

memorandum

date March 11, 2020

to City of Mercer Island City Council
City of Mercer Island Community Planning and Development Department
Washington Department of Ecology | Shorelands & Environmental Assistance

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subject City of Mercer Island 2019 SMP Periodic Review: Cumulative Impacts Analysis for Locally Adopted Updates to Redevelopment Standards for Private Docks

Introduction

The City of Mercer Island completed a comprehensive update of shoreline management policies and regulations between 2009 and 2015, with Shoreline Master Program (SMP) approved by the Washington State Department of Ecology (Ecology) in March 2015. As part of the comprehensive update effort, the City was required to evaluate the cumulative impacts of “reasonably foreseeable” future development to verify that the proposed policies and regulations for shoreline management are adequate to ensure *no net loss* of shoreline ecological functions. In 2012, the City completed an assessment of cumulative impacts from the SMP, and concluded that anticipated development and use occurring under the SMP would not result in cumulative impacts and would meet the no net loss standard (City of Mercer Island, 2012¹). A key component of protecting shoreline ecological functions under the adopted SMP was establishment of new standards for overwater moorage structures, including development standards for replacement, repair and maintenance of the pier, dock and platform lift structures that are commonly associated with shoreline residential lots around the City (MICC 19.07.110.E.6.b).

In June 2019, the City locally adopted updates to the SMP, consistent with Ecology’s mandated periodic review process. Along with minor updates to ensure ongoing consistency with State Shoreline Management Act (SMA) guidelines, the City updates integrate Critical Areas standards that were recently adopted (consistent with Best Available Science and State guidelines for wetlands, streams and other critical areas issued since 2014). In addition, the City locally adopted changes to development standards for repair and replacement of existing overwater piers and docks. Specifically, the City Council updates are intended to refine replacement actions, to differentiate between actions that involve replacement of piles and structural elements, and those that only involve only decking repairs. Decking replacement actions would no longer trigger required dimensional changes, including narrowing of the first 30 feet of the dock, as mandated previously by the SMP. The locally adopted

¹ The City of Mercer Island 2012 Shoreline Cumulative Impacts Analysis is available on the City website:
<http://www.mercergov.org/files/Attachment%203%20-%20Cumulative%20Impacts%20Analysis.pdf>

updates do still require dimensional changes for larger replacement actions, whenever more than 50% of an existing dock's structural elements (piles, stringers, etc.) are replaced within a 5-year period.

These changes to dock repair and replacement standards were requested by City Council, with the request and development of the updated standards triggering review and focused analysis of cumulative impacts for this specific code revision. Subsequent to local adoption, proposed SMP updates and a June 10, 2019 draft of this technical memorandum were submitted to Ecology for review. The City adopted its updated CAO and SMP on June 18, 2019.

This technical memorandum provides a planning level assessment of the potential cumulative impacts that would occur based on locally adopted changes to SMP standards for repair and replacement of existing piers and docks. The analysis is an addendum to the cumulative impact analysis (CIA) that was prepared in support of the SMP in 2012 (City of Mercer Island, 2012). This addendum is limited in scope to focus only on updates to repair/replacement development standards for overwater structures, and does not consider updates to integrated critical area regulations currently being considered by the City. The locally adopted updates to integrate new critical areas standards will increase protection for shoreline ecological functions, as the updated critical areas regulations are providing additional protections, buffers and setbacks for wetlands, streams, aquifers, fish and wildlife habitats, and geological hazards. The City coordinated with the Department of Ecology to incorporate required and recommended amendments related to the protection of critical areas within the shoreline jurisdiction. Other minor updates to the locally adopted SMP as identified through the Ecology Periodic Review Checklist are also not considered in this technical memorandum, as they have no implications (or minimal beneficial implications) for shoreline ecological functions.

As with the 2012 CIA, this 2019 addendum is limited to cumulative impacts of reasonably foreseeable future development in areas subject to SMA jurisdiction. For Mercer Island, the shoreline of the state extends along approximately 14.7 linear miles of Lake Washington frontage. Lake Washington is considered a "shoreline of statewide significance," due to its total area over 1,000 acres. The lake shoreline is predominantly developed with single family residential use, and the vast majority of residential lots have existing private piers/docks/floats. The large majority of these overwater structures have been in place for 30+ years, and are part of the baseline condition established by the City's 2009 Shoreline Analysis and Inventory Report² (see summary of Current Circumstances starting on page 4 of this memo).

Former Development Standards and Locally Adopted SMP Update

Regulatory Approach for Repair and Replacement of Docks

This cumulative impacts analysis is focused on one specific section of the City's SMP - [MICC 19.07.110.E.6.b³](#). Standards in this section are directed at proposals for repair and replacement of existing piers and docks. While the City does not explicitly differentiate between 'repair' and 'replacement' or define these specifically, the SMP regulatory approach is consistent with neighboring jurisdictions (both as adopted in 2015 and with recent locally adopted updates). Similar to other Lake Washington jurisdictions, the City has standards for minor actions on existing docks (commonly defined as 'repair' activities by other jurisdictions and Ecology). For more major

² Available: <http://www.mercergov.org/files/Attachment%202.pdf>

³ This is the code citation for the SMP as adopted in 2015; as part of the locally adopted 2019 update (City Ordinance 19C-06), the SMP will be re-coded as MICC Chapter 19.13, and all subordinate headings will be updated. The key section of the locally adopted 2019 SMP is MICC 19.13.050.F.2.

actions (commonly defined as ‘replacement’ activities) the City has more rigorous standards. The City and other communities implement this approach with the intent of ensuring expectations for dock maintenance are commensurate with the proposed action, while at the same time minimizing the ecological impacts associated with docks as they are repaired and replaced over time.

Former Dock Repair and Replacement Standards

Standards for ‘major’ actions (commonly referred to as dock ‘replacement’): Under the former SMP, any proposal that would replace or reconstruct “*more than 50 percent of the structure’s exterior surface (including decking) or structural elements (including pilings)*” as measured cumulatively to include the previous 5-year period, has to comply with the following standards:

(A) Piers, docks, and platform lifts must be fully grated with materials that allow a minimum of 40 percent light transmittance;

(B) The height above the OHWM for moorage facilities, except floats, shall be a minimum of one and one-half feet and a maximum of five feet; and

(C) An existing moorage facility that is five feet wide or more within 30 feet waterward from the OHWM shall be replaced or repaired with a moorage facility that complies with the width of moorage facilities standards specified in subsection (E)(4) of this section (Table D).

These standards are intended to reduce the extent of harmful overwater coverage (i.e, shading effects) from EXISTING piers/docks as they are replaced over time. Of note, these standards treat any proposal for pier reconstruction over the 50% threshold the same, whether the applicant is intending to only replace decking and other exterior surfaces, or is implementing a larger effort to replace piles, stringers or other structural elements. For example, a dock owner that proposes replacing more than 50% of the existing decking on their dock would be required to elevate the entire dock structure and narrow the width of the dock near the shoreline in order to receive City approval.

Standards for ‘minor’ actions (commonly referred to as dock ‘repair’): Under the former SMP, any proposal for repair of an existing dock that falls below the “more than 50% threshold” is considered a ‘minor’ action. Such requests do not require implementation of dimensional changes for the existing structure; however, must still follow all applicable federal and state permits (including Washington Department of Fish Wildlife [WDFW] Habitat Program – Region 4 guidance for dock repairs on freshwater lake shorelines, dated June 2018). For any repair or replacement action, City requires that all dock materials be appropriate for the aquatic environment, and WDFW guidance – as implemented through Hydraulic Project Approvals (HPAs) – requires that 100% repaired/replaced decking be light penetrating.

New Pier and Dock Redevelopment Standards

New standards for ‘major’ actions: City-adopted standards for major dock replacement proposals were adjusted to differentiate between projects that replace 50% or more of the decking and other exterior surfaces and those that include replacement of 50% or more of the structural elements (including piles). The 50% threshold would still be applied cumulatively to include the previous 5-year period.

- **For proposals that would replace greater than 50% of exterior surfaces (clarified within City-adopted standards to include decking, fascia, and platform lifts):** the applicant would be required to fully replace the decking with materials that allow a minimum of 40 percent light transmittance. The applicant would not be required to implement dimensional changes to the docks height or width.
- **For proposals that would replace greater than 50% of the structural elements (clarified within City-adopted standards to include piles, caps, and stringers):** all of the existing standards would be maintained, including requirements to increase the dock height to at least 1.5 feet above the lake level at ordinary high water and to narrow the first 30 feet of the dock structure extending from the OHWM to 4 feet in width.

Updated standards for ‘minor’ actions: The City-approved updates do not change any of the standards for minor actions or repairs, except that clarification is provided that any dock repair that replaces existing decking must replace that decking with grated decking that provides light transmittance.

Analysis Approach

To assess potential cumulative impacts, ESA reviewed dock repair and replacement permit data from recent years (since the new SMP became effective in 2015) provided by the City. The City permit data was supplemented by details from a query of the WDFW HPA database. Review focused on assessment of how the SMP standards were applied at the project level, specifically examining for instances where proposed dock replacement activities would have exceeded the threshold for required dimensional changes on the replacement structure. The purpose of this analysis was to document changes to dock dimensions across the City’s shoreline in response to the SMP standards from 2015.

To supplement this analysis of permit records, ESA used 2017 aerial photos of the Mercer Island shoreline to measure current dock width and overall dock length from the approximate OHWM. This aerial analysis was completed for 110 residential shoreline parcels, selected at random in order to provide a representative sample of existing dock dimensional patterns across Mercer Island. While a comprehensive inventory of all docks was completed as part of the 2012 CIA, that effort did not report on the width of existing docks where they intersected the shoreline.

ESA used the permit data to estimate the number of dock/pier redevelopment proposals that are expected on an annual basis in the years ahead, and to quantify approximately how many of these activities would include replacement of exterior surfaces (including decking material) versus structural elements (e.g., pilings or supports). ESA discussed the estimates of anticipated dock/pier redevelopment with City staff to get their perspective.

Relying on the 2012 CIA and updated analysis, ESA qualitatively assessed potential detrimental and beneficial effects to shoreline ecological functions. ESA concludes with a determination, based on consideration of cumulative impacts, as to whether updated pier/dock replacement standards could change the overall determination of no net loss (NNL) of shoreline ecological functions documented in the 2012 CIA. In both the original June 2019 draft of this memo and in this updated version, ESA provides optional recommendations for future updates to dock repair and replacement standards that could be considered to increase the beneficial effects of repair and replacement actions.

Current Circumstances

In 2019, shoreline conditions within the City of Mercer Island are generally similar to those described in the 2012 CIA. The 2012 CIA documented a total of 690 pier/dock structures across the City's Lake Washington shoreline, of which 678 (98%) occur within the Urban Residential environment associated with single family residential lots. As documented in 2012, the large majority of the City's 713 residential lots along the shoreline have existing private piers/docks. The total overwater coverage of piers/docks associated with private residential use was calculated to be approximately 532,000 square feet, or an average of approximately 785 square feet of overwater coverage per pier/dock. The SMP allows a maximum coverage of 480 square feet for any new or reconfigured moorage facility (pier/dock/float structure) associated with a single family lot as per MICC 19.07.110(E)(6)(a). Permit approvals for private residential piers/floats prior to 2015 resulted in a proliferation of overwater structures, resulted in generally greater overwater coverage on average than what the current regulations allow.

The SMP standards adopted in 2019 redefine which future repairs and replacements will require narrowing of the first 30 feet waterward from the OHWM as part of the action. Recent aerial imagery was analyzed to understand how frequently the repair and replacement standards could come into play, based on the typical widths of existing docks. For 110 shoreline lots selected at random, we measured existing dock width within the first 30 feet waterward from the OHWM, and approximate overall dock length from the OHWM. Results are presented in Table 1, below.

Table 1. Analysis of existing private residential pier/dock widths along the Mercer Island shoreline; random sample of 110 (approximately 16% of total private residential pier/dock count) based on 2017 aerial imagery.

APPROXIMATE DOCK WIDTH WITHIN 30 FEET OF SHORELINE (FEET)	NO. OF STRUCTURES	PERCENT OF TOTAL SAMPLED	OVERALL DOCK LENGTH (AVERAGE FEET)
4	7	6%	84
5	13	12%	78
6	62	56%	79
7	12	11%	62
8	9	8%	73
9	2	2%	63
15+	5	5%	64
TOTALS	110	100%	

Based on the sample of docks measured, the new repair and replacement standards would have implications for more than 90% of existing docks (all with a width near the shoreline of 5 feet or more).

Recent Shoreline and WDFW HPA Permit History, and Reasonably Foreseeable Future Redevelopment Requests

The 2012 CIA noted that an average of 19.4 docks per year were modified or redeveloped during the period from 2000 to 2010. The CIA anticipated an increase in this rate, based on anecdotal information from property owners and City staff observations. The CIA forecasted that an average of 25 overwater structures would be redeveloped per year for a total of 500 dock redevelopments over a 20-year planning period.

City staff provided shoreline permit records for the last several years. ESA queried these records for 2015 through 2018 to determine the number of pier/dock replacement and repair activities that have occurred since the comprehensively updated SMP became effective in 2015 (Table 2). Additionally, WDFW Hydraulic Project Approval (HPA) records for the period from 2016 through 2019 were queried (Attachment A).

Table 2. Count of shoreline permits for maintenance, repair and replacement of existing overwater piers/docks since 2015

	2015	2016	2017	2018
FULL PIER/DOCK REPLACEMENT	4		2	
PARTIAL REPLACEMENT OF PILES /FRAMING STRUCTURE, AND DECKING	7	5	8	8
REPLACE DECKING ONLY	1		1	2
NEW BOAT LIFT ONLY		1		
“NORMAL REPAIR / MAINTENANCE” (UNSPECIFIED)	1	2		1
TOTALS	13	8	11	11

Based on recent shoreline permit history, it is likely that the 2012 CIA was over-predicting the annual rate of pier/dock replacement activity. Considering projections from the 2012 effort and recent permit history, we anticipate from 10 to 20 pier/dock repair and replacement requests on an annual basis in the foreseeable future.

Specific review of individual permits, and subsequent as-built conditions, reveals a pattern where most all actions proposed fell below the 50% threshold, thus avoiding the requirements to alter dock dimensional standards. This has been the case for approved permits that included replacement of piles, dock structure, and/or decking. Several example permits highlight the pattern that we have seen:

- **Permit SHL17-019** – Dock minor repair activities included framing replacement and new decking in portions of the dock; however, more than 50% of the dock was not included in the proposed action, so dimensional changes and requirement for full grating were not required as part of the permit approval. This dock is associated with a residential property along East Mercer Way.
- **Permit SHL18-005** – The approved proposal was for replacement of exactly 50% of existing decking. The minor replacement action for this dock, associated with a residential lot located off of Forest Avenue SE, was clearly intentionally designed to stay just under the ‘more than 50% threshold’, which under the current SMP (even when only associated with decking replacement) would have required dimensional changes.
- **Permit SHL18-009** – Similar to the previous example, this approved proposal and HPA issuance was for replacement of exactly 50% of existing decking, as well as splicing of five of the existing piles. The minor replacement action for this dock, associated with a residential lot located off of 77th Avenue SE,

also appeared to be intentionally designed to stay just under the ‘more than 50% threshold’, which under the current SMP would have required dimensional changes.

The analysis also revealed instances where major replacement actions resulted in implementation of the required dimensional changes, as provided in examples below:

- **Permit SHL16-026** - Recent dock replacement at a residential property off of 100th Avenue SE resulted in both grated decking and dimensional changes consistent with the SMP. This replacement action, which was constructed in 2018, included new piles, all new structural elements, and all new decking – so would have triggered all of the same standards for replacement if reviewed under the locally adopted SMP update.
- **Permit SHL17-013** - For a residential property off of 82nd Avenue SE provided approval for a full dock replacement where the new dock would be grated and the portion of the dock within 30 feet of the shoreline would be narrowed. From review of available aerial photography, it did not appear that the approved replacement had occurred as of May 2018.
- **Permit SHL17-022** - Along the City’s NE shoreline associated with a residential lot off of Roanoke Way. This major dock replacement included replacement of several existing piles, and all structural elements and grating. As a result, the replacement dock is fully grated and is 4 feet wide within 30 feet of the shoreline.
- **Permit SHL18-010** – Along the City’s NE shoreline associated with a residential lot off of SE 35th Place. This major dock replacement included replacement of existing timber piles with steel piles, and all structural elements and grating. As a result, the replacement dock (still to be constructed) will be fully grated and will be 4 feet wide within 30 feet of the shoreline.

We also identified limited instances where major dock replacement actions that appeared not to have resulted in the dimensional changes required by the SMP. For example, this appeared to be the outcome for **Permit SHL16-016**, off of Shore Lane along the western shoreline of the City. The comprehensive dock replacement included new piles, structural elements, and all new grated decking, so presumably exceeded the 50% threshold as a major action. However, the portion of the dock within 30 feet of the shoreline was not narrowed to 4 feet in width.

Of greater significance to understanding implications of the locally adopted SMP changes, review of permit records from 2015 thru 2018 revealed only one instance where decking replacement requests alone resulted in the applicant being required to implement dimensional changes for the replacement dock (associated with **Permit SHL18-029** associated with an east shore residence off of SE 61st Street). In this one instance, only the first 16 feet of the dock was narrowed from 5 feet wide to 4 feet wide. Based on the minimal occurrence of this type of ‘major’ replacement action only associated with decking, ESA supposes that residential dock owners recognize that the cost that would be associated with implementing dimensional changes to their existing structure would likely be significantly greater than the decking replacement that they are requesting. As such, in almost all instances in the 3+ year period evaluated, dock owners completed decking replacement activities so as to remain at or below the 50% threshold under MICC.

The query of the WDFW HPA permit database for the period between 2016 and 2019 verifies the same pattern of recently approved repair and replacement projects. All but one of the issued HPAs was associated with a City shoreline permit. There were, however, a number of City shoreline permits that were not associated with an HPA, suggesting a higher rate of compliance at the local level for dock repair and replacement activities. Of the thirteen WDFW HPAs issued for residential dock repair and replacement in this four-year period, three were for decking

replacement only. The remaining included replacement of both structural and decking elements, or were reconfiguration / expansion projects.

One of the three decking replacement only HPAs indicated narrowing of the first 30 feet of the dock (associated with **City Permit SHL18-029**, as also noted above). According to the approved plans, this proposal replaced 100% of an existing residential dock's worn wooden grating with grated panels, and narrowed the first 16 feet from the shoreline to 4 feet wide (from 5 feet wide on the existing dock). This City and WDFW approved proposal noted that at greater than 16 feet from the shoreline, the lake depth was great enough that narrowing was not necessary.

The 50% threshold for major actions associated with both structural and decking elements resulted in narrowing for four dock projects reviewed within the HPA database. Review of project plans, and where feasible review of recent aerial photography, showed dock narrowing for the first 30 feet of the dock (see HPA permits 2018-4-164+01, 2018-4-833+01, 2018-4-836+01, and 2018-4-845+01 as detailed in Attachment A). In all instances, it is apparent that the narrowing was triggered by the previous SMP for each of these four docks, and would continue to be triggered by the 2019 SMP (as adopted) as all three appear to have included structural replacement above the 50% threshold.

Benchmarking from Neighboring Jurisdiction Standards

ESA reviewed current regulations from other Lake Washington cities related to repair and replacement of existing docks, specifically replacement of decking. This review included standards for dock repair and replacement in the Cities of Kirkland, Bellevue, Kenmore, Lake Forest Park, Renton, Medina, Hunt's Point and others. We also reviewed standards for dock repair and replacement for communities along the Lake Sammamish shoreline, including Sammamish and Issaquah. All of these standards are summarized in the attached *Dock Repair & Replacement Summary Matrix for Lake Washington & Lake Sammamish*. The matrix is based on the summary table document provided by Ecology to the City on September 24, 2019 (Burcar, 2019).

As summarized previously, most cities on Lake Washington have standards that apply to minor actions (typically called 'repair') and more rigorous standards that apply to more major actions (typically called 'replacement'). When reviewing dock regulations in other jurisdictions, a very common threshold that is used to distinguish between minor versus major actions is "75% of piling replacement". This is the approach taken by Bellevue, Hunt's Point, Lake Forest Park, Medina, and Sammamish. Some of these jurisdictions have a piling spacing requirement that is triggered when between 25%-75% of pilings are replaced, such that new piles must be spaced a minimum of 18' apart along the length of the dock (Lake Forest Park, Medina, and Sammamish). Several other communities have set the threshold between minor and major actions at "50% of piling replacement" (Renton and Yarrow Point) or "50% of piles, structural elements and decking". For minor actions ('repairs') below these thresholds, there is generally no expectation for elevating the dock or limiting the first 30' from shoreline to 4' width.

The City of Mercer Island dock regulations maintain the threshold between minor and major actions at 50%, a trigger that is consistent with several neighboring communities, and more stringent (lower threshold) than many neighboring communities. In addition, the City will continue to apply this 50% threshold to both pilings and other structural elements (stringers, etc.) and exterior surface (decking, etc.) replacement proposals. Anything above the 50% threshold would be a major action, with replacement of piles and other structural elements requiring

implementation of the 4' width as part of the action. The update CIA Memo will clearly highlight that these more major actions (as regulated by F.2(i)) fit into the category that is commonly referred to as 'replacement' by most other Lake Washington jurisdictions.

With regards to proposals for replacement of decking only, review of neighboring jurisdictions shows adopted standards similar to or less stringent than Mercer Island's locally adopted standards. In Kirkland and Issaquah, any proposed replacement of 50 percent or more of the decking or decking substructure for overwater docks must demonstrate the following:

- Replace solid-surface decking with grated material that allows a minimum of 40 percent light transmittance through the material.
- Materials must be environmentally neutral (no wood treated with creosote, pentachlorophenol or other toxic chemicals) and meet material standards outlined by the Washington State Department of Fish and Wildlife (WDFW) for new overwater structures.

Mercer Island's locally adopted standards for 'major' decking replacement proposals is consistent with this approach, as any proposal replacing greater than 50% of exterior surfaces would be required to use fully grated decking material consistent with WDFW standards (MICC F.2(j)). Numerous other jurisdictions, including Bellevue, Lake Forest Park, Medina, Hunt's Point, and Sammamish, have no standards triggering full replacement of solid-surface decking with grated material.

In summary, Mercer Island's locally adopted approach for permitting dock repair and replacement is consistent with the approach taken by other Lake Washington and Lake Sammamish shoreline communities. In fact, Mercer Island's approach will put more proposals in the major action / 'replacement' category than many jurisdictions, including Bellevue, Lake Forest Park, Medina, Hunt's Point, Sammamish and others.

Benchmarking from WDFW Standards

The WDFW regulates in-water and over-water development activities by issuing HPAs in accordance with 77.55 RCW. WDFW's guidance for Fresh Water Residential Overwater Structures (Revised June 2018, and issued by WDFW Region 4 Habitat Program) details requirements for both repair/replacement of piers and docks, and for new/modified/expanded piers and docks. The WDFW Guidance directs any proposal for replacement decking to use grating that has a minimum of 40% open space across the entire extent of the pier (decking with 60% open space is recommended, although this is less frequently used due to additional need for supportive substructure elements that largely negate the benefit of the additional open space). Allowances are provided for solid decking around the very edges of a pier/dock, in places where substructure would block light transmittance anyway. WDFW guidance requires replacement of decking with light penetrable grating whenever decking repair or replacement is proposed (no threshold based on percentage of area replaced, or cost).

For proposals that only replace decking, and for other projects that are only repairing or replacing other structural portions of an existing pier or dock without changing the size or configuration of the structure, WDFW guidance does not require dimensional changes (either in pier/dock width within 30 feet of the shoreline, or in pier/dock elevation above the OHWM). WDFW's dimensional standards for new, modified, or expanded pier/dock structures are generally consistent with the standards within the Mercer Island SMP. It is only for new, modified,

or expanded dock/pier structures that the first 30-feet of the structure is recommended to be 4-feet wide (the guidance actually allows for this portion to be 6-feet wide, but encourages the narrower 4-foot width).

Assessment of Cumulative Impacts

Ecology guidance states that “local governments should use existing shoreline conditions as the baseline for measuring no net loss of shoreline ecological functions.” The City’s shoreline areas are nearly fully developed consistent with established land use designations – therefore, most development proposals involve redevelopment. Our review of impacts associated with future redevelopment of overwater structures is focused on those proposals that repair and update existing structures without proposing an increase in size, dimension or reconfiguration.

Consistent with the 2012 CIA, this analysis uses methods to assess the anticipated loss and/or gain in shoreline ecological functions associated with implementation of updated overwater moorage structure development standards into the future. Categories of shoreline ecological functions include habitat, water quality, and hydrology. Unlike the 2012 CIA, we do not attempt to quantify the ecological function points associated with anticipated future development; rather, a qualitative approach is used. That said, approximate evaluation of implications on the 2012 CIA ecological functions points is provided at the conclusion of this section.

Effects to shoreline ecological functions have been summarized below by general function type, specifically by fish/aquatic habitat, water quality, hydrology and riparian vegetation.

Fish/Aquatic Habitat

Habitat for fish, especially juvenile salmonids, and other aquatic species is the primary shoreline ecological function affected by docks/piers. Chapter 12 on Piers, Docks and Overwater Structures from Ecology’s SMP Handbook (Ecology Publication Number: 11-06-010, Revised June 2017) describes the environmental impacts of overwater structures, including effects on movement of juvenile salmon along a shoreline, and patterns of predation.

The 2012 CIA concluded that each dock replacement and repair action would result in “a slight improvement” above baseline habitat conditions. The 2012 CIA appears to have assumed that requirements for light penetrable grating and structural changes would be triggered for all pier/dock replacement proposals, such that slight improvement would occur for every dock repair / reconstruction request (25 times annually).

Based upon more recent permit data from the City and from the WDFW HPA permit database, it appears that the 2012 CIA overestimated the frequency by which dock replacement or reconstruction would occur. That said, we believe that any exterior surface (decking) replacement proposal that replaces solid decking with 40% light penetrable decking will serve to reduce impacts on juvenile salmon rearing and out-migrating along the Lake Washington shoreline. Further, it is anticipated that the proposed less burdensome standards for exterior surface replacement may result in a faster conversion of light impenetrable to light-penetrable grating over time. While existing docks with replaced decking would not be required to increase height to a minimum of 1.5 feet or be required to shrink the width to 4 feet, the benefits of light penetrability alone would result in incremental benefits to aquatic habitats over time.

Water Quality

The 2012 CIA did not assess implications on docks/piers on water quality functions. The current SMP limits the use of creosote and other toxic chemicals allowed in dock construction. The proposed update to the CIA does not change standards for use of WDFW and-Corps approved materials for all in-water and over-water structures. All materials required by state and federal permit authorities remain the same. For this reason, it is anticipated that the provisions for pier/dock repair and replacement will continue to incrementally improve water quality functions by decreasing the extent of previously installed structures that have negative water quality impacts.

Hydrology

The 2012 CIA indicated that shoreline hydrology functions would not be affected as a result of the new SMP standards. Based upon our review, it appears that revisions to the decking replacement requirements for docks would not have any measurable effect on hydrologic functions such as wave action, water flow or sediment transport.

Riparian Habitat

The 2012 CIA did not separately evaluate effects of the standards to riparian habitat. However, based upon the developed nature of the shoreline in Mercer Island, it is apparent that riparian habitat is lacking and a limiting factor. For any short-term impacts to existing vegetation associated with construction of proposed dock repairs or replacement, the SMP will continue to require that disturbance be minimized to the greatest extent possible and that replacement with native herbaceous and/or woody vegetation occurs following construction. The proposed code changes do not require additional riparian plantings for projects that do not alter riparian habitat. It appears that the proposed updates to pier/dock decking replacement standards would have no measurable effect on riparian habitat values and functions over time.

Cumulative Impacts

The 2012 CIA assigned ‘cumulative impact points’ for all assessed elements of the SMP. Based on these points, the standards for redevelopment of existing docks were anticipated to result in 500 beneficial points, indicating a significant anticipated cumulative benefit (25 redevelopment projects annually, each accounting for +1 point, multiplied by the 20 year planning period). Overall, the 2012 CIA identified only 32 degradation points (associated with limited potential for new residential development and new dock development on lots without structures at the time of the 2012 analysis), and assigned beneficial points to anticipated park projects (+450) and residential redevelopment actions (+140). The 2012 CIA was reviewed and approved by Ecology as part of the full comprehensive SMP update.

Based upon this limited CIA for replacement of dock decking alone, we would not anticipate changes to the conclusions of the 2012 CIA. As a result of the new proposed standards and the reduced pace of dock/pier replacement, fewer beneficial points would accrue during the replacement of dock decking projects. Assessment of recent shoreline permit history suggests that fewer than 25 dock redevelopment projects are likely to occur annually, and the reduced expectations for actions that exceed the 50% threshold for decking replacement would result in less ecological benefit for those projects. However, as detailed previously, review of City permit history from 2015 thru 2018 and WDFW HPA Permit History from 2016 through 2019, shows that this type of ‘major’ decking replacement action has very infrequently occurred.

For the ‘major’ replacement actions that have been occurring along the City’s Lake Washington shoreline (those associated with pile replacement, structural reconstruction, and decking replacement), the requirements would continue to improve conditions for aquatic habitats incrementally over time. Further, ESA anticipates that under the locally adopted SMP, a greater number of residential docks are likely to be repaired with new decking that provides 40% minimum light transmittance. This is due to the updated standards for decking replacement becoming more commensurate with the scope of such proposals, with fewer dock owners intentionally staying below the 50% threshold. ESA anticipates that the higher frequency of actions replacing solid surface decking with grating will result in a greater rate of benefit over the planning horizon.

Based on our understanding of Shoreline Management Guidelines adopted by Washington State (WAC 173-26) and associated guidance from Ecology (Shoreline Master Programs Handbook, Chapter 4 and Chapter 17; Ecology 2017), the focus of this assessment of cumulative impacts memo is the determination of no net loss of shoreline ecological functions as compared to existing conditions (as established in the City’s Inventory and Characterization Report).

Relying on the Cumulative Impacts point quantification system that was used in the 2012 CIA, it is likely that a reduction in the number of ‘beneficial’ points of dock redevelopment from +500 is warranted. It is likely that closer to 10 ‘major’ replacement proposals will occur each year than the 25 assumed in the 2012 CIA. And, with the reduced standards for those proposals that are only above the 50% threshold for exterior surfaces, conservatively the associated ‘beneficial’ points could be reduced from +1 to +0.5 for each action. These new assumptions result in a total of +100 points associated with dock redevelopment over the next 20 years (20% of the beneficial points assumed in the 2012 CIA). Even with this reduction, the overall total summation of cumulative impacts for the locally adopted SMP would remain at +608 cumulative impact points. Further, this does not consider the likely additional ecological benefits associated with integration of new critical areas standards, as adopted by the City in 2019 consistent with best available science.

Recommendations for Future SMP Updates to Maximize Gain in Ecological Function as Future Dock/Pier Resurfacing Proposals Occur

ESA completed the evaluation in this memorandum consistent with the updated dock repair and replacement standards in the locally adopted SMP. However, as part of evaluation prior to local adoption, ESA considered recommendations for the updated development standards (MICC 19.13.050.F.2.i and j. as locally adopted) to further increase gains in ecological functions as repair and replacement of pier/dock decking occurs in the foreseeable future. ESA recognizes that the City Council elected not to implement these recommendations; however, they are maintained in this CIA memo so as to inform future SMP updates in the years ahead.

Primary recommendation: For exterior surface (including decking) replacement only, eliminate the “50% of exterior surface” threshold altogether or reduce the threshold to 20%. Implementing this change would provide additional consistency with WDFW guidance, and is anticipated to increase the frequency with which existing piers/docks would be re-decked with light transmittable grating in the years ahead. This approach may also reduce challenges associated with application of this standard.

Secondary recommendation: Consider requiring additional mitigation measures for any replacement proposal under locally adopted MICC 19.13.050.F.2.i:

- Where there is existing skirting around a pier/dock structure, require that removal (or reduction in coverage) of any existing skirting be included as a standard for decking replacement.

- Where there is no skirting around the existing structure, require implementation of shoreline vegetation enhancement, with installation of a defined amount of native tree and native shrub species within 10 feet landward of OHWM to enhance and improve riparian habitat along the shoreline. Native vegetation is lacking along the Mercer Island shoreline and adding native trees and shrubs will provide shade and nutrient inputs through leaf litter. Similar to WDFW standards, we recommend planting two native trees (Douglas fir, western red cedar, western hemlock, red alder, quaking aspen, Oregon white oak, Pacific willow) and three native shrubs with the potential to achieve heights of four feet or greater. This would be in addition to any native plantings required to mitigate construction disturbance under MICC 19.07.110.E.6.b.viii (re-codified within MICC 19.13), and in addition to any native vegetation required for new development adding over 500 square feet of additional gross floor area or impervious surface per MICC 19.07.110.E.9.d (re-codified within MICC 19.13).

If one or both of these recommended additional standards were required for all overwater moorage structure ‘major’ replacement proposals, the gains in ecological functions (primarily for fish habitat) already associated with use of light penetrable grating would be extended.

Conclusion

Based upon our review and analysis, ESA does not believe that any additional measures are required to achieve beneficial gains in shoreline ecological functions as compared to existing conditions. That said, these gains could be increased in the future if the City chooses to incorporate one or more of the recommended additional standards that are suggested in the previous section.

Conclusions on the future performance of key shoreline functions as a result of the updated standards for pier/dock/float resurfacing proposals are summarized as follows:

Aquatic Habitat: No net loss of aquatic habitat function is anticipated. The replacement of existing decking with grated materials will be an incremental improvement over existing conditions within the City’s shoreline.

Water Quality: No net loss in water quality is expected. As previously installed materials are replaced (including likely removal of treated lumber that is slowly leaching contaminants into Lake Washington), the resurfacing of existing piers/docks/floats is anticipated to improve water quality.

Hydrology: No net loss in hydrological function from baseline is expected.

Riparian Habitat: No net loss in riparian habitat functions is anticipated due to this change in standards for dock repair. If in the future the City chooses to implement additional plantings as part of the dock repair and replacement, then riparian habitat functions will likely increase incrementally.

Compared to existing standards, which had required that any proposal resurfacing more than 50% of a dock’s exterior surfaces had additionally to reconfigure the dock to narrow the portion close to shore and increase the height above the ordinary high water of the lake surface to a minimum of 1.5 feet, the new approach may result in less ecological gain for each replacement proposal. However, as previously discussed, the re-decking requirement alone will likely result in incremental gains in shoreline ecological functions over time.

HPA Permit Number	HPA Project Description	Project Type	Project Type Code (1 = decking, 2 = structural+decking, 3 = reconfigure/ expand)	Nearshore Portion Narrowed?	HPA Permit Issue Date	Parcel Number	City Shoreline Permit #	City Shoreline Permit Description	Aerial review for Dock Narrowing	Discussed in Memo?
2017-4-829+01	Repair dock on Lake Washington in same footprint. Replacement stringers to be 4"x8" ACZA treated fir. Joists/pile caps to be 6"x8" ACZA treated fir. Worn wooden decking to be replaced with ThruFlow grated panels. Piles to be sleeve if/as needed. Install planting plan of at least 9 native woody shrubs within 10' of the OHWM.	Structural + Decking	2	No	11/16/2017	1410300023	SHL17-016	C-REPAIR EXISTING REIDENTIAL DOCK (approved)	no indication of dock narrowing in 2018 aerial	
2017-4-899+01	Permanently remove a 33'X 22' moorage cover and 4 associated 8" wood piles and permanently remove 16'X 2' ELL and two (2) associated 8" wood piles. Remove and replace three (3) existing 8" wood piles, drive three (3) new 8" wood piles and construct a 2' wide addition to the eastern 25' of the existing walkway. Install a boatlift and translucent canopy including two footpads and posts to support the front portion of the canopy. Install native planting plan and 10 cubic yards of nourishment gravel, remove nearshore debris. This project is a modification of a previously permitted activity authorized by HPA issued for APP ID #8662	Expansion / Reconfigure	3	No	12/20/2017	7776700050	SHL16-003	MODIFICATION AND ADDITION TO EXISTING MOORAGE FACILITY (approved)	no indication of dock narrowing in last 5+ years (even with replacement dock as constructed in 2016 per earlier City permit SHL15-021)	
2018-4-164+01	Normal maintenance of a residential dock consisting of removing the wood deck, stringers and pile caps and replace with new treated pile caps and stringers and a fully grated deck. Reduce the inshore 30-foot to 4-foot wide. Permanently remove one mooring pile. Permanently remove the solid moorage cover. Repair one pile with the pile stub method. Install one boatlift with translucent canopy, one jet ski lift, and one platform lift. Install two mooring piles.	Structural + Decking	2	Yes	3/8/2018	7355700060	SHL17-022	MAINT OF A SFR DOCK - SEE NOTE (approved)	Google Earth aerial from 2019 shows narrowing	Discussed in Memo as example of gerater than 50% (structural + decking) requiring narrowing
2018-4-287+01	Remove the existing pier and construct a new residential dock with a 150-foot long walkway consisting of 100-foot long and 4-foot wide and 50-foot long and 6-foot wide. Construct a finger pier measuring 26-foot long and 4-foot wide. The dock is supported by (22) steel piles. Install one boatlift.	Expansion / Reconfigure	3	NA	4/30/2018	4076000070	No City Permit	NA	Review of Google Earth shows that HPA approval has not yet initiated replacement dock construction	
2018-4-343+01	Remove the existing 541 square foot residential dock and construct a new 393 square foot dock supported by two (2) 8â€ and sixteen (16) 10â€ steel support piles, plus four (4) 10" steel brace piles. Also propose to construct a 36-foot long by 16-foot wide moorage cover. Relocate an existing offsite boatlift and install a non-ground contact lift on a pile mounted platform.	Expansion / Reconfigure	3	NA	5/17/2018	3623500273	SHL17-010	C-REMOVE AND REPLACE DOCK (approved)	2019 Google Earth aerial imagery shows replacement dock construction	
2018-4-821+01	Maintenance on an existing residential pier by repairing (5) wood piles with the pile stub method. Solid wood decking to be replaced with grated decking over ~50% of the entire pier. Planting plan to be implemented as part of project as well.	Structural + Decking	2	No	11/15/2018	4097100045	SHL18-009	C-REPAIR 5 WOOD PILES, REPLACE 50% OF DECKING (approved)	Review of Google Earth shows that permitted repair activities did not trigger any change in dock footprint	Discussed in Memo as example of below 50% threshold
2018-4-823+01	Sleeve up to 6 damaged piles with HDPE tubes.	Structural	2	No	11/16/2018	8000000019	SHL17-021	REPAIRS TO AN EXISITNG COMMUNITY DOCK (approved)	Pile repairs only; no apparent changes in dock configuration in 5+ years	
2018-4-833+01	Worn wooden decking to be replaced with ThruFlow grated panels on existing Lake Washington residential dock. First +/- 37 feet of the pier will be reduced from 6' to 4' wide. Stringers will be replaced and relocated/narrowed to accommodate 4 foot wide pier secton. Existing joists/pile caps (6') will remain in place.	Structural + Decking	2	Yes	11/28/2018	2948900012	SHL18-023	REPLACE WOOD DECKING W/GRATED PANELS ON DOCK (approved)	Most recent aerial (5/2018) does not show constructed project; plans included with City permit record verify narrowing proposed	Noted in Memo as example of gerater than 50% (structural + decking) requiring narrowing
2018-4-836+01	The proposed project will repair up to nine untreated timber piles using the pile splice method, replace the wooden fascia in kind, and replace the solid wood decking with molded plastic grated (minimum 40% open space) decking. This project also proposes to reduce the nearshore pier walkway width from 6 feet to 4 feet, remove four 10"-12" existing untreated timber piles and replace with two 6" steel piles, and implement a partial planting plan.	Structural + Decking	2	Yes	11/29/2018	252404-9062	SHL18-016	REPAIR 9 PILES, REPLACE WOODEN FASCIA, REPLACE WOOD DECKING (approved)	Most recent aerial (5/2018) does not show constructed project; based on HPA description, presumed that narrowing occurred	Noted in Memo as example of gerater than 50% (structural + decking) requiring narrowing

HPA Permit Number	HPA Project Description	Project Type	Project Type Code (1 = decking, 2 = structural+decking, 3 = reconfigure/ expand)	Nearshore Portion Narrowed?	HPA Permit Issue Date	Parcel Number	City Shoreline Permit #	City Shoreline Permit Description	Aerial review for Dock Narrowing	Discussed in Memo?
2018-4-845+01	Repair existing shared dock on Lake Washington. All work to be done in existing dock footprint. Pier width to be reduced from 6' to 4' for the first (waterward) +/- 36' from OHW as shown on attached plans. Replace framing in kind/same location with ACZA treated fir - stringers to be 4" x 8", joists/pile caps to be 6" x 8". Wooden decking to be replaced with Thruflow grated panels. Piles to be sleeved with HDPE tubes. No piles to be added, replaced or removed.	Structural + Decking	2	Yes	12/6/2018	736100090	SHL18-021	REPAIR EXISTING DOCK (approved)	Most recent aerial (5/2018) does not show constructed project; based on HPA description, presumed that narrowing occurred	Noted in Memo as example of gerater than 50% (structural + decking) requiring narrowing
2019-4-62+01	Resurface existing dock on Lake Washington with ThruFlow grated panels (existing decking is wood). First +/- 16 feet of the pier will be reduced from 5 feet to 4 feet wide. No piles to be added, removed, or replaced.	Decking	1	Yes (initial 16 feet from shore)	1/24/2019	4260000060	SHL18-029	REPLACE DECKING ON EXISTING DOCK (approved)	Most recent aerial (5/2018) does not show constructed project; review of City permit records verifies narrowing within first 30 feet	
2019-4-135+01	Repair (14) wood piles with the pile stub method and (2) with steel pile stubs. Implement a planting plan within 10 feet of the ordinary high water mark for the benefit of fish life.	Structural	2	No	3/5/2019	8106100180	SHL18-032	REPAIR 14 WOOD PILESW/PILE STUB METHOD & 2 W/STEEL PILE STUB (approved)	Most recent aerial (5/2018) does not show constructed project; based on HPA description, presumed that NO narrowing occurred	
2019-4-153+01	Project proposes to turn over up to, but no more than, 50% of existing and worn deck boards and reinstall.	Decking	1	No	3/14/2019	2424049039	SHL18-005 and SHL18-028	REPAIR 50% OF EXISTING DOCK W/UNTREATED CEDAR (approved) / CEDAR BOARDS ON DOCK FLIPPED OVER TO REPAIR DETERIORATION (approved)	Most recent aerial (5/2018) does not show constructed project; City permit records for this approval would be useful	Discussed in Memo as example of below 50% threshold