

## CHAPTER 6

### POTENTIAL IMPACTS OF FLOOD CONTROL MANAGEMENT OPTIONS

Flood control management is necessary to protect the lives, property and economy of Skagit County. Yet flood control work has potential impacts on the environment. Natural resources and in-stream uses are important to preserve, but can become endangered through flood control work if mitigation measures are not taken. This chapter discusses the possible impacts on the natural resources and in-stream usage of the flood control options presented in Chapter 5.

Table 6-1 lists the impacts on fish, wildlife, navigation, water quality, hydrology, existing recreation, and scenic, aesthetic and historic resources. The existing conditions are presented first, followed by a no action alternative. Although 'no action' is not an acceptable option, it is presented as a bench mark for comparison with other alternatives and its consideration is required by the State Environmental Policy Act (SEPA). Other options presented are those discussed in Chapter 5 which are considered viable for the county today.

The alternatives discussed are not necessarily mutually exclusive. Some alternatives or aspects of alternatives could be combined. The purpose of describing these alternatives is to outline a menu of available courses of action.

Alternative	Fish resources	Wildlife resources	Scenic, aesthetic, and historic resources	Navigation	Water quality	Hydrology	Existing recreation
Existing conditions	Several anadromous fish species in both rivers; migration extends through 100-year flood plain boundary.	County has abundance of wildlife resources; within 100-year flood plain; deer, migrating water fowls and fur animals are most prevalent.	Indian shell mounds in delta areas and dry inland slough courses; early settlement historic features in LaConner; several outstanding natural areas.	Navigation in Skagit limited to shallow draft barges, small boats and logs; only South Fork Channel is navigable.	Water quality is excellent.	Damage begins at flood stage of 65,400 cfs at Mt. Vernon; serious flooding occurs at 110,000 cfs and greater. At 82,000 cfs Hamilton begins to flood.	Several boat landing facilities along rivers; parks, public fishing and hunting; recreation areas.
No action alternative	Existing trends continue; major floods carry extensive silt, gravels and velocities which cover or destroy spawning beds.	Existing trends continue; some wildlife destroyed during major floods.	Unmitigated damage unaesthetic. Takes years to recover. Threat of damage to historic structures.	Excessive siltation possible; channel changes inhibit navigation.	Degraded during floods.	Frequency of annual flooding could increase due to development.	No recreation at flood stage; existing trends continue.
<u>Structural Alternatives</u>							
Maintaining existing flood control works	Protects resources through maintaining established flood control works--possible impact during repairs.	No change from existing conditions.	Maintaining works preserves aesthetics of area.	Maintaining ensures existing conditions continue.	Temporary degradation during repairs and maintenance--existing trends continue.	Possible alteration during repairs.	Continued protection of existing recreational areas; possible disruption during repair period.
Enhancing existing flood control works	Continues existing protection of resource--possible impact during construction.	Little change from existing conditions.	Enhancement could include improving aesthetics of existing works.	No change from existing conditions.	Temporary degradation during construction--existing trends continue.	Depends on project; purpose is to improve flood conveying capacity.	Existing conditions continue.
Levees and dikes	Potential habitat reductions due to vegetation clearing, increased development of flood plain resulting in secondary impacts; temporary effect during construction; increased velocity and erosion causing harmful sedimentation.	Potential impact to bald eagles due to impact on fisheries; disruption of wetlands and salt water marshes.	Some historic and archaeology sites may be affected; will protect other historic sites. Aesthetics will change.	No impact.	Temporary degradation during construction; impacts reduced during flood.	Existing hydrology altered. Water on other side trapped and needs to be pumped or channeled in side ditch. Flood damage frequency reduced. Channel capacity reduction could increase velocities and erosion potential.	River access could be affected--possible increase of opportunities on flood-prone lands.
Coastal Control:							
Tide or flood gates	Negative impact on high tides--inhibits fish migration.	Only as it impacts fisheries.	Aesthetics change.	Navigation not possible due to stream obstruction.	Temporary degradation during construction--limits saltwater intrusion.	Flow of water changed during high tide periods.	Impacts only as affects navigation.
Bulkheads, flood-walls and dikes	Impacts on marine habitats during construction.	Disruption of salt water marshes.	Protects historic sites. Aesthetics change.	Enhances the passage through the Swinomish Channel.	No impact.	Wave actions dampened; limits saltwater flows.	Protects, enhances navigational channels, possible hindrance to boat launching facilities.
Flood Storage:							
Holding ponds	Enhanced due to control on siltation and aggradation; possible migration problems if made impassable.	No impact.	Improved aesthetics after flood due to reduction of overbank flows.	Not applicable.	Improves water quality by reducing silt and aggradation load.	Peak flows reduced; duration of flows increased.	No impact.
Detention structures	Enhanced due to control on siltation and aggradation; possible migration problems if made impassable.	No impact.	Aesthetics change.	No navigation due to obstruction.	Improves water quality by reducing silt and aggradation load.	Peak flows reduced; duration of flows increased.	No impact.
Floodway acquisition storage	Existing conditions continue.	Existing conditions continue; no impact to wetlands.	Aesthetics improved; more natural setting.	No impact.	Existing conditions continue.	Existing conditions continue; peak flows remain reduced.	Existing conditions continue; possible location for future recreation site.

Table 6-1 Impacts of Alternative Flood Control Options

Alternative	Fish resources	Wildlife resources	Scenic, aesthetic, and historic resources	Navigation	Water quality	Hydrology	Existing recreation
<b>Structural Alternatives, continued</b>							
Channel maintenance and modification:							
Bank stabilization: Rip rap Vegetal cover Gabions Revetments	Habitat reduction if vegetative clearing; rip rap better than gabions.	No impact.	Potential effect on aesthetics. If erosion is prevented, aesthetics improved.	No impact.	Reduces sedimentation and improves water quality.	Bank hardening may divert velocities to downstream	No impact.
Debris removal	Habitat reduction due to shade removal and food source; could improve migration.	Could affect home environment of beavers.	Improved aesthetics.	Navigation improved.	Temporary degradation during removal.	Removal enhances flow of water--removes restrictions that cause increased backwater.	Enhances access to water areas.
Removal of restrictions	Depends on restriction; could improve migration.	No impact.	Depends on restriction; could improve aesthetics.	Navigation could be improved.	Temporary degradation during removal.	Enhanced passage of flow; backwater reduced.	Depends on type of restriction--no impact probable.
Flow diversion	Resident fishery could be installed in channel.	Could affect migratory waterfowl.	Some resources could be affected; depends on size of project.	No impact if control structure does not obstruct river.	No impact.	Increased storage and conveyance will reduce peak flows.	Depends on location--increased opportunities along diversion.
Enlargement or dredging	Channel capacity increase would enhance habitat reduced due to channel modifications; temporary effect when dredging.	No impact.	Little or no impact.	Navigation enhanced.	Temporary degradation during removal.	Increased capacity reduces velocities and erosion potential.	No impact.
Control of contributing area:							
Increase infiltration	Reduced peak flows and velocities protects environment.	Benefit in increased vegetative cover & groundwater recharge for wetlands.	Improved aesthetics.	No impact.	Reduces sedimentation and improves water quality.	Peak flows and volumes reduced.	No impact.
Conveyance	Improved fish migration through culverts and ditches.	No impact.	Could improve aesthetics.	No impact.	Conveyance of water normally stored could degrade water quality.	Quantity of flow in river increased; flow patterns altered slightly.	No impact.
<b>Non-Structural Alternatives</b>							
Updated and improved flood plain management	Existing conditions continue or enhanced.	Existing conditions continue or enhanced.	Existing conditions continue or enhanced.	Possible improvement.	Possible improvement.	Coordinated effort should improve hydraulic and control contributing flows.	Existing conditions continue or improve.
Formation of new diking and drainage districts	Potential for improvement.	Potential for improvement.	Potential for improvement.	Possible improvements.	Possible improvement.	Probable improvement due to increased control.	Possible improvement.
Localized public information program	Potential for improvement.	No impact.	Possible improvement.	No impact.	Possible improvement.	No impact.	No impact.
Permanent evacuation	No impact.	Wildlife may reoccupy area.	Possible improvement.	No impact.	Existing conditions continue.	Removal of building reduces obstructions and backwater.	Possible location for recreation site.