

Chapter 3. Affected Environment, Significant Impacts, and Mitigation Measures

This chapter describes the potential impacts of the Preferred Alternative and compares those impacts to the Draft SEIS Alternatives, particularly Alternative 2 the closest alternative to the Preferred Alternative. This Chapter in particular addresses the following topics:

- Section 3.1: Natural Environment
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 - 3.1.2. Plants and Animals
- Section 3.2: Built Environment: Land Use and Transportation
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3.1. NATURAL ENVIRONMENT

3.1.1. Water Resources (Surface and Ground)

Water resources potentially affected by Preferred Alternative development include lakes, streams, marine waters, frequently flooded areas, groundwater, aquifer recharge areas, wetlands and stormwater runoff. Development under the Preferred Alternative would create additional

impervious surfaces and increase activities such as lawn fertilizing that can cause water quality issues in lakes, streams and marine waters. Removal of vegetation and creation of impervious surface has been shown to have the largest impact on streams and lakes by altering the watershed runoff process (Booth et al. 2002). This has the potential to affect several natural systems including: groundwater recharge, stormwater runoff, stream flow patterns, water quantity and quality, flooding, and sediment transport in many complex ways. Impervious surfaces can intercept precipitation and alter the timing and volume of discharge to groundwater and surface water, and interrupt the recharging of groundwater by diverting natural flow patterns. They are also generally pollutant sources. For example, roads receive metals and hydrocarbons from vehicles, which are concentrated and carried offsite into receiving waters by stormwater runoff.

Most of the development anticipated to occur in the UGAs under the Preferred Alternative is residential development, which is a potential source of stormwater and groundwater pollution through pet waste (bacterial and nutrient pollution), and use of yard care products including fertilizers and pesticides, which contain nutrients that can affect water quality. Excessive nutrients can cause algal blooms, which deplete dissolved oxygen adversely affecting fish and other marine organisms.

Impacts on marine/estuarine areas may include reduced water quality from increased input of pollutants from stormwater runoff such as: fertilizers, herbicides and pesticides from lawn management; metals, oils and grease from vehicles; and sediment and other contaminants in runoff. Other impacts of development on the shoreline are conversion of the natural shoreline to armoring or other hardened structures and construction of overwater piers and docks. Shoreline armoring and overwater structures affect nearshore sediment transport, beach nourishment and the erosive actions of tides and waves. Hardened shorelines tend to cause erosion and narrowing of the beach.

Similar to the other alternatives, the Preferred Alternative has the potential to affect flooding in floodplains and flood hazard areas due to changes in stream flow from the creation of additional impervious surface. However, any additional increases in stream flow are not anticipated to be significant largely because designated flood hazard areas are protected by the Kitsap County Critical Areas Ordinance (CAO) regulations and permit requirements.

The increase in impervious surface under any of the alternatives could potentially affect groundwater in several ways. A general rule is when impervious surfaces exceed 10% of a subbasin, there is an increased potential for flooding, reduced groundwater recharge, and contamination of groundwater from urban stormwater runoff. The impacts of reduced groundwater recharge include lower water tables and less available potable water, and a reduction in the base flows that are needed to maintain lakes, streams and wetlands. The increased population envisioned under the four SEIS alternatives will also increase demand for potable water, which will tend to draw down drinking water aquifers and similar effects on base flows as mentioned above. However, these impacts would be somewhat reduced under the Preferred Alternative as compared to Alternative 2, because the Preferred Alternative would create less impervious surface.

Wetlands may also be affected under the Preferred Alternative; however, Kitsap County has requirements that protect wetlands from development. Nevertheless, increases in the amount of impervious surface in a wetland's drainage basin can alter the depth and amount of water in a wetland, as well as the duration of time water remains in the wetland. This alters the wetland's hydro-period, which can cause a shift in composition of plant species in the wetland and permit invasion by non-native species. It can also change the vegetative structure – groundcover, shrubs and trees - of the wetland. The creation of impervious surface also increases the potential for

sediment and pollutants to be carried into wetlands by stormwater runoff, which adversely affects water quality in the wetland.

Table 3.1-1 shows the projected percentage of total impervious surface that would be created under the four alternatives. The Preferred Alternative’s total impervious surface area would range between 43,818 and 46,631 acres making up 17.3% and 18.4% of the county, respectively.

Table 3.1-1. Estimated Percent Total Impervious Surface Area for Each Alternative

	Alternative 1		Preferred Alternative		Alternative 2		No Action Alternative	
	Low	High	Low	High	Low	High	Low	High
Acres	43,030	45,626	43,818	46,631	44,183	47,110	44,713	47,986
Percent of County Wide	17.0%	18.0%	17.3%	18.4%	17.4%	18.6%	17.6%	18.9%

Source: Parametrix and Kitsap County 2012.

The impervious surface anticipated under the Preferred Alternative by watershed is shown in Table 3.1-2. The most development and therefore most impervious surface will occur in the Bainbridge Island, Dyes Inlet, Upper Hood Canal and Sinclair Inlet watersheds. The least amount of impervious surface would be expected in the Burley Lagoon, Minter Bay and Foulweather Bluff-Appletree watersheds.

Table 3.1-2. High and Low Estimates of Total and Percent Impervious Surface for the Preferred Alternative

Watershed Group	Total Acres	TIA Low	Percent	TIA High	Percent
Bainbridge Island	17,399	5,527	31.8%	5,527	31.8%
Burke Bay	6,940	1,715	24.7%	1,984	28.6%
Burley Lagoon	8,719	664	7.6%	685	7.9%
Colvos Passage	22,028	2,395	10.9%	2,477	11.2%
Dyes Inlet	30,412	8,270	27.2%	9,192	30.2%
Foulweather Bluff – Appletree	11,552	1,029	8.9%	1,101	9.5%
Liberty Bay – Miller Bay	26,575	4,619	17.4%	4,938	18.6%
Lower Hood Canal	22,530	2,975	13.2%	3,031	13.5%
Minter Bay	6,738	753	11.2%	793	11.8%
North Bay	14,983	2,061	13.8%	2,061	13.8%
Sinclair Inlet	27,012	8,071	29.9%	8,334	30.9%
Upper Hood Canal	58,462	5,739	9.8%	6,507	11.1%
Total	253,350	43,818	17.3%	46,631	18.4%

Source: Kitsap County and Parametrix.

TIA= Total Impervious Surface.

There are several types of impacts that would occur under the Preferred Alternative from increased stormwater runoff from impervious and other developed surfaces (e.g., roads, parking lots, roofs, and lawns). For example, impervious surfaces prevent water from soaking into the ground; as impervious surface increases, so do volume, peak flows, and velocity of stormwater runoff into rivers and streams. Increased stream volume, peak flows, and velocity exacerbate erosion and sedimentation, disrupt spawning and resting areas and increase water velocities through culverts, making fish passage more difficult. In addition, stormwater typically contains contaminants flushed

from impervious surfaces, which affects water quality. Increased stormwater also results in decreased recharge to groundwater, which leads to lower summer stream flows.

3.1.2. Plants and Animals

Habitat and Vegetation

The Preferred Alternative would impact vegetation and wildlife habitat. Development associated with this alternative would result in removal of vegetation or changes in habitat for particular plant species or groups. For all the studied alternatives including the Preferred Alternative, there would be a reduction in the amount of wildlife habitat over time as currently planned and future projects are implemented. Impacts could be both direct and indirect. Direct impacts would include loss or conversion of habitat to either unsuitable or less suitable types for many wildlife species currently occupying those habitats. Development of currently vacant or underdeveloped parcels could lead to fragmentation of wildlife habitat, potentially reducing habitat connectivity.

Indirect effects of the Preferred Alternative could include a reduction in wildlife habitat quality and function due to increased human disturbance and associated factors in areas adjacent to wildlife habitat. Increased noise and light in areas adjacent to otherwise suitable wildlife habitat can cause a trend toward reduction of species diversity, with an increase in species that are adapted to human presence. Increases in these predatory species can lead to a reduction in the number and diversity of birds and small mammals utilizing an area, which in turn can lead to a reduction in larger animals, such as raptors, that prey upon these species. Indirect impacts may occur as a result of introduction and establishment of nonnative invasive plant species, which can out compete and displace native species.

Another indirect effect of the Preferred Alternative is that development may have some benefit on wildlife and wildlife habitat by supporting increased capacity in areas already planned for some level of development, which would relieve pressure to develop areas currently outside UGAs beyond the level allowed under current zoning.

There are no known populations of rare plant species within any of the UGAs in Kitsap County, thus the Preferred Alternative is not expected to have any impact on rare plants. There is a slight potential for unmapped rare plants to be affected, but this effect is similar for all the alternatives.

Under the Preferred Alternative there would be 16,629 acres in unincorporated UGAs available for development. For Alternative 2, there are 18,186 acres that would be in unincorporated UGAs. Thus, the Preferred Alternative would have less impact on vegetation and wildlife habitat by approximately 1,557 acres as compared to Alternative 2.

Listed Fish and Wildlife Species

There is the potential to decrease habitat for listed terrestrial wildlife species under the Preferred Alternative. Similarly, there is the potential for impacts on aquatic species from loss or alteration of habitat due to changes in water quality and quantity and shoreline development. Impacts on upland habitat and wildlife (i.e., loss of vegetation, increases in non-native plant species, fragmentation of habitat, etc.) discussed above would be similar for listed wildlife species.

Listed salmon and trout are sensitive to any change in the stream environment and urban development has the potential to alter stream habitat. Development activities can pollute water, degrade instream and riparian habitat, and alter the natural flow regime of rivers and streams. Generally, listed fish such as salmonid species require good water quality and cool water

temperatures to survive, grow, and reproduce. Similar to the other alternatives, the Preferred Alternative could result in a reduction in the quality and quantity of aquatic habitat over time as current and future projects are developed. However, these effects would be reduced under the Preferred Alternative as compared to Alternative 2, because there would be fewer acres of impervious surface.

3.2. Built Environment: Land Use and Transportation

3.2.1. Land and Shoreline Use

This section addresses planned and existing land uses in the study UGAs and within Kitsap County. It also addresses the potential changes to land use under the Final SEIS Preferred Alternative and the impacts of those changes.

The focus of the impact analysis is on conversion of land uses, changes in activity levels, land use compatibility and shoreline uses. In order to describe the impacts under each of these areas of potential impact, this section first describes the Preferred Alternative UGA boundaries, and then the distribution of planned land uses, and existing land uses.

The Preferred Alternative is most similar to Alternative 2. Similarities and differences with that alternative are particularly noted in this impact analysis.

Preferred Alternative UGA Boundaries and Land Uses

UGA Acres

The Preferred Alternative uses the same density assumptions as Alternative 2 and has a population target close to Alternative 2 and the Countywide Planning Policies (CPPs). The Preferred Alternative differs from Alternative 2 in the amount of acres within the study UGAs; total acres in the study UGAs for the Preferred Alternative are between Alternative 1 and Alternative 2. Table 3.2-1 lists total acres by UGA for each for the alternatives.

Table 3.2-1. Study UGA Acres by Alternative

Urban Growth Area	Alternative 1	Preferred Alternative	Alternative 2	No Action Alternative
Kingston UGA	913	991	1,067	1,417
Silverdale UGA	4,584	4,841	5,753	6,578
Central Kitsap UGA	3,995	5,036	5,374	5,933
Bremerton East UGA	513	1,053	1,053	1,053
Bremerton West UGA	573	1,001	1,001	1,001
Gorst UGA	287	289	289	289
Port Orchard UGA	2,884	3,417	3,649	4,710
ULID 6 UGA	623	666	666	2,270

Note: The table shows unincorporated UGA acres assuming annexations have occurred between 2006-2012, except ULID6, which is shown with the EIS study acres though now it is fully annexed, except for three parcels identified for public use under the Preferred Alternative.
Source: Kitsap County Special Projects Division; BERK 2012