

August 1, 2011

Steve Gray – Planning Manager  
Clallam County Department of Community Development  
223 East 4th Street, Suite 5  
Port Angeles, WA 98362

Sent by email to: [sgray@co.clallam.wa.us](mailto:sgray@co.clallam.wa.us)

Re: Comments on Clallam County Shoreline Master Program Inventory

Dear Mr. Gray:

Our organizations appreciate the opportunity to comment on the draft inventory and characterization for the Clallam County Shoreline Master Program (SMP). SMP updates throughout Washington State are critical for future environmental health of our watersheds and major water bodies, and they need to be based on detailed and accurate information. *Futurewise* is a statewide citizens group that promotes healthy communities and cities while protecting working farms, working forests, and shorelines for this and future generations. *People For Puget Sound* is a nonprofit, citizens' organization whose mission is to protect and restore Puget Sound and the Northwest Straits. *The Sierra Club* is the oldest and largest grassroots environmental organization in the United States. Our Washington chapter works to help protect our priceless natural heritage and preserving quality of life for our families, for our future. *The Olympic Environmental Council* is a nonprofit organization that works to protect resources on the North Olympic Peninsula.

We have attached three documents to this letter for your consideration. These are guidance documents that were prepared by Futurewise to aid in updating SMPs. We hope that these documents can help the county in developing policies and regulations (including environments) for the different subjects of the SMP. It is important that the policies and regulations of the SMP be based on the Shoreline Management Act (SMA) and SMP Guidelines. We hope that these guidance documents will help the county work through the important issues that need to be addressed in the policy and regulation proposals the County will be developing.

## Introduction

Overall we are quite impressed with the detail found in the inventories. The WRIA 17-19 inventory is especially data rich in the information most relevant to shoreline planning, such as modification mapping and aquatic species information. WRIA 20 includes a good assessment map of intact vegetation areas on the habitat map. While we do have recommendations on some missing data elements, our comments are most heavily focused on the need for additional characterization and assessment of the ecological functions that use the inventory items. Doing so is critical in identifying

areas that need to be designated with protective environments, including highly functioning aquatic areas. This is of particular interest to our organizations and the SMP Guidelines.

Regarding data gaps that may exist for habitat functions, we encourage you to avoid the pitfall some jurisdictions have fallen into - that if species-specific data do not exist, the jurisdiction can ignore that function. Functions cannot be ignored because specific data do not exist. At a minimum, the scientific information on general systems for the area can be applied to make at least a rudimentary characterization of functions.

### **Inventory is inappropriately limited in scope**

Both the shoreline jurisdiction maps and inventory documents inappropriately exclude large areas of Clallam County shorelines. These are mainly focused on the Olympic National Park and tribal reservation lands. These areas need to be included because SMP regulations do apply on federal lands (especially areas such as around Crescent Lake), and sometimes apply within reservation boundaries (such as non-tribal inholdings).

Regarding the national park, the Coastal Zone Management (CZM) Act requires federal agencies to comply with state derived CZM plans. Washington State chose to utilize the Shoreline Management Act to comply with the CZM, and thus, the Washington CZM plan incorporates the local SMPs around the state. Therefore federal lands and their agencies have to follow local SMPs to a greater or lesser extent. The County appears to understand this, in part, since the Forest Service lands are included in the inventory and jurisdiction mapping - but not national park lands. The jurisdiction maps and inventory need to extend to all federal lands. Since much of this area is wilderness, general descriptions are adequate along with Natural shoreline environment designations. Unfortunately, there are also heavily used visitor areas, and it is these degraded areas that are most often subject to the SMP. We have consulted Ecology staff on this matter and have learned of no reason why the national park should be excluded from the County's shoreline planning effort. This large segment of shoreline should not be omitted by the County.

Regarding tribal reservation lands, there are sometimes inholdings by non-tribal members that are subject to the SMP; and sometimes land sales or exchanges occur that change where those lands are located within the reservation boundary. The county should work with tribal representatives to deal with those situations - likely by identifying shoreline jurisdiction and appropriate environments - and the inventory should include at least a summary of shoreline conditions. An explanation should be included in the inventory to explain the situation.

### **Inventories do not adequately include habitat areas**

*Marine habitat missing in WRIA 20* - A consequence of the issue of excluding the national park is that the WRIA 20 Inventory excludes the nearly 40 miles of marine shoreline from both the jurisdiction map and the inventory. Many freshwater shorelines are excluded as well. For the wilderness or largely pristine areas, at least a general description is needed, along with a Natural environment. Some attention is also needed for the developed areas that are most typically subject to the SMP.

*WRIA 20 needs overview sections* - The WRIA 20 inventory does a good job of describing the physical characteristics and alterations in the watershed, but when it comes to describing overall ecological functions of the watershed, and especially the fish and wildlife functions, it falls short. The WRIA 17-19 inventory includes sections that give an overview of the ecological functions for both marine areas and freshwater areas. We recommend that similar sections be incorporated into the WRIA 20 inventory. These overviews need to cover the physical processes for both in-water functions (such as water flow

and sediment transport functions) and riparian functions that support aquatic habitat. But they also need to include both aquatic habitat and upland habitat.

*WRIA 17-19 overview sections need to cover all functions* - The WRIA 17-19 inventory provides a good overview of most physical functions; however, the overview for aquatic habitat is limited, and the overview for riparian vegetation and upland habitat is almost non-existent.

*Functions described in the overview sections need to be assessed in the reach assessments* - The reason the overviews are important is because they generate full consideration of these functions throughout the rest of the inventory – specifically in describing the different functions for each reach segment. Furthermore, these documents will be informational and educational resources for the public and decision-makers. If the inventory does not acknowledge large blocks of ecological functions, they may not be considered in the SMP development or permit review, and thus not compensated for when they are lost. The inventories do describe many functions for individual reaches, but other functions are not addressed. We recommend that each reach or system be assessed for all of the different categories of ecological functions. In other jurisdictions we have seen this assessment compiled in table format to reduce space and ease the effort of making comparisons. It seems to be used incompletely for WRIA 20, and for WRIA 17-19 in the data sheets. Our comments on reach assessments are further described in the next discussion item.

*Reach assessments need to be made more complete* - In many instances, the documents only provide inventory findings and do not provide any substantive characterization of the health of the different shoreline segments. Descriptions of the WRIA 17-19 reaches (in both the text and data sheets) sometimes read more like a list of current conditions, and don't include an assessment of the reach condition or the quality of ecological functions. The data sheets provide a partial assessment in the degradation assessment paragraphs that could be expanded to a more complete assessment, and the text document sometimes includes a vague assessment statement in the Management Issues sections (and sometimes others). In the instances that a reach characterization is provided in WRIA 20 inventory, they are limited to single word descriptions (good, poor, etc.) for individual functions; and in the Elements Report, they only partially assess ecological functions in the course of making environment recommendations. We recommend that, for both inventory reach assessment sections, a sentence should be included that gives an assessment of the condition of each category of ecological functions, and that 2 or 3 sentences are used to provide an overall assessment for the reach.

*Aquatic habitat discussion is limited* - We have observed that the bulk of both inventory documents are focused on aquatic habitat. WRIA 20 is almost exclusively focused on salmonids, and WRIA 17-19 is heavily focused on salmonids and forage fish. Although salmonids are important, the full ecosystem is important to the health of Puget Sound, and salmonids are not indicators for all functions. Other aquatic species are not discussed in the documents, or only discussed incidentally, mainly as inventory items rather than assessment. The SMA requires protection of all ecological functions, not just those for target species. At a minimum, a general discussion and assessment needs to be included for crustaceans, invertebrates, and other aquatic species that is linked to the functions present.

*Upland habitat is almost completely omitted* - While aquatic habitat is discussed, upland habitat and upland species are hardly included at all. This gap should be plugged for both inventories. In addition, the importance of native riparian vegetation needs to be emphasized, and is discussed more in a separate section below. Riparian vegetation is critical in providing habitat for insects, amphibians, birds, small mammals, and even larger mammals (when large blocks of vegetation are present). As

described above, an ecological function that is not addressed in the inventory may be excluded from consideration in the SMP and permit review, and consequently allowed to be lost without compensatory mitigation.

A general overview of upland habitat is needed, as we recommended above, that is based on general wildlife association with the upland riparian conditions found in the County. In the uncommon instances when upland habitat is discussed in the reach descriptions, it is focused on very specific species (such as bald eagle nest locations) and no assessment of the habitat function is made. Whether or not detailed species data are available for each reach, a general discussion and assessment needs to be included for different groups of species that is linked to the functions present in the reach and the vegetation character that supports these species. For example: whether upland areas are intact, or they are developed but the riparian areas are intact, or the adjacent riparian areas are degraded, each situation will have different functions that can be summarized on a general level.

### **Mapped information on altered vegetation is needed**

While the buffer system for the updated SMP has not been developed yet, it might take developed locations into consideration and provide special exceptions for them. Such a system cannot adequately protect the remaining vegetative functions of these areas if the vegetation character of these areas is not assessed. Consequently, the inventory needs to assess and map the different kinds of vegetation alterations that exist in the County. Common examples that we see that need to be addressed by the buffer system are:

- areas of intense shoreline development
- areas that are largely or completely ecologically intact
- areas that are intact other than a linear facility such as a road or railroad
- areas with a strip of intensely developed land along the water, but are intact behind the strip
- areas with low density development scattered amongst intact riparian vegetation
- degraded areas with little vegetation but also little development along the water

We have seen a habitat map for WRIA 20 that seems to do a good job of characterizing intact vegetation areas – specifically closed canopy and other natural categories. These will be very important for establishing the protective environments that will limit uses to avoid loss of these vegetative areas. But the maps only identify altered areas as a whole, they don't distinguish the vegetation character well enough to identify the different ways development has altered the vegetation.

This issue is most important if the buffer system is tied to the shoreline environments. This is a common practice, but it necessitates two important consequences (which are also descri:

- If the buffers vary by environment, developed areas and intact areas cannot be designated with the same environment because the intact areas will not be adequately protected.
- Different intensities of development need to be assigned different environments, so that the associated buffer provisions for each environment can protect the vegetation characteristic found in them. Areas with remaining vegetation cannot be treated with the same buffer provisions as intensely developed areas with little vegetation.

Buffer systems that are not tied to environments, but rather tied to different reaches don't suffer from the environments issue and can be more flexible. But such systems still need to reflect where the

different vegetation conditions exist. Any exceptions to applying a science-based buffer need to be tied to segments with common characteristics so that a particular exception is appropriately applied.

We recommend that some detail be added to the vegetation mapping to characterize altered areas into categories with common characteristics so that the areas within those categories can be treated appropriately without losing ecological functions. Accomplishing this task should be fairly easy. We have found that this work can be done fairly easily by your GIS mapping staff person panning the air photos along the different shorelines with the local staff person that has first-hand knowledge of that area, and making notes on maps. The air photo and first-hand knowledge will provide a relatively high accuracy to the information. This is followed by converting the notes into additional categorization breaks on the vegetation map.

## **High functioning upland and aquatic areas need protective environments**

We see that the WRIA 20 Elements Report begins making recommendations on the application of shoreline environments. While we agree with some and not others, our primary concern is that the highly functioning areas in both upland and aquatic settings be designated with protective environments. These can include the SMP Guidelines recommended Natural and Conservancy environments, or custom environments that are similar to them. We encourage jurisdictions to also include aquatic versions of protective environments rather than treating all aquatic areas – the actual shorelines of the state – with the same environment and associated use limits and regulations. Such consideration of aquatic areas is required in the recent SMP Guideline changes made earlier this year. For example, we recommend that the county consider a Natural and Aquatic National designation for the parts of the Olympic Coast National Marine Sanctuary in Clallam County.

Of critical importance in making protective environments work well is that highly developed areas are not included within them; because jurisdictions almost always then allow an extensive range of intense uses that would adversely impact the intact areas, resulting in a net loss of shoreline functions. Better resolution of the environment segments helps alleviate this situation. Of course, even with accurately designated protective environments, the use limits must be established to actually protect the resources in the protective environments. It is particularly important in these locations to include the SMA and SMP Guideline preferences for water-dependency and use-intensity.

Lastly, we see that the inventory appears to use scientifically and ecologically grounded reasoning in determining the reach breaks throughout shoreline jurisdiction. We appreciate and support this approach. We also encourage the county to avoid a pitfall we have seen where shoreline environment boundaries are based on reaches. The scientifically and ecologically based reach breaks are not the same as environment segments. Environments are intended to be driven by the character of land use: Urban (dense city development), Shoreline Residential (subdivision and suburban development), Rural (some jurisdictions still use this for rural residential and agricultural areas), Rural Conservancy (intended for natural resources uses), and Natural (minimal development). Thus, environments do not correspond well with the reach segments. We encourage you to consider environment segments at a much finer level of detail than the reach segments. Indeed, the SMP Guidelines for Natural environments (WAC 173-26-211(5)(a)) require jurisdictions to identify and protect largely intact (and not just pristine areas) down to the parcel level – not just the reach segment level.

## **Conclusion**

We strongly support your effort to improve your SMP. This inventory effort is one of the better we have seen. While we do see some serious gaps that need to be plugged, this inventory will be a very useful foundation in which to build the SMP policies and regulations.

Since the policies and regulations are the next step in the update process, we have attached three additional documents for your consideration that discuss these components. These are guidance documents that were prepared by Futurewise aid in updating a local SMP:

- **Futurewise's Guidance on No-Net-Loss of Ecological Function, Cumulative Impact Analysis and Restoration Planning.** This document focuses on the SMA and SMP Guidelines requirements for a framework that accomplishes no-net-loss, including the need to build mitigation sequencing into the structure of the SMP. It also discusses the pitfalls in actually making it happen, including erroneous assumptions about accounting for impacts allowed by the SMP that have no logical basis in science or the practice of assessing development impacts. Of particular importance are the SMA preferences for controlling uses that cause degradation. Lastly it describes the jurisdiction's responsibility to compensate for impacts allowed by the SMP.
- **Futurewise's Guidance on Establishing Shoreline Environments.** This document focuses on the SMA and SMP Guidelines requirements for protecting the remaining areas of intact shorelines using protective environments (in both upland and in-water areas), and their importance in accomplishing mitigation sequencing. It also discusses the pitfalls in establishing environments, such as mixing developed and undeveloped areas within an environment, accurately establishing jurisdiction, and providing complete maps.
- **Futurewise's Guidance on Buffer Options Using Science.** This document describes the SMA and SMP Guidelines requirements, and the pitfalls in establishing a buffer system that is compatible with buffer science. It includes methods for dealing with the range of different buffer conditions from intact areas to heavily developed areas, and covers using small buffers for heavily developed locations. It explains why small buffers don't work to protect ecological functions unless they are accompanied by built-in mitigation in the form of enhancement requirements to offset the built-in impacts that come with small buffers. We understand that small buffers are not consistent with the buffers in the National Marine Fisheries Service - Northwest Region's *Endangered Species Act Section 7 Consultation Final Biological Opinion for Implementation of the National Flood Insurance Program in the State of Washington, Phase One Document - Puget Sound Region*.<sup>1</sup> You will need to carefully consider the potential consequences of using such small buffers.

These guidance documents lay out the reasons why these fundamental steps are important for implementing the policies and requirements of the SMA and SMP Guidelines, and point out the approaches that will accomplish the requirements. They are the foundation for the bulk of the regulatory standards that an SMP is composed of.

Thank you for the opportunity to comment on the inventory.

Sincerely,



Dean Patterson, Shoreline Planner  
Futurewise

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<sup>1</sup> Accessed on July 27, 2011 through: <http://www.nwr.noaa.gov/Salmon-Habitat/ESA-Consultations/FEMA-BO.cfm>



Heather Trim, Urban Bays & Toxics Program Manager  
People For Puget Sound



Tristin Brown, Conservation Chair  
Sierra Club - Washington State Chapter;

and Bob Lynette, Co-Chair  
Sierra Club - North Olympic Group

*Darlene Schanfald*

Darlene Schanfald  
Olympic Environmental Council



## Recommendations on *Shoreline Buffer Options That Work with Buffer Science*

May 2011

*Contact:* Dean Patterson - [dean@futurewise.org](mailto:dean@futurewise.org). Phone: 206-343-0681. Web: [www.futurewise.org](http://www.futurewise.org).

*Note:* this document may have an updated version, please check our website.

### **Introduction**

Futurewise staff has spent over two and a half years actively reviewing and participating in many Shoreline Master Programs. We have seen many different examples of how to do a Shoreline Master Program (SMP) and the documents needed to support it. While we have seen good examples, we have also seen many problems. More importantly we have seen patterns in how these problems come into being, and want to share them with those interested in developing good SMPs. We have boiled down and consolidated our observations into a series of guidance documents that discuss the requirements for developing Shoreline Master Programs (SMPs), the important consequences of those requirements, pitfalls we have observed that should be avoided, and our recommendations for implementing the many different requirements at the same time.

As one of the primary sources of ecological functions, buffers are needed to achieve the Shoreline Management Act's policy "protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life." Futurewise strongly recommends using the buffers required by the *Endangered Species Act Section 7 Consultation Final Biological Opinion for Implementation of the National Flood Insurance Program in the State of Washington, Phase One Document – Puget Sound Region*. These buffers are based on a careful analysis of the impacts of development on shorelines and the available science. Using these buffers will both comply with the Shorelines Management Act requirements for no-net-loss of shoreline functions and maintain eligibility for the Federal Flood Insurance Program. Furthermore, science-based buffers can be logically used for both developed and intact areas, as described in our recommendations at the end of this document.

In the course of reviewing Shoreline Master Programs (SMPs), Futurewise has seen many buffer systems that use small buffers in areas of existing development. While some are logically sound and work well, many of these systems seem to be based on assumptions that avoid accurately identifying impacts of development. For example, one assumption is that if a small buffer is established based on existing development patterns, then unlimited new development (including redevelopment, expansion, and more intensified uses) outside that small buffer will have no additional impacts to shoreline ecological functions, and thus no mitigation is necessary. These assumptions are also discussed in detail in our guidance document dealing with no-net-loss of ecological functions. This guidance document shows that there is no logical scientific basis for buffer systems that use such assumptions. While we also identify some ways to use small buffers in existing intensely developed areas, those systems may not achieve compliance with the requirements for the National Flood Insurance Program and will not protect fish and wildlife as well as the buffers in the biological opinion.

### ***Mitigation Sequencing Must Be Built Into the Structure of the SMP***

Before describing the buffer requirements, it is critical to understand the basic SMA policy and SMP Guidelines requirements, which are summarized below.

The Shoreline Management Act (SMA) voter approved policy statement in RCW 90.58.020 lists a primary policy objective of the act [with emphasis]: "This policy contemplates protecting against adverse effects to the public health, *the land and its vegetation and wildlife, and the waters of the state and their aquatic life*, while protecting generally public rights of navigation and corollary rights incidental thereto." Thus, while new development is allowed, it must protect natural functions and ecological features, and the public's interest in health and navigation. *Note that* not even water-dependent uses are listed as being equal to these items. Water

<sup>1</sup> RCW 98.58.020.



dependent uses are discussed in detail in our guidance document dealing with use limits and preferences. This policy is echoed by the policy paragraph that provides particular protection for Shorelines of Statewide Significance, which establishes a list of preferences for both the long term protection of the public interest, and protecting the natural character and functions of these shorelines.

In addition, the SMA policy provides that “[p]ermitted uses in the shorelines of the state shall be designed and conducted in a manner to *minimize*, insofar as practical, any resultant damage to the ecology and environment of the shoreline area and any interference with the public’s use of the water.”

These two principles are implemented in the SMP Guidelines<sup>2</sup> through requirements for no-net-loss of ecological function and mitigation sequencing. Regarding *no-net-loss of ecological functions*, the Guidelines require that: “Local master programs shall include policies and regulations designed to achieve no net loss of those ecological functions.”<sup>3</sup> Note that the requirement to “design” the SMP to accomplish no-net-loss is restated in four other locations as well, for uses, modifications, and cumulative impacts.<sup>4</sup> The no-net-loss requirement is accomplished using the concept of *mitigation sequencing*,<sup>5</sup> whereby the first task of mitigation is avoidance of impacts, the second task is minimization of impacts, and the third is compensation for remaining impacts. Stated another way, allowing development to impact the shoreline is supposed to be the last option, not the first option. WAC 173-26-221(5)(b) makes that clear, providing [with emphasis]: ‘Where uses or development that impact ecological functions are necessary to achieve other objectives of RCW 90.58.020, master program provisions shall, to the greatest extent feasible, protect existing ecological functions and avoid new impacts to habitat and ecological functions before implementing other measures designed to achieve no net loss of ecological functions.’

*Of critical importance in understanding* mitigation sequencing is that the word “mitigation” does not mean replacement of lost functions - that is “compensation” which is the last option. Many people confuse the terms, which then implies that performing mitigation means jumping straight to compensation and replacement before using avoidance and minimization. But compensatory mitigation for damage done is not the same as “prevention of damage to the natural environment,” which is an important distinction to qualify as a preferred use, as discussed in detail in our guidance document dealing with use limits and preferences.

“Designing” an SMP to accomplish the no-net-loss principle means “designing” the different components of the SMP using mitigation sequencing. The SMP Guidelines include requirements for several components that, if implemented correctly, accomplish mitigation sequencing at different levels within the SMP. These components include: designating environments, placing limits on uses and modifications, establishing buffers (or setbacks with vegetation management) based on science,<sup>6</sup> and developing regulations specific to different types of development. Each of these components is a subject of one of our Guidance Documents, each of which describes how to design mitigation sequencing into the element. Designing each component to avoid and minimize impacts, and then including specific standards for compensation of remaining impacts will result in an SMP that is structured to prevent the loss of ecological functions as much as possible.

There are two important points to keep in mind when preparing an SMP: (1) the rule of liberal construction, and (2) the requirement to rationally and carefully plan. When implementing and interpreting typical laws we use strict construction, but for shoreline law we use liberal construction (as required by RCW 90.58.900) “to give full

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<sup>2</sup> Despite being called ‘Guidelines,’ the SMA, in RCW 90.58.080(1), requires that shoreline master programs shall be consistent with the SMP Guidelines.

<sup>3</sup> WAC 173-26-186(8)(b) under Governing Principles of the Guidelines relating to ecological functions; and implemented in WAC 173-26-201(2)(c) under Basic Concepts.

<sup>4</sup> (1) Governing Principles for protecting ecological functions in WAC 173-26-186(8)(b)(i),

(2) General principles for all modifications in WAC 173-26-231(2)(d),

(3) General principles for all uses in WAC 173-26-241(2)(a)(iv),

(4) Cumulative Impacts Analysis requirement in WAC 173-26-201(3)(d)(iii).

<sup>5</sup> WAC 173-26-201(2)(c) under Basic Concepts and Protection of Ecological Functions; and implemented in WAC 173-26-201(2)(e) under Basic Concepts, Environmental Impact Mitigation.

<sup>6</sup> WAC 173-26-221(5)(b).

effect to the objectives and purposes for which it was enacted.” This means that when shoreline laws are interpreted, the correct outcome is the one providing more protection to shorelines rather than the one providing less protection. The legislative findings in the SMA policy statement (RCW 90.58.020) identifies the “clear and urgent demand for a *planned, rational, and concerted effort* ... to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.” This statement has clear repercussions, in developing an SMP because strategies that provide little detail and vague standards, or that do not address certain types of development are not undertaking a “planned, rational, and concerted effort”. Rather, such an approach is planning by default, without careful consideration, and accomplishes the opposite of the SMA policy intent.

**Pitfalls to Avoid: Don’t rely on vague statements of protection, but rather design specific regulations for all types of development.**

Some jurisdictions have attempted to meet the no-net-loss of ecological function requirement by simply repeating the no-net-loss principle in the regulations for the different types of development. In turn, they typically include few other regulations, establish few use limits, and make few distinctions in mapped environments. Aside from not meeting many other requirements, such an approach makes it uncertain that impacts will even be identified, let alone mitigated at the project stage. Such uncertainty cannot be accounted for in the Cumulative Impact Analysis (CIA). This is not the intent of the SMP Guidelines, nor the SMA’s legislative intent to plan carefully. The SMP and its array of policies and regulations *are themselves to be designed* to accomplish no-net-loss of ecological functions, not simply to restate the principle over and over.

### ***Mitigation Sequencing Using Buffers***

Since the entire SMP must be designed to accomplish no-net-loss of ecological functions, this includes the shoreline buffers. As our guidance document dealing with shoreline environments describes, a critical step in mitigation sequencing is to identify and protect the segments of shoreline that have high levels of ecological functions using Natural and Conservancy environments. A similarly important step is identifying shorelines with intact vegetative buffers, and establishing a buffer system to protect both them and the remaining ecological functions of developed areas. Thus, it is critical that the inventory include characterization of the setback and vegetation conditions of the developed shorelines.

Establishing an appropriate buffer system that protects the ecological functions of shoreline vegetation is a fundamental step in building mitigation sequencing into the SMP, because protective buffers are one of the first steps to avoid and minimize damage from development. The system must also account for degradation caused by exceptions to meeting buffers, and methods of buffer reduction.

**Use the SMA water-dependency preference in the buffer system.** The SMA requires<sup>7</sup> that in the course of implementing the SMA policy, two very important preferences must be used:

- (1) A preference for uses that control pollution and prevent damage to the environment. The SMA and SMP Guideline requirements for protecting ecological functions are summarized above and discussed in more detail in our guidance document on the subject (including cumulative impacts). Of course protecting ecological functions is the primary purpose of buffers.
- (2) A preference of water-dependency for uses that need to be in or near the water. Water-dependency is discussed in detail in our guidance document dealing with use limits and preferences, and is also a critical part of implementing a buffer system. Water-oriented uses consist of water-dependent, water-related, and water-enjoyment uses. All other uses are considered non-water-oriented.

These two preferences incorporate the understanding that uses needing to be in or near the water are preferred but inherently can damage the environment. Of course, like all development, the SMA and SMP Guidelines require that they must minimize the damage and compensate for their impacts. Conversely, uses that don’t need to be in or near the water must avoid damage to the environment to be considered preferred uses. Otherwise they are non-preferred, because the damage they cause to shoreline resources is the opposite of the SMA Policy.

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<sup>7</sup> RCW 90.58.020 – paragraph four.

The SMP Guidelines specifically state that such uses must be prohibited or carefully controlled with special conditions.<sup>8</sup> They cannot be treated the same as preferred uses are treated; otherwise there is no effect to the preference.

Since the majority of ecological functions come from native intact vegetation, degrading that vegetation (including further degrading already degraded buffers) causes damage to the environment. Similarly, meeting a buffer width or setback (even if of a science-based width) but having no intact vegetation cannot mitigate the impacts of the development. Uses and development that have an intact science-based buffer go far in preventing damage. But if the buffer is not applied, the development will harm the environment – so there must be a good reason to allow it. This is why the SMA establishes preferences, such as water-dependency, and establishes the Shoreline Variance and Conditional Use Permit processes – they ensure there is a hardship or other good reason for not meeting a buffer (or other regulation). And of course, like all development, the SMA and SMP Guidelines require that the impacts be compensated for. Preferences are discussed in detail in our guidance document dealing with use limits and preferences.

*This makes water-dependency criteria a critical factor in making buffers apply in a manner that accomplishes mitigation sequencing. If a development has no need to be near the water, it should be outside the buffer.* A jurisdiction cannot just allow whatever uses and modifications it wishes in the buffer, because they typically cause harm to the environment. Such development must be treated differently by the review system. In using water-dependency in the buffer system, water-dependent and water-related uses need to be in the buffer and are preferred. In addition, uses that provide access to or across the water, and some (but not all) types of public recreation would be considered water-dependent or water-related. But water-enjoyment and non-water-oriented uses can meet the buffer and maintain their function, such as visual enjoyment of the water. They must prevent harm to the environment, and the primary means of doing this is to meet the buffer.

The SMP Guidelines’ requirement for vegetation management standard in WAC 173-26-221(5)(c)(i) is provided below. The requirement is general and broad, and references WAC 173-26-221(5)(b), which is also discussed below. It requires SMPs to protect the functions provided by shoreline vegetation (described in the reference), and provides some examples.

“Establish vegetation conservation standards that implement the principles in WAC 173-26-221(5)(b). Methods to do this may include setback or buffer requirements, clearing and grading standards, regulatory incentives, environment designation standards, or other master program provisions. Selective pruning of trees for safety and view protection may be allowed and the removal of noxious weeds should be authorized.”

WAC 173-26-221(5)(b) provides extensive discussion of the functions of buffers, multiple statements reinforcing the requirement to ensure no-net-loss of ecological function, and describes possible tools for protecting vegetation. It also indicates that “Such vegetation conservation areas are not necessarily intended to be closed to use and development but should provide for management of vegetation in a manner adequate to assure no net loss of shoreline ecological functions.” Thus, when development is allowed, compensatory mitigation needs to be provided to offset the impacts on ecological functions.

Using Science of Buffers. Designing an SMP, and especially the buffer system, to achieve no-net-loss of ecological functions is largely a scientific exercise, and the SMA is specific in its requirements to use science in developing the SMP. It requires using “a systematic interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts.”<sup>9</sup> This science requirement is similar to the Growth Management Act’s “Best Available Science” requirement. While each has its own terminology, these two science requirements are functionally the same in that they require the use of current up-to-date science. While not all Critical Areas Ordinances (CAOs) are adequately based on science, using the CAO buffers is a possibility for those jurisdictions that do have adequate science-based buffers in the CAO.

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<sup>8</sup> WAC 173-26-241(2)(a)(iii).

<sup>9</sup> RCW 90.58.100, with emphasis added.

The science literature on the impacts of development near water bodies logically leads to the use of buffers to accomplish mitigation sequencing for shoreline waters (streams, lakes, wetlands, marine waters, etc.) and adjacent shorelands. Buffer science is discussed in detail later in this document.

### **Buffers Perform Mitigation Sequencing.**

A regulatory buffer of a width supported by science is one essential strategy for protecting the functions and values provided by intact riparian vegetation. We have observed some jurisdictions that choose to use different terminology than “buffers.” These systems use “setbacks” with “vegetation management” requirements. Either choice can accomplish the protection of ecological functions provided by vegetation; however for simplicity this discussion primarily uses the term “buffers.”

While an adequate buffer can accomplish much, it cannot mitigate everything, especially impacts from degraded upland areas and the broader watershed – for example stormwater, erosion, habitat loss, etc. Other regulations are needed to deal with such impacts, including those areas outside shoreline jurisdiction.<sup>10</sup> However, an adequate regulatory buffer can go far in providing mitigation sequencing:

- (1) It helps accomplish the first task of mitigation sequencing – avoidance. *But this is only the case if the buffer is wide enough and intact.* An adequate buffer will help protect a large percentage of the functions that riparian vegetation provides, and will encompass the most important riparian habitat areas.
- (2) An intact buffer can be a first step in minimizing the adverse impacts of development to functions that extend outside the buffer. It also reduces or helps minimize those repeating or ongoing impacts from adjacent development, such as water quality, glare, and noise impacts, by filtering pollutants, screening glare, and reducing noise transmission.
- (3) For both degraded and intact areas, a science-based regulatory buffer also identifies an area within which new development will cause impacts that need compensation. In addition, when buffers are degraded, they provide a location where any impacts of the development can be compensated for by enhancing the degraded functions.

**CAO Buffers Can be Used in the SMP.** The SMP Guidelines allow jurisdictions to incorporate other policy and regulation documents into SMP. This means the CAO and its buffers can be incorporated into the SMP if they provide adequate protection. WAC 173-26-221 addresses incorporating a CAO into the SMP. Before 2011, paragraph (2)(c) described how this was accomplished, and is provided below. After the 2011 revisions, this section was deleted along with others, and replaced with a simple statement in paragraph (2)(a)(ii) that critical areas ordinances have to assure no-net-loss of ecological functions. Both citations are provided below [with emphasis].

(2)(c) “In conducting the review for equivalency with local regulations, the department shall not further evaluate the adequacy of the local critical area regulations. Incorporation of the adopted and valid critical area regulations in effect at the time of submittal by reference as provided in section 173-26-191(2)(b) shall be deemed to meet the requirement for equivalency. However, a finding of equivalency does not constitute a finding of compliance with the requirements of this section and section (3) flood hazard reduction, nor with the guidelines overall.”

(2)(c)(ii) Provide a level of protection to critical areas within the shoreline area that assures no net loss of shoreline ecological functions necessary to sustain shoreline natural resources.

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<sup>10</sup> For example, to maintain the health of streams and salmon habitats, rivers basins should limit effective impervious surfaces to no more than ten percent and forest cover to no less than 65 percent.

Derek B. Booth, *Forest Cover, Impervious-surface Area, and the Mitigation of Urbanization Impacts in King County, Washington* p. 16 (University of Washington, Seattle Washington: September 2000). Accessed on April 30, 2011 at: <http://depts.washington.edu/cuwr/research/forest.pdf>

The highlighted section (as well as other statements in the Guidelines) ensured that any policies and regulations that are incorporated also must meet the SMA and SMP Guidelines requirements.

**Pitfalls to Avoid: Don't attempt to avoid using vegetative buffers.** While we have not encountered such an example, we have encountered some jurisdictions that have considered not establishing buffers. Their reasoning seems to be that individual reports for every project will be able to establish ad-hoc buffers at the time of project review. Using vague standards instead of "designing" policies and regulations to accomplish no-net-loss fails to meet many SMP Guideline requirements, causes great problems with the CIA, and is discussed in detail in our guidance document dealing with these issues.

**Pitfalls to Avoid: Don't assume the CAO buffers and regulations are adequate.** Some jurisdictions assume that their COA is adequate to provide shoreline buffers. This is likely based on the assumption that, if it was not appealed it must meet the current science. In fact, our observations are otherwise. Most city CAO buffers are inadequate – and some don't even cover lakes, which are a basic CAO feature. County CAO buffers are more likely to be adequate (if updated recently), since they are more often held to the science requirements by appeals. In addition, we have encountered some jurisdictions that claim that the above quoted WAC requires the state to automatically accept the CAO and its buffers without objection. These jurisdictions seem to be reading only the first part of the paragraph without considering the highlighted portion. The result is an understanding that is the opposite of what the requirement means, implying that that Ecology can't review the CAO for its adequacy in protecting shoreline ecological functions. The SMP Guidelines only allow jurisdictions the option to use their CAO, but the CAO must first be adequate to meet SMP Guideline requirements. There is no obligation to use the CAO, nor a guarantee that it will be adequate. If it is inadequate, it cannot be used without updating the CAO or establishing special supplements to it for shoreline jurisdiction.

**Pitfalls to Avoid: Don't try to avoid updating CAO buffers and regulations.** Some jurisdictions expressly try to avoid updating their CAO, for fear of additional workload and/or creating controversy. Yet they intend to incorporate the CAO into the SMP. As described above, many CAOs are inadequate. So from the beginning of the update effort, jurisdictions should plan on fixing at least some parts of the CAO rather than rigidly insisting that the CAO cannot be touched.

**Pitfalls to Avoid: Don't avoid incorporating the water-dependency preference in buffers.** We have observed many jurisdictions that allow a wide range of development in their buffers, or provide many ways to avoid meeting the buffer. These examples typically allow development that is water-enjoyment or non-water-oriented. One jurisdiction provided three pages of exceptions to meeting a buffer. Very few developments should be allowed in a buffer – and these should primarily be based on their need to be in or near the water. All others should be required to meet explicit review criteria, similar to those found for Shoreline Variances and Conditional Use Permits. This approach accomplishes the first task of mitigation sequencing – avoidance. Of course, all developments inside the buffer should include compensatory mitigation for their impacts.

**Pitfalls to Avoid: Don't "balance" away shoreline policy to accommodate development.** WAC 173-26-186(9) reads [with added emphasis]: "To the extent consistent with the policy and use preference of 90.58.020, this chapter (WAC 173-26), and these principles, local governments have reasonable discretion to balance the various policy goals of this chapter..." This is similar to the implementation statement in the SMA policy, in which preferences and priorities are established, but only in the implementation of the policy itself. (See our guidance document regarding use limits and preferences for a detailed discussion.) However, some jurisdictions have used the "balancing" phrase by itself as an excuse to allow development that has no need to be in the buffer without any regulations to accomplish mitigation sequencing. They then do not acknowledge the inherent impacts, nor require specific compensation for the losses, nor account for the losses in their Cumulative Impacts Analysis. Such a use of the "balancing" clause selectively ignores the requirement to be consistent with the policy to protect ecological functions. The facilities desired may be allowable, but they must still protect shoreline ecology to the extent feasible, and provide compensation for impacts to functions.

## ***Vegetative Buffer Areas Perform Many Functions***

The peer-reviewed scientific evidence has been reviewed and synthesized in several documents that show that intact buffers of adequate width are needed to mitigate the impacts of adjacent development on lakes, rivers, streams, marine waters, and wetlands. They in turn show that: (1) small buffers, even with intact vegetation, are incapable of fully mitigating development impacts; and (2) degraded buffers are unable to fully perform their buffering function.<sup>11</sup> An item of particular note is that some studies<sup>12</sup> found that riparian vegetation performed similar functions for all types of water environments.

*Below is a bibliographic list* of some of these scientific synthesis documents. They are generally oriented toward a particular water type, and they are grouped similarly here. They also include internet links for the reader's ease of access. ***PLEASE NOTE:*** *If some links do not operate, removing the last segment on the link may provide an alternate access path. Otherwise perform a search on that website or the internet in general.*

**Lakes:** Karen Cappiella and Tom Schueler, *Crafting a Lake Protection Ordinance*, Urban Lake Management, Watershed Protection Techniques 3(4) (2001). Accessed on April 30, 2011 at: [http://www.cwp.org/Resource\\_Library/Center\\_Docs/special/lakes/ulm\\_lakeprotectionord.pdf](http://www.cwp.org/Resource_Library/Center_Docs/special/lakes/ulm_lakeprotectionord.pdf). *Widths - p. 756; Functions - pp. 752-754.*

**Lakes:** S. Engel and J. L. Pederson Jr., *The construction, aesthetics, and effects of lakeshore development: a literature review* (Research report 177, Wisconsin. Dept. of Natural Resources, 1998). Accessed on April 30, 2011 at: <http://digicoll.library.wisc.edu/cgi-bin/EcoNatRes/EcoNatRes-idx?id=EcoNatRes.DNRRep177>. *Functions - pp. 9-24; widths not addressed.*

**Streams, Lakes, and Marine:** National Marine Fisheries Service - Northwest Region, *Endangered Species Act Section 7 Consultation Final Biological Opinion for Implementation of the National Flood Insurance Program in the State of Washington, Phase One Document - Puget Sound Region* (Sept. 22, 2008), ***also*** *Second Notice of Error and Correction in Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the on-going National Flood Insurance Program carried out in the Puget Sound area in Washington State HUC 17110020 Puget Sound* (May 14, 2009). Accessed on April 30, 2011 at: [https://pcts.nmfs.noaa.gov/pls/pcts-pub/biop\\_results\\_detail?reg\\_inclause\\_in=\('NWR'\)&idin=29082](https://pcts.nmfs.noaa.gov/pls/pcts-pub/biop_results_detail?reg_inclause_in=('NWR')&idin=29082), ***also:*** [https://pcts.nmfs.noaa.gov/pls/pcts-pub/sxn7.pcts\\_upload.download?p\\_file=F22552/200600472\\_FEMANFIP\\_errata2\\_05-14-2009.pdf](https://pcts.nmfs.noaa.gov/pls/pcts-pub/sxn7.pcts_upload.download?p_file=F22552/200600472_FEMANFIP_errata2_05-14-2009.pdf). *Widths - p. 5 of the Second Notice and; Functions and development impacts: pp. 24 - 150 of the Final Biological Opinion.*

**Streams and Lakes:** Spence, B. C., G. A. Lomnický, R. M. Hughes, and R. P. Novitzki, *An Ecosystem Approach to Salmonid Conservation*. (ManTech Environmental Research Services Corp., Corvallis, OR, Doc.#: TR-4501-96-6057, available from the National Marine Fisheries Service, Portland, Oregon. 1996). Accessed on April 30, 2011 at: <http://www.nwr.noaa.gov/Publications/Reference-Documents/ManTech-Report.cfm>. *Widths - pp. 215-230 (esp. p. 229); Functions - pp. 51-55.*

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<sup>11</sup> In particular, from the subsequent bibliographic list, see: Spence et al., *An Ecosystem Approach to Salmonid Conservation*. (ManTech Report for NOAA) Chapter 6: Effects of Human Activities.

<sup>12</sup> From the subsequent bibliographic list, see:

Sheldon, et al., *Wetlands in Washington State - Volume 1*, p. 5-25 to 5-26,  
Brennan and Culverwell, *Marine Riparian*, pp. 2 & 16. and  
EnviroVision, et al., *Protecting Nearshore Habitat*, p. III-38.

**Streams:** K. L. Knutson & V. L. Naef, *Management Recommendations for Washington's Priority Habitats: Riparian* (Wash. Dept. Fish and Wildlife, Olympia WA, 1997). Accessed on April 30, 2011 at: <http://wdfw.wa.gov/hab/ripfinal.pdf>.  
*Widths - p. 87; Functions - pp. 19-38.*

**Wetlands:** D. Sheldon, T. Hruby, P. Johnson, K. Harper, A. McMillan, T. Granger, S. Stanley, and E. Stockdale, *Wetlands in Washington State - Volume 1: A Synthesis of the Science* (Washington State Department of Ecology Publication #05-06-006, 2005). Accessed on April 30, 2011 at: <http://www.ecy.wa.gov/biblio/0506006.html>.  
*Widths - all of Chapter 5 & p. 5-55; Functions - All of Chapter 2 & parts of Chapter 3 and 4.*

**Marine:** EnviroVision, Herrera Environmental, and the Aquatic Habitat Guidelines Working Group, *Protecting Nearshore Habitat and Functions in Puget Sound: An Interim Guide* (October 2007). Accessed on April 30, 2011 at: [http://wdfw.wa.gov/hab/nearshore\\_guidelines/](http://wdfw.wa.gov/hab/nearshore_guidelines/).  
*Widths - pp III-38 to III-41; Functions - pp. II-38 to II-46.*

**Marine:** J. S. Brennan, and H. Culverwell, *Marine Riparian: An Assessment of Riparian Functions in Marine Ecosystems* (Washington Sea Grant Program, University of Washington, Seattle, 2004). Accessed on April 30, 2011 at: <http://www.wsg.washington.edu/research/pdfs/brennan.pdf>.  
*Widths - p. 16; Functions pp. ii-iii & 3-14.*

*The following table* summarizes the buffer widths recommended in these synthesis studies that are needed to protect the wide variety of ecological functions that buffers perform. Specific functions are described in more detail below the table.

#### Summary of Buffer Recommendations from Selected Studies

Science Review Source	Recommended Vegetated Buffer Width			
	Stream	Wetland	Lake	Marine
Cappiella and Schueler, <i>Crafting a Lake Protection Ordinance</i> (Review of Lake Ordinances)			Range from 50-150'; Septic 100'+	
Engel and Pederson, <i>The construction, aesthetics, and effects of lakeshore development</i>			Only functions listed	
National Marine Fisheries Service, <i>ESA Consultation Biological Opinion for NFIP in Wa. State</i>	For Shorelines: the greater of 250'; or CMZ +50'; or floodway,		150'	200'
Spence et al., <i>An Ecosystem Approach to Salmonid Conservation</i> . (ManTech Report for NOAA)	1 site pot. tree height (up to 150')		1 site pot. tree height (up to 150')	
Knutson & Naef, <i>Management Recommendations for Washington's Priority Habitats: Riparian</i> (WDFW)	150-250' per str. type + floodplain			
Sheldon et al., <i>Wetlands in Washington State - Volume 1: A Synthesis of the Science</i> (Ecology)		150'-300' for most human uses		
EnviroVision et al., <i>Protecting Nearshore Habitat and Functions in Puget Sound: An Interim Guide</i> (Aquatic Habitat Guideline Working Group)				150-200'
Brennan and Culverwell, <i>Marine Riparian: An assessment of riparian functions</i> (SeaGrant)				>30m (>100')

The science of intact buffer areas of adequate width shows that they perform many functions - some of which are provided below and grouped by similarity. The SMP Guidelines also describes vegetation functions in WAC 173-26-221(5)(b).

#### Water Quality and Infiltration Functions of Vegetation

- Inhibiting surface erosion from surface runoff and flood flows.
- Filtering sediment from surface runoff and flood flows.
- Removing and transforming nutrients and harmful substances from surface runoff and flood flows.
- Infiltrating and storing surface runoff and flood flows into groundwater for later release to water bodies.
- Removing and transforming nutrients and harmful substances from groundwater passing through root zones.

#### Stabilization Functions of Vegetation

- Providing stabilization to streambanks, lake shores, and marine waters against erosive water forces through root mats and root-strength.
- Contributing in-water woody debris which reduces and slows erosive water forces against streambanks and lake shores through barriers and increased roughness.
- Protects uplands from surface erosion caused by storms and rising sea levels.

#### In-Water Habitat Contributions Functions of Vegetation

- Providing fish with over-water hanging cover from predators.
- Providing shade to help cool the water, especially for shallow margins.
- Contributing in-water woody debris needed for creation of fish habitat.
- Contributing in-water organic matter to support fish food species (insects and invertebrates), and other aquatic life.
- Screening or dampening noise, glare, and human activity from the water.

#### Land Habitat Functions of Vegetation

- Providing refuge for fish from fast flows during floods, as well as access to new food sources.
- Providing wildlife habitat areas (for feeding, reproducing, resting, etc.) for riparian species, and for upland species that use riparian areas. This includes the small species (such as amphibians, small mammals, birds, and insects) that serve as food for larger species.
- Contributing large woody debris needed for small animal habitat, as well as larger animals.
- Providing a wildlife dispersal and migration corridor along the water to other areas.
- Generating organic matter needed for foundation of food web.
- Providing natural processes and food web functions to support wildlife.
- Altering the microclimate near the water to be more suitable for aquatic and riparian species by sheltering from wind, holding humidity, etc.
- Screening or dampening noise, glare, and human activity.
- Providing separation from human activity for sensitive aquatic and upland species.

**Pitfalls to Avoid: Don't avoid identifying the science used to develop the SMP.** We have observed some jurisdictions that do not include a science review in their update, contrary to the SMA's science requirement (discussed previously). Consequently, their regulations had little or no basis in science, particularly the buffers. These jurisdictions also typically assume their CAO is adequate to protect shoreline ecological functions, when it actually is not based on current science.

**Pitfalls to Avoid: Don't exclude certain functions from description in the SMP.** While almost all SMPs discuss the functions that buffers perform, some fail to describe all the different functions. Certainly the water quality and stabilization functions need to be included, and most jurisdictions do so. But the habitat functions also need to be included. We have observed some cities that exclude the habitat functions, apparently because of an assumption that only large animals that don't occur in



the city constitute wildlife. This problem tends to manifest in different ways. Sometimes the focus is entirely on fish habitat, and upland habitat is excluded. Sometimes both fish and wildlife functions are excluded. As indicated in the function descriptions, small animals are part of the food web and also need habitat. The SMP needs to fully describe all the functions that buffers perform to ensure that future readers (both developers and staff) are cognizant of the functions that must be protected.

## ***Developments Impact Both Intact and Degraded Shoreline Functions***

The currently available science on the characteristics needed for buffers to work has several *policy implications* that bear on the development of a buffer system that can work in different situations:

1. If the science-based buffers have intact vegetation, they can provide functions and protect the resource from most impacts of adjacent development, but some impacts will still exist.
2. If science-based buffer widths are met but they do not have intact vegetation, they cannot provide all of the functions nor protect the resource from adjacent development and there will be impacts.
3. If development takes place within the buffer area, whether intact or not, there will be impacts.
4. In the case of existing development within the science-based buffer width, the vegetation is both degraded and there is not enough width. Additional development in the science-based buffer area will increase the impacts.
5. Establishing a buffer system that incorporates assumptions that fail to identify impacts systematically establishes built-in impacts in the SMP protection system.

Thus, almost all development has negative impacts. Expansion of existing development on degraded sites, new development on vacant land, and redevelopment for different uses all adversely affect shoreline resources and functions. In fact, even existing development can continue to cause impacts to ecological functions.

Functions on a particular site range on a continuum. Even when science-based buffers are degraded, they still perform functions at a dampened level, depending on the amount of degradation. Even heavily degraded shorelines will perform functions at a very low level. This is specifically stated in the SMP Guidelines,<sup>13</sup> and documented in the science literature that compares developed and undeveloped sites. For example, even lawns can provide better animal feeding, runoff treatment, and other functions than paved surfaces and structures. New impervious surfaces and more intensive use will degrade these even further. Thus the remaining functions can still be impacted by new development. Below are descriptions of how development adversely impacts shoreline resources.

- **Water Quality and Infiltration Impacts.** New structures and impervious surfaces increase runoff volumes, remove vegetation, remove native soils that absorb water, and reduce the area available to infiltrate those volumes. These impacts may be partially mitigated through stormwater ordinances. However, stormwater regulations generally only address increased peak runoff volumes, not the other impacts.<sup>14</sup> In addition, small developments are only required to comply with some of the storm water requirements, thus reducing the ability of those regulations to address the full range of impacts.<sup>15</sup>
  - a. The increased runoff is focused into smaller receiving areas, thus increasing the erosive power and sediment carrying ability of the surface runoff in those areas.
  - b. Where infiltration can still occur, the focused runoff drives infiltrated water to the groundwater table more rapidly with less opportunity for soil treatment.
  - c. Less vegetation area is available to filter sediment and nutrients from flood waters and the larger volumes of surface runoff passing over the site.
  - d. Less native soil and vegetation root structure is available to treat groundwater.

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<sup>13</sup> WAC 173-26-201(2)(c) under Basic Concepts and Protection of Ecological Functions.

<sup>14</sup> Washington State Department of Ecology, *Stormwater Management Manual for Western Washington Volume 1 – Minimum Technical Requirements* pp. 1-20 – 1-26 (February 2005). Accessed on April 30, 2011 at: <http://www.ecy.wa.gov/biblio/0510029.html>

<sup>15</sup> *Id.* at p. 2-9.

- e. The trend of decreased infiltration in a drainage basin changes the hydrology of the basin by increasing winter flows and decreasing summer and fall flows, adversely affecting water quality and aquatic habitats.
- **Vegetation and Habitat Simplification Impacts.** Adding new structures, additions, or impervious surfaces, and removing or simplifying vegetation (cutting trees, replacing shrubs with lawn, paving, etc.) also adversely affect habitat:
  - a. Higher value habitat areas and migration pathways are eliminated or replaced with lower value areas, until the most simplified areas (open impervious surfaces) have only limited value for migration pathways and separation areas. More complex areas for nesting and refuge are most susceptible to loss.
  - b. Substituting native vegetation with non-native species, or their total removal, results in a loss of food sources for the entire food web. For example, many native insect species cannot effectively use non-native vegetation for food. The reductions in insect populations then affect the fish that feed on them.
  - c. Natural processes, insect food sources, and food web functions are reduced or eliminated with the progressive removal of complex vegetation elements.
  - d. Species (large and small) capable of using degraded areas are greatly reduced with greater degradation.
  - e. Microclimate is altered for species currently using the site.
  - f. Reduces the organic matter input to the water from drifting and blowing wind that supports the aquatic food web and aquatic life.
  - g. Reduces the large woody debris input from trees and branches falling into the water that is needed to form and diversify fish and aquatic life habitat.
- **Stabilization and Shading Impacts.** Removing or simplifying vegetation near water also:
  - a. Reduces the root strength and root mats that provide bank stabilization.
  - b. Increases sun exposure on shallow water areas and heats them.
- **Human Use Impacts:** Residential uses have additional impacts, not directly related to construction, that increase with enlargement or expansion of the use. Aside from lighting, very little can be done to mitigate these impacts – they are a function of the existence of the development. Such impacts would have to be compensated for using out-of-kind mitigation, and possibly off-site mitigation. Non-residential uses can have impacts similar to residential uses that vary depending on the activities and the level of use.
  - a. Human presence and activity that impacts or drives off fish and wildlife. Bigger residences typically mean more people on the property, whether family members or guests.
  - b. Pets that prey on or drive off fish and wildlife. More family members increase the likelihood of having more pets.
  - c. Machinery and vehicular noise that impacts or drives off fish and wildlife. More people on the property increase the likelihood of having more machines and vehicles – including automobiles, watercraft, yard machinery, and recreational vehicles.
  - d. Use of chemicals and fertilizers for house and yard. Larger structures and grounds increase the use of chemicals.
  - e. Use of night lighting that impacts or drives off fish and wildlife. Larger structures and grounds typically increase the use of exterior night lighting and escaping interior light.
- **Ongoing Impacts.** Existing development that has inadequate buffers can also have ongoing impacts or impacts that increase over time. While shoreline master programs do not apply to most existing uses, allowing an expanded, redeveloped, or new use that continues to use an existing degraded or non-existent buffer will result in increased impacts and an increased loss of shoreline functions, contrary to the requirements of the SMA. Further, shoreline master programs do apply to ongoing activities that require five year permit renewals. The SMP should require measures to protect shoreline functions when those permits are renewed.

- a. Inadequate buffers allow larger pollutant loads to pass than intact buffers. Thus the receiving waters become more and more contaminated as pollutants build up in aquatic sediments and the water body year after year. Some pollutants are removed or transformed by flushing and biological processes, but others build up over time.
- b. Inadequate buffers allow larger sediment loads to pass than intact buffers. Thus aquatic life and habitat areas continue to be smothered by sediment, and water turbidity continues to impact organisms.
- c. Buffers next to a development tend to degrade over time through continual small encroachments, so existing uses increase their pollution loads as the buffers degrade. The degraded buffers also provide fewer functions and mitigate fewer impacts.

**Pitfalls to Avoid: Don't use assumptions that avoid accurately accounting for impacts.** The above descriptions of functions and impacts to them show that with few exceptions, all development has impacts that need to be subject to mitigation sequencing. Unfortunately, *one of the biggest problems we have observed is the systematic failure to acknowledge impacts* by using a wide variety of assumptions. These assumptions are addressed in detail below.

Our guidance document addressing no-net-loss, cumulative impacts, and restoration also discusses this major problem of accurately accounting for impacts in the broader context of accounting for ecological functions and impacts of development. The reader should see that document to supplement the descriptions of impacts to buffers provided here.

**Assuming that conversion of intact areas has no impacts.** The most substantial loss of ecological function comes when new development in largely intact and undeveloped areas (those that should have protective environments) displaces vegetation that provides ecological functions and wildlife habitat - both inside and outside the buffer. A more common situation is when SMPs allow development inside a largely intact buffer (for access, docks, driveways, bridges, utility crossings, water-dependent recreation, etc.). Few SMPs require the replacement of this habitat by requiring a trail or road crossing to replace the displaced buffer vegetation. The main problem is that, while a project on a degraded site can provide compensatory mitigation on-site, how do you provide compensatory mitigation on an entirely intact site or for an intact buffer? There are little or no enhancement opportunities - certainly not at the same scale of the development impacts. This is why it is critical to both limit uses in protective environments, and limit development within buffers to uses that need to be in or near the water (water-dependent or water-related uses) - other development needlessly causes loss of functions.

The above examples allow the conversion of functioning shorelines to higher intensity uses (whether by planned intent, or by the omission of protective regulations), and thus "plan for" these ecologically intact areas to be converted to human use areas. Without explicit compensatory mitigation requirements, there is no chance for these functions to be replaced. But even with compensatory mitigation, there will be a loss of ecological functions that site-specific project mitigation almost certainly cannot mitigate due to elimination of wildlife habitat (both inside and outside the buffer), and increased human presence that drives off wildlife, as described in the next assumption.

**Not considering the impacts on fish and wildlife of human presence.** A more indirect impact is that injecting human users into largely intact areas or intact buffers - even with relatively minor development like trails - drives off fish and wildlife. Most people have experienced driving on a road and seeing wildlife. The animals may tolerate the presence of the vehicle, but when people get out of the car, the animals flee. Similarly, people who are avid fishers know that fish flee from human disturbances in and near the water, and on a dock. We have observed no SMPs that address this impact in their regulations, yet it is sometimes the largest impact. Mitigating for human intrusion will likely require out-of-kind compensatory mitigation, and possibly require off-site mitigation.

**Assuming that degraded buffers have no functions to impact.** While the above examples use relatively intact areas to demonstrate the point, even degraded areas have ecological functions that can be further degraded. Planners often equate degraded sites to having no functions to impact. This then is thought to allow

unlimited additional development near the water. However, this point of view has no logical basis in the buffer science, and is inconsistent with the concept of mitigation sequencing. Degraded buffers still perform low levels of functions, and additional development continues to impact them. The existence of lower levels of ecological function does not lessen the impacts of the development; it only reduces the maximum possible loss of functions caused by those impacts. Even converting lawn or degraded vegetation to sidewalks and roads further degrades those areas for ecological functions and habitat use.

**Assuming that avoiding more damage to degraded buffer vegetation equates to having no impacts.** Another version of the above assumption mistakenly equates development impacts to whether damage is directly caused to the vegetation, resulting in the approach that a project leaving degraded ecological functions in place is the same as having no impacts. This is incorrect. New development will have impacts whether vegetation is intact or degraded. But degraded vegetation will have a lower maximum possible loss of function.

**Assuming that degraded buffers can prevent impacts.** Some planners assume that meeting a degraded buffer width (whether small or science-based) automatically means there will be no impacts. The science shows that intact vegetation is needed to provide functions and buffer impacts. Degraded buffers cannot function fully and will automatically allow impacts. Such a system does not have a logical basis in science. If the buffer vegetation is not required to be made functional, the only way to reduce development impacts is to require additional separation with a larger setback. We recommend that the regulations require double the buffer width as a setback to avoid enhancement requirements.

**Assuming that meeting small buffers can prevent impacts.** A slightly different version of assuming that degraded buffers can prevent impacts is when planners assume that a small buffer works the same as an intact science-based buffer, and will adequately provide functions and prevent impacts as long as development is outside the buffer line. This then is thought to allow unlimited additional development outside the small buffer line. Like other pitfalls described above, there is no logical basis for such an assumption. Simply making the regulatory buffer width smaller to match the existing development does not change the presence of impacts. **Small buffers are already degraded**, even if the small width is well vegetated (which is often not the case). The science shows that inadequate width buffers cannot perform functions or mitigate impacts. In the worst cases, we have observed small buffers applied to totally intact shorelines, and to vegetated areas that are larger than the small width. This approach also causes major losses from converting intact areas to human uses, as described above.

**Assuming that waiving buffers for some development has no impacts.** We have observed a practice of systematically waiving buffer requirements for broad lists of facilities – many of which can be placed outside the buffer without eliminating their function. We have seen this pattern in almost all jurisdictions (to a greater or lesser extent) regardless of whether buffers are intact or not, and use science-based widths or not. But it typically is not accompanied by any specifics about providing compensatory mitigation along with the development. A widespread example is that trails are often allowed in the buffer with few limits, and thus allowed at the water's edge, when they could be placed outside the buffer or in the margins with no loss of their function as a trail. Access to water-dependent uses and facilities could be provided with spur trails, and are appropriate. Another common example is allowing stormwater facilities to displace buffer vegetation. Only water-dependent and water-related uses (including road and utility crossings, water-based recreation, physical public water access, etc.) should be allowed inside the buffer. Any other exceptions need to include criteria for **avoidance and minimization**, similar to Shoreline Variances and Conditional Use Permits. All instances (water-dependent or not) should also include specifics about how to do **compensatory mitigation** for that kind of development.

**Assuming that minimization standards prevent impacts.** A common assumption is that minimization will prevent impacts. Minimization is a part of mitigation sequencing, and by definition the term only reduces impacts – it doesn't avoid them. Thus development that meets minimization standards must still compensate for the remaining impacts. Minimization is commonly used for in-water development (such as docks, boating facilities, stabilization, etc.). Unfortunately, while the minimization standards may be included, there are usually no standards describing how to do compensatory mitigation for such development.

Mitigation for impacts to buffers. As previous described, the SMP regulations need to be “designed” to accomplish no-net-loss and mitigation sequencing. Accomplishing this means using a science-based buffer width wherever possible, and only allowing development within the buffer when there are no other alternatives (water-dependency, existing development that meets hardship or need criteria, etc.). Any water-enjoyment and non-water-oriented uses need to include criteria for avoidance and minimization, such as those found for Shoreline Variances and Conditional Use Permits. This accomplishes much of the avoidance and minimization components of mitigation sequencing.

Contrary to the above assumptions, development in or adjacent to the buffer will almost inevitably has built-in impacts, and built-in mitigation needs to be required to eliminate as many as possible. Even for existing developed areas, increasing the development size or intensity just makes the impacts worse. And even providing an intact, science-based buffer will have small impacts. Thus compensatory mitigation is needed for almost all new development situations. Eliminating impacts requires that the SMP (a) have a default position that, except for rare instances, development will have impacts, (b) require compensatory mitigation plans with each project, (c) include a policy to focus the compensatory mitigation on enhancing degraded conditions, and (d) include specific compensatory mitigation standards for different types of development (docks, armoring, residential development, recreation uses, etc.).

While buffer systems that do not compensate for impacts are not allowed by the Guidelines, using them also means that the jurisdiction must replace these lost functions at its own expense. This greatly complicates the Restoration Planning and Cumulative Impacts Analysis for the jurisdiction, making it extremely difficult to demonstrate that lost ecological functions will be replaced in some manner, and making it practically impossible to achieve no net loss of shoreline functions.

While all development in or next to the science-based buffer should include specifics about compensatory mitigation, doing so in areas of existing development may have to be done differently than for development of a vacant or generally undeveloped lot. For example, the lesser impacts of expanding existing development should be focused on enhancement of the degraded conditions between the development and the water. But the greater impacts of new development on vacant land or for redevelopment should be mitigated by enhancement of the full buffer’s width. Where the buffer is already intact, other options need to be used, such as removing armoring or other alterations.

### ***Options for Buffer Systems in Different Situations***

Based on the discussion above, it is possible to develop a buffer system that is logically consistent with the science for the wide variety of conditions that exist. A science-based regulatory buffer can provide a means of avoidance and minimization. But systems that avoid identifying impacts are ineffective, fail to comply with the SMA, and result in a system with built-in adverse impacts to, and loss of ecological functions. The most prominent example is the use of small buffers *alone*. The only acceptable strategy for using small buffers is if:

- (A) They are limited to situations where there are no alternatives (existing development areas) and thus inherently have some level of hardship and mitigation sequencing.
- (B) The built-in impacts are offset by built-in mitigation measures, including mitigation for habitat impacts. This is best accomplished by an improvement of the existing degraded buffer or habitat conditions.

While small buffers can be used with validity, it must be only one part of a system that addresses the range of different shoreline conditions in a logical and systematic manner. Below is our recommended strategy for a buffer system (or setbacks with vegetation management standards) that can deal with a variety of situations. PLEASE NOTE that we understand that the details of this strategy can take many forms, but they should cover all these situations when they are present within the jurisdiction.

1. For all SMPS, the buffer systems need to be supported in the SMP policies. A specific policy is needed for any small buffers that are used to indicate how they are supported by scientific information. The policy should also support the specific manner in which they are used. We recommend a policy similar to the following:

***SMALL BUFFER POLICY:*** While buffers widths based on science are necessary to protect ecological functions, using them is not possible in existing heavily developed areas, such as along some parts of [FILL IN THE BLANK]. In such areas, an alternative strategy is established using smaller buffers [OR setbacks] that are based on the existing development pattern, in combination with mitigation requirements for new development that provide enhancement of degraded features as compensatory mitigation for impacts of the new development both inside and outside the small buffer widths.

2. All shoreline areas should be carefully mapped using existing air photo data analysis, and the setbacks and vegetation condition in areas of existing development should be characterized. This should be part of the inventory and characterization step of the SMP update. When broad variations exist in setback and vegetation, the areas should be categorized based on the character, so the buffer system can consider such variations. Our guidance document dealing with shoreline environments provides a detailed discussion of requirements related to mapping, the use of existing data, and analysis of the existing data. If buffers are to be tied to the environments, it is critical that the environments be assigned based on the condition of the shoreline buffer vegetation.
3. In all shoreline areas, especially unusual situations, standards requiring existing vegetation to be protected whenever possible are needed. This is especially necessary for in-buffer vegetation. But vegetation outside the buffer should also be protected by locating development so it has the least impact, and limiting the disturbed area to the minimum needed for the use. This prevents the loss of all vegetation outside the buffer line within intact areas for no important reason. Some shorelines are heavily developed and altered in a narrow band immediately adjacent to the water, but may be entirely intact behind the developed band. These extensive intact areas still have functions, especially for habitat, and need protection. Some shorelines are developed at rural or suburban densities close to the water, but the residences are sprinkled amongst intact vegetation. These intact areas both inside and outside the buffer need protection. In both of these cases, using only setbacks or buffers based on existing development patterns (as described in 6 & 7 below) would allow these areas to be cleared, and allow the ecological functions to be lost.
4. In intact areas, and developed areas with largely intact shoreline vegetation, science-based regulatory buffer widths need to be adopted to protect them from further degradation.
5. Undeveloped areas with degraded buffers also need science-based regulatory buffer widths applied to them. However degraded or unvegetated buffers will be ineffective at buffering the impacts of new development. So the buffer system also needs clear statements that using the minimum buffer width for other than very low intensity uses is contingent on it being made functional through enhancement mitigation that plants native understories, shrubs, and trees across the shoreline (with allowances for water access and water-dependent uses). Since the only alternative way to mitigate the new impacts is reducing them through additional separation, projects that do not provide enhancement mitigation should use a setback that is twice the buffer width.
6. For new development in developed areas already inside or adjacent to the buffer, establish setbacks for the developed areas. This can use one of two approaches:
  - a. Continue to use the science-based buffer width used for intact areas in order to identify the area where development must be accompanied by compensatory mitigation, and limit development any further waterward.
  - b. Tailor the setback width to the predominant setback for different locations and limit development any further waterward. Different widths for different locations will almost certainly

be needed, and a single width set to the minimum width present in the jurisdiction does not accomplish adequate protection.

7. For new development in developed areas already inside or adjacent to the buffer, establish built-in compensatory mitigation using specific enhancement standards. Establish minimum enhancement requirements for all expansions, including those outside the small setback width. Establish tiered enhancement mitigation requirements for the more extensive types of development, including changes of use. For example: small improvements might re-establish a narrow width of vegetation, while a tear-down-rebuild or change of use might re-establish the entire buffer or remove armoring. The draft Issaquah SMP provides the best example of how to do this.

The minimum enhancement mitigation width needs to be wide enough to function, and function over time. For example, the narrowest high quality buffer that can filter nutrients is 13 feet, and for filtering pollutants you need 33 to 52 feet.<sup>16</sup> Also consider that buffers degrade over time as they filter out nutrients and pollutants. The area needs to be at least 20 feet wide (enough for a fully grown tree) to provide minimum functions. Wider buffers are needed to protect other important shoreline functions.

8. For other development inside the buffer, such as buffer reductions, buffer waivers, water-dependent uses, built-in compensatory mitigation requirements need to be specifically described that will mitigate development impacts. This should include various means of enhancing the degraded shoreline areas where doing so is possible – such as planting native shoreline vegetation, removal or reduction of unnecessary shore armoring or other near-water structures, etc. If vegetation is intact, it may require off-site mitigation. Where native vegetation is planted, it needs to include native groundcover, shrub, and tree planting; and needs to extend across the shoreline with allowances for water access.
9. We have observed some SMPs that include incentive approaches for their buffer system to encourage buffer enhancement. While we encourage incentives, they can't be substituted for thorough protections. When improperly used, the typically result is a small buffer in which any project enhancement is optional – based on choosing to use an incentive. The incentives also encourage additional development extremely close to the water. Simply meeting the small buffer and not choosing the incentives allows unlimited development outside the buffer, while ignoring the built-in impacts of such a system.

In addition to built-in mitigation in the form of enhancement, the use of small buffers means other impacts need to be much more carefully controlled, which means the use of additional standards.

- Only very limited uses and facilities should be allowed in the setback, and none can be allowed within the replanted areas if they are to function. Encroachments into a buffer or setback vegetation should be limited to those that are water-dependent and water-related. Water-enjoyment and non-water-oriented uses and facilities can function without being in the buffer area.
- Low impact development (LID) techniques should be required to minimize storm water runoff and help maintain a more natural hydrologic system. This is needed to help reduce the polluted storm water that would otherwise overwhelm the narrow planting strip.
- Major redevelopments and changes in use, which usually result in great intensification, must establish scientific based buffers to ensure no net loss of shoreline functions.
- For permits of activities that require renewal every five years, buffers or setbacks and vegetation plantings should be required.

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<sup>16</sup> K. L. Knutson & V. L. Naef, *Management Recommendations for Washington's Priority Habitats: Riparian* p. XI, p. 164 (Wash. Dept. Fish and Wildlife, Olympia WA: 1997).

Contact: Dean Patterson - [dean@futurewise.org](mailto:dean@futurewise.org). Phone: 206-343-0681. Web: [www.futurewise.org](http://www.futurewise.org).

Note: *this document may have an updated version, please check our website.*

## **Introduction**

Futurewise staff has spent over two and a half years actively reviewing and participating in many Shoreline Master Programs. We have seen many different examples of how to do a Shoreline Master Program (SMP) and the documents needed to support it. While we have seen good examples, we have also seen many problems. More importantly we have seen patterns in how these problems come into being, and want to share them with those interested in developing good SMPs. We have boiled down and consolidated our observations into a series of guidance documents that discuss the requirements for developing Shoreline Master Programs (SMPs), the important consequences of those requirements, pitfalls we have observed that should be avoided, and our recommendations for implementing the many different requirements at the same time.

In the course of reviewing many Shoreline Master Programs (SMPs), Futurewise has observed a wide range of approaches for establishing shoreline environments. Some of these have good qualities making them worth considering by other jurisdictions. Others illustrate pitfalls that should be avoided. This paper describes why protective environments are important, and identifies the common problems and the recommended solutions.

### ***Mitigation Sequencing Must Be Built Into the Structure of the SMP***

Before describing the shoreline environment requirements, it is critical to understand the basic SMA policy and SMP Guidelines<sup>1</sup> requirements, which are summarized below.

The Shoreline Management Act (SMA) voter approved policy statement in RCW 90.58.020 lists a primary policy objective of the act [with emphasis]: “This policy contemplates protecting against adverse effects to the public health, *the land and its vegetation and wildlife, and the waters of the state and their aquatic life*, while protecting generally public rights of navigation and corollary rights incidental thereto.” Thus, while new development is allowed, it must protect natural functions and ecological features, and the public’s interest in health and navigation. *Note that* not even water-dependent uses are listed as being equal to these items. Water dependent uses are discussed in detail in our guidance document dealing with use limits and preferences. This policy is echoed by the policy paragraph that provides particular protection for Shorelines of Statewide Significance, which establishes a list of preferences for both the long term protection of the public interest, and protecting the natural character and functions of these shorelines.

In addition, the SMA policy provides that “[p]ermitted uses in the shorelines of the state shall be designed and conducted in a manner to *minimize*, insofar as practical, any resultant damage to the ecology and environment of the shoreline area and any interference with the public’s use of the water.”

These two principles are implemented in the SMP Guidelines through requirements for no-net-loss of ecological function and mitigation sequencing. Regarding *no-net-loss of ecological functions*, the Guidelines require that: “Local master programs shall include policies and regulations designed to achieve no net loss of those ecological functions.”<sup>2</sup> Note that the requirement to “design” the SMP to accomplish no-

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<sup>1</sup> Despite being called ‘Guidelines,’ the SMA, in RCW 90.58.080(1), requires that shoreline master programs shall be consistent with the SMP Guidelines.

<sup>2</sup> WAC 173-26-186(8)(b) under Governing Principles of the Guidelines relating to ecological functions; and implemented in WAC 173-26-201(2)(c) under Basic Concepts.



net-loss is restated in four other locations as well, for uses, modifications, and cumulative impacts.<sup>3</sup> The no-net-loss requirement is accomplished using the concept of *mitigation sequencing*,<sup>4</sup> whereby the first task of mitigation is avoidance of impacts, the second task is minimization of impacts, and the third is compensation for remaining impacts. Stated another way, allowing development to impact the shoreline is supposed to be the last option, not the first option. WAC 173-26-221(5)(b) makes that clear, providing [with emphasis]: “Where uses or development that impact ecological functions are necessary to achieve other objectives of RCW 90.58.020, master program provisions shall, to the greatest extent feasible, protect existing ecological functions and avoid new impacts to habitat and ecological functions before implementing other measures designed to achieve no net loss of ecological functions.”

*Of critical importance in understanding* mitigation sequencing is that the word “mitigation” does not mean replacement of lost functions - that is “compensation” which is the last option. Many people confuse the terms, which then implies that performing mitigation means jumping straight to compensation and replacement before using avoidance and minimization. But compensatory mitigation for damage done is not the same as “prevention of damage to the natural environment,” which is an important distinction to qualify as a preferred use, as discussed in detail in our guidance document dealing with use limits and preferences.

“Designing” an SMP to accomplish the no-net-loss principle means “designing” the different components of the SMP using mitigation sequencing. The SMP Guidelines include requirements for several components that, if implemented correctly, accomplish mitigation sequencing at different levels within the SMP. These components include: designating environments, placing limits on uses and modifications, establishing buffers (or setbacks with vegetation management) based on science,<sup>5</sup> and developing regulations specific to different types of development. Each of these components is a subject of one of our Guidance Documents, each of which describes how to design mitigation sequencing into the element. Designing each component to avoid and minimize impacts, and then including specific standards for compensation of remaining impacts will result in an SMP that is structured to prevent the loss of ecological functions as much as possible.

There are two important points to keep in mind when preparing an SMP: (1) the rule of liberal construction, and (2) the requirement to rationally and carefully plan. When implementing and interpreting typical laws we use strict construction, but for shoreline law we use liberal construction (as required by RCW 90.58.900) “to give full effect to the objectives and purposes for which it was enacted.” This means that when shoreline laws are interpreted, the correct outcome is the one providing more protection to shorelines rather than the one providing less protection. The legislative findings in the SMA policy statement (RCW 90.58.020) identifies the “clear and urgent demand for a planned, rational, and concerted effort ... to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.” This statement has clear repercussions, in developing an SMP because strategies that provide little detail and vague standards, or that do not address certain types of development are not undertaking a “planned, rational, and concerted effort”. Rather, such an approach is planning by default, without careful consideration, and accomplishes the opposite of the SMA policy intent.

**Pitfalls to Avoid: Don’t rely on vague statements of protection, but rather design specific regulations for all types of development.**

Some jurisdictions have attempted to meet the no-net-loss of ecological function requirement by simply repeating the no-net-loss principle in the regulations for the different types of development. In turn, they typically include few other regulations, establish few use limits, and make few distinctions in mapped environments. Aside from not meeting many other requirements, such an approach makes it uncertain that impacts will even be identified, let

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<sup>3</sup> (1) Governing Principles for protecting ecological functions in WAC 173-26-186(8)(b)(i),

(2) General principles for all modifications in WAC 173-26-231(2)(d),

(3) General principles for all uses in WAC 173-26-241(2)(a)(iv),

(4) Cumulative Impacts Analysis requirement in WAC 173-26-201(3)(d)(iii).

<sup>4</sup> WAC 173-26-201(2)(c) under Basic Concepts and Protection of Ecological Functions; and implemented in WAC 173-26-201(2)(e) under Basic Concepts, Environmental Impact Mitigation.

<sup>5</sup> WAC 173-26-221(5)(b).

alone mitigated at the project stage. Such uncertainty cannot be accounted for in the Cumulative Impact Analysis (CIA). This is not the intent of the SMP Guidelines, nor the SMA's legislative intent to plan carefully. The SMP and its array of policies and regulations *are themselves to be designed* to accomplish no-net-loss of ecological functions, not simply to restate the principle over and over.

### ***Mitigation Sequencing Using Environment Designations***

Since the entire SMP must be designed to accomplish no-net-loss of ecological functions, this includes the shoreline environments. Shoreline environments are one of the basic components of the SMP that control the corresponding use and modification limits within those environments. This makes establishing environments a fundamental step in building mitigation sequencing into the SMP, because protecting the higher functioning areas with protective environments helps *accomplish the first step in mitigation sequencing – avoidance.*

Most jurisdictions have extensive areas of developed shorelines, so it is critical to protect the remaining areas with high levels of ecological function. Protecting them requires identifying them in the inventory and establishing Natural and Conservancy (or equivalent) environments that protect the remaining high functioning areas. This must be followed up in the use limits by not allowing certain uses and modifications, and by limiting development intensity as described in the SMP Guidelines. These areas should exclude intensely developed areas (such as residential development at urban densities), but should include low density residential development (with separation between homes, perhaps even with intact vegetation) typically found in rural areas.

The SMP Guidelines WAC 173-26-201(3)(d) - Preferred uses – requires the protection of intact areas, and changes to the Guidelines in 2011 emphasized intact areas both on land and in the water.

(i) Reserve appropriate areas for protecting and restoring ecological functions to control pollution and prevent damage to the natural environment and public health. In reserving areas, local governments should consider areas that are ecologically intact from the uplands through the aquatic zone of the area, aquatic areas that adjoin permanently protected uplands, and tidelands in public ownership. Local governments should ensure that these areas are reserved consistent with constitutional limits.

WAC 173-26-211 provides the requirements for establishing shoreline environments. WAC 173-26-211(2)(a) establishes the basic requirements for shoreline environments, and states [with added emphasis]:

“Master programs shall contain a system to classify shoreline areas into specific environment designations. This classification system shall be based on the existing use pattern, the biological and physical character of the shoreline, and the goals and aspirations of the community as expressed through comprehensive plans as well as the criteria in this section. Each master program’s classification system *shall be consistent with that described in WAC 173-26-211 (4) and (5) unless the alternative proposed provides equal or better implementation of the act.*”

But establishing such a system requires accurate information about the condition of the shoreline. Changes were made to the SMP Guidelines inventory requirements (WAC 173-26-201(3)(c)) in 2011, and it currently includes many specific items needed to identify blocks of intact shoreline area, highly functioning aquatic areas, and intact shoreline vegetation, as listed below. In addition, it requires inventorying the extent of alterations, such as structures and other modifications, which are important in identifying the degradation of developed locations.

(i) Shoreline and adjacent land use patterns and transportation and utility facilities, including the extent of existing structures, impervious surfaces, vegetation and shoreline modifications in shoreline jurisdiction. Special attention should be paid to identification of ecologically intact blocks

of upland vegetation, developed areas with largely intact riparian vegetation, water-oriented uses and related navigation, transportation and utility facilities.

- (ii) Existing aquatic and terrestrial wildlife habitats; native aquatic vegetation; riparian and associated upland plant communities; and critical areas, including wetlands, aquifer recharge areas, fish and wildlife habitat conservation areas, ...
- (iii) Altered and degraded areas and sites with potential for ecological restoration.
- (iv) Areas of special interest, such as priority habitats, ecologically intact late successional native plant communities, ...
- ...
- (vii) General location of channel migration zones, and flood plains.
- ...
- (xi) Information specific to the aquatic environment for siting in-water uses and development, such as sediment contamination, intertidal property ownership, aquaculture operations, shellfish beds, shellfish protection districts, and areas that meet department of health shellfish water quality certification requirements.

WAC 173-26-211(4)(b) provides the recommended environment system, and states:

“The recommended classification system consists of six basic environments: “High-intensity,” “shoreline residential,” “urban conservancy,” “rural conservancy,” “natural,” and “aquatic” as described in this section and WAC 173-26-211(5).”

WAC 173-26-211(4)(c)(i) provides for using alternative systems, and states [with emphasis]:

“Local governments may establish a different designation system or may retain their current environment designations, *provided it is consistent with the purposes and policies of this section and WAC 173-26-211(5)*” [Note: Subsection (5) describes the specific recommended environments.]

Thus jurisdictions have the discretion of establishing customized environments. But the environments chosen need to meet the general intent laid out in the SMP Guidelines:

- protect the higher functioning shoreline areas,
- provide places for residential and other preferred shoreline development, and
- provide places for higher intensity development where the development will avoid impacting shoreline resources, such as public enjoyment and ecological function.

WAC 173-26-211(4)(a) requires that the policies for each environment include its (1) Purpose, (2) Classification Criteria, and (3) Management Policies. Using the model of the recommended environments, the Management Policies should include what is allowed or not allowed in the environment. Describing allowed uses is critically important in helping decision makers and citizen committees understand the land use outcomes of mapping decisions.

To summarize the above requirements, protecting ecologically intact areas using protective shoreline environments is an important first step in building mitigation sequencing into the SMP. These environments need to be consistent with the SMP Guidelines for those environments. If a custom environment is to be used, it needs to implement the intent of the Guidelines environment that it is similar to. Whichever path is chosen, the ecologically intact areas need to be protected using the intent of the Natural and Conservancy environments.

Consistency with the SMP Guidelines environment provisions is important because there are specific requirements for these protective environments – particularly in the intent statements and the management policies. The Guidelines<sup>6</sup> for the Natural and (to a lesser extent) Conservancy environments indicate that uses

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<sup>6</sup> WAC 173-26-211(5); Natural is paragraph (a), Rural Conservancy is (b), Urban Conservancy is (c).

within them are to be low-intensity and avoid degrading the shorelines. Similar alternative environments (for example Forestry or Resource) would still have to be similar to these requirements. This means that a distinction must be included in the use limits and development standards that differentiate uses based on intensity. Broad categories of uses cannot be allowed in these environments without these limits. If a category of use (commercial, industrial, residential, etc.) is to be allowed in a protective environment, the low intensity elements of them need to be distinguished, and the use limits (such as entries in a use table) need to use that low-intensity distinction so that higher intensity uses are not allowed. For example, multifamily residential and urban density residential subdivision are higher intensity uses that are inherently too intense for the Natural and Conservancy environments. Residential subdivisions in the Natural and Conservancy environments should include density and spacing requirements to ensure that they are low intensity. Some Natural environments we have reviewed even prohibit residences.

If an SMP allows for the conversion of functioning shorelines to higher intensity uses (whether by planned intent, or by the omission of protective regulations), there will be a loss of ecological functions that site-specific project mitigation almost certainly cannot mitigate due to elimination of wildlife habitat, and increased disturbances that drive off wildlife, loss of vegetation both inside and outside the buffer, increases in impervious surface, etc. This means that the jurisdiction must replace these lost functions at its own expense. This greatly complicates the Restoration Planning and Cumulative Impacts Analysis for the jurisdiction, making it extremely difficult to demonstrate that lost ecological functions will be replaced in some manner and making it practically impossible to achieve no net loss of shoreline functions.

**Pitfalls to Avoid: Don't designate intact areas with development based environments – use Natural and Conservancy.** Designating shoreline areas that have intact functions with environments (such as Shoreline Residential or Urban) that allow intense development (such as residential subdivisions at urban densities, commercial uses, or active use public parks) “plans for” the ecologically intact areas to be converted to human use areas. This will result in a loss of shoreline functions. In such cases, the jurisdiction must be clear in how these lost ecological functions will be replaced in the Cumulative Impact Analysis and Restoration Plan.

**Pitfalls to Avoid: Don't “balance” away shoreline policy to accommodate development.** WAC 173-26-186(9) reads [with added emphasis]: “To the extent consistent with the policy and use preference of 90.58.020, this chapter (WAC 173-26), and these principles, local governments have reasonable discretion to balance the various policy goals of this chapter...” This is similar to the implementation statement in the SMA policy, in which preferences and priorities are established, but only in the implementation of the policy itself. (See our guidance document regarding use limits and preferences for a detailed discussion.) However, some jurisdictions have used the “balancing” phrase by itself as an excuse to designate intact areas with environments that allow intensive development (often for residences or water-dependent uses) that will convert those areas to human uses. Yet they do not acknowledge the inherent impacts, nor require specific compensation for the losses, nor account for the losses in their Cumulative Impacts Analysis. Such a use of the “balancing” clause selectively ignores the requirement to be consistent with the policy to protect ecological functions. The facilities they desire may be allowable, but they must still protect shoreline ecology to the extent feasible, and provide compensation for impacts to functions.

**Pitfalls to Avoid: Don't allow uses in the remaining intact areas that allow converting them to human uses.** Another problem is that jurisdictions may designate intact and functioning areas with appropriate environments, but then allow intensive uses in those environments that will result in the conversion of the intact areas. Such an SMP environment does not comply with the SMP Guideline management policies for the environment. An example is a Conservancy environment that allows urban density subdivisions, large scale commercial uses, or intense public recreation uses – all of which will displace the intact areas. An extreme version of this is where environments are established and mapped, but there is little or no distinction in the uses allowed in the different environments; and in a worst case scenario, all uses are allowed in all environments in an attempt to just rely on zoning

regulations that do not consider shoreline requirements. These strategies plan by default rather than by careful consideration, as required by the SMA. Our guidance document dealing with use limits and preferences provides more detail.

**Pitfalls to Avoid: Don't avoid distinctions in use intensity.**

Another common problem is that many jurisdictions do not distinguish between high-intensity and low-intensity developments in their use limits for the protective environments. For example, a county might allow all scales and intensities of commercial uses equally in the Rural Conservancy environment. Thus, (assuming water-dependency criteria are met) it might allow a mall as readily as allowing a small rural service establishment – which have great differences in their effects. For an urban example, a city might allow all recreation uses equally in the Urban Conservancy environment. Thus a sports complex gets treated the same as low intensity walking trail. Making a distinction in the use category for high-intensity and low-intensity uses would allow the jurisdiction to permit limited uses in the protective environments. Again, leaving out use-intensity does not comply with the SMP Guidelines management policies for the protective environments.

**Pitfalls to Avoid: Don't avoid including use limits because they are "unlikely."**

Some jurisdictions have attempted to allow a broad range of uses in their protective environments by claiming that while the SMP may allow the development, such proposals are unlikely to happen, and thus don't need to be considered in the Cumulative Impacts Analysis. Such an approach contradicts the very intent of the Cumulative Impacts Analysis by avoiding consideration of the accumulation of impacts over longer periods of time, which is one reason our shorelines are as degraded as they are. The problem is that the conditions that make the development "unlikely" may change, making it more likely. Describing something as "unlikely" is another way of saying it's allowed but there is a small percentage chance of it happening. Thus "unlikely" development is still estimable. Our guidance document dealing with No-Net-Loss and cumulative impacts provides additional details on this issue.

## ***Protect High Quality Aquatic Areas With Appropriate Environments***

The SMP Guidelines recommend a land-water environment system; where the water is placed in the Aquatic environment and the uplands are placed in a variety of other environments. This system creates three problems that need to be addressed.

**High Functioning Water Areas** - As already described, the Shoreline Management Act and the Shoreline Master Program Guidelines require<sup>7</sup> protecting the most ecologically intact and highly function areas, including highly functioning aquatic areas. The inventory requirements, described above, include inventorying highly functioning aquatic areas. However, while the Guidelines have developed an approach to identifying the most natural and ecologically intact areas for upland situations, there is not a recommended water environment that can similarly protect the in-water areas with the highest ecological functions. Thus the entire area of actual shoreline water body that is to be protected is treated the same regardless of whether it's ecologically of high quality or low quality.

**Incompatibilities** - The second problem is that if the Aquatic environment covers all water areas, there is a tendency to allow a broad range of uses within it. Thus all those uses are allowed immediately adjacent to the upland environments, which will result in compatibility problems – especially where adjacent to Natural and Residential environments.

**Permitting Complexity** - Many in-water uses also have upland components. Consequently, any project with a water component will usually have two environments that they must be compatible with. This characteristic of the system makes it very easy for a project to be allowed in the Aquatic environment, but not allowed in

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<sup>7</sup> WAC 173-26-186(8) – describing the framework for protecting ecological functions. Also see our guidance document dealing with no-net-loss of ecological functions.

the upland environment - and maybe vice versa. This contradiction can create gaps and loopholes that can result in bad shoreline development or unintended consequences.

While the SMP Guidelines recommend designating all water areas as an Aquatic environment, alternative approaches are allowed that can address these problems. In our review of different SMP environment systems, we have observed several approaches to dealing with water areas, some specific to the type of water body. Sometimes multiple approaches are used by a jurisdiction. The range of possibilities includes:

- Designate all water areas as Aquatic
- Designate water areas using multiple aquatic environments.
- Designate all water areas the same as the adjacent upland environment (works for rivers, but has complications with enclosed lakes and marine waters regarding matching the opposite shore environment, and sharply curving shores)
- Designate the entire lake and its shorelands as a single, non-aquatic environment.
- Designate both river water areas and the immediately adjacent shorelands with a larger parallel environment, such as using the FEMA Floodway or CMZ.
- Designate deep water areas (lake or marine) with a different water environment.

These different approaches generally result from the basic choice of whether to include the shallow water areas adjacent to land within the upland environment, or to have the water area be completely separate from the adjacent upland environments. Both have benefits and problems that are summarized below.

#### Using Separate Aquatic Environment

- Benefit 1: The regulations related to in-water development can be focused on the Aquatic environments - although this requires a separate regulation section for the Aquatic environment or a similar approach. Some jurisdictions using the Aquatic environment don't focus requirements and don't gain this benefit.
- Benefit 2: A deep-water version of the Aquatic can be established to deal with deep water areas, which are rarely used in conjunction with upland areas. They can then be treated differently from upland areas and shallow waters. This option can actually be used with both a regular Aquatic environment, and with including shallow water areas with the adjacent upland environment, as described below.
- Problem 1: The entire area of water in the jurisdiction is treated the same regardless of whether it's ecologically of high quality or low quality. Solution: Use the inventory to identify high quality in-water areas, and provide different shoreline environment, such as Aquatic Natural. Examples: Jefferson County has the best example (Priority Aquatic); Mukilteo also uses two aquatic environments; King County uses the Maury Island Aquatic Reserve as a non-environment designation, though it is cumbersome. A less effective alternative would be to place a requirement in the use limits that development in the Aquatic environment must also meet the use limits for the adjacent upland environment. This would use the adjacent upland environment (mainly Natural or Conservancy) as an imperfect proxy for in-water ecologic function.
- Problem 2: The entire area of water in the jurisdiction is treated the same regardless of whether it's adjacent to natural areas or residential areas. This easily results in incompatibilities with those environments. Solution: Like in Problem 1, place a requirement in the use limits that development in the Aquatic environment must also meet the use limits for the adjacent upland environment.
- Problem 3: Almost all shallow water development connects to the adjacent upland which will be in a different environment. This complicates permit review due to different use limits, regulations, and permit processes. Solution: None - upland components must meet upland rules and in-water components must meet Aquatic requirements.

### Including Water Areas Within Adjacent Upland Environment

- Benefit 1: Can treat in-water development and related upland development as a whole with the same set of environment rules.
- Benefit 2: Development allowed in water areas and their adjacent uplands will have fewer conflicts.
- Benefit 3: Upland environments can serve as an imperfect proxy for ecological quality of adjacent in-water areas. Inventory of in-water areas can be used to better refine the environment maps.
- Problem 1: In-water requirements can't be focused on just the Aquatic environment. Solution: Incorporate in-water requirements into general standards; or if not feasible, then into requirements for different types of development. Some jurisdictions that actually do use the Aquatic environment handle in-water requirements in this manner anyway.
- Problem 2: Use of deep water areas is rarely related to upland areas and thus don't fit well into upland environments. Solution: Can designate deep water separately if needed. Don't necessarily need to for rivers and some lakes.

### Recommendations:

We recommend that jurisdictions always inventory their water areas carefully and identify those with high levels of ecological function. Otherwise a proxy is needed to protect these ecologically higher functioning areas.

- (1) If the jurisdiction does inventory their high quality water areas, these areas need a separate environment or other identification to limit uses within them and protect their ecological functions.
- (2) If the jurisdiction does not inventory and identify their high quality water areas, we recommend at a minimum one of two options: (1) that adjacent upland environments be extended to shallow water areas, or (2) that a regulation be included in the use limits to require development in the Aquatic environment to also meet the requirements of the adjacent upland environment. Either option will allow the ecologically protective environments to serve as a proxy for high quality in-water areas, and also avoid in-water development that is incompatible with adjacent uplands.

## ***Jurisdiction Issues***

The SMA requires that all cities and counties plan for all shorelines within their jurisdiction. Sometimes SMPs do not clearly identify shoreline environments for all of the shorelines within their jurisdiction. We have observed two main reasons for this: (1) the jurisdiction doesn't realize the extent of their jurisdiction, or (2) the jurisdiction assumes that local governments cannot regulate some areas. Below are the general rules to consider in correctly identifying the shoreline jurisdiction and mapping shoreline environments.

### Water Bodies

Shoreline water bodies can extend great distances over lakes and marine areas. County and city boundaries often extend to a defined boundary lying out in a water body – the centerline of a river, the middle of the lake, a line in the Puget Sound or the ocean, etc. The jurisdiction must know where the jurisdiction lines lie and must plan for shorelines within those boundaries. This is something that should be *actively* determined and confirmed – especially for cities where maps may not accurately show jurisdiction over water areas. In many cases state law extends a city's jurisdiction to the middle of the water body, even if only upland areas have been annexed. Once all the shoreline water areas within the jurisdiction are identified, they must also be designated with a suitable environment.

**Pitfalls to Avoid: Don't avoid designating and mapping water areas with environments.** Some jurisdictions believe that they do not have authority over water areas beyond the harbor line, line of navigability, or other line, because there are federal or state agencies that regulate those areas. This is not the case. Different agencies administer different laws, and all the laws apply and must be followed. Shoreline law regulates "development" within shoreline jurisdiction.

Some jurisdictions have not mapped all their water areas. The result is shoreline waters with no environment mapped and no use limits based on environments, and sometimes no permit process defined for development in those areas. All areas within shoreline jurisdiction must be provided with an environment.

### **Federal and Tribal Lands**

Shoreline jurisdiction on federal land is not determined based on geographic boundaries, but rather on federal activity. The Coastal Zone Management Act requires federal compliance with state Coastal Zone Management Plans. Washington's plan includes the state's local SMPs. Federal agencies must consult with the state regarding impacts to the state CZMP, and non-federal actions on federal land must obtain permits under the local SMP. The shoreline environment mapping needs to be extended into the federal lands so that non-federal activities (leases, inholdings, cabins, etc.) will be able to be reviewed appropriately.

While the specifics of how state and local laws apply within tribal reservations may vary from situation to situation, a general rule is that lands owned by non-tribal members are subject to the SMP. We recommend consulting with the affected tribal authorities on how to map shoreline jurisdiction within reservations. Where lands may change hands between tribal and non-tribal members, and thus may change in being subject to shoreline law, it may be appropriate to assign shoreline environments so that there is a way to handle shoreline review appropriately.

#### **Pitfalls to Avoid: Don't avoid assigning environments simply because of boundary lines.**

Jurisdictions often stop their shoreline mapping at the federal land ownership line or tribal reservation boundary. Historically, many counties did the same thing, which left non-federal actions and non-tribally owned reservation lands having undefined shoreline environment regulations and permit processes. Thus implementation of the SMP was left unclear when it should have been made clear.

### ***Include Adequate Maps in the SMP***

Maps are a critical component to shoreline planning for a number of reasons: (1) understanding the condition of the shoreline in the inventory, (2) guiding the development of new environments and regulations, and (3) giving local citizens and developers an accurate understanding of where shoreline requirements apply to guide future development. Furthermore, they are required by the SMA and SMP Guidelines. The SMA in RCW 90.58.100(1) is explicit about using currently available technology in shoreline planning: "... In preparing the master programs, and any amendments thereto, the department and local governments shall to the extent feasible: ... (f) Employ, when feasible, all appropriate modern scientific data processing and computer techniques to store, index, analyze, and manage the information gathered."

The SMP Guidelines also state the need to develop accurate maps that establish environments over the known shoreline jurisdiction. In addition, since a map is only a representation of on-the-ground conditions, the WAC also requires text to guide identification of boundaries edges/changes. WAC 173-26-211(2)(b) states [with added emphasis]:

"An up-to-date and accurate map of the shoreline area delineating the environment designations and their boundaries shall be prepared and maintained in the local government office that administers shoreline permits. If it is not feasible to accurately designate individual parcels on a map, the master program text shall include a clear basis for identifying the boundaries, physical features, explicit criteria, or "common" boundary descriptions to accurately define and distinguish the environments on the ground. The master program should also make it clear that in the event of a mapping error, the jurisdiction will rely upon common boundary descriptions and the criteria contained in RCW 90.58.030(2) and chapter 173-22 WAC pertaining to determinations of shorelands, as amended, rather than the incorrect or outdated map."



Modern computer mapping capabilities make the depiction of shoreline jurisdiction and environments relatively easy and accurate. *The following sections include some mapping recommendations.*

### Shoreline Inventory Must Map All Existing Data Pertinent to Shorelines

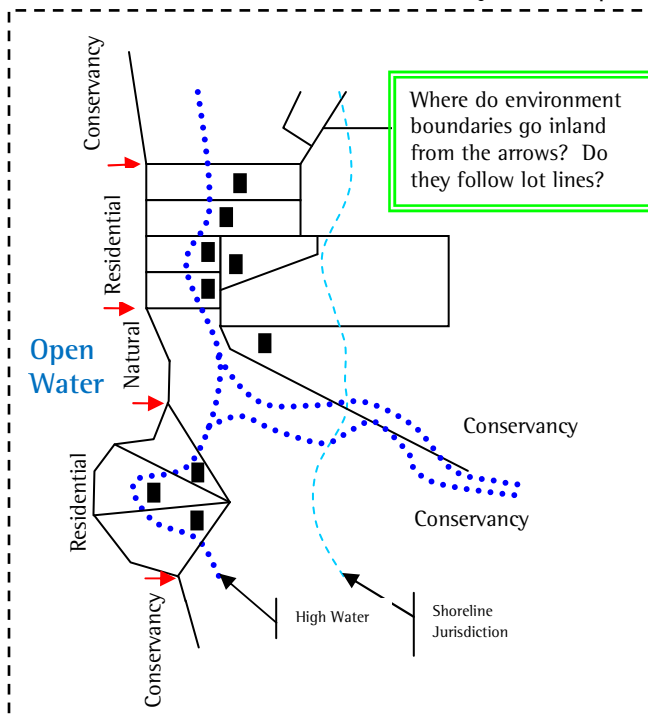
The above SMP Guideline requirements are clear about the need for maps. WAC 173-29-201(3)(c) also is clear that during the inventory the jurisdiction must: “Gather and incorporate all pertinent and available information, existing inventory data and materials ... Map inventory information at an appropriate scale. ... Collection of additional inventory information is encouraged ...” Many important pieces of shoreline condition data is found in air photos - both current and historic. The most explicit example would be simply using an air photo map and marking and measuring in-water and near-water structures, existing vegetation areas, etc. A slightly more analytical example is using historic air photos, historic maps, and topography maps/data to identify the outer boundary of a river’s channel migration zone. Such data needs to be included in the inventory, analyzed, and mapped.

#### Pitfalls to Avoid: Don’t avoid mapping data from the air photo maps.

Some jurisdictions use the part of the above provision that says they don’t have to develop new data as an excuse to avoid fully analyzing the existing data for their shorelines. Their reasoning is that the provision means they don’t have to create new maps of the relevant data. The result is an inventory with very few maps showing the characteristics of the shoreline. Even when air photos are used, some jurisdictions still refuse to generate maps of the relevant data - they only assess the data using a whole-jurisdiction overview, not for inventorying the condition of specific shoreline areas. However, this mindset ignores the requirements that they have to actually analyze the existing data to extract the relevant information it provides. The Guidelines require that existing data must be used, and “computer techniques to store, index, analyze, and manage” that data must be applied.

### Jurisdiction And Environment Maps Must Use Polygons Rather Than Lines

A critical distinction needs to be made between the old style of shoreline mapping, using lines along the shore, and current mapping technology, which uses polygons. Line-based environment designation maps suffer from two critical flaws. First, they don’t capture the broad areas that shoreline jurisdiction can cover,



such as open water areas (especially lake surfaces), floodplains, and associated wetland complexes, all of which may be much wider than a line-based map can depict. Property that is in these areas appears to landowners and untrained staff persons to be outside shoreline jurisdiction, and may mislead them in their decisions. And even when correctly identified, these properties must have their environment designation interpreted. Second, since line-based environments end in points, they cannot accurately define the boundary lines where shoreline environments meet and change. Whether a development is in one environment or another makes a dramatic difference to the project proponent, since it determines what uses are allowed or not allowed. Accurately describing the basis of boundary changes and depicting them on the map are very important - especially in settling disputes about which environment a project is located in. The graphic to the left illustrates some of the difficulty in complex property line situations.

Even polygon-based maps must be careful in how they depict boundary lines between environments. Since a map is only a representation of on-the-ground conditions, they must be based on a consistent set of rules

that are described in the SMP text. The importance of these rules becomes very apparent when extending the boundary line between environments across broad areas of open-water or floodplain. A small change in angle can propagate dramatically as the line is extended across a distance, especially a floodplain where development has a higher likelihood to occur. Thus every boundary needs to be based on a common method that is described in the SMP – whether using road centerlines, section lines, parcel lines, river centerlines, lines perpendicular to the water-line, etc. These kinds of guidance provisions are common in zoning ordinances to guide the use of zoning maps, and they should be included in the SMP.

A common situation unique to rivers is having different environment designations on either side of the river. Since rivers and streams migrate, and the location of the centerline changes overtime. Rivers can also avulse – dramatically changing locations in the floodplain. Thus a development fronting on the river can find that the river has avulsed behind it, and then it is subject to different SMP regulations based on a different environment. Such possibilities need to be considered, and the means of demarcating the boundary line between different environments on either side of the river needs to be included. It may be that an Aquatic environment is used, or that the upland environments extend to the centerline or thalweg of the river. At a minimum, the SMP text needs to provide a guidance statement for river situations.

**Pitfalls to Avoid: Don't use line-based maps – use polygons.** Developing SMP maps using old technology and methods is contrary to the SMP Guidelines. Geographic Information System (GIS) mapping technology, the data layers to use with them, and the expertise to develop map products are readily available at a reasonable cost. Smaller jurisdictions without GIS capability can work cooperatively with county or regional planning organization. So accurately maps need to be included with the SMP.

**Pitfalls to Avoid: Don't avoid defining the boundaries between environments.** Some may argue that a line is adequate. However, even for SMPs without complex shoreline designations, line designations don't indicate how the boundaries lines between environments are extended through complex property line situations, or what other basis for a line is used. Line-based mapping also typically lacks the text to provide on-the-ground guidance. When undertaking the effort of using polygon areas, one quickly realizes establishing boundaries between environments is not simple, because parcel lines intersect with shorelines at odd angles.

**Pitfalls to Avoid: Don't avoid text guidance for how boundaries between environments were set.** Some jurisdictions may actually have polygon maps, but the SMP text does not indicate the rules to guide the boundary lines on the ground. A map is only an approximation of the actual situation, and text rules are needed in the SMP to guide its application. Whatever features were used to draw the boundary lines should be apparent on the map, and if lines appear to be based on parcels, or physical features (such as centerlines of roads rights-of-way, rivers, etc.), or section lines the text should say so.

## **Environments for New Shorelines and Shoreline Wetlands**

Shoreline planners regularly encounter the problem of discovering a new shoreline. This can happen for several reasons:

- A new shoreline is created by mining or similar excavation,
- A dam creates a new reservoir that qualifies for shoreline jurisdiction
- A lake or river meeting shoreline criteria is learned about
- Inaccurate information on a river or lake is corrected, and now it meets shoreline criteria
- Associated wetlands are learned about that may be some distance from the water body.

The SMP Guidelines require<sup>8</sup> default contingencies to deal with these cases. The simplest is to say that a shoreline area that does not have an environment designation shall be assigned a specific protective

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<sup>8</sup> WAC 173-26-211(2)(e).

environment, usually the Urban or Rural Conservancy designation, until it is assigned a different environment in the next SMP update.

Wetlands are a situation that needs special attention, even if they are known. Of course, if they are already known, they should be assigned a shoreline environment. But associated wetlands that are newly discovered, or are newly found to be associated with a shoreline need special default contingencies. The most common situation is where wetlands lie outside a floodplain. Where the floodplain is cut off or isolated due to diking, the wetlands are typically still hydrologically associated with the river through the groundwater patterns driven by the river levels, especially during spring high water. However other situations may also exist for lake and marine shorelines. There needs to be a statement that such associated wetlands have a shoreline environment that is the same as the nearest adjacent shoreline segment or a protective default designation such as the urban or rural conservancy designation.

**Pitfalls to Avoid: Don't avoid text guidance for handling unidentified shorelines.** Some jurisdictions do not have this basic requirement, but even those that do often don't provide direction for the different possibilities that may result in new jurisdiction areas that were not know previously. For example, newly discovered shorelines in remote areas might need to be treated differently than human created ones, both of which might need to be treated differently from associated wetlands.



## Recommendations for *No-Net-Loss of Ecological Functions* *Including Cumulative Impacts Analysis and* *Restoration Planning*

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**Contact:** Dean Patterson - [dean@futurewise.org](mailto:dean@futurewise.org). Phone: 206-343-0681. Web: [www.futurewise.org](http://www.futurewise.org).

**Note:** *this document may have an updated version, please check our website.*

### **Introduction**

Futurewise staff has spent over two and a half years actively reviewing and participating in many Shoreline Master Programs. We have seen many different examples of how to do a Shoreline Master Program (SMP) and the documents needed to support it. While we have seen good examples, we have also seen many problems. More importantly we have seen patterns in how these problems come into being, and want to share them with those interested in developing good SMPs. We have boiled down and consolidated our observations into a series of guidance documents that discuss the requirements for developing Shoreline Master Programs (SMPs), the important consequences of those requirements, pitfalls we have observed that should be avoided, and our recommendations for implementing the many different requirements at the same time.

This document describes the requirements for no-net-loss of ecological function in the Shoreline Management Act (SMA) Policy and SMP Guidelines.<sup>1</sup> It focuses on providing a practical way of developing the Cumulative Impact Analysis (CIA) and the Restoration Plan. An accurate understanding of the cumulative impacts analysis and restoration planning requirements is critical to ensuring that the SMP covers all the impacts possible, because the jurisdiction must compensate for any impacts to ecological functions allowed by the SMP.

### **Framework of Protecting Ecological Functions**

One of the primary functions of the Shoreline Management Act (SMA) is to protect the ecology and natural character of the state's shorelines, as required in RCW 90.58.020. Unfortunately, this policy has not been fully implemented resulting in the degradation of shoreline resources over the last 30 years.<sup>2</sup> The SMA policy protecting ecological functions now permeates all areas of the updated SMP Guidelines through the concept of "no-net-loss of ecological functions," whereby any adverse impacts that are allowed have to be compensated for. The overall requirement for protecting functions is found in WAC 173-26-186(8), which provides a framework for protecting ecological functions composed of several pieces of work, all of which are interdependent on each other. ***It is critical to understand*** that the CIA and restoration plan are not stand-alone requirements that are separate from each other. They are part of the larger requirement to protect ecological function and must all work together. The requirement to protect ecological functions includes the following parts:

- An accurate inventory and characterization of ecological functions is needed, including identification of areas with degraded and intact ecological functions, as emphasized in the 2011 changes to the SMP Guidelines. It is the fundamental component used in identifying the jurisdiction's remaining intact areas so they can be protected.<sup>3</sup>

<sup>1</sup> Despite being called 'Guidelines,' the SMA, in RCW 90.58.080(1), requires that shoreline master programs shall be consistent with the SMP Guidelines.

<sup>2</sup> For a description of the adverse impacts of development on Puget Sound, please see Mary H. Ruckelshaus and Michelle M. McClure coordinators, Sound Science: Synthesizing ecological and socioeconomic information about the Puget Sound ecosystem pp. 57 – 59 and pp. 68 – 72 (Prepared in cooperation with the Sound Science collaborative team. U.S. Dept. of Commerce, National Oceanic & Atmospheric Administration (NMFS), Northwest Fisheries Science Center, Seattle, Washington: 2007). Accessed on April 30, 2011 at: [http://www.nwfsc.noaa.gov/research/shared/sound\\_science/index.cfm](http://www.nwfsc.noaa.gov/research/shared/sound_science/index.cfm)

<sup>3</sup> WAC 173-26-201(3)(d)(i)(E).

- Protecting functions by “designing” mitigation sequencing into the environments, policies and regulations of the SMP, including directing development away from intact areas and establishing specific standards that require individual projects to avoid and minimize impacts as much as possible, and then compensate for remaining impacts. Typical impacts from all types of development need to be addressed. After comparing the typical development impacts with the regulations, the gaps in protection are the basis for determining what impacts are allowed or not allowed by the SMP.
- Performing a Cumulative Impact Analysis is required to account for all the sources of degradation. It reviews gaps in the regulations to determine what impacts they allow, identifies non-regulatory impacts, and accounts for all impacts cumulatively. For the impacts allowed by the SMP regulations, the jurisdiction must either change the regulations to eliminate the impacts, or compensate for the impacts itself – generally through the Restoration Plan.
- Restoration Planning identifies ways to compensate for the remaining impacts allowed by the SMP, to compensate for the other sources of degradation, and otherwise identify ways to ensure the ecological functions of the shoreline are on an overall trend toward improvement.

Accounting for ecological functions in the CIA may seem like an esoteric exercise to many people. A good way to think of it is as an indicator of how protective the SMP is – a very protective SMP leaves few impacts to account for. It helps to think of the CIA conceptually in terms of *balancing the budget* of mitigation sequencing within the SMP. This is similar to balancing a family budget, where you try not to spend your money unnecessarily, and if you spend money, you need to replace it to keep the budget balanced. The CIA keeps track of impacts in a similar manner - the SMP should avoid degrading shoreline functions, and if it does allow degradation, the jurisdiction must replace the losses.

When the entire SMP update effort is performed well, (1) the SMP should be very protective, leaving few impacts after development review; (2) the CIA should identify the actual impacts the SMP is allowing; and (3) the Restoration Plan should provide the compensatory mitigation for those losses. This guidance document describes a logical path through the state requirements in order to ensure no-net-loss of ecological functions, and provides practical steps in developing the CIA, which are summarized below, and discussed in detail at the end of this document:

- 1) Compare common impacts of development with the SMP regulations.
- 2) Establish shoreline analysis segments.
- 3) Compare development allowed in intact areas.
- 4) Compare development allowed in existing developed areas.
- 5) Determine impacts allowed by the buffer system.
- 6) Determine if impacts will be reduced by “likelihood” considerations.
- 7) Determine impacts from other sources of degradation.
- 8) Accumulate all impacts from all sources of degradation.
- 9) Compensate for the degradation using the restoration plan.

### ***Fundamental Obstructions to Ensuring No-Net-Loss***

One of the primary problems we have observed to the development of good SMPs is the failure to accurately identify all the impacts of development because of an incomplete understanding of impacts, mitigation, compensation and restoration. This in turn means that cumulative impacts cannot be accurately measured. Throughout this document we discuss the many different permutations of the problem, and why they do not meet the SMA or SMP Guideline requirements. In our many discussions with planners we have observed these permutations in almost all jurisdictions, though of course some have fewer than others. They are:

- Assuming that vague statements of no-net-loss will prevent impacts
- Assuming that conversion of intact areas has no impacts
- Not considering the impacts on fish and wildlife of human presence in areas that previously had little or no human presence

- Assuming that degraded buffers have no functions to impact
- Assuming that degraded buffers can prevent impacts
- Assuming that avoiding additional damage to degraded buffer vegetation equates to having no impacts
- Assuming that meeting degraded buffers prevents impacts
- Assuming that meeting small buffers prevents impacts
- Assuming that waiving buffers for some development has no impacts
- Assuming that only minimization standards will prevent impacts
- Being unwilling to accurately identify impacts since they require compensation by either the project or the jurisdiction, which is financially or philosophically objectionable
- Excluding cumulative impacts from some development by claiming it is “unlikely,” even though it is still allowed in the SMP

This problem has been prevalent for the last 30 years. Historically, development impacts have been largely unmitigated. Even when specific standards were included, they were mainly limited to minimization, they rarely included using alternatives that avoid causing impacts, and almost never required compensatory mitigation for the remaining impacts. Even today, as an example, jurisdictions typically do not require the replacement of buffer vegetation for new road and utility crossings. Similarly, docks, boat ramps, access paths, bulkheads and even entire residences are typically allowed with no compensatory mitigation. There is a subconscious assumption that using small buffers, or just meeting minimization standards, or any of the other incorrect assumptions results in no impacts, and no compensatory mitigation is required from the development. This has resulted in the spiral of degradation we have historically experienced and continue to experience. Many jurisdictions are continuing this pattern by using vague statements of protection instead of specific standards that actually result in protection.

The new SMP Guideline’s requirement to account for ecological functions is a result of this historic unwillingness or inability to require projects to provide full mitigation. Consequently, there will also be inherent resistance to accounting for impacts to ecological functions – beginning with establishing a protective SMP. The “framework” for protecting ecological functions in the SMP Guidelines causes two disincentives to preparing an accurate CIA that must be carefully understood and prepared for before developing the SMP. First, jurisdictions do not want to establish stricter regulations on development, because they are unpopular for financial or philosophical reasons. Second, jurisdictions do not want the financial responsibility for the restoration projects needed to compensate for the impacts allowed by the SMP. These disincentives set up a dynamic that either consciously or unconsciously will strongly encourage the development of inadequate CIAs, as follows. If the jurisdiction leaves the regulations lenient, then they have to pay for restoration of lost ecological functions. If they make the regulations more stringent, they have to make unpopular decisions. Thus there are incentives to establish less protective regulations, but still claim there are no impacts from the regulations so they don’t have to compensate for them.

**Pitfalls to Avoid: Don’t attempt to “fudge” the CIA to cover for a poor SMP. It is too easy to identify actual impacts that are not accounted for.**

We have observed that some CIAs claim there are no lost ecological functions, even though the SMP is fundamentally structured to allow impacts. These SMPs typically include the above list of unaccounted-for impacts, they fail to identify and compensate for even the most obvious impacts, they allow conversion of intact areas, they provide nuanced exceptions from protection measures to allow more development, and they provide no specifics about replacement of lost functions. These SMPs are often accompanied by vague statements of “no-net-loss of ecological functions,” and then assuming that means there will be no cumulative impacts. This is akin to a child wishing for good grades without actually doing the studying and work needed to get good grades – wishful thinking does not accomplish the task

Another major problem regarding CIAs we have encountered is a mindset with a perceived disconnection between “mitigation” and “restoration.” This distinction seems to originate in the idea that restoration and mitigation are exclusive from each other; thus mitigation is only fixing damage from a new project, while

restoration is only fixing damage from past projects or other degradation. The result is a mindset that new development cannot be required to restore or improve degraded conditions it did not cause. When present, this mindset pervades the development of the SMP, CIA, and Restoration Plan, and results in a Restoration Plan with little relationship to the actual SMP and CIA it is supposed to support. At its worst, the effect is a black and white distinction that presumes the Restoration Plan must be completely separate from the SMP and CIA.

Because of this disconnection, (1) the Restoration Plan barely mentions the SMP regulations, if at all; focusing instead on restoration projects; and (2) the CIA is not allowed to accurately identify impacts that the restoration plan could compensate for, regardless of whether the SMP is protective or not. The outcome of this mindset is that the concept of “restoration” is not allowed in the regulations of the SMP – it has to be limited to the Restoration Plan. Furthermore, the idea of “mitigation” must be limited to the SMP and cannot be considered in the Restoration Plan. However, the SMP Guidelines do not distinguish restoration and mitigation as exclusive from each other. Rather the restoration outcomes of SMP regulations and other regulations are explicitly considered to be part of restoration planning, as discussed in the section on restoration planning. Neither is there a statement that mitigation cannot improve ecological functions - in fact, the Guidelines recognize that restoration is a tool that can be used to mitigate the adverse impacts of a development.<sup>4</sup>

The framework for protecting ecological functions is composed of items that are all interdependent on each other. If one piece of the framework is disconnected, the framework can't function to protect ecological functions. Disconnecting the Restoration Plan severely limits the jurisdiction's ability to meet the no-net-loss of ecological functions requirement.

The problem with disconnecting the CIA and SMP from the Restoration Plan is that it effectively eliminates possibly the most common way to compensate for impacts - out-of-kind mitigation. And since many impacts cannot be directly compensated for easily (i.e. new armoring to protect a residence, or shading from a new dock), this mindset encourages ignoring those impacts. Out-of-kind mitigation can improve degraded conditions, especially for impacts to ecological functions that cannot be directly replaced; for example, enhancing degraded vegetation to compensate for dock shading, shore armoring, or a heavily used trail.

Two extreme reactions can help convey the extent of the problem created in accounting for ecological functions caused by this mindset. These examples also seem to incorporate a philosophical opposition to implementing the SMA policy and SMP Guidelines.

1. Some jurisdictions have attempted to use the false distinction between restoration and mitigation to pervert the requirement of no-net-loss of ecological functions into a standard that prevents improvement of ecological functions with statements such as: “Mitigation required for a project shall not result in an increase in ecological functions above those existing at the time of development.” This is an incorrect statement. No-net-loss is a minimum, as WAC 173-26-221(5)(b) requires: “Master programs shall contain policies and regulations that assure, at minimum, no net loss of ecological functions necessary to sustain shoreline natural resources.” Increased function is allowed.
2. We have even observed one jurisdiction that included a blanket SMP statement similar to the following: “A project meeting the SMP development standards establishes the presumption that there will be no-net-loss of ecological functions.” Even with a very protective SMP (which was not the case), such a statement cannot be true.

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<sup>4</sup> As one example, WAC 173-26-241(3)(d) explicitly provides in part that “Master programs should require that public access and ecological restoration be considered as potential mitigation of impacts to shoreline resources and values for all water-related or water-dependent commercial development unless such improvements are demonstrated to be infeasible or inappropriate.”

## ***Mitigation Sequencing Must Be Built Into the Structure of the SMP***

Before describing the actual CIA and Restoration Planning requirements, it is critical to understand their source in the SMA policy and SMP guidelines. This is summarized below.

The Shoreline Management Act (SMA) voter approved policy statement in RCW 90.58.020 lists a primary policy objective of the act [with emphasis]: “This policy contemplates protecting against adverse effects to the public health, *the land and its vegetation and wildlife, and the waters of the state and their aquatic life*, while protecting generally public rights of navigation and corollary rights incidental thereto.” Thus, while new development is allowed, it must protect natural functions and ecological features, and the public’s interest in health and navigation. *Note that* not even water-dependent uses are listed as being equal to these items. Water dependent uses are discussed in detail in our guidance document dealing with use limits and preferences. This policy is echoed by the policy paragraph that provides particular protection for Shorelines of Statewide Significance, which establishes a list of preferences for both the long term protection of the public interest, and protecting the natural character and functions of these shorelines.

In addition, the SMA policy provides that “[p]ermitted uses in the shorelines of the state shall be designed and conducted in a manner to *minimize*, insofar as practical, any resultant damage to the ecology and environment of the shoreline area and any interference with the public’s use of the water.”

These two principles are implemented in the SMP Guidelines through requirements for no-net-loss of ecological function and mitigation sequencing. Regarding *no-net-loss of ecological functions*, the Guidelines require that: “Local master programs shall include policies and regulations designed to achieve no net loss of those ecological functions.”<sup>5</sup> Note that the requirement to “design” the SMP to accomplish no-net-loss is restated in four other locations as well, for uses, modifications, and cumulative impacts.<sup>6</sup> The no-net-loss requirement is accomplished using the concept of *mitigation sequencing*,<sup>7</sup> whereby the first task of mitigation is avoidance of impacts, the second task is minimization of impacts, and the third is compensation for remaining impacts. Stated another way, allowing development to impact the shoreline is supposed to be the last option, not the first option. WAC 173-26-221(5)(b) makes that clear, providing [with emphasis]: “Where uses or development that impact ecological functions are necessary to achieve other objectives of RCW 90.58.020, master program provisions shall, to the greatest extent feasible, protect existing ecological functions and avoid new impacts to habitat and ecological functions before implementing other measures designed to achieve no net loss of ecological functions.”

*Of critical importance in understanding* mitigation sequencing is that the word “mitigation” does not mean replacement of lost functions - that is “compensation” which is the last option. Many people confuse the terms, which then implies that performing mitigation means jumping straight to compensation and replacement before using avoidance and minimization. But compensatory mitigation for damage done is not the same as “prevention of damage to the natural environment,” which is an important distinction to qualify as a preferred use, as discussed in detail in our guidance document dealing with use limits and preferences.

“Designing” an SMP to accomplish the no-net-loss principle means “designing” the different components of the SMP using mitigation sequencing. The SMP Guidelines include requirements for several components that,

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<sup>5</sup> WAC 173-26-186(8)(b) under Governing Principles of the Guidelines relating to ecological functions; and implemented in WAC 173-26-201(2)(c) under Basic Concepts.

<sup>6</sup> (1) Governing Principles for protecting ecological functions in WAC 173-26-186(8)(b)(i),  
(2) General principles for all modifications in WAC 173-26-231(2)(d),  
(3) General principles for all uses in WAC 173-26-241(2)(a)(iv),  
(4) Cumulative Impacts Analysis requirement in WAC 173-26-201(3)(d)(iii).

<sup>7</sup> WAC 173-26-201(2)(c) under Basic Concepts and Protection of Ecological Functions; and implemented in WAC 173-26-201(2)(e) under Basic Concepts, Environmental Impact Mitigation.



if implemented correctly, accomplish mitigation sequencing at different levels within the SMP. These components include:

- Designating environments.
- Placing limits on uses and modifications.
- Establishing buffers (or setbacks with vegetation management) based on science.<sup>8</sup>
- Developing regulations specific to different types of development.

Each of the above components is a subject of one of our Guidance Documents, each of which describes how to design mitigation sequencing into the element. Designing each component to avoid and minimize impacts, and then including specific standards for compensation of remaining impacts will result in an SMP that is structured to prevent the loss of ecological functions as much as possible.

There are two important points to keep in mind when preparing an SMP: (1) the rule of liberal construction, and (2) the requirement to rationally and carefully plan. When implementing and interpreting typical laws we use strict construction, but for shoreline law we use liberal construction (as required by RCW 90.58.900) “to give full effect to the objectives and purposes for which it was enacted.” This means that when shoreline laws are interpreted, the correct outcome is the one providing more protection to shorelines rather than the one providing less protection. The legislative findings in the SMA policy statement (RCW 90.58.020) identify the “clear and urgent demand for a *planned, rational, and concerted effort* ... to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.” This statement has clear repercussions, in developing an SMP because strategies that provide little detail and vague standards, or that do not address certain types of development are not undertaking a “planned, rational, and concerted effort”. Rather, such an approach is planning by default, without careful consideration, and accomplishes the opposite of the SMA policy intent.

**Pitfalls to Avoid: Don’t rely on vague statements of protection, but rather design specific regulations for all types of development.**

Some jurisdictions have attempted to meet the no-net-loss of ecological function requirement by simply repeating the no-net-loss principle in the regulations for the different types of development. In turn, they typically include few other regulations, establish few use limits, and make few distinctions in mapped environments. Aside from not meeting many other requirements, such an approach makes it uncertain that impacts will even be identified, let alone mitigated at the project stage. Such uncertainty cannot be accounted for in the CIA for several reasons:

- It defers protection measures to an undefined later date during project review.
- It does not acknowledge the common impacts of different types of development as required by the Guidelines (or worse, even assumes there are no impacts).
- It leaves protection measures vague and undefined, rather than “designing” them to protect ecological functions, as required by the Guidelines.
- It leaves the project review open to tampering by influential people pressuring either to not acknowledge impacts (since are not identified in the SMP), or to not develop specific mitigation.
- It assumes future staff will have the time and expertise to understand the impacts, or at worst assumes that untrained staff just relies on the project consultant without checks and balances.

This is not the intent of the SMP Guidelines, nor the SMA legislative intent to plan carefully. The SMP and its array of policies and regulations *are themselves to be designed* to accomplish no-net-loss of ecological functions, not simply to restate the principle over and over. Vague standards of protection have been in place since the inception the SMA (and for critical areas the GMA). But such a strategy has allowed degradation for 30+ years (and 10+ years for critical areas). A famous quote says: “If you keep on doing what you’ve always done, you’ll keep on getting what you’ve always got.” [W. L. Bateman]. It is critically important to establish specific standards that actually address impacts rather than relying on the historic approach of vague protection statements that plan by default. Specific standards accomplish

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<sup>8</sup> WAC 173-26-221(5)(b).

mitigation sequencing, and are required in the SMP Guidelines provision to protect ecological functions in WAC 173-26-186(8)(b)(i) [with added emphasis]: “Local master programs shall include regulations and mitigation standards ensuring that each permitted development will not cause a net loss of ecological functions of the shoreline.”

**Pitfalls to Avoid: Don’t “balance” away shoreline policy to accommodate development.**

WAC 173-26-186(9) reads [with added emphasis]: “To the extent consistent with the policy and use preference of 90.58.020, this chapter (WAC 173-26), and these principles, local governments have reasonable discretion to balance the various policy goals of this chapter...” This is similar to the implementation statement in the SMA policy, in which preferences and priorities are established, but only in the implementation of the policy itself. (See our guidance document regarding use limits and preferences for a detailed discussion.) However, some jurisdictions have used the “balancing” phrase by itself as an excuse: (a) to designate intact areas with development-oriented environments that will allow them to be converted to human uses; (b) to allow development in the buffer that has no need to be in the buffer, and without regulations to accomplish mitigation sequencing; and (c) to allow a broad range of development they desire (i.e. recreation facilities, trails, public access, residences, or even commercial uses) in protective environments in preference to the SMA policy preferences. While doing so inherently causes a loss of functions, they do not acknowledge these inherent impacts, nor require specific compensation for the losses, nor account for the losses in their Cumulative Impacts Analysis. Such a use of the “balancing” clause selectively ignores the requirement to be consistent with the policy to protect ecological functions. The facilities they desire may be allowable, but they must still protect shoreline ecology to the extent feasible, and provide compensation for impacts to functions.

## ***Requirements for Cumulative Impact Analysis***

The basic principal of no-net-loss is that any impacts that are allowed have to be compensated for. Before discussing the requirements for cumulative impact analysis, it is useful to describe how compensation should happen in conceptual terms.

**How do you compensate for impacts?** In both the context of individual projects and the CIA and Restoration Plan, many people have asked us how you compensate for lost functions after you do avoidance and minimization. The question comes from understanding that some functions are difficult to mentally grasp and understand for non-scientists (for example, sedimentation rates, chemical interactions, etc.) and that there can be dozens of different functions. Most people also understand that particular natural features provide a group of functions. The clue for how to compensate for them comes from the Policy of the SMA, which is to protect and restore the ecology and natural character. Thus, when individual or groups of ecological functions that are derived from natural features are eliminated or degraded to a lower level, they need to be replaced with natural features that perform the lost functions. Replacement compensation should always use more natural options in preference to less natural options, and should take place at double or triple the area (or other unit) to compensate for failure rates, and for the age/maturity of the feature. Of course replacing lost vegetation on-site when the site is already intact is nearly impossible, and compensation must probably be done off-site.

Thus for example, installing an access to the water will displace intact or degraded vegetation and inject human activity into the buffer area that will impact or drive off fish and wildlife. The loss of functions would be compensated for by recreating new buffer vegetation area. On a degraded site, these impacts can be compensated for by re-establishing buffer vegetation that performs similar ecological and habitat functions. On the other hand, it is inappropriate to replace functions derived from natural features with functions derived from artificial features; such as eliminating buffer vegetation and replacing the bank stability functions with shore armoring. Lastly, some features are very difficult to replace. When straightforward compensation is not possible, “out-of-kind” mitigation (replacing lost functions with different functions) must be used, as described earlier in this document. And if the functions can’t be provided on the site, then “off-site” mitigation must be used.

The requirement for the CIA is found in the Governing Principle of the SMP Guidelines (WAC 173-26-186(8)) that requires the protection of ecological functions. The CIA is just one component in protecting ecological functions. Unlike other parts of the SMP Guidelines, there is little direction for how to perform a Cumulative Impacts Analysis. The two sections that discuss it are a short section in WAC 173-26-186(8)(d), and approximately a page of implementation text in WAC 173-26-201(3)(d)(iii). These mainly require that jurisdictions have to evaluate cumulative impacts and ensure there is (A) no-net-loss of ecological functions, and (B) no-net-loss of other shoreline values. Rather than copying the entire text, the few pieces of specific guidance are described and discussed below.

The SMP and CIA must “fairly allocate the burden of addressing cumulative impacts among development opportunities.”<sup>9</sup>

Since allocating the burden to adjacent property owners, or owners across town, or other cities/counties would be unfair, there are really only two options – either the development project or the jurisdiction must pay the cost of compensating for the impacts.

The first and most obvious option is to allocate the burden onto the development causing the impacts. This is also the primary intent of mitigation sequencing – both in the structure of the SMP, and in the permit requirements for the development. This means that the SMP environments and regulations must be very good at preventing the impacts, identifying the likely impacts that will happen, and requiring compensation for the impacts that are allowed. Even an excellent SMP will allow some impacts that cannot be mitigated on the site.

The second option is the default option. Whether the SMP is good at preventing impacts or not, the burden of compensating for all the remaining impacts allowed by the SMP (after permits, exemptions, etc.) falls on the local government that allowed them (essentially the local taxpayers).

**Pitfalls to Avoid: Don’t compensate for impacts allowed by the SMP with restoration others are paying for.**

In our discussions with planners, we have encountered the viewpoint that even though the regulations allow impacts, the restoration plan projects make up for the impacts. However, those restoration plans almost exclusively consist of projects implemented by other organizations, which are typically funded by state and federal grants. Such an approach unfairly allocates the burden of the jurisdiction’s inadequate SMP onto state and federal taxpayers, and dodges responsibility for the SMP impacts. It also undermines our restoration and salmon recovery efforts, and consumes or negates the benefits those efforts are accomplishing.

“To ... assure no net loss of shoreline ecological function ... requires assessment of how proposed policies and regulations cause and avoid such cumulative impacts.”<sup>10</sup>

A Cumulative “Impacts” Analysis requires one to analyze the impacts that the regulations are allowing (not what they are preventing), to determine if there will be a loss of ecological function. This means looking past the SMP standards that are listed to see what is still allowed – what is NOT covered in the SMP. This entails comparing common impacts of development with the regulations in the SMP, comparing uses allowed to the existing ecological conditions, and applying the impacts allowed by the regulations to the areas in which the uses are allowed. More specific details are found at the end of this document.

This also means that staff needs a thorough understanding of the impacts of different types of development, from roads and bridges, to docks, to bulkheads, to residences, to commercial and industrial uses. Each has

<sup>9</sup> WAC 173-26-186(8)(d)

<sup>10</sup> WAC 173-26-201(3)(d)(iii)

impacts particular to the type of development - partly based on the construction methods, partly based on the nature of the use, and partly based simply on their displacement of natural features.

**Pitfalls to Avoid: Do not simply list SMP protection standards.** Some CIAs we have reviewed are largely a recitation of the protection standards. Such an approach results in a Cumulative “*Protection*” Analysis, which does not meet the requirement.

“For such commonly occurring and planned development, policies and regulations should be designed without reliance on an individualized cumulative impacts analysis.”<sup>11</sup>

As we have stated before, the SMP Guidelines require that environments, policies, and regulations are themselves to be designed to mitigate commonly known impacts. Jurisdictions are not supposed to avoid including the specific regulations designed to mitigate impacts in favor of vague statements of “no-net-loss.” Doing so would mean that the CIA has no concrete standards on which to base a determination that common impacts are mitigated. Since the cumulative impacts of an SMP are those not covered by the SMP regulations, excluding specific standards that cover common impacts turns ALL the impacts of a project into cumulative impacts. Thus when a jurisdiction performs a no-net-loss of ecological functions assessment on a project (having only the vague no-net-loss standard) it is also performing an individualized cumulative impact analysis.

**Pitfalls to Avoid: Do not avoid designing regulations that address all the common impacts of different types of development.** Some SMPs use vague statements of no-net-loss rather than designing the environments and regulations to deal with common impacts. As noted above, relying only on vague no-net-loss statements is the same as performing an individualized cumulative impacts analysis on project-by-project basis, which is both contrary to this requirement and allows a net loss that is not accounted for in the CIA. In addition, it is easy to identify common impacts that are not addressed in these SMPs. As an example, one jurisdiction’s draft SMP includes 5 or 6 standards for a particular type of development. One is a general statement to result in no-net-loss, but the rest are just reminders to follow other laws. The result is effectively only one standard with no specificity to address common impacts.

Furthermore, since the resulting CIAs have little or no specific standards to base reviews of cumulative impacts, these SMPs have no SMP-level cumulative impact analysis being performed. But stating so would mean the burden of addressing the cumulative impacts falls on the jurisdiction. Thus there is an incentive for the CIA to be written stating that the regulations are adequate and that there are no cumulative impacts.

“For ... un-anticipatable or uncommon impacts that cannot be reasonably identified at the time of master program development, ... regulations should use the permitting or conditional use permitting processes to ensure that all impacts are addressed and that there is no net loss of ecological function of the shoreline after mitigation.”<sup>12</sup>

While the Guidelines require the SMP to address common impacts, all projects can have unanticipated impacts. As we have pointed out, the regulations have to do more than restate the no-net-loss principle over and over, and accomplishing the principle requires mitigation sequencing. However, a “general” no-net-loss standard and mitigation sequencing standard is still needed to cover those unanticipated and uncommon impacts in project review. While the requirements are important to understand, our observation is that these statements are typically common in both good and bad SMPs – and thus not usually a problem area.

<sup>11</sup> WAC 173-26-201(3)(d)(iii)

<sup>12</sup> WAC 173-26-201(3)(d)(iii)

**Pitfalls to Avoid: Don't avoid including no-net-loss and mitigation sequencing regulations in general standards.**

We have observed only a few jurisdictions that do not meet this requirement, since it is so easy to accomplish, but there have been some that have attempted to place both standards in non-regulation locations in the SMP, which takes them out of the normal realm of permit review. They need to be actual regulations.

Consider “reasonably foreseeable” development, but acknowledge that there are “practical limits when evaluating impacts that are prospective and sometimes indirect.”<sup>13</sup>

**Pitfalls to Avoid: Don't exclude impacts of development that is “unlikely” - estimate them.** In our reviews of CIAs and discussions of cumulative impacts with many planners, the clauses in the heading above provide one of the most common excuses for avoiding discussion of all the cumulative impacts actually allowed by the SMP impacts. The claim is that even though the SMP may allow extensive types of development, and even the conversion of intact areas, such development is “unlikely” or is not “reasonably foreseeable” and the cumulative impacts are excluded from consideration. Such a strategy is logically flawed for two reasons. (1) It avoids the very intent of the requirement (considering the accumulation of impacts over time), which is one reason our shorelines are as degraded as they are. (2) Unlikely development IS reasonably foreseeable, by estimating the “likelihood” of the development, as described below.

The most important point in considering “unlikely” impacts is that development impacts that are allowed in the SMP but are unlikely cannot be ignored completely in the CIA, they can only be reduced. Estimating the “unlikely impacts” of certain types of development is not that difficult using professional judgment. If the jurisdiction intends to reduce the impacts to be considered in the CIA based on the low likelihood of the development, three tasks are needed. First, the area where the impact is allowed needs to be determined. Second, the impacts allowed under the SMP regulations if the development happens need to be estimated. Third, the likelihood that the development will happen needs to be determined using a percentage amount anticipated to occur over a given period of time (zero or functionally zero are not acceptable since the development is not prohibited). In establishing the percentage, one has to acknowledge that given enough time, 100% occurrence will take place for some types of development and some areas (especially cities). The first two tasks can be used to estimate the total potential impacts. The “likelihood” percentage can then be used to reduce the impacts to be considered.

For linear facilities, the process would be different, since impacts can vary widely. But they are still estimable. Impacts from linear facilities allowed parallel to the shoreline have much greater impacts than the occasional water crossing (mainly over streams and wetlands), though crossings can also have major impacts when they are undersized and numerous. Since the Guidelines require utility and transportation facilities to be outside shoreline jurisdiction whenever possible, most jurisdictions include regulations that prohibit new facilities parallel to the shore, and regulations requiring that new service line and road crossings use the most direct route across. This eliminates the need to consider parallel facilities as a cumulative impact. Then public road and utility crossing impacts can be evaluated based on road and utility main patterns and subdivision requirements. And impacts of private crossings on streams and wetlands (for driveway bridges and utility service lines) can be evaluated by estimating the existing lot patterns and numbers in proximity to existing roads. The number of possible driveway bridges will depend on regulations for both existing lots and new subdivision lots (1) to require the use of alternative access points that don't need a new crossing, and (2) to require sharing access roads, utility crossings, and bridges with nearby lots. Otherwise the CIA needs to consider that each lot will build a new individual driveway, bridge, and service line over the stream - which is the existing pattern for many streams where roads already run parallel and every lot on the opposite side of the stream has a private driveway, bridge, and utility line crossing. Once these potential impacts that the SMP

<sup>13</sup> WAC 173-26-186(8)(d) & WAC 173-26-201(3)(d)(iii)

allows are estimated, a likelihood percentage can be assigned as described above to arrive at the amount of likely impacts to account for in the CIA.

These estimates will not be entirely correct, but they will be recorded so that future updates can check their accuracy with actual development, compare it with restoration projects the jurisdiction has undertaken, and then the jurisdiction can provide compensation for actual losses of ecological function in future Restoration Plans. The jurisdiction can then also use more accurate estimates in the future. Of course the Restoration Plan must have projects for the jurisdiction itself to use for this compensation.

“To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts ...”<sup>14</sup>

**Pitfalls to Avoid: Don’t avoid identifying actual impacts and designing regulations to address them.**

This requirement makes it clear that the CIA is dependent on the SMPs ability to prevent impacts. While the above statement is the most basic of the requirements for a CIA, we have observed many problems that impede the true assessment of cumulative impacts. All of these seem to have a common feature that is overlooked in SMP development - almost all development has impacts, and many developments have impacts that cannot be mitigated on-site. Many of the incorrect assumptions that obstruct the accurate assessment of impacts are discussed in detail below. As already pointed out, using vague standards of no-net-loss and excluding regulations that address the common impacts simply turns all project impacts into cumulative impacts. Yet the CIAs for SMPs that use vague statements do not account for the cumulative impacts. Even the CIAs for SMPs that do use detailed standards to address common impacts typically do not acknowledge some of these types of impacts.

Our guidance document “Shoreline Buffer Options That Work with Buffer Science” provides (1) summaries of several syntheses of science literature relating to buffers and vegetation, (2) a description of vegetation functions, (3) a discussion of the functions of degraded sites, (4) common impacts of new development, (5) common impacts of existing development, and (6) recommended options for developing buffer systems that logically flow from the science. The reader should read that document to supplement the descriptions of functions and impacts provided here.

**Assuming that conversion of intact areas has no impacts.** The most substantial losses of ecological function come when new development in largely intact areas (those that should have protective environments) displaces vegetation that provides ecological functions and wildlife habitat - both inside and outside the buffer. Few SMPs require the replacement of this habitat. Furthermore, while a project on a **degraded site** can provide compensatory mitigation on-site, how do you provide compensatory mitigation on an **intact site**? There are little or no enhancement opportunities - certainly not at the same scale of the development impacts. A more common situation is when SMPs allow development inside a largely intact buffer (for access, docks, driveways, bridges, utility crossings, water-dependent recreation, etc.). This has many of the same problems as for fully intact areas. Few SMPs require a trail, utility, or road crossing to replace the displaced buffer vegetation, as one example. In both cases where intact native vegetation is lost, the regulations need to require projects to provide compensatory mitigation, including the likely necessity of developing off-site mitigation.

**Not considering the impacts on fish and wildlife of human presence.** A more indirect impact is that the injection of human users into largely intact areas or intact buffers - even with relatively minor development like trails and docks - drives off fish and wildlife. Most people have experienced driving on a road and seeing wildlife. The animals may tolerate the presence of the vehicle, but when people get out of the car, the animals flee. Similarly, people who are avid fishers know that fish flee from human disturbances in and near the water,

<sup>14</sup> WAC 173-26-186(8)(d); with similar statements throughout this section and WAC 173-26-201(3)(d)(iii).

and on a dock. We have observed no SMPs that address this impact in their regulations. Mitigating for human intrusion will likely require out-of-kind compensatory mitigation, and possibly require off-site mitigation.

**Assuming that degraded buffers have no functions to impact.** While the above examples use relatively intact areas to demonstrate the point, even degraded areas have ecological functions that can be further degraded. Planners often equate degraded sites to having no functions to impact. On the contrary, the existence of lower levels of ecological function does not lessen the impacts of the development, it only reduces the maximum possible loss of functions caused by those impacts. Even converting lawn or degraded vegetation to sidewalks and roads further degrades those areas for ecological functions and habitat use.

**Assuming that avoiding more damage to degraded buffer vegetation equates to having no impacts.** Another version of the above assumption mistakenly equates development impacts to whether damage is directly caused to the vegetation, resulting in the approach that a project leaving degraded ecological functions in place is the same as having no impacts. This is incorrect. New development will have impacts whether vegetation is intact or degraded. But degraded vegetation will have a lower maximum possible loss of function.

**Assuming that degraded buffer can prevent impacts.** Some planners assume that meeting a degraded buffer (whether a small buffer or science-based buffer) width automatically means there will be no impacts. The science states that intact vegetation is needed to provide functions and mitigate impacts. Small buffers automatically allow impacts, and degraded science-based buffers cannot function fully and will allow impacts.

**Assuming that meeting small buffer can prevent impacts.** A slightly different version of the above example is when planners assume that meeting a small buffer width automatically means there will be no impacts. Small buffers are already degraded, even if the small width is well vegetated. The science shows that inadequate width buffers cannot perform functions or mitigate impacts. This assumption usually also comes with the assumption that unlimited additional development outside the small buffer has no impacts, which is incorrect.

**Assuming that waiving buffers for some development has no impacts.** We have observed a practice of systematically waiving buffer requirements for broad lists of facilities (one jurisdiction had 3 pages worth) – many of which can be placed outside the buffer without eliminating their function. We have seen this pattern in almost all jurisdictions regardless of whether buffers are intact or not, and use science-based widths or not. But it typically is not accompanied by any specifics about providing compensatory mitigation along with the development. Widespread examples include trails that could be placed outside the buffer or in the margins, allowing stormwater facilities to displace buffer vegetation, and sometimes even residential accessory facilities. Only water-dependent or water-related development should be allowed inside the buffer. Any other exceptions need to include criteria for avoidance and minimization, similar to Shoreline Variances and Conditional Use Permits. And all instances (water-dependent or not) should also include specifics about how to do compensatory mitigation for that kind of development.

**Assuming that minimization standards prevent impacts.** A common assumption is that minimization will prevent impacts. An example is that many dock regulations fall under this category. Minimization is a part of mitigation sequencing. By definition of the term, minimization only reduces impacts – it doesn't avoid them. Thus development that meets minimization standards must still compensate for the remaining impacts.

Contrary to the above assumptions, most SMP provisions will inevitably have built-in impacts, unless built-in mitigation is also required to eliminate most of the impacts. Eliminating impacts requires that the SMP (a) have a default position that, except for rare instances, development will have impacts, (b) require compensatory mitigation plans with each project, (c) focus the compensatory mitigation to enhance degraded conditions, and (d) use specific compensatory mitigation standards for different types of development.

Just a few examples are in-water and near-water development (docks, armoring, etc.), small buffers, and buffer reductions. Such provisions need to also have specific compensatory mitigation requirements to improved degraded conditions at the site. For example, small buffers and buffer reductions should be required to enhance degraded areas of buffer vegetation so that they function; and in-water and near-water facilities (docks, etc.) should be required to enhance vegetation or removed armoring, etc. Other examples of compensating for impacts can be found in our buffer options guidance document. Lastly, the remaining impacts that can't be mitigated on-site need to be compensated for in the Restoration Plan. Unfortunately, as we have pointed out, the easiest way for a jurisdiction to avoid responsibility for them is to write the CIA stating there are no impacts.

**It is recognized that shoreline ecological functions may be impaired not only by shoreline development subject to the substantial development permit requirement of the Act but also by past actions, unregulated activities, and development that is exempt from the Act's permit requirements.<sup>15</sup>**

In the many SMP Guidelines requirements to protect ecological functions, there are numerous references to accounting for impacts in the CIA from all the different sources. The previous section discussed the typically unmitigated impacts of new development. But existing development, unregulated activities, and exempt development also degrade shoreline functions. Our guidance document "Shoreline Buffer Options That Work with Buffer Science" discusses the impacts of both new and existing development in more detail.

While impacts of new development have a chance of being mitigated through the review of permits or exemptions, other sources of degradation are unmitigated – but the still need to be assessed and compensated for in the Restoration Plan. Without a method of offsetting these effects, shoreline wildlife will get displaced or driven off, habitat and native vegetation will slowly disappear, and shoreline waters will get slowly degraded. Other sources of degradation include:

- Ongoing impacts of existing development close to the water, including glare, noise, septic inputs, chemical use, sedimentation from development near shorelines, etc.
- The creep of un-reviewed activity and casual development near the water and in the buffer. This includes installing or expanding small landscape features that are on the boundary of needing a permit, such as extending cleared yard areas into native vegetation, paving unpaved paths, building small structures for which the jurisdiction does not review building permits, building rock landscaping walls, etc. This continual and gradual creep encroaches more and more on native vegetation, wildlife habitat, and ecological functions.
- Unenforced violations. Many jurisdictions do not enforce shoreline and critical areas violations for financial or philosophical reasons. Thus the system encourages violations and their often extreme impacts. Many SMPs have almost no description of the violation and enforcement process or consequences, yet we have observed no CIAs that account for violations. This issue is not a problem for SMPs with adequate enforcement provisions.
- Shoreline exemptions without adequate review processes and application of standards. Despite our comments, many jurisdictions refuse to describe in their SMP how they review exemptions. Exemptions must still meet the SMP standards, including the requirements for mitigation sequencing – especially compensatory mitigation. They must be reviewed in some manner – even in an abbreviated review. The SMPs have almost no description of the exemption process or requirements to qualify for an exemption. Actual compliance with SMP standards and exemption requirements is left unstated and at the whim of staff workload and experience. The CIA cannot account for impacts in such a situation, other than to

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<sup>15</sup> WAC 173-26-186(8) – The overall protection of ecological functions requirement. Also found in several locations in the SMP Guidelines, including WAC 173-26-201(3)(d)(iii), WAC 173-26-201(2)(c), and others.



pretend there will be no problems. This issue is not a problem for SMPs with adequate descriptions of the exemption process.

- Upland stormwater inputs from non-shoreline areas will eventually enter shoreline waters. While stormwater regulations also apply in shoreline jurisdiction, their effect is mostly felt across the larger drainage basins. Today's stormwater regulations can largely control the impacts from new development. However, we have seen many CIAs that review stormwater mitigation in the Restoration Plan when it should be in the CIA. Stormwater regulations for new development are not really restoration, they are mitigation for very specific new impacts – avoidance, minimization, and compensation. Furthermore, they often require structural facilities that are allowed to degrade natural features like buffers. We have observed few CIAs that seriously discuss stormwater regulations in the CIA – they are typically in the Restoration Plan, where they don't belong. Similarly, few CIAs discuss the degradation of natural features allowed in the name of mitigating stormwater impacts.

**Pitfalls to Avoid: Do not avoid considering other sources of degradation, and do not avoid thorough enforcement and project review regulations.** While all sources of degradation are supposed to be analyzed, we have reviewed no CIAs that cover all of these issues. The best CIAs get most of them but the remaining impacts are uncompensated.

### ***Requirements for Restoration Planning***

The no-net-loss framework and cumulative impact analysis requirements include several important points related to restoration planning, as follows. The impacts from all sources of degradation must be compensated for in the Restoration Plan. The burden of compensating for impacts allowed by the jurisdiction cannot be unfairly assigned to other people or entities, nor can the benefits from other restoration programs be consumed by degradation allowed by the jurisdiction. Thus impacts need to be compensated for by projects the jurisdiction pays for. To both meet the SMP Guidelines and to reduce its costs for compensation, the jurisdiction needs to include enhancement of ecological functions as compensatory mitigation. If the jurisdiction includes specific regulations to require projects to compensate for all the impacts that they can, and the jurisdiction provides compensation for the remaining impacts, then the other restoration projects of other entities above and beyond compensating for impacts will keep the shoreline in a trend toward improvement, as the Guidelines require.

The key is to ensure that compensatory mitigation using enhancement of functions is included in the regulations, rather than avoiding doing so using the artificial distinction between restoration and mitigation. The SMP Guidelines do not distinguish restoration and mitigation as exclusive from each other. Rather the restoration outcomes of SMP regulations and other regulations are explicitly considered to be part of restoration planning. Neither is there a statement that mitigation cannot improve ecological functions, as we discussed earlier. While there are several references to restoration planning, there are two requirements that provide the most specific guidance relating to this problem. WAC 173-26-186(8)(c) includes the primary restoration planning requirement, stating [with emphasis added]:

“For counties and cities containing any shorelines with impaired ecological functions, master programs shall include goals and policies that provide for restoration of such impaired ecological functions. These master program provisions shall identify existing policies and programs that contribute to planned restoration goals and identify any additional policies and programs that local government will implement to achieve its goals. These master program elements regarding restoration should make real and meaningful use of established or funded nonregulatory policies and programs that contribute to restoration of ecological functions, and should appropriately consider the direct or indirect effects of other regulatory or nonregulatory programs under other local, state, and federal laws, as well as any restoration effects that may flow indirectly from shoreline development regulations and mitigation standards.”

WAC 173-26-201(2)(f) implements the Restoration Planning requirement. It's opening sentence states [with emphasis]:

Consistent with principle WAC 173-26-186(8)(c), master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program.

The section goes on to list several steps to developing a Restoration Plan – in summary:

- identifying degraded areas and restoration opportunities,
- establishing restoration goals for those areas,
- identifying projects and programs that can contribute toward restoration – including both regulatory and non-regulatory as noted in the WACs above,
- identifying projects and programs that are needed to achieve restoration goals, and
- developing implementation and achievement mechanisms for restoration goals.

In reviewing many recent restoration plans, many of the problems we have observed stem from not implementing the following points (which are derived from the above requirements):

- The Restoration Plan is intended to describe how the jurisdiction will “achieve overall improvements in shoreline ecological functions over time” in the face of historic and future degradation.
- The Restoration Plan is supposed to identify and address the areas and functions that are degraded, as stated in the first sentence of WAC 173-26-186(8)(c). (For example, the sediment processes degraded by shore armoring, and habitat functions degraded by lost vegetation.
- The Restoration Plan is supposed to include both projects and programs that result in restoration.
- The Restoration Plan is supposed to include both regulatory and non-regulatory programs that result in restoration, as stated in WAC 173-26-186(8)(c).
- The Restoration Plan is supposed to include restoration outcomes from the actual SMP policies and regulations that the restoration plan is intended to support, as stated in the last sentence of WAC 173-26-186(8)(c).

As can be seen, SMP regulations are supposed to be considered in the Restoration Plan. Using the underlying assumption that “restoration” only applies to restoration projects and “mitigation” only applies to regulations has serious repercussions in the Restoration Plan and its relationship to the CIA:

1. Since regulations are usually not discussed, the focus is almost entirely on projects.
2. Since undertaking projects is expensive, the focus is on projects undertaken by other entities.
3. Since only a limited number of stand-alone restoration projects that cover a small fraction of the total degraded land are identified, they don't address the vast areas of degraded shorelines and degraded functions. The Restoration Plan will leave the degraded areas largely degraded.
4. Since the restoration projects are traditionally focused on the less developed locations, the functions they restore are unlikely to match the functions that are degraded.
5. Since projects are heavily emphasized and regulatory programs are not allowed to be considered under restoration, programs in general receive little attention or are ignored.
6. Since regulatory programs are not to be discussed, the Restoration Plan almost never discusses the actual SMP regulations
7. In the SMPs that do discuss programs, they typically limit the discussion to the jurisdiction's stormwater regulations or educational programs.
  - When stormwater programs are included, they usually only focus on the development standards (which is mitigation of new development rather than restoration), and do not discuss the restoration outcomes of the stormwater program – i.e. correcting pollution problems from existing development.

- Education programs are described as restoration, though most of the education subjects described focus on preventing damage rather than actual restoration. There is almost never specific restoration outcomes described.
  - When the SMP regulations are discussed, it is typically that they exist rather than describing the restoration outcomes of them – i.e. enhancement that occurs from compensatory mitigation.
8. Since the Restoration Plan is not allowed to consider mitigation or include outcomes of regulations, it becomes necessary for the CIA to avoid documenting impacts from the regulations, even where there are obvious impacts allowed by an SMP.

Accomplishing the requirements for no-net-loss of ecological functions will take a broader approach than using a mindset that separates the SMP and CIA from the Restoration Plan. Avoiding this mindset and allowing the regulations to improve ecological functions avoids most of the problems listed above, and throughout this document. The idea that compensatory mitigation can result in the enhancement of functions is fairly elementary, yet compensatory mitigation is a regulatory measure. Whether the word “restoration,” “enhancement”, or some other term is used to avoid controversy is immaterial, as long as the intent is to improve degraded areas and thereby offset the adverse impacts of development and redevelopment.

Restoration planning is intended to improve degraded conditions over time. The most effective method of addressing these extensive degraded areas in a programmatic way is through the regulatory program, which functions jurisdiction-wide and will encounter degraded areas on a scale that is hundreds of times larger and more common than normal restoration projects. *These are the actual degraded areas that are the very reason for the restoration planning requirement.* Allowing enhancement in the regulations for impacts of new development can improve conditions in the actual degraded areas, though it will be slow. Our current degraded ecological functions across the state happened over decades - one project at a time. Similarly, improving them will take decades into the future - one project at a time.

## ***Practical Steps to Developing a CIA***

Preconditions for a Good CIA            The points discussed in this document lead to practical steps that can be used in developing the CIA, but there are important preconditions to preparing a good CIA: knowledgeable staff and a protective SMP.

Even before beginning it is critical to appoint a qualified and knowledgeable staff to develop the SMP and CIA. Designing mitigation sequencing into the SMP is not difficult, but it does require that staff persons have knowledge of construction practices, and an understanding of their consequences. Specifically they should have:

- A scientific understanding of the particular shoreline area
- An understanding of the common impacts of various types of development
- An understanding of what the various mitigation techniques can and cannot do
- The ability to make careful judgments of the uncertainties of mitigation

As pointed out numerous times, the most important element in a good CIA is a protective SMP. Preparing the CIA means you have to consider all the impacts allowed by the SMP and accumulate them in your analysis. If well designed to incorporate mitigation sequencing, the SMP will have few remaining impacts that accumulate and have to be compensated for. If not well designed, there will be many impacts to account for, which are probably allowed across broad areas, making them very difficult to assess. Our other guidance documents discuss the pitfalls to avoid for different parts of the SMP in order to ensure they best capture and prevent impacts. The SMP should include the following:

- Protective environments need to be placed on the remaining intact areas.
- Use limits need to match the environments’ intent and implement SMA preferences, especially to prevent the conversion of the remaining intact areas to human uses.

- Buffers need to protect existing vegetation and keep development away, and should be of a science-based width whenever possible.
- Regulations need to avoid and minimize common impacts for specific types of development.
- Regulations need to describe compensation for specific types of development.
- General standards are needed to require mitigation sequencing and no-net-loss ecological function for unanticipated impacts at the project level.
- Acknowledge the different impacts of development, and specifically avoid the assumptions that prevent accurate assessment of impacts that are discussed in this document.

If the SMP is protective, it is able to capture all the impacts that on-site mitigation can capture, leaving little for the CIA to account for, and reduces the burden of compensating for lost functions on the jurisdiction and its taxpayers.

**Steps in Assessing Cumulative Impacts** The CIA is not just a listing of the protection standards. It is an assessment of what impacts are allowed by the environments and regulations that accounts for the loss of ecological function. This means looking past the SMP standards to see what is still allowed – or more specifically, what is NOT in the SMP. Preparing the CIA entails comparing common impacts of development with the regulations in the SMP, and applying the allowed impacts to the areas the development is allowed. Below are more specific details:

- 1) **Compare Common Impacts of Development With SMP Regulations.** For the different types of uses and modifications that are allowed by the SMP (both in explicit use limits, and by default for not addressing uses), compare the typical impacts associated with that type of development to the SMP regulations for it. For example, compare common impacts of roads and bridges with the regulations for roads and bridges. When impacts are not addressed by the regulations, they become cumulative impacts that the jurisdiction must compensate for. Alternatively, and preferably, the regulations should be supplemented to prevent the impacts. Our guidance document dealing with development standards includes most of the common impacts that need to be addressed, along with recommended standards to do so. The impacts identified after comparing development impacts with the regulations will be the impacts that apply to all the shoreline areas where that type of development is allowed.
- 2) **Establish Shoreline Analysis Segments.** Divide shoreline areas into segments with consistent development patterns. With a carefully established environment system, environments should be relatively homogenous to help with the CIA analysis. But many SMPs we have reviewed broadly mix different development patterns in their environments, making the CIA assessment much more complex, and likely less accurate. For example, applying the same designation and use limits for the Rural Conservancy environment to both near-urban-density residential areas and nearly intact areas. These use limits would typically be established to allow development for the residential areas - not to protect the intact areas.
- 3) **Compare Development Allowed in Intact Areas.** Compare the development pattern in individual intact segments with what uses are allowed in the assigned environment. Intact areas that can be converted to human uses will have dramatic losses of functions that are nearly impossible to compensate for on-site, but must somehow be compensated for by the jurisdiction. Alternatively, the environment designation or use limits can be modified to prevent the loss. This issue applies to both intact areas inside and outside the buffer line. It applies to developed areas with an intact buffer of science-based width. And it applies to areas that are largely intact inside shoreline jurisdiction, but may be heavily developed just outside.
- 4) **Compare Development Allowed in Existing Developed Areas.** Compare the development patterns in individual developed shoreline segments with what uses and modifications are allowed in the assigned environment. Existing developed areas that are allowed to become more intense will also suffer losses of function due to increased use-area coverage and more intense activity. The loss will depend on how degraded the existing functions are in the developed area – some may be highly functioning, others may have low levels of function. Use limit systems that do not include use-intensity distinctions are left to assume an intense level of possible development. Residential or

recreational areas that can convert to commercial use will often become more intense. Commercial areas that can convert to industrial use will often become more intense. Low intensity recreation areas are often allowed to convert to higher intensity recreation use, or even commercial facilities. Undeveloped recreation areas are typically allowed to install trails which can be intensively used. Without explicit compensatory mitigation requirements, unaddressed impacts from these developments will be cumulative impacts that must be compensated for by the jurisdiction. This makes the regulations for the different types of development very important.

- 5) **Determine Impacts Allowed by the Buffer System.** Our buffer options guidance document discusses the consequences of different buffer system choices. The buffer system needs to be applied to all shoreline segments and compared to existing vegetation functions. Lost functions from areas that are inadequately protected need to be compensated for by the jurisdiction, unless the buffer system is altered to protect those functions.
- 6) **Determine if Impacts Will be Reduced by “Likelihood” Considerations.** We recommend that “likelihood” considerations be used sparingly or not at all. If the jurisdiction is intent on not considering the full impacts of what is allowed by the SMP, some assessment of the likelihood percentage must be performed and applied to the full area where those “unlikely” developments are to be allowed. The percentage cannot be zero or effectively zero, since the development is not prohibited.
- 7) **Determine Impacts From Other Sources of Degradation.** Estimate the impacts from:
  - Ongoing impacts of existing development
  - The creep of un-reviewed activity and casual development near the water and in the buffer.
  - Impacts of unenforced violations when jurisdictions do not enforce shoreline and critical areas violations.
  - Impacts from shoreline exemptions without adequate review processes and application of standards.
  - Impacts from non-shoreline upland stormwater inputs.
- 8) **Accumulate All Impacts From All Sources of Degradation.** The total impacts from all sources of degradation are the cumulative impacts that the jurisdiction must compensate for in the Restoration Plan.
- 9) **Compensate for the Degradation using the Restoration Plan.** The total impacts from all sources of degradation must be compensated for in the Restoration Plan by activities undertaken by the jurisdiction. The burden cannot be shifted unfairly to other entities, nor can the benefits from other restoration programs be consumed by degradation allowed by the jurisdiction. Restoration above and beyond compensating for impacts allowed by the jurisdiction that is provided by projects of other entities will keep the shoreline in a trend toward improvement, as the Guidelines require.

These steps still depend on a broader approach than either using a mindset that separates the SMP and CIA from the Restoration Plan, or not acknowledging all impacts if they are to accomplish the requirements for no-net-loss of ecological functions. With a protective SMP that focuses compensatory mitigation on enhancing ecological functions, the importance of the Restoration Plan is relatively low. The CIA can more easily account for impacts, and fewer impacts will remain from the SMP. The Restoration Plan can identify the enhancement outcomes of the specific compensatory mitigation regulations. And the Restoration Plan needs fewer projects and programs to offset both the remaining impacts from new development, and the other sources of degradation. But with a lax SMP that allows impacts, the importance of the Restoration Plan goes up dramatically since the jurisdiction must compensate for the impacts the SMP allows. And if it is disconnected from the CIA and SMP regulations, it is incapable of providing adequate compensation of the cumulative impacts.