

Appendix C

Goal Risk Report



Goal-Risk Report

Goal 1: Create vibrant centers, corridors, and neighborhoods while accommodating growth.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
1	High	High	Increasing Drought	Place	0-10 years	Low	Take Action
16	Medium	High	Warmer Winter	Extensive	10-30 years	Medium	Take Action
4	Low	Medium	Warmer Summer	Place	More than 30 years	Medium	Take Action

1 Increasing drought makes it harder to balance competing demands for water (for housing, industry, energy, agriculture, and the environment).

16 Warmer winters increase the range and survival of invasive species, pests, and diseases that threaten native flora and fauna.

4 Warmer summers cause urban heat islands, which could affect livability/health in heavily developed centers and corridors.

Goal 2: Preserve environmentally sensitive lands, farmlands, prairies, and rural lands and develop compact urban areas.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
7	High	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action
	Intensifying precipitation increases the frequency and intensity of the heaviest 24-hour rain events and the overall volume of winter streamflow, which could degrade sensitive riparian areas.						
8	High	High	Increasing Drought	Extensive	0-10 years	High	Take Action
	Increasing drought degrades critical habitat (lakes, rivers and streams) due to changes in water volume and temperature.						
10	High	High	Increasing Drought	Extensive	0-10 years	High	Take Action
	Increasing drought stresses sensitive plants and habitat, which could reduce long-term viability of preserved and restored areas.						
11	Medium	High	Warmer Winter	Place	0-10 years	High	Take Action
	Warmer winters degrade critical habitat (rivers and streams) due to greater winter runoff.						
12	High	High	Sea-level Rise	Place	0-10 years	Medium	Take Action
	Sea-level rise increases the frequency, depth, and duration of inundation of low-lying coastal areas, which could turn marshes, estuaries, and other upland areas into mudflats (dams limit sedimentation and 1-5 berms limit vegetation adaptation in the Nisqually Estuary).						
13	High	High	Warmer Summer	Extensive	0-10 years	High	Accept
	Warmer summers stress sensitive plants and habitat (including urban landscaping), which could leave them vulnerable to extreme heat, pests, or pathogens.						
14	Medium	High	Warmer Winter	Extensive	10-30 years	Medium	Accept
	Warmer winters cause salmon to remain active during winter and deplete their store of energy/health.						
16	Medium	High	Warmer Winter	Extensive	10-30 years	Medium	Take Action
	Warmer winters increase the range and survival of invasive species, pests, and diseases that threaten native flora and fauna.						
20	Medium	High	Sea-level Rise	Extensive	10-30 years	Medium	Take Action
	Sea-level rise increases wave-action exposure, which could increase the erosion rate of coastal bluffs, degrade coastal wildlife habitat, and threaten the property and safety residents.						
22	High	High	Increasing Drought	Place	10-30 years	High	Take Action
	Increasing drought raises the risk of wildfires, which could damage forests and other sensitive lands that provide wildlife habitat, economic resources (e.g., timber), and recreation opportunities.						
15	Medium	Medium	Warmer Summer	Extensive	More than 30 years	Medium	Accept
	Warmer summers decrease climatic suitability of areas that currently support Garry oak and prairie habitat.						
18	Medium	Medium	Warmer Winter	Extensive	0-10 years	Medium	Accept
	Warmer winters shift the timing of flowering and abundance of pollinators, which could reduce some species of plants throughout the region.						
19	Medium	Medium	Warmer Water	Extensive	More than 30 years	Medium	Take Action
	Warmer water expands the range for invasive aquatic species.						
23	Medium	Medium	Population Change	Extensive	10-30 years	Medium	Accept
	Population change increases pressure on existing parks and open space.						



Goal 2: Preserve environmentally sensitive lands, farmlands, forest lands, prairies, and rural lands and develop compact urban areas.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
139	Warmer summers decrease climatic suitability of areas that currently support Douglas fir.	Medium	Warmer Summer	Extensive	0-10 years	Medium	Accept
113	Population change increases pressure to develop rural areas, which could reduce, fragment and/or degrade farms, forests, and prairies.	Low	Population Change	Extensive	10-30 years	Low	Accept

Goal 3: Create a robust economy through sustainable practices.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
1	High	High	Increasing Drought	Place	0-10 years	Low	Take Action
26	High	High	Sea-level Rise	Place	10-30 years	High	Take Action
27	High	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action
29	Medium	High	Increasing Drought	Extensive	More than 30 years	Medium	Take Action
30	Medium	High	Intensifying Precipitation	Place	0-10 years	High	Take Action
32	Medium	High	Sea-level Rise	Place	0-10 years	High	Take Action
90	Medium	High	Population Change	Extensive	0-10 years	Low	Take Action
36	Medium	Medium	Population Change	Extensive	More than 30 years	Low	Take Action
38	Low	High	Warmer Summer	Extensive	More than 30 years	Medium	Accept
41	Low	High	Ocean Acidification	Extensive	More than 30 years	Medium	Accept
42	Low	High	Warmer Winter	Extensive	More than 30 years	High	Accept
45	Low	Medium	Warmer Water	Extensive	More than 30 years	Medium	Accept
50	Medium	Low	Intensifying Precipitation	Site	0-10 years	Medium	Accept
51	Low	Low	Warmer Summer	Site	10-30 years	Low	Accept





Goal 4: Protect and improve water quality, including groundwater, rivers, streams, lakes, and the Puget Sound.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
52	Increasing drought reduces groundwater recharge (drinking water and in-stream flows).	High	Increasing Drought	Place	0-10 years	Medium	Take Action
55	Warmer water increases the growth and reach of pathogens (e.g., cyanobacteria and algal blooms) harmful to humans, fish, and other water users.	High	Warmer Water	Extensive	0-10 years	High	Take Action
56	Increasing drought increases the concentration of pollutants in first-flush runoff.	High	Increasing Drought	Place	10-30 years	Medium	Take Action
57	Intensifying precipitation contaminates water (turbidity and sedimentation) due to landslides.	High	Intensifying Precipitation	Extensive	10-30 years	Medium	Take Action
58	Sea-level rise increases coastal flooding of downtown Olympia and LOTT wastewater treatment plant assets, which could threaten the ability to treat and discharge water and increase the energy consumed to operate pumps.	High	Sea-level Rise	Place	10-30 years	Medium	Take Action
59	Ocean acidification decreases marine pH and -- when coupled with increases in ocean temperature and land-borne pollution -- threatens marine water quality.	High	Ocean Acidification	Extensive	0-10 years	Medium	Take Action
61	Intensifying precipitation contaminates water (nutrients) from septic systems due to high groundwater flooding.	Medium	Intensifying Precipitation	Site	0-10 years	High	Take Action
62	Sea-level rise inundates former industrial sites, which could mobilize pollutants in the soil and degrade water quality.	High	Sea-level Rise	Place	More than 30 years	High	Take Action
63	Intensifying precipitation contaminates water (bacteria, pathogens) due to a greater incidence of combined stormwater/sewer system overflows.	Medium	Intensifying Precipitation	Place	10-30 years	Medium	Take Action
65	Population change increases transportation-related energy consumption, CO2 emissions, and other pollutants related to buildings and transportation.	High	Population Change	Extensive	More than 30 years	Low	Take Action
60	Population change increases pollution related to development (e.g., more septic systems and impervious surfaces).	High	Population Change	Extensive	More than 30 years	Low	Take Action
64	Warmer water increases periods of low dissolved oxygen and hypoxic conditions in lakes and other freshwater areas.	Medium	Warmer Water	Extensive	10-30 years	Medium	Take Action
66	Increasing drought raises the risk of wildfires, which could contaminate water (turbidity and sedimentation).	Low	Increasing Drought	Place	10-30 years	Medium	Accept
67	Warmer summers increase recreational activity in waterbodies and the risk of boat fuel spills.	Low	Warmer Summer	Place	10-30 years	Low	Take Action

Goal 5: Plan and act toward zero waste in the region.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
27	Intensifying precipitation raises the risk of floods and landslides, which could damage private property and public infrastructure, endanger lives, and cut off access to goods and services (affects agriculture, buildings, roads, bridges, cultural sites, and other assets).	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action
68	Sea-level rise raises the risk of coastal inundation and landslides, which could damage public- and private-sector infrastructure (homes, businesses, roads, etc.) and create waste that cannot be reused or recycled.	Low	Sea-level Rise	Place	More than 30 years	Medium	Accept
71	Population change increases solid waste generation.	Low	Population Change	Extensive	More than 30 years	Low	Take Action
72	Warmer summers increase the use of parks, which could raise waste volume and disposal costs.	Low	Warmer Summer	Site	More than 30 years	Low	Accept
74	Increasing drought raises the risk of wildfires, which could damage public- and private-sector infrastructure (homes, businesses, roads, etc.) and create waste that cannot be reused or recycled.	Low	Increasing Drought	Site	10-30 years	Medium	Accept



Goal 6: Ensure that residents have the resources to meet their daily needs.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
1	High	High	Increasing Drought	Place	0-10 years	Low	Take Action
26	High	High	Sea-level Rise	Place	10-30 years	High	Take Action
27	High	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action
78	Medium	High	Warmer Summer	Extensive	0-10 years	Medium	Take Action
82	Medium	High	Increasing Drought	Extensive	0-10 years	High	Take Action
85	High	Medium	Warmer Winter	Extensive	0-10 years	Medium	Accept
87	High	Medium	Intensifying Precipitation	Extensive	0-10 years	Medium	Take Action
90	Medium	High	Population Change	Extensive	0-10 years	Low	Take Action
91	High	Medium	Warmer Summer	Extensive	0-10 years	High	Take Action
92	Medium	High	Warmer Summer	Extensive	0-10 years	Medium	Take Action
117	High	Medium	Population Change	Extensive	0-10 years	High	Take Action
36	Medium	Medium	Population Change	Extensive	More than 30 years	Low	Take Action
80	Medium	Medium	Increasing Drought	Place	10-30 years	Medium	Take Action
89	Medium	Medium	Population Change	Extensive	10-30 years	Low	Take Action

Goal 6: Ensure that residents have the resources to meet their daily needs.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
93	Warmer winters reduce snowpack that supports winter recreation activities.	Low	High	Warmer Winter	Site	10-30 years	High Accept
98	Sea-level rise reduces shoreline recreation opportunities.	Low	High	Sea-level Rise	Place	0-10 years	Low Accept
94	Increasing drought raises the risk of wildfires, which could damage utility infrastructure.	Low	Medium	Increasing Drought	Place	0-10 years	Medium Take Action
95	Increasing drought raises the risk of wildfires, which could close roads and cut off access to vital goods and services.	Low	Medium	Increasing Drought	Place	0-10 years	Medium Take Action
99	Increasing drought raises the risk of wildfires, which could result in personal injury or death.	Low	Low	Increasing Drought	Place	0-10 years	Low Take Action



Goal 7: Support local food systems to increase community resilience, health, and economic prosperity.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
1	High	High	Increasing Drought	Place	0-10 years	Low	Take Action
27	High	High	Intensifying Precipitation	Extensive	0-10 years	High	Take Action
102	High	High	Warmer Water	Extensive	0-10 years	High	Take Action
103	High	High	Ocean Acidification	Extensive	0-10 years	High	Take Action
104	High	High	Ocean Acidification	Extensive	10-30 years	Medium	Accept
105	Medium	Medium	Increasing Drought	Extensive	10-30 years	Medium	Take Action
106	Medium	Medium	Warmer Winter	Extensive	10-30 years	High	Take Action
107	Medium	Medium	Warmer Summer	Extensive	10-30 years	Low	Take Action
109	Low	High	Sea-level Rise	Site	10-30 years	Medium	Accept
110	Low	Low	Warmer Summer	Place	10-30 years	Medium	Accept
111	Low	Medium	Warmer Summer	Extensive	10-30 years	Medium	Accept
113	Low	Low	Population Change	Extensive	10-30 years	Low	Accept

Goal 8: Ensure that the region's water supply sustains people in perpetuity while protecting the environment.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
1	Increasing drought makes it harder to balance competing demands for water (for housing, industry, energy, agriculture, and the environment).	High	Increasing Drought	Place	0-10 years	Low	Take Action
114	Sea-level rise makes coastal groundwater more vulnerable to saltwater intrusion and inundation.	High	Sea-level Rise	Place	10-30 years	High	Take Action
117	Population change makes it harder to balance competing demands for water (for housing, industry, energy, agriculture, and the environment).	High	Population Change	Extensive	0-10 years	High	Take Action
116	Increasing drought raises pollutant concentrations in shallow wells and surface waters.	High	Increasing Drought	Extensive	10-30 years	Low	Take Action
118	Warmer winters increase plant transpiration (root uptake and leaf release of water) during winter months, which could lower water table.	Low	Warmer Winter	Extensive	More than 30 years	Low	Accept
119	Intensifying precipitation increases volume of urban runoff and flooding, which decrease groundwater recharge.	Low	Intensifying Precipitation	Extensive	0-10 years	Low	Take Action



Goal 9: Move toward a carbon-neutral community.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
65	High	High	Population Change	Extensive	More than 30 years	Low	Take Action
	Population change increases transportation-related energy consumption, CO2 emissions, and other pollutants related to buildings and transportation.						
122	Low	High	Increasing Drought	Place	0-10 years	Medium	Accept
	Increasing drought raises the risk of wildfires, which could destroy forests that serve as a net carbon sink.						
123	Low	High	Intensifying Precipitation	Site	0-10 years	Low	Accept
	Intensifying precipitation causes erosion and loss of organic materials (e.g., plants) that build up in reservoirs (e.g., Alder Lake), decay, and emit greenhouse gases (e.g., methane).						
124	Low	Medium	Warmer Summer	Extensive	0-10 years	Medium	Accept
	Warmer summers accelerate the release of carbon stored in soils.						
125	Low	Medium	Increasing Drought	Site	0-10 years	Low	Accept
	Increasing drought lowers reservoir levels, which exposes organic materials and causes them to decay and emit greenhouse gases.						
129	Low	Low	Increasing Drought	Extensive	10-30 years	Medium	Accept
	Increasing drought necessitates moving water farther distances, which consumes more energy and may increase greenhouse gas emissions (depending on the energy fuel source).						

Goal 10: Maintain air quality standards.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
65	Population change increases transportation-related energy consumption, CO2 emissions, and other pollutants related to buildings and transportation.	High	Population Change	Extensive	More than 30 years	Low	Take Action
132	Warmer summers increase production of surface ozone (VOCs interacting with NOx) and accumulation of fine particulate matter (PM2.5).	Medium	Warmer Summer	Extensive	0-10 years	Medium	Take Action
135	Increasing drought parches farm fields and other open spaces, which could erode and release windblown dust (e.g., PM10) that degrades air quality.	Low	Increasing Drought	Place	10-30 years	Medium	Take Action
136	Intensifying precipitation increases use of polluting generators following storm-induced power outages.	Low	Intensifying Precipitation	Extensive	0-10 years	Low	Accept



Goal 12: Make strategic decisions and investments to advance sustainability regionally.

	Consequence	Likelihood	Stressor	Spatial Extent	Horizon	Confidence	Strategy
1	High	High	Increasing Drought	Place	0-10 years	Low	Take Action
138	Medium	High	Intensifying Precipitation	Place	0-10 years	High	Take Action

1 Increasing drought makes it harder to balance competing demands for water (for housing, industry, energy, agriculture, and the environment).

138 Intensifying precipitation necessitates retrofitting stormwater and wastewater infrastructure to mitigate flooding and backups that threaten water quality and human health and welfare.