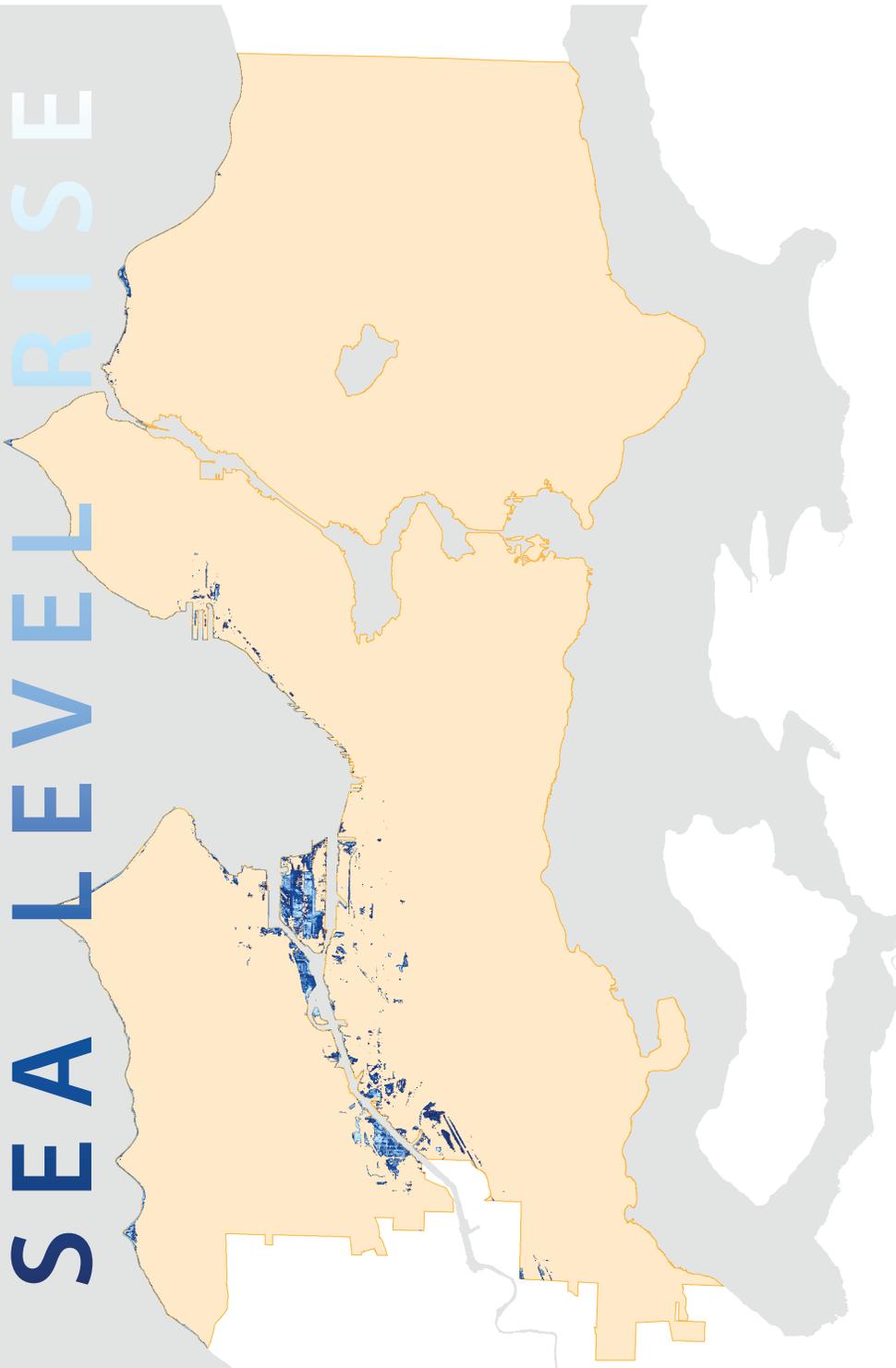


SEA LEVEL RISE



Climate Preparedness

a mapping inventory of changing coastal flood risk

Prepared for Seattle Office of Sustainability & Environment by:

GGLO DESIGN

ACKNOWLEDGMENTS



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TABLE OF CONTENTS

01 INTRODUCTION

Purpose
Approach
Area Impacted
Report Key

09 CITYWIDE IMPACTS

SEATTLE LAND AREA (2FT, 3FT, 4FT and 5 FT above MHHW)

14 CRITICAL AREAS (2FT, 3FT, 4FT, and 5FT above MHHW)

Aquatic Areas Includes: Riparian Corridors, Wetlands, Shoreline Buffers, Stream Length
Habitat & Parks Includes: Priority Habitat & Species Areas, Parks
Soils Includes: Peat Settlement Areas, Liquefaction Prone Areas, Geologic Hazard Areas

27 LAND USE (2FT, 3FT, 4FT, and 5FT above MHHW)

Zoned Use Includes: SF, MF, C/M, D, I, MPC, MI
Planning Areas Includes urban centers, villages, manufacturing and industrial centers
Existing Land Use Includes SF, MR, LR NC, C, C, I, MPC

40 TRANSPORTATION (2FT, 3FT, 4FT, and 5FT above MHHW)

Transit Includes: Bus stops, bus routes, Transit Master Plan Priority Corridors, Frequent Transit Corridors, Rail (light/street car/monorail/Sounder Train)
CIP & Streets Includes: Capital Improvement Projects (CIP) Proposed Projects and Arterials

49 FREIGHT (2FT, 3FT, 4FT, and 5FT above MHHW)

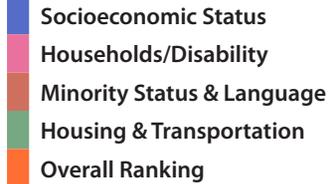
Trucks & Rail Includes: Major Truck Routes, Freight Rail

53 IMPACTS TO FRONTLINE COMMUNITIES

BACKGROUND

FRONTLINE COMMUNITIES: CITYWIDE (2FT–5FT above MHHW)

Total Impacts Summary



- Socioeconomic Status
- Households/Disability
- Minority Status & Language
- Housing & Transportation
- Overall Ranking

62 FRONTLINE COMMUNITIES: DUWAMISH (2FT–5FT above MHHW)

(Enlarged Maps only)



- Socioeconomic Status: Duwamish
- Households/Disability: Duwamish
- Minority Status & Language: Duwamish
- Housing & Transportation: Duwamish
- Overall Ranking: Duwamish

68 FOCUS AREA IMPACTS

ALKI (2FT–5FT above MHHW)

INTERBAY (2FT–5FT above MHHW)

DUWAMISH (2FT–5FT above MHHW)

72 APPENDIX

IMPACTS TO DUWAMISH STUDY AREA (2FT above MHHW)

(Enlarged Maps only) Includes Critical Areas: Aquatic, Habitat & Parks, Soils; Planning: Zoned Use, Urban Villages; Transportation: Transit)

PORT OF SEATTLE TERMINAL - 18: ADJUSTED INUNDATION AREAS

Includes Potential Inundation Areas map pre and post grading changes

METHODOLOGY

See GIS Files & Data (Maps may be enlarged by accessing the GIS data)

INTRODUCTION: Purpose

PURPOSE

This study, including the associated GIS layers, provides a screening tool for broadly assessing the impacts of sea level rise on Seattle. The report provides an inventory of specific critical areas, land uses, select transit infrastructure and planned investments, and communities at risk of flooding under future climate conditions. The GIS layers can be used to evaluate additional categories of infrastructure, specific assets, or project sites.

Uncertainties inherent in climate projections, the limits of LiDAR imagery in accurately capturing the elevation of an individual site, a range of plus/minus 7 years in the timing of impacts presented herein, and grade changes that have occurred since the LiDAR data was collected in 2000/2001 mean the report and GIS layers should be used for screening purposes only. The study is intended to be used as a guide to better understand the increasing risk of coastal flooding across the city and in general geographic areas. To understand the risk at a specific location, a more detailed evaluation of site-specific elevations would be needed. The City and its partners assume no liability in the use of this information. Please see box (left) for an example illustrating the screening nature of this assessment.

Assessment as Screening Tool

Case Study: Port of Seattle

Recent work by the Port of Seattle highlights the screening nature of this study. Since the LiDAR data were collected in 2000/2001, the Port of Seattle completed work that changed land elevations at six sites reducing the areas at risk of flooding from sea level rise. The Port property with the most extensive changes is Terminal-18 (T-18) where regrading reduces the at-risk area by 5%. Please see the appendix for maps that illustrate the changes at T-18.

APPROACH

The approach used in this study is a departure from those more commonly used. This study focuses on changes in the frequency and water levels associated with high tides and extreme storm events, rather than emphasizing change in base sea level. The study incorporates the latest sea level rise projections for Seattle using projections at the higher end of the range identified by the National Research Council (NRC) 2012¹, but modifies how that information is presented to facilitate wider understanding of impacts and adaptation planning.

The projections and scenarios are based on a 2012 National Research Council report (Sea-Level rise for the Coasts of California, Oregon, and Washington: Past Present and Future). Water levels account for the National Tidal Datum Epoch 1983-2001 (NTDE 83-01). The base digital elevation model (DEM) used in the analysis was produced using a 2001 Puget Sound LiDAR Consortium study, which notes a vertical accuracy, or margin of error, of 1 foot (NAVD88). Breaklines were not applied, therefore some objects such as piers may not be accurately depicted.

In our approach, data were interpolated from the NRC study to 2035 and 2060 to better align with City planning processes and rounded for clarity within a range consistent with the inherent uncertainties described and appropriate for a screening tool. These values were then added to the highest water level observed in Seattle over the last century (for 100-year, annual, and monthly events) to produce projected water levels associated with different flood intervals. For example, the **maps reflecting flooding at 5 feet above the current average daily high tide (MHHW) do not reflect 5 feet of base sea level rise but a combination of:**

1. The historical 100-year event storm surge, which is about 3 feet above the average daily high tide), and
2. A 2 feet rise in sea level in 2060 (the high end of the mid-century range in the NRC study extrapolated to 2060).

Other maps illustrating other water levels reflect flooding during high tides based on the high end of the range of projected sea level rise for the specified years.

Traditional sea-level rise assessments

provide specific height projections for specific periods (for example, four feet of sea-level rise by the year 2100). While information on the timing of specific projections is useful, the traditional approach can lead to vulnerability assessments that are too anchored on a defined amount and time frame for sea level rise, which may change as our scientific understanding of sea level rise evolves. Further, assessments that model a change in base sea level also fail to capture how sea level rise alters the frequency of episodic flood events that drive coastal land use and infrastructure planning.

¹ National Research Council. 2012. *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*.

INTRODUCTION: Approach

The chart below details this approach. Please note the data are rounded for ease of use.

Basing the analysis on changes in daily, monthly, annual, and 100-year water levels **better captures how we will experience the leading edge of future sea level conditions**. The approach also **allows users to better evaluate impacts on land use and infrastructure by supporting a more refined consideration of sensitivity to flooding**.

The amount and extent of coastal flooding experienced by a community will depend on a variety of factors. **The values presented in this analysis combine Seattle's highest observed water levels for storm surge and high tides with projected changes in relative sea level for Seattle** as described by NRC 2012. Other factors influencing coastal flood levels, such as erosion or long-term changes in land elevation due to soil compaction, are not included in this study. Natural variability will also affect when we exceed specific sea level rise thresholds due to human-caused climate change,

While this study illustrates projections for 2035 and 2060 it is important to remember that by 2100 under current projections another 2 feet of sea level rise is expected, further increasing the areas at risk of flooding due to sea level rise

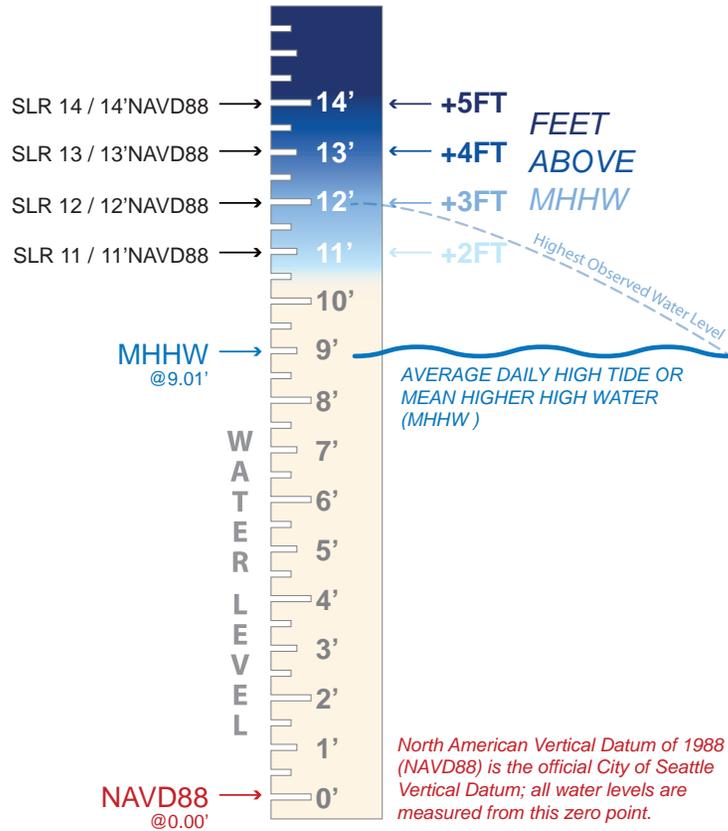
FREQUENCY	NOW	2035		2060	
	A	B	C = A + B	D	E = A + D
	Water Level*	Projected Sea Level Rise	Water Level	Projected Sea Level Rise	Water Level
100 Yr Storm (Surge)†	3'	1'	4'	2'	5'
Annually	2'	1'	3'	2'	4'
Monthly	1'	1'	2'	2'	3'
Daily	0	1'	1'	2'	2'

* Above average daily high tide (MHHW)

† Current projections do not show a change in storm surge as a result of sea level rise.

Projected water levels associated with different flood intervals based on National Research Council 2012 data and observed water levels over the last century in Seattle. Data are rounded for ease of use.

INTRODUCTION: Approach



potentially causing these thresholds to be crossed sooner or later than would be expected on the basis of climate change alone.

SEA LEVEL RISE: VERTICAL DATUM & FEET OF RISE

Four water level projections were provided by Seattle Public Utilities. This diagram shows what level of water each of these data correspond to in relation to North American Vertical Datum of 1988 (NAVD88) (the City's official vertical datum), and Average Daily High Tide or mean higher high water (MHHW).

Establishing and clarifying the starting vertical datum is critical to understanding water levels. Many different climate change studies use different vertical datums, as well as different units (inches versus feet, for example) to talk about sea level rise. **This study uses NAVD88 as the base vertical datum for the data, and looks at water levels 11–14 feet above this zero point.** In order to understand what that means in relation to the water levels we actually see and experience these water levels are further explained in relation to today's Average Daily High Tide (MHHW) levels, which is 9.01 feet above NAVD88. **The number of feet above the MHHW level is used to indicate water levels throughout this study (2–5 feet).** Additionally, these vertical datum are highlighted in the matrix on the following page.

VERTICAL DATUM: ELEVATIONS & DATA

This diagram illustrates the relationship between the 2FT-5FT water levels, the City's Official Vertical Datum (NAVD88), and the city's current Average Daily High Tide (MHHW) level, which is 9.01 feet above NAVD88.

INTRODUCTION: Approach

PROJECTED WATER LEVELS: WHEN & IMPACT ON FLOODING

The frequency and magnitude of flooding will increase due to sea level rise, with existing annual events projected to become monthly events by around 2035 and daily events by about 2060. The matrix below details the projected frequency and magnitude of flooding over time. Both mid and high climate projections are presented. The map pages which follow are organized by water level and are based on only the high climate projections due to clarity and space considerations.

		NOW		2035		2060		
		WATER LEVEL (DISTANCE ABOVE)		WATER LEVEL (DISTANCE ABOVE)		WATER LEVEL (DISTANCE ABOVE)		
		PROJECTIONS	NAVD88 (0.00')	Avg Daily High Tide (MHHW)	NAVD88 (0.00')	Avg Daily High Tide (MHHW)	NAVD88 (0.00')	Avg Daily High Tide (MHHW)
FREQUENCY (Daily/monthly/annually/100yr)	100 Year ¹ "Surge"	High	12 feet	3 feet	13 feet	4 feet	14 feet	5 feet
		Mid			n/a	n/a	13 feet	4 feet
	Annually	High	11 feet	2 feet	12 feet	3 feet	13 feet	4 feet
		Mid			n/a	n/a	12 feet	3 feet
	Monthly	High	n/a	n/a	11 feet	2 feet	12 feet	3 feet
		Mid	n/a	n/a	n/a	n/a	11 feet	2 feet
	Daily	High	n/a	n/a	n/a	n/a	11 feet	2 feet
		Mid	n/a	n/a	n/a	n/a	n/a	n/a

1. A "100 Year" frequency corresponds to the highest water level (or extreme high tide) achieved through a combination of the inverted barometer effect (low atmospheric pressure) and/or wind and wave action, that is, a "storm surge." It is not possible to estimate how many times per year this level will occur, but a 100 Year frequency has a 1% probability of occurring in any given year. Seattle's highest tide ever observed was 12.14 FT above NAVD88 (NOAA, January 27, 1983), and its most recent extreme high tide, which matched the highest observed tide, was in December 2012. With sea level rise, the 100 Year surge level is projected to increase to 13 feet and 14 feet NAVD88.

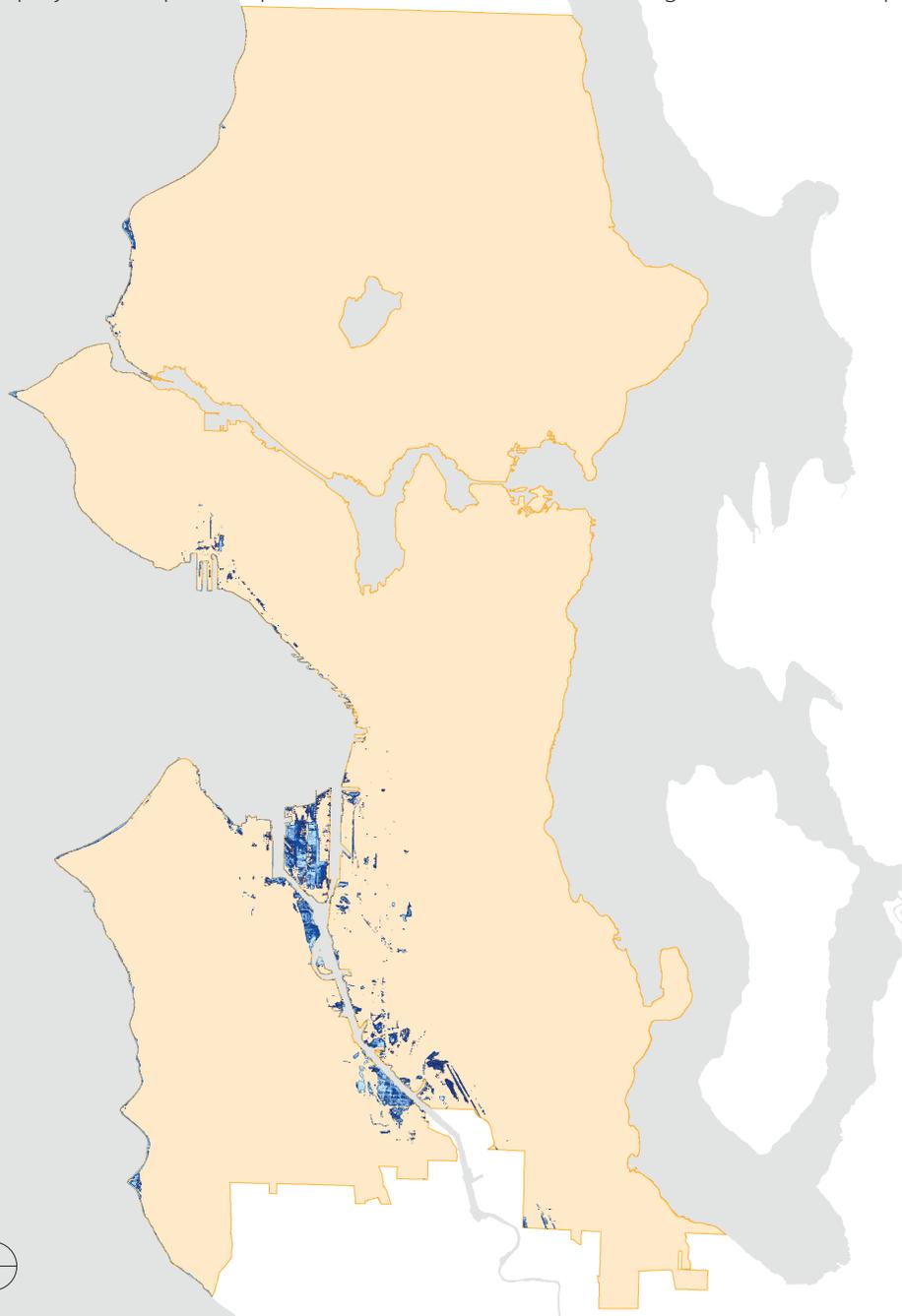
INTRODUCTION: Approach

HOW TO USE THIS STUDY

This study can be used in two main ways. First, a planner can evaluate additional GIS layers of infrastructure assets or community attributes to better understand the scope and scale of impacts at a broad level. Second, specific sites or assets can be evaluated to determine their vulnerability to future sea level conditions. In this case, the user would identify the known base elevation for the site or elevation of concern for a particular asset, cross-reference the specific elevation with mapped water levels, and then determine sensitivity to inundation of the site or asset considering the projected daily, monthly, annual, and 100-year frequencies provided.

INTRODUCTION: Area Impacted

The projected impact frequencies shown are based on the highest sea level rise projections for the year; see explanation on previous pages.



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area
Now: N/A				
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA	53,238	100%		
5FT ABOVE MHHW (14' NAVD88)			771 acres	1.5%

Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area
Now: N/A				
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA	53,238	100%		
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%

Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area
Now: 100 YEAR				
2035: ANNUALLY				
2060: MONTHLY				
SEATTLE LAND AREA	53,238	100%		
3FT ABOVE MHHW (12' NAVD88)			259 acres	0.5%

Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area
Now: ANNUALLY				
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA	53,238	100%		
2FT ABOVE MHHW (11' NAVD88)			120 acres	0.2%



INTRODUCTION: Report Key

HOW TO READ THIS REPORT: QUANTIFYING IMPACT BY AREA, LENGTH, AND NUMBER

PLANNING IMPACTS: Urban Villages					
Year of Occurrence: FREQUENCY		BASELINE		IMPACTED	
Now: ANNUALLY		A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
2035: MONTHLY				D/C = % of Total PA Area	
2060: DAILY		C TOTAL - LAND USE: PLANNING AREAS		E Specific Planning Area	
SEATTLE LAND AREA		53,238		F Specific PA Area Impacted	
2ft ABOVE MHHW (1' NAVD88)		120 acres		0.2%	
TOTAL - LAND USE: PLANNING AREAS		15,307		77 acres	
SPECIFIC PLANNING AREA (PA)		E Specific Planning Area		F/E = % of Specific PA Area	
Ballard-Interbay-Northend	934 acres	5 acres	0.5%		
Belltown	220 acres	2 acres	0.9%		
Commercial Core	277 acres	1 acres	0.4%		
Greater Duwamish	4,953 acres	69 acres	1.4%		
Pioneer Square	141 acres	no impact	n/a		
South Park	263 acres	no impact	n/a		
Other Urban Villages	8,519 acres	no impact	n/a		

2FT
ABOVE MHHW

Where the area subject to increased flooding and a study category¹ area overlap a measurement is taken in plan, and a percent of area impact is calculated based on the city's total land area, as well as the total city-wide area of the specific study category area. For example:

- At a water level 2 feet above MHHW,
- 120 acres within the city are impacted
- which represents 0.2% of the total baseline Seattle land area.
- This impact affects 0.5% of Seattle's total Planning Areas areas
- (or 77 acres of Planning Areas are impacted compared to the total 120 acres of land impacted city-wide).
- For Baseline comparison see chart at the beginning of each study category

Where area is not an appropriate unit of measurement, such as for analyzing impacts to the length (linear feet) of streams, alternate units are used, but the same impact overlay and calculation method applies.

¹ See study area categories on page 13.



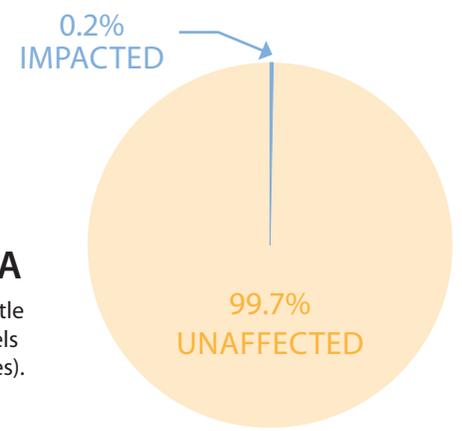
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area*
Now: ANNUALLY				
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA	53,238	100%		
2FT ABOVE MHHW (11' NAVD88)			120 acres	0.2%

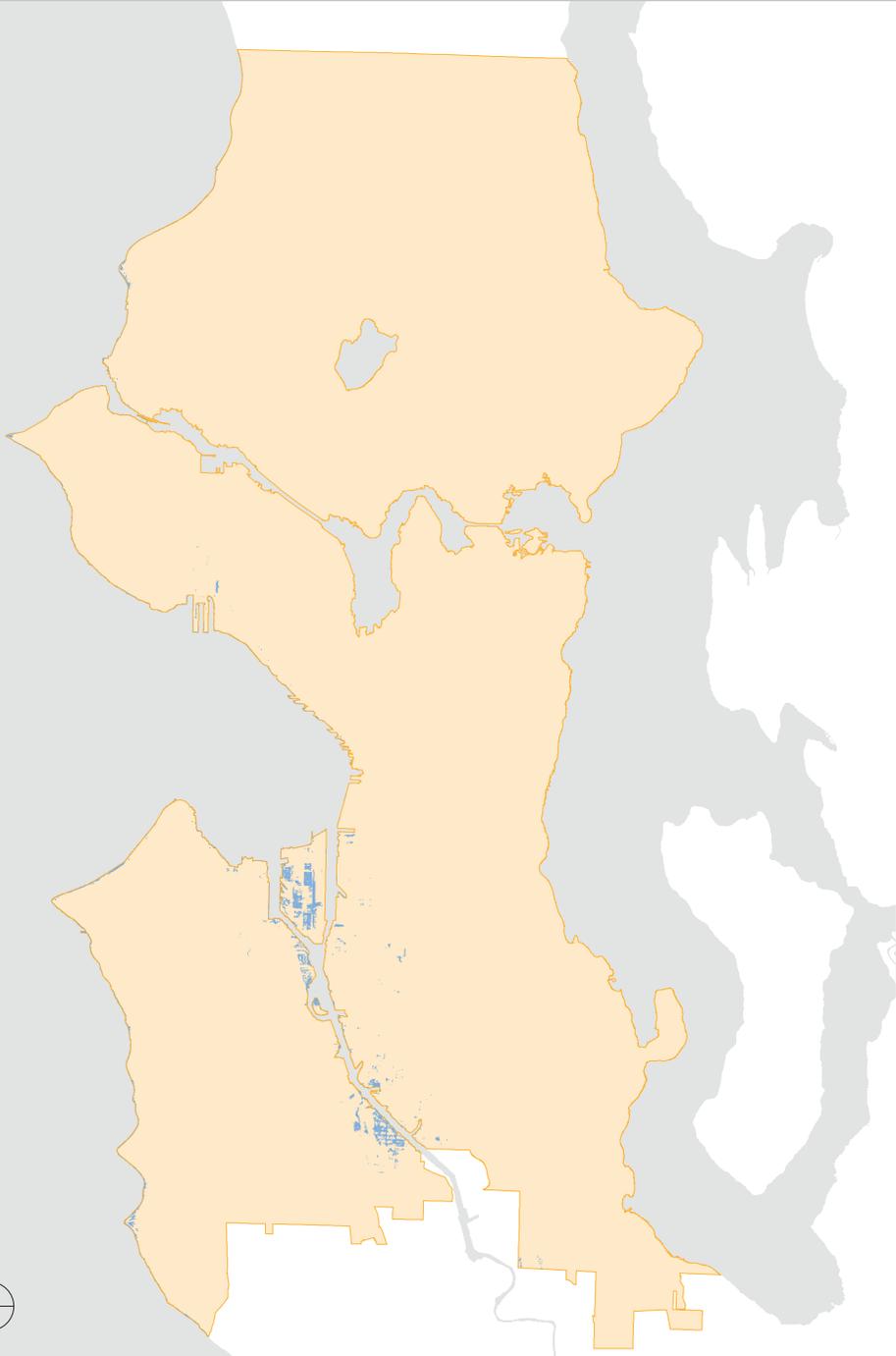
At 2 feet above MHHW, 120 acres - representing 0.2% of Seattle's total land area - will be impacted. The frequency of this flooding occurs annually now, and is projected to increase to monthly by 2035, and daily by 2060.

**The Baseline Area for inundation is the total Seattle Land Area*

2FT IMPACTS TO LAND AREA

The pie chart shows the percentage of total Seattle Land Area (53,238 acres) impacted by water levels 2FT above MHHW (Total Area Impacted 120 acres).





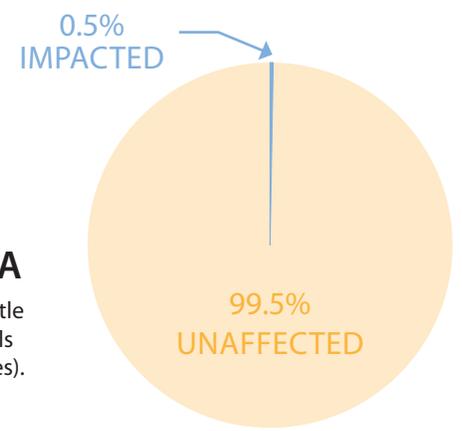
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area*
Now: 100 YEAR				
2035: ANNUALLY				
2060: MONTHLY				
SEATTLE LAND AREA	53,238	100%		
3FT ABOVE MHHW (12' NAVD88)			259 acres	0.5%

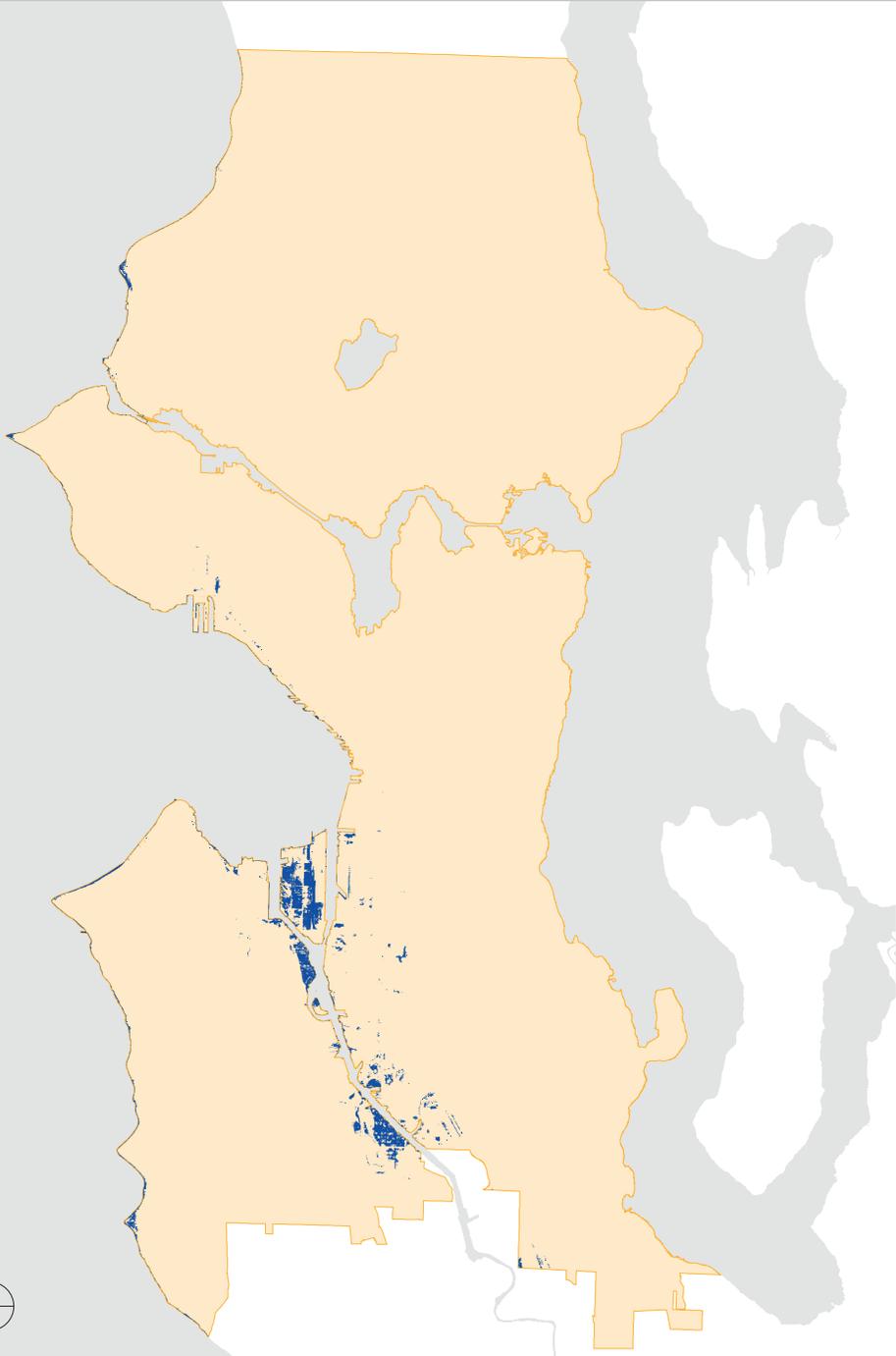
At 3 feet above MHHW, 259 acres - representing 0.5% of Seattle's total land area - will be impacted. The frequency of this flooding occurs as a 100-year event now, and is projected to increase to annually by 2035, and monthly by 2060.

**The Baseline Area for inundation is the total Seattle Land Area*

3FT IMPACTS TO LAND AREA

The pie chart shows the percentage of total Seattle Land Area (53,238 acres) impacted by water levels 3FT above MHHW (Total Area Impacted 259 acres).

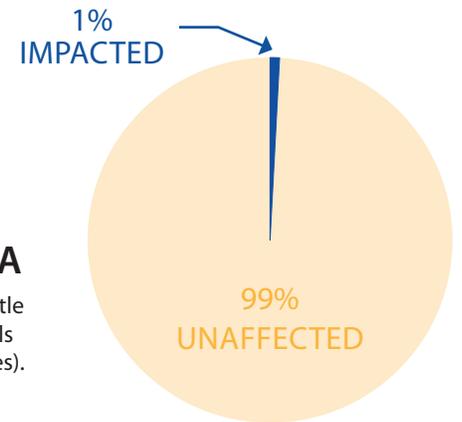




Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area*
Now: N/A				
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA	53,238	100%		
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%

At 4 feet above MHHW, 478 acres - representing 1% of Seattle's total land area - will be impacted. The frequency of this flooding is projected to occur as a 100-year event by 2035, and increase to an annual event by 2060.

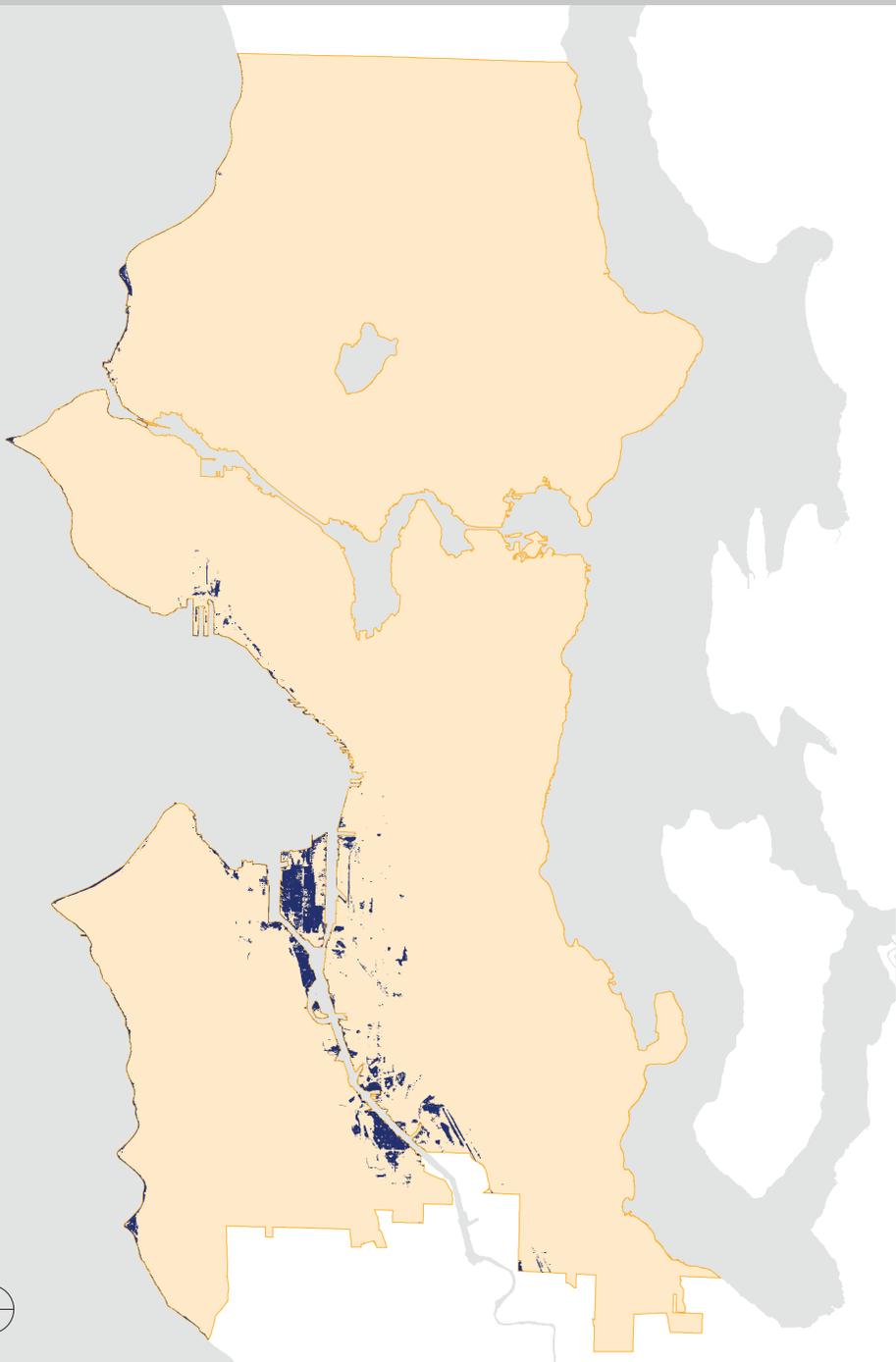
**The Baseline Area for inundation is the total Seattle Land Area*



4FT IMPACTS TO LAND AREA

The pie chart shows the percentage of total Seattle Land Area (53,238 acres) impacted by water levels 4FT above MHHW (Total Area Impacted 478 acres).





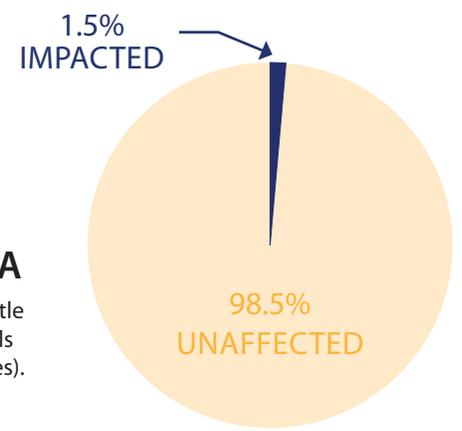
Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Total Area (acres)	% of Total Seattle Land Area	Total Area Impacted	% of Total Baseline Seattle Land Area*
Now: N/A				
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA	53,238	100%		
5FT ABOVE MHHW (14' NAVD88)			771 acres	1.5%

At 5 feet above MHHW, 771 acres - representing 1.5% of Seattle's total land area - will be impacted. The frequency of this flooding is projected to occur as a 100-year event by 2060.

**The Baseline Area for inundation is the total Seattle Land Area*

5FT IMPACTS TO LAND AREA

The pie chart shows the percentage of total Seattle Land Area (53,238 acres) impacted by water levels 5FT above MHHW (Total Area Impacted 771 acres).



IMPACTS TO STUDY AREAS



The following pages summarize city wide impacts for water levels 2 - 5 feet above MHHW by study area. These land use study areas include:

CRITICAL AREAS

Aquatic Areas	<i>Includes: Riparian Corridors, Wetlands, Shoreline Buffers, Stream Length</i>
Habitat & Parks	<i>Includes: Priority Habitat & Species Areas, Parks</i>
Soils	<i>Includes: Peat Settlement Areas, Liquefaction Prone Areas, Geologic Hazard Areas</i>

PLANNING

Zoned Use	<i>5 of 7 zone classes impacted</i>
Urban Villages	<i>6 of 42 Urban Villages impacted</i>
Existing Land Use	<i>6 of 9 zone classes impacted</i>
Jobs & Housing	<i>Includes Jobs, & SF & MF Housing Units</i>

TRANSPORTATION

Transit	<i>Includes: Bus stops, bus routes, Transit Master Plan Priority Corridors, Frequent Transit Corridors, Rail (light/street car/monorail/Sounder Train)</i>
CIP & Streets	<i>Includes: Capital Improvement Projects (CIP) Proposed Projects and Arterials</i>

FREIGHT

Trucks & Rail	<i>Includes: Major Truck Routes, Freight Rail</i>
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CRITICAL AREAS: Baseline

CRITICAL AREAS		BASELINE	
Aquatic Areas, Habitat & Parks		A Total Area (acres)	
SEATTLE LAND AREA		53,238	
TOTAL-CRITICAL AREAS: AQUATIC AREAS		n/a*	
SPECIFIC AQUATIC CRITICAL AREAS		E Specific Aquatic Area	E/A = % of Total Seattle Land Area
 Riparian Corridors		1,326	2.5%
 Wetlands		502	0.9%
 Shoreline Buffer		1,115	2.1%
 Stream Length (linear feet)		284,787 LF	n/a
TOTAL - CRITICAL AREAS: HABITAT & PARKS		n/a*	
SPECIFIC HABITAT & PARKS CRITICAL AREAS		E Specific Habitat & Parks Area	E/A = % of Total Seattle Land Area
 PHS-Biodiversity Area/Corr, Eagle		605	1.1%
 Eagle Mngmt Area		1,139	2.1%
 PHS-Biodiversity Area/Corr		3,572	6.7%
 PHS-Biodiversity Area/Corr, Heron		49	0.1%
 Heron Habitat Area		372	0.7%
 PHS-Biodiversity Area/Corr, Eagle & Heron		2.5	0.01%
 Parks		5,304	10%

*areas cannot be totaled due to overlapping areas

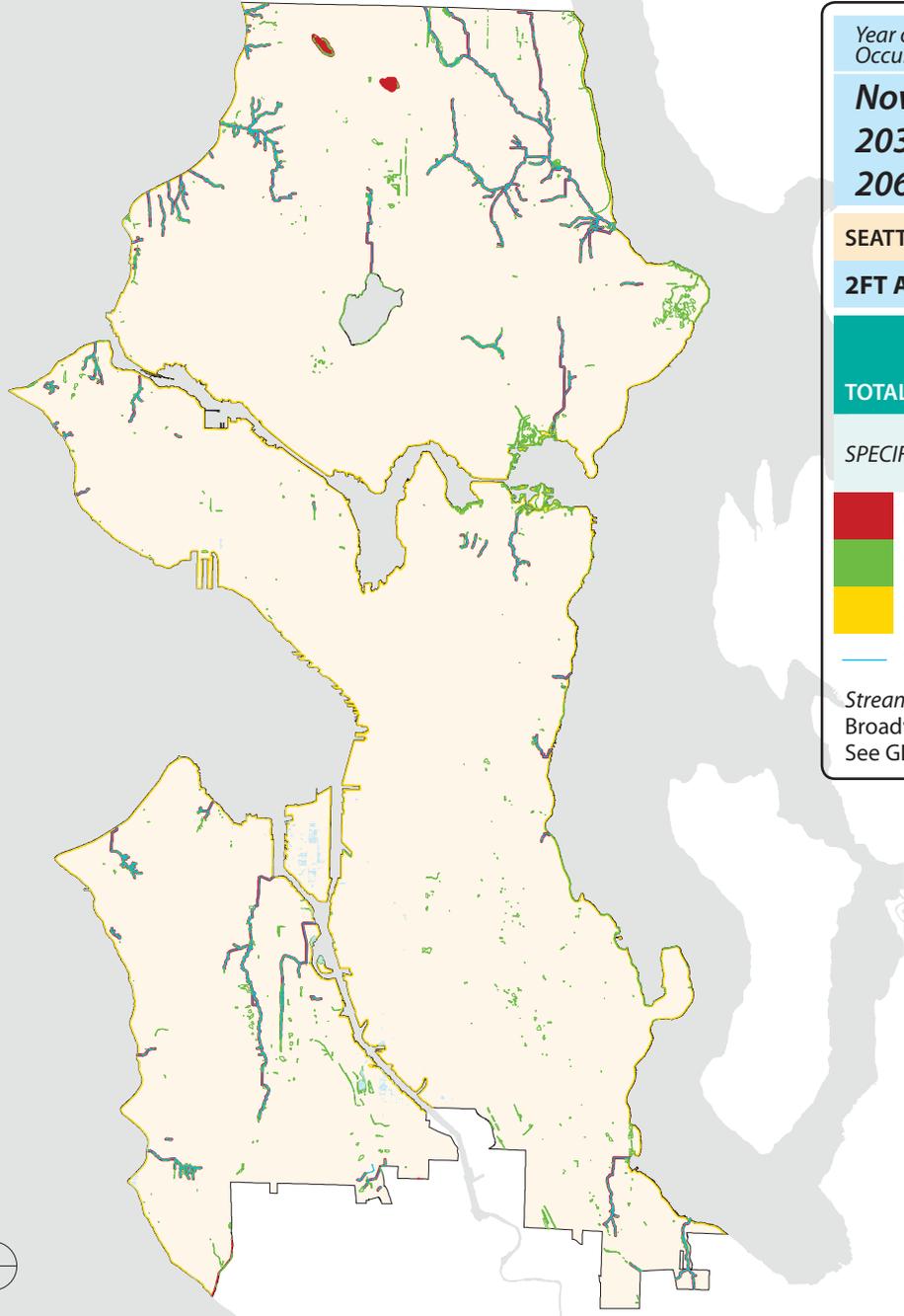
CRITICAL AREAS		BASELINE	
Soils		A Total Area (acres)	
SEATTLE LAND AREA		53,238	
TOTAL-CRITICAL AREAS: SOILS		n/a*	
SPECIFIC SOILS CRITICAL AREAS		E Specific Soils Area	E/A = % of Total Seattle Land Area
 Peat Settlement Prone Areas		1,928	3.6%
 Liquefaction Prone Areas		8,029	15%
 Geologic Hazard Areas ¹		6,888	13%

*areas cannot be totaled due to overlapping areas
¹. Geologic Hazard Areas include known slide areas, potential slide areas, and steep slope erosion areas

CRITICAL AREAS IMPACTS: Aquatic Areas

2FT
ABOVE MHHW

GIS data: Streams_LandOnly; Riparian_SeattleLimits; Wetlands_SeattleLimits; ShorelineHabitat_SeattleLimits



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
Now: ANNUALLY				
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA	53,238			
2FT ABOVE MHHW (11' NAVD88)		120 acres	0.2%	
TOTAL - CRITICAL AREAS: AQUATIC AREAS	n/a*			
SPECIFIC AQUATIC CRITICAL AREAS	E Specific Aquatic Area	F Specific Aquatic Area Impacted	F/E = % of Specific Aquatic Area	
Riparian Corridors	1,326	2 acres	0.2%	
Wetlands	502	11 acres	2.2%	
Shoreline Buffer	1,115	66 acres	6.0%	
Stream Length (linear feet)	284,787 LF	534 LF	0.2%	
<i>Streams Impacted:</i> Broadview, Fairmont, Golden Gardens, Longfellow, Pelly, Pipers, Schmitz, Seola Beach. See GIS for specific locations.				

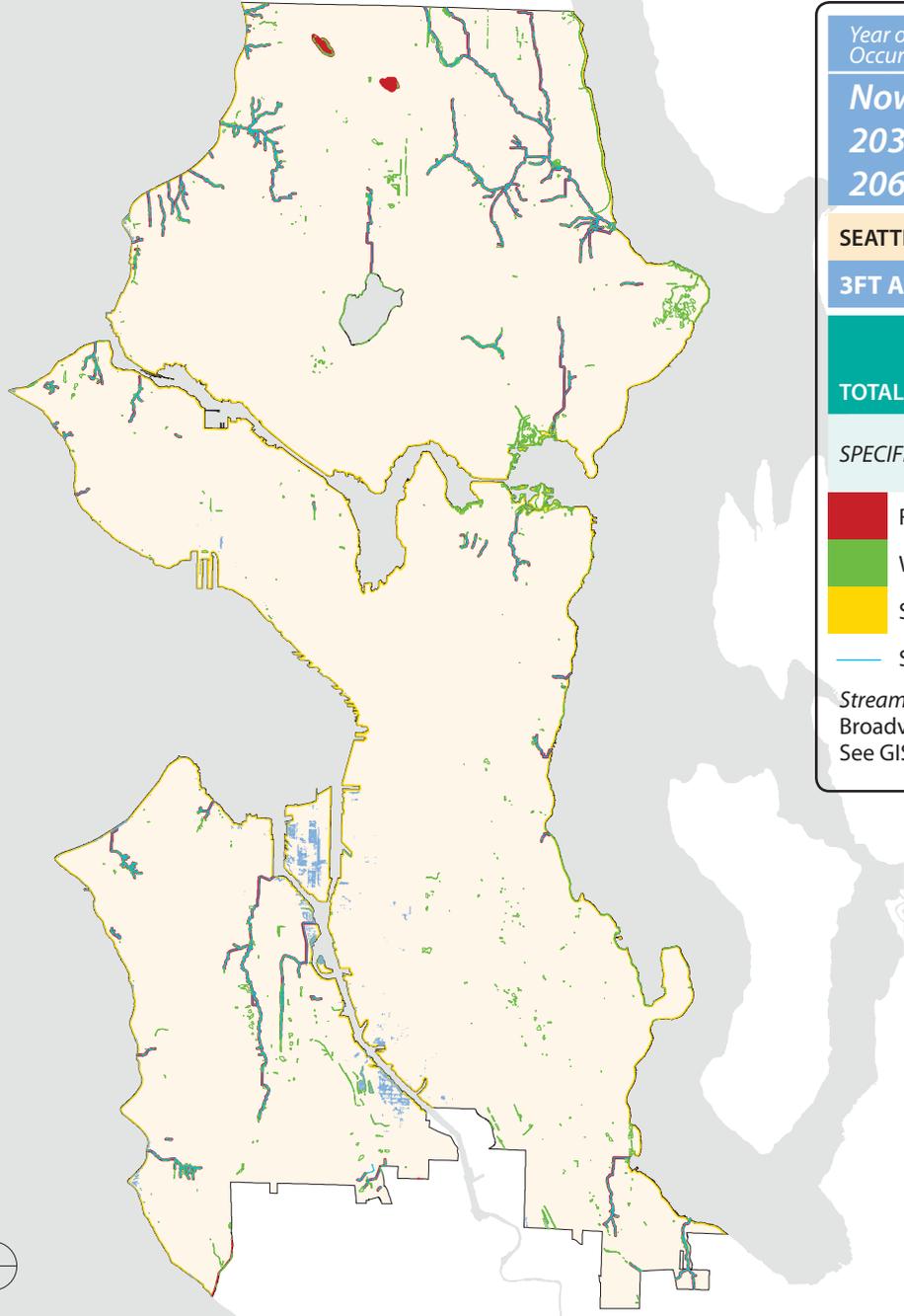
*Areas cannot be totaled due to overlapping areas. For example, a wetland may overlap a shoreline buffer, or a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Aquatic Areas

3FT
ABOVE MHHW

GIS data: Streams_LandOnly; Riparian_SeattleLimits; Wetlands_SeattleLimits; ShorelineHabitat_SeattleLimits



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	A Total Area (acres)	B Total Area Impacted		B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)		259 acres	0.5%	
TOTAL - CRITICAL AREAS: AQUATIC AREAS	n/a*			
SPECIFIC AQUATIC CRITICAL AREAS	E Specific Aquatic Area	F Specific Aquatic Area Impacted		F/E = % of Specific Aquatic Area
Riparian Corridors	1,326	3 acres		0.2%
Wetlands	502	14 acres		2.8%
Shoreline Buffer	1,115	94 acres		8.4%
Stream Length (linear feet)	284,787 LF	911 LF		0.3%

Streams Impacted:
Broadview, Fairmont, Fauntleroy, Golden Gardens, Longfellow, Pelly, Pipers, Puget Ridge, Schmitz, Seola Beach.
See GIS for specific locations.

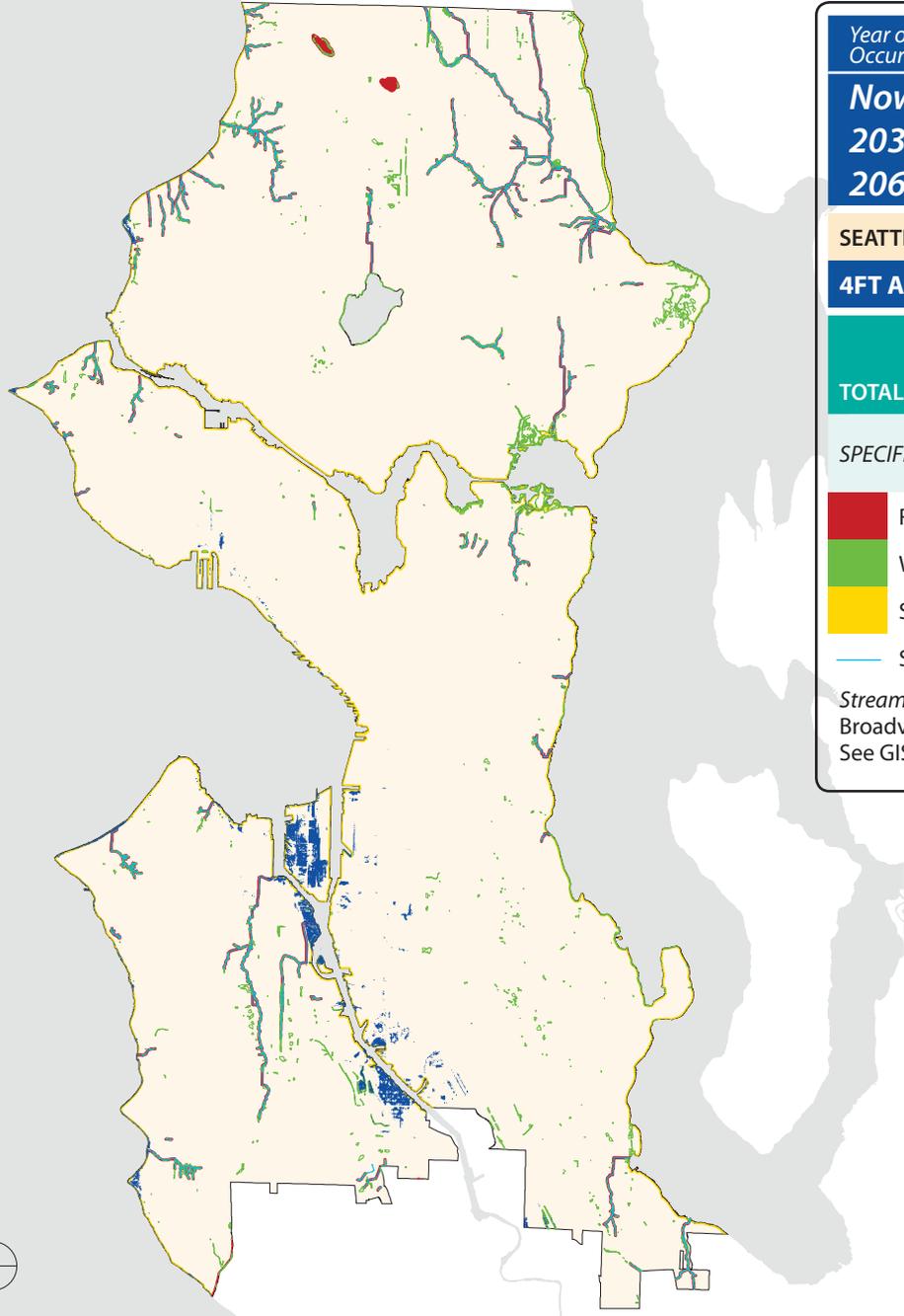
*Areas cannot be totaled due to overlapping areas. For example, a wetland may overlap a shoreline buffer, or a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Aquatic Areas

4FT
ABOVE MHHW

GIS data: Streams_LandOnly; Riparian_SeattleLimits; Wetlands_SeattleLimits; ShorelineHabitat_SeattleLimits



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA			478 acres	1.0%
4FT ABOVE MHHW (13' NAVD88)				
TOTAL - CRITICAL AREAS: AQUATIC AREAS	n/a*			
SPECIFIC AQUATIC CRITICAL AREAS	E Specific Aquatic Area		F Specific Aquatic Area Impacted	F/E = % of Specific Aquatic Area
Riparian Corridors	1,326		5 acres	0.4%
Wetlands	502		17 acres	3.4%
Shoreline Buffer	1,115		135 acres	12%
Stream Length (linear feet)	284,787 LF		1,634 LF	0.6%
Streams Impacted: Broadview, Fairmont, Fauntleroy, Golden Gardens, Longfellow, Pelly, Pipers, Puget Ridge, Schmitz, Seola Beach. See GIS for specific locations.				

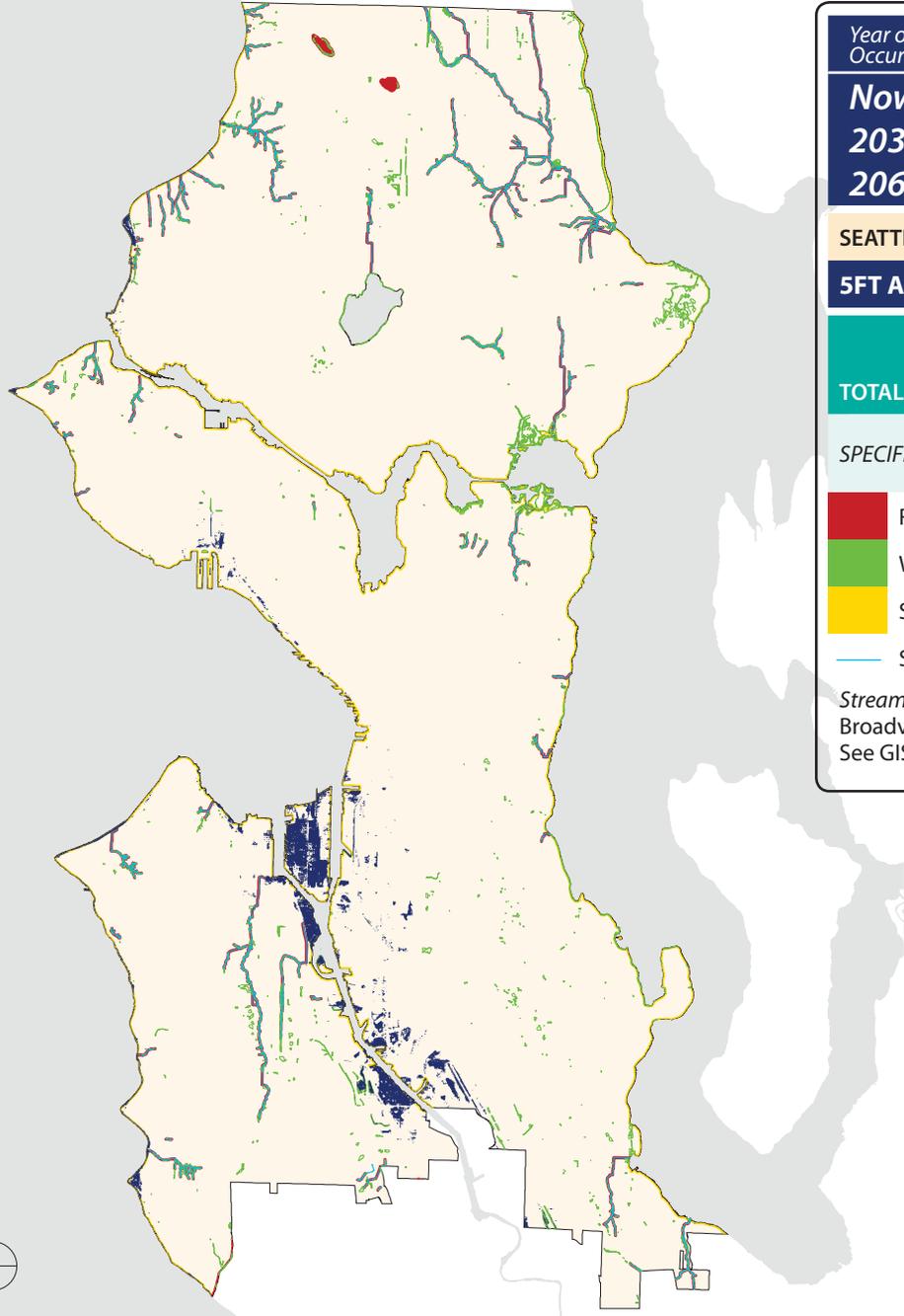
*Areas cannot be totaled due to overlapping areas. For example, a wetland may overlap a shoreline buffer, or a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Aquatic Areas

5FT
ABOVE MHHW

GIS data: Streams_LandOnly; Riparian_SeattleLimits; Wetlands_SeattleLimits; ShorelineHabitat_SeattleLimits



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	SEATTLE LAND AREA	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: N/A				
2060: 100 YEAR				
	53,238		771 acres	1.5%
5FT ABOVE MHHW (14' NAVD88)				
TOTAL - CRITICAL AREAS: AQUATIC AREAS		n/a*		
SPECIFIC AQUATIC CRITICAL AREAS		E Specific Aquatic Area	F Specific Aquatic Area Impacted	F/E = % of Specific Aquatic Area
	Riparian Corridors	1,326	10 acres	0.8%
	Wetlands	502	20 acres	4%
	Shoreline Buffer	1,115	182 acres	16%
	Stream Length (linear feet)	284,787 LF	2,740 LF	1%
<p><i>Streams Impacted:</i> Broadview, Fairmont, Fauntleroy, Golden Gardens, Longfellow, Pelly, Pipers, Puget Ridge, Schmitz, Seola Beach. See GIS for specific locations.</p>				

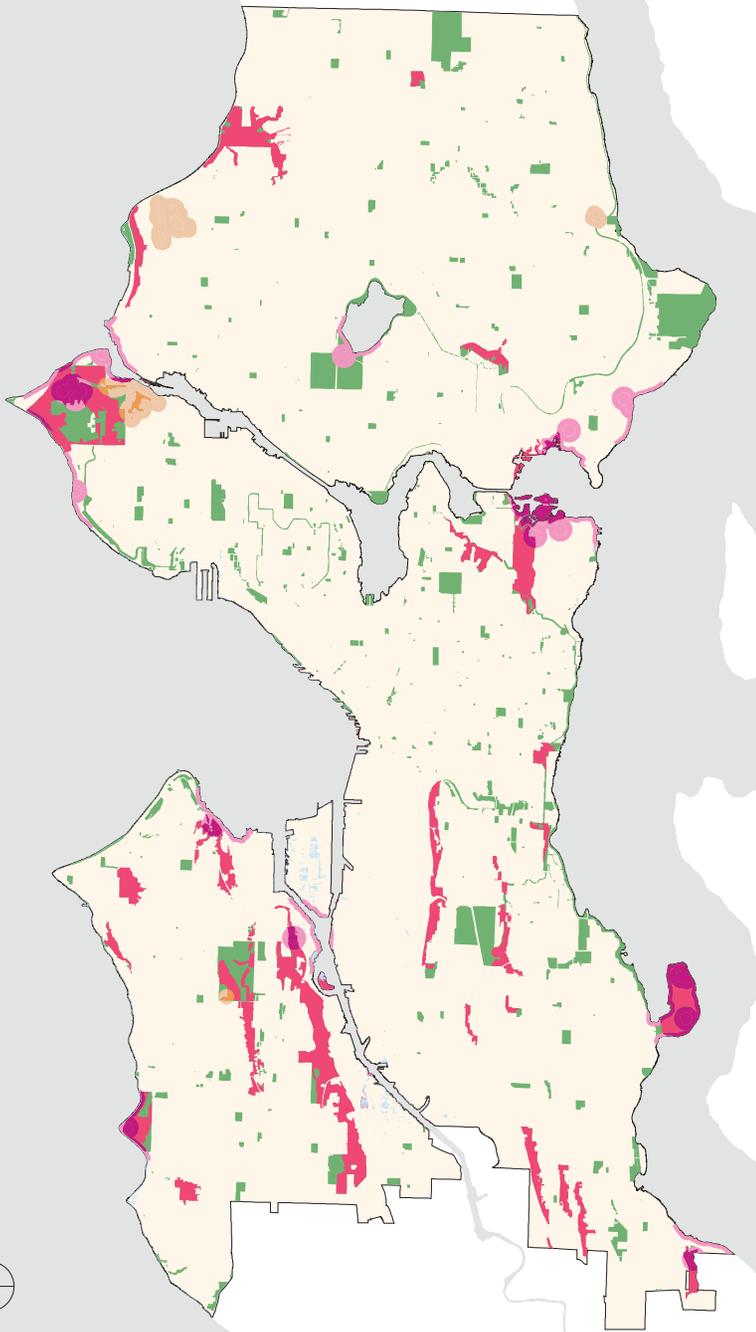
*Areas cannot be totaled due to overlapping areas. For example, a wetland may overlap a shoreline buffer, or a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Habitat & Parks

2FT
ABOVE MHHW

GIS data: PriorityHabitats_CityLimits.shp, Parks_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
Now: ANNUALLY				
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA	53,238			
2FT ABOVE MHHW (11' NAVD88)		120 acres	0.2%	
TOTAL - CRITICAL AREAS: HABITAT & PARKS				
	n/a*			
SPECIFIC HABITAT & PARKS CRITICAL AREAS				
	E Specific Habitat & Parks Area	F Specific Habitat & Parks Area Impacted	F/E = % of Specific Habitat & Parks Area	
PHS-Biodiversity Area/Corr, Eagle	605	2 acres	0.3%	
Eagle Mngmt Area	1,139	15 acres	1.3%	
PHS-Biodiversity Area/Corr	3,572	14 acres	0.4%	
PHS-Biodiversity Area/Corr, Heron	49	0.1 acres	0.2%	
Heron Habitat Area	372	0.2 acres	0.05%	
PHS-Biodiversity Area/Corr, Eagle & Heron	2.5	0.03 acres	1.2%	
Parks	5,304	16 acres	0.3%	
<p><i>Habitat areas impacted:</i> Eagle Nest buffer, heron habitat buffer, saltwater wetland, sea lion habitat, estuarine zone, biodiversity area. Impacted areas are generally located in Discovery Park, Downtown waterfront, and the Duwamish River. See GIS for detailed locations.</p> <p><i>Parks w/ largest area impacted:</i> Alki Beach, Herrings House, Lincoln Park, Discovery Park, Golden Gardens</p>				

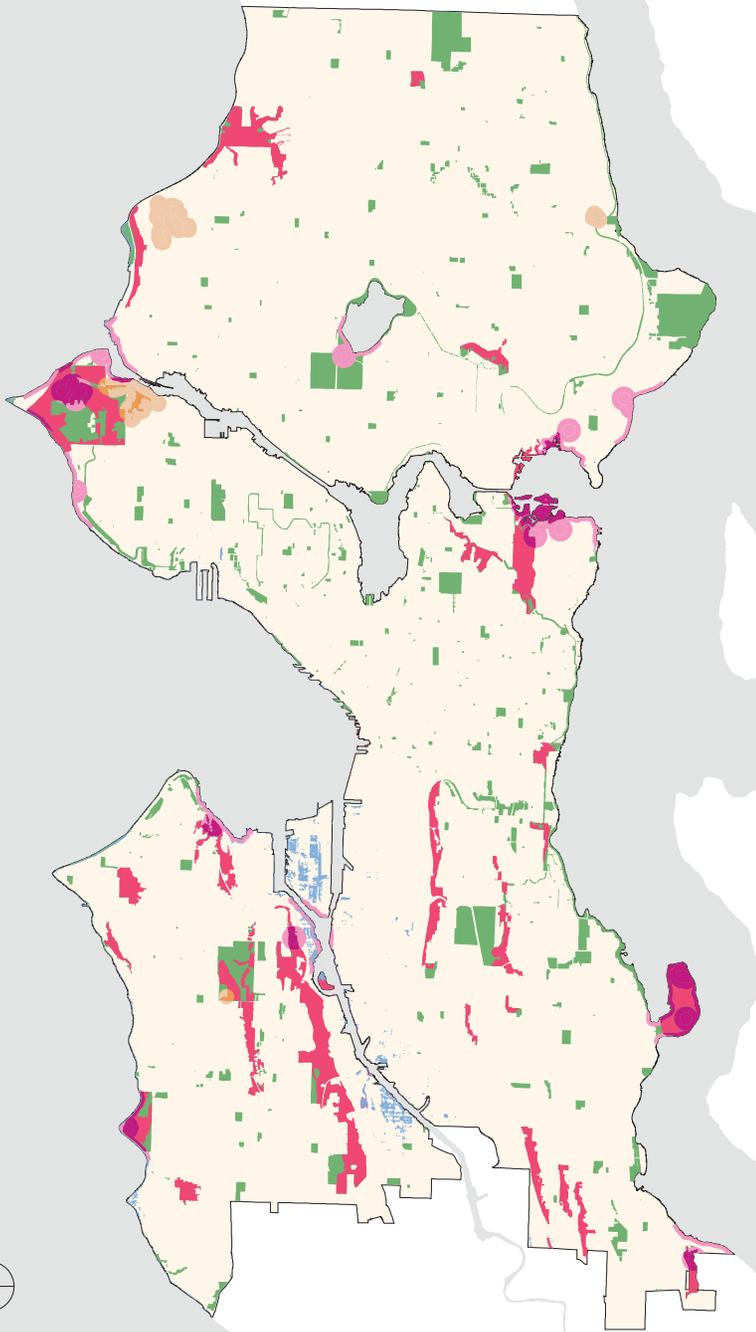
*Habitat Areas and Park Areas cannot be totaled due to overlapping areas. For example, a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Habitat & Parks

3FT
ABOVE MHHW

GIS data: PriorityHabitats_CityLimits.shp, Parks_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)		B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
Now: 100 YEAR				
2035: ANNUALLY				
2060: MONTHLY				
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)			259 acres	0.5%
TOTAL - CRITICAL AREAS: HABITAT & PARKS	n/a*			
SPECIFIC HABITAT & PARKS CRITICAL AREAS	E Specific Habitat & Parks Area	F Specific Habitat & Parks Area Impacted	F/E = % of Specific Habitat & Parks Area	
PHS-Biodiversity Area/Corr, Eagle	605	2 acres	0.3%	
Eagle Mngmt Area	1,139	23 acres	2%	
PHS-Biodiversity Area/Corr	3,572	16 acres	0.5%	
PHS-Biodiversity Area/Corr, Heron	49	0.1 acres	0.2%	
Heron Habitat Area	372	0.2 acres	0.05%	
PHS-Biodiversity Area/Corr, Eagle & Heron	2.5	0.04 acres	1.6%	
Parks	5,304	25 acres	0.5%	

Habitat areas impacted: Eagle Nest buffer, heron habitat buffer, saltwater wetland, sea lion habitat, estuarine zone, biodiversity area. Impacted areas are generally located in Discovery Park, Downtown waterfront, and the Duwamish River. See GIS for detailed locations.

Parks w/ largest area impacted: Alki Beach, Herrings House, Lincoln Park, Discovery Park, Golden Gardens

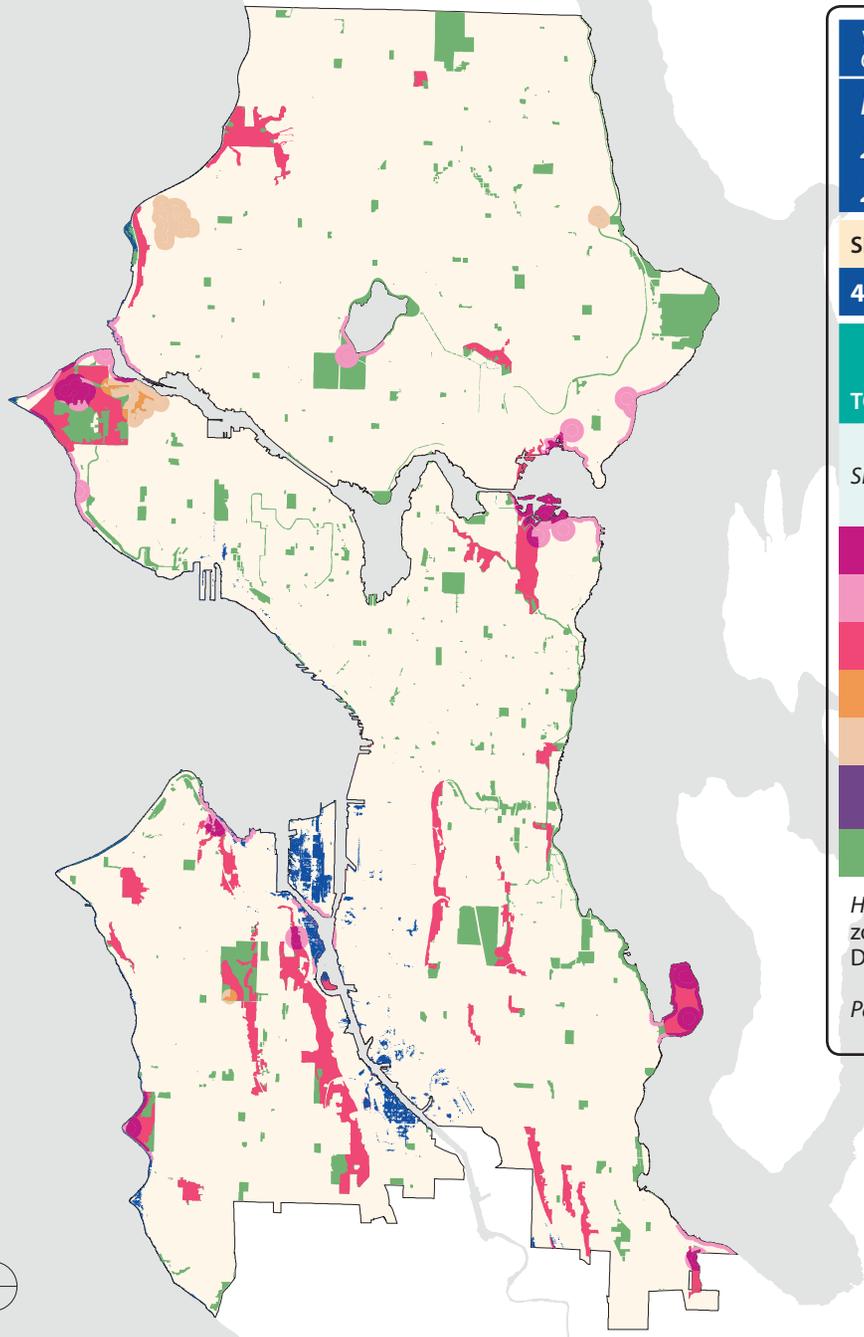
*Priority Habitat & Species Areas and Park Areas cannot be totaled due to overlapping areas. For example, a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Habitat & Parks

4FT
ABOVE MHHW

GIS data: PriorityHabitats_CityLimits.shp, Parks_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	Now: N/A		2035: 100 YEAR	
2060: ANNUALLY		A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA		53,238		
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%
TOTAL - CRITICAL AREAS: HABITAT & PARKS		n/a*		
SPECIFIC HABITAT & PARKS CRITICAL AREAS		E Specific Habitat & Parks Area	F Specific Habitat & Parks Area Impacted	F/E = % of Specific Habitat & Parks Area
	PHS-Biodiversity Area/Corr, Eagle	605	3 acres	0.5%
	Eagle Mngmt Area	1,139	40 acres	3.5%
	PHS-Biodiversity Area/Corr	3,572	18 acres	0.5%
	PHS-Biodiversity Area/Corr, Heron	49	0.1 acres	0.2%
	Heron Habitat Area	372	0.3 acres	0.08%
	PHS-Biodiversity Area/Corr, Eagle & Heron	2.5	0.05 acres	2%
	Parks	5,304	38 acres	0.7%

Habitat areas impacted: Eagle Nest buffer, heron habitat buffer, saltwater wetland, sea lion habitat, estuarine zone, biodiversity area. Impacted areas are generally located in Discovery Park, Downtown waterfront, and the Duwamish River. See GIS for detailed locations.

Parks w/ largest area impacted: Alki Beach, Herrings House, Lincoln Park, Discovery Park, Golden Gardens

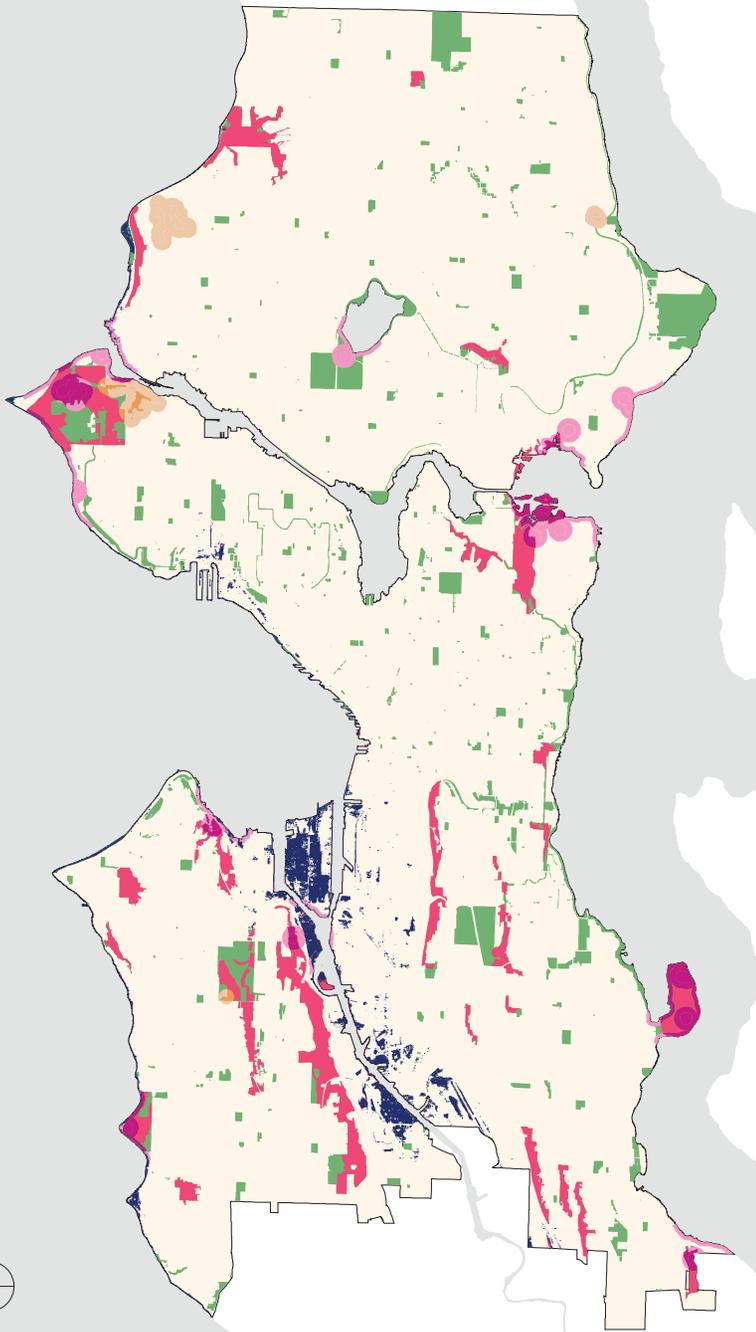
*Priority Habitat & Species Areas and Park Areas cannot be totaled due to overlapping areas. For example, a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Habitat & Parks

5FT
ABOVE MHHW

GIS data: PriorityHabitats_CityLimits.shp, Parks_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
Now: N/A				
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA	53,238			
5FT ABOVE MHHW (14' NAVD88)		771 acres	1.5%	
TOTAL - CRITICAL AREAS: HABITAT & PARKS	n/a*			
SPECIFIC HABITAT & PARKS CRITICAL AREAS	E Specific Habitat & Parks Area	F Specific Habitat & Parks Area Impacted	F/E = % of Specific Habitat & Parks Area	
PHS-Biodiversity Area/Corr, Eagle	605	3 acres	0.5%	
Eagle Mngmt Area	1,139	53 acres	4.7%	
PHS-Biodiversity Area/Corr	3,572	21 acres	0.6%	
PHS-Biodiversity Area/Corr, Heron	49	0.1 acres	0.2%	
Heron Habitat Area	372	0.3 acres	0.08%	
PHS-Biodiversity Area/Corr, Eagle & Heron	2.5	0.06 acres	2.4%	
Parks	5,304	50 acres	1.0%	

Habitat areas impacted: Eagle Nest buffer, heron habitat buffer, saltwater wetland, sea lion habitat, estuarine zone, biodiversity area. Impacted areas are generally located in Discovery Park, Downtown waterfront, and the Duwamish River. See GIS for detailed locations.

Parks w/ largest area impacted: Alki Beach, Herrings House, Lincoln Park, Discovery Park, Golden Gardens

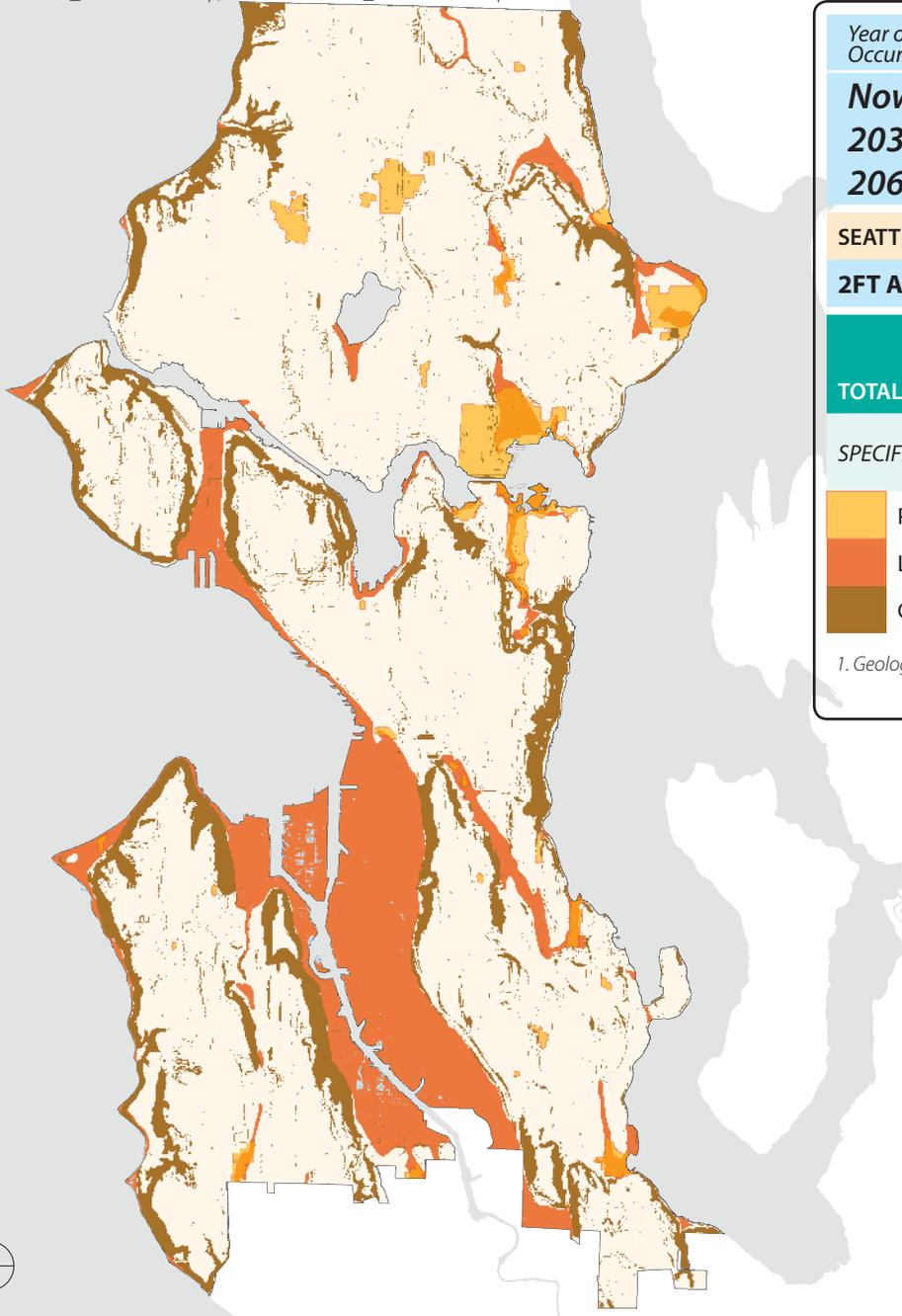
*Priority Habitat & Species Areas and Park Areas cannot be totaled due to overlapping areas. For example, a priority habitat area may exist within a park; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Soils

2FT
ABOVE MHHW

GIS data: PeatSettlementProneAreas_SeattleLimits, Liquefaction Prone Areas.shp, Potential Slide Areas.shp, Steep Slope Erosion Areas_SeattleLimits.shp, KnownSlideAreas_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: ANNUALLY	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: MONTHLY				
2060: DAILY				
SEATTLE LAND AREA				
2FT ABOVE MHHW (11' NAVD88)			120 acres	0.2%
TOTAL - CRITICAL AREAS: SOILS	n/a*			
SPECIFIC SOILS CRITICAL AREAS	E Specific Soils Area		F Specific Soils Area Impacted	F/E = % of Specific Soils Area
 Peat Settlement Prone Areas	1,928		no impact	n/a
 Liquefaction Prone Areas	8,029		96 acres	1.2%
 Geologic Hazard Areas ¹	6,888		13 acres	0.2%

1. Geologic Hazard Areas include known slide areas, potential slide areas, and steep slope erosion areas

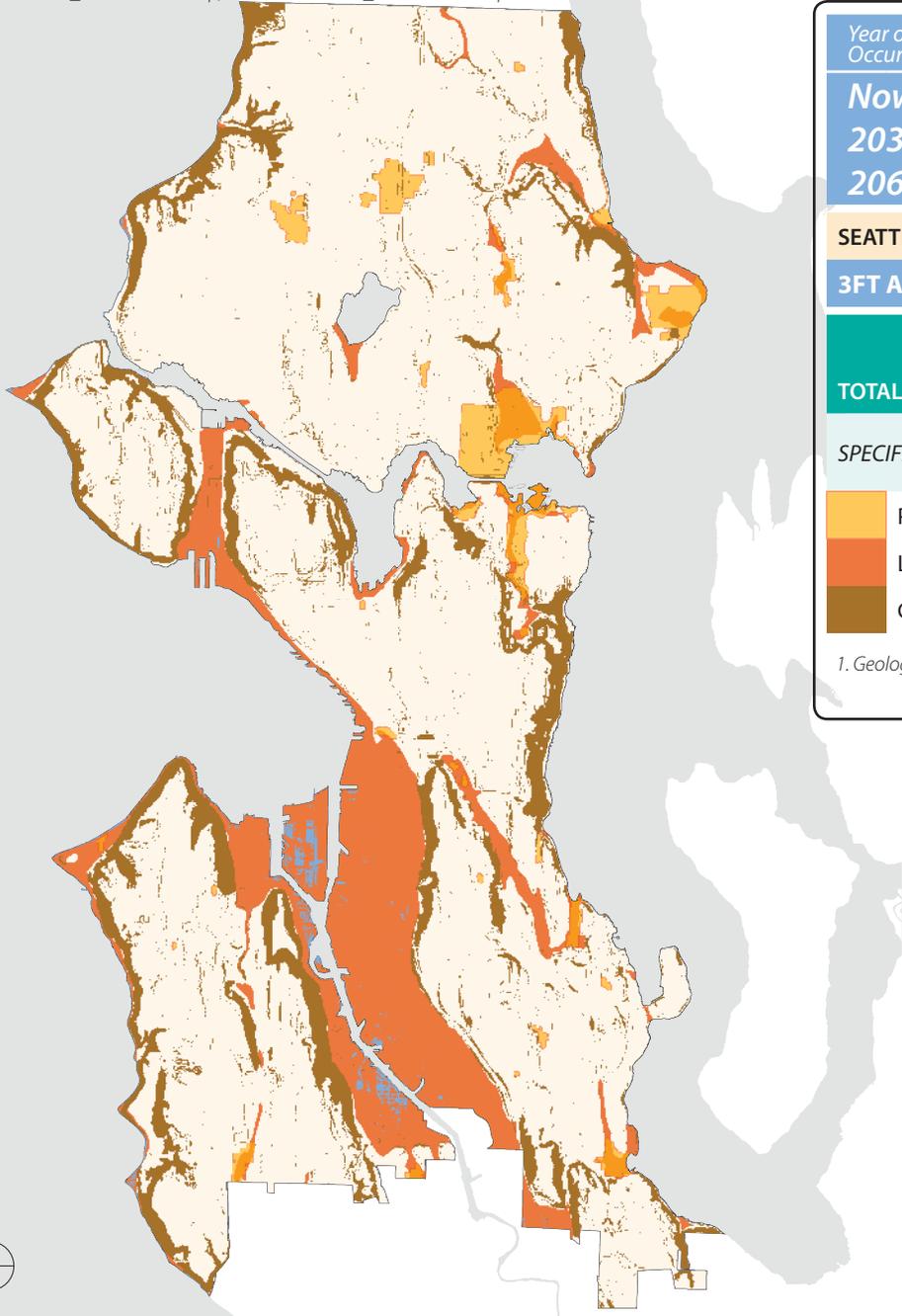
*Areas cannot be totaled due to overlapping areas. For example, a steep slope area may overlap a liquefaction prone area; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Soils

3FT
ABOVE MHHW

GIS data: PeatSettlementProneAreas_SeattleLimits, Liquefaction Prone Areas.shp, Potential Slide Areas.shp, Steep Slope Erosion Areas_SeattleLimits.shp, KnownSlideAreas_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	53,238			
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)		259 acres	0.5%	
TOTAL - CRITICAL AREAS: SOILS	n/a*			
SPECIFIC SOILS CRITICAL AREAS	E Specific Soils Area	F Specific Soils Area Impacted	F/E = % of Specific Soils Area	
Peat Settlement Prone Areas	1,928	no impact	n/a	
Liquefaction Prone Areas	8,029	230 acres	2.9%	
Geologic Hazard Areas ¹	6,888	16 acres	0.2%	

1. Geologic Hazard Areas include known slide areas, potential slide areas, and steep slope erosion areas

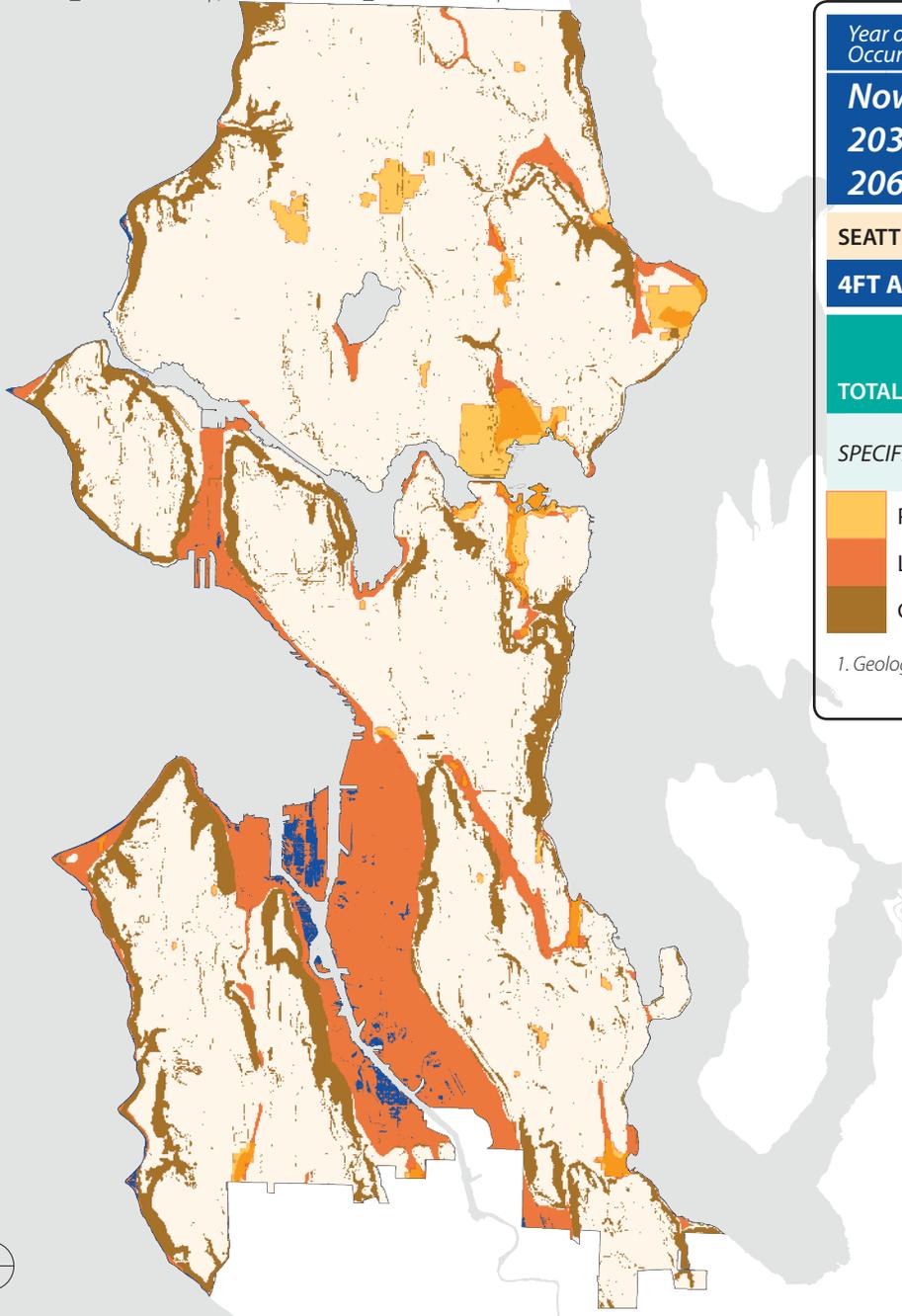
*Areas cannot be totaled due to overlapping areas. For example, a steep slope area may overlap a liquefaction prone area; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Soils

4FT
ABOVE MHHW

GIS data: PeatSettlementProneAreas_SeattleLimits, Liquefaction Prone Areas.shp, Potential Slide Areas.shp, Steep Slope Erosion Areas_SeattleLimits.shp, KnownSlideAreas_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
Now: N/A				
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA	53,238			
4FT ABOVE MHHW (13' NAVD88)		478 acres	1.0%	
TOTAL - CRITICAL AREAS: SOILS	n/a*			
SPECIFIC SOILS CRITICAL AREAS	E Specific Soils Area	F Specific Soils Area Impacted	F/E = % of Specific Soils Area	
Peat Settlement Prone Areas	1,928	no impact	n/a	
Liquefaction Prone Areas	8,029	442 acres	5.5%	
Geologic Hazard Areas ¹	6,888	20 acres	0.3%	

1. Geologic Hazard Areas include known slide areas, potential slide areas, and steep slope erosion areas

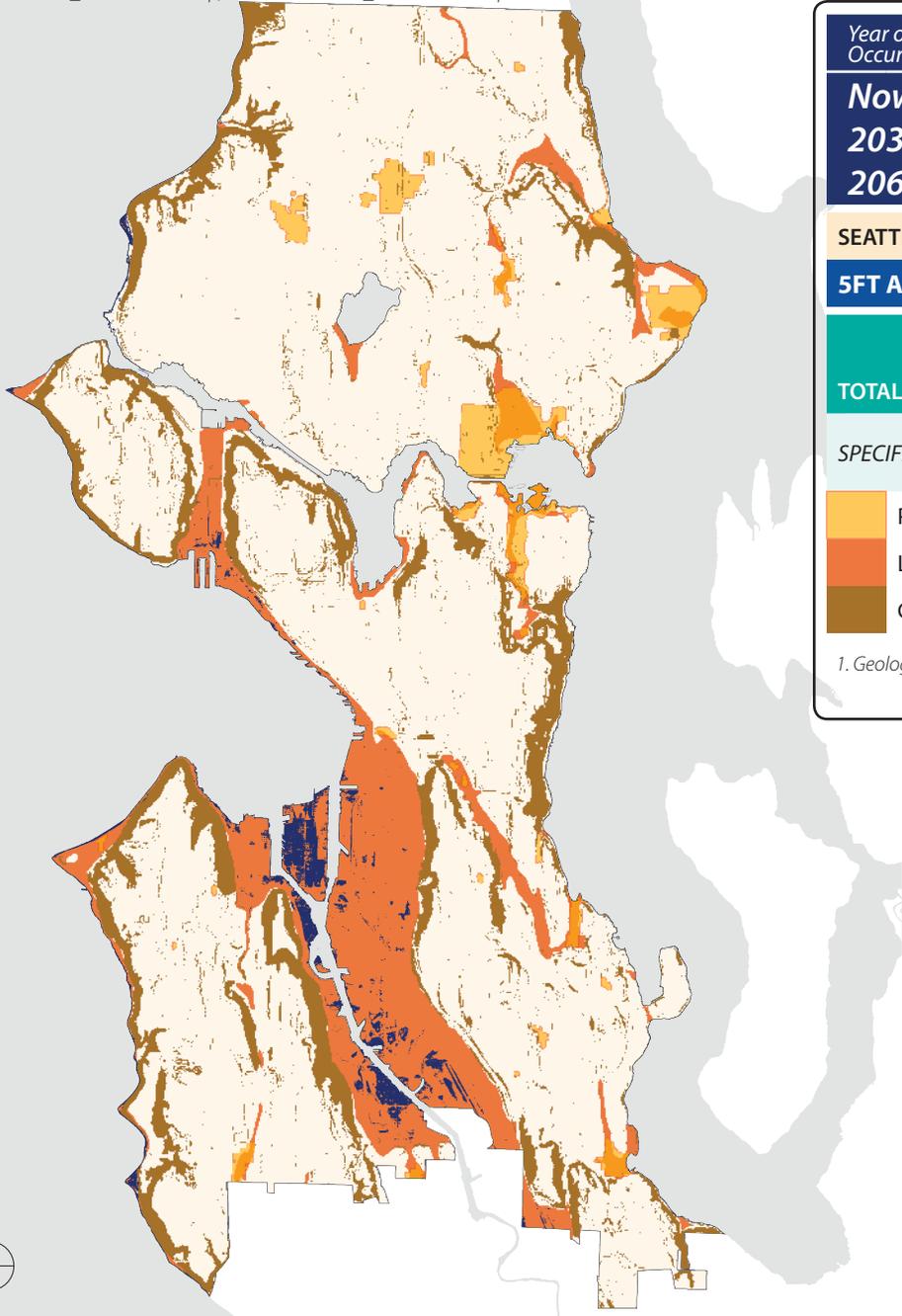
*Areas cannot be totaled due to overlapping areas. For example, a steep slope area may overlap a liquefaction prone area; areas are not counted twice -- see impacted acreage by specific area as appropriate.



CRITICAL AREAS IMPACTS: Soils

5FT
ABOVE MHHW

GIS data: PeatSettlementProneAreas_SeattleLimits, Liquefaction Prone Areas.shp, Potential Slide Areas.shp, Steep Slope Erosion Areas_SeattleLimits.shp, KnownSlideAreas_SeattleLimits.shp



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
Now: N/A				
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA	53,238			
5FT ABOVE MHHW (14' NAVD88)		771 acres	1.5%	
TOTAL - CRITICAL AREAS: SOILS				
	n/a*			
SPECIFIC SOILS CRITICAL AREAS		E Specific Soils Area	F Specific Soils Area Impacted	F/E = % of Specific Soils Area
	Peat Settlement Prone Areas	1,928	no impact	n/a
	Liquefaction Prone Areas	8,029	725 acres	9%
	Geologic Hazard Areas ¹	6,888	24 acres	0.4%

1. Geologic Hazard Areas include known slide areas, potential slide areas, and steep slope erosion areas

*Areas cannot be totaled due to overlapping areas. For example, a steep slope area may overlap a liquefaction prone area; areas are not counted twice -- see impacted acreage by specific area as appropriate.



LAND USE: BASELINE

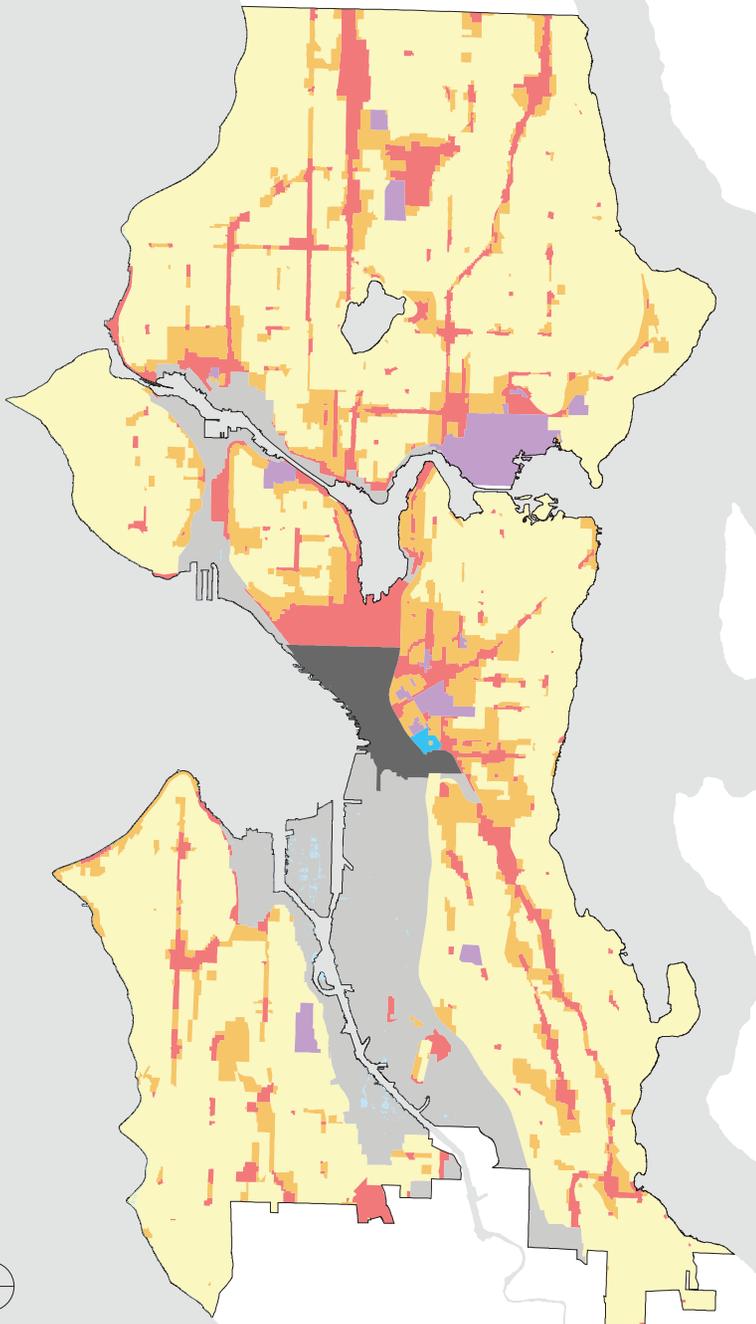
LAND USE IMPACTS ZONED USE & PLANNING AREAS		BASELINE	
		A Total Area (acres)	
SEATTLE LAND AREA		53,238	
TOTAL - LAND USE: ZONED USE		C 53,246*	C/A N/A*
<i>SPECIFIC ZONED USE</i>		E <i>Specific Zone Area</i>	E/C <i>% of Total Zone Area</i>
 Single Family		34,491 acres	65%
 Multi-Family		5,827 acres	11%
 Neighborhood/Res. Commercial		4,671 acres	11%
 Downtown		913 acres	1.7%
 Industrial Areas		6,183 acres	12%
 Master Planned Community		43 acres	0.1%
 Major Institutions		1,118 acres	2%
TOTAL - LAND USE: PLANNING AREA		C 15,307	C/A 29%
<i>SPECIFIC PLANNING AREA (PA)</i>		E <i>Specific PA Area</i>	E/C <i>% of Total PA Area</i>
 Ballard-Interbay-Northend		934 acres	6.1%
 Belltown		220 acres	1.4%
 Commercial Core		277 acres	1.8%
 Greater Duwamish		4,953 acres	32.4%
 Pioneer Square		141 acres	0.9%
 South Park		263 acres	1.7%
 Other Planning Areas		8,519 acres	55.7%

LAND USE IMPACTS EXISTING LAND USE		BASELINE	
		A Total Area (acres)	
SEATTLE LAND AREA		53,238	
TOTAL - LAND USE: EXISTING LAND USE		C 53,246*	C/A 73%
<i>SPECIFIC LAND USE</i>		E <i>Specific Land Use Area</i>	E/C <i>% of Total Land Use Area</i>
 Single Family		25,705	66.2%
 Midrise		747	2%
 Lowrise		3,919	10.1%
 Neighborhood Commercial		1,633	4.2%
 Commercial		1,446	3.7%
 Downtown		501	1.3%
 Industrial Areas		4,745	12.2%
 Master Planned Community + Highrise		108	0.3%
TOTAL - LAND USE: HOUSING UNITS		C 308,026 units	
<i>SPECIFIC HOUSING UNITS</i>		E <i>Specific Housing Units</i>	E/C <i>% Total Units</i>
 Single Family Units		133,971 units	43.5%
 Multi-Family Units		1,118 units	56.5%

LAND USE IMPACTS: Zoned Use

2FT
ABOVE MHHW

GIS data: Zoning_Land

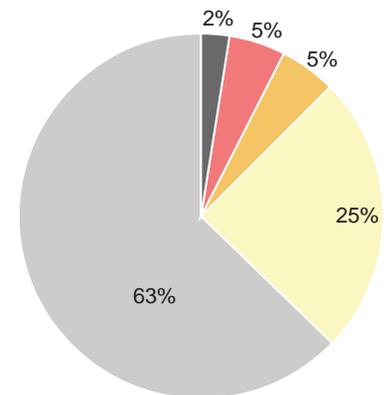


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: ANNUALLY 2035: MONTHLY 2060: DAILY	A Total Area (acres)		B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA	53,238		120 acres	0.2%
2FT ABOVE MHHW (11' NAVD88)				
TOTAL - LAND USE: ZONED USE	C 53,246*		D 118 acres	D/C = 0.22%
SPECIFIC ZONED USE	E Specific Zone Area		F Specific Zone Area Impacted	F/E = % of Specific Zone Area
Single Family	34,491		29 acres	0.1%
Multi-Family	5,827		6 acres	0.1%
Neighborhood/Res. Commercial	4,671		6 acres	0.1%
Downtown	913		3 acres	0.3%
Industrial Areas	6,183		74 acres	1.2%
Master Planned Community	43		no impact	n/a
Major Institutions	1,118		no impact	n/a

*The Total Zoned Area does not equal the Total Seattle Land Area due to discrepancies in the GIS data. The difference is less than 37 acres (0.07%).

IMPACTS BY ZONED USE

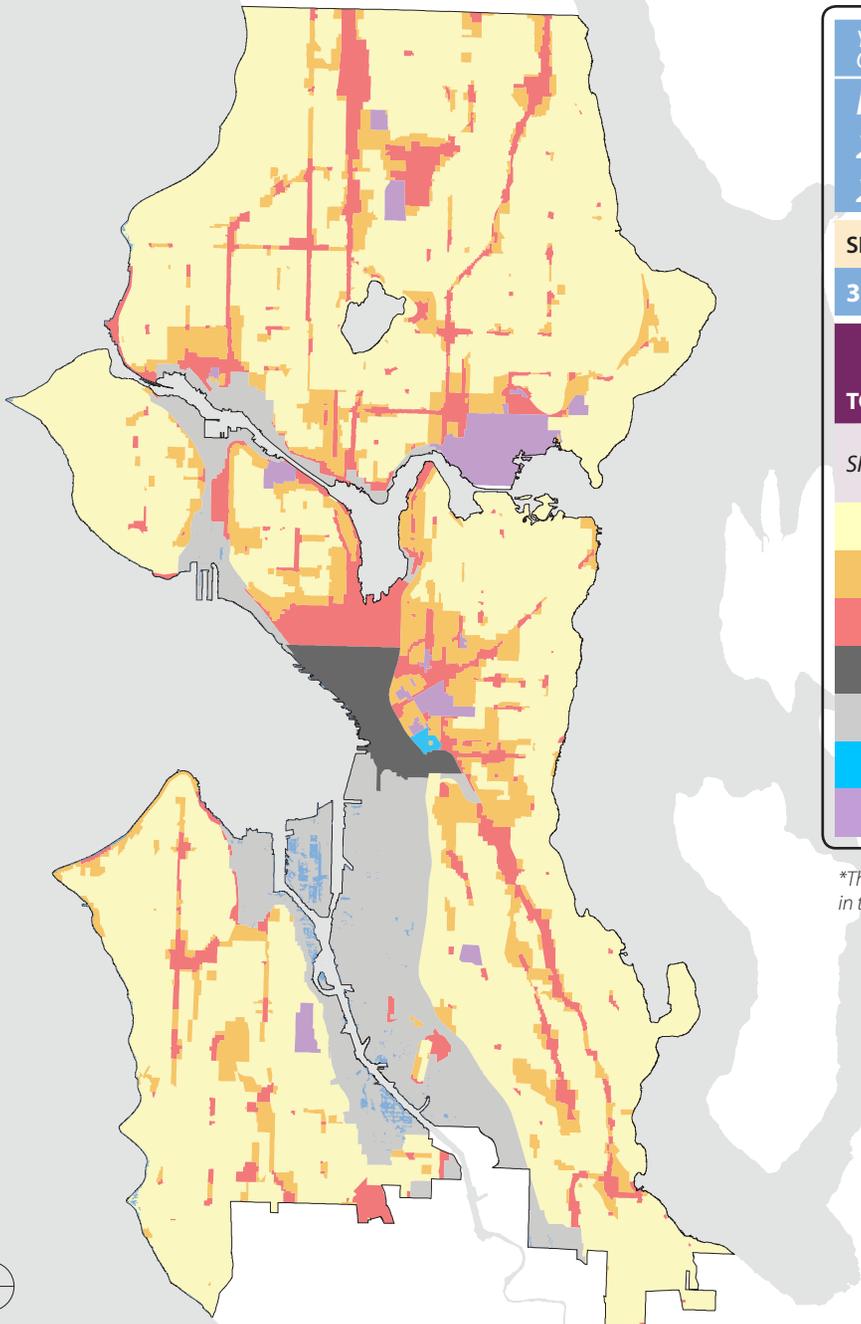
The pie chart shows the specific proportion of zoned use impacted at water levels 2FT above MHHW.



LAND USE IMPACTS: Zoned Use

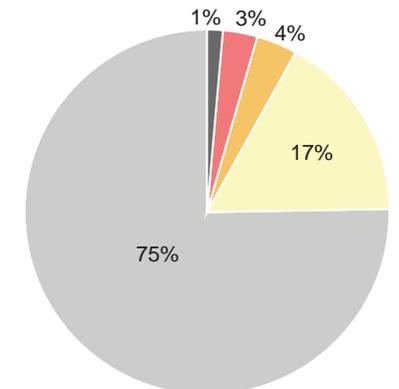
3FT
ABOVE MHHW

GIS data: Zoning_Land



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY				
	A	B		B/A =
	Total Area (acres)	Total Area Impacted		% of Total Baseline Seattle Land Area
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)		259 acres	0.5%	
	C	D		D/C =
TOTAL - LAND USE: ZONED USE	53,246*	257 acres		0.48%
	E	F		F/E =
SPECIFIC ZONED USE	Specific Zone Area	Specific Zone Area Impacted		% of Specific Zone Area
Single Family	34,491	43 acres		0.1%
Multi-Family	5,827	9 acres		0.2%
Neighborhood/Res. Commercial	4,671	8 acres		0.1%
Downtown	913	4 acres		0.4%
Industrial Areas	6,183	193 acres		3%
Master Planned Community	43	no impact		n/a
Major Institutions	1,118	no impact		n/a

*The Total Zoned Area does not equal the Total Seattle Land Area due to discrepancies in the GIS data. The difference is less than 37 acres (0.07%).



IMPACTS BY ZONED USE

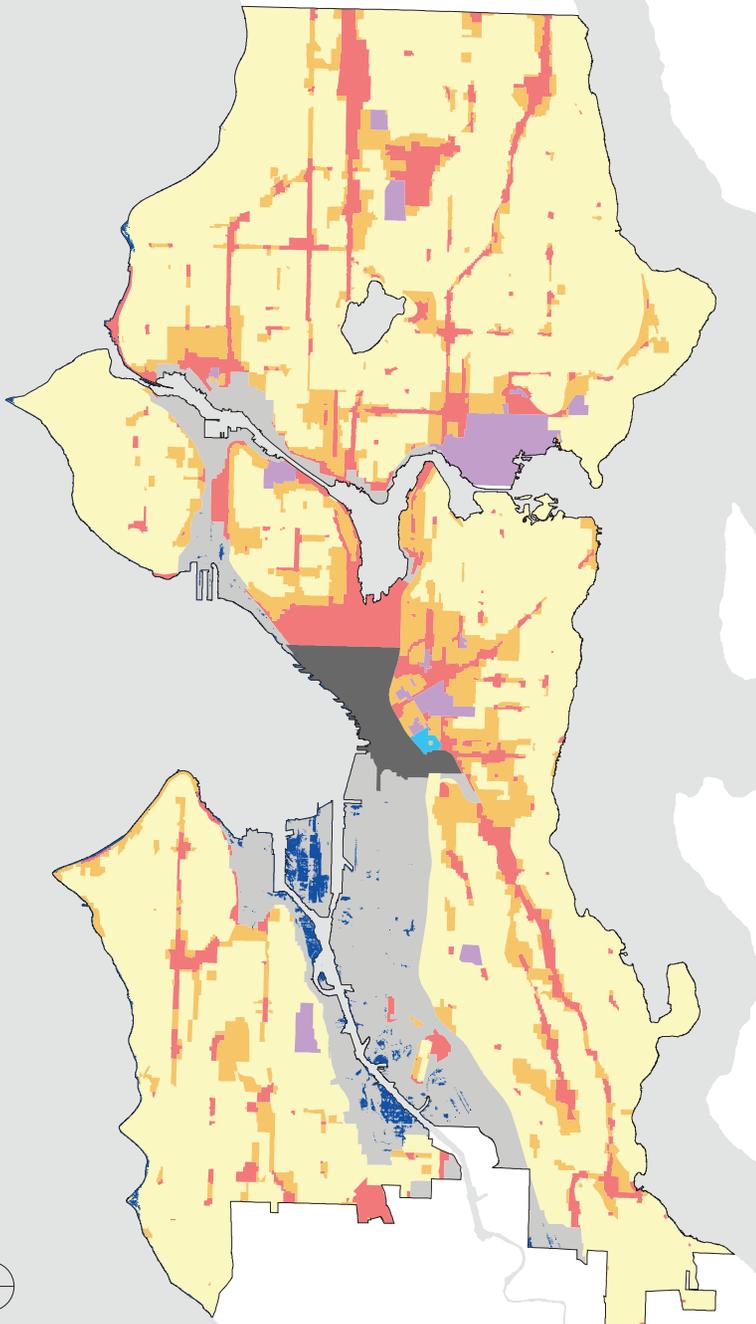
The pie chart shows the specific proportion of zoned use impacted at water levels 3FT above MHHW.



LAND USE IMPACTS: Zoned Use

4FT
ABOVE MHHW

GIS data: Zoning_Land

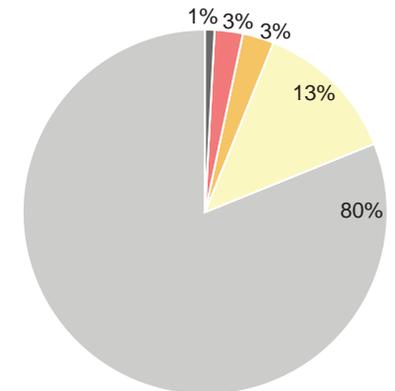


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA				
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%
TOTAL - LAND USE: ZONED USE	C 53,246*		D 476 acres	D/C = % of Total ZoneArea 0.89%
SPECIFIC ZONED USE	E Specific Zone Area		F Specific Zone Area Impacted	F/E = % of Specific Zone Area
Single Family	34,491		60 acres	0.2%
Multi-Family	5,827		13 acres	0.2%
Neighborhood/Res. Commercial	4,671		12 acres	0.2%
Downtown	913		5 acres	0.5%
Industrial Areas	6,183		385 acres	6.2%
Master Planned Community	43		no impact	n/a
Major Institutions	1,118		no impact	n/a

*The Total Zoned Area does not equal the Total Seattle Land Area due to discrepancies in the GIS data. The difference is less than 37 acres (0.07%).

IMPACTS BY ZONED USE

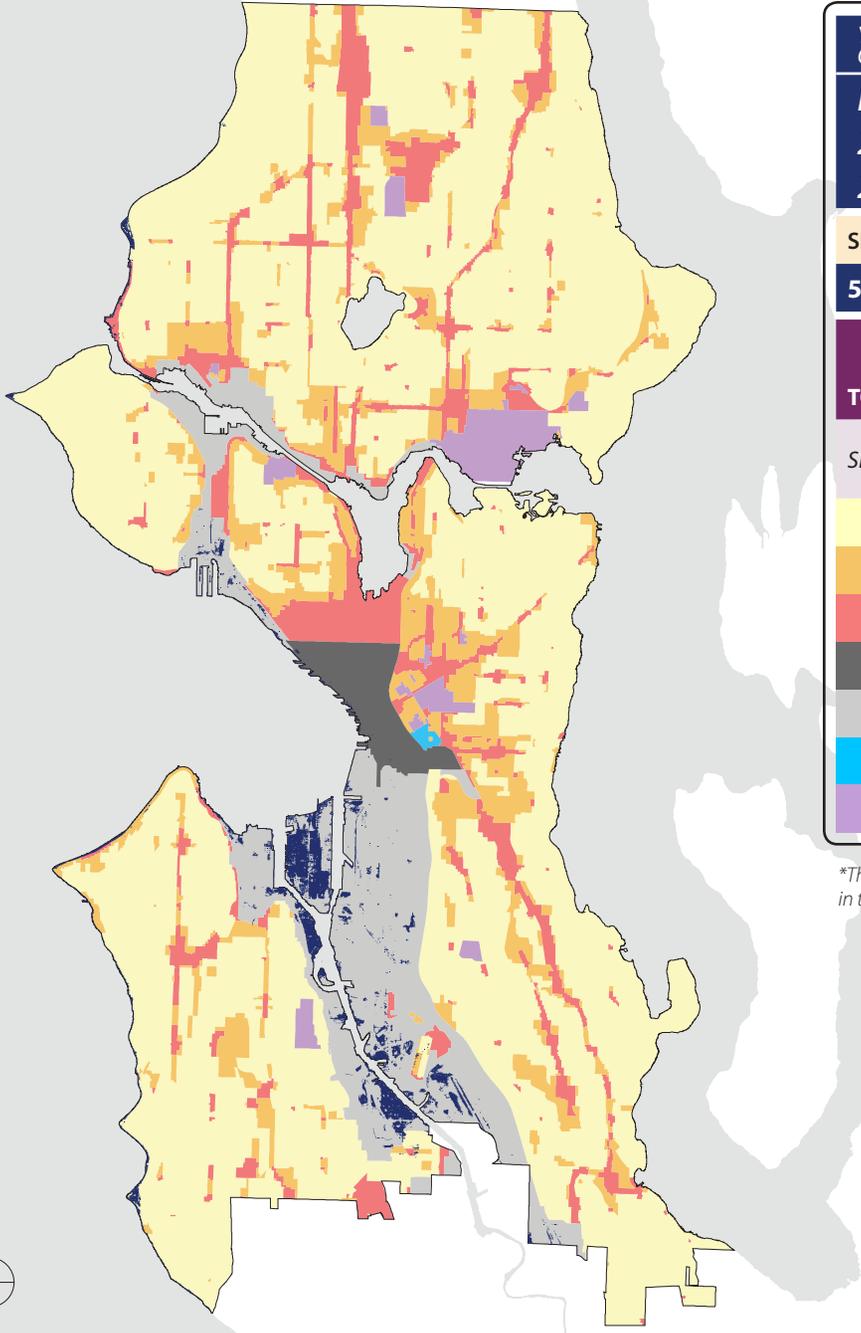
The pie chart shows the specific proportion of zoned use impacted at water levels 4FT above MHHW.



LAND USE IMPACTS: Zoned Use

5FT
ABOVE MHHW

GIS data: Zoning_Land

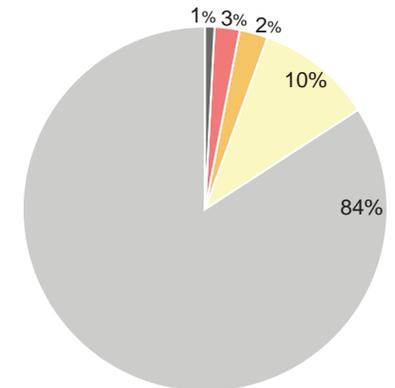


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA				
5FT ABOVE MHHW (14' NAVD88)			771 acres	1.5%
TOTAL - LAND USE: ZONED USE	C 53,246*		D 769 acres	D/C = % of Total ZoneArea 1.5%
SPECIFIC ZONED USE	E Specific Zone Area		F Specific Zone Area Impacted	F/E = % of Specific Zone Area
Single Family	34,491		79 acres	0.2%
Multi-Family	5,827		17 acres	0.3%
Neighborhood/Res. Commercial	4,671		19 acres	0.3%
Downtown	913		8 acres	0.9%
Industrial Areas	6,183		646 acres	10%
Master Planned Community	43		no impact	n/a
Major Institutions	1,118		no impact	n/a

*The Total Zoned Area does not equal the Total Seattle Land Area due to discrepancies in the GIS data. The difference is less than 37 acres (0.07%).

IMPACTS BY ZONED USE

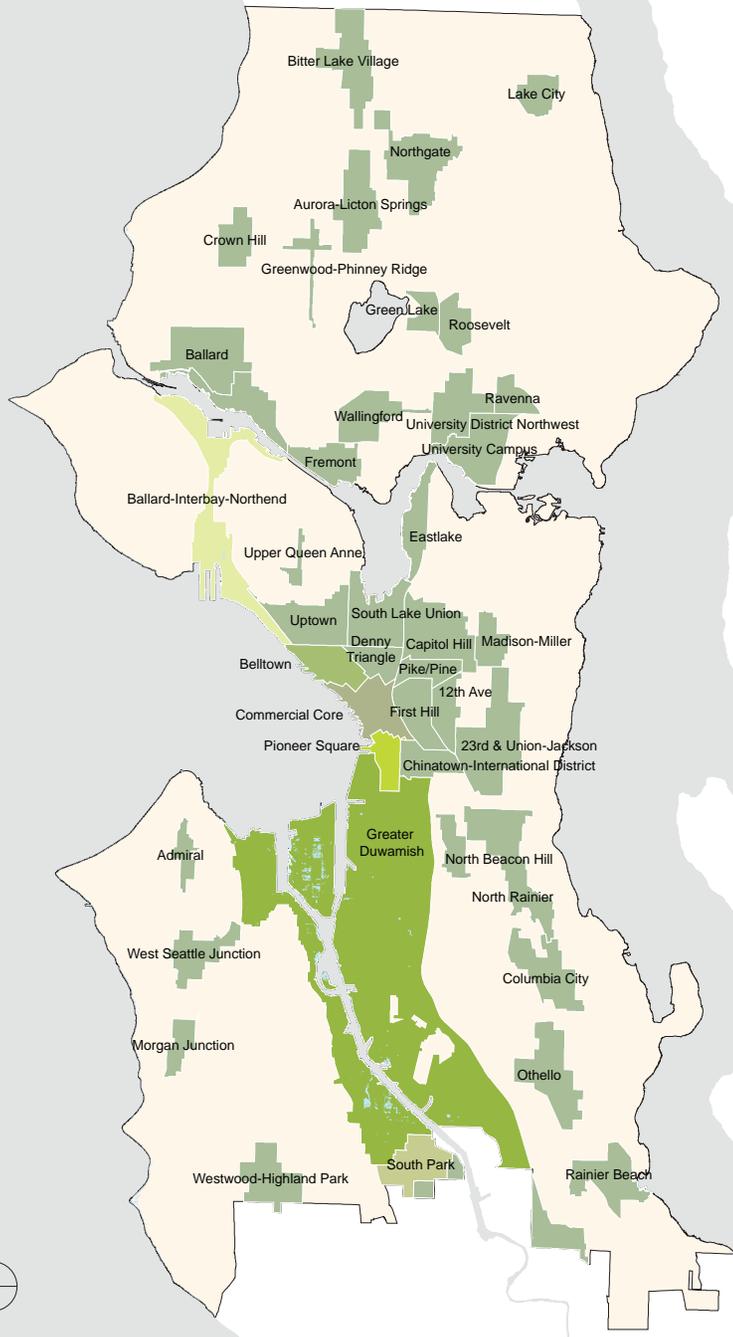
The pie chart shows the specific proportion of zoned use impacted at water levels 5FT above MHHW.



LAND USE IMPACTS: Planning Areas

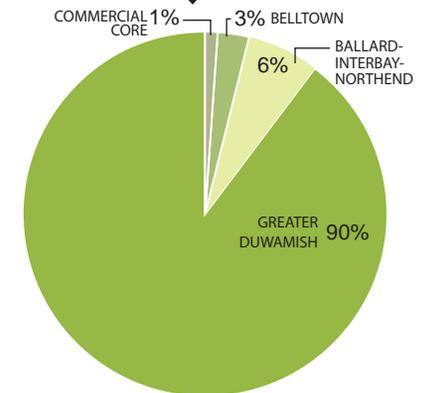
2FT
ABOVE MHHW

GIS data: UrbanVillages_Land



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED		
Now: ANNUALLY 2035: MONTHLY 2060: DAILY	A	Total Area (acres)	B	Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA		53,238		120 acres	0.2%
2FT ABOVE MHHW (11' NAVD88)				120 acres	0.2%
TOTAL - LAND USE: PLANNING AREA	C	15,307	D	77 acres	D/C = % of Total PA Area
SPECIFIC PLANNING AREA (PA)	E	Specific Planning Area	F	Specific PA Area Impacted	F/E = % of Specific PA Area
Ballard-Interbay-Northend		934 acres	5 acres		0.5%
Belltown		220 acres	2 acres		0.9%
Commercial Core		277 acres	1 acres		0.4%
Greater Duwamish		4,953 acres	69 acres		1.4%
Pioneer Square		141 acres	no impact		n/a
South Park		263 acres	no impact		n/a
Other Planning Areas		8,519 acres	no impact		n/a

Planning Areas include urban centers, villages, manufacturing and industrial areas



IMPACTS BY PLANNING AREA

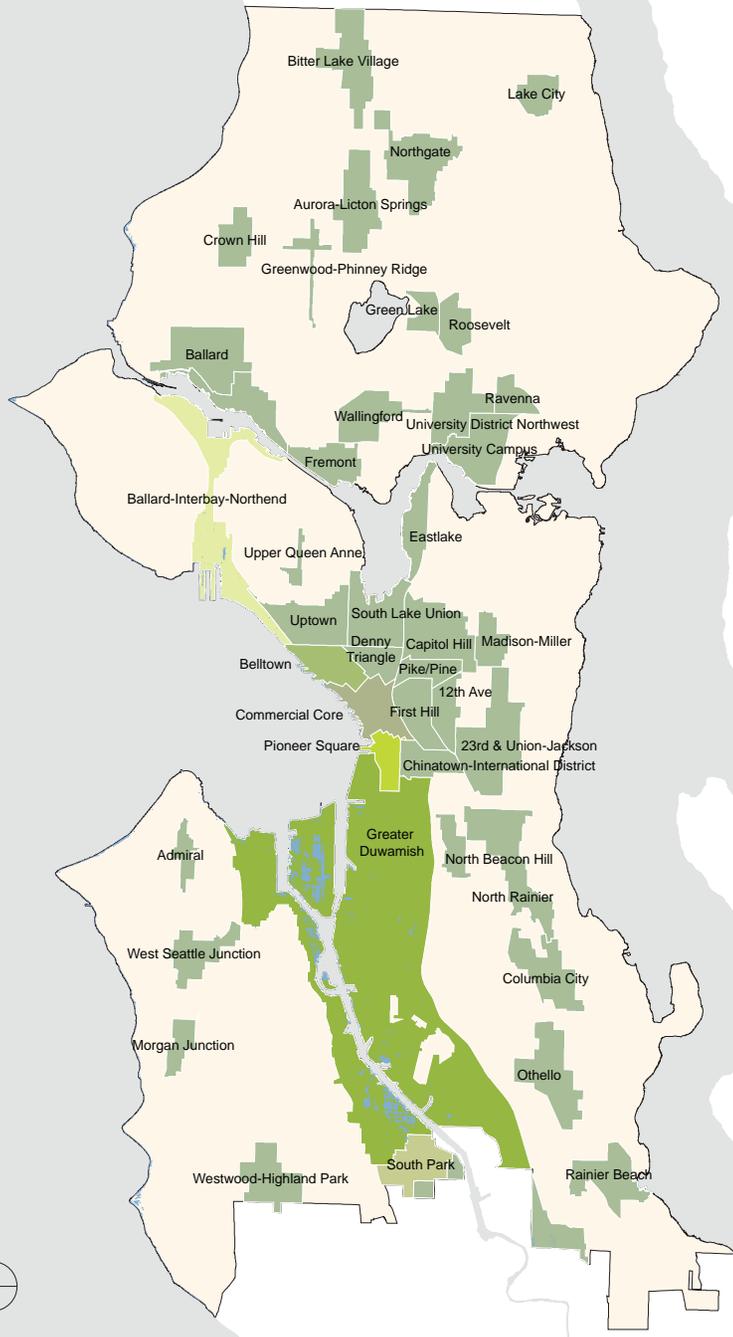
The pie chart shows the specific proportion of planning areas impacted at water levels 2FT above MHHW.



LAND USE IMPACTS: Planning Areas

3FT
ABOVE MHHW

GIS data: UrbanVillages_Land

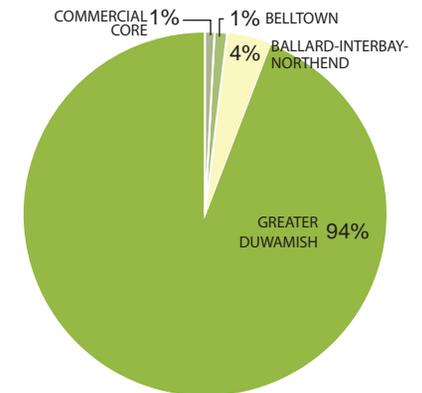


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	A		B	
	Total Area (acres)	Total Area Impacted	B/A = % of Total Baseline Seattle Land Area	
SEATTLE LAND AREA		53,238	259 acres	0.5%
3FT ABOVE MHHW (12' NAVD88)				
	C		D	
TOTAL - LAND USE: PLANNING AREA	15,307		197 acres	
	E		F	
SPECIFIC PLANNING AREA (PA)	Specific Planning Area	Specific PA Area Impacted	F/E = % of Specific PA Area	
Ballard-Interbay-Northend	934 acres	8 acres	0.9%	
Belltown	220 acres	2 acres	0.9%	
Commercial Core	277 acres	2 acres	0.7%	
Greater Duwamish	4,953 acres	185 acres	3.7%	
Pioneer Square	141 acres	no impact	n/a	
South Park	263 acres	no impact	n/a	
Other Planning Areas	8,519 acres	no impact	n/a	

Planning Areas include urban centers, villages, manufacturing and industrial areas

IMPACTS BY PLANNING AREA

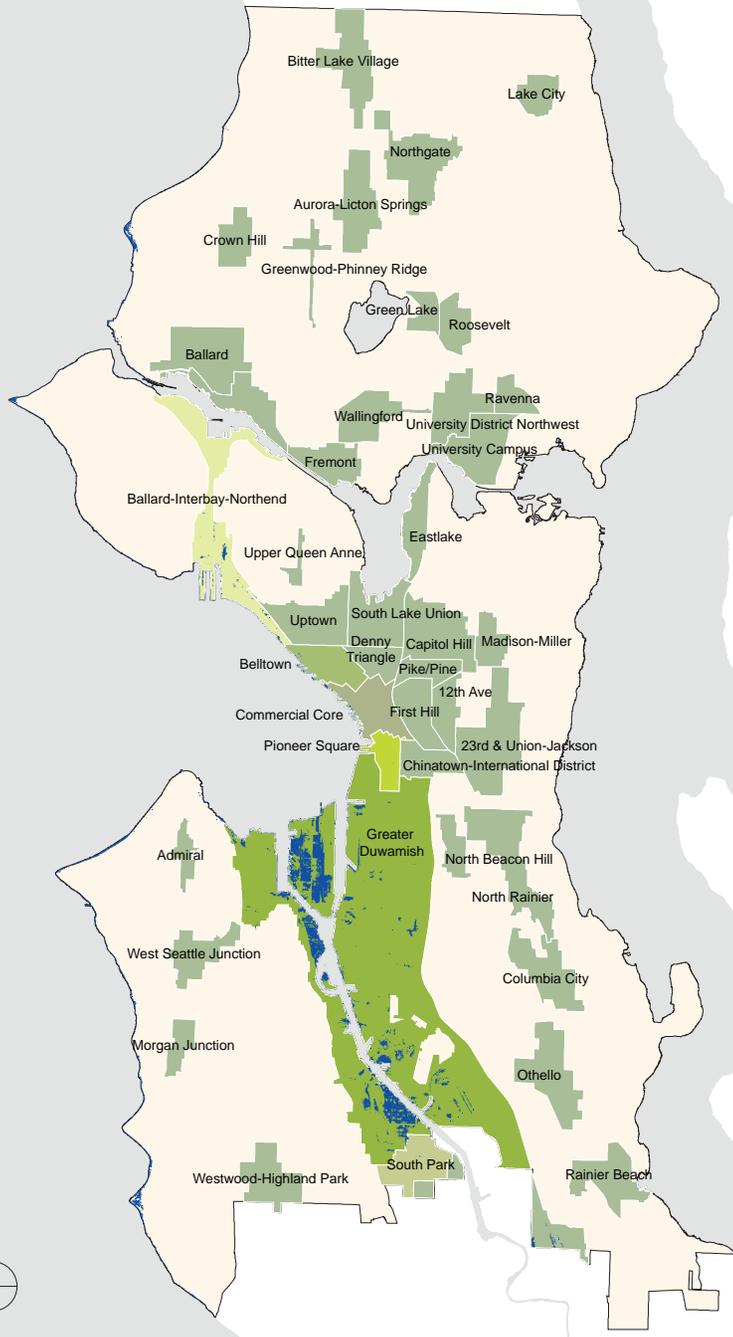
The pie chart shows the specific proportion of planning areas impacted at water levels 3FT above MHHW.



LAND USE IMPACTS: Planning Areas

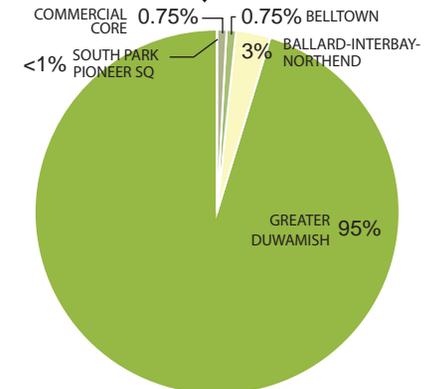
4FT
ABOVE MHHW

GIS data: UrbanVillages_Land



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA				
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%
TOTAL - LAND USE: PLANNING AREA	C	15,307	D	D/C = % of Total PA Area
SPECIFIC PLANNING AREA (PA)	E Specific Planning Area		F Specific PA Area Impacted	F/E = % of Specific PA Area
Ballard-Interbay-Northend	934 acres		12 acres	1.3%
Belltown	220 acres		3 acres	1.4%
Commercial Core	277 acres		3 acres	1.1%
Greater Duwamish	4,953 acres		372 acres	7.5%
Pioneer Square	141 acres		0.2 acres	0.1%
South Park	263 acres		0.8 acres	0.3%
Other Planning Areas	8,519 acres		no impact	n/a

Planning Areas include urban centers, villages, manufacturing and industrial areas



IMPACTS BY PLANNING AREA

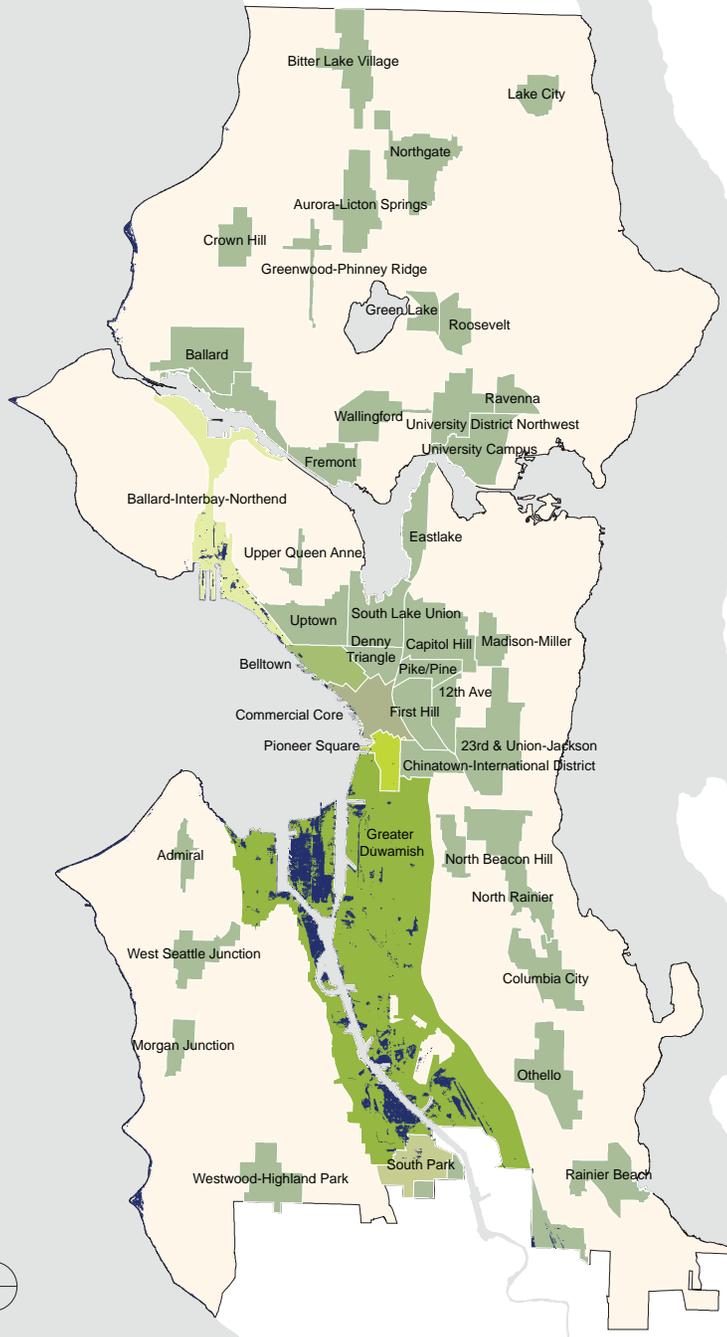
The pie chart shows the specific proportion of planning areas impacted at water levels 4ft above MHHW.



LAND USE IMPACTS: Planning Areas

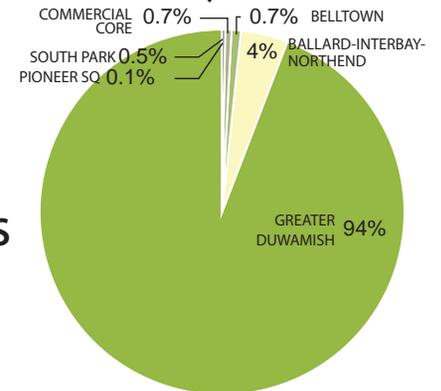
5FT
ABOVE MHHW

GIS data: UrbanVillages_Land



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A 2035: N/A 2060: 100 YEAR			B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
SEATTLE LAND AREA	53,238			
5FT ABOVE MHHW (14' NAVD88)			771 acres	1.5%
TOTAL - LAND USE: PLANNING AREA	15,307		D 656 acres	D/C = % of Total PA Area 4.3%
SPECIFIC PLANNING AREA (PA)	E Specific Planning Area		F Specific PA Area Impacted	F/E = % of Specific PA Area
Ballard-Interbay-Northend	934 acres		27 acres	2.9%
Belltown	220 acres		4.4 acres	2.0%
Commercial Core	277 acres		4.2 acres	1.5%
Greater Duwamish	4,953 acres		617 acres	12.5%
Pioneer Square	141 acres		0.4 acres	0.3%
South Park	263 acres		3 acres	1.0%
Other Planning Areas	8,519 acres		no impact	n/a

Planning Areas include urban centers, villages, manufacturing and industrial areas



IMPACTS BY PLANNING AREAS

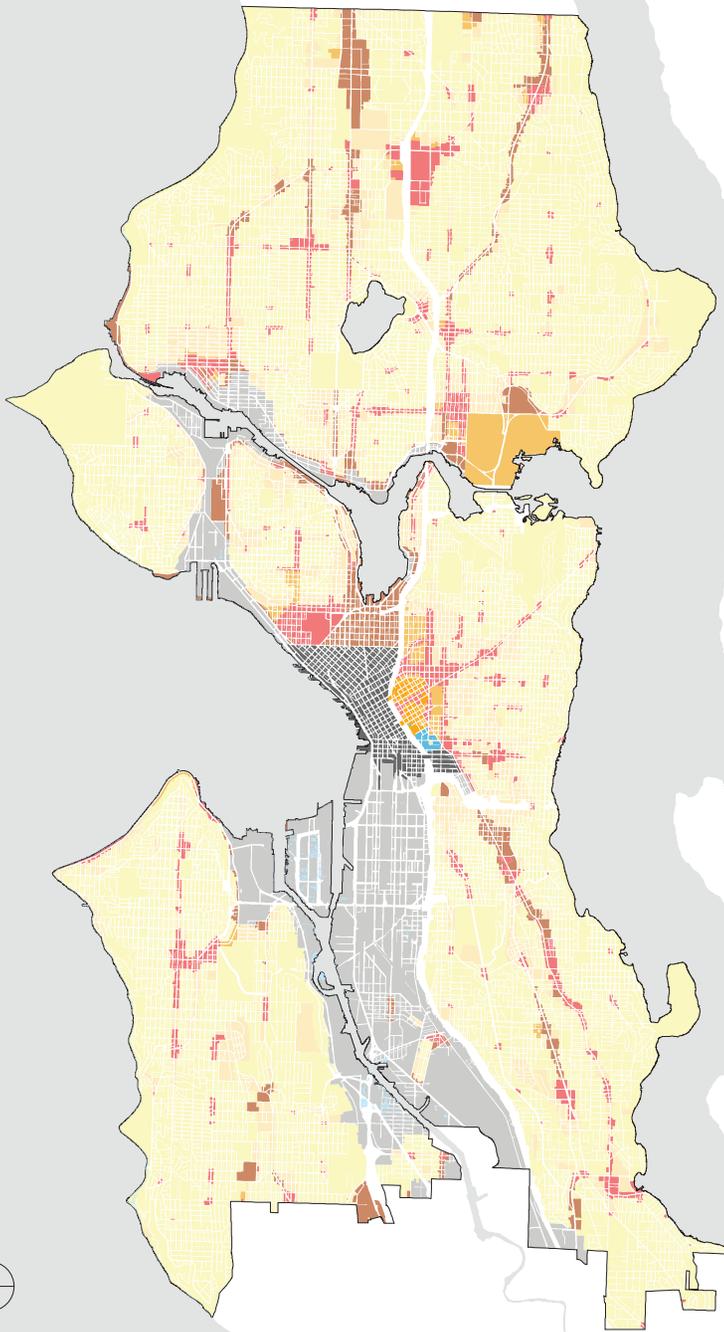
The pie chart shows the specific proportion of planning areas impacted at water levels 5FT above MHHW.



LAND USE IMPACTS: Existing Land Use

2FT
ABOVE MHHW

GIS data: DevCap_Land

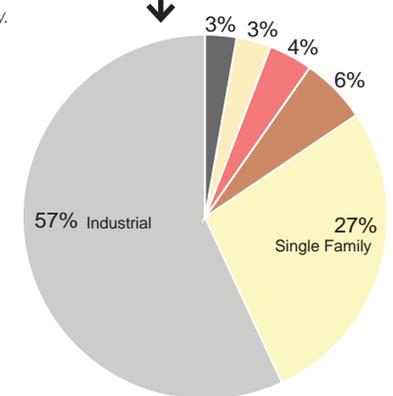


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: ANNUALLY 2035: MONTHLY 2060: DAILY	A	B		B/A =
	Total Area (acres)	Total Area Impacted	% of Total Baseline Seattle Land Area	
SEATTLE LAND AREA	53,238			
2FT ABOVE MHHW (11' NAVD88)		120 acres	0.2%	
TOTAL - LAND USE: EXISTING LAND USE*	C	D	D/C = % of Total LU Area	
	38,804	102 acres	0.3%	
SPECIFIC EXISTING LAND USE (LU)	E	F	F/E = % of Specific Land Use Area	
	Specific Land Use Area	Specific LU Area Impacted		
Single Family	25,705	28 acres	0.1%	
Midrise	747	no impact	n/a	
Lowrise	3,919	3 acres	0.1%	
Neighborhood Commercial	1,633	4 acres	0.2%	
Commercial	1,446	6 acres	0.4%	
Downtown	501	3 acres	0.6%	
Industrial Areas	4,745	58 acres	1.2%	
Master Planned Community + Highrise	108	no impact	n/a	

*The Total Existing Land Use Areas exclude right-of-way area; they are parcel areas only. That is why the Total Impacted Land Use Area (D) does not match the Total Seattle Land Area (B).

IMPACTS BY LAND USE

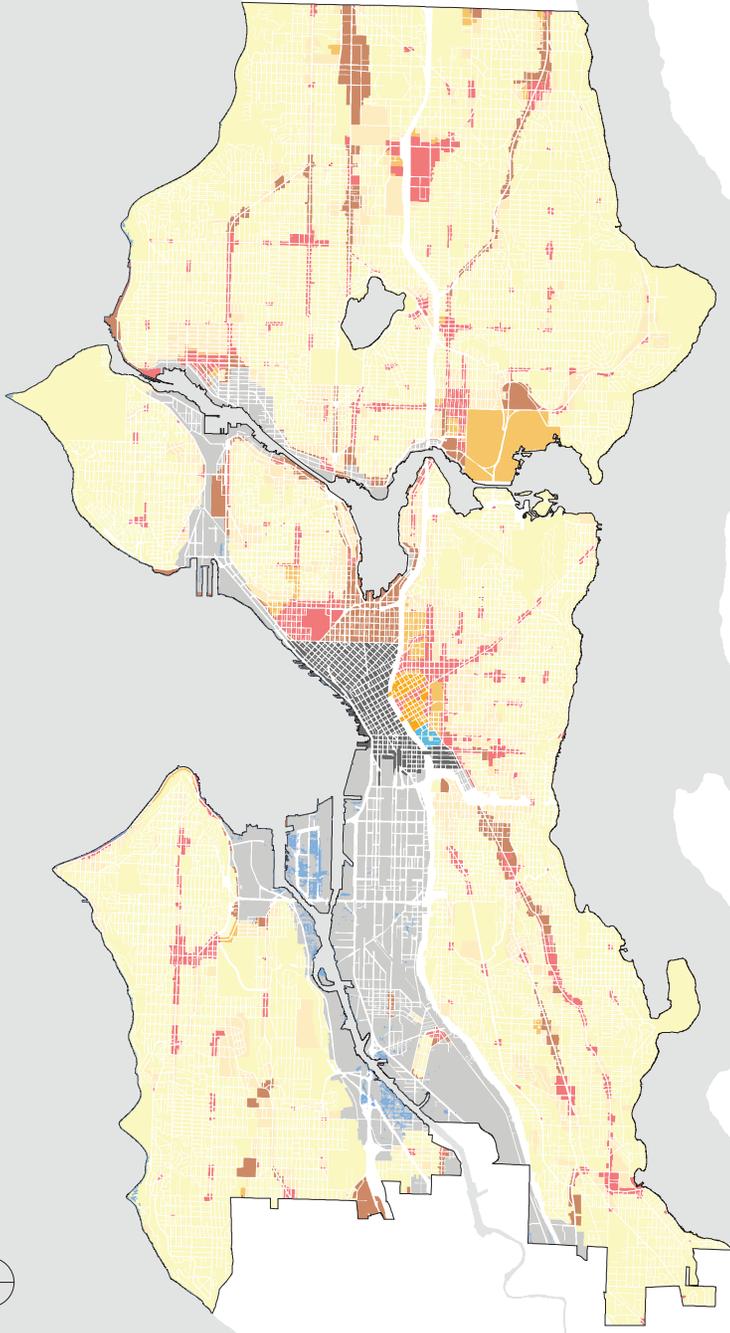
The pie chart shows the specific proportion of existing land use impacted at water levels 2FT above MHHW.



LAND USE IMPACTS: Existing Land Use

3FT
ABOVE MHHW

GIS data: DevCap_Land

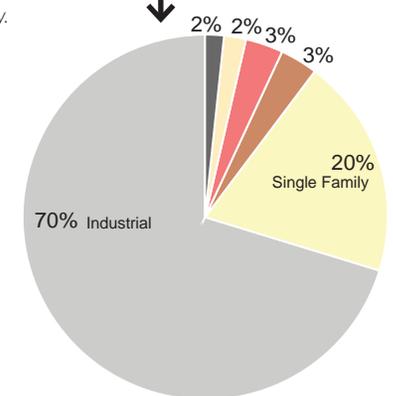


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: 100 YEAR 2035: ANNUALLY 2060: MONTHLY	A	B		B/A =
	Total Area (acres)	Total Area Impacted	% of Total Baseline Seattle Land Area	
SEATTLE LAND AREA	53,238			
3FT ABOVE MHHW (12' NAVD88)		259 acres	0.5%	
TOTAL - LAND USE: EXISTING LAND USE*	C	D	D/C = % of Total LU Area	
	38,804	211 acres	0.54%	
SPECIFIC EXISTING LAND USE (LU)	E	F	F/E = % of Specific Land Use Area	
	Specific Land Use Area	Specific LU Area Impacted		
Single Family	25,705	41 acres	0.2%	
Midrise	747	no impact	n/a	
Lowrise	3,919	4 acres	0.1%	
Neighborhood Commercial	1,633	7 acres	0.4%	
Commercial	1,446	7 acres	0.5%	
Downtown	501	4 acres	0.8%	
Industrial Areas	4,745	148 acres	3.1%	
Master Planned Community + Highrise	108	no impact	n/a	

*The Total Existing Land Use Areas exclude right-of-way area; they are parcel areas only. That is why the Total Impacted Land Use Area (D) does not match the Total Seattle Land Area (B).

IMPACTS BY LAND USE

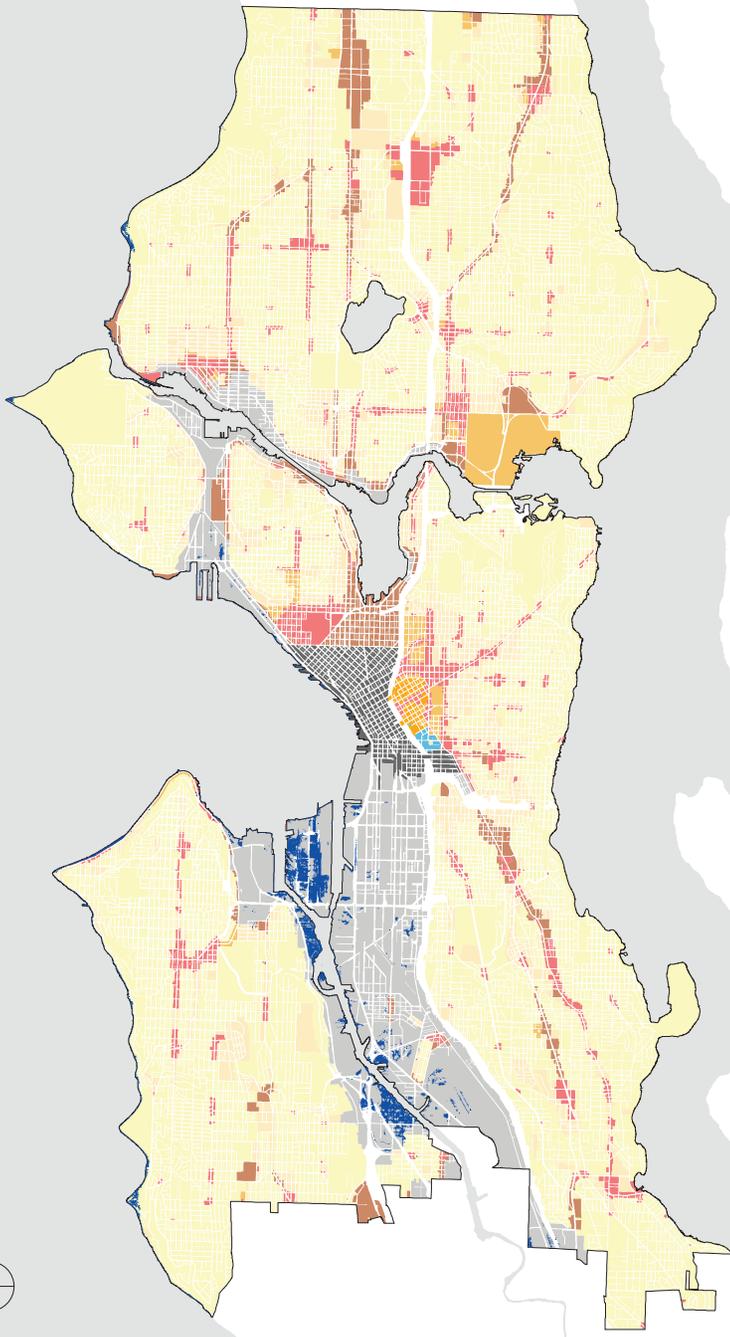
The pie chart shows the specific proportion of existing land use impacted at water levels 3FT above MHHW.



LAND USE IMPACTS: Existing Land Use

4FT
ABOVE MHHW

GIS data: DevCap_Land

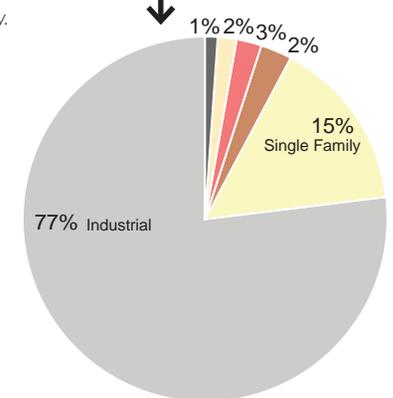


Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
Now: N/A	A Total Area (acres)	53,238	B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
2035: 100 YEAR				
2060: ANNUALLY				
SEATTLE LAND AREA				
4FT ABOVE MHHW (13' NAVD88)			478 acres	1.0%
TOTAL - LAND USE: EXISTING LAND USE*	C	38,804	D	D/C = % of Total LU Area
SPECIFIC EXISTING LAND USE (LU)	E Specific Land Use Area		F Specific LU Area Impacted	F/E = % of Specific Land Use Area
Single Family	25,705		58 acres	0.2%
Midrise	747		no impact	n/a
Lowrise	3,919		6 acres	0.2%
Neighborhood Commercial	1,633		11 acres	0.7%
Commercial	1,446		8 acres	0.6%
Downtown	501		5 acres	1.0%
Industrial Areas	4,745		297 acres	6.3%
Master Planned Community + Highrise	108		no impact	n/a

*The Total Existing Land Use Areas exclude right-of-way area; they are parcel areas only. That is why the Total Impacted Land Use Area (D) does not match the Total Seattle Land Area (B).

IMPACTS BY LAND USE

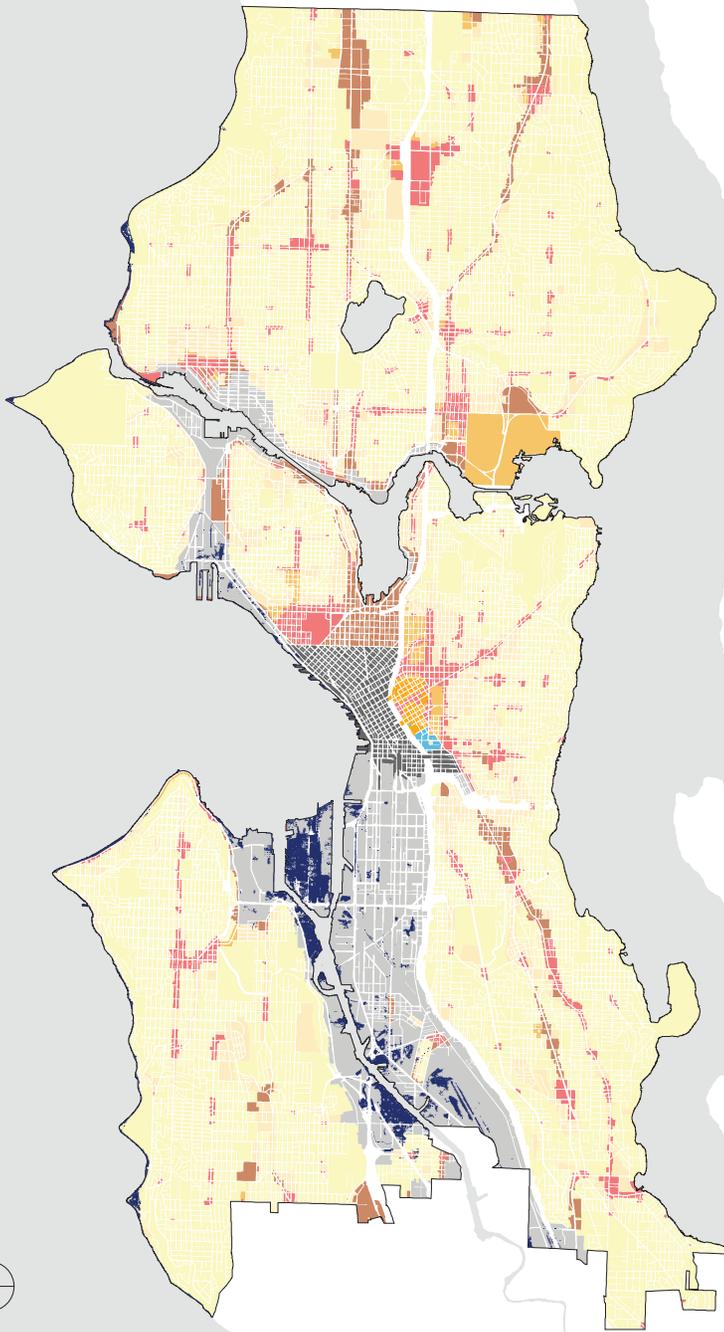
The pie chart shows the specific proportion of existing land use impacted at water levels 4FT above MHHW.



LAND USE IMPACTS: Existing Land Use

5FT
ABOVE MHHW

GIS data: DevCap_Land



Year of Occurrence: FREQUENCY	BASELINE		IMPACTED	
	A Total Area (acres)		B Total Area Impacted	B/A = % of Total Baseline Seattle Land Area
Now: N/A				
2035: N/A				
2060: 100 YEAR				
SEATTLE LAND AREA	53,238			
5FT ABOVE MHHW (14' NAVD88)			771 acres	1.5%
TOTAL - LAND USE: EXISTING LAND USE*	38,804	C	635 acres	1.6%
<i>SPECIFIC EXISTING LAND USE (LU)</i>	<i>E Specific Land Use Area</i>		<i>F Specific LU Area Impacted</i>	<i>F/E = % of Specific Land Use Area</i>
Single Family	25,705		76 acres	0.3%
Midrise	747		no impact	n/a
Lowrise	3,919		9 acres	0.2%
Neighborhood Commercial	1,633		13 acres	0.8%
Commercial	1,446		14 acres	1.0%
Downtown	501		8 acres	1.6%
Industrial Areas	4,745		515 acres	11%
Master Planned Community + Highrise	108		no impact	n/a

*The Total Existing Land Use Areas exclude right-of-way area; they are parcel areas only. That is why the Total Impacted Land Use Area (D) does not match the Total Seattle Land Area (B).

IMPACTS BY LAND USE

The pie chart shows the specific proportion of existing land use impacted at water levels 5FT above MHHW.

