

CHAPTER 8 SHORELINE ANALYSIS SUMMARY

This chapter summarizes key issues and recommendations for the SMP update, and provides a summary of how the recommendations would help to address some of the impaired ecosystem conditions in Island County.

8.1 Key Issues

The following list of key issues provides a summary of the major concerns for the SMP update. Additional issues may be identified in future versions of this report, and some issues listed below may be eliminated if new information suggests that the issues are not critical for the SMP update.

- Bluff erosion and sediment transport:
 - Slope / bluff stability for existing and proposed land uses at the top or toes of slopes, (considering land uses and modifications such as clearing, creation of impervious surfaces, modified surface/groundwater dynamics)
 - Disconnection of feeder bluff areas from beaches due to toe armoring and/or development fronting bluff areas leading to greater down-drift erosion rates
 - Potential increases in coastal flooding and rates of bluff erosion due to sea level rise
- Habitat loss or modification
 - Long term habitat implications of disconnection of coastal lagoons from tidal influence and use by marine species (due to past development, including residential, transportation, utility, etc.)
 - Effects of reduction in natural feeder bluff erosion on nearshore processes and ecology due to past development and shoreline modification (impacts on eel grass beds, mud flats)
 - Habitat impacts from agricultural activities such as riparian clearing contributing to increased sedimentation and higher water temperature; decreased wood recruitment, insect and leaf litter input; increased invasive/noxious weed growth, and water diversion decreasing summer flows.
 - Potential implications of sea level rise on coastal lagoons, beaches, associated wetlands – loss of habitat
 - Habitat impacts from aquaculture, moorage, and other in-water uses
 - Habitat impacts from increased public access to sensitive sites
 - Potential issues related to marine renewable energy facilities
- Shoreline use issues:
 - Continued pattern of predominantly residential use and further development of the shoreline with new homes
 - Potential implications of sea level rise and/or coastal flooding on development within or near coastal floodplain areas
 - Water quality requirements of commercial and recreational shellfish harvest versus shoreline and upland development that can potentially harm water quality
 - Private shoreline uses that preclude access to public shorelines, and impacts of increased public access on adjacent private property
 - Drinking water supply (aquifer) issues associated with existing and additional development and intensified use (potential water quality impacts and increased demand)
 - Aesthetic concerns about moorage and aquaculture from both public viewpoints and private properties

- Water quality issues associated with additional development (subdivision / intensified use) - septic systems, road runoff, agricultural runoff, and other non-point pollution sources
- Saltwater intrusion into sole-source aquifers, and potential exacerbation from sea level rise

8.2 Shoreline Use and Modification Recommendations

The primary function of the SMP is to regulate uses of the shoreline. This set of recommendations is provided as a springboard for discussion in the development of new policies and regulations on key issues. There are likely to be more issues that will arise as part of the SMP update that are also important, so this list is not intended to limit the focus of the SMP update, but rather to summarize recommendations on the key findings in the inventory.

8.2.1 Residential Use and Development

Residential use is expected to continue to be the predominant use of the shorelines of Island County. On the most intensively developed shoreline areas, older dwellings, many of which were built as seasonal cabins, can be expected to be remodeled or replaced with larger structures and/or used for more of the year. Regulations for these communities already vary in terms of density, and each has a character that is unique in some way. Public comments on the vision for the shoreline emphasized the need to recognize and support the desired character in each community. Creating customized rules for more intensively developed communities, while trying to prevent any net loss in ecological functions, will require looking closely at reach and parcel level information, and finding a balance between flexibility and predictability.

Residential density should be limited in areas of the shoreline that are susceptible to ecological damage from development. In some cases, this may mean reducing density allowed under the current zoning. Conversely, areas that are already developed at higher densities should be regulated in a similar manner, whether or not they are designated as RAIDs, and the County should consider incentives that would encourage ecological enhancement and restoration in such areas.

Docks and piers, while common in residential shorelines in many parts of the state, are not as common in Island County, probably due to the amount of high bank shorelines, which are not conducive to dock development for a variety of reasons, and the high wave action in some areas. There are a few concentrated areas of docks and piers that comprise a large portion of the total number of residential piers, and in these areas, the cumulative effects of structures in close proximity should be considered in developing regulations.

One of the most important issues for existing residential areas in the future relates to how and when to protect these areas from erosion. This issue is discussed in section 8.2.2.

8.2.2 Stabilization

Continued residential use will require shoreline armoring (in some areas) to protect existing development, and will like result in the addition and maintenance of docks and moorage, continued inputs of pollutants from septic systems and roads, and modification and management of shoreline vegetation. Approximately 16 percent of the shoreline has been armored, according to available inventory information. Additional modifications include dredged channels, diking,

weirs, boat piers, and docks. The SMP guidelines (WAC 173-26) provide specific guidance on when shoreline stabilization should be allowed, requiring that the residential structure itself must be under a fairly immediate threat, and that the “softest” approach that is feasible to protect the structure must be used. There may also be value in establishing policies as to where stabilizing the shoreline without losing ecological functions is considered infeasible or impossible, such as along exceptional feeder bluffs, coastal lagoons, or pocket estuaries. In such areas, the consequences for existing development could mean moving or removing structures instead of stabilizing slopes.

It will also be important to consider sea level rise in permit decisions on any shoreline modifications, since present conditions in many locations are expected to change, some becoming more unstable, some possibly accreting more sediment or becoming more inundated, and some expected to see shifts in habitat types. While precise predictions of local effects from sea level rise are not available, estimates continue to be refined and should allow for reasonable consideration of this issue on a project-by-project basis. It would be desirable to establish criteria that should be employed in evaluating projects relative to sea level rise impacts, because this will facilitate assessment of risk to both new and existing development.

8.2.3 Dredging

Maintenance dredging will continue to be needed in the few residential developments in the county that were developed around dredged channels. Rules for dredging and disposal of spoils should consider potential habitat loss, water quality effects, the value of the spoils for beach nourishment, and effects on shoreline erosion rates.

8.2.4 Vegetation Management

Maintenance and renovation of existing landscaping can affect whether some ecological functions can be sustained over the long-term. Many rural types of land uses such as commercial and “hobby” farms must be encouraged to follow best management practices. Standards for landscape maintenance, including commercial and non-commercial farms, need to address what types of vegetation can be removed, replacement requirements, and must take into consideration slope stability, fire, and windthrow, and aesthetic concerns in addition to habitat considerations.

8.2.5 Shellfish Harvest

Shellfish are harvested in Island County as a food source, for recreational purposes, and for commercial purposes. Shellfish harvest is therefore an important aspect of the local economy. Water quality issues related to land use constrain where shellfish can be safely harvested. Regulations should protect water quality in important shellfish areas from additional impacts. Regulations should also provide incentives to reverse impacts from past development practices, such as by encouraging improvement of wastewater treatment systems in the shoreline where they would help to reverse degraded water quality.

8.2.6 Boating Facilities

Other than docks associated with single-family development, there is very limited recreational moorage in Island County. Langley and Oak Harbor have moorage facilities and have studied expansion. Because these areas have on-shore services and wastewater treatment available, they are best suited to accommodate future demand for moorage. New or expanded moorage

facilities in the unincorporated areas of the County should be undertaken only once those areas have been built out.

Boatyard facilities exist in Langley, Oak Harbor, and Freeland. While Langley and Oak Harbor are in urban areas and therefore are more appropriate for further intensification of water-dependent uses, provisions for expansion of the boatyard at Freeland should also be included in the SMP.

8.3 Park and Public Access Recommendations

The economy of the County relies on tourism, most of which is connected to recreational use of the shorelines. Public access to the shorelines is therefore an important asset for the local economy as well as for residents. Acquiring, improving, and/or maintaining public access areas all cost money. The SMP update is an opportunity to set policies prioritizing areas of the county where public access should be improved, and what sort of improvements should be the focus of limited resources.

Although public access is available in many parts of the shoreline, there are areas of the shoreline with little or no access, due to private ownership, topography and historic development patterns. The analysis of the vacant parcels and/or subdividable on the islands shows that there are a few areas where future subdivisions could present opportunities to increase public access opportunities. There are also a number of areas where public properties or easements abut the shoreline but there are no improvements allowing or facilitating access. There are conflicts about private use of public land, and public use of private land, including dedicated, privately-owned, community access areas where only residents who share ownership are allowed. The shift in the general population of the state and of the county toward an older demographic group could also produce new demands for accessibility in already developed shoreline access points.

The SMP should clarify through maps showing the range of public access available, and establish policies and priorities for acquisition, development, and maintenance of public access.

8.4 Restoration Opportunities

Substantial work has already occurred to identify opportunities for restoration and protection of marine nearshore areas in Island County. As part of the WRIA 6 salmon recovery planning process, Coastal Geologic Services has prepared matrices listing restoration and conservation opportunities at specific locations on Whidbey and Camano Islands (CGS, 2005). The general types of restoration activities recommended include:

- Removing derelict structures from the intertidal zone
- Removal of derelict fishing nets and “ghost” crab pots from the subtidal environment
- Restoring tidal connectivity to lagoons and marshes
- Controlling *Spartina*
- Enhancing riparian cover and bluff vegetation
- Complete projects identified in WRIA 6 Multi-Species Salmon Recovery Plan
- Removing riprap from the shoreline
- Educating landowners regarding best practices for protecting and improving shorelines

- Formally protecting ecologically important areas

In addition to Island County efforts, the Whidbey Camano Land Trust has been acquiring land and conservation easements to preserve priority lands both in and outside of the shoreline planning area. Policies that set priorities for preservation and restoration will help to ensure the most effective use of public and private funds. Regulations should be developed that support preservation priorities and encourage restoration.

The Island County shoreline planning area includes four freshwater lakes (Deer, Goss, Lone, and Kristoferson) that are not associated with marine environments and two (Dugualla and Cranberry, both on north Whidbey Island) that were created by placing weirs at the mouths of marine lagoons and tidelands. Restoration opportunities for the non-marine associated lakes include management of invasive species and potential for restoring portions of the riparian vegetation that has been removed. No specific barriers to migrating fish have been identified, but there may be opportunities to restore fish passage to and from these lakes.

Of the two marine associated lakes, Dugualla Lake is already being studied for reconnection to tidal influence. Cranberry Lake is an important freshwater amenity in the state park. In the long term, sea level rise will likely inundate more of the barrier beach between this lake and Puget Sound, and could accelerate erosion. When that occurs, it may force consideration of restoring this former lagoon to a coastal lagoon, or constructing additional modifications to maintain it as a freshwater lake.

8.5 Summary of Recommendations

The ecosystem functions associated with Island County’s shorelines are at least partly influenced by conditions that are outside the control of the County. However, shoreline uses in the county affect the cumulative conditions of Puget Sound and are therefore part of comprehensive solutions to these watershed issues. Table 8-1 summarizes the impairments to ecosystem processes described in this inventory, and indicates whether they are primarily at the large (basin) scale, or are primarily local, as at the scale of a specific shoreline reach, or occur at both scales.

The information presented in this report support the development of management recommendations to address the key impairments to ecosystem-wide processes identified in Section 8.2. Table 8-1 provides initial recommendations on how these impaired processes can be addressed.

Table 8-1. Summary of Ecosystem Process Impairments and Management Recommendations

Ecosystem Process	Causes of Impairment to Ecosystem Process	Scale of Alterations (Basin or Reach)	Management Recommendations
Marine Nearshore			
Sediment Generation and Transport	Shoreline stabilization	Approximately 16% of the shoreline has been	Prohibit development that would require future

Ecosystem Process	Causes of Impairment to Ecosystem Process	Scale of Alterations (Basin or Reach)	Management Recommendations
		armored, scattered throughout most reaches of the marine shoreline.	armoring except for limited instances to support water dependent uses; ensure that new armoring is only allowed when necessary to protect existing development. Require proof of need for stabilization. Provide a spectrum of options and promote use of the least impacting approach.

Ecosystem Process	Causes of Impairment to Ecosystem Process	Scale of Alterations (Basin or Reach)	Management Recommendations
Hydrology	Diking of coastal lagoons and marshes for agriculture and freshwater lakes	Affects specific reaches, only, but over 4,000 acres of marshlands and lagoons have been converted to upland uses and lakes countywide.	Where feasible, restore tidal influence to marshes and lagoons by removing dikes, tide gates, and weirs.
Water Quality	Septic failure, agricultural runoff, sewage and stormwater outfalls	Although often caused by basin-wide changes such as loss of forest cover, effects on marine shorelines are localized, especially in coves and bays that have limited flushing action from tides and currents.	Improve enforcement of existing health regulations for septic systems; optimize low-impact development methods; improve sewage and stormwater systems outfalls; ensure future development has sufficient capacity for septic treatment on site; and carry out farm conservation planning on agricultural lands to identify specific threats to water quality and select the NRCS best management practices to address these threats, and implement these best management practices.
Biological Resources	Numerous species of fish, mammals, birds, and plants are listed as threatened or endangered due to habitat loss or conversion (particularly loss of forest cover and loss of small estuary/saltmarsh habitat), water pollution, and excessive harvest (especially of salmonids).	Alterations are basin-wide, but degree of habitat conversion and loss varies widely among marine reaches.	Include provisions to ensure no net loss of habitat with new development, including mitigation sequencing; continue building inventory documentation including encouraging volunteer programs; protect remaining intact habitat areas; provide incentives for habitat restoration and enhancement; participate in regional efforts to manage for species recovery.
Freshwater Lakes			
Hydrology	Damming of brackish lakes has converted	Damming affects specific lakes; forest	Consider reconversion of dammed lakes to

Ecosystem Process	Causes of Impairment to Ecosystem Process	Scale of Alterations (Basin or Reach)	Management Recommendations
	some lakes fresh water; Extensive loss of forest cover has altered hydrology of most basins.	cover loss is widespread and affects most lakes.	tidally influenced waters where feasible; protect wetlands and remaining riparian forest surrounding lakes, streams and wetlands.
Water Quality	Limited data available, but septic failure, agricultural runoff, sewage and stormwater outfalls all contribute to degraded water quality.	Most waterbodies have some impairment, but none are listed on 303(d) list.	Improve enforcement of existing health regulations for septic systems; improve sewage and stormwater systems outfalls; ensure future development has sufficient capacity for septic treatment on site; optimize low-impact development methods; and carry out farm conservation planning on agricultural lands to identify specific threats to water quality and select the NRCS best management practices to address these threats, and implement these best management practices.
Biological Resources	Clearing of riparian and wetland vegetation for agriculture and development; excessive nutrient input and invasive plants causing eutrophic conditions in some lakes; stream culverts and weirs present fish barriers.	Alterations are basin-wide, but degree of habitat conversion and loss varies widely among lake reaches.	Protect remaining intact riparian forest; include provisions to ensure no net loss of habitat with new development, including mitigation sequencing; provide incentives for habitat restoration and enhancement; continue building inventory documentation including encouraging volunteer programs.