshop group which included representatives from individual diking districts and the Coordinated Diking Council. Plan recommendations were reached by consensus.

Q: Under the proposed plan will districts be eligible for Washington State Flood Control Assistance Account Program grants?

A: Yes

Q: If the Corps of Engineers do not accept the Snohomish County 5-year + 1 foot elevations, or if the Corps will not sanction the uses of 5-year elevation overtopping segments, will the proposed plan be amended to allow all districts to improve their levees to the Corps' 5-year + 1 foot elevations?

A: It is expected that these issues will be resolved prior to adoption of the final plan.

Q: What will happen if some districts can't attain the proposed height?

A: It depends on the sequence of individual improvements. However, if the upriver levees are improved first, the lower districts will generally flood more than they do presently. If some districts do not meet the level of protection goals of this plan, the inequity between the districts will continue.