TACOMA TIDEFLATS

# SEA LEVEL RISE

## TACOMA TIDEFLATS SUBAREA PLAN & EIS

March 10, 2024



## Introduction

For over a century, the Tideflats has been industrialized and transformed into a strategic seaport. It hosts critical infrastructure and services, supports marine cargo operations and major shipping activities, and serves as a prime location for manufacturing. While economically significant, the Tideflats also provide important environmental services as a unique natural enviornment, containing shoreline, river deltas, tidal creeks, marshes, naturalized creeks, and river channel corridors. Additionally, much of the area is part of the ancestral lands of the Puyallup Tribe and is an important location for cultural traditions, the practice of tribal treaty rights, and essential governmental facilities. Natural, human, or technological hazards can endanger and threaten the facilities, overall operations, and activities found within the Tideflats as well as public health and safety.

As climate change impacts become more salient, climate related hazards such as sea level rise and coastal flooding are emerging. Communities and infrastructure in low-lying areas may see increased flooding risks in the future if no actions are taken today to protect existing facilities, assets, and infrastructure.

## Existing Policies and Regulations

There is a range of existing policies and regulations that highlight mitigation and adaptation strategies for sea level rise and climate change related hazards. The following table provides an overview of these policies and regulations.

**Table 1. Policies and regulations related to sea level rise.**

PUYALLUP TRIBE of INDIANS · Tacoma · Pierce County · FIFE WASHINGTON · Port of Tacoma

| Planning Goal, Policy, Code, Ordinance | Jurisdiction | Description |
|---|---|---|
| Goal EN-1, One Tacoma Plan | City of Tacoma | Ensure that Tacoma's built and natural environments function in complementary ways and are resilient to climate change and natural hazards. |
| Policy EN-1.30, One Tacoma Plan | City of Tacoma | Promote community resilience through the development of climate change adaptation strategies. Strategies should be used by both the public and private sectors to help minimize the potential impacts of climate change on new and existing development and operations, include programs that encourage retrofitting of existing development and infrastructure to adapt to the effects of climate change. |
| Policy EN-3.5, One Tacoma Plan | City of Tacoma | Discourage development on lands where such development would pose hazards to life, property or infrastructure, or where important ecological functions or environmental quality would be adversely affected:<br>a. Floodways and 100-year floodplains<br>b. Geologic hazard areas<br>c. Wetlands<br>d. Streams<br>e. Fish and wildlife habitat conservation areas<br>f. Aquifer recharge areas<br>g. Shorelines |
| Chapter 19.06.010 Shoreline Use | City of Tacoma | Evaluate sea level rise data and consider SLR risk and implications in the development of regulations, plans and programs. |
| Chapter 19.06.020 Site Planning | City of Tacoma | Development should be located, designed, and managed both to minimize potential impacts from sea level rise and to promote resilience in the face of those impacts, by such actions as protecting wetland and shoreline natural functions, incorporating green infrastructure, retaining mature vegetation, and considering soft-shore armoring wherever possible. |
| | | Assess the risks and potential impacts on both City government operations and on the community due to climate change and sea level rise, with special regard for social equity. |
| Chapter 19.06.040 Critical Areas and Marine Shoreline Protections | City of Tacoma | Protect natural processes and functions of Tacoma's environmental assets (wetlands, streams, lakes, and marine shorelines) in anticipation of climate change impacts, including sea level rise. |
| Policy 7.6, Puyallup Tribes of Indians Comprehensive Land Use Plan | Tribal | Create and restore off-channel habitat (including wetlands and marshes) in place to prepare for the inundation of saline conditions as sea level rise pushes the salt wedge further inland. |
| Policy 11.3, Puyallup Tribes of Indians Comprehensive Land Use Plan | Tribal | Encourage local jurisdictions to remove bulkheads and shore defense works to restore shoreline, preserve natural processes, and help adapt to sea level rise. |
| Policy 16.1, Puyallup Tribes of Indians Comprehensive Land Use Plan | Tribal | Identify Tribal facilities & land that will be inundated by sea level rise and explore options for federal compensation. |
| Policy 16.2, Puyallup Tribes of Indians Comprehensive Land Use Plan | Tribal | Inventory Tribal property, structures, and cultural sites at risk from natural hazards and sea level rise. Create criteria for assessing an approach for adaptation or relocation of identified land and facilities. |

| Planning Goal, Policy, Code, Ordinance | Jurisdiction | Description |
|---|---|---|
| Policy 16.4, Puyallup Tribes of Indians Comprehensive Land Use Plan | Tribal | Study economic development impacts associated with sea level rise in the Tideflats. |
| MPP-CC-10, Vision 2050 PSRC | Regional | Address rising sea water by siting and planning for relocation of hazardous industries and essential public services away from the 500-year floodplain. |
| CC-Action-4, Vision 2050 PSRC | Regional | Cities and counties will update land use plans for climate adaptation and resilience. Critical areas will be updated based on climate impacts from sea level rise, flooding, wildfire hazards, urban heat, and other hazards. |
| Northwest Ports Clean Air Strategy 2021 Joint Resolution | Regional | [The Port of Seattle, Port of Tacoma, The Northwest Seaport Alliance, and The Vancouver-Fraser Port Authority] embrace the aspirational vision articulated in the 2020 NWPCAS: "Phase out emissions from seaport-related activities by 2050, supporting cleaner air for our local communities and fulfilling our shared responsibility to help limit global temperature rise to 1.5°C." |

# Baseline Conditions

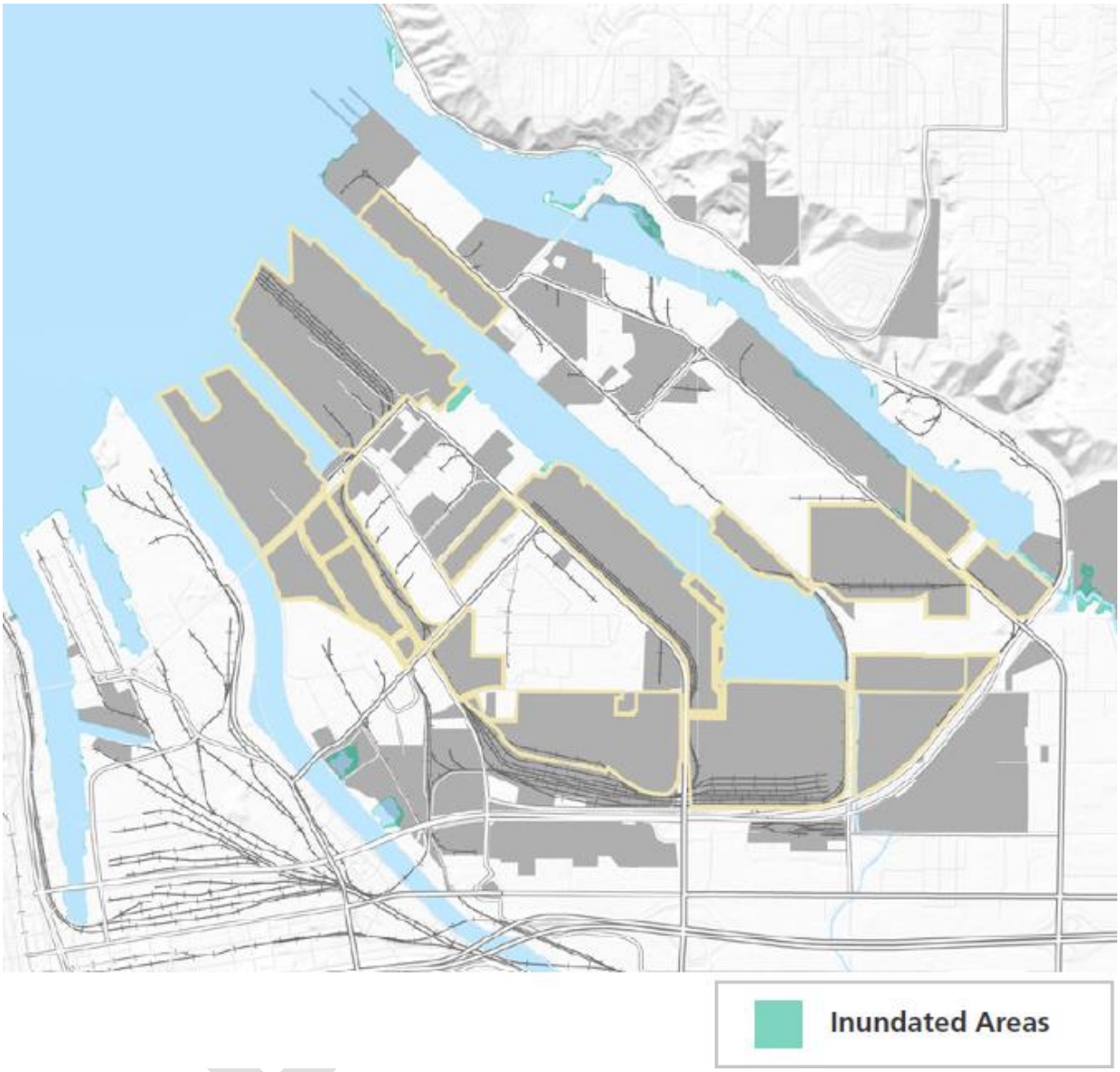
Sea level is a measure of the relative height of the ocean and land surface. In a tectonically active region like the Puget Sound, land motion is an important consideration for determining sea level rise, which represents an increase in overall water levels. It is expected that with higher water levels, sea level rise will increase the likelihood of coastal flooding or inundation of areas within the Tideflats.

Coastal floods are caused by extreme sea levels, which arise as a combination of four main factors: waves, King Tides, storm surges, and relative mean sea level. The effects of coastal flooding can occur during high tide events and storm events. While high tide events are predictable, sea level rise projections indicate that these events are expected to become more severe over time.

The typical high tide[1] in the Tideflats today is represented by 0' Mean Higher-High Water (MHHW)[2] as seen in Exhibit 1. Under the 0' MHHW condition, a few low-laying areas are at risk of flooding during a high tide event.

[1] Water levels are always changing with the tides and weather conditions. In Washington, there are two low tides and two high tides. The difference between the typical low and high tide in Tacoma is over 11 feet.
[2] The MHHW is the average of the higher of the two high tides.

Exhibit 1. 0' Mean Higher-High Water.




Source: National Oceanic and Atmospheric Administration (NOAA)
Note: The map does not account for areas that may be inundated by wave runup.

## Sea Level Projections

Most coastal areas of Washington State and the Puget Sound will be affected by sea level rise. Regionally, sea level has risen by 7.8 inches over the last century. Under a low and high emissions scenario[3], sea levels in Washington State are projected to increase by -0.1 to 1.6 feet by 2050,

[3] Representative Concentration Pathways (RCP) describe different possible futures based on the volume of greenhouse gases emitted over time. RCPs are labeled after the expected radiative forcing level by 2100; radiative forcing quantifies the imbalance between incoming solar radiation and outgoing infrared radiation, which influences

and by 0.3 to 4.7 feet by 2100, relative to 2000 levels. Tacoma is projected to see 1.5 to 3.3 feet of sea level rise by 2100 as described on Table 2. The rate of rise is projected to accelerate throughout the 21st century, with the largest changes occurring after 2050 (Tacoma Climate Change Resilience Study, 2016 and Resilient Gateway – Vulnerability Assessment, 2023). The potential extent of flooding due to sea level rise can be seen illustrated in Exhibit 2.

**Table 2. Tacoma Harbor Sea Level Rise Projections.[4]**

| Time Period | Greenhouse Gas Scenario | Tacoma Harbor Likely Range of SLR (ft) |
|---|---|---|
| 2050 | Low | 0.6 – 1.1 |
| | High | 0.7 – 1.2 |
| 2100 | Low | 1.5 – 2.7 |
| | High | 1.9 – 3.3 |
| 2150 | Low | 2.1 – 4.6 |
| | High | 3.0 – 5.7 |

Source: Washington Coastal Resilience Project.
*Note: Greenhouse gas scenario low corresponds with the Representative Concentration Pathway (RCP) 4.5 and high corresponds with RCP 8.5.*

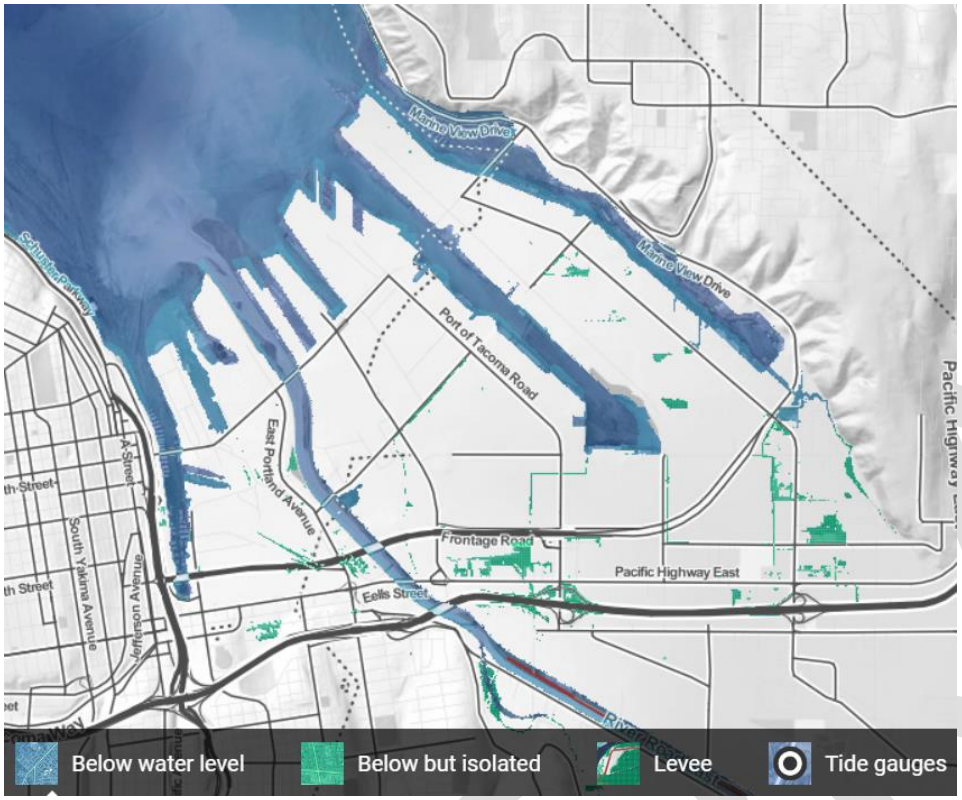


the Earth's temperature. The Intergovernmental Panel on Climate Change (IPCC) uses 4 RCPs – RCP 2.6, 4.5, 6.0, 8.5. For the purposes of this issue paper, low and high RCPs refer to RCP 4.5 and 8.5, respectively. RCP 4.5 is a low scenario, where emissions peak around mi-century and then decline. RCP 8.5 is a high scenario that assumes increases in emissions until the end of the century.

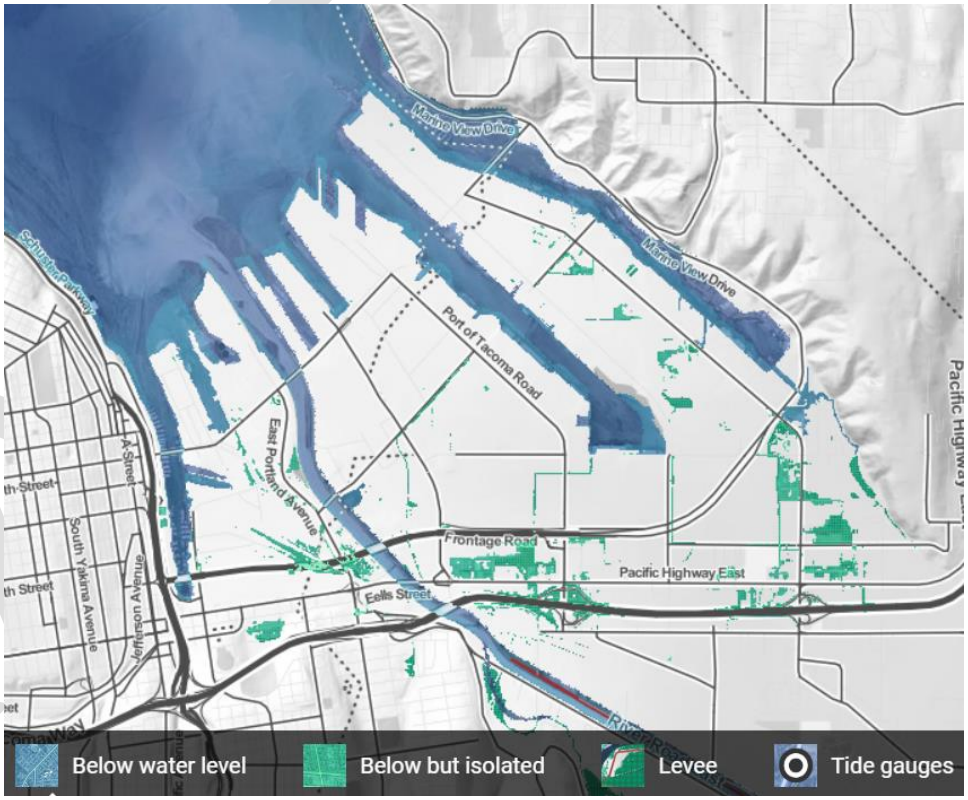
[4] These projections are probabilistic, that is, the likelihood that the sea level will rise above a certain level. The projected sea level rise quoted in this table has a probability range of 17-83% probability, but the uncertainty range can expand beyond that.

Exhibit 2. Flooding impacts due to sea level rise across 1ft to 5ft scenarios.

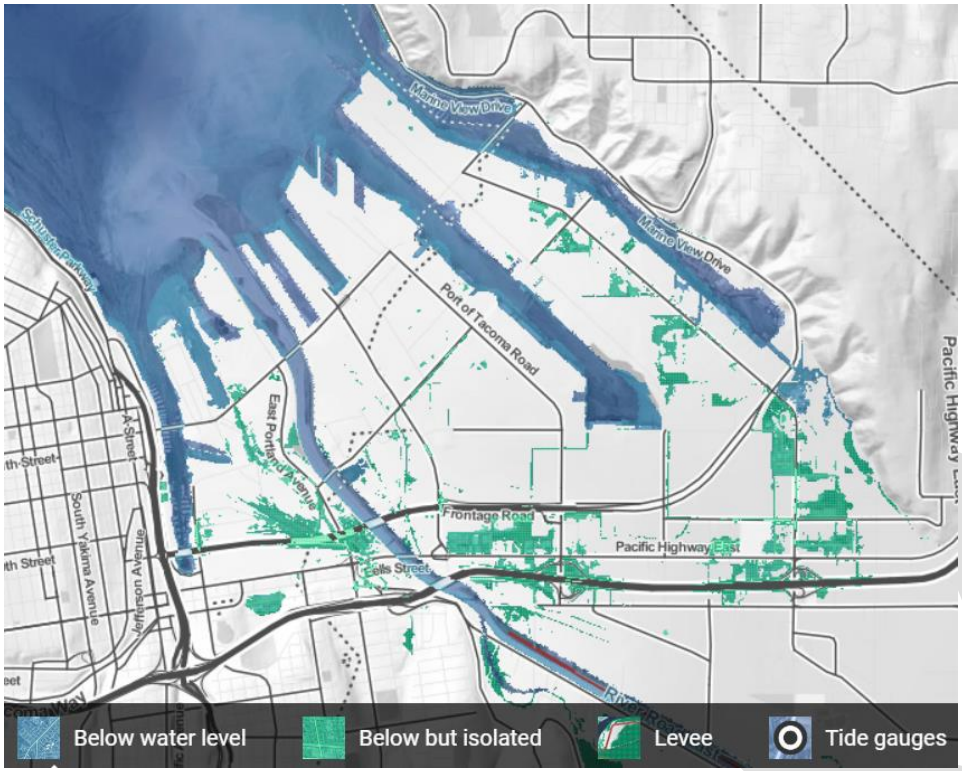
1ft SLR



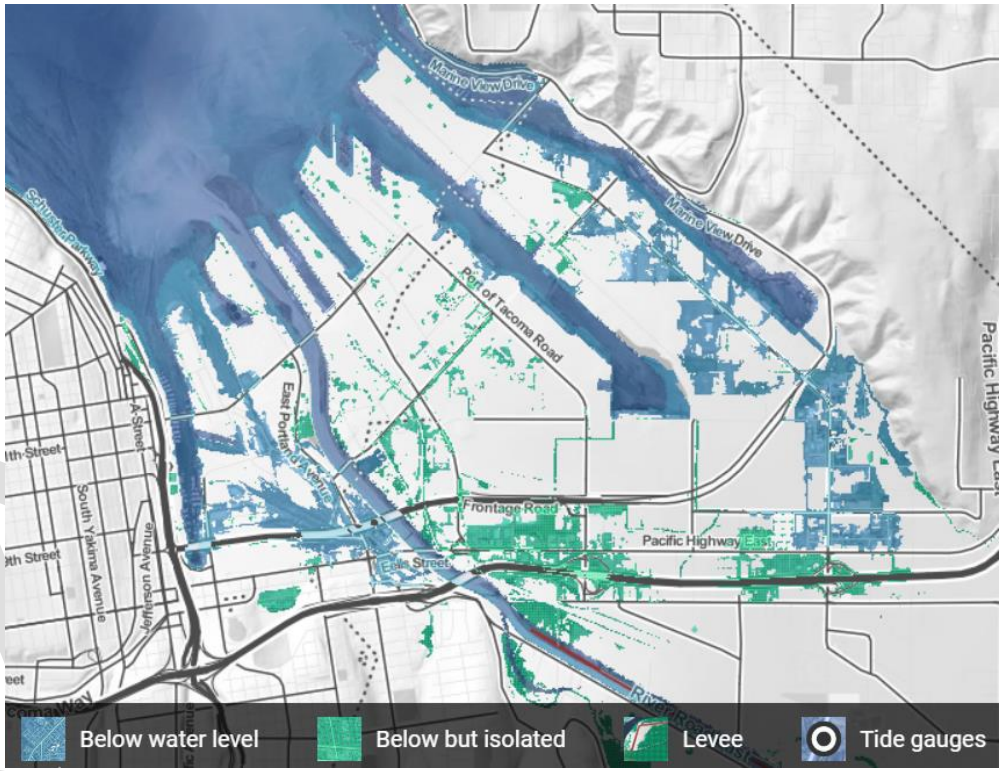

2ft SLR



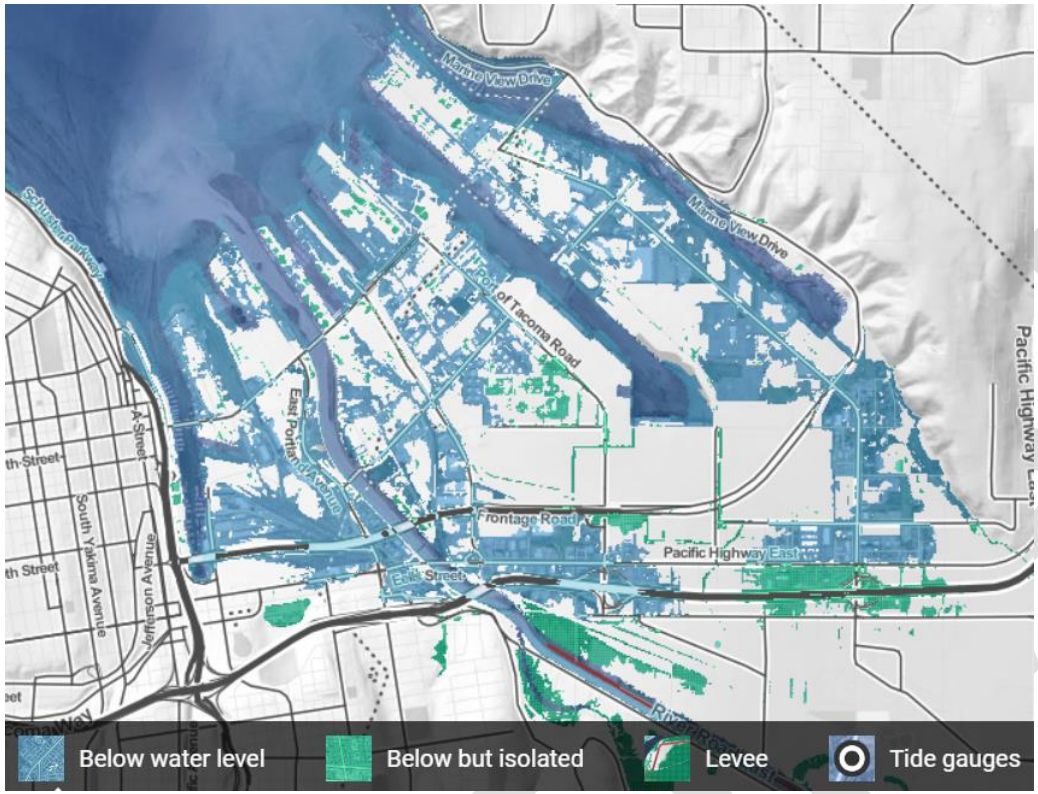
3ft SLR




4ft SLR



5ft SLR




Source: Climate Central Surging Seas Risk Zone Map, additional elevation data courtesy of NOAA

## Flooding Vulnerabilities

While high tide events are predictable, sea level rise predictions indicate that high tide events and storm events are expected to become more severe over time, which ultimately increases the likelihood of coastal flooding. Tidal events can aggravate stream, river, and upland flooding by backing up water into those channels and into nearshore drainage pipes and infrastructure. Likewise, wind events can increase the impacts from wave action and exacerbate damage from high tide events, which is often referred to as "storm surge." A rise in sea level will increase the reach of coastal floods even in the absence of a change in surge and wave heights. This means that coastal flood elevations should be expected to rise in tandem with sea level rise (Pierce County Comprehensive Flood Hazard Management Plan, 2023).

According to the relative sea level rise (RSLR) scenarios[5], flooding is largely restricted to low-lying areas bordering drainage canals and do not extend into any terminal areas in the Tideflats. Exposed infrastructure under MHHW conditions for 1ft and 2ft RSLR primarily consists of outfalls and stormwater infiltration ponds. Additionally, flood hazard exposure for potable water, wastewater, and power infrastructure is minimal. Similarly, flood hazard exposure for transportation infrastructure is also minimal, with only the local roadways bordering Hylebos Waterway drainage channels projected to experience flood impacts.

Exposure to risks increase under a 1% annual chance floodplain condition[6]. Under this condition, coastal flood projections with 1ft RSLR show inundation at additional stormwater outfalls and important utility resources such as the Central Wastewater Treatment Plant. The flood hazard exposure for power utility infrastructure also increases under a 1% annual chance flood condition with 2 ft RSLR as flood projections illustrate potential inundation at several substations in areas bordering the Hylebos Waterway, Blair Waterway, and Sitcum Waterway. The flood hazard exposure for water utility infrastructure also becomes significant under these conditions due to projected flooding at numerous outfall locations.

Roadways such as Taylor Way and St Paul Avenue located within areas under a 1% annual chance flood conditions will also see its flood hazard exposure increase. Additionally, low-lying areas surrounding Route 509 are also projected to experience flooding between the Thea Foss Waterway and Puyallup River under these conditions. Further, under the 1% annual chance flood conditions with 2 ft RSLR hazard exposure grows to encompass significant portions of local roadways within the Tideflats. Segments of Interstate 5 south of the Blair Waterway are projected to experience flooding. However, bridges crossing the Thea Foss Waterway, Puyallup

[5] Relative sea level rise (RSLR) combines estimates of absolute sea level rise and vertical land movement. RSLR scenarios are limited to a 20-year planning horizon and utilize MHHW conditions, which illustrate flooding during high tide events.

[6] Areas designated by the Federal Emergency Management Agency (FEMA) with a 1% annual chance floodplain have a 1% chance that a 100-year flooding event will occur in any given year. Areas within the Tideflats that are designated with a 1% annual chance floodplain has a 1% chance of a flood reaching water conditions of 1-2 ft in height under the 1-2 ft RSLR scenario in any year through the end of the century.

River, and Hylebos Waterway are expected to have minimal flood hazard exposure across the 1 ft and 2 ft RSLR scenarios due to their elevation above grade or at Puyallup River levee height.

Coastal environmental resources such as wetlands have a high exposure to RSLR hazards as these areas are continuously exposed to changes in tidal water elevations over time. Though wetlands are largely resistant to temporary inundation hazards, coastal wetlands can be highly sensitive to consistently elevated non-storm water levels, as these changes can significantly alter the structure and function of wetland ecosystems. This is particularly true if the inland migration of tidal floodwaters exceeds the landward migration rate or sediment accretion rate of wetland areas. If wetlands areas cannot match the gradual increase in tidal elevations due to RSLR, these systems will gradually transition to subtidal areas, covered by water at all states of the tide.

Table 3 summarizes the flooding vulnerabilities for RSLR scenarios 1ft to 5ft.

**Table 3. Vulnerability Rating for Resources and Infrastructure within the Study Area.**

| Resource | RSLR-Related Hazards | RSLR Scenario | | | | |
|---|---|---|---|---|---|---|
| | | 1ft | 2ft | 3ft | 4ft | 5 ft |
| **Coastal Development** | | | | | | |
| Industrial Areas within MIC | Coastal/fluvial flooding | L | M | H | S | S |
| Development Bordering MIC | Coastal/fluvial flooding | M | M | H | S | S |
| **Utilities Infrastructure** | | | | | | |
| Stormwater | Loss of function due to higher tidal elevations | M | M | M | H | S |
| Wastewater | Coastal/fluvial flooding | H | H | H | S | S |
| Water | Coastal/fluvial flooding | L | L | L | M | H |
| Power | Coastal/fluvial flooding | L | M | M | H | S |
| **Transportation Infrastructure** | | | | | | |
| Highways | Coastal/fluvial flooding | L | M | M | H | H |
| Roadways | Coastal/fluvial flooding | M | M | H | H | S |
| Bikeways | Coastal/fluvial flooding | L | L | M | H | H |
| Trails | Coastal/fluvial flooding | L | L | M | H | H |
| **Environmental Resources** | | | | | | |

| Resource | RSLR-Related Hazards | RSLR Scenario | | | | |
|---|---|---|---|---|---|---|
| | | 1ft | 2ft | 3ft | 4ft | 5 ft |
| Wetlands | Habitat loss due to inundation | M | M | M | H | S |

Source: Draft Tideflats Baseline Report, 2024

Low (L): Limited areas of vulnerability during extreme conditions
Medium (M): Significant areas of vulnerability during extreme conditions or limited vulnerability during normal conditions
High (H): Area-wide vulnerability under extreme conditions, or significant vulnerability under normal conditions
Severe (S): Area-wide vulnerability under normal conditions

As illustrated in Exhibit 2, flooding under 1ft to 3ft is limited to a few areas in the Tideflats. While flooding does not currently pose a substantial threat to the Tideflats, the risk of flooding due to sea level rise and climate related hazards remains.

Sea levels will rise in Commencement Bay, impacting not only the shoreline. Sea level rise will also impact the riverine, stream and urban systems directly connected or in close proximity to saltwater sources; the rise in the sea level limits the ability of these systems to drain causing back water situations in urban systems and sediment deposition in riverine systems (Pierce County Comprehensive Flood Hazard Management Plan, 2023). Both rainstorms and riverine flooding will become more frequent and severe. It is projected that there will be an increase in streamflow volume of 37% or greater during a 100-year flood. Furthermore, it is projected that there will be an increase of 5 or more additional days of heavy rain events (an increase from 2 days to 7 days) by the 2080 and a 22% increase in the intensity of 24-hour rain events by the 2080s (Climate Change in the Puyallup River: A Quick Reference Guide for Local Decision-Makers, 2018). These factors suggest that flooding could become a significant threat to the Tideflats in the coming decades.

Additionally, high and severe vulnerability ratings become more common beyond the 20-year planning horizon at 3ft and greater RSLR scenarios. Vulnerability becomes high to severe across all resource types for the 4ft and 5ft RSLR scenarios except for potable water infrastructure, which maintains moderate vulnerability under the 4ft RSLR scenario due to lack of projected flooding at pump stations.

# Environmental Impact Statement

A Draft Environmental Impact Statement (Draft EIS) has been completed as a prerequisite mandated by the State Environmental Policy Act for development of the Tideflats Subarea Plan. The Draft EIS offers a No Action Alterative (Alternative 1) and three development alternatives (Alternative 2, 3, and 4), which analyzes the degree of potential environmental degradation. Within the 20-year planning horizon of the Tideflats Subarea Plan, low to moderate impacts of sea level rise are expected. The Draft EIS acknowledges that beyond the 20-year planning horizon of the Tideflats Subarea Plan, risk exposure due to sea level rise increases from low to

moderate to high and severe. The reduction of risks can be achieved by requiring new construction and redevelopment to proactively incorporate climate mitigation measures, ongoing monitoring, and adaptive management.

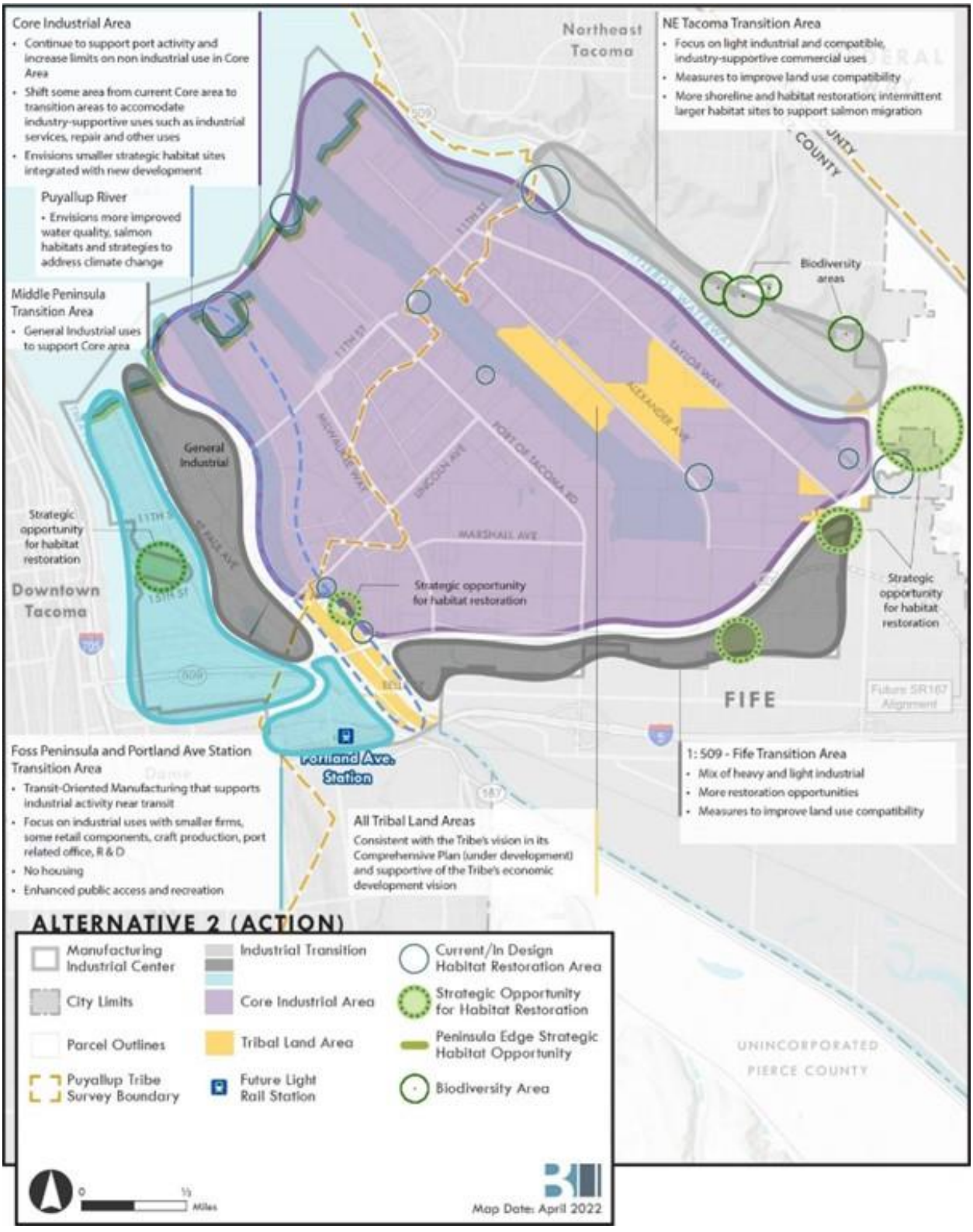
## Alternative 1 (No Action Alternative)

Alternative 1 represents the baseline and assumes continuation of policies, regulations, and programs in effect when the EIS process was initiated. In Alternative 1, there is limited housing development within the Tideflats (206 in total, 202 housing units above existing count) and minimal increase in employment totals (approximately 1,048 additional jobs compared to existing conditions). Preliminary reports indicate that at 1 to 2 ft sea level rise, there will be low and moderate risk to coastal development; at 3 to 5ft sea level rise, there will be high and severe risk to coastal development. In the 20-year horizon of the Tideflats Subarea Plan, low to moderate impacts to coastal development are expected, that is, **the impacts of 1 to 2 ft of sea level rise within the next 20 years should be anticipated.** In the longer term, there is a potential for greater sea level rise impacts. The impacts of sea level rise are less than significant within the 20-year planning period of the Subarea Plan. **Alternative 1 offers limited redevelopment opportunities to implement comprehensive habitat restoration and adaptation measures for sea level rise over the long term. Sea level rise would be addressed on a site- or project-specific basis rather than with an overall balance of growth, habitat restoration, and adaptation. Mitigation efforts would be completed within existing regulatory requirements and implemented permit by permit.** Additionally, Alternative 1 is less consistent with the Puyallup Tribe of Indians Comprehensive Land Use Plan as the Tribe's plan promotes more habitat restoration as a mechanism of addressing sea level rise.

## Alternative 2

Alternative 2 explores a moderate increase in employment (over 5,000 additional jobs compared to existing conditions) but allows no additional housing development. **Alternative 2 would include more redevelopment opportunities, which could help the City implement a comprehensive habitat restoration and adaptation measures for sea level rise over the long term. In Alternative 2, sea level rise adaptation measures are focused on preserving industrial lands and protecting essential public facilities.** Land use or zoning shifts on the western, southern, and eastern edge of the Tideflats to support industrial services, repairs, and other uses provides the opportunity for strategic habitat restoration and mitigation sites to be integrated with new development. Exhibit 3 identifies the potential areas for habitat restoration along the Puyallup River and Hylebos Waterway. Alternative 2 proposes a coordinated approach to mitigation and restoration site implementation. Mitigation and restoration opportunities are identified in advance of permitting.

Exhibit 3. Alternative 2



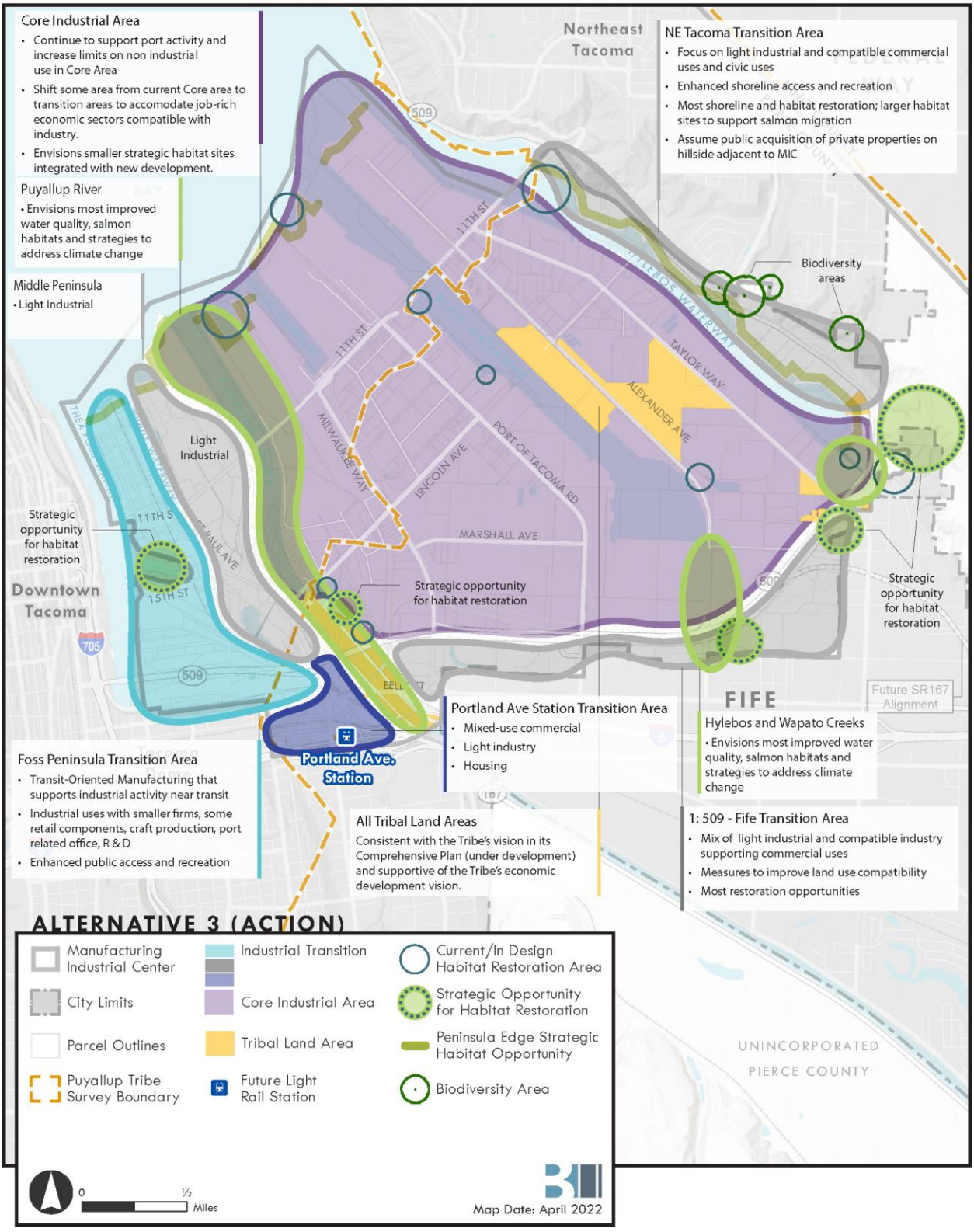

Source: Berk, 2023

With limited impacts during the 20-planning period and less exposure of future residents, Alternative 2, similar to Alternative 1, would have a less-than-significant adverse impact on sea level rise. Alternative 2 is more consistent than Alternative 1 with the Puyallup Tribe of Indians' Comprehensive Land Use Plan.

## Alternative 3

Alternative 3 explores the highest increase in employment totals (approximately 8,529 additional jobs compared to existing conditions) with the highest increase in housing development (409 additional units) compared to the other alternatives. **Alternative 3 identifies the broadest coordinated approach to mitigation and restoration within the study area, which would provide the greatest degree of resiliency to sea level rise. Restoration or mitigation actions occur concurrent with sea level rise adaptation and analysis, and pro-active investments in restoration occur. Mitigation sites would be identified in advance of permitting.** More industrial land would be repurposed for habitat restoration alongside measures to address the implications of sea level rise across the entire Manufacturing Industrial Center. Exhibit 4 identifies the potential areas for habitat restoration along the Puyallup River, Hylebos Waterway, and Hylebos and Wapato creeks. Habitat restoration projects will contribute to enhanced water quality, salmon habitats, and implementation of strategies addressing climate change impacts. Under Alternative 3, the policies would emphasize proactive accommodation and managed retreat.

## Exhibit 4. Alternative 3




Source: Berk, 2023

With limited impacts during the 20-year life of the Subarea Plan, Alternative 3 would have a less-than-significant adverse impact on sea level rise. Over the longer term, more residences and employees could be exposed to climate change impacts, although Alternative 3 would be designed to protect, retreat, adapt infrastructure and land uses and would have the potential to avoid significant impacts. Alternative 3 is more consistent than Alternative 2 with the Puyallup Tribe's Comprehensive Land Use Plan.

### Alterative 4

Like Alternative 1, Alternative 4 explores a low employment density and limited housing density scenario with existing employment uses, limiting potential exposures to hazards. **Alternative 4 would also have limited redevelopment opportunities to implement comprehensive habitat restoration and adaptation measures for sea level rise over the long term. It would, however, include some accelerated habitat restoration and efforts to preserve industrial lands and protect essential public facilities such as Port operations as a measure for sea level rise adaptation and mitigation.**

Alternative 4 would potentially amend policies or implementation strategies around enhancement of shoreline access and recreation, sea level rise adaptation, coordinated transportation mitigation agreements, and decarbonization. This would be an improvement (benefit) in policy alignment with state, regional, and local plans for sustainability and resiliency.

## Community Input

During the 2021 Visioning phase of the planning process for the Tideflats Subarea Plan, addressing climate change and improving the natural environment were identified as the greatest opportunity in the Tideflats. Community responses offered that restoration of the natural environment prepares and adapts the Tideflats for climate change. Additional responses identified that infrastructure improvements and redevelopment should be based on climate change scenarios, particularly sea level rise, as a preferred environmental mitigation option. One response also suggested the option of conducting "a coordinated process of voluntarily and equitably relocating people, structures, and infrastructure away from vulnerable areas to protect the Tideflats from flooding due to sea level rise." Overall, the community expressed interest in actions and policies that respond to climate change impacts such as flooding and sea level rise.

## Potential Policies and Actions

Sea level rise and coastal flooding has the potential to endanger communities, damage infrastructure and facilities, and disrupt operations. While sea level rise and coast flooding does not present an immediate threat to the facilities, assets, and activities found within the Tideflats, sea levels will increase, and risks will increase in the coming decades. The following are potential

policies and actions[7] that could mitigate and adapt to the sea level rise projections for the Tideflats.

| Potential Policy | Potential Actions |
|---|---|
| Monitor and re-evaluate RSLR hazards on a regular basis to maintain flexibility in RSLR adaptation strategies. | 1) Implement monitoring program to track sea level and shoreline changes at key locations to determine needed adaptation actions and reduces chances of over or underestimating hazard mitigation needs. Information from a shoreline inventory and characterization report will help determine sea level rise monitoring locations.<br>2) Map, monitor, and analyze coastal flood events.<br>3) Conduct a Sea Level Rise Risk Assessment or add sea level rise into other hazard assessments such as wave runup, storm surge, and tsunami hazard assessments.<br>4) Conduct a review of current science focusing on flooding impacts to critical roads, infrastructure, and steep slopes due to increasing intense rainfall events, sea level rise, flooding, and landslides. Integrate findings into City development codes, emergency management, and capital planning.<br>5) Explore smart technologies to monitor changing conditions and identify potential threats. Smart technology applications may be especially useful in monitoring sites and areas that are hard to reach. For example, installing water-detection sensors in underground utility vaults may help identify water intrusion from events like groundwater flooding that may otherwise go unnoticed.<br>6) Maintain up-to-date floodplain maps. Work with FEMA to update outdated areas and develop a systematic way to regularly update the maps as projects are completed that affect the floodplain.<br>7) Develop a local floodplain definition to help revise mitigation and adaptation strategies. |
| Utilize lower RSLR scenarios (1ft-3ft) to guide short-term mitigation and adaptation response. | 1) Implement flood mitigation measures in low-lying areas such as in surrounding drainage canals within the MIC, the southern portion of the Thea Foss Waterway at the Route 509 bridge, and Near I5 south of the Blair Waterway. |

[7] The suggested policies and actions were developed by referencing the following documents: the Tideflats Subarea Plan Draft Baseline Report, Tideflats Subarea Plan Draft Environmental Impact Statement, Pierce County 2023 Comprehensive Flood Hazard Management Plan, 2021 Tacoma Climate Adaptation Strategy, 2023 Tacoma Climate Action Plan, 2016 Puyallup Tribe of Indians Climate Change Impact Assessment and Adaption Options.

| Potential Policy | Potential Actions |
|---|---|
| | 2) Implement flood mitigation efforts at the Central Wastewater Treatment Plant. |
| Account for 5ft RSLR in long-term planning. | 1) Require planning for sea level rise in shoreline areas found within the Shoreline District S-8 (Thea Foss Waterway, Downtown Waterfront) S-9 (Puyallup River), S-10 (Port Industrial).<br>2) Restrict hazardous uses in the 500 year floodplain.<br>3) Develop a retrofit plan for public infrastructure in coastal flood hazard areas.<br>4) Assess conditions of seawalls, piers, revetments, shoreline infrastructure, open spaces, parks, and habitat to identify length of service, repair, and maintenance.<br>5) Identify the most at-risk facilities to help prioritize resiliency improvements.<br>6) Evaluate flooding impacts on existing habitat areas such as areas at the mouth of the Puyallup River, Blair Waterway, and Hylebos Waterway. Implement additional modifications to mitigate flooding impacts on surrounding areas. |
| Adopt responsive design standards and thresholds to address projected climate change impacts including SLR, coastal flooding, riverine flooding, extreme rainfall, and storm surges. | 1) Identify places where infrastructure can be set back as part of capital improvement project implementation.<br>2) Conduct a shoreline inventory and characterization to establish a baseline and repository of data that can be used to inform:<br>a) appropriate changes to existing setback and buffers distances around marine shoreline that are responsive to sea level rise and flooding impacts<br>b) sea level monitoring locations<br>c) area widths for transitional zones around the nearshore.<br>3) Ensure that stormwater infrastructure protects against flooding hazards such as coastal flooding, riverine flooding, urban flooding, and groundwater flooding. With rising sea levels and increasing extreme precipitation events, it is especially important to maintain stormwater infrastructure in good condition and adapt stormwater systems to changing conditions. |

| Potential Policy | Potential Actions |
|---|---|
| Coordinate RSLR adaptation efforts across jurisdictions and with regional initiatives. | 1) Establish a coastal hazard working group to continue solving coastal flooding issues as they relate to zoning and land use. The group should have representatives from Port/NWSA, Pierce County, City of Tacoma, Puyallup Tribe, and City of Fife.<br>2) Coordinate with climate change planners to anticipate infrastructure improvements or adaptation techniques to minimize damage to infrastructure or disruption to services related to future sea level rise or other climate-related effects to the community.<br>3) Collaborate with the City of Tacoma, City of Fife, Port, Puyallup Tribe, and County to implement the programmatic and project recommendations outlined in the Pierce County 2023 Comprehensive Flood Hazard Management Plan.<br>4) Collaborate with the City of Tacoma to develop a Sea Level Rise Flood Damage Ordinance or Flood Damage Protection Ordinance. The ordinance would reduce losses due to flooding by restricting or prohibiting uses that are dangerous to health, safety, and property due to water related hazards, requiring uses vulnerable to floods to be protected, controlling the alteration of natural habitat, and/or regulating development that may increase flooding.<br>5) Collaborate with the City of Tacoma, Port, Puyallup Tribe, and County to develop and implement a Commencement Bay Restoration and Resiliency Plan.<br>6) Collaborate with the City of Tacoma, Port, Puyallup Tribe, City of Fife, and County to develop uniform flood control standards to prevent riverine flooding due to coastal flooding and tidal influence of Hylebos and Wapato Creeks and the Puyallup River.<br>7) Collaborate with the City of Fife to maintain functionality and legal compliance of stormwater systems that rely on discharge into Commencement Bay, namely the Erdahl Ditch and Fife Ditch. |
| Prioritize habitat preservation and restoration to maximize potential hazard mitigation co-benefits. | 1) Remove bulkheads and shore defense works to restore shoreline, preserve natural processes, and help adapt to sea level rise.<br>2) Develop additional habitat sites along the Puyallup River, the Hylebos Creek, and Wapato Creek that support the ecosystem and increase flood storage capacity.<br>3) Prioritize protecting existing habitat sites to avoid decrease in ecological function due to coastal flooding impacts. |

| Potential Policy | Potential Actions |
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| Support safety and a resilient workforce in the Tideflats. | 1) Develop and maintain emergency response plans for various hazards and hazardous working conditions. Allow for coordination and collaboration with stakeholders.<br>2) Encourage the use of emergency response plans to include worker safety plans in the event of hazards or evacuation.<br>3) Support development of and collaboration on Continuity of Operations Plans in the Tideflats for continuation or quick recovery after an event.<br>4) Maintain Port of Tacoma's status and capabilities as a Strategic Seaport. The Port of Tacoma is a Strategic Seaport and part of the National Port Readiness Network and must be ready to make the port and its facilities available to support the deployment of military forces. |
| Use nature-based solutions to reduce vulnerability to hazards. | 1) Use green infrastructure to capture stormwater and reduce urban flooding issues.<br>2) Increase tree and vegetative cover where appropriate to reduce urban heat island effect.<br>3) Protect shorelines from coastal flooding and erosion using natural hardening methods that help reduce wave action, decrease water velocity, or prevent waters from overtopping the shoreline and getting on terminals.<br>4) Employ vegetative planting techniques to avoid coastal erosion while avoiding outright armoring of coastal areas. |
| Align emissions reductions targets with City and Regional goals and targets. | 1) Implement the Northwest Ports Clean Air Strategy and other efforts to reduce emissions and the impacts of climate change.<br>2) Establish a net-zero by 2050 emissions reductions target. The Northwest Seaport Alliance has adopted to "phase out emissions from seaport-related activities by 2050". The City of Tacoma has a net-zero by 2050 goal outlined in the 2030 Climate Action Plan. The Puyallup Tribe established "a goal to transition existing fossil fuel facilities to non-fossil fuel sources by 2035" and a commitment to a "carbon neutral economy by 2050". Pierce County plans to reduce emissions 45% below 2015 levels by 2030. |