



DEPARTMENT OF
ECOLOGY
State of Washington

Preliminary Cost-Benefit and Least Burdensome Alternative Analyses

*Chapter 173-18, 20, 22, 26 and 27 WAC
Shoreline Management Act*

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Preliminary Cost-Benefit and Least Burdensome Alternative Analyses

Chapter 173-18, 20, 22, 26 and 27 WAC

Shoreline Management Act

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Executive Summary

The Washington State Department of Ecology (Ecology) is proposing to amend the following Shoreline Management Act rules:

- Chapter 173-18 Washington Administrative Code (WAC) - Shoreline management act — streams and rivers constituting shorelines of the state
- Chapter 173-20 WAC - Shoreline management act — lakes constituting shorelines of the state
- Chapter 173-22 WAC - Adoptions of designations of wetlands associated with shorelines of the state
- Chapter 173-26 WAC - State master program approval – Amendment procedures
- Chapter 173-27 WAC - Shoreline management permit and enforcement procedures

The Administrative Procedures Act (RCW 34.05.328(d)(e)) requires two types of analyses before adopting a significant legislative rule – a cost-benefit analysis and a least burdensome alternative analysis. This report provides the results of these analyses and shows the potential impacts associated with the proposed rule.

Ecology concludes that the probable benefits exceed the probable costs.

The Shoreline Management Act (SMA, RCW 90.58) charges Ecology with periodically reviewing and amending guidelines for implementing SMA (RCW 90.58.060). There are three groups of proposed changes:

1. Changes to Shoreline Master Program Guidelines to address commercial geoduck aquaculture siting and operations as instructed by House Bill 2220 (RCW 43.21A.681).
2. Changes to 173-26-201 as to when and why limited (non-comprehensive) amendments to local Shoreline Master Programs will be allowed.
3. Housekeeping amendments to better align the rules with changes in statute.

Quantifiable costs are limited to the impacts of the conditional use permit (CUP) requirement for commercial geoduck growers. These costs depend on the buffer size required by the local jurisdictions. Over a 15 year period, costs are estimated to range from \$36 million to \$204 million.

The quantitative benefits consist of two parts:

- Part one is derived from a survey conducted by the social and economic science research center of Washington State University for Ecology in 1996, which includes the benefits from improved habitat for fish and wildlife, improved water quality, reduced flooding, and recreational benefits.
- Part two is the reasonable assumption that people want to pay a fixed portion of their income instead of fixed amount of money for environment protection. A total willingness to pay for these commodities for Washington households over the 15-year period of study is estimated to be \$126,216,106,498. However, the proposed rule changes do not represent significant impacts on the overall quantity or quality of these amenities. Instead, they represent marginal changes. For this reason, we used small changes to estimate the

benefits to the rule changes. Therefore, Ecology estimates that benefits range from \$12.6 million to \$1.26 billion.

The proposed rule amendments represent a net benefit in nearly all of the combinations of scenarios used in estimating the costs and benefits of the changes. Where they do not, non-quantifiable benefits will likely increase the net benefit to a point where they will, in fact, provide a net benefit.

In the Least Burdensome Analysis, Ecology concluded that there is sufficient evidence the rule is the least burdensome version of the rule for those who are required to comply. Ecology considered two main alternatives:

1. No action; continued implementation of existing rules.
2. Prescriptive standards.

Based on those alternatives, Ecology concluded the proposed amendments are the least burdensome.

Chapter 1: Background and Scope

Background

Ecology is proposing to amend the following Shoreline Management Act rules:

- Chapter 173-18 Washington Administrative Code (WAC) - Shoreline management act — streams and rivers constituting shorelines of the state
- Chapter 173-20 WAC - Shoreline management act — lakes constituting shorelines of the state
- Chapter 173-22 WAC - Adoptions of designations of wetlands associated with shorelines of the state
- Chapter 173-26 WAC - State master program approval – Amendment procedures
- Chapter 173-27 WAC - Shoreline management permit and enforcement procedures

The Shoreline Management Act (SMA, RCW 90.58) charges Ecology with periodically reviewing and amending guidelines for implementing SMA (RCW 90.58.060). Therefore, as part of the rulemaking, Ecology is proposing amendments to Part III of WAC 173-26.

Washington’s Shoreline Management Act (SMA) was passed by the State Legislature in 1971 and adopted by voters in 1972. The overarching goal of the SMA is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.” The SMA applies to all 39 counties and more than 200 towns and cities that have “shorelines of the state” (RCW 90.58.030(2)) within their boundaries.

There are three basic policy areas to the SMA:

- Shoreline use
- Environmental protection
- Public access

Under the SMA, each city and county with shorelines of the state must prepare and adopt a Shoreline Master Program (SMP) that is based on state laws and rules but is tailored to the specific geographic, economic and environmental needs of the community. The local SMP is essentially a shoreline-specific combined comprehensive plan, zoning ordinance and development permit system. Most shoreline programs were originally written between 1974 and 1978.

The SMA establishes a balance of authority and partnership between local and state government. Towns, cities, and counties are the primary regulators. Ecology acts primarily in a support and review capacity. Ecology provides technical assistance to local governments and funding in the form of grants. Ecology is also required to take final action on certain kinds of permits and on locally-adopted shoreline master programs, to ensure they comply with the law and agency rules.

The most recent version of the SMA Guidelines rule was the result of a negotiated settlement agreement between the Department of Ecology and interested parties such as cities and counties,

business associations, environmental organizations, and individuals. The final outcome was the 2004 version of the Guidelines.

Several other rules were adopted by Ecology for the administration of the Shoreline Management Act. Amendments to these rules are also proposed.

Reason for this rule proposal

There are three groups of proposed changes:

1. Changes to Shoreline Master Program Guidelines to address commercial geoduck agriculture siting and operations as instructed by House Bill 2220 (RCW 43.21A.681).
2. Changes to 173-26-201 as to when and why limited (non-comprehensive) amendments to local Shoreline Master Programs will be allowed.
3. Housekeeping amendments to better align the rules with changes in statute.

Commercial geoduck aquaculture

The 2007 Legislature directed Ecology to help address conflicts surrounding Washington's expanding intertidal geoduck aquaculture by revising the shoreline master program guideline rules. The guidelines provide direction for local governments to update their shoreline master programs to avoid the environmental harm inherent in piecemeal and uncoordinated shoreline development. Lawmakers also directed Ecology to create a special Shellfish Aquaculture Regulatory Committee (SARC) to advise the Ecology on rule changes. The SARC is made up of representatives from:

- Large and small aquaculture operations
- Environmental interests
- Shoreline property owners
- Tribal and local governments

The Committee's recommendations were included in a January 2009 report to the Legislature. Ecology's proposed rule amendments reflect SARC's recommendations and perspectives offered by SARC members. SARC and local governments across the state also reviewed and helped shape the current draft rules available for public comment.

The proposed amendments define aquaculture as: "The culture or farming of fish, shellfish or other aquatic plants and animals." This definition does not apply to wild stock or shellfish from private or public lands harvested for private consumption.

Limited Amendments to Shoreline Master Programs (SMPs)

Proposed amendments focus on criteria for achieving Ecology approval. It also drops outdated criteria in the existing rule that restricted limited amendments and pushed comprehensive updates (comprehensive updates will be accomplished per statutory schedule and agreement to provide state grant funding.)

Housekeeping rule changes

“Housekeeping” changes are defined as changes that are not determined to be legislatively significant rules, as determined by RCW 34.05.328(5)(b). These are necessary over time to align rules with any changes that have occurred to statute since adoption.

Scope of Analysis

This document analyzes the impacts of Ecology’s proposed rule in the following sections:

- **Chapter 2: Baseline**
This chapter explains the baseline concepts to which Ecology’s proposed rule was compared in Ecology’s analysis, as well as how rule impacts were analyzed.
- **Chapter 3: Costs of the Proposed Rule**
This chapter explains the cost of the proposed rule.
- **Chapter 4: Benefits of the Proposed Rule**
This chapter explains the benefits of the proposed rule.
- **Chapter 5: Conclusions**
This chapter summarizes Ecology’s results and includes comments on the analysis.
- **Chapter 6: Least Burdensome Alternative Analysis.**
This chapter explains Ecology’s determination on whether the proposed rule places the least burden possible on those required to comply with it, while fulfilling the goals and objectives of the authorizing legislation.

Chapter 2: Baseline for Analysis

Baseline

The baseline for this analysis is the current rules in place. Ecology analyses the difference between what the world looks like today with the current rules, compared to how it will change with the proposed amendments.

Current Rule

Due to the criteria contained in the current rule language, local governments are essentially forced into expensive comprehensive SMP amendments, for most changes they want to pursue. Comprehensive SMP amendments are now being funded by state grant monies, at a cost of between \$40,000 and \$800,000, depending on the size and complexity of the jurisdiction.

Also under the current rule, commercial geoduck aquaculture is treated as all other aquaculture. Geoducks are not discussed in the current rule. Because of this, jurisdictions have little guidance on how to treat them. Accordingly, there is currently a wide range of treatment across jurisdictions. This includes requiring a conditional use permit (CUP) in some jurisdictions. The specific requirements for a CUP also differ across jurisdictions.

Changes under Ecology's Proposed Rule Changes

Proposed rule amendments related to general aquaculture and commercial geoduck aquaculture include:

- WAC 173-26-020: “Aquaculture” definition added.
- WAC 173-26-201: Improved language related to ecologically intact shoreline areas; clarified relationship between Growth Management Act (GMA) critical areas and SMA critical resource areas; included language to emphasize importance of water quality to shellfish aquaculture consistent with 2003 SFEIS.
- WAC 173-26-211: Clarified language to support Attorney General Opinion 2007 No. 1; new section in Aquatic Environment designation regarding area for protection and restoration; language to clarify local governments should ensure adequate space for water dependent shoreline uses.
- WAC 173-26-221: “Critical saltwater habitats” is redefined. The proposed definition includes only habitats, not uses, such as commercial aquaculture. Habitats listed within the “critical saltwater habitat” definition are some of the most ecologically important within the intertidal area, and removing uses from the definition is necessary to ensure no net loss of ecological functions.
- WAC 173-26-241: Aquaculture use provisions are revised to require a shoreline conditional use permit for new and expanded commercial geoduck aquaculture. At a minimum, this permit must include, where appropriate and applicable:
 1. Prohibiting or limiting the practice of placing tanks or pools or other impervious materials directly on the intertidal sediments.
 2. Prohibiting or limiting the use of trucks, tractors, forklifts, and other motorized equipment below the ordinary high water mark and requiring that such equipment, when authorized, use a single identified lane to cross the upper intertidal to minimize impacts.
 3. Limiting on-site activities during specific periods to minimize impacts on fish and wildlife.
 4. Limiting alterations to the natural condition of the site, including removal of vegetation or rocks, regrading of the natural slope and sediments or redirecting freshwater flows.
 5. Limiting the area of the site that can be planted or harvested at one time, to limit the areal extent of impacts.
 6. Limiting the portion of a site that can be covered by predator exclusion devices at any one time.
 7. Requiring compliance with the Washington department of fish and wildlife shellfish transfer permitting system to minimize the risk of transferring or introducing parasites and disease into areas where they currently do not exist.
 8. Requiring installation of property corner markers that are visible at low tide.
 9. Requiring buffers between geoduck operations and sensitive habitat features like critical saltwater habitats.

10. Requiring measures to minimize impacts to fish and wildlife.
11. Requiring the use of predator exclusion devices with minimal adverse ecological effects and requiring that they be removed as soon as they are no longer needed for predator exclusion.
12. Requiring the use of the best available methods to minimize turbid runoff from the water jets used to harvest geoduck.
13. Establishing limits on the number of barges or vessels that can be moored or beached at the site as well as duration limits.
14. Requiring measures to minimize impacts to navigation, including recreational uses of the water over the site at high tide.
15. Requiring good housekeeping practices at geoduck aquaculture sites, including removing equipment, tools, extra materials and all wastes at the end of each working day.

Proposed rule changes related to limited shoreline master program updates include:

- WAC 173-26-201: New provisions for limited (non-comprehensive) shoreline master program amendments are added.
- ‘Housekeeping’ changes are defined as changes that are not determined to be legislatively significant rules, as determined by RCW 34.05.328(5)(b). The proposed housekeeping changes include:
- WAC 173-18: Lists of shoreline streams are removed for cities and counties where shoreline master program comprehensive updates have been approved. Applies to Section 130 and Section 430.
- WAC 173-20: Lists of shoreline lakes are removed for cities and counties where shoreline master program comprehensive updates have been approved. Applies to Section 200, Section 210, Section 800, and Section 810.
- WAC 173-22-030: Definitions no longer needed are removed.
- WAC 173-22-035: Reference to wetland delineation method is deleted; reference to current version of wetland delineation manual adopted by Ecology is added.
- WAC 173-22: Reference to wetland maps maintained by Ecology is removed for cities and counties where shoreline master program comprehensive updates have been approved. Applies to Section 618, Section 674, and Section 678.
- WAC 173-22-080: Entire outdated section deleted.
- WAC 173-26-020: Definitions for “floodway” and “master programs” are added consistent with legislative changes to the Shoreline Management Act.
- WAC 173-26-060: Record retention requirements for adopted shoreline master programs is revised.
- WAC 173-26-080: List of jurisdictions required to adopt an shoreline master program is updated.
- WAC 173-26-110: Requirements for shoreline master program submittals is updated.

- WAC 173-26-130: Shoreline master program appeals process is updated per HB 2395 (2010).
- WAC 173-26-150: Pre-designation of future annexation areas authorized for non-GMA cities is added.
- WAC 173-26-190: Acknowledgement of exemptions from SMA; “project of statewide significance” revised per SSB 5473 (2009).
- WAC 173-26-221: “Critical areas” section is updated to conform to HB 1635 (2010); clarifies that SMA critical resource areas must include all GMA critical areas, but may go beyond; added “lakes” in critical freshwater habitat discussion to correct previous oversight.
- WAC 173-26-360: Ecology address and citation in Ocean Management discussion corrected.

Analytic Approach

The analytic approach will focus on three distinct areas as discussed above:

1. Commercial Geoduck Aquaculture;
2. Limited Amendments to Local Shoreline Master Programs; and
3. Housekeeping Rule Changes

While there are five rules that are being amended (173-18, 20, 22, 26, and 27 WAC), Ecology is focusing on WAC 173-26 (State master program approval – Amendment procedures) for this analysis as it is the only rule creating costs.

Uncertainty limits this analysis. It is impossible to know with certainty how a particular local government will apply the rule changes. Therefore, this analysis presents an estimate of the environmental benefits and costs based on available data, and hypothetical “scenarios”. Moreover, even if the effects could be predicted, the lack of any available data on the linkage between the requirements in the guidelines and environmental improvements produces uncertainty regarding the magnitude of the benefits associated with the proposed rule¹.

Long run forecasts are difficult to do. Most forecasts are based on historical data which do not consider changes in preference, economic structure and technology. This analysis is also subject to these limits. Most of the ‘future data’ used is linearly derived from historical data. Moreover, some of the historical data is incomplete. On the other hand, to reveal the whole effects of a new rule, a long run analysis is better than a short run analysis. So in this cost benefit analysis, a 15-year horizon is used to balance these two aspects. The initial period was assumed to be 2011, and the end of the 15-year period was assumed to be 2026.

¹ Also, approximately 35 local governments will have adopted their updated SMPs by the time rule changes become effective, and they will not have to respond to the rule until they do their next update. For example, Whatcom will not have to respond to the new rule language and change their local policies and regulations until 2018. Others will update over time- a staggered implementation over the next 10 years

The discount rate reflects the time value of money. Benefits and costs are worth more if they are experienced sooner. All future benefits and costs, including non-monetary benefits and costs, should be discounted. The higher the discount rate, the lower is the present value of future cash flows. The discount rate used in this analysis is 1.68 percent.

Commercial Geoduck Aquaculture

It is important to note that these changes are limited to commercial geoduck aquaculture and do not apply to all aquaculture. This analysis will focus on the provision to require a CUP for new and expanded commercial geoduck aquaculture.

Currently existing commercial geoduck aquaculture and other existing water-dependent uses are 'grandfathered'. Currently 210 sites have been applied to be 'grandfathered' under the federal Section 404 Nation Wide Permit 48 and would not be subject to acquiring a new CUP under the proposed rules. However, current federal permit applications are used as a proxy for the size (in terms of area and productive capacity) of future sites.

Because current commercial geoduck aquaculture permit, siting and operational requirements differ across jurisdictions, a range of impacts is considered. The analysis considers the possibility that current SMPs require no permit (resulting in the maximum impact) to current SMPs already requiring each of the provisions in the rule revision (resulting in the minimum impact).

In the last year, ten new Federal applications for geoduck aquaculture in Washington State have been received. Future applications are assumed to average ten per year. There is speculation that growers are currently applying at a relatively slow rate to work through application information needs, questions, concerns, etc. associated with new regulatory requirements. It is impossible to forecast how this behavior would impact the rate of future applications.

While the pending applications average 1.4 acres in area, the 210 existing sites average 1.6 acres. Ecology chose to use the larger number as a proxy for the estimated area of future permitted operations because of the small sample size of current applications.

Limited Amendments to Local Shoreline Master Programs

A comparison is made between the former requirements for these limited amendments and the proposed requirements. The focus is on the cost savings that would accrue to governmental agencies due to the changes and the potential increase in flexibility afforded to local jurisdictions. Due to the uncertainty involved with predicting future submissions of limited amendments, this analysis is focused on qualitative issues.

Housekeeping Rule Changes

For this analysis, Ecology assumes there are no quantifiable costs or benefits due to these housekeeping revisions.

Chapter 3: Costs of Proposed Rule

Quantified Costs of Ecology's Proposed Rule Changes

Commercial Geoduck Aquaculture

The costs of acquiring a CUP vary across jurisdictions. Some jurisdictions require additional permitting for some projects, including, but not limited to, SEPA, variances, and Shoreline Substantial Development permitting. These costs can range up to \$10,000, but average roughly \$3,500.

Beyond the actual cost of the CUP, meeting the requirements of the permit represents additional costs for the applicant. These requirements potentially include:

1. Prohibiting or limiting the practice of placing tanks or pools or other impervious materials directly on the intertidal sediments.
2. Prohibiting or limiting the use of trucks, tractors, forklifts, and other motorized equipment below the ordinary high water mark and requiring that such equipment, when authorized, use a single identified lane to cross the upper intertidal to minimize impacts.
3. Limiting on-site activities during specific periods to minimize impacts on fish and wildlife.
4. Limiting alterations to the natural condition of the site, including removal of vegetation or rocks, regrading of the natural slope and sediments or redirecting freshwater flows.
5. Limiting the area of the site that can be planted or harvested at one time, to limit the areal extent of impacts.
6. Limiting the portion of a site that can be covered by predator exclusion devices at any one time.
7. Requiring compliance with the Washington department of fish and wildlife shellfish transfer permitting system to minimize the risk of transferring or introducing parasites and disease into areas where they currently do not exist.
8. Requiring installation of property corner markers that are visible at low tide.
9. Requiring buffers between geoduck operations and sensitive habitat features like critical saltwater habitats.
10. Requiring measures to minimize impacts to fish and wildlife.
11. Requiring the use of predator exclusion devices with minimal adverse ecological effects and requiring that they be removed as soon as they are no longer needed for predator exclusion.
12. Requiring the use of the best available methods to minimize turbid runoff from the water jets used to harvest geoducks.
13. Establishing limits on the number of barges or vessels that can be moored or beached at the site as well as duration limits.
14. Requiring measures to minimize impacts to navigation, including recreational uses of the water over the site at high tide.
15. Requiring good housekeeping practices at geoduck aquaculture sites, including removing equipment, tools, extra materials and all wastes at the end of each working day.²

² Numbering included for ease of the current analysis only.

Non-quantifiable costs include requirements 1, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, and 15. While requirement 2 would appear to be represent a potential cost savings to the applicant by minimizing its construction costs, current practice often shows use of multiple lanes and accesses to a site. This indicates that the growers yield a net benefit from the additional access. Therefore, requirement 2 would yield the potential for net costs for the grower, though it is also non-quantifiable. Though requirement 8 would represent a cost for the grower, this cost is negligible.

The proposed rule changes require that buffers, if the site conditions warrant them, would come out of the commercial geoduck aquaculture as opposed to critical saltwater habitats. This effectively decreases the amount of land available for planting of stock, resulting in decreased harvest and revenue generated. The extent of buffers in requirement 9 is left to the discretion of the individual jurisdictions. Therefore, a range of 5 to 10 feet is used, as is buffers on 2 or 4 sides of the commercial geoduck aquaculture.

The 210 currently permitted geoduck harvesting sites average 1.6 acres in size. This corresponds to an area roughly 200' by 400'. With a harvest density of approximately 2 geoduck per square foot³, this yields a harvest of 160,000 geoduck spread over several years. Assuming a harvest weight of 1.5 lbs, this corresponds to 240,000 lbs. It should be noted that this planting and harvest occurs over time. For the purpose of this analysis we assume that growers typically plant geoduck in blocks of 20,000 tubes each year. The time needed to reach the 1.5 lb harvest rate depends on a many factors⁴. However for the current analysis Ecology assumed that geoduck planted in year 1 would be harvested in year 6, requiring the revenues generated from harvest to be discounted appropriately.

At current wholesale prices of roughly \$14.50/lb³, one 20,000 block harvest would yield 30,000 lbs of geoduck for revenues of \$435,000 in year 6 for a net present value of \$400,232. Revenues from geoduck harvested in later years would be further discounted.

Table 1 illustrates the impact of buffers on harvest and revenue. Note that this table reflects the impact on one block. The average parcel will support a total of four blocks. It should also be noted that some of this impact may be mitigated by cost savings due to decreased planting⁵. However, it is more likely that growers would simply increase the initial size of their parcel or slightly increase their planting density.

³ Diane Cooper of Taylor Shellfish. July 27, 2010.

⁴ Including water quality, sediment and substrata characteristics and wave exposure, tidal height, and suspended food availability (Davis, 2004)

⁵ If harvesters decreased their planting, this savings would be negligible.

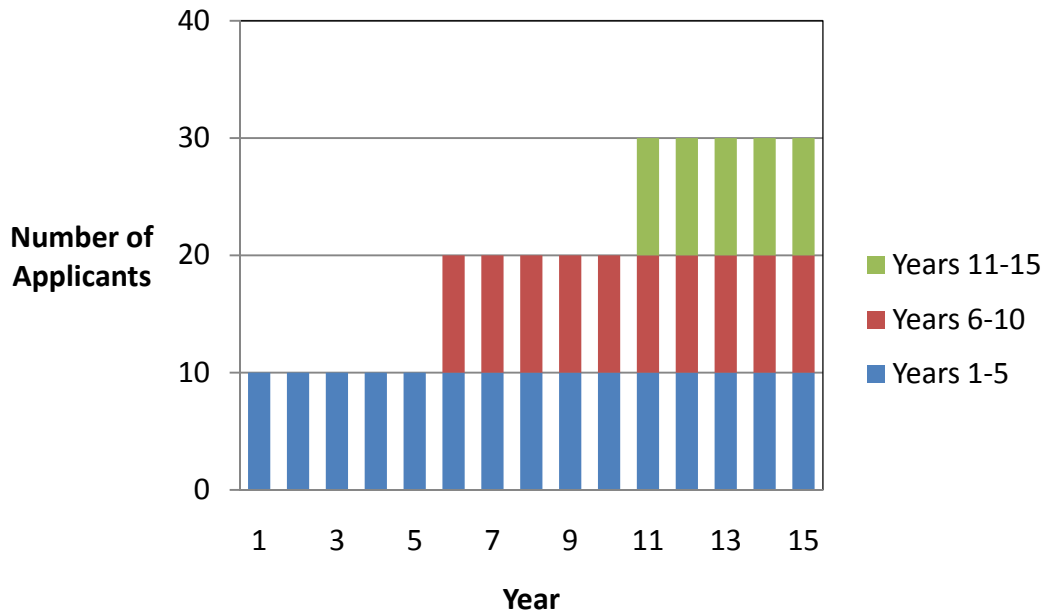
Table 1: Impact of buffers on harvest and revenues for single 20,000 tube block

Buffer	Harvest without buffer (lbs)	Harvest with buffer (lbs)	Revenue without buffer	Revenue with buffer	Impact of Buffer (\$)	Impact of buffer (%)
2-sided 5'	30,000	29,250	\$ 400,232	\$390,226	\$ 10,006	2.5%
2-sided 10'	30,000	28,500	\$ 400,232	\$380,220	\$ 20,012	5.0%
4-sided 5'	30,000	27,788	\$ 400,232	\$370,715	\$ 29,517	7.4%
4-sided 10'	30,000	25,650	\$ 400,232	\$342,198	\$ 58,034	14.5%

Number of Growers Affected

If the number of new applications remains constant at a rate of 10 per year, this will result in the total number of growers affected by the rule revision growing non-linearly as shown in Graph 1. This is due to the 5-year period covered by the CUP. This means that the growers that received their CUP in Year 1 would need to reapply in year 6 (and again in Year 11). A total of 150 growers would need to apply for a total of 300 CUPs over the 15 year period of analysis.

Graph 1: Annual Number of Affected Growers



Adding up the cost of the initial application fee by the number of applicants per year and discounting future costs appropriately yields an aggregate cost of \$910,856 for the application fees over the 15 year period.

Table 2 below lists the total costs across all applicants by buffer size and type for the 15-year period of study. These totals reflect appropriate discounting over the 15-year period of analysis. It reflects each of the 150 growers planting eight 20,000 tube blocks on a parcel size of 80,000 sq ft (roughly 1.6 acres) over several years. As some growers may repeat the

process after their initial 5-year permit expires, a total of 2,400 plantings are assumed to occur over the 15-year period of study.

Table 2: Aggregate Costs by Buffer Size and Type

Buffer	Total Costs
2-sided 5'	\$ 35,092,416
2-sided 10'	\$ 70,184,831
4-sided 5'	\$ 103,522,626
4-sided 10'	\$ 203,536,011

Limited Amendments to Local Shoreline Master Programs

Since the 2004 effective date of the current SMP Guidelines, Ecology has processed fifty four (54) “limited” SMP amendments. The costs of processing limited amendments are borne by local government and Ecology. Both are required to include the public in the SMP application process. This includes:

- Public workshops
- Public hearings
- Preparing staff reports
- Responding to comments
- Securing official approval.

Depending on the topics of the limited amendment, the staff time required to process them can vary widely.

The limited amendment process begins at the local government level. If a private party requests the amendment, in most cases they must apply with the local planning department, and pay an application fee. If the local government requests the limited amendment, it would incur the costs of processing the amendment. Ecology but does not require a application fee.

Due to the criteria contained in the current rule language, local governments are essentially forced into expensive comprehensive SMP amendments, for almost any changes they want to pursue. Comprehensive SMP amendments are now being funded by state grant monies, at a cost of between \$40,000 and \$800,000, depending on the size and complexity of the jurisdiction.

The current rule language is also confusing and ambiguous, leading to confusion and delays in processing SMP amendments.

Currently, few applications for limited amendments are being submitted. This is due to jurisdictions working on comprehensive updates of their SMPs, as mandated by the legislature. However, once these comprehensive revisions are completed, assuming the rule changes have their desired impact of increasing the flexibility of local jurisdictions to respond to relatively small requests for changes, the number of requests would likely increase.

Due to the variable nature of the potential impacts and the uncertain timing of future requests, it is impossible to predict the increased governmental costs that may accrue. However, similar to

CUPs, the costs vary greatly for Ecology depending on the complexity and location of the limited amendment. About 16 hours of staff time is required for a CUP and about 60 hours to process each application for a limited amendment. In addition Ecology spends significant time and funds on public hearings and overhead such as legal advice, records retention, budgeting, and other support services.

Total Costs

Quantifiable costs are limited to the impacts of the CUP requirement for commercial geoduck growers. These costs depend on the buffer size required by the local jurisdictions. These costs also include the initial application fee and appropriate discounting. Table 3 shows these costs.

Table 3: Aggregate Costs by Buffer Size and Type

Buffer	Total Costs
2-sided 5'	\$ 36,003,271
2-sided 10'	\$ 71,095,687
4-sided 5'	\$ 104,433,482
4-sided 10'	\$ 204,446,867

Chapter 4: Benefits of Proposed Rule

Measurement of the benefits associated with a rule change is easier if the resource in question is a marketed commodity and information on prices and quantities consumed are available. This information can be used to define a demand curve and can be used to quantify the benefits.

Unfortunately, most of the benefits generated from the proposed amendments to the shoreline guidelines are from “commodities” that are not associated with a market, and no market prices exist. Moreover, we don’t know the quantity of these beneficial “commodities” produced by the proposed rule amendments, because the existing science cannot clarify the cause and effect relationship between them. Although it is impossible to assess these benefits directly, alternative methods have been developed in economics to analyze broad policy shifts that may have a wide range of beneficial impacts.

One of the most frequently used methods is the contingent valuation (CV) method which uses survey techniques to indirectly derive people’s willingness to pay for the “commodities” and therefore derive the benefits. Even so, not all benefits are assessed in this analysis due to the lack of knowledge and data.

The quantitative benefits consist of two parts:

- Part one is derived from a survey conducted by the social and economic science research center of Washington State University (WSU) for Ecology in 1996, which includes the benefits from improved habitat for and wildlife, improved water quality, reduced flooding, and recreational benefits.⁶
- Part two is the reasonable assumption that people want to pay a fixed portion of their income instead of fixed amount of money for environment protection. A total willingness to pay for these commodities for Washington households over the 15-year period of study is estimated to be \$126,216,106,498. However, the proposed rule changes do not represent significant impacts on the overall quantity or quality of these amenities. Instead, they represent marginal changes. For this reason, we used small changes to estimate the benefits to the rule changes. Therefore, Ecology estimates that benefits range from \$12.6 million to \$1.26 billion.

CV surveys generate data based on hypothetical scenarios. Given this the survey data has been handled conservatively in that assumptions were chosen that would be biased against the proposed rule amendments. The 1996 WSU survey suggests that, in general people thought the shoreline is over-developed. When asked about their preferred shoreline uses, people tended to have high priorities for wildlife habitat, public parks and fishing. Conversely, they register low or no priority for marinas, industry, shops or restaurants, office buildings, apartments and condominiums.

Questions that help determine the value residents place on shoreline management were also asked. From the answers to those questions the distribution of willingness to pay (WTP) of each Washington household for shoreline improvements in 1996 can be derived.

The mean and median of WTP for each Washington State household in 1996 were calculated based on the distribution. The mean is \$373.19 per household per year and the median is \$248.47 per household per year. Only the median is used in the benefits analysis.⁷ Once these have been adjusted for inflation, the median WTP is \$510.50 and \$339.92 respectively.

It is reasonable to assume that people want to pay a fixed portion of their income instead of fixed amount of money for environment protection. However, this analysis only assumes the households just want to pay a fixed amount of money and this conservative arrangement will result in significantly reduced benefits (about 50percent).

To calculate the total social benefit, the total number of households needs to be determined by using data on population and household size. The population trend⁸ and the household size trend⁹

⁶ Question 121 to Question 137 in 1996 survey. 'Reduced litter' is included in the total benefits, but we assume it is not significantly large.

⁷ The Mean is sensitive to outlying values. The median was deemed to be a more appropriate measure.

⁸ Washington State Office of Financial Management. FORECAST OF THE STATE POPULATION BY AGE AND SEX: 1990 TO 2030 NOVEMBER 2002 FORECAST.

⁹ Washington State Office of Financial Management. Illustrative Household and Persons per Household Projections.

were decided by the data obtained from the Office of Financial Management (OFM)¹⁰. Because the household size is relatively stable, 2.468 persons/household¹¹ was chosen as the average household size.

After calculating the households in Washington State each year from 2011 to 2026, Ecology could calculate the WTP¹² for shoreline improvement each year from 2011 to 2026. Adding up the figures over the 15-year period of study and discounting appropriately results in an overall WTP of \$126,216,106,498. It must be noted that this total represents the total amount that Washington State households are placing on shoreline improvements. The proposed rule amendments represent marginal changes in these amenities. Therefore, when estimating the benefits we present a range of impacts and show the value households would place on such an impact.

Commercial Geoduck Aquaculture

By requiring a CUP and related limits and conditions on siting and operation the rule change will act to limit the environmental impact of the activity. Also, language is added to include “uses”, so when aquaculture is considered a use and not a development, it is covered as well.

Commercial geoduck aquaculture is taken out of the critical saltwater habitat definition, which provides a mechanism to protect the most critical aquatic habitats from impacts of a use currently allowed within these habitats.

The current rule requires no net loss of ecological functions, which includes ecological functions of critical saltwater habitats. Water quality is one feature of ecological functions.

Subsistence, commercial, and recreational shellfish beds are currently provided a higher level of environmental protection by their inclusion in the definition of critical saltwater habitats, if the local government develops protective policies and regulations for such habitats. This was done to protect shellfish beds for human consumption from fecal coliform and other water pollution.

Buffers are currently allowed between critical saltwater habitats and uses that may have an environmental impact, but the current rule language is not clear whether or not the buffer area comes out of the habitat or the use area.

The proposed rule removes “subsistence, commercial and recreational shellfish beds” from the critical saltwater habitat definition given they are uses, not habitats, and adds: “naturally occurring beds of native shellfish species.” This provides local governments the ability to continue to use this classification to protect sensitive habitat features such as salmon spawning grounds and eelgrass beds, and other economically valuable habitats - and clarifies that buffers should come out of adjacent use areas if required. This protects the economic viability of critical saltwater habitats for other business sectors, such as fishing, recreation, and tourism.

¹⁰ Office of Financial Management, Washington State

¹¹ Forecasting data in year 2010

¹² With income growth

To retain the ability of local governments to protect shellfish beds from water pollution, language has been added to ensure local governments consider the following in their inventory and characterization:

- Sediment contamination,
- Intertidal property ownership,
- Aquaculture operations,
- Shellfish beds,
- Shellfish protection districts, and
- Areas that meet department of health shellfish water quality certification requirements.

This lays the foundation for siting in-water uses such as geoduck aquaculture. Specific language is also added that reflects the importance of water quality to shellfish, and minimizing impacts to existing shellfish beds when siting upland uses.

The proposed rule amendments will have environmental and various social benefits including the following:

- **Water quality** - The proposed rule amendments enhance water quality protections for commercial geoduck aquaculture as well as for the environment in general through limiting and conditioning commercial geoduck aquaculture by requiring local governments to consider upland impacts to existing operations. They are required to not introduce new uses that will impact current operations. This reduces the potential human health threat.

Under the proposed CUP, monitoring is required. Local governments may use this to assess water quality impacts from sediment suspension and/or cumulative environmental impacts.

A more thorough inventory and characterization of shorelines and proper siting actions should result in avoiding siting aquaculture in areas with contaminated sediments.

Buffers should avoid turbidity and suspended sediments affecting adjacent properties and critical saltwater habitats.

Aquaculture is considered a preferred use of water areas and the expected improvements in water quality will benefit aquaculture. Although there are additional requirements related to eelgrass and micro-algae, as well as the spread of disease and non-native species, aquaculture should benefit from the proposed changes.

- **Buffers** - The requirement to take buffers out of the commercial geoduck aquaculture area as opposed to any neighboring critical saltwater habitats will minimize physical impacts to neighboring critical saltwater habitats such as forage fish and eelgrass beds, which have their own economic values to other food crops (salmon, crab, etc.).
- **Upland impacts and Upper-intertidal** - The minimum CUP requirements include the consideration of road impacts, and limiting road construction (if allowed) to one lane

through the upper shoreline. This serves to reduce shoreline vegetation removal, potential erosion, and the introduction of fuel spills.

The proposed rule amendments also require local jurisdictions to minimize impacts from introduced land uses into the upland areas near existing shellfish beds, and to consider consistency in environmental designations from the aquatic designation up through the upland designations (natural, urban, conservancy, etc).

Fewer roads and development along the shoreline also increases the potential for vegetative connectivity along the shoreline. Requiring limited use of pools avoids potential impacts to upper intertidal forage fish spawning areas, juvenile salmonid habitat, and other economically valuable areas

- **Recreation** – The proposed rule amendments clarify that public access to public waters and shorelines must be maintained by commercial geoduck aquaculture and navigation rights must be preserved. This is important for this use because commercial geoduck aquaculture is intertidal, affecting small boat navigation (kayaks, small fishing or pleasure boats).
- **Property values** - - Property owners who lease land to geoduck farmers may benefit, but neighbors may not. While property values would improve over time as the price of the geoduck increases (as it is forecasted to do), this would only be a benefit due to the rule change if the change leads to more commercial geoduck aquaculture. The requirement to add corner markers for properties in the CUP will allow property owners to determine whether their property rights are being violated.
- **Aesthetics** - Lights and noise are required to be addressed under CUP limits and conditions. The proposed changes clarify the results of recent case law. Local jurisdictions cannot restrict all nighttime activities. This provides more certainty for the industry that they will not be overly harassed by residents or neighbors, and guidance for local jurisdictions about what to require under permit. The proposed rule amendments also seek the removal of predator exclusion netting in a more timely way¹³. However, it also requires the addition of property corner markers. Better control of litter from these sites is also intended. The net impact is uncertain.

Limited Amendments to Local Shoreline Master Programs

Due to the criteria contained in the current rule language, local governments are essentially forced into expensive comprehensive SMP amendments, for almost any changes they want to pursue. Comprehensive SMP amendments are now being funded by state grant monies, at a cost of between \$40,000 and \$800,000, depending on the size and complexity of the jurisdiction. The current rule language is also confusing and ambiguous, leading to confusion and delays in processing SMP amendments.

¹³ Benefits include less litter (nets, rubber bands) loose in the marine environment – where birds, fish and others can end up digesting it. Also, less impact on neighbors (up to several miles) who can be affected by the litter ending up on their beaches.

The primary benefit to the proposed rule amendments is more clarity on when a limited amendment would be an option for local jurisdictions. This may allow them to implement economically beneficial projects that would not have been viewed as feasible under the previous rule language. The specific benefits of such projects could vary significantly across projects and are impossible to predict.

Total Benefits

When adding up the benefits of the proposed rule amendments, the uncertainty involved with valuing non-market commodities like environmental amenities (which represent the vast majority of the estimated benefits), as well as the impact of the proposed changes on those commodities, requires the use of ranges based on different levels of impact.

In the current analysis, a total WTP for these commodities for Washington households over the 15-year period of study is estimated to be \$126,216,106,498. However, the proposed rule amendments do not represent significant impacts on the overall quantity or quality of these amenities. Instead, they represent marginal changes. For this reason, we used small changes to estimate the benefits to the rule changes. Table 4 shows the estimated benefits to the proposed changes for several levels of improvement to these amenities.¹⁴ The impact percentages listed in Table 4 represent improvements in environmental amenities including:

- flood hazard reduction,
- public access,
- shoreline vegetation conservation,
- water quality,
- storm water,
- non-point pollution, etc.

A 0.01 percent improvement represents an improvement of 1/100 of a percent.

Table 4: Estimated Benefits

Impact	Estimated Benefits
0.01%	\$ 12,621,610.65
0.05%'	\$ 63,108,053.25
0.1%	\$ 126,216,106.50
0.5%	\$ 631,080,532.49
1.0%	\$ 1,262,161,064.97

Additionally, non-quantifiable benefits will add up due to the changes in the form of increased potential for stability and certainty for the commercial geoduck aquaculture industry, and the better ability to adjust to evolving science and availability on the part of local jurisdictions.

¹⁴ An improvement can also be thought of as a foregone decrease in the quantity or quality of the amenity.

Chapter 5: Conclusion

As noted before, this cost benefit analysis is based on the best available information. The scenarios and hypothetical constructs used to illustrate potential benefits and costs are intended to be reasonable.¹⁵ Moreover, because shoreline areas are one of the most heavily regulated areas, and most highly valued areas by society, many of these benefits or costs are the direct result of other laws, rules and programs, and it is difficult to distinguish between their impacts and those impacts that are a result of the proposed rule changes. Further, the actual impact will critically depend on implementation at the local level.

The proposed rule amendments represent a net benefit in nearly all of the combinations of scenarios used in estimating the costs and benefits of the changes. Where they do not, non-quantifiable benefits will likely increase the net benefit to a point where they will, in fact, provide a net benefit. Table 5 shows the net benefit under each scenario.

Table 5: Net benefits of proposed rule changes

Impact on Amenities	Buffer Required			
	5' two sides	10' two sides	5' four sides	10' two sides
0.01%	\$ (23,381,661)	\$ (58,474,076)	\$ (91,811,871)	\$ (191,825,256)
0.05%'	\$ 27,104,782	\$ (7,987,634)	\$ (41,325,429)	\$ (141,338,813)
0.1%	\$ 90,212,835	\$ 55,120,419	\$ 21,782,625	\$ (78,230,760)
0.5%	\$ 595,077,261	\$ 559,984,845	\$ 526,647,051	\$ 426,633,666
1.0%	\$ 1,226,157,794	\$1,191,065,378	\$1,157,727,583	\$ 1,057,714,198

Chapter 6: Least Burdensome Alternative Analysis

Introduction

RCW 34.05.328(1)(e) requires Ecology to “determine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection.”

Determination

Based on research and analysis required by RCW 34.05.328(1)(e) the Department of Ecology determines:

There is sufficient evidence the rule is the least burdensome version of the rule for those who are required to comply, given the goals and objectives of the law, for Ecology to propose the rule.

¹⁵ Conservative assumptions (reflecting higher costs/lower benefits) were used whenever required.

General Goals and Specific Objectives of the Authorizing Statutes

The overarching goal of the Shoreline Management Act is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.”

Alternative Rule Content Considered

Ecology considered the following alternatives.

ALTERNATIVE A: No Action, Continued Implementation of Existing Rules

No Action means the continued implementation of the existing rules.

For purposes of this analysis, continuing to use the existing Shoreline Management rules is considered to be the “no action alternative.” Previous environmental impact statements, and the 2003 Supplemental Final Environmental Impact Statement, have analyzed the continued use of the existing rules.

Continued use of the existing rules would be a violation of state law, given Ecology would not fulfill the requirements established by SSB 2220 (see RCW 42.21A.681) to address commercial geoduck aquaculture in the Shoreline Master Program Guidelines. To comply with RCW 42.21A.681, Ecology must reject the “no action” alternative. Regardless, lack of sufficient guidance in the existing rules creates relatively inconsistent regulations from county-to-county for aquacultural businesses and the public. It also makes it difficult for local governments to protect critical saltwater habitats. Ecology expects the changes will increase regulatory consistency, and increase consideration of the built and natural environments.

The existing rules also contain information that is out of date or not in alignment with the SMA or other existing laws. The “no action” alternative does not provide for an opportunity to bring the rules into alignment with existing statute.

Also, continued use of the existing rules would not allow Ecology to clarify the process for review and approval of limited amendments to Shoreline Master Programs contained in WAC 173-26-201. The existing language has proven to be too restrictive, leading to uneven application across jurisdictions. Under the “no action” alternative, less-than-comprehensive amendments will continue to be restricted and may result in inconsistent policies and regulations, legal challenges and time consuming and costly requirements for comprehensive SMP updates.

ALTERNATIVE B: Prescriptive Standards

Prescriptive standards would result in a rule with specific numerical standards, effective state-wide, that set minimum requirements for local governments to achieve through their local shoreline master programs for the full range of shoreline uses.

Alternative B would include the development of stringent limits and conditions for local governments to include in their SMPs that protect the intertidal habitat and meet the future shoreline use and development needs of the community. Existing federal, state, and local

regulations would continue to protect water quality, reduce and mitigate habitat degradation, and maintain an element of “no net loss” of resources.

Ecology considered updating the rules to reflect specific prescriptive standards for commercial geoduck aquaculture operations. This would result in a rule update with specific numerical standards and minimum requirements for local governments to meet in their local shoreline programs for commercial geoduck aquaculture, and guidance for submitting limited amendments of their shoreline programs to Ecology for approval.

Anticipated Impacts from Alternative B, Prescriptive Standards

Habitat, Plants, Animals

In consideration of the importance of eelgrass, proposed limits and conditions in the proposed rule changes would include specified buffers widths and dimensions from:

- Eelgrass beds
- Known spawning areas
- Other critical saltwater habitats

Specific buffer distances would be required to minimize damage from planting, maintenance, and harvest activities on the site. Buffers should be based on scientific investigation of potential impacts. At this time, most studies of commercial geoduck harvest have focused on Washington’s subtidal fishery (Ebasco, 1992) and recreational harvest.

Research on intertidal commercial geoduck impacts is currently under way as part of Sea Grants geoduck research program, and is scheduled to be completed 2013 (Washington Sea Grant, 2009). However, without proper site specific baseline information, such as a survey of priority habitat and species, it is difficult to evaluate the impacts of individual aquaculture operations.

The practice of placing pools, tanks or other impervious materials, site alterations, and equipment use may be detrimental to the intertidal ecology. More information on the biological effects of commercial geoduck operations is needed to understand the ecological interactions, seasonal flux of species, as well as planting and harvest effects on the landscape (Washington Sea Grant, 2009). These findings may support more or less restrictive limits and conditions in the future to ensure “no net loss” of ecological functions in the intertidal system.

Navigation, Transportation, Recreation

To reduce the impact of commercial geoduck aquaculture on boat navigation and recreation, the proposed rule amendments would require property corner markers that are visible at low tide, and mandate limits on the number of barges or vessels moored or beached at the site. Measures to minimize impacts to recreational uses of the water over the site at high tide would also be required. Debris removal schedules and restricted use of predator exclusion devices would be required in each CUP.

Aesthetics, Noise, Light

Establishing fixed buffers, prohibitions on site activities, and mandated mitigation activities does not provide local governments the flexibility needed to protect natural resources on a site specific

basis. The Puget Sound contains a wide variety of intertidal ecosystems, each with unique resources, species interactions, and site resources. There is not enough scientific research to support the development of prescriptive limits and conditions on CUPs issued for commercial geoduck aquaculture. Alternative B does not provide enough support for local governments to develop a SMP that is protective of the environment and sensitive resources while recognizing the needs and conditions of specific commercial geoduck aquaculture sites and local shorelines.

Noise and light use would be confined to limits set forth in local or state ordinances. Using existing ordinances will provide local consistency and predictability for operators and adjacent landowners.

Limited amendments to local shoreline master programs

The proposed rule amendments to Chapter 173-26-201(1) includes entirely new provisions for non-comprehensive SMPT updates (limited amendments). The proposed rule language provides criteria for review and approval of limited SMP amendments by local government and Ecology. The existing language restricts limited amendments and favors comprehensive updates. With the proposed rule amendments in place, comprehensive updates will continue to be accomplished per statutory schedule and with state funding.

Housekeeping changes

Proposed rule changes to will prompt compliance with current state statute. Housekeeping changes do not require environmental assessment because they are required by statute.

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