

CHAPTER 8

RECOMMENDED PLAN

Given the framework for flood control decisions and the various alternatives for flood control, preferred alternatives were developed for each area within the County, and for specific projects within these areas. The recommended flood control management plan prioritizes the current major flood control projects and lists associated impact reduction measures. Means for updating and implementing the plan are also presented.

General Prioritization

Goals and objectives stated previously in Chapter 4 were used to prioritize projects. Each project was evaluated based on how well it meets these goals (as stated in Chapter 4) of reducing flood threat, protecting the economy, reducing damage, etc. Appendix D contains the project ranking sheets used to determine project prioritization. The projects on the list were determined from a previous evaluation of alternatives (process described and outlined in Chapter 7). The final prioritized list reflects how each project achieves flood control objectives.

Although an assessment of the flood control situation has been made for the current situation, additional assessments will need to occur following a flood of any significance. Floods stress the existing facilities in sometimes unforeseen ways, and quite often produce a different set of priority actions than those of the pre-flood assessment.

Given the evaluation procedure described in the last chapter, the County can fairly evaluate and prioritize new flood control projects after a flooding situation. The prioritization can be broken down on a county-wide or geographic area basis. These geographic areas are shown in Figure 8-1. New areas of concern would be evaluated, scored, and placed on the post-flood prioritization list.

Tables 8-1 and 8-2 list the area- and County-wide prioritizations. They are general guidelines for developing a project list. A severe problem would produce a high priority score which may make it a different priority than the guidelines in these tables. Emergency, life-threatening situations would be addressed immediately and are not subject to this process.

Table 8-1. Prioritization by Area

Area	Priority ^a	Alternative
Leveed area	1	Maintain existing flood control works
	2	Enhance existing flood control works.
	3	Specific education.
Coastal area	1	Maintain existing flood control works.
	2	Enhance existing flood control works.
	3	Specific education.
Urban/rural areas	1	Maintain existing flood control works.
	2	Enhance existing flood control works.
	3	Improve drainageways.
	4	Specific education.
	5	Form additional districts.
Upper Skagit/ Samish Valleys	1	Maintain existing flood control works.
	2	Enhance existing flood control works.
	3	Stabilize banks.
	4	Remove point bar accumulations.
	5	Specific education.
	6	Form additional districts.
Feeder streams	1	Maintain existing flood control works.
	2	Enhance existing flood control works.
	3	Bank stabilization.
	4	Debris removal.
	5	Specific education.
	6	Holding ponds.
	7	Form additional districts.

^aLower numbers indicate higher priority.

Table 8-2. County-Wide Prioritization

Priority	Action
1	Maintain existing flood control works in feeder stream area.
2	Maintain existing flood control works in leveed area.
3	Enhance all existing flood control works County-wide.
4	Stabilize banks in Upper Skagit/Samish Valleys.
5	Remove point bar accumulations in Upper Skagit/Samish Valleys.
6	Maintain existing flood control works in urban/rural areas.
7	Improve drainageways in urban/rural areas.
8	Maintain existing flood control in Upper Skagit/Samish Valleys.
9	Stabilize banks along feeder streams.
10	Maintain existing flood control along the coast.
11	Remove debris from feeder streams.
12	Specific education programs County-wide.
13	Install holding ponds along feeder streams.
14	Form additional districts where necessary.

An example of the revised post-flood prioritization process is as follows. All emergency situations are stabilized and clean-up operations are made. After the flood, all existing flood control facilities (levees and dikes, pumps, riprap, drainage facilities,

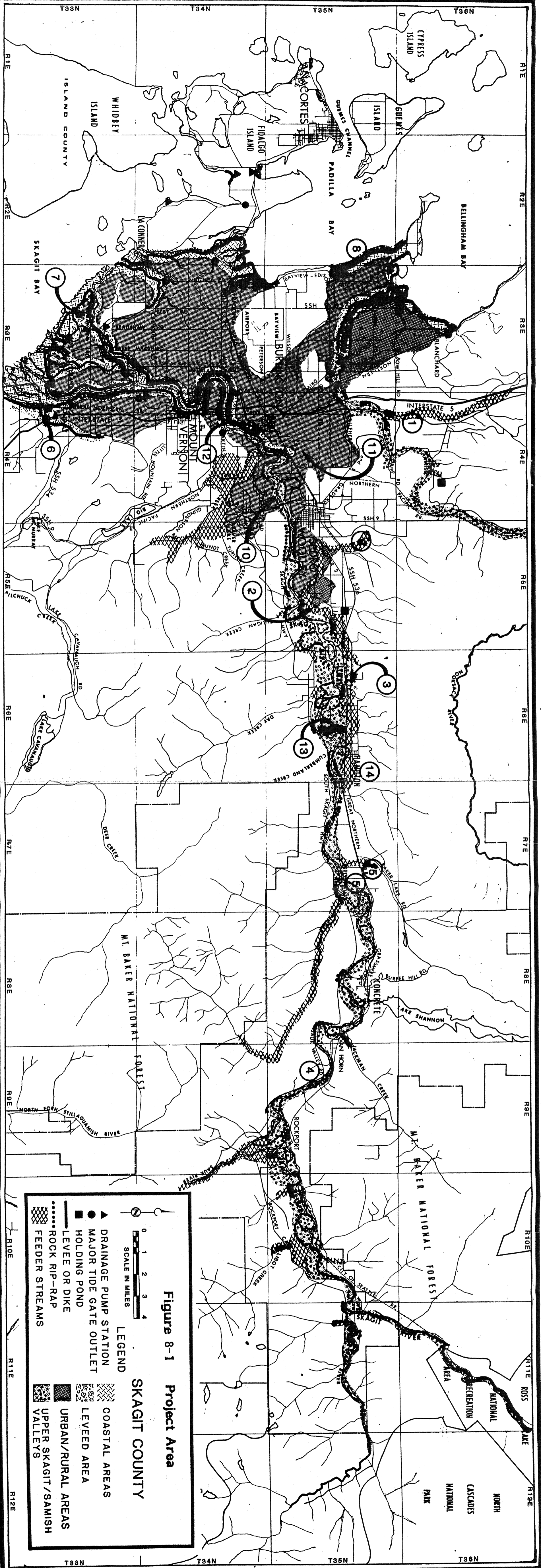


Figure 8-1 Project Area

0 1 2 3 4
SCALE IN MILES

LEGEND

- ▲ DRAINAGE PUMP STATION
- MAJOR TIDE GATE OUTLET
- HOLDING POND
- LEVEE OR DIKE
- ROCK RIP-RAP
- FEEDER STREAMS
- ▨ COASTAL AREAS
- ▩ LEVEED AREA
- URBAN/RURAL AREAS
- ▨ UPPER SKAGIT/SAMISH VALLEYS

SKAGIT COUNTY

holding ponds) are inspected and assessed for damage and are given necessary routine maintenance. Both rivers are inspected over their entire length, noting areas of impending bank failure, debris and gravel accumulations, and potential channel changes. Other information, such as assessed damages and community input (reaction, distress) is also taken into consideration.

For an example, imagine that a flood occurs this fall with a 10-year frequency. As usual with a 10-year flood, the upper valley will be flooding, but the levees will have protected the lower valley area, with an extensive flood fight at Mount Vernon. After assessment, the flood control engineer might note that the previous gravel accumulation near Van Horn had washed away during the flood. Also noted might be that the Avon Bend (Skagit levee at Avon) had suffered extensive abuse, requiring additional riprapping maintenance before the next flood. The Van Horn point bar accumulation would be removed from the project list. The preferred solution in the leveed area is maintenance of existing flood control works which would include riprapping an existing levee.

Levee maintenance is second priority County-wide, so it would probably have priority over the Padilla dike and Gages Slough projects. The project would be scored, along with a reassessment of the remaining projects, to obtain the new prioritized list.

Current Prioritized Project List

The following Table 8-3 lists the prioritized projects based on a current assessment of flood control facilities within the County. Project locations and numbers are also shown on Figure 8-1. Skagit County does not have full authority over these flood control projects. Many of the projects on this prioritized list are under the jurisdiction of diking and drainage districts, and others would need to have a district or zone created to maintain and oversee the proposed project. Although the list reflects the County's priorities, this may not be representative of the accumulative desires of all of the drainage and diking districts. Therefore, implementation of these projects is dependant upon local agency cooperation and coordination. Further planning and design will be accomplished for each project as time and budget constraints permit.

Table 8-3. Recommended Priority of Skagit County
Flood Control Projects

Priority	Project	Area
1	<p>No.7--North Fork sloughed levee</p> <p>Maintain existing flood control works by repairing the sloughed levee through the 1,000-foot section. Levee needs widening and reinforcing. The timing of the repair should be such that fish resources are minimally impacted and little chance of flooding exists during the repair period. The bank should also be stabilized at the same time to prevent further sloughing, along with possible widening to allow for emergency vehicle access to the area.</p>	Leveed area
2	<p>No. 8--Padilla Dike piling</p> <p>Maintain existing flood control work by repairing existing Padilla dike protective piling. Piling may be repaired, if possible, or replaced with additional piling or other suitable material in order to continue to dampen the strong wave action before it reaches the dike. Construction should be timed when wave action is low, marine habitats are at lower risk, and recreational activities will not be severely impacted.</p>	Coastal area
3	<p>No. 12--Gages Slough drainageway</p> <p>Improve natural drainageway through the old channel of the Skagit River which is now Gages Slough. Culverts and outlets need redesign and replacement, and the channel needs considerable work to effectively carry the flood waters away from the City of Burlington once a flood begins to recede. (A 25-year flood or greater would overtop Highway 20 and flood the entire Samish Valley.) Construction should be timed so as not to impact migrating waterfowl or put workers in danger in flood season.</p>	Urban/rural area
4	<p>No. 5--Cape Horn road bank stabilization</p> <p>Stabilize right bank of Skagit River along the long curve in the high gravel bank near Cape Horn Road. The stabilization may require piling and riprap reinforcement to protect the roadway and to armorize the high gravel bank. Construction should be timed for lower river flows and lower traffic volumes on Cape Horn Road. Efforts should be made to prevent excessive loss of vegetative habitat or structures that would divert velocities to other erosion-prone areas.</p>	Upper Skagit Valley
5	<p>No. 6--Big Ditch underpass repair</p> <p>Maintain existing flood control work through repairing the Big Ditch underpass through the Fisher Creek dike. Deteriorated structural pieces would need to be replaced and resealed to prevent water flowing under the structure and through the Fisher Creek dike. Construction should be timed to minimize risk and impacts.</p>	Leveed area
6	<p>No. 10--Highway 9 bridge bank stabilization</p> <p>Stabilize about 2,000 feet of eroded left bank of Skagit River downstream from Highway 9 bridge at Sedro Woolley. Riprap will be used to stabilize the bank. Construction will be timed to minimize impacts and construction hazard and will be designed to minimize diversion of velocities to other erosion-prone areas.</p>	Upper Skagit Valley

Table 8-3. Recommended Priority of Skagit County
Flood Control Projects, continued

Priority	Project	Area
7	No. 9--Hansen Creek holding pond Construct a holding and settling pond on Hansen Creek to control gravel and silt deposition. Coordination through Hansen Creek subflood control zone for maintenance and upkeep of the facility. Also, remove existing gravel and silt deposits that are flood hazards during a time when it will not affect fishery resources.	Feeder streams
8	No. 1--Friday Creek bank stabilization Stabilize a high, unstable eroded bank on the 90° turn on Friday Creek to prevent landslide and possible damming of the stream. Time construction so as to minimize impact to fisheries.	Feeder streams
9	No. 15--Grady Creek debris removal Remove buildup of gravel and silt and other debris at railroad bridge crossing Grady Creek just north of Highway 20. Assess area to determine whether the restriction can be lessened. Remove gravel at a time when water quality would impact fish resources and in enough time before fish runs to allow some stabilization of the area.	Feeder streams
	<u>Other Priority Areas</u>	
10	No. 14--Specific education program for Hamilton	Upper Skagit Valley
11	No. 11--Burlington point bar accumulation removal	Upper Skagit Valley
12	No. 3--Remove point bar accumulations near Lyman	Upper Skagit Valley
13	No. 13--Specific education program for Cockreham Island	Upper Skagit Valley
14	No. 4--Remove point bar accumulation near Van Horn	Upper Skagit Valley
15	No. 2--Remove point bar accumulation near Gilligans Creek	Upper Skagit Valley

Costs

Determination of financial impacts and funding alternatives is beyond the scope of this plan. However, some general costs for flood control maintenance actions have been compiled from recent projects. Specific project costs depend on the nature, size, and extent of the project and other variables, but Table 8-4 gives a general guideline as to the cost comparison between different actions. These costs include labor and equipment associated with the construction and do not include engineering, planning, or administration fees.

Table 8-4. Costs of Flood Control Maintenance Actions in Skagit County

Project	Cost, dollars
Gravel deposit cleanup, per lineal foot	10-25
Rock riprap repair, per lineal foot	10-50
Levee repair (riprap and lining), per lineal foot	70-100
Levee widening, per lineal foot	15-60
Pump station upgrade, per pump	20,000-60,000
Storm drain replacement, per lineal foot	25-100

Implementation Schedule

An implementation schedule for the prioritized projects is vital for timely flood control actions and effective use of public dollars. Successful implementation of this plan will depend on interagency coordination of planning, design, review, and final construction of the projects. The following implementation schedule outlines the steps necessary to be considered for FCAAP funding of projects. The FCAAP application process currently occurs on a two-year basis.

<u>Milestone</u>	<u>Time</u>
Release draft comprehensive flood control management plan	July 1988
Obtain comments and release final report	January 1989
WDOE approval of comprehensive plan	April 1989
Begin planning of priority projects	September 1988
Submit prioritized applications to WDOE	December 30, 1988
WDOE review of applications	April 1989
WDOE Public hearings	May 1989
Earliest date WDOE signs grant agreements	July 1989