2024 KING COUNTY FLOOD MANAGEMENT PLAN

SEPA Final Programmatic Environmental Impact Statement

June 2024

King County Water and Land Resources Division
201 S Jackson Street # 600
Seattle, WA

ESA

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Prepared for
King County Water and Land Resources Division
201 S Jackson Street # 600
Seattle, WA

June 2024

Cover Photograph: View facing downstream of the Cedar River Trail Site 2 revetment post construction. River Mile 6.4 of the Cedar River. Photograph by King County Department of Natural Resources and Parks. January 25, 2023.

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June 10, 2024

Dear Affected Agencies, Tribes, Organizations, and Interested Parties:

King County Water and Land Resources Division is pleased to issue the Final Programmatic Environmental Impact Statement (EIS) for the 2024 King County Flood Management Plan (Flood Plan).

King County prepared this Programmatic (non-project) EIS to evaluate alternatives to reduce flood risk in King County. In accordance with the Washington State Environmental Policy Act (SEPA), this EIS summarizes the elements of the environment that could potentially be affected by this proposal and the potential adverse impacts that could occur from adoption of either a No Action Alternative (Alternative 1) or the preferred alternative, Adoption of the 2024 Flood Plan (Alternative 2).

Under the No Action Alternative, King County would not adopt a new Flood Plan. Adoption of this alternative would result in the continued use of the *2006 King County Flood Hazard Management Plan* and the *2013 King County Flood Hazard Management Plan Update and Progress Report* and their focus on mainstem rivers (excluding the Duwamish River) and existing flood facilities. Under this alternative, coastal processes, tributary streams, lakes, and urban flooding would not be substantively addressed in flood risk reduction planning. Climate change, equity, and multi-benefit and multi-objective planning also would not be comprehensively integrated into flood planning or King County's floodplain management policies.

Under Alternative 2, King County would adopt the 2024 Flood Plan. The Flood Plan includes flood risk reduction activities (including programmatic approaches and capital projects) and policies that address flood risk reduction, climate change, and equity as well as those that provide multiple community benefits. The Flood Plan addresses flooding for rivers, coastal processes, tributary streams, lakes, and urban areas.

Impacts are evaluated in the EIS at a programmatic level, to provide a comprehensive evaluation of potential impacts and mitigation associated with implementation of the Flood Plan. Site-specific project evaluations will be conducted at a later date, when individual projects are identified, and additional information is available.

Environmental elements covered in the EIS include Agriculture, Aquatic Resources, Climate Change, Earth, Historic and Cultural Resources, Indian Tribal Rights and Resources, Land and

Shoreline Use, Public Health and Safety, Public Services and Utilities, Recreation and Public Access, Riparian and Terrestrial Resources, Transportation, Visual Resources, Water Resources, and Wetlands.

The Draft Programmatic EIS was issued on February 16, 2024, and the comment period was open until March 18, 2024. King County received a total of eight comment submissions on the Draft Programmatic EIS via email, letter, or the Flood Plan Engagement Hub website. Those comments and responses to them are included in Chapter 18 of the Final Programmatic EIS. Where appropriate, changes were made to the text in the Final Programmatic EIS in response to comments or to provide clarification or updates to information presented in the Draft Programmatic EIS.

Additional information on the Flood Plan can be found at https://www.kingcounty.gov/floodplan.

Thank you for your interest in the Flood Plan.

Sincerely,

Josh Baldi
SEPA Responsible Official

FACT SHEET

Proposal Title

2024 King County Flood Management Plan (Flood Plan)

Proposed Action

The following alternatives were identified for evaluation in this Final Programmatic Environmental Impact Statement (EIS):

- No Action Alternative (Alternative 1)
- Adoption of the 2024 Flood Plan (Alternative 2)

Brief Description of Proposal

King County prepared this Final Programmatic EIS to evaluate alternatives to reduce flood risk in King County. In accordance with the Washington State Environmental Policy Act (SEPA), this EIS summarizes the elements of the environment that could potentially be affected by this proposal and the potential adverse impacts that could occur from adoption of either a No Action Alternative (Alternative 1) or the preferred alternative, Adoption of the 2024 Flood Plan (Alternative 2).

Under the No Action Alternative, King County would not adopt a new Flood Plan. Adoption of this alternative would result in the continued use of the *2006 King County Flood Hazard Management Plan* and the *2013 King County Flood Hazard Management Plan Update and Progress Report* and their focus on mainstem rivers (excluding the Duwamish River) and existing flood protection facilities. Under this alternative, coastal processes, tributary streams, lakes, and urban flooding would not be substantively addressed in flood risk reduction planning. Climate change, equity, and multi-benefit and multi-objective planning also would not be comprehensively integrated into flood planning or King County's floodplain management policies.

Under Alternative 2, King County would adopt a new Flood Plan. The plan includes programmatic approaches, projects, and policies that address flood risk reduction, climate change, and equity and that provide multiple community benefits. The Flood Plan addresses flooding for rivers, coastal processes, tributary streams, lakes, and urban areas.

Location

Activities included in the Flood Plan would be implemented throughout King County.

Plan Proponent and Lead Agency

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Authors and Principal Contributors to this EIS

This Final Programmatic EIS has been prepared under the direction of the King County Water and Land Resources Division. The following consulting firms provided research and analysis associated with this EIS:

- **Environmental Science Associates (ESA)** – Lead EIS consultant, document preparation; writing of all EIS sections.
- **The Vida Agency** – EIS subconsultant, communication materials preparation.

Date of Issuance of Draft Programmatic EIS

February 16, 2024

End of the Public Comment Period on the Draft Programmatic EIS

The comment period on the Draft Programmatic EIS ended on March 18, 2024. The comment letters and responses to them are included in Chapter 18 of this Final Programmatic EIS.

Changes to the Draft Programmatic EIS

This Final Programmatic EIS has been revised from the draft to incorporate responses to comments on the Draft Programmatic EIS. Changes include:

- Additional avoidance, minimization, and mitigation strategies were added for multiple elements of the environment.
- Additional detail was added to Chapter 1: Background and Introduction on the potential for cumulative impacts.
- Additional context was added to Chapter 2: Alternatives.
- Additional information as added to Chapter 5: Climate Change on the vulnerability of Black, Indigenous, or other People of Color (BIPOC), low-income, and other historically underrepresented populations to climate change.

Comments on the Draft Programmatic EIS and responses to those comments are included in Chapter 18 of this Final Programmatic EIS.

Document Availability

The Final Programmatic EIS and additional background materials are available for viewing online and can be downloaded from the County's public project webpage at: https://www.kingcounty.gov/floodplan.

Additional Environmental Review

The analysis presented in this EIS is programmatic in nature. The EIS has been prepared to disclose probable significant adverse impacts associated with implementation of the Flood Plan, involving a variety of strategies that could be used to reduce flood risks in King County.

As individual flood risk reduction activities identified in the Flood Plan are pursued, site-specific environmental review, project-level design, and engagement and consultation with interested parties will be conducted prior to implementation. If a decision is made to adopt the Flood Plan, some projects and actions could be advanced and ready for additional environmental review in 2024; others could require multiple years before they would be advanced for implementation.

Potential Required Approvals or Permits

Because alternatives and construction methods have not been selected for any flood risk reduction activities, it is not possible to present a complete list of approvals and permits that would be required for future improvements. It is possible to identify the most common types of approvals and permits that would generally be required for the types of improvements presented in the Flood Plan.

Potential approvals and permits are listed below by jurisdictional agency.

- Federal
  - Section 10 or Section 404 permit, Conditional Letter of Map Revision (CLOMR) – Federal Emergency Management Agency (FEMA).
  - Regional General Permits (RGP) or the Nationwide Permit (NWP) Program – U.S. Army Corps of Engineers (Corps) (Dredged Material Management Office [DMMO]).
  - Endangered Species Act consultation – National Marine Fisheries Service and/or U.S. Fish and Wildlife Service.
  - Conditional Letter of Map Revision (CLOMR) – Federal Emergency Management Agency (FEMA)
- State
  - National Pollutant Discharge Elimination System (NPDES) construction stormwater general permit – Washington State Department of Ecology (Ecology).
  - Section 401 Water Quality Certification, Coastal Zone Management Act – Ecology.
  - Shoreline Conditional Use Permit, or Variance – Ecology.
  - Hydraulic Project Approval (HPA) – Washington Department of Fish and Wildlife (WDFW).
  - Section 106 National Historic Preservation Act – Department of Archaeology and Historic Preservation (DAHP).
  - Governor's Executive Order 21-02 Consultation – DAHP.
  - Open Water Disposal Site Use Authorization – Washington State Department of Natural Resources (WDNR).
- Local Jurisdictions
  - State Environmental Policy Act (SEPA) compliance.
  - Environmentally Critical Areas Review/Approval.
  - Land Use Permit.
  - Shoreline Permit(s).
  - Building and Related Permit(s).
  - Clearing and Grading Permit(s).
  - Right-Of-Way Use Permit(s).
  - Street Use Permit(s).

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ACRONYMS AND OTHER ABBREVIATIONS

Acronym/Abbreviation	Definition
°F	degrees Fahrenheit
APD	Agricultural Production District
BIPOC	Black, Indigenous, and People of Color
BMPs	best management practices
CEMP	Comprehensive Emergency Management Plan
CFR	Code of Federal Regulations
CLOMR	Conditional Letter of Map Revision
Corps	U.S. Army Corps of Engineers
CPP	Countywide Planning Policies
CRS	Community Rating System
CWA	Clean Water Act
CWHH	Clean Water Healthy Habitat Strategic Plan
DAHP	Department of Archaeology and Historic Preservation
DMMO	Dredged Material Management Office
DNRP	Department of Natural Resources and Parks
DPS	Distinct Population Segment
DRCC	Duwamish River Community Coalition
DS	Determination of Significance
Ecology	Washington Department of Ecology
EIS	Environmental Impact Statement
EMS	Emergency Medical Service
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FDA	U.S. Food and Drug Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
Flood Plan	2024 King County Flood Management Plan
GEO	Governor's Executive Order

Acronym/Abbreviation	Definition
GHG	greenhouse gas
GMA	Growth Management Act
GWMA	Groundwater Management Area
HPA	Hydraulic Project Approval
HRI	historic resources inventory
I-5	Interstate 5
I-90	Interstate 90
K.C.C.	King County Code
KCHPP	King County Historic Preservation Program
KCSO	King County Sherriff's Office
LID	low-impact development
MS4	Municipal Separate Storm Sewer System
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OHWM	Ordinary High Water Mark
OSHA	Occupational Safety and Health Administration
PHS	Priority Habitats and Species
PPI	Program for Public Information
PSRC	Puget Sound Regional Council
PTSD	Post-Traumatic Stress Disorder
RCW	Revised Code of Washington
RGP	Regional General Permit
SC	State Candidate (species)
SCAP	Strategic Climate Action Plan
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
SMP	Shoreline Master Program
SPRS	Strategic Plan for Road Services
TCP	Traditional Cultural Property

Acronym/Abbreviation	Definition
TNR	Transportation Needs Report
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WISAARD	Washington Information System for Architectural and Archaeological Records Database
WLRD	Water and Land Resources Division
WNHP	Washington Natural Heritage Program
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation
WTD	Wastewater Treatment Division
WWTP	Wastewater Treatment Plant

CHAPTER 1
Background and Introduction

This Programmatic Environmental Impact Statement (Programmatic EIS) evaluates potential impacts associated with adoption of the 2024 King County Flood Management Plan (Flood Plan). The Flood Plan includes a Comprehensive Risk Mitigation Strategy, which identifies activities that could be undertaken by King County or by other entities to reduce flood risk in King County; an Action Plan, which identifies those activities King County is committed to implementing or advancing in the next 5 years; and updated goals, objectives, guiding principles, and policies that inform the development and implementation of the Flood Plan. The Flood Plan will be considered for adoption by the King County Council in 2024.

Activity — Any specific action or category of actions taken to reduce flood risk, including programs and capital projects. The Federal Emergency Management Agency identifies the six flood risk reduction activity types as preventive, property protection, natural resource protection, emergency services, structural projects, and public information, all of which are detailed further in Chapter 2.

1.1 Purpose and Objectives of the Flood Plan

Flooding is the costliest and most frequent natural disaster in King County. Since 1956, King County has experienced 29 presidentially declared flooding disasters, resulting in millions of dollars of property damage. Smaller floods are no less significant for those who are affected by them. More than 50,000 people live in King County's mapped flood hazard areas, and many thousands more people work and transit through areas subject to flooding. Flooding affects residences, commercial and industrial properties, and parks and open space. It affects small neighborhood access roads, and it affects major highways. Flooding affects property owners and renters. Due to climate change, King County now experiences flooding in places that have not historically flooded. Flood events are a natural occurrence that cannot be prevented, but flood risks to people and property can be greatly reduced, if not eliminated, in some cases.

The purpose of the Flood Plan is to establish a shared regional vision for comprehensive flood hazard management in King County that reduces risk to people and property from flooding and related geomorphic hazards and supports resilient communities and ecosystems. The Flood Plan brings the key themes of multi-benefit approaches, climate change, and equity to the forefront of flood risk reduction in King County and promotes solutions that preserve, restore, and enhance the natural functions of flood-prone areas wherever possible. The Flood Plan addresses flooding along the county's mainstem rivers (excluding the Duwamish River) as well as coastal flood hazards, lake flooding, urban flooding, and tributary flooding. In addition to describing types of

flooding and flood-related risks, the Flood Plan recommends policies, programs, and projects focused on reducing risk and increasing community resilience to floods.

1.2 SEPA and Non-Project Evaluation

The State Environmental Policy Act (SEPA) requires agencies to consider the likely environmental consequences of governmental decisions, including decisions on the adoption of plans, policies, or programs, pursuant to Chapter 43.21C Revised Code of Washington [RCW] and the SEPA Rules (Chapter 197-11 Washington Administrative Code [WAC]). The SEPA Rules provide detail for the environmental review process, including the EIS process.

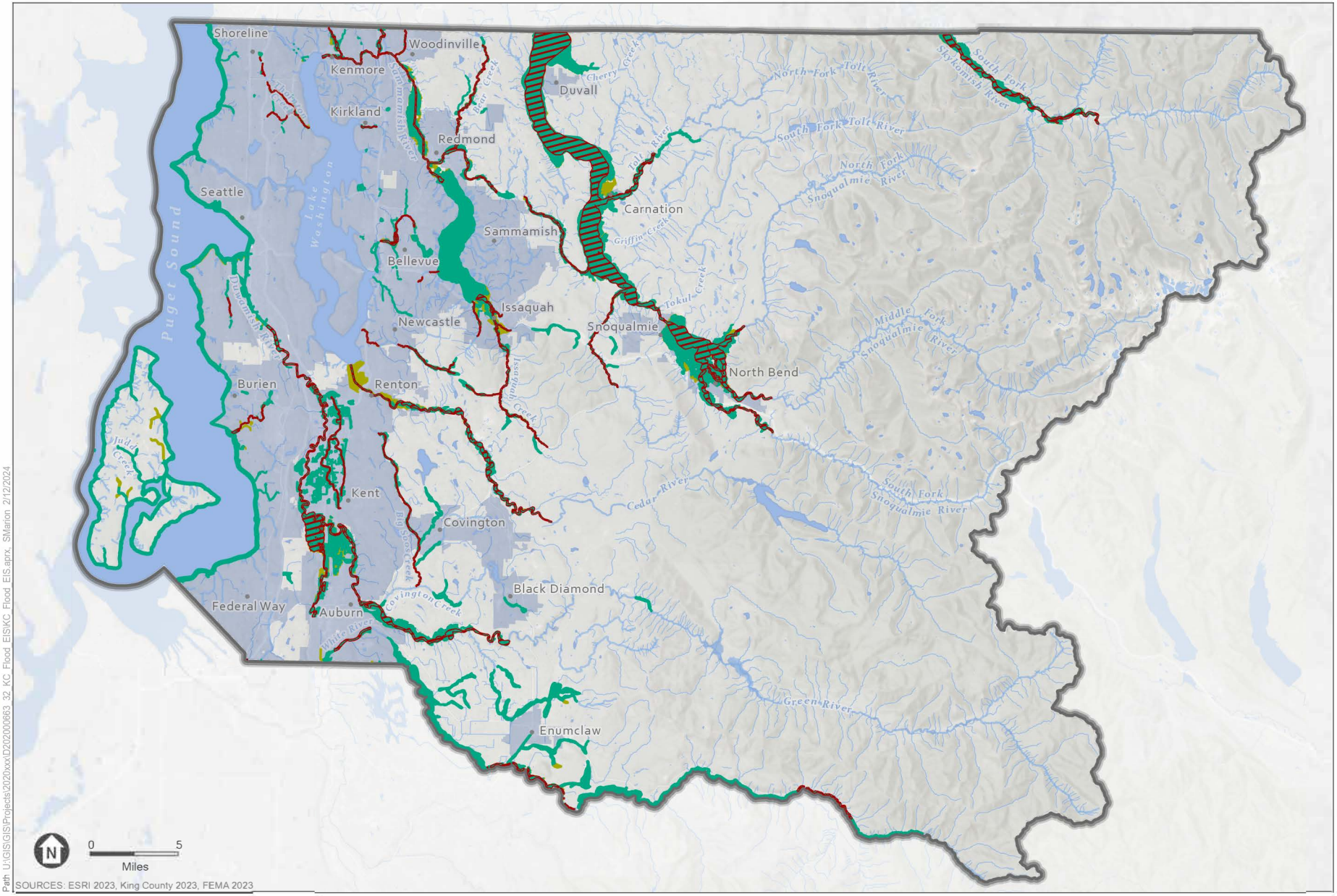
A non-project EIS has been prepared because the Flood Plan is not a specific project, but rather a countywide plan that includes a set of potential activities that could be implemented to reduce flood risks throughout King County. A non-project EIS, also known as a programmatic EIS, is prepared for planning decisions that provide the basis for later proposed environmental review of potential activities (WAC 197-11-704). Non-project actions are governmental actions involving decisions on policies, plans, or programs that provide requirements for how the environment can be modified. Non-project review allows consideration of the "big picture" and will form the basis for subsequent activity-specific review. A non-project EIS differs from a "project-specific" EIS in that it does not focus on specific projects or project locations, design details, or precise footprints of projects.

1.3 Project Location

King County is a county in Western Washington, located between Puget Sound and the Cascade Mountains. The most populous county in the state, King County includes 39 incorporated municipalities, with most residents in Seattle, Bellevue, Kent, Renton, and Federal Way. King County also features many rural areas, including six designated Agricultural Production Districts (APDs). Major lakes in King County include Lake Washington and Lake Sammamish. The county's four major river watersheds are:

- South Fork Skykomish/Snoqualmie River (part of Water Resource Inventory Area [WRIA] 7)
- Lake Washington/Cedar/Sammamish River (WRIA 8)
- Green/Duwamish River (WRIA 9)
- White River (part of WRIA 10)

Figure 1-1 shows the study area, including the mapped floodway, the 1 percent and 0.2 percent annual chance floodplain, streams, and incorporated municipalities as mapped by the Federal Emergency Management Agency (FEMA). Note that local jurisdictions within King County may have locally developed flood maps that show additional areas of flood risk that are not depicted on FEMA flood maps.



King County Flood Plan EIS

Figure 1-1
Study Area

Last Updated 2/12/2024

ESA

1.4 Background

The 2024 King County Flood Management Plan updates and supersedes the *2006 King County Flood Hazard Management Plan* and the *2013 King County Flood Hazard Management Plan Update and Progress Report.* Like those previous plans, the 2024 Flood Plan was developed following FEMA's Community Rating System (CRS) 10-step planning process (FEMA 2017). In addition to advancing the goals of the National Flood Insurance Program (NFIP), the Flood Plan is consistent with Chapter 86.12 RCW (Flood Control by Counties) and was further guided by the principles outlined in the Washington Department of Ecology's (Ecology) Comprehensive Flood Hazard Management Planning Guidebook (Ecology 2021). King County's obligations under the federal Endangered Species Act (ESA)—and specifically, to restore habitat for salmonids listed as threatened under the ESA—were a primary planning consideration when developing the 2024 Flood Plan, alongside other King County initiatives related to equity and social justice, climate change, local food production, conservation, and clean water and healthy habitat.

King County developed the 2024 Flood Plan with input from tribal and other partners and community members. The main engagement elements included the formation of a Partner Planning Committee, an Internal Staff Planning Committee, and a Coordinating Committee; facilitation of topic-specific workshops; and direct community engagement. The Partner Planning Committee members represented local and state government (including King County), tribal government, non-governmental organizations, interest groups, floodplain residents, and community members. The committee advised and provided input and direction on topics such as updating goals, objectives, and guiding principles; discussed approaches to address priority floodplain and flood hazard management issues; and provided input on appropriate floodplain management strategies and actions to address expected flood risks. Topic-specific workshops focused on tributary, coastal, and urban flooding hazards. King County held two workshops for each of these three flood topics. The workshops were organized to hear from participants about flood hazards, specific problem areas, impacts associated with those problems, and potential solutions to consider in the Flood Plan. King County also gathered community input through community partnerships and events, online polling, and public meetings.

1.5 Scoping and Public Input

1.5.1 Scoping

King County published a Determination of Significance (DS) for the 2024 Flood Plan on November 7, 2022. The DS identified the following elements of the environment as likely to be impacted by the Flood Plan: agriculture; aquatic resources; climate change; earth (sediment); historical, archaeological, and cultural resources; land and shoreline use; public health and safety; public services and utilities; recreation and public access; riparian and terrestrial resources; transportation; tribal rights and resources; visual resources; water resources; and wetlands. It also identified an alternative to adoption of the Flood Plan, in which the 2024 Flood Plan is not adopted and the 2006 Flood Plan as amended in 2013 is retained (the No Action Alternative or

Alternative 1). SEPA requires evaluation of a No Action Alternative, which considers the potential impacts if an agency action, such as adopting the 2024 Flood Plan, were not to occur.

Agencies, affected tribes, and members of the public were invited to comment on the scope of the EIS, including potential alternatives, probable significant adverse impacts, and mitigation measures. Notice of the scoping period was posted on the King County website and in the Seattle Times and the Daily Journal of Commerce, and notice was distributed via King County's Flood Plan email list and by direct outreach to organizations that have jurisdiction or interests in the topic. The scoping period ended on December 9, 2022.

King County received 18 written comments during the designated scoping period. Some of the most frequent comment topics included aquatic resources, climate change, earth (sediment), equity, tribal rights, and water resources. Many comments addressed issues that are at the intersection of multiple elements of the environment, reflecting the significant overlap of issue areas in integrated floodplain management and the importance of considering multiple benefits in the flood planning process.

Many of the comments addressed topics that commenters believed should be considered in the 2024 Flood Plan. The applicability of these comments to the scope of the EIS was considered in development of this Programmatic EIS, but numerous comments focused on identification of specific flood risks and recommended activities for reducing flood risk and not on the assessment of potential impacts from the Flood Plan in the EIS analysis process. These comments were referred to King County for consideration during development of the 2024 Flood Plan.

Scoping comments are summarized and responded to in the Scoping Summary document (ESA 2023).

1.5.2 Public Input on Draft Programmatic EIS

Public comments were accepted on the Draft Programmatic EIS from February 16, 2024 through March 18, 2024. All public comments received during the Draft Programmatic EIS comment period were considered and addressed in the Final Programmatic EIS. Public comments and responses are included within Chapter 18. Information on the public comment process is included in the SEPA Fact Sheet at the beginning of this Final Programmatic EIS document.

Numerous revisions were made to this Programmatic EIS based on comments submitted in response to the Draft Programmatic EIS. Most of these revisions were minor and did not change the overall findings or conclusions of this Programmatic EIS. Revisions incorporated into this document include the following:

- Additional avoidance, minimization, and mitigation strategies were added for multiple elements of the environment chapters that are more explicit about incorporating climate resilience into projects, specify the avoidance of removing native vegetation and mature trees, suggest removal of invasive species, call for enhancing ecosystem services, and consider the use of monitoring and adaptive management.

- Additional detail was added to Chapter 1: *Background and Introduction* on the potential for cumulative impacts on a reach or watershed from multiple site-specific projects, including property protection projects, which may not have substantial impacts at a project level.
- Additional context was added to Chapter 2: *Alternatives* that the 2006 Flood Plan, which is the basis for the No Action Alternative, does not address flooding on the Duwamish River, while Alternative 2 does address the Duwamish River.
- Additional information in Chapter 5: *Climate Change* on the vulnerability of Black, Indigenous, or other People of Color (BIPOC), low-income, and other historically underrepresented populations to climate change.

1.6 Organization of the Final Programmatic EIS

Chapter 2 of this Final Programmatic EIS describes the two alternatives being analyzed in greater detail. Chapters 3 through 17 of the Final Programmatic EIS are each dedicated to an element of the environment. Each of these chapters includes sections describing the affected environment (including plans and policies); construction impacts; operational impacts; avoidance, minimization, and mitigation measures; and references. Chapter 18 presents comments received on the Draft Programmatic EIS during the comment period and King County's responses. The chapters cover the following elements of the environment:

- Chapter 3 – Agriculture
- Chapter 4 – Aquatic Resources
- Chapter 5 – Climate Change
- Chapter 6 – Earth
- Chapter 7 – Historic and Cultural Resources
- Chapter 8 – Indian Tribal Rights and Resources
- Chapter 9 – Land and Shoreline Use
- Chapter 10 – Public Health and Safety
- Chapter 11 – Public Services and Utilities
- Chapter 12 – Recreation and Public Access
- Chapter 13 – Riparian and Terrestrial Resources
- Chapter 14 – Transportation
- Chapter 15 – Visual Resources
- Chapter 16 – Water Resources
- Chapter 17 – Wetlands
- Chapter 18 – Comments and Responses

1.7 Summary of Impacts

Table 1-1 summarizes the identified potential impacts and mitigation measures for each element of the environment analyzed in this Programmatic EIS. Because most activities are common to both alternatives, impacts are summarized for both alternatives in the table. Summaries of the affected elements of the environment, distinctions between the two alternatives, and further details on impacts and mitigation measures are described in Chapters 3 through 17.

TABLE 1-1
POTENTIAL IMPACTS AND MITIGATION MEASURES BY ENVIRONMENTAL RESOURCE

Resource	Potential Construction Impacts	Potential Operational Impacts	Potential Mitigation Measures
Agriculture (Chapter 3)	Construction noise, visibility, and transportation impacts may occur adjacent to or in the vicinity of agricultural lands.	Farmland property acquisition; potential impacts on agricultural drainage.	• Site construction and truck routes away from active agricultural lands where possible. • Prioritize activities that do not require acquisition of agricultural land over those that do.
Aquatic Resources (Chapter 4)	Construction activities can disturb soils and may occur adjacent to or within buffer zones or occur below the ordinary high water mark of rivers and streams.	Structural flood hazard management actions and subsequent maintenance or upgrades can impact natural processes and habitats in aquatic environments.	• Implement best management practices (BMPs) to avoid or minimize temporary construction impacts. • Site projects away from mapped priority habitats and species locations where possible, except projects that improve instream and riparian habitats. • Retain vegetation as much as possible during construction and revegetate after construction is complete, unless the vegetation on-site is considered invasive or noxious. Prioritize retention of vegetation with a diameter at breast height of 4 inches or more. • Design capital projects to include features that improve instream and riparian habitats.
Climate Change (Chapter 5)	Construction activities would include vehicles and equipment producing greenhouse gas emissions.	Minor emissions from use of buildings, equipment, and vehicles for operations; structural activities that alter natural processes could reduce climate resilience.	• Implement vehicle and equipment electrification, as part of King County climate goals. • Implement sustainable procurement practices. • Utilize ecological restoration as mitigation for impacts of structural projects and for improvement of climate resilience across the landscape.
Earth (Chapter 6)	Excavation, fill, and site clearing could occur in critical environments.	Structural projects altering natural geomorphic processes; erosion from capital projects altering hydrology.	• Provide long-term net ecological benefit through multi-benefit and nature-based projects. • Implement critical areas and shoreline BMPs for construction activities.
Historic and Cultural Resources (Chapter 7)	Construction activities could occur in proximity to historic resources and/or physically impact them through activities like renovation, relocation, and demolition; construction activities could occur near or within archaeological sites and districts, cemeteries, and areas containing unmarked human remains, and Traditional Cultural Properties (TCPs).	Acquisition and subsequent alterations to or demolitions of historic resources.	• Record or preserve resources with history essays, additional documentation, salvage, historic context development, interpretive signage, elevation/relocation over demolition. • Avoid siting projects in locations with archaeological resources, cemeteries, and human remains.

Resource	Potential Construction Impacts	Potential Operational Impacts	Potential Mitigation Measures
Indian Tribal Rights and Resources (Chapter 8)	Impacts on tribal sites and resources could occur due to construction activities involving excavation or ground disturbances; construction activities for large structural projects.	Potentially disrupted access to accustomed fishing grounds or other wildlife and plant resources.	• Seek early comment from and consult with tribes during planning processes on potential impacts on tribal resources and identification of potential locations of tribal resources. • Implement BMPs and runoff and erosion control measures to reduce disturbances to earth and vegetation that could impact plants, wildlife, or fish.
Land and Shoreline Use (Chapter 9)	Construction activity preventing preferred shoreline uses like public access and recreation; construction affecting access to existing land uses.	Displacement of existing land uses by property acquisition; changes to land use regulations and flood maps.	• Primarily work with voluntary property owners for property acquisition. • Provide relocation assistance and property owner support. • Allow legal nonconforming uses following land use regulation updates. • Provide alternative options for shoreline access, phasing construction.
Public Health and Safety (Chapter 10)	Construction activities heighten risk for potential contamination or pollution; detours or equipment and materials transport could temporarily delay emergency service routes.	Variation in degree of flood risk reduction across activities.	• Implement prevention and control plans to prevent accidental release of contaminants during construction. • Coordinate, schedule, and notify the public of construction activities.
Public Services and Utilities (Chapter 11)	Construction in or near roads could affect utility infrastructure or require increase of traffic management.	Increased need for emergency management services	• Provide advance notification to public service and utility providers. • Plan for and avoid potential impacts on downstream utilities.
Recreation and Public Access (Chapter 12)	Construction and maintenance could obstruct access to open space.	Instream and shoreline projects obstructing water-based recreation.	• Avoid siting projects and staging construction in recreational areas when possible. • Phase construction to limit extent of recreational land affected. • Provide alternative access points and recreational areas during construction activities. • Improve existing recreational areas and create new public spaces.
Riparian and Terrestrial Resources (Chapter 13)	Construction noise and activities could occur within or adjacent to critical habitats or priority species.	Changes in habitat types or features.	• Limit the timing or duration of construction noise and lights so that they occur outside of breeding or other sensitive seasons. • Design projects so that construction occurs outside of critical habitat areas. • Limit tree removal. • Prioritize projects that enhance habitat

Resource	Potential Construction Impacts	Potential Operational Impacts	Potential Mitigation Measures
Transportation (Chapter 14)	Construction activities and staging could require temporary road closures and detours; increases in vehicular traffic may result due to mobilization of construction equipment and materials to sites.	Changes to road or trail infrastructure.	• Provide advance notice and coordinate with affected transportation services. • Develop a Traffic Control Plan for work within the public right-of-way. • Maintain access to transit services.
Visual Resources (Chapter 15)	Construction activities and equipment could alter local views during construction period.	Infrastructure becoming larger or more visible; realignment of infrastructure to be farther from water or obstructing views of water.	• Select staging areas to avoid impacts on public views. • Restore disturbed areas after construction. • Select project options that minimize impacts on public views of scenic resources.
Water Resources (Chapter 16)	Construction activities may require in-water work or work along shorelines, resulting in temporary increases in turbidity and sedimentation.	Changes in river hydraulics and flood levels.	• Include post-construction restoration or enhancement of riparian areas, when feasible. • Implement BMPs including toxic spill prevention measures and pollutant source controls. • Consider including monitoring and adaptive management plans when applicable.
Wetlands (Chapter 17)	Construction activities could encroach on wetlands and their buffers.	Filling, dredging, or permanent encroachment in wetlands and their buffers.	• Where possible, do not place construction staging areas in wetlands or buffers that would otherwise not be impacted. • Design projects so that construction occurs outside of wetlands and wetland buffers. • Keep existing hydrologic connections within wetlands intact and/or do not discharge storm or other surface waters directly into a wetland. • Prioritize projects that result in an improvement of wetland functions.

1.7.1 Significant Adverse Impacts

Adoption of the 2024 Flood Plan is a programmatic action that would not, in and of itself, have any significant adverse impacts on elements of the environment. Neither would selecting the No Action Alternative. However, individual activities implemented under either alternative could have significant adverse impacts on elements of the environment. The impacts analyzed and described throughout Chapters 3 to 17 of this Programmatic EIS could be significant depending on the extent, duration, and specific location of the activities implemented.

King County and other implementers would avoid or minimize significant impacts by:

- Complying with all permit requirements and federal, state, and local requirements.
- Implementing the mitigation measures identified in Chapters 3 to 17 where reasonable and appropriate.
- Implementing activities with a multi-benefit approach (which would be more systematically done under Alternative 2 through the multi-benefit framework included in the 2024 Flood Plan), which would cause potential impacts of concern to the implementer, partners, and community members to be raised earlier in the design and alternatives process, allowing for impacts to be avoided through project design and for benefits to the natural and built environment to be incorporated into projects.
- Selecting project alternatives and designs that avoid significant impacts when possible while meeting the purpose and need of the activity.

Even with these measures taken, individual activities could still have significant adverse impacts. In this case, the significant impacts would be analyzed and disclosed through project-level environmental review (e.g., under SEPA).

1.8 Cumulative Impacts

Cumulative impacts are the effects that may result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. *"Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time"* (40 Code of Federal Regulations [CFR] 1508.1). Activities in the Flood Plan could be constructed in areas that may have recently been subject to other construction projects or will be subject to construction of future planned projects (including other recent or future activities included in the Flood Plan). Cumulative impacts for all elements of the environment are assessed together in this section to reflect the overlapping and compounding nature of these impacts. The cumulative impacts associated with the Flood Plan relate to both Alternative 2 and the No Action Alternative.

Construction Impacts. Implementation of activities in the Flood Plan could result in cumulative impacts associated with construction impacts if activities are located near each other or near construction for other public or private projects. The primary construction impacts related to improvements from activities common to both alternatives would include traffic and slowdowns, increased dust and emissions, restricted access for recreational or cultural uses, and construction noise. The long-term effects of construction-related impacts can negatively affect residents,

businesses, and those who access or travel to the area, resulting in impacts that range from temporary inconvenience to construction fatigue on residents, businesses, and recreational activities. Extended periods of construction can also contribute to cumulative impacts on aquatic and terrestrial resources and to surface water (for example through ongoing runoff). Proper construction best management practices (BMPs) would be implemented. Construction activities should be sequenced and coordinated with other planned and ongoing construction activities. Alternative 2 would include a multi-benefit framework that could potentially reduce cumulative impacts from construction if single projects meet multiple needs and thereby reduce the number of future projects needing to be constructed.

Property Acquisition and Property Protection Impacts. Activities common to both alternatives include property acquisitions, both to remove people and structures from high flood risk areas and to secure the land base needed to implement other activities that will reduce flood risk (such as ecological restoration, levee setback, or structural flood risk reduction projects). If multiple property acquisitions occur in the same general area, they can have long-term, operational cumulative impacts on land use and agriculture. These impacts are discussed in Chapter 3 (*Agriculture*) and Chapter 9 (*Land and Shoreline Use*). A concentration of property protection actions in the same general area, including removal of structures and structural elevations, could have cumulative construction impacts on earth, riparian and terrestrial resources, and aquatic resources. For individual properties, these activities can cause minor temporary impacts that can be largely avoided or mitigated, but these activities occurring on multiple properties in close proximity could result in cumulatively greater levels of erosion, vegetation clearing, and runoff, which could impact soil and potentially aquatic habitat, especially during construction. These cumulative impacts can be minimized or avoided with BMPs.

Changes in River Hydraulics and Flooding. Several activities common to both alternatives would impact river hydraulics and flood levels. For example, conveyance capacity projects (such as culvert replacements) would allow for larger volumes of water to flow through infrastructure. Levee setback projects would increase floodwater storage capacity. Structural projects that protect areas from flooding have the potential to redirect floodwaters to other areas. Implementing a variety of activities throughout a given river's floodplain can have cumulative impacts on river hydraulics or flood levels. These impacts can also be cumulative with other development within the floodplain, which reduces flood storage capacity. In general, implementation of activities in the Flood Plan would have long-term benefits by reducing flood hazards and restoring ecological function. However, the project-level impacts of individual activities should be analyzed within the context of other activities being implemented within the same area, river reach, and watershed to ensure there are not negative cumulative impacts.

1.9 Future Project-Level Analysis

As described in Section 1.2, this non-project Programmatic EIS is being prepared to inform decision-making on the adoption of the 2024 Flood Plan and not to analyze specific projects or project locations, design details, or precise footprints of projects. Future project-level analyses will occur after the completion of the Flood Plan. Many of the capital improvements and projects that are planned or proposed to be constructed in the Flood Plan may be implemented even if the

Flood Plan were not to be adopted; however, the Flood Plan informs the selection, timing, and implementation of future activities to reduce flood risks throughout the county. Implementation of these activities will require separate project-level environmental review. The future project-level reviews will inform decision-makers about site-specific, project-level environmental impacts and mitigation.

1.10 References

Ecology (Washington Department of Ecology). 2021. *Comprehensive Planning for Flood Hazard Management: A Guidebook.* Publication no. 21-06-019. July 2021.

ESA (Environmental Science Associates). 2023. *King County Flood Plan Environmental Impact Statement (EIS) Scoping Summary*. Prepared for King County. May 2023.

FEMA (Federal Emergency Management Agency). 2017. *National Flood Insurance Program Community Rating System Coordinator's Manual*. FIA-15/2017. OMB No. 1660-0022. URL: https://crsresources.org/manual/.

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King County. 2013. *2013 Flood Hazard Management Plan Update and Progress Report: King County, Washington.* King County Department of Natural Resources and Parks, Water and Land Resources Division. Seattle, Washington.

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CHAPTER 2
Alternatives

This chapter describes the two alternatives that are analyzed in this Final Programmatic EIS: Alternative 1 (No Action) and Alternative 2 (Adopt the 2024 Flood Plan). Alternative 1 would not include the adoption of a new Flood Plan, and King County's flood hazard management activities would continue to be informed by existing plans, particularly the 2006 Flood Hazard Management Plan and the 2013 Flood Hazard Management Plan Update and Progress Report. Alternative 2, which is the preferred alternative, would include the adoption of the 2024 Flood Plan. Both alternatives relate to programmatic (non-project) actions that would guide future management of flood hazards, which include consideration of how policies and programmatic actions would affect the selection and implementation of capital projects.

2.1 Elements Common to Both Alternatives

Under both alternatives, King County and other entities in the county would implement a variety of actions to address flood hazards. King County Water and Land Resources Division implements programs and individual actions that address flood hazards and risks, stormwater management, watershed stewardship, and fish passage. King County Office of Emergency Management also implements programs that address flood risks, and other King County agencies such as the Road Services Division and Parks and Recreation Division implement actions that are consistent with the goals and objectives of flood plans in King County (whether the 2006 Flood Plan, which would remain the active flood plan under the No Action Alternative, or the proposed 2024 Flood Plan that would be adopted under Alternative 2). Other entities in the county, including cities, tribes, and special purpose districts (such as the King County Flood Control District), conduct their own flood hazard management activities and implement capital improvement programs that include flood risk reduction, stormwater management, and ecosystem recovery capital projects. Under both alternatives, these other entities would continue to implement those programs and projects.

FEMA organizes flood risk reduction measures into six broad categories as part of its Community Rating System (CRS): preventive, property protection, natural resource protection, emergency services, public information, and structural projects. Programs and projects that would be implemented under both alternatives all fall into one of these categories, and some actions may fall into multiple categories. To identify potential impacts related to more specific types of projects among these six categories, this Programmatic EIS defines 12 subcategories, listed in **Table 2-1**. The 12 activity subcategories are described in greater detail below.

TABLE 2-1
FLOOD RISK REDUCTION ACTIVITY TYPES

Flood Plan Activity Types	EIS Activity Subcategory	Description
Preventive	Preventive	Proactive activities that prevent new risks from being created or avoid future damages, such as infrastructure maintenance, land use and environmental regulations, stormwater management, and flood hazard mapping and modeling.
Property protection	Property protection	Activities that make resilience improvements, retrofits, or enhance recovery capabilities, such as buying flood insurance.
	Property acquisition	Activities that acquire properties to remove them from harm's way.
Natural resource protection	Levee setback projects	Activities that involve moving existing levees that are within the floodplain farther away from the waterbody to the outer perimeter of the floodplain or as far as property ownership allows, to reconnect waterbodies with floodplain ecosystems and increase flood storage capacity.
	Ecological restoration projects	Activities (other than levee setbacks) that enhance or improve connectivity of channels, riparian areas, floodplains, watersheds, or other habitat, typically by returning them to more natural conditions.
	Natural resource protection	Activities that preserve existing open space or other natural resources in perpetuity.
Emergency services	Emergency services	Activities that involve flood warnings, emergency response, and post-disaster recovery operations.
Structural projects	Levee and floodwall projects	Activities that build, rehabilitate, or improve levees and floodwalls.
	Conveyance capacity projects	Activities that increase the volume of water that can flow through infrastructure or channels, such as dredging channels or replacing culverts with larger ones or bridges.
	Stormwater infrastructure projects	Activities that involve structural solutions for storing, draining, or moving stormwater runoff, especially from impervious areas.
	Other structural projects	Activities that include the construction, rehabilitation, or improvement of floodwater storage infrastructure, revetments, and pump stations.
Public information	Public information	Activities that include outreach, education, making flood risk information available, and technical assistance.

2.1.1 Preventive Actions

Preventive activities include:

- Infrastructure maintenance and improvements (drainage system maintenance, stormwater management monitoring and support).
- Regulations and codes (low-impact development [LID], alluvial fan hazard regulations, incentivize development outside the floodplain, multi-benefit floodplain development code improvements, regulatory flexibility for resilience improvements, internal permit review, compliance, and enforcement services).

- Mapping and modeling (flood insurance studies, channel migration zone studies, drainage basin assessment, alluvial fan hazard mapping).

Under both alternatives, King County would continue infrastructure maintenance and improvements to existing infrastructure, such as street resilience improvements, drainage system maintenance, and levee revegetation.

2.1.2 Property Protection

Under both alternatives, King County would continue efforts to reduce flood risks to properties, their uses, and their occupants. Property protection activities under both alternatives could include:

- Mitigation (elevations, structure relocation, sandbags).
- Property owner support (CRS certification, education, assistance for low-income property owners).
- Adaptive reuse (repurposing to flood-compatible land uses).

2.1.3 Property Acquisitions

King County and other jurisdictions would continue property acquisitions as a flood risk reduction solution under both alternatives. In all but the rarest circumstances, King County only acquires properties from willing sellers. Typically, when a property is acquired for flood risk reduction purposes, any structures on the property are demolished or otherwise removed. In instances when a property is acquired that has structures located outside of flood hazard areas, structures may be repurposed for beneficial public uses.

2.1.4 Levee Setback Projects

Levee setback projects involve the removal of flood control structures from a river or streambank, installation of a new flood control structure farther (i.e., set back) from the riverbank, and restoration of the floodplain area between the previous and new structures, which is now reconnected to the river. Under both alternatives, King County and other entities would continue to construct new levee setbacks.

2.1.5 Ecological Restoration Projects

Ecological restoration projects include riparian restoration, floodplain reconnection, improved habitat connectivity, salmonid habitat projects, channel and side channel restoration, and watershed restoration. Under both alternatives, King County and other entities would continue to pursue nature-based solutions to flood risk reduction.

2.1.6 Natural Resource Protection

Natural resource protection activities include the conservation of existing open space, such as upper watershed wetland protection and acquisition of floodplain land for conservation purposes. Under both alternatives, King County would continue efforts to acquire open space in floodplains

and upland areas to avoid creating new risks, mitigate runoff, maintain hydrologic function, and provide floodwater storage space.

2.1.7 Emergency Services

Emergency services activities include:

- Hazard recognition and warning systems (stream gage network, flood warning center).
- Hazard response operations (flood emergency response operations, intergovernmental coordination).
- Post-disaster mitigation action.

Under both alternatives, King County would maintain existing levels of hazard response operations, in coordination with existing governmental and organizational partners.

2.1.8 Levee and Floodwall Projects

Levee and floodwall projects primarily include the rehabilitation and improvement of existing levees. Levee and floodwall projects maintain or restore the existing (or intended) level of protection provided by levees, through rehabilitation of damaged levees. A small number of projects would extend or raise the height of levees to increase the level of protection provided. Neither alternative proposes the construction of entirely new levees. Under both alternatives, King County and other entities would continue to rehabilitate and improve existing levees and floodwalls.

2.1.9 Conveyance Capacity Projects

Conveyance capacity projects include:

- Conveyance (culvert replacement).
- Dredging or sediment removal.

Both alternatives would include many conveyance capacity improvement projects in the form of culvert removal and replacement, with the potential for rare and targeted instances of gravel removal activities.

2.1.10 Stormwater Infrastructure Projects

Under both alternatives, King County and other entities would continue efforts to manage flooding in developed areas through the implementation of stormwater infrastructure projects. Stormwater infrastructure projects include:

- Stormwater infrastructure retrofits.
- New or expanded stormwater infrastructure.
- Green stormwater infrastructure.

2.1.11 Other Structural Projects

Other structural projects include:

- Revetments (rehabilitation, improvements).
- Pump stations (improvements and operations).
- Storage (dam storage, upper watershed storage/drainage improvements, developed area stormwater storage improvements).

Under both alternatives, King County and its partners would continue maintenance and operations of existing drainage and flood control infrastructure, such as revetments, pump stations, and water storage (such as dams and detention ponds). Some individual projects would be designed to provide multiple benefits.

2.1.12 Public Information

Public information activities include:

- Map information (studies and information on interpreting Flood Insurance Rate Maps [FIRMs]).
- Outreach and education (brochures, mailers, online materials, culturally appropriate materials and outreach).
- Transparency (real estate disclosures).
- Technical assistance (expanded stormwater management support, community capacity-building).

Under both alternatives, King County would continue to regularly update FEMA Flood Insurance Studies, which delineate regulated floodplains, as well as provide services to help members of the public understand FIRMs. King County would continue outreach to residents in the floodplain and technical assistance related to permit review and supporting property owners with drainage and stormwater issues.

2.2 Alternative 1: No Action

Alternative 1, the No Action Alternative, assumes that King County does not adopt the 2024 Flood Plan. Selection of this alternative would result in the continued application of the policies and programmatic actions in the 2006 Flood Plan and 2013 Flood Plan Update.

King County's primary areas of focus for flood hazard management would be rivers and major streams, with the exception of the Duwamish River. Coastal processes, small tributaries, lakes, urban flooding, and the Duwamish River would not be substantively addressed in flood hazard planning because these topics and geographies are not substantially addressed in the 2006 Flood Plan and 2013 Flood Plan Update. Climate change, equity, and multi-benefit planning would not be comprehensively integrated into flood planning.

Capital improvement planning and project implementation for flood risk reduction would continue to be undertaken by various governmental agencies, including the King County Flood Control District and individual cities, as described in Section 2.1 (*Elements Common to Both Alternatives*). Typical flood risk reduction projects would continue to include maintenance and improvement of flood control infrastructure, resilience improvements to roads, conveyance capacity improvements, property acquisition, property protection actions (such as elevating homes), and natural resource restoration efforts. Projects and actions advanced by governmental agencies beyond King County would not be coordinated through inclusion in a comprehensive risk mitigation strategy.

Capital improvement projects would be guided by policies established in the 2006 Flood Plan. These policies detail procedures, prioritization metrics, evaluation criteria, scopes, and standards for King County's flood hazard management efforts. Protection of the environment and achieving multiple benefits are reflected as priorities in numerous 2006 Flood Plan policies; however, the application of these principles is narrower and less explicitly integral to the overall approach to flood hazard management than would be the case in Alternative 2.

2.3 Alternative 2: 2024 Flood Plan

Under Alternative 2, King County would adopt the 2024 King County Flood Management Plan. The 2024 Flood Plan would have an expanded geographic scope that considers flood hazard management for rivers (including the Duwamish River), streams, coastal areas, lakes, and urban areas. Alternative 2 would expand upon the 2006 Flood Plan and 2013 Flood Plan Update by integrating considerations of climate change, equity, and multi-benefit planning. Capital projects and programmatic activities occurring under the No Action Alternative (as described in Section 2.1, *Elements Common to Both Alternatives*) would continue to be implemented, as well as expanded upon, under Alternative 2.

The 2024 Flood Plan would prioritize actions that can be initiated or completed within 5 years. Long-term projects that would require more than the 5-year plan life to complete may be included as priorities in the Flood Plan if the activity can be advanced within the life of the Flood Plan. King County's capital improvement programs, as well as those of other jurisdictions, are typically developed on a 6-year timeline. Many projects in existing capital improvement programs with defined timelines are included in the Flood Plan. Some projects in the Flood Plan are not based on adopted capital improvement programs and include phases of the project that were scalable to the approximate timeline of the Flood Plan.

Alternative 2 would center integrated floodplain management principles, which would guide the consideration of the 2024 Flood Plan's key themes of equity, climate change, and multiple benefits in flood hazard management activities. While there is substantial overlap in the types of activities that would occur under the No Action Alternative, Alternative 2 would prioritize activities that align with the key themes of the Flood Plan. Alternative 2 would include additional activities that specifically serve these principles, which are not included in the No Action Alternative.

2.3.1 Geographic Scope

Alternative 2 would have a countywide geographic scope, inclusive of all areas in King County. Alternative 2 would include flood risk reduction activities that address all types of flooding, including coastal, river, tributary, lake, and urban flooding, which expands upon the scope of past flood plans that have primarily addressed flooding along major rivers and significant tributaries. It would also include activities within incorporated areas of the county and activities that would be implemented by entities other than King County. While Alternative 2 includes activities in incorporated areas and activities implemented by entities other than King County, this alternative would not alter the policies or operations of jurisdictions besides King County, nor does it commit other entities to any actions. King County would continue to work with the local jurisdictions in which flood risk reduction activities are implemented and operate within their regulatory frameworks to advance projects that align with local policies and priorities.

2.3.2 Policies

Under Alternative 2, the policies in the 2024 Flood Plan would replace the 2006 Flood Plan policies, which currently inform flood hazard management operations and methods for implementation of flood risk reduction activities. The 2024 Flood Plan policies emphasize consideration of equity, climate change, and multiple benefits in daily flood hazard management operations and implementation of risk reduction activities. These considerations are currently incorporated into daily operations and activities, but they would be consistently applied across operations and activities under Alternative 2. Policies in the 2024 Flood Plan would provide general guidance to inform the decision-making of staff with related expertise; unlike in the 2006 Flood Plan, detailed operating procedures would not be outlined in policies.

The 2024 Flood Plan policies are organized into several broad topic areas: equity, natural systems, multiple benefits, climate change, land use and regulatory compliance, and integrated floodplain management. The 2024 Flood Plan policies outline methods, standards, and conditions for:

- Implementing a variety of flood risk reduction activities.
- Providing equitable flood risk reduction services.
- Protecting and restoring natural systems in conjunction with reducing flood risks.
- Working with community members, governments, and other partners to serve multiple objectives and provide multiple benefits alongside flood risk reduction activities.
- Integrating climate change projections (such as sea level rise, changing snowmelt patterns, and increased precipitation) and resilience benefits into flood hazard management.
- Meeting legal obligations related to planning, public health and safety, and fish and wildlife protection.
- Developing effective, sustainable, and collaborative flood risk reduction strategies.

2.3.3 Comprehensive Risk Mitigation Strategy

The 2024 Flood Plan includes a Comprehensive Risk Mitigation Strategy, which includes activities proposed by King County and by other entities, including cities, nonprofits, tribes, and other government organizations. Past King County Flood Plans primarily included only activities being implemented by King County or in partnership with King County. Although the Comprehensive Risk Mitigation Strategy includes activities that would be implemented by other entities, their inclusion does not obligate those entities to implement them but rather helps to identify activities that address priority flood risk reduction needs throughout King County. The Comprehensive Risk Mitigation Strategy includes the King County Action Plan as a subsection, which are activities that have funding or a funding strategy, will be completed or initiated within the 5-year lifespan of the Flood Plan, and will be led by King County.

Activities in the Comprehensive Risk Mitigation Strategy include both programmatic and capital activities. All activities were vetted through evaluation criteria for inclusion in the Flood Plan. However, any capital projects included in the Comprehensive Risk Mitigation Strategy require additional technical review outside of the scope of the Flood Plan and this Programmatic EIS.

2.3.4 Action Plan

The 2024 Flood Plan includes an Action Plan as a subsection of the Comprehensive Risk Mitigation Strategy. The Action Plan consists only of flood risk reduction activities that King County is committed to implementing, has secured funding for or has identified a funding strategy for, and would be completed or initiated within the 5-year lifespan of the Flood Plan. Approximately half of the activities in the Comprehensive Risk Mitigation Strategy are part of King County's Action Plan. The most common activities under the King County Action Plan include:

- Culvert removal and replacement projects.
- Stormwater technical assistance and services.
- Open space protection.
- Ecological restoration.
- Studies to support future capital projects.

If the 2024 Flood Plan is adopted, King County would commit to several actions or expansions of/revisions to existing programs in the Action Plan. These include:

- Develop a comprehensive Flood Resilience Improvement Program to raise awareness about flooding, increase flood preparedness, reduce flooding impacts, and increase community resilience. Engage with communities and community-based organizations to identify their needs in building flood resilience and provide support to achieve their flood resilience goals.
- Provide emergency response technical assistance for communities and community organizations.
- Develop and provide information about permitting requirements and potential strategies related to home resilience.

- Develop a Program for Public Information (PPI) to connect floodplain managers, community members, and partners to collaboratively create and implement more targeted outreach to change behavior, building more resilient communities.
- Analyze and map alluvial fan hazard areas.
- Develop alluvial fan hazard regulations.
- Develop performance measures for floodplain management equity outcomes and incorporate them into King County monitoring activities.
- Develop a pre-acquisition process for evaluating factors such as the equity implications and cultural interests affected by a potential acquisition and the effects to neighborhoods and communities of converting private property to public open space.
- Identify high-risk neighborhoods where managed retreat (a strategy in which buildings and people are relocated away from risks) may be preferred or necessary, including retreat from severe channel migration zones.
- Provide expanded drainage services to rural King County landowners in the non-built (i.e., natural) environment through development of an Integrated Drainage Program Pilot, using a multi-objective approach to provide drainage improvements, mitigate local flood hazards, and enhance fish passage and aquatic and riparian habitats.
- Update the King County Water and Land Resources Project Management Manual to include multi-benefit considerations early in the project development process (at project charter) so that multi-benefit opportunities are identified and considered across all projects.
- Provide technical assistance to low-income property owners so that they can secure the funding needed to elevate their homes.
- Develop a geospatial project decision-support tool to inform the development of projects that will advance multi-benefit outcomes.
- Collaborate with jurisdictions to identify differences in municipal flood hazard area regulations within King County, identify implications for achieving plan outcomes, and provide technical assistance to jurisdictions within King County to support strengthening local regulations where desired.
- Evaluate opportunities for code updates for flood resilience upgrades to structures that do not conflict with the County's NFIP standing.
- Expand voluntary floodplain acquisitions to coastal areas.

2.4 Comparison of Alternatives

Category	Alternative 1: No Action Alternative	Alternative 2: Adopt the 2024 King County Flood Management Plan
Policies	No updates to policies from 2006 Flood Plan.	Adoption of updated policies in 2024 Flood Plan, including policies related to integrated floodplain management, multiple benefits, climate change, and equity.
Geographic scope	Six major river systems and streams with existing flood protection facilities. The Duwamish River is not included in the geographic scope.	All major river floodplains (including the Duwamish River), coastal areas, urban areas, and tributaries.
Activities	• King County would implement programmatic elements as part of its ongoing work programs, informed by the policies and elements in the 2006 Flood Plan and 2013 Update. • Multiple entities in King County would implement activities to manage flood hazards, but they would not be coordinated through inclusion in a countywide Flood Plan.	• King County would implement the Action Plan component of the 2024 Flood Plan. • The Flood Plan would include a Comprehensive Risk Mitigation Strategy, including a range of activities that may be implemented by a broader range of entities and partners, such as tribes, cities, special purpose districts, and nonprofits. • When implementing flood risk reduction measures in the future, King County would more systematically address climate change through integration of climate projections and resilience measures and would develop design alternatives to provide multiple benefits. • King County would implement an expanded public information program. • King County would implement an expanded range of equity-focused actions to address flood hazards, through targeted outreach, building community capacity, and flood planning equity performance measures.

2.5 References

King County. 2006. *Flood Hazard Management Plan: King County, Washington.* King County Department of Natural Resources and Parks, Water and Land Resources Division, Seattle, Washington.

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CHAPTER 3
Agriculture

3.1 Affected Environment

3.1.1 Relevant Plans, Policies, and Regulations

Plans

The King County Comprehensive Plan includes policies and designations related to agriculture. The current Comprehensive Plan was adopted in 2016 and has been updated several times, most recently in 2022 (King County 2022). King County is currently developing a major 10-year update to the Comprehensive Plan. Chapter 3 of the Comprehensive Plan covers Rural Areas and Natural Resource Lands. Policy R-101 states:

> *King County will continue to preserve and sustain its rural legacy and communities through programs and partnerships that support, preserve, and sustain its historic, cultural, ecological, agricultural, forestry, and mining heritage through collaboration with local and regional preservation and heritage programs, community groups, rural residents and business owners including forest and farm owners, rural communities, towns, and cities, and other interested stakeholders (King County 2022).*

The Comprehensive Plan establishes in Policy R-649 that agriculture must remain the predominant land use in Agricultural Production Districts (APDs), setting conditions for habitat and floodplain restoration projects in APDs that must be followed until a watershed-scale planning process has been undertaken in line with Policy R-650, which states:

> *Aquatic habitat restoration projects, floodplain restoration projects and projects under King County's mitigation reserves program in an Agricultural Production District shall be evaluated through a collaborative watershed planning process with the goal of maintaining and improving agricultural viability, improving ecological function and habitat quality, and restoring floodplains through integrated, watershed-wide strategies. A watershed planning process shall be established for an agricultural production district because of the number of potential restoration projects and shall:*
>
> *a. ensure that agricultural viability in the Agricultural Production District is not reduced as the result of actions taken and that agriculture remains the predominant use in the agricultural production district;*
>
> *b. evaluate and recommend actions at all scales across the affected watershed to maintain and improve agricultural viability, restore ecological functions and aquatic habitat and restore floodplains, including voluntary actions taken by landowners;*

c. *be a collaborative effort among affected landowners, interested stakeholders, and King County and shall be updated on a periodic basis; and*

d. *identify and recommend actions that King County should take or ensure are taken to maintain and improve agricultural viability in the Agricultural Production District and address any impacts to agriculture from aquatic habitat restoration projects, floodplain restoration projects and projects under King County's mitigation reserves program constructed in the Agricultural Production District* (King County 2022).

Policy R-650 has been applied to support a watershed planning process for the Snoqualmie Valley Agricultural Production District, resulting in the Snoqualmie Fish, Farm, Flood Advisory Committee Report and Recommendations, which outlines recommendations that support habitat restoration, floodplain restoration, and agricultural viability (Snoqualmie Fish, Farm, Flood Advisory Committee 2017).

Agricultural planning at the intersection of watershed management and flood risk reduction is an established practice in King County beyond the Snoqualmie Fish, Farm, Flood initiative. The Snoqualmie Valley APD Agriculture Task Force developed an Agricultural Strategic Plan in 2023, which aims to improve farm productivity and expand protected farmland through strategies to address climate change, flood risks, wildlife, and drainage, among other topics.

Policies and Regulations

Agriculture is regulated at the federal, state, and local levels, and there are many regulations related to food safety, agricultural labor practices, and other elements of agriculture as an industry. For example, in Washington State, Title 15 RCW covers agricultural products and marketing. This section summarizes several regulations that mostly relate to the overlap of agriculture and floodplain management.

Section 402(a)(4) (21 United States Code [U.S.C.]) of the Federal Food, Drug, and Cosmetic Act declares that any crop that has its edible portion exposed to floodwaters is considered adulterated and cannot be sold for human consumption. The U.S. Food and Drug Administration (FDA) administers this law and recommends that crops exposed to floodwater be disposed of.

State regulations related to agriculture include the Growth Management Act (GMA), which requires jurisdictions to designate agricultural lands and adopt regulations to conserve agricultural lands as part of comprehensive planning.

King County Code (K.C.C.) Title 26 covers Agricultural and Open Space Lands. K.C.C. 26.04.010 states the importance of agriculture to King County, including the statement that "Land suitable for farming is an irreplaceable natural resource." K.C.C. Title 26 also includes K.C.C. Chapter 26.12, covering the County's Conservation Futures Program, which funds land acquisitions and easements for conservation purposes, including farmland protection easements.

3.1.2 Agriculture in King County

Agriculture is a major land use in King County. As of the 2017, the U.S. Department of Agriculture (USDA) Census of Agriculture, there were 1,796 farms in King County, 84 of which had sales of $100,000 or more. There was a total of 41,975 acres of farmland, 18,691 acres of which were cropland. The market value of agricultural products was $135,464,000, the sixth highest among Western Washington counties (after Whatcom, Skagit, Thurston, Snohomish, and Lewis counties). Total livestock in the county included 18,883 cattle, 6,540 hogs and pigs, and 2,546 sheep and lambs (USDA 2019).

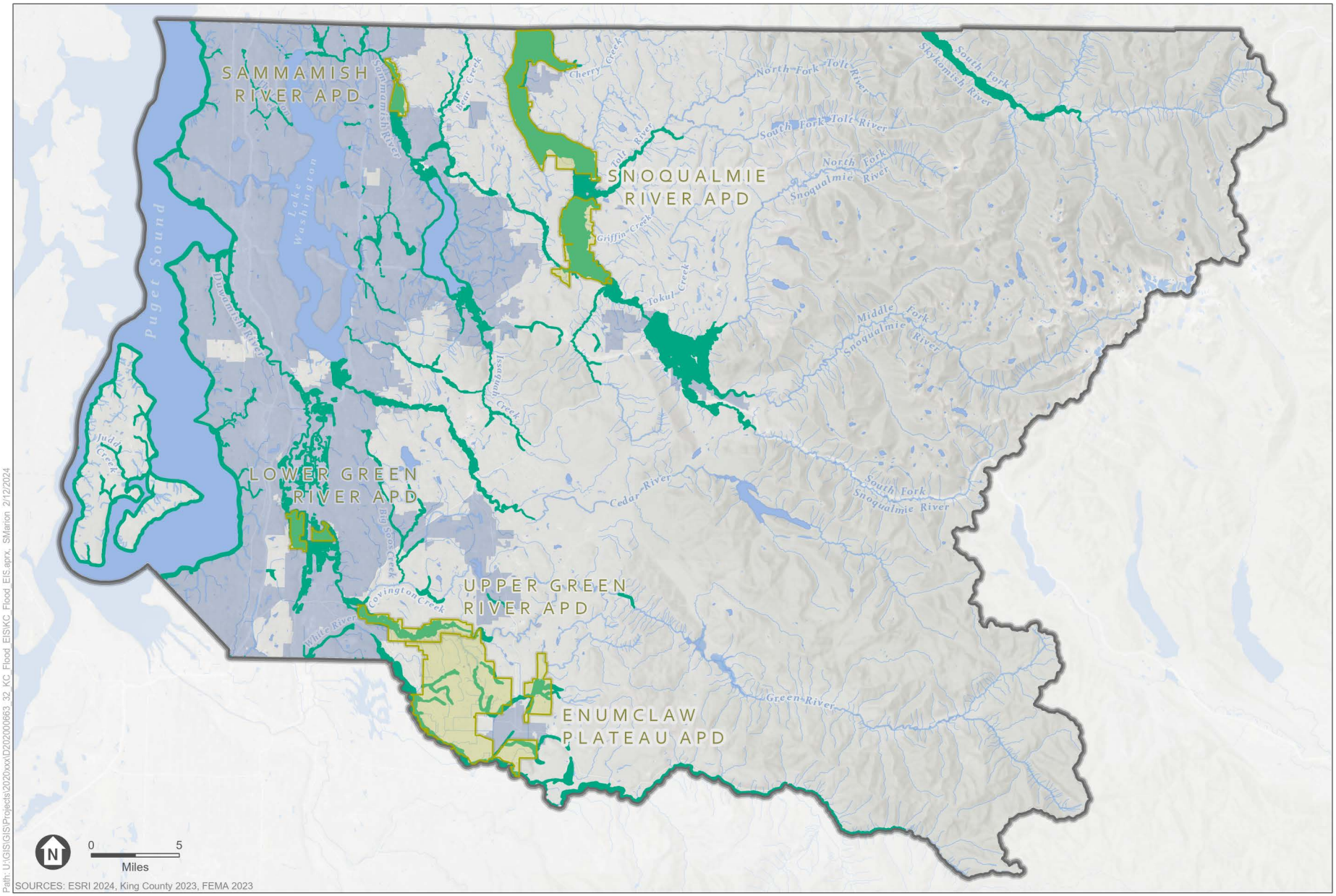
3.1.3 Agriculture in Unincorporated King County

Most agriculture in King County is within unincorporated areas and therefore within King County's jurisdiction. King County operates an Agriculture Program that works to "preserve prime agricultural soils with efforts to protect water resources and ensure the continuing economic vitality of agriculture in the County" (King County 2023a). Specific county programs include the Farmland Preservation Program, which has acquired the development rights on approximately 15,500 acres of farmland (King County 2023b), and the Agricultural Drainage Assistance Program, which provides technical assistance and financial support to maintain agricultural drainage.

King County has designated five Agricultural Production Districts (APDs). The Comprehensive Plan identifies the APDs as areas where agriculture should be the principal land use. The five APDs are:

- Enumclaw Plateau APD
- Snoqualmie River APD
- Upper Green River APD
- Lower Green River APD
- Sammamish River APD

Figure 3-1 shows the location of APDs in King County and where they overlap with the mapped floodplain.



SOURCES: ESRI 2024, King County 2023, FEMA 2023

Path: U:\GIS\GIS\Projects\2020xxx\D20200663_32_KC_Flood_EIS\KC_Flood_EIS.aprx SMarion 2/12/2024

Incorporated Municipalities

Streams

FEMA Flood Zone

Floodplain (Regulatory Floodway, 1% and 0.2% Annual Chance)

Agricultural Production District

King County Flood Plan EIS

Figure 3-1
Agricultural Production Districts

Last Updated 2/12/2024

ESA

3.1.4 Agriculture in the Mapped Floodplain

A large portion of agriculture in King County is located within the mapped floodplain. Floodplains often contain very productive agricultural soils due to sediment deposition from historical flooding. Agriculture is also often a preferred land use in the floodplain because fewer people and less infrastructure will be at risk in a flood event compared to residential or industrial development. However, flooding and channel migration still pose risks to farms and farm businesses, including damage to agricultural structures such as barns and farmhouses, risk to livestock and crops, erosion of farm soils, and disruption of business.

Large portions of most of King County's APDs are located within floodplains. See **Table 3-1** for the acreage of each APD within flood zones.

TABLE 3-1
FLOODPLAINS WITHIN AGRICULTURAL PRODUCTION DISTRICTS

APD	Total Acres	Acres of Regulatory Floodway	Acres of 1% Annual Chance Floodplain	Acres of 0.2% Annual Chance Floodplain	Percent of APD with Flood Risk
Enumclaw	20,683	48	2,078	2,100	10%
Snoqualmie	14,782	9,392	12,393	12,499	85%
Upper Green	3,418	432	1,317	1,342	39%
Lower Green	1,460	841	1,207	1,321	91%
Sammamish	1,094	24	504	653	59%

Note: Acre totals for flood risk categories are cumulative. The entire regulatory floodway is within the 1% annual chance floodplain, which is within the 0.2% annual chance floodplain.

3.2 Construction Impacts

3.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could occur directly adjacent to or in the vicinity of active agricultural lands. Construction noise is unlikely to affect most agricultural activities, but particularly loud noise or noise with prolonged duration could affect livestock. Noise could also affect agritourism activities (such as u-pick berries or pumpkin patches) by disturbing participants or discouraging participation. The visibility of construction activities or equipment from nearby farms is unlikely to affect regular farming operations, but could affect agritourism activities, similar to noise. Construction-related traffic (such as truck traffic related to earthwork or the transport of construction equipment) could cause delays on local roads used by farms. This is likely to have the greatest impact on farm operations that use local roads to move equipment between fields.

Types of activities that could impact agriculture if construction occurs adjacent to or in the vicinity of active agricultural lands include preventive activities, property acquisition (if demolition of existing structures is included), property protection, levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects,

stormwater infrastructure projects, or other structural projects. Activities like property protection or preventive actions are likely to have relatively minor impacts due to the shorter duration and lower intensity of construction activities, whereas activities such as levee setback projects or structural projects (including levee and floodwall projects) would likely have greater impacts due to the longer duration and higher intensity of construction.

For any activities implemented under either alternative, elements of the activity that affect the level of impact of construction on agriculture (such as duration of construction or number of truck trips) would be identified as part of project-level planning and design. All activities would undergo the appropriate level of project-level permitting and impact analysis.

3.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 3.2.1, *Impacts Common to Both Alternatives*.

3.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 3.2.1, *Impacts Common to Both Alternatives*.

3.3 Operational Impacts

3.3.1 Impacts Common to Both Alternatives

A number of activity types could affect agriculture through property acquisition of agricultural parcels. Acquisition of farmland that converts it to another use would take farmland out of production. Easements on a portion of agricultural properties in support of natural resource protection projects could take portions of farmland out of production but would allow continued agricultural production on the rest of the property. Most acquisitions that would be pursued under either alternative would only be advanced with willing landowners, particularly acquisition of high-risk properties and acquisition for habitat restoration. However, farmland is a limited resource in King County. Acquisition and demolition of housing within Agricultural Production Districts reduces the housing stock for agricultural workers and farmers, particularly in APD areas located within the regulatory floodway where new housing cannot be constructed.

In addition to property acquisition activities, agricultural land could potentially be acquired as part of activities that require acquisition to secure the land base needed to implement the activity, such as levee setback projects, ecological restoration projects, and, to a lesser degree, structural projects.

Activities that affect the conveyance of water or groundwater could impact agricultural drainage. For example, a restoration project that meanders a stream through a newly created habitat area has the potential to slow drainage for upstream farms. Building a setback levee closer to agricultural fields could impact the drainage from farmlands into waterbodies by causing water to back up on the landward side of the levee. Activity types that could potentially impact agricultural drainage include levee setbacks, ecological restoration projects, levee and floodwall

projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Whether or not drainage patterns would be impacted and whether those effects would be positive or negative for agricultural production is highly dependent on specific local conditions and the design of the project and can often be addressed in project design.

All activity types have the potential to reduce flood hazards for farms depending on their location or scope, which is a beneficial effect.

3.3.2 Alternative 1: No Action

Under the No Action Alternative, floodplain management activities would continue to be conducted under the 2006 Flood Plan and its goals, objectives, guiding principles, and policies. The objectives and guiding principles of the 2006 Flood Plan include acknowledgement that agriculture is a land use within King County's floodplains (see Objective 10 and Guiding Principle 4) (King County 2007). However, the 2006 Flood Plan policies do not discuss agriculture. Some individual activities would be planned and designed with agricultural needs and benefits in mind, but there would be no overarching multi-benefit framework for activity development explicitly including agriculture.

3.3.3 Alternative 2: 2024 Flood Plan

Compared to the 2006 Flood Plan (which would remain the current documentation of guiding principles for flood hazard management in King County under the No Action Alternative), the 2024 Flood Plan more explicitly states that agriculture is a valued land use in King County's floodplains and must be considered when developing actions to address flood risk. The guiding principles in the 2024 Flood Plan state:

- "King County's floodplains and flood-prone areas exhibit many different activities and land uses and include developed areas with homes, **farms**, businesses, and infrastructure that are valued by King County and its communities" [emphasis added].
- "Actions to address flood risk to existing development must consider the existing land use context, other land uses and interests (such as urban development, fish and wildlife habitat, open space, **agriculture**, recreation, and transportation), and climate change and other future landscape changes" [emphasis added].

The 2024 Flood Plan includes a policy stating that multi-benefit outcomes could include "productive, viable agriculture." The Flood Plan also includes a multi-benefit framework in alignment with this policy statement. Under Alternative 2, King County would develop flood risk reduction activities in alignment with this policy and the multi-benefit framework, increasing the likelihood that projects would provide benefits to and minimize impacts on agriculture in comparison to the No Action Alternative.

3.4 Avoidance, Minimization, and Mitigation Measures

The guiding principles and policies in the 2024 Flood Plan encourage project development and design that minimize impacts and provide benefits to agriculture. Specific mitigation measures for construction and operation of flood risk reduction activities would be identified as part of

project design and project-level permitting and environmental review. Example mitigation measures could include:

- When projects impact agricultural land within APDs, follow Comprehensive Plan Policy R-649 (described above in Section 3.1.1, under *Plans*).
- Where possible, site construction staging areas farther away from active agricultural parcels.
- Avoid routes used to move agricultural equipment on local roads and access for agritourism activities when determining routes for truck trips and construction equipment.
- As part of a multi-benefit framework, consider prioritizing restoration and setback levee projects that do not require acquisition of agricultural land (particularly agricultural land within APDs) over those that do, when possible.
- Prioritize elevations of at-risk agricultural structures (such as barns and farmhouses) over acquisition and demolition.
- Design flood infrastructure in agricultural areas with dynamic flood gates that allow effective drainage of agricultural fields when flooding is not occurring.

3.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on agriculture. However, individual activities implemented under either alternative could have significant adverse impacts depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 3.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 4
Aquatic Resources

4.1 Affected Environment

4.1.1 Relevant Plans, Policies, and Regulations

King County manages its land and shoreline use within a regulatory framework that is guided by plans that the County is required to maintain under Washington State law. King County's fish and wildlife policies and regulations have been informed by current state fish and wildlife guidance, recommendations, and requirements. The GMA directs local jurisdictions to designate and protect critical areas, including Fish and Wildlife Habitat Conservation Areas. Fish and Wildlife Habitat Conservation Areas are designated to ensure the conservation of individual species recognized as declining or imperiled as well as to protect and connect specific areas of habitat deemed important (King County 2022a).

Plans and Programs

The King County Comprehensive Plan describes the County's overall goal for the protection of aquatic resources, which includes habitat restoration projects to improve ecological function and habitat quality for salmon, while addressing flood risk reduction and floodplain restoration (King County 2022a). The Water Resources Inventory Areas (WRIA) plans listed below address the effects of current and future growth on salmonids and their habitat and provide the framework for agencies to make science-based choices and prioritize actions that will protect and restore salmon habitat in King County. The following plans cover the WRIAs that are either fully or partially located within King County:

- **WRIA 7 –** Snohomish River Basin Salmon Conservation Plan (Snohomish Basin Salmon Recovery Forum 2005).
- **WRIA 8 –** Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan 10-year Update (WRIA 8 Salmon Recovery Council 2017).
- **WRIA 9 –** Duwamish/Green and Central Puget Sound Watershed Salmon Habitat Plan 2021 Update (WRIA 9 2021).
- **WRIA 10 –** Salmon Habitat Protection and Restoration Strategy for Puyallup and Chambers Watersheds (Puyallup and Chambers Watersheds Salmon Recovery Lead Entity 2018).

The King County Clean Water Healthy Habitat Strategic Plan (2020-2025) guides King County's efforts to protect and restore habitat and addresses broader water quality concerns expressed by communities in the face of a growing population and climate change (King County 2020).

The King County Fish Passage Restoration Program lays out the strategy to accelerate restoration of fish passage at existing barriers owned or operated and maintained by King County, demonstrating the County's commitment to ecosystem recovery and tribal treaty rights (King County 2022b).

Policies and Regulations

Federal policies and regulations that apply to aquatic resources are:

- Endangered Species Act (50 CFR Part 17).
- Marine Mammal Protection Act (1972) (16 U.S.C. 1361 et seq.).
- Magnuson-Stevens Fishery Conservation and Management Act (Public Law 94-265).
- Clean Water Act; also referred to as Water Pollution Control Act (33 U.S.C. 1251 et seq.).
- Rivers and Harbors Act, Sections 9 and 10 (33 U.S.C. 401 and 33 U.S.C. 403).
- Coastal Zone Management Act, codified (16 U.S.C. 1452 et seq.).
- Floodplain Management (Presidential Executive Order 11988, May 24,1977).

State policies and regulations that apply to aquatic resources are:

- State Surface Water Quality Standards (RCW 90.48; WAC 201A).
- State Environmental Policy Act (SEPA) (RCW 43.21C).
- Hydraulic Code (RCW 90.48; WAC 220-110).

4.1.2 Aquatic Resources in King County

There are approximately 3,100 miles of rivers and streams in King County (King County 2008). The river and stream channels, the surrounding riparian (streamside) areas and upland areas, and their floodplains all contribute to the functioning and integrity of rivers and streams. Many rivers and streams provide habitat that is essential for various life stages of many species of wildlife and fish, including salmonids.

There are six major watersheds in King County (Cedar/Lake Washington, Green/Duwamish, Puget Sound, South Fork Skykomish, Snoqualmie, and White) that, in turn, contain numerous smaller catchments and waterbodies. Several coastal streams drain directly to Puget Sound, including Des Moines Creek, Massey Creek, McSorley Creek, Judd Creek, and Walker Creek. The headwaters and middle reaches of rivers in King County are typically steep and dominated by bedrock and boulders. In these areas, floodplains are often narrow or absent. When these rivers eventually reach the Puget Sound lowlands, however, they flatten out, deposit sediments, and form floodplains that are often broad, ecologically complex, and biologically productive.

There are approximately 103 miles of marine shoreline in King County, including 51 miles in unincorporated areas. The marine nearshore environment provides essential habitat for a variety of species including juvenile salmonids, forage fish, and several commercially important shellfish species. Kelp and eelgrass populations are particularly important for providing food and habitat, especially for juvenile life stages for a variety of key fish and invertebrate species. Subtidal areas

within these marine areas provide important ecosystem functions and essential habitat for a variety of important species, including marine mammals, fish, and invertebrates.

Federally listed aquatic species that occur in King County can be found in both freshwater and marine environments. These species are presented in **Table 4-1** (King County 2022a).

TABLE 4-1
FEDERALLY LISTED AQUATIC SPECIES FOUND IN KING COUNTY

Federally Listed Species	Date Listed	Listing Status	Critical Habitat in Plan Area
Chinook salmon Puget Sound Evolutionarily Significant Unit (ESU)	1999	Threatened	Yes
Steelhead Puget Sound Distinct Population Segment (DPS)	2007	Threatened	Yes
Bull trout Coterminous U.S. DPS	1999	Threatened	Yes
Eulachon (Columbia River smelt) Southern DPS	2010	Threatened	No
Bocaccio rockfish Puget Sound DPS	2010	Endangered	No
Canary rockfish Puget Sound DPS	2010	Threatened	No
Yelloweye rockfish Puget Sound DPS	2010	Threatened	No
Southern Resident killer whale	2005	Endangered	Yes
Humpback whale	1970	Endangered	No
Steller sea lion	1990	Threatened	No

In addition to federally listed species, Washington Department of Fish and Wildlife (WDFW) implements its own protections for aquatic species. The state aquatic species of interest that occur in King County are listed in **Table 4-2** (King County 2022a). Additional species found in the floodplain (birds, reptiles, amphibians) are described in Chapter 13 (*Riparian and Terrestrial Resources*).

TABLE 4-2
WASHINGTON STATE SPECIES OF SPECIAL CONCERN FOUND IN KING COUNTY

Aquatic Species	WDFW Status
Pacific lamprey	PHS
River lamprey	SC
White sturgeon	PHS
Pacific herring	PHS
Chum salmon	PHS
Coastal cutthroat trout	PHS
Coho salmon	PHS
Pink salmon	PHS
Sockeye salmon	PHS

Note: PHS = Priority Habitats and Species, SC = Species of Concern

In addition to federal and state listed species, King County oversees local aquatic species of special concern, which applies to additional fish species as well as invertebrates. King County defines species of special concern as "those species of local concern primarily because of their population status or sensitivity to habitat fragmentation" (King County 2007). Aquatic species of local concern are:

- **Salmonids and Other Anadromous Fish** (which are also listed in Table 4-1 and Table 4-2 above) – Kokanee salmon, sockeye/red salmon, chum salmon, coho/silver salmon, pink salmon, coastal resident/sea-run cutthroat trout, rainbow trout, Dolly Varden, and Pacific lamprey.
- **Marine Fish** – White sturgeon, Pacific herring, longfin smelt, surf smelt, lingcod, Pacific sand lance, English sole, and rock sole.
- **Shellfish** – Dungeness crab, pandalid shrimp, geoduck clam, and Pacific oyster.
- **Native Freshwater Mussels** – Western pearlshell mussel, Oregon and western floater, and western ridge mussel.

4.2 Construction Impacts

4.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could occur directly adjacent to or in the vicinity of active aquatic resources. Operating heavy equipment and moving or placing construction materials below the ordinary high water mark (OHWM) of a waterbody can directly damage fish habitat and decrease water quality by increasing turbidity levels through sediment disturbance and runoff and through leaks and spills from heavy equipment. Temporary stream diversions, cofferdams, and block nets for fish salvage can be used to safely remove fish during construction. Temporary stream diversions also can block fish from accessing spawning or rearing habitats for the duration of construction, although construction activities typically occur only in summertime "fish windows." These fish windows are during the lowest flow months and outside of primary salmonid migration timeframes, which helps to minimize impacts on most aquatic species.

Types of activities that could impact aquatic resources if construction occurs adjacent to or within the buffer zones established by Critical Area Ordinances for sensitive environments or Shoreline Master Programs include levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects within the floodplain. Activities such as levee setback projects or structural projects (including levee and floodwall projects) would likely have greater impact due to the potential direct and indirect effects of these projects on aquatic resources, both permanent and temporary.

Historical construction and maintenance techniques for levees and revetments tended to degrade natural riparian conditions and aquatic habitats. Construction activities disturb soils, which often opens up area for fast-growing non-native species such as reed canarygrass, Himalayan blackberry, and Japanese knotweed to invade and negatively impact instream aquatic and riparian habitat. More desirable native plant communities stabilize banks better, provide much more habitat for fish and wildlife, and are not as apt to form monocultures.

4.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 4.2.1, *Impacts Common to Both Alternatives*.

4.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for the Alternative 2 would be the same as described in Section 4.2.1, *Impacts Common to Both Alternatives*.

4.3 Operational Impacts

4.3.1 Impacts Common to Both Alternatives

Traditional flood hazard management actions (such as building levees and dredging channels) have significant detrimental impacts on aquatic resources, including threatened and endangered fish species. For example, levees and revetments negatively impact floodplain habitat and disconnect this habitat from the main channel of the river, yet floodplain habitat provides important refuge for salmon during high flows and sheltered rearing areas for juvenile fish. Projects that channelize rivers and streams—such as what occurs through the construction of levees and revetments—can increase flow velocities and erosion, and increased sediment loads can impair water quality and potentially smother salmon redds and harm or kill rearing juveniles, which can negatively affect the total fish stock. Because salmon are a keystone species, impacts on salmon result in impacts on the health and function of natural ecosystems and on other species (including plants and other animals), on the natural environment, and on other species (from coniferous trees to shorebirds). Levees and revetments impact riparian vegetation, biodiversity, and sediment dynamics, and they can reduce or restrict the ability for community members to access rivers for fishing and other recreation. The continued existence of levees on King County rivers means that impacts on aquatic resources continue.

Under both alternatives, King County would implement a variety of actions to address flood hazards. New levee and floodwall projects or other structural projects could have substantial impacts on aquatic resources, and any project to maintain or upgrade existing structural projects (such as levees) could extend or increase impacts on aquatic resources. Adding new untreated pollution-generating impervious surfaces in structural projects without proper stormwater treatment could adversely affect fish. Untreated stormwater discharged directly to waterbodies can harm juvenile and adult salmon. Structural project types can alter natural habitats and limit access to upstream areas or riparian or side channel habitats. New structural projects may not construct entirely new barriers but could extend or maintain existing barriers. Barriers that prevent or limit access to aquatic habitats can impact the productivity and viability of fish populations. The impacts of individual activities would be analyzed as part of project-level design and environmental assessment.

Activity types such as levee setback projects, ecological restoration projects, natural resource protection, and property acquisitions would have positive effects on aquatic resources by protecting or restoring natural floodplain areas. Conveyance capacity projects, such as culvert

replacements, would improve fish passage. Other activity types, such as property protection activities, would have limited potential impact on aquatic resources due to the small scale of on-the-ground work. Potential impacts would be identified during project-level design and environmental review. Multiple small-scale property protection activities could potentially result in cumulative impacts on aquatic resources, particularly if located in close proximity to each other. Cumulative impacts of property protection and other activity types are described in Section 1.8.

4.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 4.3.1, *Impacts Common to Both Alternatives*.

4.3.3 Alternative 2: 2024 Flood Plan

Operational impacts for Alternative 2 would be the same as described in Section 4.3.1, *Impacts Common to Both Alternatives*. Implementation of the multi-benefit framework included in the 2024 Flood Plan would lead to more consistent consideration of aquatic habitats in the design of flood hazard management activities, with the potential to greatly decrease negative impacts on aquatic habitat and increase habitat lift and beneficial ecosystem functions.

4.4 Avoidance, Minimization, and Mitigation Measures

Washington State law (RCW 77.55) requires agencies planning hydraulic projects in or near state waters to obtain a Hydraulic Project Approval (HPA) from WDFW. This includes most marine and fresh waters and would also apply to waters within the floodplain. An HPA ensures that construction is done in a manner that protects fish and their aquatic habitats. Work done in the floodplain would likely require an HPA, which contains specific avoidance, minimization, and mitigation measures for protecting aquatic resources during construction, and all of these would likely apply to the construction done in the floodplain.

Mitigation measures would be identified as part of project-level design and environmental review. Specific mitigation measures could include:

- Site projects away from mapped priority habitats and species locations where possible, except projects that will produce an improvement in instream or riparian habitats.
- Design capital projects to include features that improve instream and riparian habitat.
- Limit construction to approved fish windows to minimize disturbance.
- Implement best management practices (BMPs) to avoid or minimize temporary construction-impacts such as site runoff.
- Retain native vegetation and remove invasive or noxious plants as much as possible during construction, and revegetate sites with native plants after construction is complete. As much as possible, strive to retain vegetation with a diameter at breast height of 4 inches or greater.

4.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on aquatic resources. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 4.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 5
Climate Change

Climate change is a process in which greenhouse gas (GHG) emissions from human sources cause increases in global temperatures that result in a variety of changes in weather conditions. GHG emissions can be caused by energy generation and consumption, manufacturing and using certain materials, transportation, buildings, and other sources. Climate change is projected to increase the severity of floods and other related weather impacts in the Pacific Northwest.

Climate change mitigation efforts refer to those that attempt to reduce potential future impacts of climate change through reducing GHG emissions and sequestering carbon, while climate change adaptation efforts refer to efforts to increase resilience of people, the built environment, and the natural environment to potential climate impacts.

5.1 Affected Environment

5.1.1 Relevant Plans, Policies, and Regulations

Methods of reducing GHG emissions recommended by King County in the Strategic Climate Action Plan (SCAP) largely focus on incentives, behavioral changes, sustainability programs, and retrofits to infrastructure and equipment, rather than direct restriction on emissions sources (King County 2021). As King County would lead many of the projects and programs in the 2024 Flood Plan, the County's climate change policies and regulations could influence how these projects and programs would be implemented.

Plans

King County adopted its current SCAP in 2021, which sets goals, strategies, and policies for mitigating and adapting to climate change. Major SCAP initiatives that inform how King County operates include:

- 50 percent emissions reductions, which will involve vehicle fleet electrification, procuring renewable energy, and improving energy efficiency, especially in government operations.
- Retrofitting built systems and conserving and restoring natural systems play a large role in the climate change adaptation component of the SCAP, which would be applicable to flood risk reduction measures, as climate change is projected to worsen flood impacts in King County.
- King County's Sustainable and Resilient Frontline Communities Framework, which acknowledges the disproportionate impact climate change has on some communities, such as BIPOC, low-income, limited English skills, or the disabled, and outlines strategies to address the vulnerabilities of these communities, such as addressing root causes of vulnerability and

inequality, increasing opportunities for building community capacity and leadership, enhancing the resilience of services these communities rely on, and increasing emergency preparedness.

King County maintains other plans that identify strategies that could support the goals of climate change mitigation and adaptation, such as natural resource conservation, increased development density, public transportation improvements, and improved energy efficiency. King County also engages with regional entities to support broader climate change mitigation and adaptation planning efforts.

These other plans and initiatives addressing climate change include:

- **King County Comprehensive Plan** – This plan includes policies for King County to support efforts at all levels of government to reduce GHG emissions, track and report on King County operating emissions, and implement broad strategies to reduce emissions across government sectors (King County 2022).
- **King County Equity and Social Justice Strategic Plan** – This plan establishes strategies for integrating equity and social justice considerations across county functions, including strategies for equitably addressing climate change, such as increasing diversity and inclusion in environmental governance and programs, incorporating equity considerations and metrics into long-term planning and projects, and prioritizing climate change resilience efforts that serve the most vulnerable populations (King County 2016).
- **Clean Water, Healthy Habitat** – This plan outlines numerous strategies that would enhance ecological functions, including those that improve climate resilience, as well as strategies to provide multiple benefits in capital projects and updating regulations to account for climate change (King County 2020).
- **Land Conservation Initiative** – This initiative prioritizes acquisition of land in floodplains that can accommodate more severe future flooding, natural lands and coastlines that support resilience, preserving farmland, and forestlands that can help mitigate climate change (King County DNRP 2022).
- **Puget Sound Regional Council (PSRC) VISION 2050** – This plan sets a goal for 50 percent reduction in GHG emissions, compared to 1990 levels, by 2030, using policies such as protection of natural resources, assessing hydrological impacts of climate change, and increasing resilience of the natural and built environments (PSRC 2020).
- **PSRC Puget Sound Action Agenda** – This plan outlines an array of strategies for reducing GHG emissions and increasing resilience, including enhancing emissions monitoring, identifying conservation strategies that support carbon sequestration, and implementing multi-benefit projects (Puget Sound Partnership 2022).

Policies and Regulations

GHG emissions are regulated at the federal, state, and local levels. Many restrictions on GHG emissions sources and content are developed at the federal level, with further elaboration on these standards developed through plans, regulations, and policies developed at the state and local levels.

King County Code (K.C.C.) does not extensively regulate GHG emissions sources; however, it has policies to support climate change mitigation in K.C.C. Title 18 (Environmental Sustainability Program). The Environmental Sustainability Program includes codified practices

that advance GHG emissions reductions through green building techniques, sustainable procurement practices, implementing the SCAP, and electrifying King County vehicles.

King County also advances climate adaptation through various regulations, especially related to the resilience of buildings and preserving resilient ecosystems.

- **K.C.C. Title 16 Building and Construction Standards:** The Building Codes of King County expand upon the requirements in the International Building Code to add higher freeboard requirements and flood-resistant design in flood hazard areas and coastal high-hazard areas. In addition to adding resilience to current floods, this will support flood risk reduction against deeper floods driven by climate change. King County's building code also sets higher energy efficiency standards than the International Building Code, under some conditions.
- **K.C.C. Chapter 21A.23 Sea Level Rise Risk Area:** King County delineates and regulates a Sea Level Rise Risk Area, outlining development restrictions on areas at risk of future sea level rise, even though these areas are not mapped as flood hazard areas by FEMA.
- **K.C.C. Chapter 21A.24 Critical Areas Ordinance:** In addition to elaborating on the elevation and freeboard requirements from King County's Building Code, the Critical Areas Ordinance sets development restrictions above required FEMA NFIP standards. The Critical Areas Ordinance also regulates floodplains, wetlands, geological hazard areas, and other sensitive environments by restricting certain activities; requiring BMPs for avoiding, reducing, or mitigating impacts; and preserving ecological functions of sensitive environments.
- **K.C.C. Chapter 21A.25 Shoreline Master Program:** The Shoreline Master Program sets restrictions on land use activity and identifies BMPs that prioritize the preservation of ecological function in sensitive shoreline environments, which can support climate resilience, especially against worsening flood conditions.

5.1.2 Climate Change in King County

The climate of King County is temperate, with cool, wet winters and warm, dry summers. The lowlands of King County are largely in the rain shadow of the Olympic Mountains, resulting in lower levels of precipitation compared with upland areas in the mountainous, eastern portion of King County.

Anthropogenic GHG emissions have driven changes in the climate, especially over the course of the 20th century and up through the present. During this time, many changes have been observed in the climate of the Puget Sound region:

- Air temperatures have increased approximately 1.3 degrees Fahrenheit (F) in lowland areas.
- The frequency and intensity of heavy rainfall events have both increased.
- Seasonal snowpack and glacial ice volumes in the Cascades and Olympic Mountains are in a long-term trend of decline.
- Local sea level in Seattle has risen more than 9 inches since 1900 (King County 2021).

Table 5-1 depicts the percentage of GHG emissions caused by the production, transportation, use, and disposal of goods and services in King County.

TABLE 5-1
SOURCES OF CONSUMPTION-BASED GHG EMISSIONS FOR KING COUNTY (2015)

Emissions Source	Percent of King County Consumption Emissions
Goods	25%
Services	18%
Buildings	15%
Food	13%
Personal Transportation	12%
Commercial Transportation	10%
Construction	7%

SOURCE: King County Strategic Climate Action Plan (2021).

Table 5-2 depicts the percentage of GHG emissions originating from different operations of the King County government.

TABLE 5-2
KING COUNTY OPERATIONAL GHG EMISSIONS BY SECTOR (2019)

Emissions Source	Percent of King County Operating Emissions
Metro Transit	44%
Landfill Emissions	22%
Buildings and Facilities	14%
Fleet and Equipment	10%
Wastewater Emissions	10%

SOURCE: King County Strategic Climate Action Plan (2021).

According to the data used to inform King County's 2020 Strategic Climate Action Plan, the continued impacts of climate change are projected to result in:

- Increases in the volume and frequency of heavy rainfall events.
- More winter precipitation falling as rain instead of snow in mountain watersheds, which can also increase melting of existing snow.
- Local sea level rise throughout the 21st century under a high emissions scenario, with a projection of likely increases of 0.5 to 0.9 foot relative to current conditions by 2050, with the lower likelihood potential of extreme increases as high as 1 to 2 feet (Miller et al. 2018).

Climate change is projected to increase the intensity and frequency of flooding within the mapped floodplain. Effects of climate change in the floodplain could include higher intensity floods, increased erosion and higher volumes of sediment transport, higher volumes of stormwater runoff, impacts on riparian and floodplain ecosystems as a result of more severe flooding, air temperature changes, and seasonal streamflow pattern changes.

Floodplain areas that lack extensive flood protection facilities are not typically a large source of GHG emissions, due to the low intensity of development in such areas, and flood risk reduction activities have little influence on the overall emissions of these areas. However, some sources of GHG emissions in the floodplain include roads and automobile traffic, commercial and industrial development (such as in areas with significant flood protection infrastructure, like the lower Cedar, lower Green, and Duwamish River floodplains), and agriculture. While natural floodplain environments can often withstand or recover from flood impacts and built environments can be designed to withstand higher severity floods, natural and built environments in the floodplain may not be resilient to potential climate impacts without efforts to enhance or adapt these environments.

5.2 Construction Impacts

5.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction could generate GHG emissions from vehicles, equipment, and materials used in flood risk reduction capital projects. Over time, construction could become less impactful as King County and cities within King County implement energy efficiency improvements and electrification of vehicles and equipment. Construction activities associated with levees and floodwalls, levee setback projects, conveyance capacity projects, property acquisition, property protection, ecological restoration projects, stormwater infrastructure projects, and other structural projects could employ equipment or heavy machinery that emit GHGs. Clearing activities related to construction staging could have minor, temporary impacts on carbon sequestration due to removal of vegetation, as well as minor temporary impacts on climate resilience.

Heavy construction vehicles, such as those used for excavation, fill, demolition, and transportation of materials, could be the largest sources of GHG emissions associated with construction activities. Most levees and floodwalls, levee setback projects, conveyance capacity projects, and other structural projects require extensive use of heavy construction vehicles. New construction of stormwater infrastructure projects or major retrofits typically also require extensive use of heavy construction vehicles, but many small-scale stormwater infrastructure projects or maintenance activities may have less need for extensive use of heavy machinery. Some large-scale ecological restoration projects (such as those adding large wood or excavating new channels), those that are combined with other project types, or those that remove obsolete infrastructure could also require the use of construction vehicles.

Property protection and property acquisition projects could utilize heavy construction vehicles that contribute to GHG emissions, but these projects would likely occur at a smaller scale than many of the capital projects and require less construction vehicle activity. For these project types, site clearing, elevating structures, demolition of structures, and transportation of construction materials would be the primary activities that could contribute to GHG emissions.

The creation and transportation of most manufactured construction materials used in projects for both alternatives could generate GHG emissions. In particular, concrete manufacturing can be a major source of GHG emissions. Conveyance capacity projects (such as replacing culverts with box culverts), levees and floodwalls, stormwater infrastructure projects, and components of other

structural projects could require concrete, which could increase GHG emissions. Most projects could require transportation of natural materials, such as earth and rocks for structural fill, which could increase GHG emissions.

5.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 5.2.1, *Impacts Common to Both Alternatives*.

5.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 5.2.1, *Impacts Common to Both Alternatives*.

5.3 Operational Impacts

5.3.1 Impacts Common to Both Alternatives

Most flood risk reduction infrastructure projects do not utilize energy or generate emissions passively. Pump stations and mechanical components of stormwater management infrastructure can use energy, which can generate emissions and contribute to climate change. Dredging involves heavy machinery used for gravel removal, which could cause emissions during operations, although dredging would be a little-used activity under both alternatives.

Under both alternatives, energy would be utilized to implement programmatic activities from offices, transportation, equipment, and supplies, although neither alternative would be likely to substantially increase GHG emissions for programmatic activities, limiting the potential for programmatic activities to have climate change impacts. Routine maintenance, monitoring, and management operations related to capital projects and infrastructure could increase emissions under both alternatives. These activities could include site visits to capital projects for data collection, vegetation management at ecological restoration or levees and floodwalls, or spot maintenance of stormwater infrastructure projects.

Activities that reduce flood risk would increase resilience to some impacts of climate change, but the degree and duration of resilience benefits vary. For example, structural activities that incorporate current projected climate change effects into the design could provide improved protection from flooding, but the flood protection benefits could be less than expected if the effects of climate change are greater than anticipated. Natural resource protection projects, however, could provide resilience benefits for a longer duration by allowing room for floodwaters to occupy floodplain areas without putting the built environment at risk. While property protection, levees and floodwalls, and other structural projects can provide resilience benefits at the site of the project, they can also increase the impacts of flooding in downstream or off-site areas by changing hydraulic patterns and flood elevations. Conveyance capacity projects may reduce potential flow capacity constraints at the project site, but could also impact downstream areas by enabling higher flow volumes, which could further increase as a result of climate change. Potential downstream or off-site impacts of actions would be identified during design and

project-level environmental review. Levees and floodwalls, levee setback projects, stormwater management projects, conveyance capacity projects, and other structural projects can often be designed to withstand a specified flood severity. Under both alternatives, some infrastructure could be modified to withstand higher severity floods that would be more frequent under climate change, but infrastructure that is not adapted could leave areas protected by this infrastructure vulnerable to climate change, which could have disproportionate impacts on some populations, including BIPOC, low-income, limited English speaking, or disabled communities.

5.3.2 Alternative 1: No Action

The 2006 Flood Plan (which would remain in effect under the No Action Alternative) does not substantially account for climate change, which could result in projects being implemented to design standards that may not be resilient under projected future conditions, although some infrastructure projects would still be implemented to account for higher streamflow events and greater flood volumes.

The 2006 Flood Plan also does not thoroughly account for urban flooding, coastal flooding, or tributary flooding. Climate change would worsen these types of flooding, which could result in impacts on climate resiliency as planning and policy mechanisms may not be in place to sufficiently address these types of flood impacts.

5.3.3 Alternative 2: 2024 Flood Plan

Under Alternative 2, the adoption of the 2024 Flood Plan would involve the implementation of policies that acknowledge climate change and adapting to climate change impacts. This could influence the planning and implementation of projects to account for projected future conditions under climate change. Consideration of future conditions could guide projects to be implemented that are designed to account for more severe flood conditions and accommodate floodwaters, which could enhance climate resilience.

5.4 Avoidance, Minimization, and Mitigation Measures

King County has numerous regulations, policies, and plans in place that are designed to advance climate mitigation and climate adaptation. As a result, climate mitigation and adaptation efforts could be implemented that could avoid, minimize, or mitigate potential impacts from flood risk reduction measures, including:

- Implement energy efficiency improvements in projects, such as proposed energy efficiency improvements to dams and pump stations under both alternatives, as an approach to mitigate construction impacts.
- Follow sustainable procurement practices that call for reducing the emissions associated with construction projects contracted out to private firms, as well as emissions associated with materials acquired for internal operations.
- Pursue fleet electrification in order to reduce emissions from internal construction and operational activities.

- Prioritize projects that provide multiple benefits, including those that incorporate climate change mitigation and adaptation elements.
- Implement ecological restoration activities that can increase resilience through restoring or enhancing natural floodplain or watershed functions and implement activities that protect or restore riparian and upland forests to increase resilience through carbon sequestration. Both can mitigate for GHG emissions and climate resilience impacts associated with construction of activities through long-term enhanced ecological function.
- Involve frontline communities in planning and decision-making processes to identify potential impacts and communities that may be vulnerable to climate impacts, in order to avoid or minimize disproportionate impacts on vulnerable populations.

5.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse climate change impacts. However, individual activities implemented under either alternative could have significant adverse impacts depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 5.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 6
Earth

6.1 Affected Environment

This element of the environment includes soils, sediment, topography, geology, and geomorphic processes in King County.

6.1.1 Relevant Plans, Policies, and Regulations

Plans

Much of King County's planning on topics related to earth (including sediment and soils) is addressed in its Comprehensive Plan, which sets policies that inform regulations for critical areas, shoreline management, floodplain management, earthwork, and dredging. The policies concerning earth in the Comprehensive Plan emphasize reducing and mitigating activities that disrupt earth in critical areas, reducing development that impacts critical areas or involves disruptive earthwork, preserving habitat and ecological functions, and outlining earthwork permitting priorities and restrictions. The Comprehensive Plan also outlines stormwater management policies related to construction and development standards, including erosion and sediment control. These policies promote mitigating stormwater runoff and utilizing green stormwater infrastructure, low-impact development, and measures for improving water quality (King County 2022).

Policies and Regulations

Removal, fill, and disturbance of earth are regulated activities under K.C.C. Chapter 16.82 (Clearing and Grading). A Clearing and Grading permit is required for most earthwork activities; even if an activity is permit-exempt, environmental review for earthwork is still required to determine compliance with King County's Critical Areas Ordinance in all critical areas, such as floodplains, channel migration zones, steep slopes, habitat conservation areas, and wetlands. Earthwork exceeding 500 cubic yards also requires SEPA analysis. K.C.C. Chapter 21A.24 (Critical Areas) outlines protections for sensitive environments, including restrictions and BMPs related to maintenance, grading, clearing, filling, and construction. The Critical Areas Ordinance also regulates development within geologic hazard areas, such as those at increased risk of landslide and channel migration. Fill activities are particularly restricted in the floodplain, which is subject to zero-rise requirements that prevent the addition of materials that could increase the base flood elevation without mitigation measures that provide floodwater storage elsewhere.

Most cities and towns within King County also maintain comparable critical area ordinances, floodplain development regulations, and earthwork regulations. Federal regulations, including

Section 10 of the federal Rivers and Harbor Act, the Clean Water Act, and the Endangered Species Act (all three of which are described in greater detail in Chapter 16, *Water Resources*), include requirements related to dredging, filling, grading, and sediment management.

6.1.2 Earth in King County

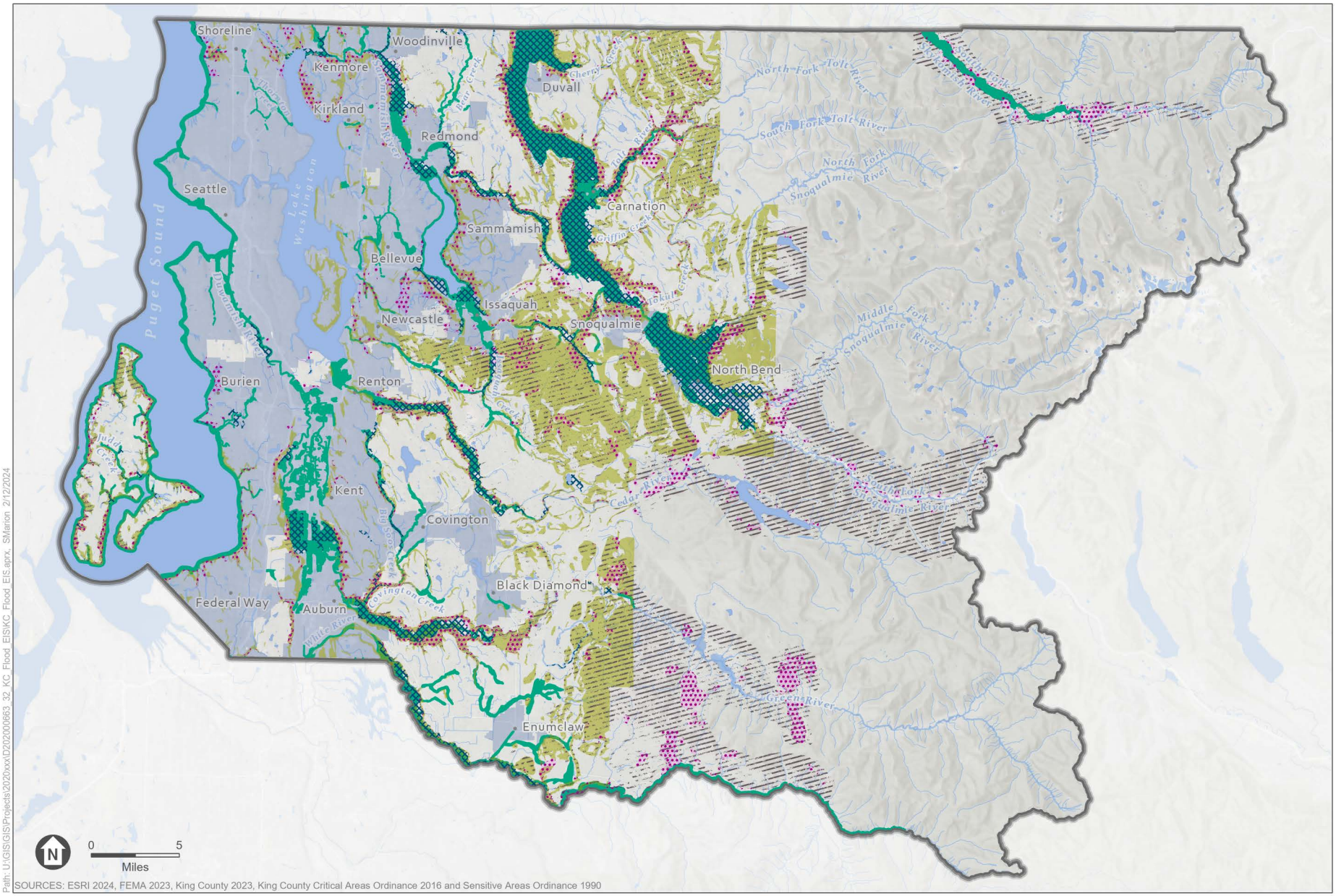
The geology of King County is shaped by the region's extensive history of glacial, seismic, and volcanic activity (WDNR 2015). The western part of King County is largely underlain by unconsolidated sediments, including glacial till and outwash, respectively, deposited by glaciers and glacial meltwater streams during the Pleistocene. Glaciers and meltwater streams also formed much of the present topography of the Puget Lowland, including north-south oriented hills and troughs now occupied by major rivers, lakes, and Puget Sound. Older bedrock crops out in the Cascade Range and its foothills within the eastern part of King County (WDNR 2017). A number of active faults within Western Washington, including those associated with the Seattle Fault Zone, generate earthquakes that can affect King County. Fluvial and coastal processes as well as human activity have also influenced geologic conditions.

Certain sensitive environments and hazardous areas are regulated by the Critical Areas Ordinances and other codes adopted by King County and cities in incorporated areas of King County. These regulations apply to areas that include channel migration zones, steep slope hazard areas, landslide hazard areas, erosion hazard areas, and seismic hazard areas subject to liquefaction. The locations of these areas throughout King County are shown in **Figure 6-1** and are described further below.

Steep slopes are present in many locations in King County, including mountainous uplands areas of eastern King County, high-relief areas of western King County, along river channels and valleys, and coastal bluffs. A large percentage of the steep slopes that have been delineated inland are located at the margins of major river valleys (King County 2019). Steep slopes are studied and regulated to mitigate landslide and erosion risks under Critical Areas Ordinances by King County within unincorporated areas and cities within incorporated areas of King County.

Soils that are at heightened risk of erosion are present through large swaths of King County. Many of the erosion hazard areas in King County are present in coastal areas exposed to wave and tidal action, riverbanks exposed to fluvial processes, and landslide hazard areas and steep slopes that are vulnerable to heavy rainfall. Erosion hazard areas are particularly present along the coast of Vashon-Maury Island, shoreline areas of Lake Sammamish, and along major river corridors, especially in the Snoqualmie River watershed, the Cedar River watershed, and upper reaches of the Green River watershed (King County 2019).

Liquefaction refers to the poorly consolidated, saturated sediments near the ground surface losing their cohesion due to strong ground shaking. This process may lead to failure of overlying structures including buildings, levees, and roads. Low-density soils and artificial fill are at heightened risk of moving during earthquakes. Seismic hazard areas, which consist of liquefaction-prone soils, are present along segments of most of the major rivers in King County, as well as some coastal bluffs, tributaries, and lakes (King County 2019).



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SOURCES: ESRI 2024, FEMA 2023, King County 2023, King County Critical Areas Ordinance 2016 and Sensitive Areas Ordinance 1990

Incorporated Municipalities

Streams

FEMA Flood Zone

Floodplain (Regulatory Floodway, 1% and 0.2% Annual Chance)

Environmentally Sensitive Areas

Erosion Hazard

Seismic Hazard

Environmentally Sensitive Areas, continued

Landslide Hazard

Steep Slope Hazard

King County Flood Plan EIS

Figure 6-1
Geologic Hazards

Last Updated 2/12/2024

ESA

King County has undertaken efforts to preserve prime farmland, which consists of soils and hydrologic conditions that are optimal for agriculture. Prime farmland occurs throughout King County, but few large concentrations of undeveloped prime farmland remain (King County DNRP 2009). King County has protected these areas of prime farmland with its Agricultural Production District land use designations, which are located in areas on the lower Green River, upper Green River, Enumclaw Plateau, Snoqualmie River, and Sammamish River (see Chapter 3, *Agriculture*).

6.1.3 Earth in the Mapped Floodplain

Under the Critical Area Ordinances of King County and cities within it, earthwork is a regulated activity in the mapped floodplain, as well as other critical areas.

Natural fluvial processes affect earth in the floodplains through erosion and aggradation of earth, including related phenomena such as alluvial fans, channel migration, and avulsion. Modifications to earth in the mapped floodplain are present in many areas of King County, such as levees and revetments. These modifications can impact sediment transport, channel migration, recruitment of large wood, and associated geomorphic processes. However, many instances of restoration of natural sediment processes in the floodplain have also occurred in King County, such as through side channel restoration and introduction of large wood.

6.2 Construction Impacts

6.2.1 Impacts Common to Both Alternatives

Most activities involving construction could have varying degrees of impacts on earth from a variety of construction activities that could expose or disturb soils, which in many cases could be in floodplains or other critical areas. These activities include property acquisitions (more specifically, demolition associated with acquisition), property protection, levee setback projects, ecological restoration projects, levees and floodwalls, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Staging of equipment, site clearing, movement of vehicles, and other activities related to construction could cause erosion or otherwise destabilize soils, despite not being excavation or fill activities.

Soils that are present on-site, but unsuitable for reuse as fill or landscaping (such as polluted soils), may need to be removed from a site, which could require increased construction vehicle traffic and potentially increase earth impacts at the construction site. Any contaminated soils would need to be disposed of properly in accordance with the best practices for the type of contamination present. Contaminated soils are possible in many locations in the county and have often been encountered in the lower Green/Duwamish and lower Cedar floodplain areas.

Most of the flood risk reduction activity types that could involve minor soil disturbance could also involve excavation and fill as a part of construction. Property acquisition and property protection activities could involve excavation associated with demolition of acquired structures, excavation associated with the construction of new foundations or other property protection improvements, or fill associated with property protection improvements. Major capital improvements or new construction, levee setback projects, ecological restoration projects, levees

and floodwalls, conveyance capacity projects, stormwater infrastructure projects, and other structural projects could involve excavation or fill in greater volumes than most property protection or acquisition projects. In most cases, these projects could occur in regulated critical areas, with some exceptions for stormwater infrastructure projects in urban areas.

Excavation activities could include the removal of existing levees or other infrastructure for levee setbacks or ecological restoration, removal or replacement of culverts or outdated stormwater infrastructure, sediment management activities like dredging, creating swales or other green stormwater infrastructure, or creating pilot channels and daylighting streams. Fill activities could include expanding or maintaining existing levees and floodwalls and other structural projects, constructing or maintaining setback levees, and structural fill or landscaping around new culverts or stormwater infrastructure. Some ecological restoration projects (such as maintenance, planting, and invasive plant removal) and stormwater infrastructure projects (such as maintenance and retrofits) would be unlikely to require substantial excavation or fill and may have little or no impact on earth.

For activities implemented under either alternative, elements of the activity that affect the level of construction impacts on earth (such as the volume of excavation or extent of construction in geological hazard areas) would be identified and characterized as part of project-level planning and design. All activities would undergo the appropriate level of project-level permitting and impact analysis. As many of these activities could occur in or around critical areas, including geological hazard areas, incorporating BMPs around erosion, unstable soils, and stormwater runoff would be integral parts of construction planning.

6.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 6.2.1, *Impacts Common to Both Alternatives*.

6.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 6.2.1, *Impacts Common to Both Alternatives*.

6.3 Operational Impacts

6.3.1 Impacts Common to Both Alternatives

Many of the projects common to both alternatives have ecological restoration benefits that could avoid or minimize impacts but could result in initial changes that produce short-term impacts. Conveyance capacity projects such as culvert removal could provide habitat or ecological improvements, but the increased flow capacity could also result in increased sediment deposits downstream, especially in the short term due to upstream sediment buildup caused by the constraints of culverts being released downstream. Levee setbacks or ecological restoration projects, which reconnect floodplains or restore channels, could increase exposure of floodplain soils to streamflow or floodwaters, potentially temporarily increasing sedimentation from areas that were previously not exposed to flowing water. These areas could be exposed to erosion,

channel migration, and other earth impacts in the long term, but this would be the result of more natural geomorphic processes, as opposed to the direct impact of a project.

Levee setback projects, levees and floodwalls, conveyance capacity projects, stormwater infrastructure projects, and other structural projects could have long-term earth impacts, including increasing sedimentation downstream or restricting sediment transport. Structural fill and maintenance, such as vegetation removal, could increase runoff and erosion from levee setback projects, levees and floodwalls, conveyance capacity projects, and other structural projects. Similarly, levees and floodwalls, conveyance capacity projects, and other structural projects can increase the speed of streamflow, which can increase downstream erosion, incision, or channel migration. Conveyance capacity activities, particularly dredging, could impact soil health and ecological processes that rely on sediment deposition at the site of dredging or in downstream areas. However, these types of impacts are typically considered as part of project design and can be avoided or minimized.

Other structural projects, such as pump stations, can inhibit natural sediment transportation functions by limiting the amount of sediment transported downstream, but pump stations could also drive increased sediment transportation downstream, if not capturing sediment.

6.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 6.3.1, *Impacts Common to Both Alternatives*.

6.3.3 Alternative 2: 2024 Flood Plan

Operational impacts for Alternative 2 would be the same as described in Section 6.3.1, *Impacts Common to Both Alternatives*. In addition, Alternative 2 could include the adoption of alluvial fan hazard regulations, which could increase the area subject to activity restrictions to reduce geological hazards or result in the creation of new restrictions. Alluvial fan hazard regulations could reduce the amount of future construction that could result in earth impacts or require increased mitigation of potential impacts.

6.4 Avoidance, Minimization, and Mitigation Measures

The 2024 Flood Plan's goals, guiding principles, and policies establish the value of and prioritize preserving and enhancing natural processes, as well as avoiding or mitigating activities that could be harmful to these processes where feasible. The 2024 Flood Plan's emphasis on multiple benefits also indicates that where flood risk reduction could harm natural processes, such as geomorphic processes, efforts should be taken to mitigate those impacts and, ideally, improve ecological conditions. Specific mitigation measures for construction and operation of flood risk reduction activities would be identified as part of project design and project-level permitting and environmental review. Example mitigation measures could include:

- Avoid construction in geologically hazardous areas (such as steep slopes) where feasible.
- Use erosion and sediment control measures during construction.

- Implement construction BMPs.
- Pursue projects that could improve the capacity for natural geomorphic processes in the long term, such as certain conveyance capacity projects, levee setbacks, and ecological restoration projects.
- Implement gravel removal activities consistent with the policies in the 2024 Flood Plan, which state that, unless a project is congressionally authorized or being undertaken to address threats to critical infrastructure, King County should only pursue gravel removal activities that result in a net gain in habitat functions and values.
- Identify opportunities to align or combine multiple benefit project opportunities, which could potentially increase the intensity of construction activities in the short term but could reduce the duration or number of construction projects at a site by combining the projects into a single activity.
- Increase the implementation of self-sustaining, nature-based flood risk reduction activities, which could reduce impacts over time by reducing the need for maintaining flood risk reduction infrastructure.

6.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on earth resources. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 6.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 7
Historic and Cultural Resources

7.1 Affected Environment

The National Park Service defines *cultural resources* as "physical evidence or place of past human activity: site, object, landscape, structure; or a site, structure, landscape, object or natural feature of significance to a group of people traditionally associated with it" (National Park Service 2023). As such, this definition encompasses *archaeological* resources and *historic* (or *built environment*) resources. *Archaeological* resources are sites, objects, or districts that contain tangible evidence (typically buried) of past human activity that occurred 50 or more years ago. *Historic* resources are sites, structures, objects, buildings, or districts that are over 50 years old – the term only indicates age, not significance of the resource. Resources that have been listed in the National Register of Historic Places (NRHP) or determined eligible for listing are referred to as *historic properties*.

In the State of Washington, certain cultural resources requirements apply to cemeteries and human remains, and these resources would generally be expected to be susceptible to similar types of impacts that would affect archaeological sites. The National Park Service also recognizes an additional type of cultural resource – Traditional Cultural Properties (or TCPs) – which "can be defined generally as [a resource] that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community" (National Park Service 1992). Within King County, there are currently no "publicly released" TCPs on the Washington State Department of Archaeology and Historic Preservation's (DAHP) Washington Information System for Architectural and Archaeological Records Database (WISAARD) (DAHP 2023a). However, due to the often-sensitive nature of TCPs, this lack should not be interpreted to mean that tribes or other living communities do not have recognized TCPs.

7.1.1 Relevant Plans, Policies, and Regulations

Plans

Historic Resources

The King County Comprehensive Plan includes the following policies related to historic resources:

- **P-216** – King County shall administer a historic preservation program to identify, protect and enhance historic properties throughout the region.
- **P-218** – King County shall establish comprehensive review and protection procedures for historic properties affected by public and private projects.

- **P-219** – King County may condition public and private projects in order to protect historic properties. King County agencies shall coordinate with the Historic Preservation Program to provide consistent review and mitigation for their projects and undertakings throughout the county.

Archaeology/Cemeteries/TCPs

The Comprehensive Plan includes the following policies related to cultural resources:

- **P-201** – King County shall be a steward of cultural resources under its control. It shall identify and evaluate cultural resources, preserve public art works and significant historic properties, and interpret and provide public access to them whenever appropriate. County departments and divisions shall collaborate with the Historic Preservation Program to nominate eligible properties for landmark designation.
- **P-202** – King County shall consider equity and racial, social, and environmental justice in its promotion and protection of cultural resources.[1]

Policies and Regulations

The protection of cultural resources in the state is overseen by the State Historic Preservation Office (SHPO), also known as the DAHP. Additionally, any federal undertakings – projects that require federal permits, occur on federally owned land, receive federal funding, etc. – are subject to Section 106 of the Historic Preservation Act ("Section 106"). Section 106 requires that the lead federal agency consider the effects of the undertaking (a particular project) on historic properties within the project's Area of Potential Effect, and this includes a requirement that an effort be made to identify historic properties as part of the undertaking. If properties are adversely affected, mitigation may be required. Additionally, projects that are not subject to Section 106 but are state-funded construction or acquisition projects, including grant and pass-through funds, are subject to Governor's Executive Order (GEO) 21-02. GEO 21-02 has similar requirements for projects to consider any effects it might have on historic properties and possible mitigation. Any individual project under either alternative may be subject to Section 106 or GEO 21-02.

Historic Resources

Although Section 106 and GEO 21-02 do not apply to all projects, many municipalities have additional protections for historic resources within their jurisdiction. The King County Historic Preservation Program (KCHPP) is responsible for review of county projects involving cultural resources through King County Executive Policy LUD 16-1-1-EP – Cultural Resources Review and Protection. This review includes projects in both unincorporated King County and incorporated areas. KCHPP also reviews private and non-county public projects through K.C.C. 20.62. These include projects impacting cultural resources listed in the County's historic resource inventory (HRI) and those designated as local landmarks. KCHPP has interlocal agreements with approximately two-thirds of the county's incorporated cities. These interlocal agreements allow the Historic Preservation Program to provide landmark designation and protection services (and other cultural resource reviews) using local municipal codes that have adopted K.C.C. 20.62 by

[1] The inclusion of racial justice is a proposed update for the 2024 Comprehensive Plan.

reference. Many municipalities in King County have their own regulations that apply to historic resources. Some examples include:

- The City of Kent Landmark Designation and Preservation (Kent City Code Chapter 14.12).
- The City of North Bend Historic Preservation (North Bend City Code Chapter 15.16).
- The City of Redmond Historic and Archaeological Resources (Redmond Municipal Code Chapter 21.30.
- The City of Seattle Landmarks Preservation (Seattle Municipal Code Chapter 25.12).
- The City of Snoqualmie Historic Overlay Zones and Landmarks (Snoqualmie Municipal Code Chapter 17.35).

Archaeology/Cemeteries/TCPs

RCW 27.53 (Archaeological Sites and Resources) provides protections for archaeological sites and resources. RCW 68.60 (Abandoned and Historic Cemeteries and Historic Graves) provides protections for historic cemeteries and graves. RCW 27.44 (Indian Graves and Records) provides specific protections to Indian graves. RCW 68.50 (Human Remains) provides guidance regarding the inadvertent discovery of human remains in general.

7.1.2 Cultural Resources in King County

Historic Resources

Historic resources are located throughout King County, in both urban and rural areas. Buildings (residences, barns, commercial structures, etc.) typically are the most identifiable resources, but other resources can include levees, dams, culverts, bridges, and landscapes, among a wide variety of other types.

Archaeology/Cemeteries/TCPs

More than 1,000 archaeological resources have been recorded throughout King County (DAHP 2023a). Cumulatively, the resources demonstrate at least 11,000 to 12,000 years of human occupation within King County. These include some of the oldest known archaeological sites in Western Washington, including evidence for human habitation of King County by the Pleistocene-Holocene transition, around 12,000 years ago (Kopperl et al. 2010; 2015). A wide range of Indigenous site types from the ancestors of today's federally recognized Muckleshoot Indian Tribe, Puyallup Tribe of Indians, Snoqualmie Indian Tribe, Stillaguamish Tribe of Indians, Suquamish Tribe, and Tulalip Tribes, and non-federally recognized Duwamish Tribal Organization are represented in King County including (but not necessarily limited to) villages; seasonal occupation sites; procurement and processing sites for resources including birds and mammals, shellfish, fish, and plants; quarries for obtaining raw materials to make stone tools; culturally modified trees; trails; rock art; and burial sites (Kopperl et al. 2016). Post-contact sites, falling in the period from early contact between Indigenous and non-Indigenous people to the last 50 years, are also widespread and contain traces related to past domestic existence, commerce, and industry, including economic pursuits such as transportation and trade, coal mining, logging, and agriculture, and other aspects of life.

King County contains numerous marked cemeteries, as well as many unmarked burial sites. As noted above, there are no publicly released TCPs in King County within DAHP's WISAARD.

7.2 Construction Impacts

7.2.1 Impacts Common to Both Alternatives

Historic Resources

Under both alternatives, construction activities could occur in proximity to historic resources and/or physically impact them through activities like renovation, relocation, and demolition.

Several common impacts from construction activities occur in proximity to historic resources. These include noise, dust, vibration, and visual impact, although not every project has every effect on every resource. Typically, these impacts are temporary and only last for the time of construction. Vibrations have the potential to damage resources, based on their intensity and duration, along with the resilience of the structure itself.

Projects that physically alter historic resources will affect them. These types of activities include infrastructure maintenance, property acquisition and protection, levee setback, post-disaster recovery options, levee and floodwall projects, conveyance capacity projects, or any other projects that involve the relocation, rehabilitation or improvements, elevation, and/or demolition of a historic resource. Although some of these activities, such as the relocation of a building, may be intended to ultimately preserve the resource, the changes will have an effect.[2] Typical types of effects include physical, atmospheric, socioeconomic, visual, auditory, and neglect; cumulative effects are also considered. These impacts can be temporary (most often during construction) and/or permanent, and all are considered.

The types of projects included under both alternatives are likely to have a potential effect on a variety of resources. Some of the most common types of resources are expected to be levees, culverts, dams, and other water-related infrastructure. It is also expected that buildings will be impacted due to their ubiquity and human preference for proximity to water. Based on the types of projects to be implemented under the alternatives, typical impacts would likely include physical (relocation, demolition, elevation, rehabilitation/improvements) and visual (alterations to an area's setting and/or viewshed), although this is dependent on project specifics. It is also possible that some projects may have a cumulative effect – if an area is notably changed, this can have an impact on surrounding resources.

Archaeology/Cemeteries/TCPs

Under both alternatives, it is possible that construction activities could occur near or within archaeological sites and districts, cemeteries and areas containing unmarked human remains, and TCPs. Construction noise is unlikely to affect archaeological sites and districts, and cemeteries, but could affect the characteristics of TCPs that draw people to them. For example, loud noises

[2] It is implied that within the context of historic resources, effects/impacts are negative. There is no language or regulatory framework to discuss possible positive effects. Instead, possible project effects/impacts are weighed against the expected project outcomes.

could discourage the use of traditional sacred sites or could drive away animals that are integral to the use of a TCP. Similarly, impacts on the visual setting due to the presence of equipment or lighting, as well as nuisance dust, during construction could affect TCPs in ways similar to noise.

Construction ground disturbance within archaeological sites and districts, as well as cemeteries, has the potential to damage or remove buried resources. Types of activities that could impact these resources if construction occurs include preventive activities, property acquisition (if demolition of existing structures is included), property protection (if ground-disturbing construction is required), levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, or other structural projects. Projects with larger construction footprints, such as levee setbacks, are likely to have the greatest impacts on buried resources due to the larger amount of ground disturbance.

For any activities implemented under either alternative, elements of the activity that affect the level of impact of construction on cultural resources would be identified as part of project-level planning and design. All activities would undergo the appropriate level of project-level permitting and impact analysis.

7.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 7.2.1, *Impacts Common to Both Alternatives*.

7.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for t Alternative 2 would be the same as described in Section 7.2.1, *Impacts Common to Both Alternatives*.

7.3 Operational Impacts

7.3.1 Impacts Common to Both Alternatives

Historic Resources

Acquisition and subsequent alteration/demolition of historic resources would have the same impacts for both alternatives as described in Section 7.2.1 for construction impacts.

Archaeology/Cemeteries/TCPs

Whether or not the operation of specific activities would be positive or negative for cultural resources is dependent on specific local conditions and the design of the project and can often be addressed in project design.

Broadly speaking, however, alternatives are intended to reduce the magnitude and frequency of flood events. If flood events are large enough or frequent enough, they may result in stream channel migration or avulsion or other types of erosion that lead to increased potential for resources within archaeological sites and districts, and cemeteries and unmarked human remains, to be damaged or removed. Therefore, while construction activities, such as

setbacks/extensions/height increases to levees, or ecological restoration projects, may cause localized damage to or removal of cultural resources, their operation may ultimately lead to the preservation of a greater number of other resources. Flood Plan activities that increase floodplain connectivity, however, could potentially increase impacts on cultural resources by encouraging channel migration within areas that were frequently inhabited by Indigenous and historical people.

Several activity types could benefit archaeological sites and districts, cemeteries and areas containing unmarked human remains, and TCPs as a result of operation. Natural resource protection of open space, property protection (if no demolition is conducted), and cessation of ground-disturbing agricultural activities protect in-ground cultural resources by preserving existing open space or discontinuing ground-disturbing practices.

7.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 7.3.1, *Impacts Common to Both Alternatives*.

7.3.3 Alternative 2: 2024 Flood Plan

Operational impacts for Alternative 2 would be the same as described in Section 7.3.1, *Impacts Common to Both Alternatives*.

7.4 Avoidance, Minimization, and Mitigation Measures

7.4.1 Historic Resources

Mitigation can take several different forms and is highly dependent on the project and its goals, the type of effect(s), and the significance and type of resource being adversely affected. Specific mitigation measures for construction and operation of flood risk reduction activities would be identified as part of project design and associated permitting and cultural resources review. According to DAHP (2023b), "mitigation measures may include public participation activities, support for an alternate cultural resource, or general non-site-specific mitigation. There is no such thing as a standard mitigation package." Based on the project types included in the alternatives and likely types of resources that may be affected, probable mitigation for individual projects includes history essays, additional documentation, salvage, historic context development, interpretive signage, elevation/relocation over demolition, and/or GIS Story Maps.

While disaster responses prioritize health and safety, historic resources may be condemned in instances where they need not be. Integrating historic preservation alongside disaster mitigation planning can guide responses and minimize unnecessary loss to the area's historic fabric. It can also help direct later recovery efforts and reduce the burden for on-the-ground efforts.

7.4.2 Archaeology/Cemeteries/TCPs

Avoidance of impacts on archaeological resources, cemeteries and human remains, and TCPs is preferred over minimization, which, in turn, is preferred over mitigating for effects. Avoidance of

archaeological resources, cemeteries, and human remains is dependent on the completion of project-specific cultural resources assessments that include archival research and consultation with tribes and other interested parties, and usually field studies, to identify the presence of resources. Efforts to avoid TCPs is dependent upon consultation with tribes and other communities that may recognize and value the TCPs within the study area.

Mitigation under applicable regulations, whether at the local, state, or federal level, is typically dependent on consensus building through consultation with tribes and other interested parties. This allows substantial flexibility in the determination of appropriate mitigation measures.

7.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on historic and cultural resources. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 7.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

7.6 References

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CHAPTER 8
Indian Tribal Rights and Resources

8.1 Affected Environment

Indian tribal rights include rights reserved in treaties and rights inherent to tribes whether they are recognized treaty tribes or not. Tribal resources include spiritual and cultural resources as well as plants, wildlife, and fish used for spiritual, ceremonial, subsistence, or commercial purposes.

8.1.1 Relevant Plans, Policies, and Regulations

Plans

Under the Endangered Species Act (ESA) and Washington State law, plans must be developed to outline strategies for recovery of listed salmon species. Washington State co-manages fisheries with treaty tribes to guide recovery efforts. The Puget Sound Salmon Recovery Plan was drafted in 2005 and adopted by the National Oceanic and Atmospheric Administration (NOAA) in 2007 as a path to recovery for threatened Puget Sound Chinook salmon (*Oncorhynchus tshawytscha*). In 2020, NOAA finalized a recovery plan for steelhead (*O. mykiss*). These plans outline a path toward self-sustaining salmonid populations that would support delisting of Puget Sound salmonid species and upholding tribal fishing rights (NMFS 2007). The Recovery Plans include regional and watershed-based recovery plans for each major population group and watersheds with spawning and rearing populations. The watershed-based recovery plans and their implementation are guided by watershed forums comprised of partners from local, state, and federal governments; tribes; and non-governmental organizations. In 2014, the Lake Sammamish Kokanee Work Group developed the *Blueprint for the Restoration and Enhancement of Lake Sammamish Kokanee Tributaries*, which recommends actions to support kokanee recovery (Lake Sammamish Kokanee Work Group 2014).

Tribal governments in the region were key partners in developing King County's Clean Water Healthy Habitat Strategic Plan (CWHH). The CWHH is a King County initiative to protect and restore water quality and habitat. CWHH centers on six 30-year goals that focus on improving fish habitat and river floodplains, reducing pollution, controlling stormwater runoff, and building resilient marine shorelines. The CWHH establishes in its purpose the intent to fulfill tribal treaty rights and includes goals of restoring abundant salmon populations (King County 2020).

King County maintains a Comprehensive Plan in accordance with Washington's GMA. The current Comprehensive Plan was adopted in 2016 and has been updated several times, most recently in 2022. The Comprehensive Plan is currently in the process of a major 10-year update. The Comprehensive Plan outlines policies related to planning and coordination with tribes. These

policies include guidance or standard operating procedures that involve working with or consulting tribes in planning processes, management of resource lands, water supply planning, habitat and sensitive environment protection efforts, and identifying and protecting historic and cultural resources. While this is reflected in many of the Comprehensive Plan policies, the core principle of these other policies is reflected in the Comprehensive Plan policy under which King County has invited local tribes to join the County in a coordinated land use planning process and is simultaneously seeking comment from tribes during its planning process (King County 2022).

Policies and Regulations

Under the United States Constitution, a treaty made by the United States is the supreme law of the land, entailing that treaty rights are perpetual and cannot be denied by other laws. Treaty tribes retain any inherent rights that are not forfeited under treaties.

Multiple federal laws establish protections, rights to access, or processes for consulting with tribes with regards to historical and cultural resources, including:

- **The National Historic Preservation Act of 1966,** which requires federal agencies to consult with Native American tribes before conducting any activities that could affect their historic sites or associated rights.
- **The American Indian Religious Freedom Act of 1978**, which protects spiritual and culturally significant sites on public lands and requires that Native American religious practices be allowed or accommodated on public sites.
- **The Archaeological Resources Protection Act of 1979,** which requires federal agencies to consult with tribes with regard to activities on archaeological sites.

Some tribal rights have been clarified or reaffirmed through federal court cases. Notable court cases that have upheld or set standards for tribal rights include:

- *Winters v. United States* (1908) — The ruling of this case affirmed that the establishment of a reservation entailed that sufficient water rights to satisfy the use of the reservation were guaranteed, referred to as reserved water rights. The ruling also affirmed that access to water was a right guaranteed for pre-existing tribal uses such as hunting and fishing, referred to as aboriginal water rights.
- *United States v. Washington* (1974) — This case reaffirmed fishing rights of tribes with treaties in the Pacific Northwest and established that tribes held a right to up to half the fish harvest each year. This ruling, commonly referred to as the Boldt Decision, established the grounds for tribes and Washington State to co-manage fisheries. *United States v. Washington* (1994) further determined that fishing rights were intended to apply broadly in relation to biological life forms, including shellfish in addition to finfish.
- *United States v. Washington* (2018) – This Supreme Court case affirmed lower court rulings that culverts maintained by the Washington State Department of Transportation (WSDOT) violated tribal fishing rights by impeding fish migration. This ruling required that WSDOT remove almost 2,000 culverts that impede access to upstream habitat, also reaffirming that that tribes retain a right to protect off-reservation fish habitat.

The RCW includes numerous laws that guide government-to-government relations with tribes, including on topics related to land use, natural resource management, cultural and archaeological resources, and rural development. In many cases, state agencies are required to pursue government-to-government collaboration or cooperation with tribes for planning processes and other agency actions, but there are few requirements for counties or local governments to pursue similar engagement mechanisms with tribes when undertaking government actions that could affect tribal rights or resources. County and local government collaboration with tribes is often guided by internal policies or interlocal agreements (Urban Transitions Planning Studio 2020).

8.1.2 Tribal Treaty Rights and Resources in King County

King County is located on the ancestral lands of the Coast Salish Peoples, who are the traditional stewards of this region. Tribes with reservations or interests in King County include the Muckleshoot Indian Tribe, Snoqualmie Indian Tribe, Puyallup Tribe of Indians, the Tulalip Tribes, Suquamish Tribe, and the Duwamish Tribe (not federally recognized). Spiritual sites, historical sites, and usual and accustomed fishing sites are types of geographic locations that are important to tribal culture. Hunting of wildlife and gathering of plants is a right for recognized treaty tribes on open and unclaimed lands, which are not restricted to the usual and accustomed lands of tribes or their activities. Access to these locations is guaranteed through tribal rights, consistent with treaties and federal law.

Tribes existed as sovereign nations prior to existence of the United States. Tribal rights existed before the U.S. Constitution and before U.S. treaties were established. The treaties the tribes entered into with the U.S. reserved the sovereign rights inherent in tribes and exclusive to the tribes. The ability to access and use resources to which rights are reserved is critical to upholding treaty rights and ensuring tribal sovereignty. As such, it is important for members of tribes to be able to access usual and accustomed fishing grounds, uplands, culturally significant sites, and other locations where rights like hunting, gathering, and other spiritual and cultural practices can be exercised.

The Treaty of Medicine Creek and Treaty of Point Elliott are the primary treaties applicable to lands and tribes in King County. Both treaties ceded aboriginal title to land, established reservations, and retained fishing, hunting, and gathering rights within the signatory tribes. The Duwamish, Muckleshoot, Snoqualmie, and Tulalip tribes were signatories of the Treaty of Point Elliott in 1855, and the Muckleshoot and Puyallup tribes were signatories of the Treaty of Medicine Creek in 1854. While the Snoqualmie Tribe is a recognized signatory of the Treaty of Point Elliott, federal courts have ruled that the tribe is not the governmental successor to those treaty rights in the legal sense, and therefore whatever fishing, hunting, and gathering rights the tribe may have are not derived from treaty. (*see Snoqualmie Tribe v. Washington* (2021).

Access to usual and accustomed fishing grounds includes the ability to access tributaries, lakes, and major rivers. Court cases affirming treaty rights have found that violations of treaty fishing rights can include physical barriers blocking fish habitat, restricted streamflow that limits fish habitat or viability, and other environmental harms that could impact the ability for tribes to use fishing sites or that could impact the ability of fish to access or survive in usual and accustomed fishing sites. In efforts to uphold and protect their fishing rights and support healthy ecosystems,

the tribes with rights and resources in King County have been extensively active in floodplain and watershed management planning, advancing fish habitat and ecological restoration efforts.

Tribal resources and rights to use and access those resources span multiple elements of the environment. Potentially affected elements of the environment that are connected to tribal rights and resources are described in further detail in the following chapters:

- Chapter 4 (*Aquatic Resources*)
- Chapter 7 (*Historical and Cultural Resources*)
- Chapter 13 (*Riparian and Terrestrial Resources*)
- Chapter 16 (*Water Resources*)

8.2 Construction Impacts

8.2.1 Impacts Common to Both Alternatives

Large structural projects, such as levee and floodwall projects, other structural projects, and levee setback projects, could have impacts on the ability to access usual and accustomed fishing grounds within the construction footprint for extended periods of time, although temporary. During construction, barriers to access would likely include fencing or other construction site boundaries used for public safety, which would be removed after the construction phase to restore access in most cases. However, structural activities that affect the movement of water (such as levees) or that affect vegetation (such as clearing) could impact access beyond the construction phase, even after temporary fencing is removed. Impacts on access would likely be limited to shoreline and riparian areas, while access and navigation of adjacent waterbodies would be feasible from other points. Conveyance capacity projects, particularly gravel removal projects that involve instream work, could impact the ability to access water or navigate waterbodies in or around a project site. Gravel removal could also have substantial impacts on the habitat, productivity, and viability of fish stock to which tribes have rights (see Chapter 4, *Aquatic Resources*, for more information). However, gravel removal projects would be rare, and proposed activities under both alternatives include few and targeted gravel removal projects.

Any project with construction could potentially impact tribal cultural, archaeological, or spiritual sites. Projects involving excavation or other ground disturbance could be more likely to impact tribal sites and resources present at those sites. Levee setback projects, levee and floodwall projects, and other structural projects often have large construction footprints that could increase the potential for impacts on tribal resources and the potential scale of the impacts. Property protection, property acquisition, ecological restoration, and stormwater infrastructure projects typically have small footprints, resulting in lower likelihood of impacts on tribal resources or greater potential for the impact to be minor in scale. These types of projects also typically have smaller operating impacts than larger structural projects, which could further minimize potential impacts. Projects on public lands, where tribal use of resources and access to sites have greater protections, could be more likely to have an impact on tribal rights and resources. More information on potential impacts on cultural and archaeological resources is included in Chapter 7 (*Historic and Cultural Resources*).

Projects that involve excavation, clearing, or other site disturbances could have temporary impacts on fish, wildlife, and plants that are important resources for tribes. These projects include property protection, property acquisition, maintenance and construction of levees and floodwalls, levee setback projects, ecological restoration projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Activities that could temporarily increase runoff or erosion could affect water quality and be potentially harmful to fish, which could impact fishing rights. While site disturbances from construction of flood risk reduction activities may have temporary impacts, the operation of some activity types, particularly structural activities, could result in similar impacts for longer periods or permanently (described further in Section 8.3, *Operational Impacts*). More information on projects that could increase runoff or erosion is included in Chapter 6 (*Earth*). Activities involving site clearing and excavation could directly impact plants and the habitat of wildlife that may be culturally significant. Refer to Chapter 13 (*Riparian and Terrestrial Resources*) for more information on potential impacts on plants and wildlife.

8.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 8.2.1, *Impacts Common to Both Alternatives*.

8.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 8.2.1, *Impacts Common to Both Alternatives*.

8.3 Operational Impacts

8.3.1 Impacts Common to Both Alternatives

Levee and floodwall projects, other structural projects, conveyance capacity projects, and stormwater infrastructure projects could be harmful to fish that are important to tribal rights. These types of projects can increase streamflow and stormwater runoff, erosion, and sediment deposition, which can impact the health, viability, and productivity of fish. Polluted stormwater runoff can be toxic to fish, with potential increases to risk from stormwater infrastructure projects that can convey greater volumes of stormwater. Projects that channelize rivers and streams, including maintenance and rehabilitation of existing shoreline armoring, can increase flows and erosion, with the sediment impacting water quality and having the potential to smother salmon redds and harm or kill rearing juveniles, which can impact the total fish stock. For more information on potential impacts on fish refer to Chapter 4 (*Aquatic Resources*).

Levee and floodwall projects and other structural projects could impact access to waterbodies, which could affect fishing rights or the exercise of other rights that require access to waterbodies. These types of projects would be unlikely to completely impede access to a waterbody but could limit the points of access or create additional challenges to access.

Maintenance of levee and floodwall projects and other structural projects, such as vegetation removal, could impact terrestrial resources, such as plants and animals, by direct removal of vegetation or impacts on habitat that affect viability of plant and animal species. Impacts on plants and animals could have minor impacts on tribal hunting and gathering rights, with maintenance impacts being mostly limited to project sites and not substantially affecting the viability of plant and animal populations at a county or regional level. For more information on potential impacts on plants and animals, refer to Chapter 13 (*Riparian and Terrestrial Resources*).

8.3.2 Alternative 1: No Action

While the 2006 Flood Plan policies that would be in place under the No Action Alternative establish that floodplain management activities should involve coordination with tribes and be in accordance with salmon recovery plans, the No Action Alternative does not establish policy mechanisms for incorporating habitat benefits into flood hazard management, nor does it explicitly identify that flood hazard management be performed in a way that honors tribal rights. As such, flood hazard management activities could involve fewer ecological and habitat restoration benefits, and impacts on tribal rights could be more substantial.

8.3.3 Alternative 2: 2024 Flood Plan

The 2024 Flood Plan policies that would be in place under Alternative 2 establish that flood hazard management activities should honor tribal rights and that flood hazard management activities should be planned in coordination with tribal governments, other jurisdictions, and other interested partners to produce multiple benefits, including those that support habitat restoration, environmental justice, and equity. These policies would likely guide projects toward enhancing salmon habitat and other natural processes, which could support wildlife and plants that are subject to hunting and gathering rights. The emphasis of the Alternative 2 policies on honoring tribal rights could reduce the potential for projects to directly impact tribal rights or resources, including through collaborative planning with a focus on multi-beneficial outcomes.

8.4 Avoidance, Minimization, and Mitigation Measures

Specific mitigation measures would be determined through direct coordination with tribes during government-to-government consultations. These measures would be developed as part of design, permitting, and consultation for individual actions. In many cases mechanisms for mitigation and requirements for consultation with tribes are established in existing policy and would be undertaken. Required mitigation and other potential measures include:

- Seek early comment from tribes and consult with tribes during planning processes on potential impacts on tribal resources to identify acceptable mitigation measures and potential locations of tribal resources to avoid impacting them.
- Apply no net habitat loss (No Action Alternative) and net ecological gain (Alternative 2) requirements for gravel removal.
- Implement BMPs and runoff and erosion control measures to reduce the potential for disturbances to earth and vegetation that could impact plants, wildlife, or fish.

- Apply mitigation tactics identified in Chapter 12 (*Recreation and Public Access*), which would reduce impacts on public access and could support continued access by tribal members to usual and accustomed fishing grounds, open and unclaimed lands, and other important sites.
- Apply mitigation tactics identified in Chapter 4 (*Aquatic Resources*), Chapter 7 (*Historical and Cultural Resources*), Chapter 13 (*Riparian and Terrestrial Resources*), and Chapter 16 (*Water Resources*), which could reduce potential impacts on tribal resources.

8.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on Indian tribal rights. However, individual activities implemented under either alternative could have significant adverse impacts depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 8.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

8.6 References

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CHAPTER 9
Land and Shoreline Use

9.1 Affected Environment

9.1.1 Relevant Plans, Policies, and Regulations

King County manages its land and shoreline use with a regulatory framework that is guided by plans that the County is required to maintain under Washington State law. In particular, Washington's GMA and Shoreline Management Act set requirements for local and county governments to establish plans and regulations for managing growth, land use and zoning, provision of services, capital planning, and environmental protection.

Plans

King County maintains a Comprehensive Plan in accordance with Washington's GMA. The current Comprehensive Plan was adopted in 2016 and has been updated several times, most recently in 2022. The Comprehensive Plan is currently in the process of a major 10-year update. The Comprehensive Plan includes policies and strategies for growth management related to land use, housing, capital facilities, utilities, rural development, transportation, and climate change. Within these elements required by the GMA, the King County Comprehensive Plan includes policies that guide land use planning around topics that include restricting development in the floodplains and other hazard areas, managing and reducing stormwater runoff, natural resource conservation, and climate change resilience. In addition to reinforcing floodplain and hazard area land use regulations, which are described in the following section, the Comprehensive Plan policies provide guidance for supporting productive agriculture, aquatic species viability, and ecological function in waterbodies and floodplains (King County 2022).

King County's strategic plans provide management guidance for achieving county goals on topics that are not extensively addressed in required planning updates, such as the Comprehensive Plan. King County's 2020 Strategic Climate Action Plan provides a 5-year framework for reducing greenhouse gas (GHG) emissions and increasing resilience to climate change. Key priorities of this plan include reducing shoreline armoring to enhance ecological function and updating land and shoreline use codes to account for future climate conditions (King County 2021).

King County also engages with regional entities in the development and implementation of collaborative, interjurisdictional land use planning. The PSRC's VISION 2050 Regional Growth Strategy establishes growth management policies that address similar categories to the King County Comprehensive Plan, except on a regional scale. VISION 2050's key policies related to flood hazard management include restricting the siting of critical facilities and hazardous

industries outside of current and future flood hazard areas, siting development to protect ecological functions and sensitive environments, and climate resilience through ecological restoration (PSRC 2020). King County works with the jurisdictions within it to develop Countywide Planning Policies that guide the implementation of VISION 2050's growth management strategies within incorporated and unincorporated King County. The Countywide Planning Policies inform local efforts related to the environment (including flood hazards and water resources), development patterns, housing, economic activity, transportation, and public facilities and services (Growth Management Planning Council 2021).

Policies and Regulations

Land and shoreline use in King County is regulated by King County government in unincorporated areas and city governments in incorporated areas. County and city governments do not typically have authority over land use activities on state and federal lands, such as in Washington State Parks or National Forest Service lands.

K.C.C. Title 21A (Zoning) details land use regulations for King County's jurisdiction. The Zoning Code regulates land use districts, allowed property uses in each district, dimensional standards for structures, and other provisions for protection of the environment, health, and public safety. King County's Land Use Code is a codification of its Comprehensive Plan, which establishes policies that accommodate development in areas prioritized for growth, as well as restricting development in areas that are prioritized for or required to be protected, such as floodplains, shorelines, and critical areas. All cities and towns within King County maintain their own land use regulations, which reflect local priorities for growth and protection of critical environments.

King County maintains a Critical Areas Ordinance in accordance with the GMA. K.C.C. Chapter 21A.24 (Critical Areas) establishes protections for sensitive environments through land use restrictions and BMPs. Sensitive environments regulated by the Critical Areas Ordinance include floodplains, wetlands, channel migration zones, and aquatic areas (including shorelines of the state) as defined and regulated under King County's Shoreline Master Program, codified under K.C.C. Chapter 21A.25.

King County's Zoning Code allows few land use activities by-right in regulated critical areas and their delineated buffers, setting additional restrictions for most land use activities and completely disallowing many high-intensity land uses. Single-family homes, accessory structures, and agricultural land uses are in most cases conditionally allowed in the aforementioned critical areas. Maintenance and construction of roads, culverts, utilities, and flood control infrastructure are conditionally allowed in these areas as well. Conditions for land use in critical areas can include increased dimensional restrictions on structures, BMPs, or mitigation.

All cities and towns within King County also maintain comparable zoning codes, critical areas ordinances, and floodplain development regulations, in accordance with the GMA.

In addition to the regulation of shoreline areas under the Critical Areas Ordinance, King County maintains a Shoreline Master Program in accordance with the Shoreline Management Act.

Shoreline Master Programs define shoreline zones, priority shoreline uses, BMPs, and restrictions on use intensity that preserve ecological function. The King County Shoreline Master Program establishes regulations for land use, environmental protection, and public access to shorelines of waterbodies, wetlands, floodplains, and shorelands, which encompass a 200-foot buffer landward of regulated shorelines. In King County jurisdiction, utility facilities (such as stormwater, water storage, and drainage infrastructure) are conditionally allowed in all shoreline zones. Agriculture and water-dependent uses are allowed or conditionally allowed in most shoreline zones, while non-water dependent uses and higher intensity land uses are more restricted.

Most cities and towns within King County also maintain a Shoreline Master Program, which establish comparable environmental protections and shoreline use priorities, while including local goals.

9.1.2 Land and Shoreline Use in King County

Land use in King County is heavily influenced by the natural landscape, with historical development guided by access to resources and economies that grew around those industries, and current development guided by growth management principles that protect critical environments and natural resources. The lowland areas in the western portions of King County largely consist of urban and suburban development, with access to navigable waters supporting industrial development. The mountainous upland areas of eastern King County are mostly undeveloped, with much of the land being protected or working forest, few incorporated areas, and disparate rural development. Central King County has a diverse mix of land uses including small cities, rural and suburban development, agricultural lands in river valleys, open space, and working forests.

There are 39 incorporated municipalities in King County, which manage their land and shoreline use planning. Land use district types are structured differently by different governments, which prevents them from being directly comparable. While each jurisdiction develops its own zoning districts and codes, common land use district types include residential areas of varying densities, industrial, commercial, resource extraction (agriculture, forestry, mining, etc.), and urban or town centers.

Shorelines in the county are managed by King County in unincorporated areas and cities or towns in incorporated areas. The extensive shorelines of western King County are primarily in incorporated areas that host intensive water-dependent uses, single-family homes, and recreational open space. Shoreline use in inland areas of King County consists mostly of low-intensity, non-water dependent land uses, such as open space, single-family homes, and agriculture.

9.1.3 Land and Shoreline Use in Unincorporated King County

King County has more widespread land use authority in eastern King County, with large swaths of western King County being incorporated cities (the primary exception being Vashon-Maury Island). In many cases, lower watersheds are in incorporated areas, but King County has extensive jurisdiction throughout middle watersheds of many of the major rivers in King County.

Even the Green, Cedar, and Snoqualmie rivers, which have many small cities along them, have most of their river miles in unincorporated areas of King County. Vashon-Maury Island is the only unincorporated coastal area of King County.

Land around major lakes in King County is mostly within incorporated areas, with only small areas of southeast Lake Washington and the northern tip of Lake Sammamish being in King County's land and shoreline use jurisdiction.

Table 9-1 summarizes the acreage of zoning districts in unincorporated King County. Zoning in unincorporated King County is guided by the King County Comprehensive Plan. Most of the developed area in unincorporated King County is rural or suburban, with some unincorporated urbanized areas, such as White Center and Fall City. Resource extraction, such as agriculture and forestry, is the land use type with the highest acreage in unincorporated King County. Open space accounts for a large portion of unincorporated King County, although much of this land is under federal jurisdiction and not regulated by King County's Zoning Code (King County 2018).

TABLE 9-1
ZONING DISTRICT BY ACRES

Zoning District	Acres	Percent of Total
Agricultural, one DU per 10 acres	12,442	1.2%
Agricultural, one DU per 35 acres	28,198	2.7%
Community Business	130	<0.1%
Forest	817,956	78.2%
Industrial	339	<0.1%
Mineral	3,449	0.3%
Muckleshoot Indian Tribe	1,891	0.2%
Neighborhood Business	108	<0.1%
Office	6	<0.1%
Regional Business	15	<0.1%
Residential, 12 DU per acre	93	<0.1%
Residential, 18 DU per acre	276	<0.1%
Residential, 24 DU per acre	302	<0.1%
Residential, 48 DU per acre	69	<0.1%
Residential, eight DU per acre	128	<0.1%
Residential, four DU per acre	6,154	<0.6%
Residential, one DU per acre	2,527	0.2%
Residential, six DU per acre	4,343	0.4%
Rural Area, one DU per 10 acres	42,654	4.1%
Rural Area, one DU per 5 acres	106,999	10.2%
Rural Area, one DU per 5 acres	14,851	1.4%
Urban Reserve, one DU per 5 acres	2,594	0.2%

King County manages 234 miles of lake shoreline, 1,696 miles of river and stream shoreline, and 51 miles of marine shoreline within its jurisdiction (unincorporated areas). This accounts for most of the total shoreline miles within geographic King County (King County 2022). Agriculture and open space are the most common land uses in unincorporated King County's shoreline areas. Rural residential development and some higher intensity residential development are present in unincorporated shoreline areas, with the latter often pre-dating the Shoreline Management Act.

9.1.4 Land and Shoreline Use in the Mapped Floodplain

The 1 percent annual chance floodplain of King County covers 56,889 acres of land. The 1 percent annual chance floodplain is mapped as regulated flood hazard areas for major rivers, tributaries, lakes, and coastal areas in King County. Mapped floodplains are regulated zones under Shoreline Master Programs and Critical Areas Ordinances, greatly restricting the type, siting, and intensity of any land use in these areas. As such, floodplains often consist of low-intensity land uses, such as agriculture (especially in inland riverine and tributary floodplains) and single-family homes. High-intensity water dependent uses are typically absent from inland floodplains, with a greater presence in coastal areas or near the mouths of major rivers. Many floodplains have roads and drainage infrastructure, which often pre-date floodplain land and shoreline use regulations.

9.2 Construction Impacts

9.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could impact existing land uses, including in shoreline zones, such as through staging areas affecting access to shoreline areas or demolition of structures affecting existing land uses. Construction could affect adjacent land uses and priority shoreline land uses, such as through disrupting access to residences and businesses or noise and visual impacts on commercial or public uses. Construction activity is unlikely to affect existing land uses in most cases, but intensive construction activities in shoreline zones could require mitigation plans or conditional use permits to avoid adverse impacts.

Types of activities that could impact land and shoreline use of areas within or adjacent to construction sites include property acquisition, property protection, levee setback projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Activities such as property protection and property acquisition would be unlikely to have impacts on off-site land or shoreline uses, as these activities typically occur at a site level, involving little to no off-site construction. Construction staging and construction activities could affect access to sites and the operation of on-site land uses in the short-term. Stormwater infrastructure projects and conveyance capacity projects often occur in the right-of-way, which could have impacts on off-site land uses due to construction activities disrupting street or sidewalk access. Construction associated with levee and floodwall, levee setback, and other structural projects could impact access to adjacent land and shoreline uses in cases where these projects occur near or within the right-of-way of roads, but in many cases these projects occur on public land outside of traffic corridors. In these cases, construction could affect on-site access and use of shoreline areas or other public lands. Construction of levee and floodwall, levee

setback, or other structural projects would be more likely to have impacts of longer durations, as the scale of these projects is often greater than those of stormwater infrastructure, conveyance capacity, or property protection projects.

For activities implemented under either alternative, elements of the activity that affect the level of impact of construction on land and shoreline use (such as duration of construction or extent of activity in public rights-of-way) would be identified as part of project-level planning and design. All activities would undergo the appropriate level of project-level permitting and impact analysis. Most construction activities that disturb land in a floodplain would require approval under land and shoreline use regulations, which would set conditions for minimizing impacts and may require additional mitigation efforts.

9.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 9.2.1, *Impacts Common to Both Alternatives*.

9.2.3 Alternative 2: 2024 Flood Plan

Construction could increase in intensity or duration for property protection activities under Alternative 2 due to increased public information activities raising awareness of property protection opportunities. Preventive activities, such as more resilient design regulations for floodplain land uses, could somewhat increase the construction requirements for projects like home elevations, floodproofing, or other retrofits.

9.3 Operational Impacts

9.3.1 Impacts Common to Both Alternatives

Multiple activity types could affect land and shoreline use at the site of flood risk reduction activity implementation, but all activity types would be unlikely to have direct off-site impacts. Property acquisition activities, as well as resulting follow-up on-site activities like ecological restoration or levee setback projects, could have permanent impacts on the existing land use of acquired properties, which would be in the floodplain in most cases. Property acquisitions could displace people from residential properties, although most acquisitions under both alternatives would only be advanced with willing landowners. The number of people displaced by acquisitions varies, largely depending on the number of structures acquired, which could range from individual properties to concentrations of properties up to a few dozen homes. Property acquisition and related displacement of people could have equity impacts, especially for renters, who would not have a say in acquisition, although relocation assistance would be provided consistent with federal law. Acquisition of floodplain properties could eliminate housing that can often be more affordable than other housing options, potentially reducing the total housing stock in an area, which could have impacts on low-to-moderate income people seeking housing, such as further displacement or housing instability. However, floodplain properties that are not acquired could inherently face risks to existing land uses and occupants from potential flooding.

Natural resource protection projects could also permanently impact potential future uses of a site through conservation measures, but these projects would be less likely to displace people or impact existing land uses. Preventive activities, such as updating flood hazard maps and floodplain regulations, could also have long-term or permanent impacts on existing land uses in affected areas by potentially adding floodplain land and shoreline use restrictions to these areas.

Levee and floodwall and other structural projects would largely occur on public lands or properties where this infrastructure already exists, making it unlikely that these activities could have operating impacts on existing land uses. The operation of these activities as infrastructure in shoreline areas could impact priority shoreline uses, such as public access or water-dependent uses. Any potential impacts on priority shoreline uses would be assessed in project-level planning and design, as well as any mitigation needed to offset impacts on priority uses.

Underground flood risk reduction facilities, such as conveyance pipes and stormwater management projects, could limit potential future uses of the sites these are implemented on, as permanent access is often necessary for future maintenance. Compatible land uses for facilities requiring utility access could include passive recreation, athletic fields, streets and sidewalks, parking, or other land uses with limited development.

9.3.2 Alternative 1: No Action

Operating impacts under the No Action Alternative would be the same as described in Section 9.3.1, *Impacts Common to Both Alternatives*.

9.3.3 Alternative 2: 2024 Flood Plan

Operating impacts under Alternative 2 would be the same as described in Section 9.3.1, *Impacts Common to Both Alternatives*. In addition, Alternative 2 would explore mapping alluvial fan hazards and developing alluvial fan hazard regulations. These activities could restrict existing land use or potential future use of areas that have not historically been subject to flood hazard regulations. Existing land uses subject to alluvial fan hazard regulations could be restricted from increasing the intensity of the current property use or changing the use of their property. New development or other new uses of undeveloped properties could also be restricted in locations where land use activities have historically not been restricted by critical areas regulations. However, alluvial fan hazard regulations could also have substantial overlap with existing critical areas regulations, which could limit the number of new properties subject to these types of land use restrictions.

9.4 Avoidance, Minimization, and Mitigation Measures

The projects that could have the greatest impacts on land and shoreline use would be those that acquire properties or substantially restrict the potential use of the property by other means. Specific mitigation measures for construction and operation of flood risk reduction activities

would be identified as part of project design and project-level permitting and environmental review. Avoidance, minimization, or mitigation of these activities could include:

- Work primarily with willing property owners for voluntary property acquisition and protection measures.
- Consider equity impacts and relocation assistance to avoid displacing low-income households, including provision of federally mandated relocation assistance for renters displaced by property acquisition.
- Provide shoreline access in other locations, if construction or operation of infrastructure eliminates or reduces access to shorelines for preferred uses.
- Where property acquisition has been flagged for potential concerns related to equity or community priorities (such as through a multi-benefit planning process), consider avoiding displacement by implementing property protection and preventive activities that support existing land uses, such as open space conservation and property protection, as opposed to primarily using property acquisition to achieve flood risk reduction outcomes.

9.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on land or shoreline use. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 9.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 10
Public Health and Safety

10.1 Affected Environment

Public health and safety includes flood risk reduction facility safety, potential contamination from hazardous material sites, and flood warning systems.

10.1.1 Relevant Plans, Policies, and Regulations

Plans

King County's Comprehensive Plan is a policy document developed in accordance with Washington's GMA to guide growth and development in King County over a 20-year timeframe (King County 2022). The Comprehensive Plan is currently in the process of a major 10-year update. Relevant to public health and safety, the plan sets forth policies and regulations that address the County's role in establishing and maintaining housing and assistance programs and behavioral health services such as crisis services and mental health treatment, and it addresses the impacts of flooding on public safety. Relevant policies in the plan include:

- **Policy F-299a** – King County should seek to site new critical public facilities outside of the 500-year floodplain.

The King County Comprehensive Emergency Management Plan (CEMP) describes the framework in which King County will address emergencies and disasters (King County 2020a). The CEMP identifies primary programmatic obligations of the County before, during, and after emergencies. These obligations maintain essential services and provide support services for the protection and safety of the community via public health services and emergency shelters.

The King County Regional Hazard Mitigation Plan promotes programs and projects to build a foundation of resilience before, during, and after disasters (King County 2020b). In addition to a base plan covering King County as a whole, each participating jurisdiction developed an annex that meets most FEMA planning requirements.

Policies and Regulations

K.C.C. Chapter 2.35A covers the duties and regional services the Department of Public Health is responsible for, such as emergency medical services and community health services. K.C.C. 2.35A.020 describes the department's regional services, which include convening and leading programs to improve public health access and its quality, as well as increasing the efficiency and

effectiveness of public health services. K.C.C. Chapter 2.56 addresses the County's responsibilities to prepare for emergencies and protect the public health and safety of citizens.

10.1.2 Public Health and Safety in King County

King County's Emergency Medical Service (EMS) system coordinates with five dispatch centers, five paramedic providers, and 28 fire departments. King County's EMS provides services to all areas of the county except for the City of Seattle, which coordinates its emergency medical services through the Seattle Fire Department (King County 2023a).

ALERT King County is King County's free regional public information and notification service. The system serves residents, businesses, and visitors, helping individuals stay informed about potential hazards and threats that impact their area. The notifications are sent by King County government agencies, partners within the cities, or other partner agencies, such as water or fire districts. Since its launch in 2017, more than 57,000 residents and businesses have enrolled in notifications.

The County also operates the King County Flood Warning System. Notifications are sent through email, text, or through the phone application. Flood alerts are activated during high-water conditions for the Skykomish, Snoqualmie, Tolt, Raging, Cedar, Green, and White rivers, and Issaquah Creek (King County 2023b). Additionally, King County Road Alerts notifies subscribers about significant weather-related road closures and natural disasters (King County 2023c).

FEMA aids and coordinates with state and local governments to prepare and respond to disasters, such as hazard mitigation and emergency preparedness. On a state level, King County is Region 6 within the Washington Emergency Management Division. The division manages state emergency operations, providing disaster assistance for individuals, families, and government agencies in the form of funding or repairs and restoration of infrastructure or services.

10.1.3 Public Health and Safety and Flooding

Flooding can cause various health and safety vulnerabilities and risks, such as disruption of critical public services. When flood events close roadways, emergency vehicles can be delayed in providing needed public services from police or fire departments, ambulances, or flood-related emergency response. Residing in flood-prone areas can also increase exposure to flood risks. These risks include increases in acute exposure to flood risks, secondary flood risks, and, for those living in the floodplain, vulnerability to more severe impacts if homes are not elevated or if critical services are exposed to flooding. Acute trauma caused by flooding includes non-fatal injuries such as falls or being struck by falling debris or objects moving quickly in floodwater, and acute respiratory infections like bronchitis or pneumonia. Vulnerabilities also lie in contaminated floodwaters and secondary risks such as hypothermia, carbon monoxide, and exposure to mold (Paterson et al. 2018). Additional secondary flood risks include health issues worsened due to disruptions in critical health services when people are unable to access medical care during flood events due to road closures or other flood impacts. Secondary risks also include mental health impacts such as Post-Traumatic Stress Disorder (PTSD) from displacement and exposure to flood events (Clayton et al. 2021). Displacement may also cause losses of or

disruption to social ties and resource availability and increase stress, leading to adverse health outcomes.

Floodwater can become contaminated in a variety of ways. Water can come in contact with agricultural chemicals or hazardous materials at contaminated sites, or it can dislodge chemicals stored aboveground. Floods can inundate livestock areas and septic and wastewater treatment systems and be contaminated with untreated sewage and decomposing bodies of drowned livestock. Wastewater treatment plants (WWTPs) can become flooded or malfunction and release untreated sewage to nearby waterbodies. Septic systems can be inundated by floodwaters; in coastal areas, this can contaminate septic systems with saltwater. Drinking water can be contaminated when wells or water treatment systems are flooded. Contaminated floodwater can also seep into groundwater. Overflows and backups due to flooding (affecting both sewer and septic systems) can cause sewage or wastewater to come up through sinks, toilets, and drains in homes, which can expose people to dangerous bacteria and viruses. This is particularly a concern in the South Park neighborhood of Seattle along the Duwamish River, where it primarily affects low-income communities of color.

Contaminated waters are health hazards if the public comes in contact with them through direct physical contact, ingestion, or open wounds (OSHA 2019). Household items that have been flooded pose a health concern if they come into close contact with people. Floodwater often contains infectious organisms such as *E. coli* and *Salmonella*, which can cause intestinal illnesses. Agricultural or industrial chemicals can cause chemical poisoning. Many materials used in home construction, including wood, fiberglass, and insulation, can absorb floodwater and the contaminants it carries, leaving flooded homes contaminated even after they dry out.

10.2 Construction Impacts

10.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could have short-term impacts on traffic. Temporary disruptions associated with increases in traffic, such as detours or equipment and materials transport, could cause delays to public emergency services. Construction activities under both alternatives could also present short-term potential contamination or pollution risks. Materials that could be released during excavation or dewatering projects could expose construction workers, air, or water to hazardous substances. Additionally, accidental spills of diesel or petroleum products from equipment or vehicles could occur during construction. These spilled materials could enter groundwater or surface water and pose pollution and health risks.

10.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 10.2.1, *Impacts Common to Both Alternatives*.

10.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 10.2.1, *Impacts Common to Both Alternatives*.

10.3 Operational Impacts

10.3.1 Impacts Common to Both Alternatives

Under both alternatives, most of the operational effects on public health and safety associated with activities to reduce flood risk are expected to be positive. Activities vary in the extent of their overall beneficial effects on public health and safety.

Natural resource protection projects could include installation of engineered log jams or other in-water structures. One potential impact on public health and safety resulting from both alternatives is that in-water structures can present a safety threat to in-river recreational users in the event they (or their boat or float) collide with or get entangled with the structures. These impacts would be mitigated under both alternatives through application of King County's most current requirements, policies, and procedures applicable to these in-water structures, as explained below in Section 10.4.

10.3.2 Alternative 1: No Action

Operation impacts for the No Action Alternative would be the same as described in Section 10.3.1, *Impacts Common to Both Alternatives*.

10.3.3 Alternative 2: 2024 Flood Plan

Operation impacts for Alternative 2 would be the same as described in Section 10.3.1, *Impacts Common to Both Alternatives*. The 2024 Flood Plan includes targeted activities to increase public information around flooding and coordination between government agencies during flood response. These activities could provide additional benefits for public health and safety.

10.4 Avoidance, Minimization, and Mitigation Measures

Potential construction impacts on public health and safety could be managed with construction BMPs. Specific mitigation measures for construction impacts would be identified as part of project design and project-level permitting and environmental review. Example avoidance, minimization, or mitigation measures could include:

- Provide prevention and control plans to prevent accidental release of contaminants during construction activities.
- Coordinate construction activities with emergency service providers, schedule construction to minimize impacts, and notify the public of construction that will cause service response delays related to traffic and activities.
- For any projects that include installation of engineered log jams or other similar in-water structures (most commonly natural resource protection projects or structural projects), design

the projects in compliance with King County's most current requirements, policies, and procedures for in-water structures to avoid potential public health and safety impacts associated with the structures. For wood that is placed as part of a project, King County is required to follow the procedures outlined in a 2010 Public Rule that are intended to protect public safety (Public Rule LUD 12-1, effective April 30, 2010). The procedures include project-specific analysis assessing potential recreational uses, identifying potential project impacts on public safety, accounting for public safety in project design, performing public outreach to allow for two-way communication with the public, and monitoring and adaptively managing projects following completion. The rule also implements adaptive management principles by reconvening partners and interested parties to re-evaluate and update (as needed) the rule's large wood policies at least every 3 years. Potential public safety impacts of individual actions would be identified and addressed in project-level design and environmental review.

10.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on public health and safety. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 10.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 11
Public Services and Utilities

11.1 Affected Environment

11.1.1 Relevant Plans, Policies, and Regulations

Plans

King County maintains a Comprehensive Plan in accordance with Washington's GMA. The current Comprehensive Plan was adopted in 2016 and has been updated several times, most recently in 2022. The Comprehensive Plan is currently in the process of a major 10-year update. The Comprehensive Plan outlines policies and strategies for growth management, including for public services and utilities. Policies are established for King County's services and utilities that outline services provided, level of service, coordination with other jurisdictions on service provision, where services should be provided, strategies for improving service, and adaptive management of services.

Public services and utilities with policies that relate to development and implementation of the Flood Plan include:

- Resource management and protection (including protecting drinking water, while supporting access to watersheds and water resources for fish, agriculture, and recreation).
- Stormwater management (including basin-level planning with other jurisdictions, infrastructure maintenance and management, and low-impact development strategies).
- Flood hazard management (including maintaining the flood warning system and flood control infrastructure, critical facilities protection, adapting systems to climate change, and compliance with the NFIP).
- Energy and telecommunications (including coordination with private utility providers to align service provision with county infrastructure development, growth management planning, and other strategic initiatives, such as climate mitigation and adaptation) (King County 2022).

Key principles of the policies across public service and utility categories include:

- Equitable and culturally appropriate provision of services.
- Coordinating with other jurisdictions for consistency in level of service provision across jurisdictions, including addressing interjurisdictional issues, such as watershed and stormwater management.
- Focusing service provision to more intensively developed areas, while providing rural levels of service to less intensively developed areas, to discourage urbanization of rural areas.

- Improvement of the provision of services and management of utilities to be more sustainable and resilient (King County 2022).

Climate change mitigation and adaptation are key concerns in King County's provision of services and utilities. In 2021, King County adopted its Strategic Climate Action Plan, which outlines priorities and actions for mitigating and adapting to climate change across all county operations. Key elements of the Strategic Climate Action Plan include:

- Providing equitable access to resources and services that support climate change mitigation and adaptation, including health and human services support for vulnerable populations.
- Providing education, information, and technical assistance to support community efforts in climate mitigation and adaptation.
- Develop and implement climate-resilient approaches to floodplain management projects, permitting, stormwater management, wastewater management, and other operations.
- Assess and monitor potential impacts from climate change on service provisions and government operations (King County 2021).

King County services and government operations during emergencies, disasters, or other disruptions are guided by the Comprehensive Emergency Management Plan (CEMP) and the Continuity of Governance Plan. The CEMP provides a framework for action and decision-making that can apply to any emergency situation, such as floods. The CEMP identifies the responsibilities of all agencies and departments that work together to provide Emergency Support Functions, which are categories of services that are critical to provide during emergencies to minimize impacts and support recovery. Emergency Support Functions that could be particularly relevant to floods include communications, public works and engineering, search and rescue, agriculture and natural resources, and public safety and security. In addition to emergency responsibilities designated in the CEMP, the Continuity of Governance Plan outlines high-level protocol for maintaining the essential day-to-day services and functions of county government through an emergency, with each department or agency required to maintain detailed internal plans for continuity of departmental services and operations (King County 2020).

11.1.2 Public Services and Utilities in King County

King County provides certain public services countywide to both cities and unincorporated areas, referred to as regional services. King County regional services that could be affected by either alternative are detailed below.

Human Services

King County works with cities and non-government organizations to provide shelter, safe transportation, food, emergency supplies, and a variety of other support services. While King County provides these services at all times, human services play a crucial role in flood response and recovery, especially under the CEMP Emergency Support Function of Mass Care, Emergency Assistance, Temporary Housing, and Human Services (King County 2020).

Wastewater Management

King County's Wastewater Treatment Division (WTD) manages the collection, treatment, and disposal of wastewater for most urban areas in King County, including incorporated and unincorporated areas. WTD manages conveyance of wastewater from local sewer districts to regional treatment systems, regional wastewater treatment systems, a community septic system, combined sewer overflow treatment facilities, and extensive conveyance infrastructure. WTD works with King County Stormwater Services, local governments, and other entities to reduce stormwater runoff that can overwhelm combined sewer overflow systems, which can cause outflow of untreated sewage into waterbodies. Wastewater in rural areas is primarily treated by on-site septic systems, which are regulated by the King County Department of Public Health (King County 2022).

Stormwater Management

King County manages stormwater using a watershed approach that involves coordination with incorporated cities to implement BMPs and comparable stormwater management regulations to mitigate flooding and avoid impacts on receiving waters. King County works with cities and unincorporated areas in its wastewater treatment service areas to reduce stormwater runoff as part of its NPDES permit under the Clean Water Act, which requires mitigation of stormwater runoff to minimize the number of discharges of untreated storm and wastewater into waterbodies, resulting from stormwater systems (and, within the City of Seattle, combined sewer systems) being overwhelmed by high volumes of runoff. King County also works with small cities to provide services on a contract basis, which it would otherwise only provide to unincorporated areas.

Law Enforcement

Law enforcement in King County consists of the King County Sheriff's Office (KCSO). KCSO serves the law enforcement needs of over half a million people in unincorporated areas, and also provides police departments for multiple public transportation entities, cities, towns, and the Muckleshoot Indian Tribe (King County 2016).

KCSO operates the Air Support Unit, the only full-time law enforcement aviation unit in the state. The unit averages about 1,200 hours a year in annual flight time. Of its primary duties, the unit includes Search & Rescue, which assists in extracting victims and inserting rescuers into remote locations (King County 2016). KCSO coordinates extensively with local law enforcement, state agencies, and other county entities, such as the King County Office of Emergency Management for planning and emergency response activities, including working on inter-agency committees and contributing to the King County Emergency Operations Center. KCSO activities related to flood and other hazards include response to in-water large wood accumulation that may pose a public safety hazard, water-based rescues (including those operated through the KCSO Marine Rescue Dive Unit), emergency volunteer coordination, dispatch, site security, traffic control, and support to other law enforcement agencies (King County 2020).

The King County Fire Marshal is responsible for administering and enforcing the provisions of the International Fire Code in all new and existing buildings in unincorporated King County.

King County does not provide standard fire response services, which are provided by cities and locally funded fire districts. King County's Office of Emergency Management and Fire Marshal Department coordinate with local fire districts.

Other Services

Common contract services for cities include law enforcement, waste management, and permitting or engineering review (King County 2022). In most cases, cities provide their own local services, aside from those that King County provides. Other public services and utilities may be provided at a district-level, such as schools, fire departments, water, and sewer, which often do not strictly adhere to municipal boundaries. Water and sewer utilities especially vary between urban and rural areas, where urban areas typically cannot source drinking water from on-site or dispose of wastewater on-site, while rural areas are more likely to be served by private wells and on-site septic or small community water and wastewater systems.

Private companies provide many utility services in incorporated and unincorporated King County, such as gas, electricity, and telecommunications, with Seattle City Light being a major exception as a public electricity provider. Both public and private utility infrastructure often line rights-of-way or other publicly maintained corridors.

11.2 Construction Impacts

11.2.1 Impacts Common to Both Alternatives

Most flood risk reduction activities do not directly impact the provision of public services or utilities, but coordinated construction or maintenance of utility facilities to avoid potential impacts could cause minor utility disruptions. The construction of some activities could place demands on public services or utilities that could indirectly impact the ability to provide those utilities or services in other instances.

Under both alternatives, the large number of culvert replacement projects (conveyance capacity) and other construction projects that involve construction in or near roads could increase demand for police to perform traffic management at construction sites. Culvert replacement projects would be the most likely to occur in roadways, but stormwater infrastructure projects and other structural projects (particularly those near roadways, parks, and trails) could also involve traffic disruptions that require additional government staff support to manage. Construction projects that occur in the right-of-way could also temporarily affect utility infrastructure, with culvert replacement projects being the most likely to affect rights-of-way. Construction involving excavation, roadway elevation, or armoring of roadside areas could require alteration to utilities or result in temporary service disruptions to nearby utility customers. The potential for increased risk to utilities from projects that increase conveyance capacity or introduce flows to areas that were not previously exposed to streamflow or flooding, such as levee setbacks or ecological restoration projects, could require that utility corridors be moved, which could also temporarily disrupt service.

11.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 11.2.1, *Impacts Common to Both Alternatives*.

11.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 11.2.1, *Impacts Common to Both Alternatives*.

11.3 Operational Impacts

11.3.1 Impacts Common to Both Alternatives

Most flood risk reduction activities do not directly impact the provision of public services or utilities, but the operation of some activities could place demands on public services or utilities that could indirectly impact the ability to provide those utilities or services in other instances.

Ecological restoration and conveyance capacity projects could increase flows to areas that previously had less exposure to water, which could impact underground and aboveground utility infrastructure through erosion or intrusion of water, which may have previously been protected by levees, floodwalls, or revetments. However, individual projects would be designed to address and avoid these impacts. Stormwater infrastructure projects could similarly increase exposure to water where retrofits allow increased flows. Improvements to stormwater management infrastructure, especially those that increase conveyance capacity or add drainage to new areas, could also increase the maintenance and monitoring requirements by government staff. However, projects would consider and design-in protections for infrastructure when that infrastructure cannot be moved out of the project footprint.

Property protection efforts that do not remove at-risk structures from the floodplain could increase the need for rescue efforts by emergency management services due to people remaining in the floodplain. Property protection activities that do not remove at-risk structures would also require maintaining utility infrastructure in areas exposed to flooding, which could impact the reliability of utility services. Changes to floodplain regulations or updated floodplain maps could impact the ability to add or improve utility services on a property.

11.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 11.3.1, *Impacts Common to Both Alternatives*.

11.3.3 Alternative 2: 2024 Flood Plan

Under Alternative 2, King County would increase coordination with other entities during emergency response and add new components of serving affected communities during emergencies, which could increase the need for public services, such as police, emergency management staff, and human services workers. The 2024 Flood Plan would involve building

community capacity to prepare for and respond to flood emergencies, which could require dedicating additional staff time and resources to training and working with community organizations, which could impact the ability to provide existing services. The 2024 Flood Plan would also increase efforts to provide support services to those affected by or displaced by flooding, which could require increased staff time from human services, emergency management, or health workers, which could impact the ability to provide day-to-day services or strain the ability to provide established baseline emergency services.

Under Alternative 2, King County would implement a Public Information Program, which could involve increases in engagement, outreach, and education efforts by the County. This could have minor impacts on day-to-day operations by increasing demand on staff time and resources.

11.4 Avoidance, Minimization, and Mitigation Measures

King County and other governments can plan for these potential demands on public services and utilities in ways that could largely prevent substantial impacts. Avoidance, minimization, and mitigation measures could include:

- Continue to work with public service and utility providers and provide advance notification of proposed culvert replacement or repair projects near roadways and public services to allow for mitigation planning and avoid impacts on these resources to the extent practicable.
- Work with permitting and planning staff to streamline permitting processes to reduce the permitting requirements for some projects with net ecological benefits or little impact.
- Work with project proponents early in planning processes to ensure a thorough understanding of permitting requirements and applicable codes to avoid slowdowns in the permitting process.
- Study potential hydrologic impacts of increased conveyance capacity or new flow pathways to plan for and avoid potential impacts on downstream utilities.

11.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on public services and utilities. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 11.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 12
Recreation and Public Access

12.1 Affected Environment

12.1.1 Relevant Plans, Policies, and Regulations

King County manages its open space system to provide the access and infrastructure to support an array of recreational activities within the framework established by plans and policies at the county level. King County also coordinates with Washington State government, regional entities, and cities to fund, plan, and implement actions that represent an array of open space goals to support recreation.

Plans

King County maintains a Comprehensive Plan in accordance with Washington's GMA. The Comprehensive Plan is currently in the process of a major 10-year update. The 2022 Comprehensive Plan (the most recent update) sets policies related to parks and recreation that provide high-level guidance for establishing new open spaces and recreational facilities, interjurisdictional coordination on parks and recreation, and equitable access to open space (King County 2022).

King County Council adopted its current Open Space Plan in 2022 (King County DNRP 2022a). The King County Open Space Plan provides the policy framework for how the County plans, develops, manages, and expands its open spaces for public use and enjoyment. Particularly relevant goals in the Open Space Plan include:

- **Goal 1:** Take care of King County's existing system of parks and trails, ensuring the system remains clean, safe, and open.
- **Goal 2:** Grow and connect regional open space and natural lands to protect habitat important for fish and wildlife and provide recreation opportunities.
- **Goal 4:** Make parks, green spaces, and recreation opportunities more accessible for all King County residents to enjoy (King County 2022).

King County's Land Conservation Initiative, established in 2022, prioritizes 65,000 acres of land for protection over a 30-year period, with conservation priorities that emphasize equitable access to open space, river corridors that sustain salmon and reduce flooding, and providing recreational opportunities (King County DNRP 2022b).

King County also engages with regional entities in the development and implementation of collaborative, interjurisdictional open space planning. The PSRC's Open Space Conservation Plan inventories conservation priorities for the region and outlines strategies for prioritizing land protection. Protection of floodplains, with subgoals of reducing flood risk and preserving critical habitat, is one of the goals of the plan (PSRC 2018).

All cities within King County manage their own recreation facilities and open space systems. Under the GMA, all cities in King County must develop Open Space Plans.

Policies and Regulations

K.C.C. Title 7 (Parks and Recreation) outlines county rules for the management, operation, establishment, and public use for recreation of King County's open spaces and associated facilities.

In 2010, King County Council adopted Ordinance 16948, which established 14 determinants of equity that included monitoring metrics. Under this legislation, King County monitors access to green space and distribution of regional trails as indicators of equity under the Parks and Natural Resources determinant category. Access to these open spaces and associated facilities also functions as a measure of access to quality recreational opportunities.

12.1.2 Recreation in King County

King County owns and operates an open space system, which includes five categories of public lands: recreation sites (developed park sites with facilities supporting active recreation), regional trails, natural areas (protected environments that serve ecological functions, which may support accessory passive recreation functions), working forest lands, and multi-use sites (sites with a combination of ecological protection and active or passive recreation uses). This open space system includes 205 improved park facilities, 175 miles of public access trails, and 32,000 acres of natural open space. Working forest lands, which may support recreation but do not have recreation as a primary objective, are excluded from the open space acreage metric.

Many of the open spaces in unincorporated King County are large natural areas, regional corridors along rivers or critical areas, or multi-use destination parks, with facilities for camping, swimming, mountain biking, and other recreation. For reasons including development restrictions, environmental protection, and recreational access, some open space areas are located in the floodplains of lakes, rivers, tributaries, and coastal waters. **Table 12-1** identifies the acreage of open space by open space manager in King County as a whole, unincorporated King County, and the floodplain.

TABLE 12-1
OPEN SPACE ACREAGE BY MANAGEMENT TYPE

Open Space Manager	Total Acres in King County	Acres in Unincorporated King County	Acres in the Regulatory Floodplain
King County Parks	32,000	29,449	3,997
City	19,669	469	2,954
State	34,126	32,935	595
Federal	161,488a	161,483a	0
Other	687	559	57

NOTE: The administrative boundaries of national forests in King County cover a much larger area than this. This acreage only accounts for the portions of national forests designated as parkland.

SOURCE: King County (2018).

In addition to the King County Department of Natural Resources and Parks (DNRP), open space land managers in King County include municipalities, the State of Washington, other government entities, school districts, private entities, and nonprofits. Some open spaces are maintained for reasons that do not include recreation, but most entities that manage open space in King County provide parks and recreational facilities that support passive or active recreation. There are 39 incorporated municipalities in King County, which manage their own open space systems. Cities in King County manage 19,669 acres of open space. There are an additional 5,342 acres of open space within incorporated King County, which are not managed by incorporated cities, but managed by federal, state, private, or other entities.

Most city-managed parks are small-to-moderately sized curated spaces, such as landscaped urban parks and athletic fields, although there are numerous natural areas within the cities of King County, many of which have trails or support passive recreation. The City of Seattle manages the largest parks system among the cities in King County, with 6,441 acres of open space (King County DNRP 2022a). Washington State Parks manages 12 state parks in King County, many of which are multi-use sites that support a variety of types of passive and active recreation. The U.S. Forest Service manages large swaths of recreational forestland in the upland areas of eastern King County, all of which are in the South Fork Skykomish/Snoqualmie River watershed.

King County allows boating and fishing on all lakes and rivers with public access in its jurisdiction, although some areas are protected against recreational access for conservation or public health and safety. Additional regulations apply to the types of fishing and boating allowed. Swimming is allowed in fewer than half of the publicly accessible small lakes in King County's jurisdiction and most of the large lakes within King County (King County DNRP 2011). Swimming access is provided on all major rivers in King County except the Duwamish River and the Sammamish River because these rivers have highly modified shorelines to serve flood risk reduction and water-dependent industry functions, which would also create unsafe conditions for swimming.

Recreational access via trails and waterfront parks is available along segments of most of the rivers in King County, with notable examples including the Sammamish River Trail, Green River Trail, Snoqualmie Valley Trail, and Cedar River Trail. A number of these trails and parks were

created as an additional public benefit in conjunction with land acquired or improved to provide flood risk reduction functions, such as levee and floodwall projects, property acquisitions, natural resource protection projects, and ecological restoration projects. Large waterbodies throughout King County, while not always designated as open space, often have areas that are publicly accessible for recreation, such as boating, swimming, and fishing.

There are 12,083 acres of open space in the 1 percent annual chance floodplain (King County 2018, FEMA 2020). Many parks and open spaces are present in floodplains and other flood hazard areas that are the focus of risk reduction efforts in the Flood Plan. Parks without substantial built environments can be flood compatible land uses. As such, many athletic fields, trails, and green spaces for passive recreation are in the floodplain, especially flood-prone areas where development could present risks to public health and safety.

Large parks located in or partially in the floodplain include:

- Marymoor Park near Redmond on the Sammamish River
- Lake Sammamish State Park on Issaquah Creek
- Three Forks Natural Area on the Snoqualmie River
- Tolt McDonald Park on the Snoqualmie River
- Cedar River Park on the Cedar River
- Flaming Geyser State Park on the Green River

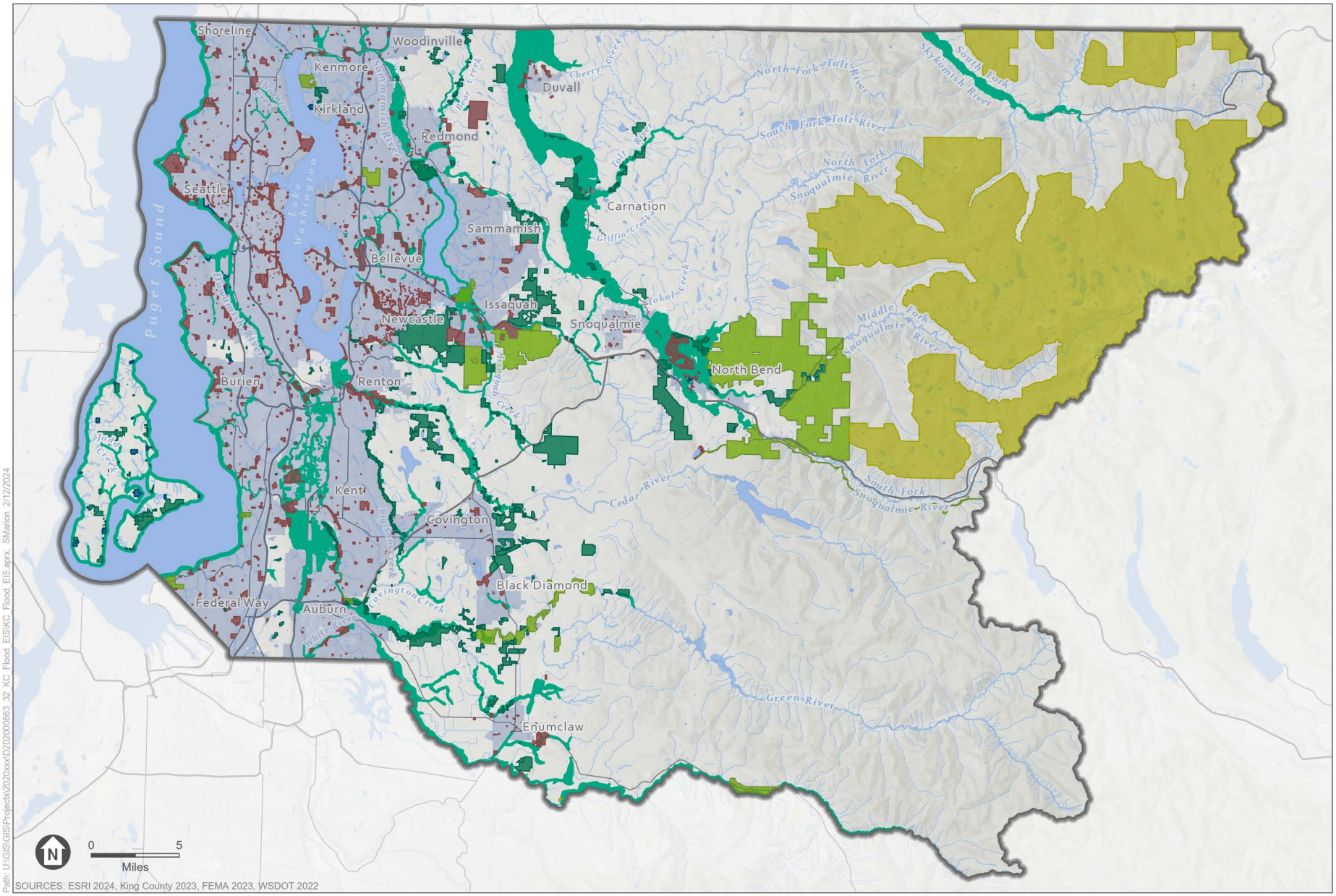
Most floodplain parks lack substantial built environments or facilities that could be severely impacted by flooding. Low-intensity multi-use site facilities, such as trails, athletic fields, playgrounds, beaches, and parking areas, are present in numerous floodplain parks. Private golf courses are also present in the floodplains of each major river in King County.

Figure 12-1 shows recreational features within King County.

12.2 Construction Impacts

12.2.1 Impacts Common to Both Alternatives

Under both alternatives, many of the activity types could occur on or directly adjacent to publicly accessible lands used for recreation. In most cases, construction activities and staging areas would be unlikely to impact access to entire parks, trails, or other publicly accessible recreation facilities, but these activities could temporarily prevent access to sections of public land or facilities. The degree of potential impact generally correlates to the scale of the project, where activities like spot maintenance of drainage infrastructure could cause minor, short-term disruptions to access of small, isolated areas, while construction of larger levee setback or levee and floodwall projects could impact access to thousands of feet of trails, shoreline areas, and adjacent open space over many months. Construction activities could have a disproportionately high impact on recreation and public access if occurring in areas with limited access to parks and recreation sites.



King County Flood Plan EIS

Figure 12-1
Parks

Last Updated 2/12/2024

ESA

Projects requiring more-intensive construction, such as those that involve staging areas and construction vehicles, could have additional impacts on recreation beyond access, such as noise or visual impacts that could affect the enjoyment of public open space or disrupt recreational activities. Higher intensity construction projects could also disrupt recreation and public access from construction vehicle trips and staging in parking areas.

Activity types including ecological restoration projects, stormwater infrastructure projects, conveyance capacity projects, and preventive projects (such as maintenance) can impact public access and recreation, but in many cases these projects occur outside of areas designated for public recreation. Ecological restoration projects could limit access to portions of parks and recreational facilities within the project footprint, but these types of activities would be unlikely to impact access to and use of facilities for active or passive recreation at recreational or multi-use sites. Ecological restoration projects occurring in close proximity to recreational facilities or in conjunction with improvement to those facilities could temporarily limit access. Most stormwater infrastructure projects and conveyance capacity projects occur in developed areas outside of parks and open space, but some projects could occur in parks with substantial facilities or more developed areas (such as green stormwater infrastructure projects) or on trails (such as culvert replacement projects). Parks with developed areas, such as athletic fields, and other low-intensity park facilities can be used as ground cover for underground stormwater infrastructure to allow for maintenance access with minimal disruption to surface land uses. Maintenance or retrofits of this infrastructure could cause temporary access disruptions to recreational facilities.

Levee setback projects, levee and floodwall projects, and some other structural projects could involve large construction footprints that require heavy machinery and construction durations that could last for months. These activity types can occur in shoreline areas, which could temporarily impact access to waterbodies for fishing, boating, swimming, or other water-based recreational activities, although in many cases waterbodies and shoreline areas could be accessed from other locations. Levees often have trails on top of or adjacent to them, including regional trails, and other structural projects like revetments may protect areas with trails, recreational sites, or other parks behind them, which could be impacted by construction or maintenance activities. However, maintenance and rehabilitation activities could involve smaller areas of construction focused on damaged sections of existing infrastructure, which could limit potential impacts on access or recreational use around the infrastructure. Levee setbacks could have large impacts on access and recreation, as these projects can have long construction durations and large footprints due to the excavation of existing levees and construction of a new setback levee.

Activities that involve instream construction could have impacts on water-based recreation and access to waterbodies. These activities could include ecological restoration projects (such as installation of engineered log jams), conveyance capacity projects (including gravel removal and culvert removal), levee setback projects, floodplain reconnection projects, and other structural projects. Impacts could range from construction preventing access to waterbodies via shoreline areas, to instream construction preventing navigation of waterbodies or recreation within the water.

The level of impact on public access and recreation for any construction activity would be identified as part of project-level planning and design. All activities would undergo the appropriate level of project-level permitting and impact analysis.

12.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 12.2.1, *Impacts Common to Both Alternatives*.

12.2.3 Alternative 2: 2024 Flood Plan

The 2024 Flood Plan establishes in its goals, policies, and recommendations the prioritization of activities that provide multiple benefits, with consideration of recreation as a benefit. The prioritization of multiple benefits and the recommendation to develop a tool for identifying opportunities for providing additional benefits could increase the scope of existing projects to include elements that improve recreational opportunities or open space access. Including improvements to recreation as part of proposed projects could increase the scale, duration, or intensity of construction of those projects, which could increase temporary impacts on recreation and public access.

12.3 Operational Impacts

12.3.1 Impacts Common to Both Alternatives

Public access around major flood control infrastructure, such as levee setbacks, levee and floodwall projects, and other structural projects (such as revetment repairs) would be unlikely to be restricted more than before the construction of any of these projects. However, levee setbacks could alter trail alignments to be farther from waterbodies, potentially affecting enjoyment of proximity to water, and extensions of levee and floodwall projects could affect access to a greater extent of shoreline areas than before construction. Levee and floodwall projects that heighten levees could impact views from areas behind levees, and levee setbacks could also affect views and viewsheds by aligning trails or other public open spaces farther from waterbodies.

Some activities that rely on nature-based solutions could impact access to small areas where recreational activities could affect natural functions. Green stormwater infrastructure projects and daylighting of streams could prevent access to areas within the footprint of these types of infrastructure but would be unlikely to affect access in adjacent areas. Ecological restoration projects could realign trails out of sensitive environments or restrict the extent of access to natural areas outside of trails and recreational facilities but would be unlikely to completely eliminate access to existing trails and facilities.

12.3.2 Alternative 1: No Action

Operational Impacts for the No Action Alternative would be the same as described in Section 12.3.1, *Impacts Common to Both Alternatives*.

12.3.3 Alternative 2: 2024 Flood Plan

Under Alternative 2, pursuing equitable outcomes and monitoring equity indicators are incorporated into the 2024 Flood Plan's objectives, guiding principles, policies, and recommended actions. Incorporating equity considerations into flood risk reduction activities, especially those providing multiple benefits, could result in providing more access to recreation for underserved populations and more equitable distribution of public access and recreation opportunities.

12.4 Avoidance, Minimization, and Mitigation Measures

Both the No Action Alternative and Alternative 2 are informed by components of their respective Flood Plans that recognize the value of recreation, its role as a land use in the floodplain, and balancing recreation with flood risk reduction. Specific mitigation measures to preserve or improve recreation and public access for construction and operation of flood risk reduction activities would be identified as part of project design and project-level permitting and environmental review. Example mitigation measures could include:

- Avoid siting construction activities or construction staging in developed parks or other active recreational facilities when possible. Note that natural open space areas used for passive recreation may be the site of restoration-related construction activities without impacting passive recreational uses, but impacts should still be identified and avoided where possible.
- Coordinate with county or municipal parks departments for any projects that could impact recreational opportunities to minimize impacts on recreational users and functions and ensure the continued enjoyment of the park or open space during construction and operation of the project. Specific measures could include coordinating construction timing with special events at parks, scheduling to avoid overlap with construction of other projects in the vicinity, and providing advance public notice and signage.
- Implement phased approaches to construction that limit the total area of public space made inaccessible during construction of projects.
- Create temporary detours or alternative routes to mitigate trail closures.
- Restore open spaces and facilities used for passive or active recreation to the extent possible after construction.
- Create new public spaces via property acquisition or improvement of other land to offset impacts on public access or recreation, including new trails, recreation sites, shoreline access areas, and restored or natural open space areas.
- Incorporate improvements to affected recreation and multi-use sites during construction of flood risk reduction projects to avoid the need for future maintenance-based closures of recreation facilities and enhance recreation opportunities post-construction.

12.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on recreation. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through

implementation of the mitigation measures described above in Section 12.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

12.6 References

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CHAPTER 13
Riparian and Terrestrial Resources

13.1 Affected Environment

This chapter evaluates riparian and terrestrial resources including wildlife and wildlife habitat, biodiversity areas, and rare plants. In addition to dense urban cities and the Puget Sound marine environment, King County contains a diverse range of landforms and habitats. Riparian habitats are upland areas adjacent to and associated with lakes, rivers, streams, and marine waters. In-water habitats are addressed in Chapter 4 (*Aquatic Resources*), shoreline critical areas are addressed in Chapter 9 (*Land and Shoreline Use*), and wetland habitats are addressed in Chapter 17 (*Wetlands*). Terrestrial habitats include land-based environments in the lowlands, highlands, and alpine areas. Urban development, climate change, and associated habitat loss and fragmentation are major threats to biodiversity in King County (King County 2008).

13.1.1 Relevant Plans, Policies, and Regulations

King County manages its land use, wildlife and habitat, and vegetation within a regulatory framework that is guided by federal and state policies as well as the King County Comprehensive Plan.

Plans

The King County Comprehensive Plan outlines the County's overall plan to protect and recover biodiversity, including planning at a landscape scale, protecting and enhancing habitat connectivity, prioritizing ecosystem resilience, and protecting rare ecosystems, habitats, and species. The Comprehensive Plan, which is guided by best available science, identifies plans and policies to manage non-native species, establish fish and wildlife habitat conservation areas, and designate Species and Habitats of Local Importance (King County 2022a). Species of Local Importance are chosen for a variety of factors including native species that have been labeled a priority species by the Washington Department of Fish and Wildlife (WDFW) and species whose habitat or mobility is limited. The terrestrial species of local importance (which will be updated as a part of the 2024 Comprehensive Plan) are listed in **Table 13-1**.

TABLE 13-1
SPECIES OF LOCAL IMPORTANCE

Taxonomy	Species of Local Importance
Birds	western grebe, American bittern, great blue heron, brant, harlequin duck, wood duck, hooded merganser, Barrow's goldeneye, common goldeneye, cinnamon teal, tundra swan, trumpeter swan, surf scoter, white-winged scoter, black scoter, osprey, western screech-owl, sooty grouse, band-tailed pigeon, belted kingfisher, hairy woodpecker, olive-sided flycatcher, western meadowlark, Cassin's finch, marbled murrelet, and purple finch
Mammals	American marten, mink, Columbian black-tailed deer, elk (in their historic range), mountain goat, pika, and roosting concentrations of big-brown and myotis bats
Reptiles	western fence lizard
Rare Plants	bristly sedge, Canadian St. John's-wort, clubmoss cassiope, Oregon goldenaster, toothed wood fern, Vancouver ground-cone, and white-top aster

Habitats of local importance include caves, cliffs, talus, old-growth forest, sphagnum-dominated peat bogs, and snag-rich areas.

The 2020 King County Strategic Climate Action Plan (SCAP) outlines the County's goals to protect high-value forests, expand forest canopy, and restore the health, viability, and climate resilience of forests and farmland (King County 2020).

The King County 30-Year Forest Plan outlines priorities and goals associated with rural and urban forest cover and forest health that are unified throughout the county and municipalities. The Forest Plan was developed to ensure that county forests continue to play a role in mitigating impacts of climate change and that the County continues to meet goals while expanding forest cover. The primary goals of the Forest Plan are: mitigating climate change by increasing carbon storage and resilience of forests, improving and restoring forest health, increasing urban forest canopy, increasing tree canopy cover and access to forested spaces to improve human health, increasing salmon habitat, and improving water quality and quantity (King County 2021b).

The King County Open Space Plan provides a framework for creating and developing new spaces, as well as maintaining and managing an existing 205 parks, 175 miles of trails, and 32,000 acres of open space. In particular, one goal of the Open Space Plan is "to grow and connect regional open space and natural lands, in order to protect habitat important for fish and wildlife and to provide recreation opportunities" (King County 2022b).

The King County Department of Natural Resources and Parks is the agency responsible for managing the animals, plants, and habitat in the county, although other federal and state agencies have a role in setting and enforcing policies and regulations (as described below). Particularly, the Water and Land Resources Division (WLRD) provides natural resource management services throughout the county including acquiring open space, restoring habitat, controlling noxious weeds, and providing support for forestry and agriculture. The Noxious Weed Control Board identifies the need for invasive and non-native species eradication or control within the county (King County 2023b).

Policies and Regulations

The federal Endangered Species Act (ESA), 16 United States Code (U.S.C.) 1531, was introduced in 1973 and established protections for fish, wildlife, and plants that are listed as federally threatened or endangered. The ESA also defines critical habitat as specific geographic areas within the range of a listed species that contains features considered essential for the conservation of the listed species. If a project has the potential to harm any federal species, even unintentionally, consultation with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA is required. Applicable species are identified in **Table 13-2** (USFWS 2023). The ESA considers habitat loss an impact on the species. Additional federal laws in place to protect migratory birds and wildlife include the following:

- **Migratory Bird Treaty Act, 16 U.S.C. 703-712** – Prohibits the take of protected migratory bird species without prior authorization.
- **Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668C** – Prohibits the take specifically of bald and golden eagles, including their parts (including feathers), nests, or eggs.

TABLE 13-2
FEDERALLY LISTED SPECIES OF KING COUNTY

Taxonomy	Listed Species
Birds	marbled murrelet, northern spotted owl, streaked horned lark, yellow-billed cuckoo
Mammals	gray wolf, North American wolverine
Reptiles	northwestern pond turtle
Insects	monarch butterfly, Taylor's checkerspot
Conifers and cycads	whitebark pine

Washington State has established further protections for fish, wildlife, and plants under Title 77 RCW: Fish and Wildlife. The WDFW is primarily responsible for enforcing the Fish and Wildlife Code (Title 220 WAC). Additionally, Chapter 17.10 RCW provides regulations for noxious weeds, which may degrade or cause economic loss to agricultural, natural, and human resources.

K.C.C. Chapter 21A.24 provides definitions and regulations for critical areas, including protecting unique fish and wildlife habitats and maintaining and promoting countywide native biodiversity (K.C.C. 21A.24.382 through 21A.24.388). The 2022 King County Countywide Planning Policies (CPPs) include policies aimed at maintaining healthy ecosystems and environments for both people and wildlife and protecting biodiversity across all landscapes within King County (King County 2021a).

13.1.2 Riparian and Terrestrial Resources in King County

King County is made up of three major ecoregions: Puget Lowlands, North Cascades, and Cascades (King County 2008). According to the 2008 King County Biodiversity Report, King County is home to approximately 220 species of breeding and non-breeding birds annually, as well as 69 species of mammals, 12 species of amphibians, and eight species of reptiles.

Additionally, 1,249 species of vascular plants have been identified within the county, 383 of which are introduced (non-native) species.

Within King County, five terrestrial animal species (not including fish or aquatic-only species) are federally listed as endangered or threatened or are proposed or candidates to be listed; and 23 terrestrial animal species are listed by the state as endangered, threatened, sensitive, or candidate species. The WDFW Priority Habitats and Species (PHS) list includes all federally and state-listed species, as well as vulnerable animal groups; vulnerable species of recreational, commercial, or tribal importance; and habitats with unique or significant value to a large number of species (WDFW 2023).

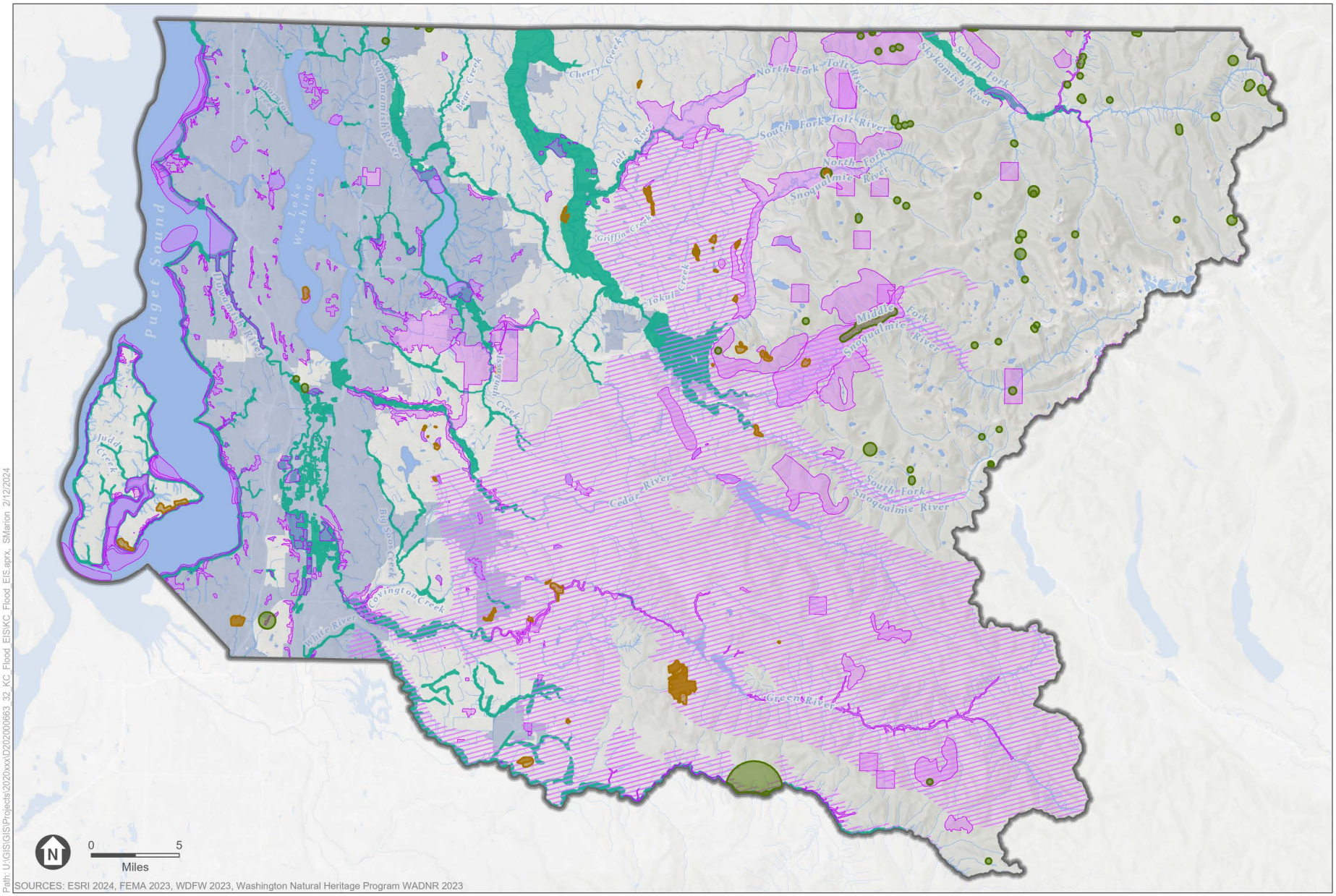
Incorporated cities are located primarily on the western side of King County, within the Puget Lowlands ecoregion. These dense urban areas contain relatively low biodiversity and are less likely to contain important habitats or species of importance. However, designated greenspaces, greenbelts, open spaces, and wildlife corridors designated by cities may still be used by a variety of species at different life stages and serve an important role in creating navigable wildlife networks and connections to larger or higher quality habitats.

Unincorporated areas of King County are primarily located within the Cascades ecoregion in the southeastern portion of the county, and the North Cascades ecoregion in the northeastern and east central parts of the county. The Cascades ecoregion contains the Cedar River, Green River, and White River watersheds and is dominated by agriculture and timber harvest. The North Cascades ecoregion includes the upslope valleys of the Skykomish, Tolt, and Snoqualmie rivers, and alpine forests. The North Cascades ecoregion is the least developed and is characterized by dense forests.

The Comprehensive Plan notes that while habitat conditions vary throughout the county, higher quality habitat is generally found in areas with less development (King County 2022a). The County has identified approximately 460 miles of wildlife habitat network, which links wildlife habitat with critical areas and buffers, priority habitats, trails, parks, and open spaces to facilitate wildlife movement across fractured landscapes. Approximately 400 of those miles are located within unincorporated King County (King County 2023a). The Washington Department of Natural Resources (WDNR) Natural Heritage Program maps rare plant species and high-quality ecosystems. Of those rare plants and high-quality ecosystems mapped in King County, almost all are found in unincorporated King County (WDNR 2023).

Species most likely to be found in the floodplain are those that have a strong association with riparian or aquatic environments, either because that is their preferred breeding or nesting area, or because that is the location of their food source. Examples of priority animal species that are likely to be found in the mapped floodplain include marbled murrelet, cavity-nesting ducks, harlequin duck, belted kingfisher, and red-legged frog. Riparian corridors also serve as important connectors between other habitats.

Figure 13-1 shows the location of riparian and terrestrial resources throughout the county.



King County Flood Plan EIS

Figure 13-1
Riparian and Terrestrial Resources

ESA

Last Updated 2/12/2024

13.2 Construction Impacts

13.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could occur within or adjacent to priority or critical habitats, and/or priority species. In addition, activities could impact riparian and terrestrial resources through removal of vegetation or by disturbing species with construction noise. The locations of construction projects and construction staging, as well as the volume and duration of construction noise, have the potential to impact species up to 1 mile away.

The types of activities that could impact riparian and terrestrial plants and animals include preventive actions, levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Activities including property acquisition and protection and natural resource protection may provide the opportunity to improve riparian and terrestrial resources. Activities like emergency services and public information projects are unlikely to affect riparian or terrestrial resources as they typically do not involve the removal of vegetation, construction, or construction staging.

For activities implemented under either alternative, the temporary removal of vegetation, the placement of construction staging areas, and construction noise would be identified as a part of project-level planning and design. All activities would comply with the appropriate permit conditions and project-specific analysis required for the project. Even those activities that are intended to have an overall positive effect on wildlife and habitat would still need to obtain all appropriate permitting compliance.

13.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 13.2.1, *Impacts Common to Both Alternatives*.

13.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 13.2.1, *Impacts Common to Both Alternatives*.

13.3 Operational Impacts

13.3.1 Impacts Common to Both Alternatives

Under both alternatives, riparian and terrestrial habitats could occasionally be permanently altered through the removal of vegetation (particularly the removal of mature trees), removal of snags or other specific habitat features, a change in habitat type, or the interruption of a continuous wildlife corridor.

The types of activities that could impact riparian and terrestrial plants and animals include preventative actions, levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, and other structural

projects. Activities such as property acquisition and protection, natural resource protection, emergency services, and public information projects are unlikely to negatively impact riparian or terrestrial resources as they typically do not involve the removal of vegetation or construction.

For activities implemented under either alternative, the permanent removal of vegetation and/or mature trees or any other permanent change in habitat type would be identified as a part of project-level planning and design. All activities would comply with the appropriate permit conditions and project-specific analysis required for the project. Even activities such as ecological restoration projects, which are intended to have an overall positive effect on wildlife and habitat, would still need all appropriate permitting compliance.

13.3.2 Alternative 1: No Action

Operation impacts for the No Action Alternative would be the same as described in Section 13.3.1, *Impacts Common to Both Alternatives*.

13.3.3 Alternative 2: 2024 Flood Plan

Operation impacts for Alternative 2 would be the same as described in Section 13.3.1, *Impacts Common to Both Alternatives*. Implementation of the multi-benefit framework included in the 2024 Flood Plan would lead to more consistent consideration of ecological functions, including riparian and terrestrial habitats, in design of flood hazard management activities, with the potential to greatly decrease impacts to ecological function and habitat quality.

13.4 Avoidance, Minimization, and Mitigation Measures

As part of project-level design, each activity should be individually assessed by a qualified biologist to determine if any priority species or critical habitats are within the project vicinity and, if so, the effect of the project on those species or habitats. If any project element of the Flood Plan would impact a priority species or critical habitat, it should be in compliance with the regulations listed above and development standards listed in K.C.C. 21A.24.382 – Wildlife habitat conservation areas, and K.C.C. 21A.24.386 – Wildlife habitat networks. Any project in the vicinity of a federal or state-protected species may need consultation with the NMFS, USFWS, and/or WDFW under Section 7 of the ESA.

Any temporary or permanent adverse impacts on wildlife habitat conservation areas or wildlife networks must be mitigated on-site following the requirements listed in K.C.C. 21A.24.388. Off-site mitigation is limited to those sites that will enhance the wildlife habitat conservation area. The goal of mitigation is to prevent the disturbance of protected species, provide equivalent or greater biologic function, and provide, to the maximum extent practicable, the same environmental conditions as the pre-altered site. Other mitigation measures to limit impacts on priority species and habitats include:

- Limit the timing or duration of construction noise and lights so that they occur outside of breeding or other sensitive seasons.
- Design projects so that construction occurs outside of critical habitat areas.

- Limit removal of native vegetation and mature trees. If any trees must be removed, strive to retain those with a diameter at breast height of 4 inches or greater and use cut trees on-site as habitat features, such as snags or downed woody material.
- Remove non-native / invasive species and replant with native plants wherever possible.
- Prioritize projects that result in enhanced habitat.

13.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on riparian or terrestrial resources. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 13.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 14
Transportation

14.1 Affected Environment

King County collaborates with state and local governments to provide integrated, multimodal transportation throughout the county. The transportation system includes bridges, highways, marine transportation, and airports.

14.1.1 Relevant Plans, Policies, and Regulations

Plans

King County maintains a Comprehensive Plan in accordance with Washington's GMA. The Comprehensive Plan is currently in the process of a major 10-year update. The plan identifies policies and strategies pertaining to transportation to provide high-level guidance for transit services and facilities throughout the county. Transportation policies in the Comprehensive Plan include the following policy relevant to flooding:

- **T-109 –** As directed by King County's Comprehensive Emergency Management Plan, King County shall seek to protect its transportation system against disasters, to the extent possible, by developing prevention and recovery strategies in partnership with other jurisdictions and agencies and coordinating emergency transportation response.

The County is in the process of implementing several transportation plans. The King County Transportation Needs Report (TNR) is a functional plan of the King County Comprehensive Plan and fulfills the requirements of growth management legislation. The TNR focuses on improvement needs for county roads, bridges, and other related infrastructure (King County 2020a). King County's Strategic Plan for Road Services (SPRS) guides public transportation investments through the years 2014–2024. The SPRS provides policy guidance for managing road infrastructure and presents information about the county road system needs, costs, and alternative service levels to inform future service options (King County Department of Transportation 2014). The King County Strategic Plan for Public Transportation 2021–2031, updated in 2015, identifies and defines 10 goals for the agency with corresponding policies, strategies, and measures for implementation. Goals in the plan address investing upstream and where needs are considered greatest, and the review of transit emergency plans (King County Metro 2021).

Policies and Regulations

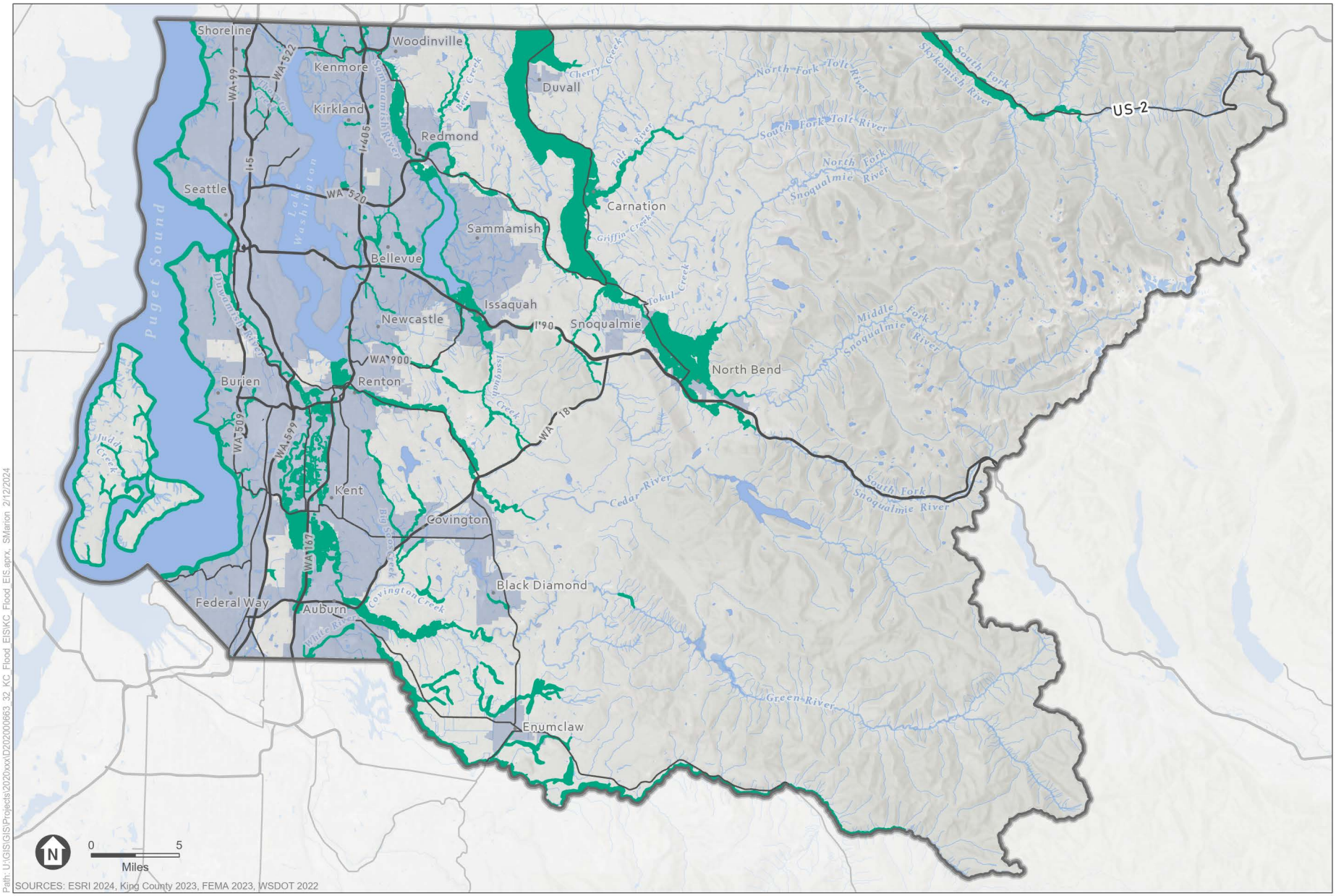
K.C.C. Title 14 outlines the County's rules and regulations of roads and bridges in accordance with the King County Comprehensive Plan and the GMA. Additionally, K.C.C. Title 15 sets rules and regulations for aircraft operation, maintenance, and management.

14.1.2 Transportation in King County

Major transportation infrastructure in King County consists of federal, state, and local highways and roads. Roadways in the county provide basic mobility and connection to employment and regional services such as emergency service routes, education, and recreation. Trail infrastructure in the county, which is often located adjacent to levees and revetments, provides both recreational opportunities and transportation for walkers, bicyclists, and others. The network of roadways in King County includes Interstate 5 (I-5) and Interstate 90 (I-90), multiple state highways, and numerous local roadways. The Washington State Department of Transportation (WSDOT) is the primary governmental agency that constructs, maintains, and regulates transportation infrastructure in the state, including major highways and bridges in King County. King County manages and maintains roughly 1,500 miles of roadways that carry more than 1 million trips every day. The road system includes local neighborhood streets, principal arterials, minor arterials, and collector arterials (King County Department of Transportation 2014). Major roads and highways that run through the county are shown in **Figure 14-1**.

Other transportation infrastructure in the county includes marine and waterfront transportation, airports, bridges, and the rail network. Within King County, the rail network is comprised of two Class 1 railroads (BNSF Railway and Union Pacific Railroad), intercity passenger rail carrier (Amtrak), and the region's transit authority (Sound Transit), which operates light rail and commuter rail. Passenger railways are primarily concentrated in the Seattle metropolitan area and include the Seattle station on the Amtrak Cascades route, managed by WSDOT. The Port of Seattle (Port) is the main agency that oversees Seattle's waterfront and maritime activities, supporting cargo shipping, commercial fishing, and cruise lines. The Port also owns and operates Seattle-Tacoma International Airport, the region's primary commercial airport. King County International Airport-Boeing Field is owned and managed by the County and serves small commercial airlines, cargo carriers, private aircraft owners, helicopters, corporate jets, and military and other aircraft.

Public transportation in unincorporated King County is primarily managed by King County Metro, which operates a variety of services such as bus, paratransit, and vanpool. The agency also provides services specific to the Seattle metropolitan area, including railways and bus routes. Sound Transit is co-managed by King, Pierce, and Snohomish counties, providing public transportation services throughout King, Snohomish, and Pierce counties.



Incorporated Municipalities

Streams

FEMA Flood Zone

Floodplain (Regulatory Floodway, 1% and 0.2% Annual Chance)

State and Federal Roads

Freeway

Major Road

King County Flood Plan EIS

Figure 14-1
Major Roadways

Last Updated 2/12/2024

ESA

14.2 Construction Impacts

14.2.1 Impacts Common to Both Alternatives

Any activities under either alternative that would require construction could affect transportation. Construction could require temporary road closures and rerouting. Construction could affect available parking, particularly if construction staging areas are located in parking areas. Construction activities could cause some increases in construction-related vehicular traffic on the road network, such as vehicle trips. Activities that require vehicle trips include mobilization of construction equipment and materials to the site, with the number of trips dependent on the level of excavation and disposal materials and construction equipment needed. Construction could also involve excavation beneath roadways, which would require traffic lanes, sidewalks, regional trails, or bike lanes to be entirely or partially closed for the duration of construction and require detours.

Activity types that would likely cause the greatest transportation impacts are those with the highest intensity and longest duration of construction, such as levee setback projects, ecological restoration projects, levee and floodwall projects, and other structural projects. Construction impacts from these activity types would be particularly noticeable where the transportation network is tied into floodplain management infrastructure that is being modified (such as where a road adjacent to a river acts as a levee or where a conveyance capacity project requires replacement of a culvert under a roadway). Other activity types that require construction, such as property protection or demolition associated with property acquisitions, would have more minor impacts on transportation because the construction duration would be short, and roads are unlikely to require closures or rerouting. The specific transportation impacts of proposed activities would be assessed as part of future project-specific design and environmental review as appropriate.

14.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 14.2.1, *Impacts Common to Both Alternatives*.

14.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 14.2.1, *Impacts Common to Both Alternatives*.

14.3 Operational Impacts

14.3.1 Impacts Common to Both Alternatives

Impacts of flood risk reduction activities implemented under either alternative could include changes to road or trail infrastructure. Portions of roadways could be rebuilt and/or relocated as part of large-scale capital projects such as flood facility maintenance and construction, ecological restoration projects, conveyance capacity, and other structural projects. However, impacts would be minor because the original level of service would be met, and in some cases improved by reducing the risk of roadway flooding, by any rebuilt or relocated roads. In the unlikely case that roads would be altered in a way that reduced the level of service, those impacts would be assessed

in project-level environmental review. Many activities would either directly or indirectly increase the resilience of roads and other transportation infrastructure to flooding.

14.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 14.3.1, *Impacts Common to Both Alternatives*. Flood risk reduction activities would continue to be developed under the policies in the 2006 Flood Plan, which does not include policies that speak to transportation.

14.3.3 Alternative 2: 2024 Flood Plan

Operational impacts for Alternative 2 would be the same as described in Section 14.3.1, *Impacts Common to Both Alternatives*. The 2024 Flood Plan includes a policy that states "King County should look for opportunities to improve, modify, or relocate existing county roads to ensure safe ingress and egress during flood events." In addition, the 2024 Plan includes a multi-benefit framework, in which actions to address flood risk to existing development would consider the existing land use context, such as transportation.

14.4 Avoidance, Minimization, and Mitigation Measures

The goals, guiding principles, and policies in the 2024 Flood Plan encourage projects that minimize flood impacts on transportation infrastructure. Specific mitigation measures for construction and operation of flood risk reduction activities would be identified as part of project design and project-level permitting and environmental review. Potential avoidance, minimization, or mitigation measures for activities involving transportation infrastructure during construction could include:

- Provide advance notice and coordinate with affected transportation services to minimize disruption of services during construction.
- Develop a Traffic Control Plan for any work within the public right-of-way that affects vehicular, transit, bicycle, or pedestrian traffic.
- Provide on-site loading areas for removal and delivery of materials.
- Provide traffic controls such as flaggers and traffic control officers as appropriate and detour routes as necessary.
- Maintain access to transit services and coordinate with transit agencies if transit stop closures or route detours are needed.

14.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on transportation. However, individual activities implemented under either alternative could have significant adverse impacts depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 14.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental

analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

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CHAPTER 15
Visual Resources

15.1 Affected Environment

15.1.1 Relevant Plans, Policies, and Regulations

Plans

King County maintains a Comprehensive Plan in accordance with Washington's GMA. The Comprehensive Plan is currently in the process of a major 10-year update. Policies relevant to visual resources in the plan include:

- **E-499b –** River and stream channels, stream outlets, headwater areas, riparian corridors, and areas where dynamic ecological processes are present should be preserved, protected and enhanced for their hydraulic, hydrologic, ecologic and aesthetic functions, including their functions in providing large wood to salmonid-bearing streams. Actions taken along river and stream channels should provide multiple benefits, resiliency to climate change, and ensure flood risk reduction actions benefit all communities, especially frontline communities, consistent with equity and racial and social justice goals and the policies of the King County Flood Hazard Management Plan or successor plans.
- **S-313 –** King County should ensure that public and private development proposals protect and restore the aesthetic quality of shorelines in the project design.

Policies and Regulations

K.C.C. Title 21A addresses zoning requirements, standards, and regulations. K.C.C. 21A.02.030 states that a general purpose of the zoning policies is "to provide for the economic, social, and aesthetic advantages of orderly development through harmonious groupings of compatible and complementary land uses and the application of appropriate development standards." Additionally, K.C.C. Title 26 covers agricultural and open space lands, with K.C.C. 26.04.010 declaring open space resources as providing important aesthetic benefits to citizens.

15.1.2 Visual Resources in King County

The area covered by the Flood Plan is King County as a whole. Areas that flood and that could be the site of flood risk reduction activities include major rivers and their floodplains, coastal areas, tributaries and small streams, and urban areas, which can experience stormwater and shallow flooding. Rivers and tributaries in King County flow through a wide range of land uses, each with different visual environments, including largely natural and wooded riparian areas; rural areas with views dominated by agricultural fields and operations or low-density residential development; urban and suburban areas with views of single-family housing, commercial

development, industrial areas, warehouses, and/or more highly urbanized development; and parks with open views of recreation areas or more natural views. In all of these areas, views from rivers and tributaries and their floodplains often include infrastructure such as levees, highways and other roads, and bridges. Rivers and streams themselves often provide scenic views where they are visible. Coastal areas susceptible to flooding also vary in their visual environment and include many of the same types of views as rivers and tributary floodplains. However, coastal areas are more likely to have scenic views of Puget Sound.

15.2 Construction Impacts

15.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could alter local views during the construction period. Construction activities, equipment, and materials could change the appearance of sites and temporarily modify views from surrounding neighborhoods. Construction activities would be visible from nearby residences, commercial areas, and surrounding streets. Larger scale construction projects may require larger equipment or staging areas, causing temporary visual changes for the duration of construction. For activities constructed underground or for activities that use smaller equipment, impacts on views could be more limited. Views of rivers or of Puget Sound could potentially be impacted.

Activity types that would most likely disrupt views during construction are those with the highest intensity and longest duration of construction, such as levee setback projects, ecological restoration projects, levee and floodwall projects, and other structural projects. Less intensive actions, such as removal of structures following property acquisitions or property protection projects (such as elevating homes), would also be visible during construction but would be less disruptive to views.

15.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 15.2.1, *Impacts Common to Both Alternatives*.

15.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 15.2.1, *Impacts Common to Both Alternatives*.

15.3 Operational Impacts

15.3.1 Impacts Common to Both Alternatives

Flood risk reduction activities implemented under both alternatives could permanently alter views. For example, levee setback projects and ecological restoration projects would have visual changes on the landscape. In most cases, these changes would restore natural features and vegetation. In some cases, post-construction visual quality would improve over time as vegetation grows and natural features and channel processes are restored.

Some activities could include changes to the visual environment that could be perceived negatively due to vegetation impeding views of waterbodies. For example, levee setback projects could move trails farther away from rivers and impact views of those rivers, and additional vegetation may replace the connected space and further disrupt views of the river. Other activity types, such as levee and floodwall projects, stormwater infrastructure, or property protection, could alter views in ways that some would find negative. For example, elevating a home or increasing the height of a levee (including as part of a levee setback project) could make those features more visible from certain viewpoints. The visual impacts of individual actions would be identified (and potentially avoided or mitigated) during project-level design and environmental review.

15.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 15.3.1, *Impacts Common to Both Alternatives*.

15.3.3 Alternative 2: 2024 Flood Plan

Operational impacts for Alternative 2 would be the same as described in Section 15.3.1, *Impacts Common to Both Alternatives*.

15.4 Avoidance, Minimization, and Mitigation Measures

Specific mitigation measures for construction and operation of activities would be identified as part of project design and project-level permitting and environmental review. Many activities implemented under both alternatives would be considered beneficial to views (through removal of invasive vegetation or revegetating floodplain areas) and could be considered mitigation for other actions. For other impacts, potential avoidance, minimization, or mitigation measures could include:

- Select staging areas that avoid placing construction equipment or activities in locations where they would impact public views of scenic resources to the degree possible.
- Restore disturbed areas after construction in compliance with local jurisdictional requirements.
- Select project designs and/or native vegetation planting techniques that minimize impacts on public views of scenic resources such as rivers or Puget Sound where possible without compromising the benefits of the proposed activity (such as benefits of restoring a native riparian buffer or of other actions intended to provide a lift in ecological function).
- Provide educational signage about projected future visual changes as vegetation is restored to mitigate negative perceptions of projects post-construction.

15.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on visual resources. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through

implementation of the mitigation measures described above in Section 15.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

15.6 References

King County. 2022. *2016 King County Comprehensive Plan.* Updated December 6, 2022. URL: 2016_kccp_kingcountycomprehensive_plan-updated_12062022_with_ord_19555.pdf. (2024 Update in progress.)

CHAPTER 16
Water Resources

16.1 Affected Environment

16.1.1 Relevant Plans, Policies, and Regulations

Plans

King County's Shoreline Master Program (SMP) dictates land use and environmental protections to marine waters, streams, rivers, lakes, and wetlands, as well as areas within 200 feet of larger waterbodies. SMP policies establish broad shoreline management directives in order to restore and enhance shorelines and their ecological processes and functions. The SMP addresses the protection of habitat and ecological functions (including in floodplains) and supports natural processes that mitigate flood risk, balanced with the interests of water-dependent industries and shoreline property owners. Policies in the SMP include development regulations that protect various aspects of the environment and implement other King County policies, including the County's surface water management and stormwater regulations.

The Clean Water Healthy Habitat (CWHH) Strategic Plan is a King County initiative to protect and restore water quality and habitat. CWHH centers on six 30-year goals that focus on improving fish habitat and river floodplains, reducing pollution, controlling stormwater runoff, increasing green spaces, and building resilient marine shorelines (King County 2020).

Policies and Regulations

The U.S. Environmental Protection Agency (EPA) is responsible for developing and enforcing federal pollution regulations, including the Clean Water Act (CWA) and Comprehensive Environmental Response, Compensation, and Liability Act, also known as Superfund. In Washington State, portions of EPA's authority for pollution control are delegated to the Washington State Department of Ecology (Ecology). Specifically, Ecology is the certifying authority for Section 401 under the CWA and is responsible for issuance of water quality certifications. In Washington State, Ecology also enforces state pollution laws and regulations that, in some cases, are stricter than federal standards. State regulations are designed, in part, to help meet surface water quality standards adopted by the State of Washington under Chapter 173-201A WAC.

The CWA is jointly overseen by the EPA and the U.S. Army Corps of Engineers (Corps), protecting waters of the United States and discharge into them. The Corps is responsible for the implementation of Section 404 of the CWA, in which the discharge of dredged or fill material into U.S. waters is regulated, including wetlands (for more information on wetlands, see Chapter

17, *Wetlands*, of this Programmatic EIS). Under the CWA, National Pollutant Discharge Elimination System (NPDES) permits may be issued to cover discharge to surface waters. Authorized by the EPA, NPDES permit programs enable state governments to perform permitting, administration, and enforcement aspect of the NPDES program. In King County, the CWA is applied to stormwater runoff, combined sewer overflows, construction or excavation activities, and other activities that may impact water quality. The CWA is the primary federal statute in the United States governing water pollution, aiming to prevent, reduce, and eliminate pollution in water resources. Under the CWA, federal facilities must implement regulatory responsibilities including obtaining discharge permits, developing risk management plans, and meeting applicable water quality standards.

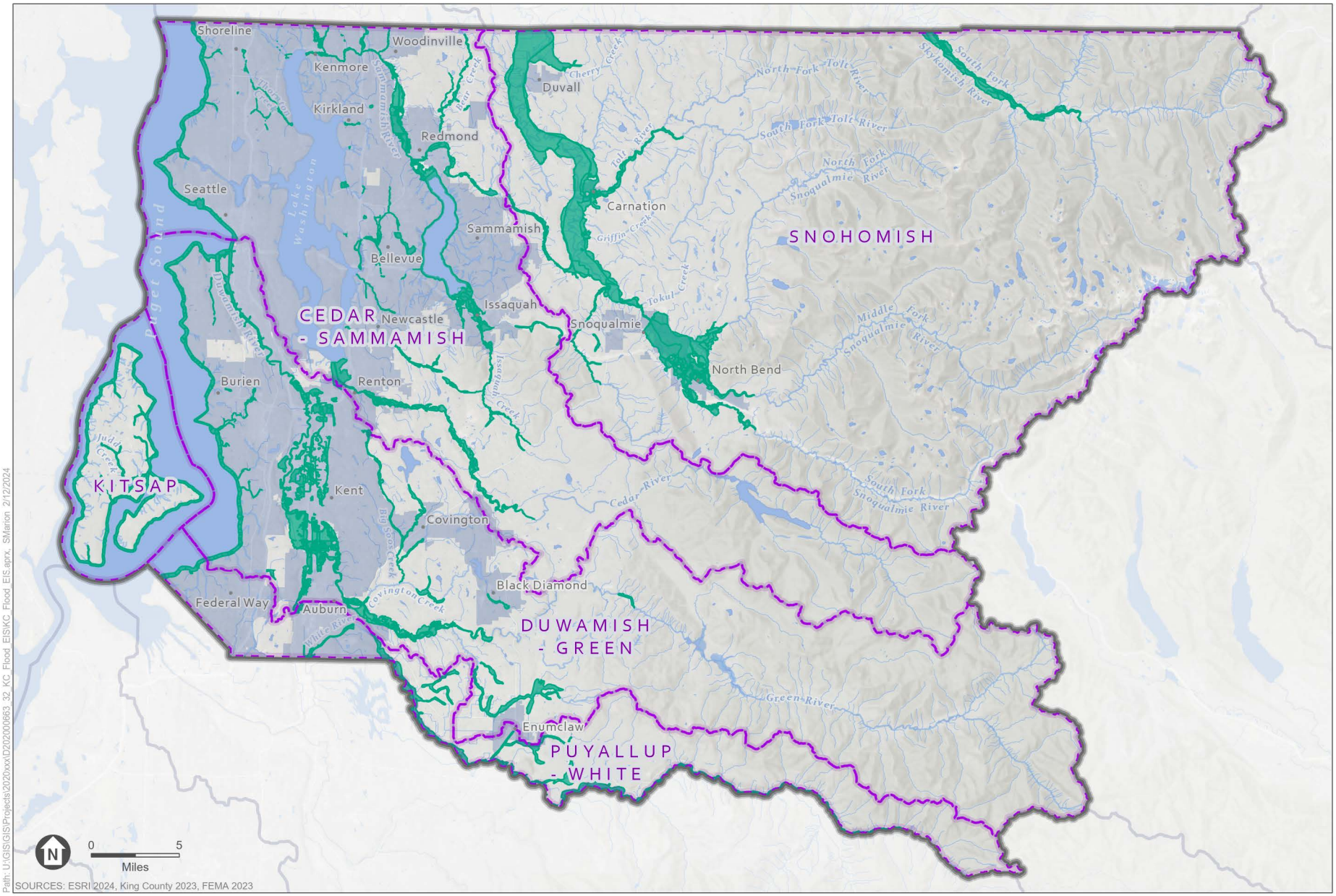
Section 10 of the federal Rivers and Harbors Act regulates activities occurring in navigable waters of the United States, including dredging, filling, and construction. Permits under Section 10 are reviewed and issued by the Corps. Dredging activities to remove sediment or gravel have historically been performed in King County to increase channel capacity in waterbodies, which has sometimes been required to ensure that levees meet Corps design flood standards.

The federal Endangered Species Act (ESA) establishes protections for listed species of plants, wildlife, and aquatic species. Certain earthwork and sediment management activity can disturb these species and their habitat in aquatic and terrestrial environments. Destruction or disconnection of wetland and floodplain habitat and natural processes are of particular concern to endangered aquatic species. Increased sediment loads in waterbodies are also a concern for endangered aquatic species. The ESA prohibits federal agencies from modifying or destroying critical habitats, which includes actions permitted by federal agencies, such as work in waters of the United States.

16.1.2 Surface Water

King County identifies six major rivers—the South Fork Skykomish, Snoqualmie, Sammamish, Cedar, Green/Duwamish, and White rivers. Using Washington's Water Resource Inventory Area (WRIA) framework, these rivers fall within four WRIAs: WRIA 7 (Snohomish River basin, which includes the South Fork Skykomish and Snoqualmie); WRIA 8 (Lake Washington/Cedar/Sammamish watershed, which includes the Sammamish and Cedar); WRIA 9 (Green/Duwamish and Central Puget Sound watershed, which includes Vashon-Maury Island); and WRIA 10 (Puyallup-White watershed). **Figure 16-1** shows the location of WRIAs within King County. Other surface waters in the county include marine waters, lakes, wetlands, tributaries, and creeks.

The Snoqualmie River and the South Fork Skykomish River, in the northeast portion of King County, are part of the larger Snohomish River watershed. The Snoqualmie River Valley is the most flood-prone area of King County, and flooding typically results in inundation by deep, slow-moving floodwaters, with some areas of deep and fast flows, especially along certain tributaries. The South Fork Skykomish River generates deep, fast-moving flood flows capable of severe bank erosion.



SOURCES: ESRI 2024, King County 2023, FEMA 2023

Path: U:\GIS\GIS\Projects\2020xxx\D20200663_32_KC_Flood_EIS\KC_Flood_EIS.aprx, SMarion 2/12/2024

Incorporated Municipalities

Streams

FEMA Flood Zone

Floodplain (Regulatory Floodway, 1% and 0.2% Annual Chance)

Watershed (WRIA)

King County Flood Plan EIS

Figure 16-1
Water Resources

Last Updated 2/12/2024

ESA

The Lake Washington/Cedar/Sammamish watershed has two rivers—the Cedar and Sammamish—and these rivers connect to Puget Sound via lakes and a manmade system of channels and the Hiram Chittenden (Ballard) Locks. The Cedar River experiences fast, erosive flows, whereas the Sammamish River experiences very little overbank flooding. Flooding occurs in other areas of the watershed, including flashy flows along Issaquah Creek and other urban streams and elevated water levels in Lake Sammamish.

The Green River becomes the Duwamish River at the Black River confluence (River Mile 11.0). Flooding along the Green River can be faster flow in areas (especially in the middle and upper watershed) and slow-moving overbank inundation in others (primarily in the lower watershed). The Duwamish River is characterized primarily by slow-moving inundation. The Howard Hanson Dam in the upper reaches of the Green River, built and managed by the Corps, provides flood control to the highly developed downstream areas along both rivers. Flooding on the Green River is primarily precipitation-driven, and the Duwamish River in the lower watershed also faces flood risk arising from tidal influences and storm surges.

The White River corridor is lightly populated upstream of Mud Mountain Dam, but substantial flood risk to developed areas within Auburn and downstream exists due to sediment deposition. The river carries the most significant sediment load of any King County river, and reduced channel capacity arising from ongoing sediment deposition is a challenge in this watershed.

Periodic flooding helps to create and maintain river floodplains that contain unique and productive habitats. Because of floods and river movement, floodplains are highly dynamic, and the ecosystems within them are adapted to and dependent on periodic inundation. Floodplains created by periodic flooding provide additional beneficial functions. These beneficial functions of flooding and connected floodplains include recruitment of large wood, creation and maintenance of side channel habitat, routing and storage of coarse sediment, and connection to floodplain habitat for multiple aquatic species. Flooding occurs in many locations in King County, and the types of flooding and the risks it presents to people, property, and infrastructure are numerous and vary by location. Intensive residential, commercial, and industrial land uses occupy a large areal extent of the floodplains in the lower reaches of King County's rivers and streams.

In addition to its rivers, King County has 103 miles of saltwater shoreline, with 51 miles under the County's jurisdiction. Coastal flood risks are prominent during storms, and one factor affecting King County communities is referred to as compound flooding, which is when high tides, storm surges, and inland factors—such as saturated soils and large volumes of freshwater inflow—combine to exacerbate flooding conditions. In addition, sea level rise has profound implications for future risk along marine shorelines, especially those that are highly developed. King County has identified a sea level rise risk area for the Vashon-Maury Island shorelines and developed accompanying regulations. Sea level rise will also increase the frequency and extent of coastal flooding. Sea level in King County is projected to rise approximately 1 to 2 feet by mid-century and 2 to 5 feet by 2100 under a high greenhouse gas scenario, and this increase may also exacerbate compound flooding in coastal drainages.

King County has five groundwater management areas (GWMAs) within the county boundaries: East King County, Issaquah Creek Valley, Redmond Bear Creek Valley, South King County and Vashon-Maury Island. These areas are designated under the provisions of Chapter 173-100 WAC. The Vashon-Maury Island GWMA is an EPA-designated Sole Source Aquifer.

There are many stormwater management systems and programs in operation across the region to meet multiple objectives, including protecting against property damage and transportation impacts from urban flooding during rainstorms. In urbanized areas of the county, Municipal Separate Storm Sewer System (MS4) pipes and facilities are used to convey and store stormwater flows from streets, buildings, and other surfaces to regional waterbodies. While originally designed to minimize urban flooding during storm events, MS4s can also be configured to reduce the amount of pollutants carried by stormwater, and to store or infiltrate stormwater to reduce the adverse impacts that high peak storm flows can have on natural systems. King County WLRD operates stormwater management infrastructure and programs for unincorporated areas of the county, while cities are responsible for stormwater management within their boundaries.

16.2 Construction Impacts

16.2.1 Impacts Common to Both Alternatives

Multiple activities under both alternatives would include construction activities that take place in or adjacent to surface waters, which would have the potential to impact water resources. Activity types that would involve in-water work or work along shorelines include preventive actions, levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Construction activities in or adjacent to surface waters could cause impacts on water resources through sedimentation, turbidity, and disruption to habitat. Impacts could potentially be significant for some actions. Project-specific environmental review would be conducted as appropriate during the application and review for federal, state, and local permits. In-water work would only be allowed with approved permits and within the required work windows.

16.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 16.2.1, *Impacts Common to Both Alternatives*.

16.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for t Alternative 2 would be the same as described in Section 16.2.1, *Impacts Common to Both Alternatives*.

16.3 Operational Impacts

16.3.1 Impacts Common to Both Alternatives

Many activities included in both alternatives would impact river hydraulics and flood levels. For example, conveyance capacity projects (such as culvert replacements) would allow for larger

volumes of water to flow through infrastructure and create fish passage. Levee setback projects would increase floodwater storage capacity and groundwater recharge in floodplains. Structural projects that protect areas from flooding have the potential to redirect floodwaters to other areas. Most projects would be designed to have positive effects on flood conditions and would reduce flood risk to property and people. Project types such as property acquisitions, levee setback projects, ecological restoration projects, and natural resource protection would have beneficial effects on a range of water resource elements, including sedimentation, erosion, water temperature, water quality, and aquatic habitat. Specific impacts of each project would be assessed during project-level design and environmental review.

Traditional floodplain management approaches (such as building levees, floodwalls, and revetments) have had a wide range of significant, detrimental impacts on water resources through disconnection of rivers to floodplain habitat, channelization of rivers, alterations to sediment dynamics, and flooding impacts on upstream and downstream areas. Some activities under both alternatives, such as preventive actions (like levee maintenance) or structural projects (like a new floodwall to protect a vulnerable area) could continue these impacts or create new impacts. Other activities, like stormwater infrastructure projects or conveyance capacity projects, would be designed to have beneficial effects on water resources (through removing barriers or controlling stormwater flows) but, as structural projects, would have the potential to have some negative impacts on other aspects of water resources. Structural activities would also likely be less resilient to climate change, and even if they were designed to avoid or minimize impacts on water resources, impacts could increase as conditions change (for example, as streamflow magnitude increases, and as higher flows become more frequent). Impacts of these activities would be assessed during project-level design and environmental review.

16.3.2 Alternative 1: No Action

Operational impacts for the No Action Alternative would be the same as described in Section 16.3.1, *Impacts Common to Both Alternatives*.

16.3.3 Alternative 2: 2024 Flood Plan

Operational impacts for Alternative 2 would be the same as described in Section 16.3.1, *Impacts Common to Both Alternatives*. For Alternative 2, flood risk reduction actions would be developed under the goals and policies of the 2024 Flood Plan, which includes a goal “To achieve multi-benefit flood risk reduction outcomes that preserve, restore, and enhance the natural functions of flood-prone areas; improve floodwater storage and conveyance; contribute to habitat restoration; honor tribal sovereign rights, including treaty-reserved fishing, hunting, and gathering rights; and meet other needs identified by local communities.” The Flood Plan also includes a suite of policies related to natural systems, including Policy 5: “King County shall seek to preserve and enhance natural functions of flood hazard areas and promote natural hydrologic function at the watershed scale to build resilience to changing precipitation patterns in a changing climate.” Projects implemented under the policies and multi-benefit framework of the 2024 Flood Plan would be more likely to have positive effects on water resources and to minimize or avoid negative impacts.

16.4 Avoidance, Minimization, and Mitigation Measures

Activities under both alternatives contain actions to improve water quality and mitigate existing impacts on surface water, groundwater, and stormwater. Specific mitigation measures for construction and operation of all flood risk reduction activities would be identified as part of project design and project-level permitting and environmental review. Avoidance, minimization, or mitigation measures to reduce impacts on water resources could include:

- Implement toxic spill prevention measures during construction.
- Include restoration or enhancement of aquatic and riparian areas as an integral part of all projects.
- Limit construction to approved fish windows to minimize disturbance.
- Implement pollutant source controls and surface water and stormwater management.
- Implement BMPs to reduce runoff and nutrients into water sources.
- Consider developing project monitoring and adaptive management plans when applicable.
- Ensure that maintenance standards are consistent with stormwater regulations and the NPDES.

16.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on water resources. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 16.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

16.6 References

King County. 2020. *Clean Water Healthy Habitat Strategic Plan 2020-2025.* URL: https://cdn.kingcounty.gov/-/media/king-county/depts/dnrp/about-king-county/about-dnrp/sustainability-commitments/clean-water-healthy-habitat/clean-water-healthy-habitat-strategic-plan.pdf?rev=c480531583c9495a85192008ab2c3d6f&hash=9A52FE6CBAA1ECE0DD60E2CEA7D18443.

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CHAPTER 17
Wetlands

17.1 Affected Environment

This chapter evaluates wetlands, seasonally and permanently saturated land, and wetland buffers. Wetlands provide important ecosystem functions by providing fish and wildlife habitat, protecting water quality by trapping sediments and absorbing pollutants, protecting lands from flooding by storing floodwater, controlling runoff and stabilizing shorelines, and recharging groundwater. Wetlands in King County include deep ponds, shallow marshes, swamps, wet meadows, and bogs. Wetlands comprise forested and scrub-shrub vegetation communities, emergent vegetation, and other lands supporting a prevalence of plants adapted to saturated soils and varying flooding regimes. The areal extent of wetlands within King County has been reduced from pre-development conditions through fill and drainage to allow for development and agriculture.

17.1.1 Relevant Plans, Policies, and Regulations

King County manages its land and shoreline use within a regulatory framework that is guided by plans that the County is required to maintain under Washington State law. The Washington State GMA requires that each city and county in Washington identify, designate, and protect critical areas, including wetlands, present in their local environment.

Plans

The King County Comprehensive Plan identifies that the County's overall goal for the protection of wetlands is **no net loss of wetland functions and values** within each drainage basin. The Comprehensive Plan notes that watershed management plans, including Water Resource Inventory Area (WRIA) plans, should be used to coordinate and inform priorities for acquisition, enhancement, regulations, and incentive programs within unincorporated King County to achieve the goal of no net loss of functions and values within each drainage basin (King County 2022). The WRIAs located within or partially within King County include WRIA 7 - Snohomish, WRIA 8 – Cedar/Sammamish, WRIA 9 – Duwamish/Green, and WRIA 10 Puyallup/White. The Comprehensive Plan allows for the enhancement or restoration of degraded wetlands provided that the restoration or enhancement results in improvement to the wetlands' functions and values.

Policies and Regulations

K.C.C. Chapter 21A.24 provides definitions and regulations for critical areas including flood hazard areas (K.C.C. 21A.24.230 through 21A.24.275) and wetlands (K.C.C. 21A.24.318 through 21A.24.345).

Wetlands in Washington are identified, and the boundaries delineated in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Western Mountains, Valleys, and Coast Regional Supplement (Corps 2010), which is in compliance with WAC 173-22-035.

Wetlands in King County are rated as Category I, Category II, Category III, or Category IV based on the Washington State Wetland Rating System for Western Washington Version 2.0 (Hruby and Yahnke 2023). The Rating System scores wetlands based on special features, wetland functions, or a combination of the two, with Category I wetlands having the most value to the landscape, and Category IV having the least value. Wetland buffers are then assigned to the wetlands based on the wetland category, the habitat function score, and the intensity of impact of adjacent land use. Wetland buffers range from 25 feet for a Category IV wetland with a low-impact adjacent land use, to 300 feet for a Category I, II, or III wetland with a high level of habitat function and a high-impact adjacent land use. Buffers may be modified under certain conditions listed in K.C.C. 21A.24.325.B-C.

Incorporated cities within King County have their own policies and regulations for wetlands, typically under critical areas regulations. For example, the City of Seattle regulates wetlands under Seattle City Code (SCC) Chapter 25.09 – *Regulations for Environmentally Critical Areas.* Both incorporated and unincorporated areas of King County use the same methods for the identification, delineation, and rating of wetlands. However, the system for assigning buffers and buffer distances varies slightly among jurisdictions.

17.1.2 Wetlands in Incorporated Areas of King County

The National Wetlands Inventory (NWI) maps 24,807 acres of estuarine and marine wetlands, freshwater emergent wetlands, and forested/shrub wetlands within incorporated areas of King County (USFWS 2023). However, not all wetlands mapped by NWI have been formally delineated, and there are likely additional wetlands in the county that are unmapped by NWI.

There are few large or high-quality wetlands within the incorporated cities in King County, especially in the more densely populated cities such as Seattle and Bellevue. One of the larger wetland complexes (more than 600 acres) that once occurred near the location of the Southcenter Mall in Tukwila was drained and ditched for agriculture by 1940 (Collins and Sheikh 2005). The WDNR Washington Natural Heritage Program (WNHP) maps a high-quality forested wetland in the City of Black Diamond, and West Hylebos wetland, a scrub-shrub wetland, in the City of Federal Way (WNHP 2023). Other large or notable wetlands include those found in Lake Sammamish State Park in Issaquah, in Valley Floor Community Park in Kent, and along the South Fork McSorley Creek (north of S 272nd Street) in Kent (USFWS 2023).

17.1.3 Wetlands in Unincorporated King County

NWI maps 4,368 acres of estuarine and marine wetlands, freshwater emergent wetlands, and forested/shrub wetlands in unincorporated King County. Rare or high-value wetlands mapped by WNHP in unincorporated King County include Patterson Creek Natural Area to the northeast of the City of Sammamish, Charly Creek Natural Preserve to the northeast of the City of Enumclaw,

a fen along Griffin Creek to the east of the City of Carnation, and Kings Lake Bog Natural Area Preserve to the east of the City of Carnation (WNHP 2023). The largest contiguous non-marine wetland in King County mapped by NWI is near Lake Fenwick, just south of the City of Kent. There are several large wetland complexes in unincorporated King County including the estuarine wetlands along the shoreline of Vashon-Maury Island, along the White River floodplain in the southeast corner of the City of Auburn and along the border of King County and Pierce County, and along Soos Creek including Soos Creek Park and Trail in the cities of Kent and Renton as well as unincorporated King County (USFWS 2023).

17.1.4 Wetlands in the Mapped Floodplain

Wetlands along the floodplain provide an important role in slowing and retaining water during high-flow or flood events. Wetlands also provide an important water quality role by filtering sediment and pollutants out of the water as it moves downstream.

NWI maps 4,421 acres of estuarine and marine wetlands, freshwater emergent wetlands, and forested/shrub wetlands within the 1 percent annual chance and the 0.2 percent annual chance floodplains (USFWS 2023). Additional wetlands may also exist in the mapped floodplain other than what is mapped by NWI and/or King County iMap (King County 2023).

The allowable alterations to wetlands (listed in K.C.C. 21A.24.045) include the construction of new/maintenance on existing surface water conveyance systems, construction of new flood protection facilities, flood risk reduction gravel removal, construction of new/maintenance on existing instream structures, and other activities relevant to activities included in the Flood Plan.

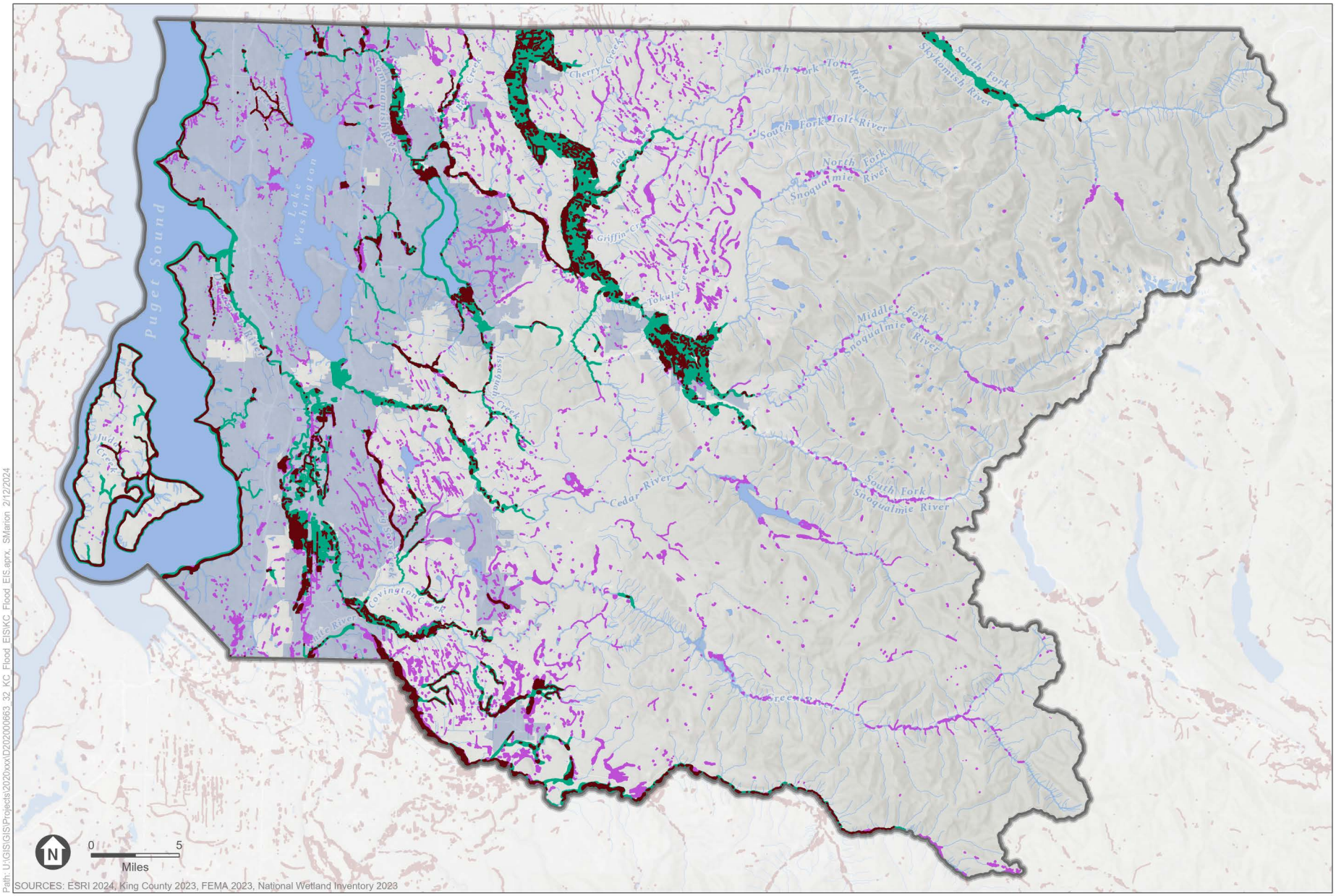
Figure 17-1 shows mapped wetlands within the study area.

17.2 Construction Impacts

17.2.1 Impacts Common to Both Alternatives

Under both alternatives, construction activities could occur within or adjacent to wetlands. Due to the nature of flood risk reduction projects, riverine and estuarine wetlands will likely be impacted more than other types of wetlands within the county. Construction activities that remove vegetation within wetlands or their buffers or where construction staging areas or activities themselves would be located within wetlands or their buffers would have the potential to damage the wetlands and reduce their ecological functions.

The types of construction activities that could impact wetlands include preventive actions, levee setback projects, ecological restoration projects, levee and floodwall projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Activities like property acquisitions and protection, natural resource protection, emergency services, and public information projects are unlikely to affect wetlands as they typically do not involve removal of vegetation or setting up construction staging areas within wetlands/wetland buffers.



Incorporated Municipalities

Streams

FEMA Flood Zone

Floodplain (Regulatory Floodway, 1% and 0.2% Annual Chance)

Wetlands

Wetlands within floodplain

Wetlands outside of floodplain

King County Flood Plan EIS

Figure 17-1
Wetlands

Last Updated 2/12/2024

ESA

For activities implemented under either alternative, the temporary removal of vegetation or the placement of staging areas would be identified as part of project-level planning and design. All activities would comply with the appropriate permit conditions and project-specific impact analysis required by the project.

17.2.2 Alternative 1: No Action

Construction impacts for the No Action Alternative would be the same as described in Section 17.2.1, *Impacts Common to Both Alternatives*.

17.2.3 Alternative 2: 2024 Flood Plan

Construction impacts for Alternative 2 would be the same as described in Section 17.2.1, *Impacts Common to Both Alternatives*.

17.3 Operational Impacts

17.3.1 Impacts Common to Both Alternatives

Under both alternatives, wetlands could be permanently altered through filling, dredging, or permanent encroachments in the wetlands or their buffers, all of which would have the potential to reduce the ecological functions of the wetlands. The types of construction activities that could impact wetlands include preventative actions, levee setback projects, conveyance capacity projects, stormwater infrastructure projects, and other structural projects. Activities like property acquisitions and protection, natural resource protection, emergency services, and public information projects would be unlikely to affect wetlands as they typically do not involve construction, particularly filling or dredging within a wetland. Even activities such as ecological restoration projects, which may have overall positive effects on wetlands, still need to comply with wetland regulations, especially if any filling or dredging occurs within the wetland or buffer, or the hydrologic regime could change as a result of the activity.

17.3.2 Alternative 1: No Action

Operation impacts for the No Action Alternative would be the same as described in Section 17.3.1, *Impacts Common to Both Alternatives*.

17.3.3 Alternative 2: 2024 Flood Plan

Operation impacts for Alternative 2 would be the same as described in Section 17.3.1, *Impacts Common to Both Alternatives*. In addition, the 2024 Flood Plan includes guiding principles to encourage projects that minimize disturbance to wetlands and encourage wetland enhancement and restoration to provide multi-benefit outcomes that benefit both the built environment and natural habitat. The inclusion of coastal areas and tributaries in the 2024 Flood Plan could expand the geographies where wetland enhancement and restoration are implemented, which could increase benefits to wetlands in these areas.

17.4 Avoidance, Minimization, and Mitigation Measures

If any project element of the Flood Plan would affect a wetland, it would need to comply with the policies and regulations described above in Section 17.1.1 and with the allowable alteration conditions listed in K.C.C. 21A.24.045.D. Any permanent impacts on a wetland or wetland buffer (either due to construction or operation) must be mitigated following the ratio listed in K.C.C. 21A.24.340 based on the category and type of wetland and the type of mitigation desired – wetland creation, reestablishment, rehabilitation, enhancement, or some combination thereof. Voluntary habitat enhancement projects that involve wetland creation and restoration will create a functional lift of existing habitats. In highly degraded or dense urban areas, on-site wetland mitigation may not be possible. In this case, alteration of low-functioning wetlands is allowed in exchange for compensatory mitigation that contributes to wetlands of higher functions and values within a connected wetland system. Other mitigation measures to limit impacts on wetlands could include:

- Where possible, avoid placing construction staging areas in wetlands or buffers that would otherwise not be impacted.
- Design projects so that construction occurs outside of wetlands and wetland buffers or improves wetland functions and values.
- Keep existing hydrologic connections to wetlands intact and/or avoid discharging stormwater or other surface waters directly into a wetland.
- Prioritize projects that result in an improvement of wetland functions.

17.5 Significant Unavoidable Adverse Impacts

Adoption of either alternative would not, in and of itself, have any significant adverse impacts on wetlands. However, individual activities implemented under either alternative could have significant adverse impacts, depending on the extent, duration, and specific location of the activities implemented. Significant impacts could be avoided or minimized through implementation of the mitigation measures described above in Section 17.4 or through the approaches identified in Section 1.7.1. As described in Section 1.7.1, additional environmental analysis (e.g., under SEPA) would be conducted in the future for project-specific actions and activities, as needed.

17.6 References

Collins, B., and A. Sheikh. 2005. *Historical Aquatic Habitats in the Green and Duwamish River Valleys and the Elliott Bay Nearshore, King County, Washington*. Project Completion Report to: King County Dept. of Natural Resources and Parks.

Corps (U.S. Army Corps of Engineers). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0).* ERDC/EL TR-10-3. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

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King County. 2022. *2016 King County Comprehensive Plan.* Updated December 6, 2022. King County Office of Performance Strategy and Budget. [2024 Update in progress.]

King County. 2023. *King County iMap.* URL: https://gismaps.kingcounty.gov/iMap. Accessed: November 23, 2023.

USFWS (U.S. Fish and Wildlife Service). 2023. *National Wetlands Inventory (NWI) Wetland Mapper*. URL: https://www.fws.gov/wetlands/Data/Mapper.html. Accessed: November 23, 2023.

WNHP (Washington Natural Heritage Program). 2023. W*etlands of High Conservation Data Explorer*. URL: https://www.dnr.wa.gov/NHPdataexplorer. Accessed: November 23, 2023.

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CHAPTER 18
Comments and Responses

The Draft EIS was published on February 16, 2024, with a public comment period open until March 18, 2024. Eight comment letters were submitted. **Table 18-1** presents the comments received alongside responses.

TABLE 18-1
COMMENTS AND RESPONSES

<table>
<tr><th>Commenter</th><th>Comment #</th><th>Comments and Responses</th></tr>
<tr><td>Karl Veggerby</td><td>1-1</td><td>Comment: This PEIS is well written. My expertise is in aquatic ecology and fisheries science. I would like to express my strong support for continued or increased action aimed at stormwater storage and treatment, and habitat restoration to restore ecosystem function. This would in turn aid in flood prevention and the local provisioning of ecosystem services. The 2024 flood plan appears to address these needs.</td></tr>
<tr><td></td><td></td><td>Response: Thank you for your comment.</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-1</td><td>Comment: On behalf of the Washington State Department of Fish and Wildlife (WDFW), thank you for the opportunity to formally comment on the 2024 King County Flood Management Plan SEPA Draft Programmatic Environmental Impact Statement. WDFW provides our comments and recommendations in keeping with our legislative mandate to preserve, protect, and perpetuate fish and wildlife and their habitats for the benefit of future generations – a mission we can only accomplish in partnership with local governments. Specific comments on the proposed draft are provided in the following table
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 1. Background and Introduction</td></tr>
<tr><td>Table 1-1, Aquatic Resources (Chapter 4) row</td><td>Potential Mitigation Measures – “Retain vegetation as much as possible during construction and revegetate after construction is complete, unless the vegetation on-site is considered invasive or noxious.”</td><td>WDFW recommends adding language that focuses on the retention of vegetation with a DBH greater than or equal to 4-inches.
Invasive plant species and noxious weeds should not be retained during construction activities.</td></tr>
</table>
Response: Table 1-1 has been revised to incorporate this suggestion, as have the avoidance, minimization, and mitigation measures in Chapter 4, Aquatic Resources.</td></tr>
</table>

<table>
<tr><th>Commenter</th><th>Comment #</th><th>Comments and Responses</th></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-2</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 1. Background and Introduction</td></tr>
<tr><td>Table 1-1, Aquatic Resources (Chapter 4) row</td><td>Potential Mitigation measures – “Site projects away from mapped priority habitats and species locations where possible”
“Design capital projects to include features that improve instream and riparian habitats.”</td><td>These two comments may potentially contradict each other. While impacts to priority habitats should be avoided, minimized, and mitigated for, projects that will improve instream and riparian habitats should still occur within mapped priority habitats. For example, if a mapped priority habitat is degraded, that location should be prioritized for restoration efforts (e.g. improvement of instream and riparian habitat, improvement of habitat connectivity).</td></tr>
</table>
Response: Table 1-1 has been revised to address this comment, as have the avoidance, minimization, and mitigation measures in Chapter 4, Aquatic Resources.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-3</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 1. Background and Introduction</td></tr>
<tr><td>Table 1-1, Climate Change (Chapter 5) row</td><td>Potential Mitigation Measures – “Ecological Restoration as mitigation for impacts of structural projects and improvement of climate resilience across the landscape.”</td><td>WDFW recommends incorporating Climate Resilience strategies into ecological restoration projects.</td></tr>
</table>
Response: Table 1-1 has been revised to address this comment, as have the avoidance, minimization, and mitigation measures in Chapter 5 Climate Change.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-4</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 1. Background and Introduction</td></tr>
<tr><td>Table 1-1, Riparian and Terrestrial Resources (Chapter 13) Row</td><td>Potential Mitigation Measures –
“Prioritize projects that provide a functional lift in habitat values and ecosystem services.”</td><td>WDFW recommends adding this language as another potential mitigation measure to Table 1-1. This language could potentially replace the existing measure “Prioritize projects that enhance habitat.”</td></tr>
</table>
Response: Table 1-1 and the avoidance, minimization, and mitigation measures in Chapter 13, Riparian and Terrestrial Resources, identify prioritizing projects that enhance habitat, which is generally consistent with the Flood Plan’s multi-benefit approach. Several elements of the Flood Plan—including the goals, guiding principles, policies, and some specific recommendations in the Action Plan—acknowledge the significance of floodplain habitat and natural floodplain functions, and the Flood Plan promotes solutions that preserve and enhance natural ecological functions. Habitat protection and restoration are among several benefits that could be achieved through implementation of individual projects. While the Flood Plan calls for considering habitat elements across all projects, the multi-benefit approach outlined in
</td></tr>
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<table>
<tr><th>Commenter</th><th>Comment #</th><th>Comments and Responses</th></tr>
<tr><td></td><td></td><td>the plan requires consideration of a range of community needs, which may preclude functional lift of habitat values and ecosystem services in some cases.</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-5</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 1. Background and Introduction</td></tr>
<tr><td>Table 1-1, Water Resources (Chapter 16), row</td><td>Potential Mitigation Measures –
“Consider including long term monitoring and adaptive management plans when applicable”</td><td>WDFW recommends adding another potential mitigation measure to Table 1-1, allowing for the consideration of monitoring and adaptive management plans to projects when applicable.</td></tr>
</table>
Response: Table 1-1 has been revised to address this comment, as have the avoidance, minimization, and mitigation measures in Chapter 16, Water Resources. King County currently monitors and adaptively manages projects as required by permits. In select cases, some projects are monitored for longer timeframes.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-6</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 2. Alternatives</td></tr>
<tr><td>2.1.5 Ecological Restoration Projects</td><td>“Ecological restoration projects include riparian restoration, floodplain reconnection, improved habitat connectivity, salmonid habitat projects, and channel restoration, and watershed restoration.”</td><td>WDFW recommends incorporating additional project examples.</td></tr>
</table>
Response: Chapter 2, Alternatives, has been revised to address this comment. Specific examples of ecological restoration projects (and examples within other project categories) are provided throughout the EIS, particularly when impacts are related to specific types of projects.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-7</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 4. Aquatic Resources</td></tr>
<tr><td>4.3.1 Impacts Common to Both Alternatives</td><td>“Other activity types, such as property protection activities, would have limited potential impact on aquatic resources due to the small scale of on-the-ground work, and any potential impacts would be identified during project-level design and environmental review.”</td><td>WDFW recommends adding language that acknowledges the cumulative effect of multiple smaller scale, personal protection activities, as they could have a larger negative impact on aquatic resources than what is determined in an individual project environmental review process.</td></tr>
</table>
Response: Section 4.3.1 has been revised. Revisions have also been made to Section 1.8 (Cumulative Impacts) to address this comment.
The potential for cumulative impacts from multiple property protection activities, as described in the comment, were noted in Chapter 4, Aquatic Resources, as well as these cumulative impacts being assessed in Section 1.8, Cumulative Impacts.
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<tr><th>Commenter</th><th>Comment #</th><th>Comments and Responses</th></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-8</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 4. Aquatic Resources</td></tr>
<tr><td>4.4 Avoidance, Minimization, and Mitigation Measures</td><td>“Retain vegetation as much as possible during construction and revegetate after construction is complete.”</td><td>WDFW recommends adding language that focuses on the retention of vegetation with a DBH greater than or equal to 4-inches.
Invasive plant species and noxious weeds should not be retained during construction activities.</td></tr>
</table>
Response: The avoidance, minimization, and mitigation measures in Chapter 4, Aquatic Resources, have been revised to address this comment, as has the summary of these measures in Table 1-1.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-9</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 5. Climate Change</td></tr>
<tr><td>5.1.1 Relevant Plans, Policies, and Regulations</td><td>K.C.C. Title 21A.24 Critical Area Ordinances: ……. require BMPs for mitigating impacts, and aim to preserve ecological functions of sensitive environment.”</td><td>BMPs should be used to avoid and reduce impacts, prior to mitigating environmental impacts.</td></tr>
</table>
Response: Chapter 5, Climate Change, has been revised to address this comment.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-10</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 5. Climate Change</td></tr>
<tr><td>5.4 Avoidance, Minimization, and Mitigation Measures</td><td>General Comment</td><td>WDFW recommends a long-term strategy to phase out development in flood prone areas as an avoidance measure.</td></tr>
</table>
Response: A complete phase out of development in flood-prone areas does not align with Flood Plan policies and goals under either the No Action Alternative or Alternative 2, which emphasizes multi-benefit floodplain management. However, King County maintains strict floodplain development regulations that exceed federal requirements. King County also regularly acquires and demolishes at-risk floodplain properties, working with willing landowners to remove some of the structures and occupants at greatest risk from flooding, and the County implements other property protection measures (such as home elevations) that help to minimize the risk of flood damage. Additionally, the Flood Plan proposes evaluating high-risk properties or neighborhoods for potential managed retreat.
</td></tr>
</table>

<table>
<tr><th>Commenter</th><th>Comment #</th><th>Comments and Responses</th></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-11</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 5. Climate Change</td></tr>
<tr><td>5.4 Avoidance, Minimization, and Mitigation Measures</td><td>General Comment</td><td>WDFW recommends integrating Climate Resilience and Climate Adaptation efforts to reduce flood impacts with salmon recovery planning efforts.</td></tr>
</table>
Response: The avoidance, minimization, and mitigation measures in Chapter 5 Climate Change have been revised to address this comment.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-12</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 13. Riparian and Terrestrial Resources</td></tr>
<tr><td>13.4 Avoidance, Minimization, and Mitigation Measures</td><td>“Limiting native vegetation and mature trees removed, and if any trees must be removed, using the large woody material in on-site mitigation as habitat features such as snags or downed woody material.”
“Removing non-native / invasive species and replanting with native plants wherever possible.”</td><td>WDFW recommends incorporating this language throughout the document.</td></tr>
</table>
Response: Language about limiting impacts on vegetation has been incorporated throughout the Final Programmatic EIS.
</td></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-13</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 15. Visual Resources</td></tr>
<tr><td>15.4 Avoidance, Minimization, and Mitigation Measures</td><td>“Select Project Designs and/or native vegetation planting techniques that minimize impacts on public views of scenic resources such as rivers or Puget Sound where possible without compromising the benefits of the proposed activity (such as benefits of restoring a native riparian buffer).”</td><td>The priority of view preservation could lead to a negative impact on ecosystem services, wildlife habitat, and wildlife connectivity corridors. A minimum of no net loss of ecological function should be achieved, but a lift in ecological function is recommended.</td></tr>
</table>
Response: Section 15.4 describes measures to avoid, minimize, and mitigate impacts on visual resources specifically. The mitigation measure notes that minimization of impacts on views should not compromise the benefits of the proposed activity. The statement has been revised in the Final Programmatic EIS to provide additional clarity.
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<tr><th>Commenter</th><th>Comment #</th><th>Comments and Responses</th></tr>
<tr><td>Bethany Scoggins, WDFW</td><td>2-14</td><td>
<table>
<tr><th>Policy Number</th><th>Policy Language (with WDFW Suggestions)</th><th>WDFW Comment</th></tr>
<tr><td colspan="3">Chapter 17. Wetlands</td></tr>
<tr><td>17.1.1 Plans</td><td>General Comment</td><td>WDFW recommends incorporating language that prioritizes projects that provide a functional lift in habitat values and ecosystem services.</td></tr>
</table>
Response: Section 17.4, Avoidance, Minimization, and Mitigation Measures, identifies prioritizing projects that result in an improvement of wetland functions, which is generally consistent with the Flood Plan's multi-benefit approach. Several elements of the Flood Plan—including the goals, guiding principles, policies, and some specific recommendations in the Action Plan—acknowledge the significance of floodplain habitat and natural floodplain functions, and the Flood Plan promotes solutions that preserve and enhance natural ecological functions. Habitat protection and restoration are among several benefits that could be achieved through implementation of individual projects. While the Flood Plan calls for considering habitat elements across all projects, the multi-benefit approach outlined in the plan requires consideration of a range of community needs, which may in some cases preclude functional lift of habitat values and ecosystem services.
</td></tr>
<tr><td>Jamie Hearn, DRCC</td><td>3-1</td><td>
Comment: The Duwamish River Community Coalition (DRCC) has long been a community steward for environmental justice in the Duwamish Valley, which is one of the most polluted areas in the entire Pacific Northwest following 100 years of industrial dumping of toxic waste and historic disinvestment in the community. DRCC has worked tirelessly alongside community groups and neighbors for more than 20 years to clean up the water, land, and air while fighting to eliminate ongoing industrial pollution that makes our communities among the least healthy in the County.

We appreciate the opportunity to provide public comment on the 2024 King County Flood Management Plan (Plan) and the Draft Programmatic Environmental Impact (DEIS) Statement for the Plan as our community is uniquely impacted by climate change and flooding. South Park is the lowest-lying land in the City of Seattle; up to 63 acres in South Park will be inundated by seawater overtopping the banks of the Duwamish River by the mid-2000s. Ninety percent (90) of City property that is predicted to be impacted by coastal flooding is in the Duwamish Valley. Chronic flooding impacts for households and businesses will be exacerbated by the presence of contaminated soils and impermeable surfaces. Flooding in the area comes from three major pathways: 1) stormwater generated by heavy rainfall; 2) groundwater upwelling which causes flooding and sewage backups; and 3) the River rising (and overtopping) during storms and high tides, which pushes saltwater up the River delta. Recent projections from the City for a 100-year, 1-hour storm event are projected to be 25% greater than historically recorded (1981-2010); estimates from the Washington Coast Network estimate that Duwamish Valley will experience approximately 10 inches of sea level rise by 2050.

Following the River overtopping in December 2022 (which FEMA refers to as the "Christmas Flood"), the community has been encouraged by a growing partnership and more communication between Seattle Public Utilities (SPU) and King County Wastewater Treatment Division (KCWTD). While we are steadfast in our belief that this new level of responsiveness is long overdue both from a racial justice as well as a legal perspective, we are pleased that community members are receiving support for planning, prepping, and recovering from flooding and storm events.

We appreciate the thoughtful outreach that was done in preparation for the Draft Plan and DEIS. The way that regular committee meetings were organized to create the Plan with impacted parties like local jurisdictions, community groups, and community members is a great example of gathering public input through co-creation. We also recognize the thought that the County has given to social equity and the ways that climate change and flooding will not impact all residents equally. These social justice considerations are essential to building the foundation for a just and equitable Plan. Additional comments on the Plan and DEIS are below.
</td></tr>
</table>

Commenter	Comment #	Comments and Responses
		SECTION 1.8 CUMULATIVE IMPACTS The Cumulative impacts section of this DEIS is undeveloped. In several EISs that we have reviewed in the past, cumulative impacts are evaluated for every chapter of the EIS. Washington State Department of Transportation has some good examples of how they are addressing cumulative impacts in some of their environmental impact statements
		Response: Addressing cumulative impacts in each chapter of the EIS is a common practice for project-level analyses where specific project locations have been identified and where projects have advanced to a stage that can support quantification of construction and operational impacts. For this Programmatic EIS, cumulative impacts cannot be assessed at that level of detail. Identified cumulative impacts relate to construction, property acquisition and protection, and changes in river hydraulics and flooding, all of which impact multiple elements of the environment. Therefore, cumulative impacts are addressed in Section 1.8 to reduce fragmentation of the analysis, increase clarity and readability, and reduce repetition. Section 1.8, *Cumulative Impacts,* has been revised to address this comment by elaborating further on cumulative impacts and providing more information on how cumulative impacts were assessed.
Jamie Hearn, DRCC	3-2	**Comment**: CHAPTER 4: AQUATIC RESOURCES In section 4.3, additional impacts should be included when assessing the operational impacts of levees and revetments. Fish are often impacted by these structures due to shifts in water chemistry caused by changing flow and surrounding ecosystem alterations. Salmon are also a keystone species and any impacts to salmon will have a disproportionately large effect on its natural environment. This section should acknowledge this, and the greater impacts that will be felt by other species ranging from waterfowl to deer.
		Response: The Programmatic EIS focuses on the impacts of projects recommended under the two alternatives, which do not include construction of new levees or revetments. Section 4.3.1 describes the impacts of levees and revetments on salmon and other threatened and endangered fish species. The section has been revised to reflect broader ramifications of impacts on salmon.
Jamie Hearn, DRCC	3-3	**Comment**: CHAPTER 4: AQUATIC RESOURCES Other operational impacts from levees and revetments that are not sufficiently expanded upon in the DEIS include changes to riparian vegetation, groundwater levels, biodiversity loss, sediment changes, and potential changes in flow velocity which can lead to increased erosion, riverbed destabilization, and runoff which can spread chemicals from industrial areas and pesticides from agricultural areas.
		Response: The Programmatic EIS focuses on the impacts of projects recommended under the two alternatives, which do not include construction of new levees or revetments. The Final Programmatic EIS has been revised to acknowledge other operational impacts from levees and revetments.
Jamie Hearn, DRCC	3-4	**Comment**: CHAPTER 4: AQUATIC RESOURCES We request more information on how these structures can impact nearby and downstream communities, such as limiting their ability to fish or access green space. Due to artificial modifications like levees and revetments, river communities “commonly experienced loss of livelihoods; food security; and other factors contributing to their physical, cultural and spiritual well being.”
		Response: Chapter 4 of the Final Programmatic EIS has been revised to acknowledge these impacts, which are evaluated in greater detail in Chapter 8, *Indian Tribal Rights and Resources*, and Chapter 12, *Recreation and Public Access.*

Commenter	Comment #	Comments and Responses
Jamie Hearn, DRCC	3-5	**Comment**: CHAPTER 5: CLIMATE CHANGE Climate change is at its core an issue of racial justice. Our most vulnerable communities, particularly those that are predominantly BIPOC and low-income, are already disproportionately burdened by climate change. While Chapter 5 discusses climate change risks like increase in precipitation, sea level rise, and flooding, it lacks the crucial connection to our communities and fails to explicitly address the reality that certain people will suffer more than others in our County because of racist land use policies and systemic inequities.
		Response: Chapter 5 has been revised to address this comment.
Jamie Hearn, DRCC	3-6	**Comment**: CHAPTER 5: CLIMATE CHANGE There is a false assertion that all activities that reduce flood risk also increase resilience to climate change. This is not true, and we know that in many instances, flooding mitigation infrastructure like levees or engineered log jams can exacerbate flooding risks by preventing water from flowing through existing flood plains and creating overtopping. This can create long-term issues like even more severe flooding events, which is antithetical to climate resilience. It is also important to consider the impacts of eventual infrastructure decay that will become inevitable over the next few decades. Even with developing mitigation technology, the risks associated with levee failures will be felt more severely by “minorities, people with disabilities, and individuals and families with lower income and lower levels of education.” As stated above, we support green infrastructure and habitat restoration as a flood mitigation strategy, as this provides multiple benefits to people, plants, and animals. Mitigation that focuses on green infrastructure and habitat restoration is best suited to address both climate changes and flood risks.
		Response: Section 5.3.1 acknowledges that the degree and duration of resilience provided by flood risk reduction activities may vary by the type of activity and that some activities can also detract from resilience. Equity and social justice considerations were incorporated throughout the development of the 2024 Flood Plan and will be factors in decision-making related to the design and implementation of the individual activities recommended by the Flood Plan. Ecological restoration and “green infrastructure” activities account for many of the activities recommended by the Flood Plan. While the Flood Plan includes numerous recommendations for monitoring and maintaining existing flood protection facilities to maintain (or in some cases enhance) existing protections, there are relatively few structural activities that would result in new flood control infrastructure. Revisions have been made in Chapter 5 to increase clarity.
Jamie Hearn, DRCC	3-7	**Comment**: CHAPTER 7: HISTORICAL AND CULTURAL RESOURCES The section on cultural site preservation should also include more details about social and cultural impacts. For example, the DEIS identifies loud noise as a potential deterrence from using traditional sites or driving away animals in the area that are integral to using the Traditional Cultural Property. While we understand that individual projects will have their own EIS process, it is still important to acknowledge that the impacts of flood mitigation can last beyond the construction phase depending on how new infrastructure is built or the surrounding environment is changed to become more flood resilient. The DEIS does not mention this nor does it address how nearby communities will feel these impacts.
		Response: The impacts of noise are identified in Chapter 7, *Historical and Cultural Resources*, and in Chapter 9, *Land and Shoreline Use*. The level of detail is appropriate for a programmatic analysis, as the construction techniques, site locations, and construction durations of specific actions have not been identified at this time. Further environmental review will be conducted for each individual project prior to its implementation to evaluate potential site-specific impacts.

Commenter	Comment #	Comments and Responses
Jamie Hearn, DRCC	3-8	**Comment**: CHAPTER 8: INDIAN TRIBAL RIGHTS AND RESOURCES Depending on the extent of the project, calling impacts from excavation, clearing, or other disturbances "temporary" is false and misleading. Certain flooding mitigation projects could have long-term impacts on the area and local tribal communities.
		Response: Impacts that were described as temporary were specific to physical access to locations during construction, and were not intended to describe impacts from the operation of any flood risk reduction activities. Section 8.2 has been revised to address this comment by elaborating on the types of construction impacts that may be temporary and further describing how long-term impacts may occur during operation of certain activities.
Jamie Hearn, DRCC	3-9	**Comment**: CHAPTER 8: INDIAN TRIBAL RIGHTS AND RESOURCES We request more information on how federally unrecognized tribes were consulted when creating the sections on mitigation development. The Duwamish Tribe Longhouse and cultural sites such as the həʔapus Village Park and Shoreline Habitat are adjacent to the Duwamish River and could be impacted by hazard management activities.
		Response: All tribes were given equal opportunity through notification of opportunities to comment, including commenting on mitigation strategies. Notifications about the opportunity to comment were distributed to tribes during the scoping period of the EIS and at the publication of the Draft Programmatic EIS, including notifications of public meetings at which EIS comments were accepted. Specific cultural sites are not described in the EIS and will be identified during project-level review of actions when appropriate.
Jamie Hearn, DRCC	3-10	**Comment**: CHAPTER 9: LAND AND SHORELINE USE The DEIS states that "activities such as property protection and property acquisition would be unlikely to have impacts on off-site land or shoreline uses, as these activities typically occur at a site level, involving little to no off-site construction." Along the Duwamish River, there is significant residential and industrial development on shorelines. There are also public parks that include the shoreline. These shoreline areas would be highly impacted by property protection and acquisition.
		Response: Property protection activities only occur with willing landowners, and King County strives for acquisition to occur only with willing landowners. The potential for off-site impacts from property acquisition and protection are negligible as standalone activities. Impacts from other activities that could occur at acquired sites, such as ecological restoration, are described throughout the EIS. Additionally, industrial sites and public parks are not priority areas for acquisitions.
Jamie Hearn, DRCC	3-11	**Comment**: CHAPTER 9: LAND AND SHORELINE USE There should be an acknowledgment of the ways that stormwater infrastructure projects and conveyance capacity projects could disrupt access to sidewalks and streets in river-adjacent communities like South Park.
		Response: Chapter 9 has been revised to note that projects in the right-of-way can disrupt access to streets and sidewalks. Impacts on streets and sidewalks are discussed in Chapter 14, *Transportation*.
Jamie Hearn, DRCC	3-12	**Comment**: CHAPTER 10: PUBLIC HEALTH AND SAFETY This chapter should include the ways that displacement because of flooding is a public health issue due to the ways that it can "disrupt existing social ties, increase stress, and reduce social and economic resource availability" which are associated with adverse health outcomes.
		Response: Section 10.1.3 has been revised to address this comment.

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Jamie Hearn, DRCC	3-13	**Comment**: CHAPTER 10: PUBLIC HEALTH AND SAFETY A serious public health and safety issue related to flooding along the Duwamish River in South Park is sewer overflows and backups when sewage or wastewater comes up through sinks, toilets, or drains in people's homes. This occurs in both city pipe infrastructure and onsite septic systems that are failing during flood events. This can expose people to dangerous bacteria and viruses and is most common in low-income communities of color. This chapter should acknowledge this flooding-related risk as the public health issue that it is.
		Response: Section 10.1.3 has been revised to address this comment.
Jamie Hearn, DRCC	3-14	**Comment**: CHAPTER 10: PUBLIC HEALTH AND SAFETY The impacts of engineered log jams or other in-water structures should be elaborated on, including " hazards to downstream infrastructure, increase flood hazards or create hazards for recreational boating."
		Response: The potential impacts of engineered log jams and other in-water structures are addressed in Section 10.3.1.
Jamie Hearn, DRCC	3-15	**Comment**: CHAPTER 16: WATER RESOURCES As stated earlier in our letter, this chapter downplays the potential impacts of structural projects such as levees, revetments, or engineered log jams. The issue is not merely that floodwaters would be redirected to other areas, but that this redirection could then potentially ruin surrounding habitat, change physical environments, displace people from their homes and jobs, and create long-lasting effects for plants, animals, and people in the decades to come.
		Response: This comment has been noted. The EIS focuses on the impacts of projects recommended under the two alternatives, which do not include construction of new levees or revetments. Engineered log jams undergo a detailed review of potential health and safety impacts (which is discussed in Chapter 10, *Public Health and Safety*) and provide benefits for habitat, plants, and animals. Impacts of legacy flood control infrastructure are discussed in Chapter 4, *Aquatic Resources*, Chapter 5, *Climate Change*, Chapter 6, *Earth*, Chapter 10, *Public Health and Safety*, and Chapter 13, *Riparian and Terrestrial Resources.*
Andrew Greenhill, SPU	4-1	**Comment**: Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (EIS) for the 2024 King County Flood Plan. Overall, the Programmatic EIS is thorough in description and analysis of the alternatives, and well-organized. Seattle supports the Alternative 2, the 2024 King County Flood Management Plan as it is a much more forward-looking plan than the existing one. It broadly addresses flooding issues throughout King County, including riverine, coastal, and urban flooding, considers the importance of multi-benefit projects, incorporates climate change including sea level rise, and race and social justice equity considerations. We offer the following comments: Figure 1-1. Please note that the figure does not include all the areas that flood, some of which are not mapped in the floodway. Please see our related comment on the draft plan.
		Response: Section 1.3 has been revised to clarify that Figure 1-1 only shows flood risk areas as mapped by FEMA and that local jurisdictions may have locally developed flood maps that identify additional areas with flood risk.
Andrew Greenhill, SPU	4-2	**Comment**: Section 2.2 Alternative 1. While this section notes that the primary areas of focus would be rivers and major streams, it should also state that the Duwamish River is not in the current plan.
		Response: Section 2.2 has been revised to address this comment.

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Andrew Greenhill, SPU	4-3	**Comment**: Section 2.3 Alternative 2. This section should call out that the Duwamish River is included in the plan update.
		Response: Section 2.3 has been revised to address this comment.
Andrew Greenhill, SPU	4-4	**Comment**: Section 2.4. Comparison of Alternatives. Under geographic scope, it should be called out that the Duwamish River is not included in the No Action Alternative. For Alternative 2, wording could include something like “all major rivers” to show this is a broader alternative.
		Response: Section 2.4 has been revised to address this comment.
Nancy Sackman, Duwamish Tribe	5-1	**Comment**: Thank you for reaching out to the Duwamish Tribe and for the opportunity to review and comment on the King County Flood Management Plan, specifically the Draft Programmatic EIS (DEIS). The Duwamish Tribe will be providing a brief narrative of our existence on our ancestral lands, commenting on cultural resources, re-stating our previous comments with additions from December 8th, 2022, and providing comments on the alternatives and action plans. The Duwamish Tribe, known as the People of the Inside (dxʷdəwʔabš), originated on the southern shores of Lake Washington and at the confluences of the Black, Cedar and Duwamish Rivers in and around present day Renton. Our Tribe extended up the Cedar and Green Rivers, down the Duwamish River to Elliott Bay, Interbay, Salmon Bay, Lake Union, Lake Washington and Lake Sammamish encompassing most of present day King County. We have been here since at least the end of the Vashon Stade of the Fraser Glaciation which was about 10 to 12 thousand years ago. Like other tribes in the area, we managed and respected our land, river and resources that held abundant diversity in floral and fauna. Our longhouses were also abundant and populated the shores of the Duwamish River and the Salish Sea. After European contact, the land we once knew was divided and taken from the Duwamish and other local tribes. At the turn of the 20th century, our last traditional longhouses were burned and the land regraded to make a port in downtown Seattle, and the Duwamish River armored and straightened to create a waterway for industrial traffic. The sediment from this reshaping was used to create a false island known as Harbor Island. It was also used to fill in part of the Duwamish estuary, now known as SoDo. In addition the Montlake Cut was created to make ship passage from Shilshole Bay via the newly created Ballard (Hiram M. Chittenden) Locks into Lake Washington. The cut and waterways through Lake Union were never a permanent passageway during our ancestors’ time. It was a seasonal place to put our canoes as well as a burial place for our ancestors. These changes effectively cut us off from our access to water, our food sources, transportation and trade, and our way of life by lowering Lake Washington and drying up the Black River, a river which helped mitigate seasonal tides coming up from Elliott Bay through the Duwamish River. The Duwamish Tribe and other local tribes have experienced the same adverse effects of climate change on our ancestral lands many years before the documentation of global warming. Regarding cultural resources, we would like to be notified of any earth moving, demolition or ground breaking activities associated with any flood planning restoration. There are hundreds of ancestral and historic placenames in and around King County, mostly near water, and more than a thousand archaeological sites and more than a thousand archaeological resources as mentioned in the DEIS. We would like the opportunity to comment on each project to evaluate it on its own merit and provide guidance for cultural resources protection. If any archaeological work or monitoring is performed, we would like notification. Cultural and archaeological resources are non-renewable and are best discovered prior to ground disturbance. The Tribe would also like the opportunity to be present if or when an archaeologist is on site. The Duwamish Tribe provided comments during the initial public engagement period. Below are the points we noted for the King County Flood Plan on December 8th, 2022: • Ample notice and participation – commenting was from November 7th through December 9th. As mentioned above, we had less than a week to comment after the email was internally routed to the correct person at the Tribe. • The Tribe strongly recommends native plantings in and around waterways and streams to encourage native habitat and slow down run-off in urban areas during

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		significant rain events that have above average precipitation amounts and/or prolonged duration. We also encourage homeowners and developers to plant native vegetation for the same reason and to encourage native pollinators. It would also be beneficial to have native plants easily accessible and available for everyone along with planting guides (in the form of digital guides and/or native plant experts) for those not familiar with native plants. • The Tribe recommends that woody debris be used where it makes sense in urban streams and outside of the tidal zone for the Duwamish River to slow down waterflow. We also recommend that natural drainage system or street swales be implemented when reconstructing or redesigning public works like sewer or storm water systems – see link: Sustainable Streets • The Tribe recommends that wetland buffers be implemented or maintained along rivers and streams to allow for meandering and reduce armoring to slow the flow of water. • The Tribe recommends that more greenspace (with native vegetation) be allotted during large urban planning projects that include public works. • The Tribe recommends that culverts be evaluated for flood event capacity and also fish conveyance, particularly around the lower Duwamish River in West Seattle. • The Tribe recommends strongly recommends that all urban streams are daylighted, particularly those in West Seattle - Longfellow Creek, Puget Creek and Hamm Creek (all tributaries). • The Tribe recommends that attention to waste and storm water treatment plants be given one of the highest priorities to avoid untreated, polluted waters into our waterways during power outages as a result of storm events or other natural disasters. • The Tribe recommends that a solution to tire pollution be addressed as this severely affects fish and aquatic wildlife during storm events. • The Tribe recommends that water be monitored continuously throughout the year for water quality and particularly after storm events. • The Tribe also recognizes that climate change has affected the seasonal timing of precipitation and meltwater from our mountains and mountain reservoirs. We ask that flood control be reevaluated to take into account this change. We also request that human development closest to these reservoir resources be evaluated and regulated to slow down water flow during high storm events or during rapid changes in temperatures that would quickly melt snow or ice. • The Tribe recommends that computer models be employed to evaluate hydrologic displacement both above and below ground during strong seismic shaking due to fault slippage, and displacement due to landslides, tsunamis (or seiches) and/or volcanic lahar flows. We would like to call to your attention additional points that is of concern to the Duwamish Tribe to improve water quality and potentially reduce the risk of seasonal urban flooding. • The re-establishment of the Black River to its original course and flow. The Black River had the capacity to flow both ways to regulate the waters in Lake Washington and to mitigate the seasonal King Tides that inundated the Duwamish River and still inundate the Duwamish Waterway. The Black River also housed abundant aquatic resources like salmon that sustained our ancient villages. It could again be a place for salmon and other fish to spawn and migrate. • The consistent and increased planting of native plants in and around local agricultural farms to mitigate the effects of seasonal urban flooding and to attract native pollinators and native fish and wildlife. These plants would then be available for local restoration projects and to sell to the general public and to increase public awareness of the benefits and uses of native plants. • The Duwamish Tribe strongly recommends the ban of harmful or toxic fertilizers and insecticides. Fertilizers increases nitrate pollution and soil acidification leading to dead zones through water run-off. • The Duwamish Tribe strongly recommends that gas-powered watercraft are banned from our waterways except for emergency and construction use to reduce oil based pollution, noise pollution and prop wash to create a more sustainable habitat for aquatic life.

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		• The Duwamish Tribe recommends that the transfer of development rights (TDRs) be banned. TDRs have increased urbanization within the major cities of King County and have put at risk for flooding our traditional lands (King County). The Tribe has been told by King County that TDRs preserve food sources in rural areas and do not encroach on traditional hunting grounds. However, prior to European contact, our food sources and traditional hunting grounds were well within the current city limits like Seattle, Bellevue and Shoreline. By continuing the program of TDR within King County cities, this allows for increased impervious surfaces, decreased vegetation and the creation of urban heat islands. • The Duwamish Tribe would like to address the flood risk reduction activity types. In general, the Duwamish Tribe is in favor of the 6 flood plan activity types. We are in particular favor of property acquisition that prevents people and property from devastating flood events. We request that if property is acquired by King County that the Duwamish Tribe be given the opportunity to provide cultural resources protection and the opportunity to be involved in any restoration. • The Duwamish Tribe is also in favor of the natural resources protection type. We would request that we are involved in providing cultural resources and the opportunity to be involved in activities that preserve existing open spaces. • Regarding the Action Plan, the Duwamish Tribe is in favor of the ones listed under section 2.3.4. We do have questions regarding the stormwater technical assistance and services, and the open space protection. Our main question on the technical assistance and services is who would be eligible, how much (either monetarily or for how long) and how would it be implemented? Many public programs can inadvertently exclude underserved and underrepresented populations by lack of access, lack of time and lack of awareness. In addition the action plan calls out open space protection. Where would the open space protection be? We would recommend that the open space protection also include urbanized areas. Urban and industrialized areas often have lack of access to green spaces. • Also the Duwamish Tribe would strongly recommend that when developing a program for Public Information (PPI), it includes developers, individual city planners and managers as well as urban farmers. During our commenting and engagement with various local governments, the Duwamish Tribe has seen the disconnect between developers, construction contractors and community partners.
		Response: Thank you for your comments. Comments on the Draft Flood Plan, including suggestions for policies, strategies, or capital actions that King County could implement, were considered in the development of the Final Flood Plan. The comments received from the Duwamish Tribe during the EIS scoping comment period, which are reiterated in this comment, were considered in scoping for the EIS, as well as in the development of the Flood Plan itself. King County will continue to coordinate with and engage tribes and other partners and community members through project-level planning and design of activities identified in the 2024 Flood Plan, as well as work with interested parties as identified in the avoidance, minimization, and mitigation measures described in the Final Programmatic EIS.
Nancy Sackman, Duwamish Tribe	5-2	**Comment**: The Duwamish Tribe supports Alternative 2 of the 2024 Flood Plan. We do call your attention to the statement “The Flood Plan would include a Comprehensive Risk Mitigation Strategy, including a range of activities that may be implemented by a broader range of entities and partners.” The statement seems vague and we would like to understand who these entities and partners are. The Duwamish Tribe would hope that these entities and partners would be able to work with the Duwamish Tribe and underserved and underrepresented communities. Also, the statement “…King County would more systematically address climate change and would develop design alternatives to provide multiple benefits.”, does not specifically say which aspects of climate change. The Duwamish Tribe would like to understand what this means. Finally Alternative 2 states that, ”King County would implement an expanded range of equity-focused actions to address flood hazards.” The Duwamish Tribe would like to understand what actions the Flood Plan addresses. While Alternative 2 appears to address the broader impacts of flooding, the Duwamish Tribe is concerned that the statements are somewhat vague and need a more in depth discussion. The Duwamish Tribe sincerely hopes that the 2024 Flood Plan is a success for all affected communities and hopes that we can be a community partner with King

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		County regarding this matter. We would also like to extend an invitation to meet with the Tribe at our Longhouse to discuss the King County Flood Plan at any time.
		Response: Descriptions of Alternative 2 in Section 2.3 of the EIS have been revised to address this comment by including more information on the entities and partners involved in implementing Alternative 2, the ways in which Alternative 2 addresses climate change, and the types of equity-focused actions included in Alternative 2.
Michelle Clark, KCFCD	6-1	**Comment**: I hope this letter finds you well. The King County Flood Control District (KCFCD) appreciates the opportunity to review the Programmatic Environmental Impact Statement (Programmatic EIS) for the 2024 King County Flood Management Plan (Draft Flood Plan). We commend King County (County) for its commitment to thorough environmental review. The KCFCD acknowledges the County's decision process regarding the Draft Flood Plan, which involves choosing either adoption of a No Action Alternative (Alternative 1) or the County's preferred alternative, Adoption of the 2024 Flood Plan (Alternative 2). The KCFCD remains committed to working collaboratively with the County on flood management efforts in our region, regardless of the final decision on the Draft Flood Plan. We believe that a strong partnership between the KCFCD and the County is essential to ensure the safety and well-being of our communities in the face of flood risks. In addition to this response letter, the KCFCD is attaching and incorporating by reference the comments it submitted during the public review process directly associated with the Draft Flood Plan. These comments provide further detail on our perspectives regarding the Draft Flood Plan itself. We look forward to continued collaboration with the County on flood management strategies for our region. **Flood Plan Letter** I hope this letter finds you well. On behalf of the King County Flood Control District (KCFCD), I am writing to provide feedback on the recently proposed 2024 King County Flood Management Plan (Draft Flood Plan). The KCFCD appreciates the opportunity to review and contribute to this important document aimed at mitigating a variety of flood risks throughout King County. As stewards of flood risk management within our jurisdiction, the KCFCD has carefully examined the Draft Flood Plan and wishes to share observations and recommendations. Before providing KCFCD's observations and recommendations, it is important to understand and acknowledge the distinction between the foremost focus of the KCFCD, which predominantly addresses riverine and large tributary flooding throughout King County, and the new, wide-ranging scope of the Draft Flood Plan. It is clear, after a thorough evaluation, the scope of the Draft Flood Plan is far larger than previous flood plans created by King County (County). The KCFCD's comprehensive policy approach to flood management is primarily focused on improving the County's existing aging and inadequate flood protection facilities and implement integrated floodplain management principles, including multi-benefit flood risk reduction facilities along the six major river systems flowing through King County (South Fork Skykomish, Snoqualmie, Sammamish, Cedar, Green, and White rivers) and their significant tributaries (Tolt, Raging, Miller, and Greenwater rivers). The Draft Flood Plan, by contrast, clearly encompasses various types of flooding hazards such as coastal, lake, tributary, and urban (including stormwater) flooding, in addition to riverine flooding along the mainstem rivers. The KCFCD commends the efforts put forth by the County to develop a detailed strategy to mitigate flood risks throughout King County. Despite the apparent difference in scope between the focused work of the KCFCD and the Draft Flood Plan, the KCFCD would like to acknowledge the following strengths of the Draft Flood Plan. 1. <u>Comprehensive risk assessment:</u> The Draft Flood Plan demonstrates a clear understanding of the complex flood risk challenges found throughout King County, including possible future flood issues brought about by climate change impacts. Chapter 2 concisely explains various flood hazards, considering geography, land use, and other factors as it breaks down flood risks by area: major river watersheds, coasts, urban zones, and tributary streams. Additionally, the Draft Flood Plan clearly explains how floods cause widespread damage and can destroy or harm homes, businesses, and infrastructure. It helps the reader understand

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		recovery and repair efforts following flood events can take months, potentially displacing residents and posing other health risks, such as contaminated water and inundated sewer and septic systems. In addition to physical health concerns, all this combined, can cause of tremendous mental health and financial stress to those impacted. Therefore, the comprehensive risk assessment detailed in Chapter 2 clearly identifies the need for the Comprehensive Risk Mitigation Strategy and Action Plan and Adaptive Management Strategies, which follow in later chapters of the Draft Flood Plan. 2. Flood Risk Reduction Tools: Chapters 3 thoroughly explains flood risk reduction activities considered in the Draft Flood Plan to address the flood and channel migration hazards identified in Chapter 2. It was a great accomplishment for this technical information to be transmitted in language the public reader can understand. The different types of mitigation strategies and activities summarized in Chapter 3 provides a solid foundation for the reader to understand potential options to enhance community resilience and safeguard life, property, and critical infrastructure from the dangers of flooding. 3. Adaptive Management Strategies: As a supporter of adaptive management techniques, the KCFCD is pleased to see the section in Chapter 5 related to this subject. The Draft Flood Plan relies on adaptive management, meaning it will be adjusted as the County learns more. It was stated the County will regularly review new data on flood risks and the effectiveness of mitigation strategies to help prioritize actions. Given the County is the primary service provider to the KCFCD, the County's expertise is heavily relied upon to ensure we are focusing KCFCD resources on the areas with the greatest risk to people and the economy. Therefore, the KCFCD commends the Draft Flood Plan for its commitment to keeping all relevant information – data, maps, studies, project designs, and monitoring results – well-organized and accessible. After all, informed decisions are crucial for directing limited funds to the most critical areas of the floodplain. While the KCFCD commends the strengths of the Draft Flood Plan, we also recognize the importance of ongoing collaboration and continuous improvement. As such, the Draft Flood Plan could benefit from increased clarity in the following areas: roles and responsibilities between the County and its partners (including the KCFCD), King County Action Plan (Action Plan) funding, multi-benefits, and repetitive loss areas. The KCFCD offers the following suggestions for consideration: 1. Clarity Regarding Roles and Responsibilities: The Draft Flood Plan outlines an ambitious vision for tackling flood risks throughout King County. However, the Draft Flood Plan's success hinges on a crucial factor that is under-emphasized: intergovernmental partnerships. The sheer scope of the Draft Flood Plan, coupled with its reliance on external funding sources, necessitates collaboration with various entities beyond the County, including KCFCD and others. That collaboration, in turn, necessitates a proper acknowledgment of the roles of partners. The KCFCD and County are separate entities, yet deeply intwined together, and this close relationship, in name as well as in project and activity collaboration, continues to be a source of confusion with the public. The Draft Flood Plan does, in several places, explain the clear separation and distinction between the KCFCD and County, and that explanation is appreciated by the KCFCD. However, while Chapter 3 does a fair job identifying flood risk reduction activities implemented by the County with KCFCD funding, Chapter 4 of the Draft Flood Plan seems to conflate the distinct actions of the KCFCD and County in several locations. First, the Comprehensive Risk Mitigation Strategy, found in Chapter 4 adds a layer of complexity and confusion to the Draft Flood Plan. Regarding "what" the Comprehensive Risk Mitigation Strategy is, the Draft Flood Plan states it "is based on actions identified by King County and those that emerged from more than 1,700 comments and conversations gathered in a variety of settings…." Regarding "how" the County came to this information, the Draft Flood Plan states, "[t]he activities listed on the Comprehensive Risk Mitigation Strategy were either submitted voluntarily by the lead agency, identified through partner feedback during the Flood Plan process, or obtained using publicly available information." The Draft Flood Plan fails to adequately explain "why" the County is choosing to include projects and activities that may be funded and/or implemented by non-County partners in the County's Draft Flood Plan.

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		This lack of clarity is compounded when the Draft Flood Plan goes on to state the County "evaluated each activity in the Comprehensive Risk Mitigation Strategy," and "all activities included must meet at least one goal of the Flood Plan (as identified in Chapter 1) and must not inherently conflict with King County's legal obligations." The document further states, in relation to the Comprehensive Risk Mitigation Strategy, "[t]his remains King County's plan for flood resilience and flood risk reduction…." The clear implication of these statements is that the County is including in its Draft Flood Plan projects and activities that may be funded and/or implemented by non-County partners. Although the Draft Flood Plan states this inclusion does "not constitute an obligation" and "King County does not have the authority to direct the work of others, including the King County Flood Control District," the KCFCD urges the County to strengthen the Comprehensive Risk Mitigation Strategy section of the Draft Flood Plan by clarifying why non-County projects and activities are being included. A clear answer should be provided to the question: why are some non-County projects and activities being included in the body of the County's Draft Flood Plan? Second, looking closely at the programmatic and capital projects recommendations in Chapters 4.4 and 4.5, several of the projects and activities listed commingle the responsibilities of the KCFCD and County. It appears a great deal of effort was put into Chapters 4.4 and 4.5 of the Draft Flood Plan to properly identify the KCFCD as a "Source/Origin of Activity" – that effort is appreciated by the KCFCD. However, in our review of the document, there were several activities listed where "King County" was identified as the source even though the activity is funded entirely or in part by the KCFCD. The KCFCD is requesting a further review of the charts associated with Chapters 4.4 and 4.5, and recommending: • **For activities funded solely by the KCFCD**, the KCFCD should be properly listed as the only source; and • **For activities funded in part by the KCFCD and in part by other County funds**, both KCFCD and County should be listed as the source. To assist with this requested review and recommendations, the KCFCD can share a list with the County of the Chapters 4.4 and 4.5 activities in question. Third, in our review of the Action Plan (Chapter 4.6), like Chapters 4.4 and 4.5 there are activities listed which are funded solely or in part by the KCFCD. However, unlike Chapters 4.4 and 4.5, the KCFCD is not identified at all as a potential lead agency or potential funding source in the Action Plan, despite there being items on the list funded entirely or in part by the KCFCD. As above, the KCFCD is requesting increased transparency and clarity by properly acknowledging the activities it funds if these activities are to be included in the County's final Flood Plan. Again, to assist with this requested review and recommendation, the KCFCD can share a list with County of activities in question. For future versions of the Draft Flood Plan, the KCFCD urges a clearer delineation of roles throughout the document, and particularly in Chapter 4 where the lines between the KCFCD and County are blurred. The County should rightly be recognized for the critical projects and activities it implements with funds from the KCFCD, and, likewise, the KCFCD should be acknowledged as the dedicated funding source for these vital initiatives. This clarity will ultimately lead to an accurate public understanding of the collaborative efforts between the County and the KCFCD in safeguarding area residents from flood risks. The KCFCD would welcome the opportunity to cooperate with the County in further defining the specific roles and responsibilities outlined in the Draft Flood Plan. This joint approach will ensure transparency and accountability for the public and interested parties alike. 2. Clarity Regarding Action Plan Funding: In addition to the concerns mentioned above, the KCFCD has a concern regarding the Action Plan (Chapter 4.6). There is an incongruity regarding the funding of the Action Plan in the Draft Flood Plan. The Draft Flood Plan states the Action Plan includes activities the County is committed to **"funding, reporting on, and implementing."** Yet, the Action Plan lists activities relying heavily on non-County funding. The KCFCD sees two possible solutions to this incongruity. **a. Change the Wording:** A simple fix would be changing "and" to "or" in the above referenced sentence. This allows for activities with non-County funding to be included in the Action Plan. However, this solution, if implemented, would still require a fix to the transparency and proper acknowledgement of funding partnerships, including that with the KCFCD.

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		b. Clarify the Commitment: If the County intends to fully fund all Action Plan activities (thus leaving the sentence as currently written), the KCFCD raises these key questions: *i. Question 1: Why are non-County funding sources listed in the Action Plan if the County is committed to funding these activities?* If the following sentiment is accurate, it should be clarified that the County's "commitment" to funding the Action Plan activities means the County is committed to both using its funds and to finding sufficient non-County funding to accomplish the Action Plan activities. Without this explanation, or some rationale for including non-County funding sources in the Action Plan, the funding incongruity will remain. *ii. Question 2: If identifying non-County funding sources is an aspect of the County's commitment to fund these activities, then are all the non-County funding sources properly* identified *and explained to the public?* As previously mentioned, the KCFCD contributions listed in the Action Plan are not currently recognized and request rectification. *iii. Question 3: Does the Draft Flood Plan have alternative funding mechanisms or prioritization processes if external funding falls short?* The KCFCD anticipates a continued partnership with the County. However, the KCFCD suggests clarifying the County's reliance on KCFCD, and other non-County, funding, and outlining a course of action if any external funding fails or falls short. The KCFCD recognizes that a realistic and sustainable funding strategy is crucial for the Draft Flood Plan's success and the County acknowledges budgetary constraints (Chapter 5.5). The County's reliance on external funding is understandable but is contradicted by the opening sentence to the Action Plan. Clear identification of this reliance or restricting projects in the Action Plan to those that the County currently funds, or plans to fund, completely will only serve to enhance transparency and ensure the Draft Flood Plan's achievability and accountability to partners and residents alike. 3. Achieving True Multi-Benefits: The Draft Flood Plan offers a valuable definition of "multi-benefit (or multi-benefits)." The KCFCD supports the concept of integrated floodplain management, as identified in the Draft Flood Plan as a means of "moving beyond project-level decision-making to more holistic, reach-based or watershed-scale implementation." It should be acknowledged, however, that there are significant challenges to achieving true multi-benefits which requires reconciling opposing viewpoints among partners and a commitment to community engagement. The Draft Flood Plan falls short in outlining a clear strategy for achieving these true multi-benefits. While the Draft Flood Plan mentions the need for "a concerted effort" and presents itself as an opportunity for a "systematic and holistic approach," it lacks specifics on how these goals will be met. From the perspective of the KCFCD, the Draft Flood Plan needs to address how the County will bridge the gap between partners, interested parties, and local communities to achieve true and equitable multi-benefits. In Chapter 5.1, the County states they will "continue to coordinate and partner with local jurisdictions, special districts, state and federal agencies, tribal governments, and others to collaboratively advance the goals of this Flood Plan." Further, in Chapter 5.2, the County acknowledges they need to "develop a structure for watershed-based portfolio planning" and "should develop systems and accompanying expectations that foster collaboration across agencies and work programs." Additionally, Chapter 5.1 includes a recognition by the County of the "need to expand its work in local communities, to build relationships and trust, and to move toward co-creation of flood resilience by working with community groups and representatives." Chapter 5.2 also says, "Understanding the needs of local communities is an imperative component of developing equitable flood risk reduction solutions." The KCFCD completely agrees with these statements and offers support to achieving these worthy goals. However, these statements, in and of themselves, do not go far enough. The KCFCD suggests that Chapter 5.2 of the Draft Flood Plan include a basic outline for the frameworks associated with the needs identified by the County to reconcile diverse program priorities and identify County

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		funding opportunities that support equitable, multi-benefit projects, including those identified in the Draft Flood Plan: • Structure(s) for watershed-based portfolio planning; • System(s) and accompanying expectations to foster collaboration across agencies; and • Expanded equity-based community outreach and trust building. By providing a clear roadmap for these critically important activities, the County can demonstrate its commitment to these actions and the Draft Flood Plan can empower interested parties to achieve true and equitable multi-benefits in flood risk reduction projects. This will not only enhance project and activity effectiveness but also foster a more unified approach to flood risk reduction and increased community resiliency. 4. Clarity Regarding Repetitive Loss Areas: The KCFCD suggests adding a definition to the glossary for the term "repetitive loss area" to accompany the existing definition for "repetitive loss property." This is important to both demonstrate the inequities which often result from flooding as well as the how the efforts to address repetitive loss areas can promote equity. Residents in repetitive loss areas may not be living in a home recognized as a NFIP-insured property, and their limited access to resources for mitigation or post-disaster recovery, which could include lack of financial assistance, building upgrades, or relocation options, further disadvantage low-income residents compared to wealthier individuals who can afford federally backed flood insurance, private mitigation measures, or to move to safer locations. This inequity is a driver of the KCFCD's work addressing repetitive loss areas rather than just targeting repetitive loss properties, which, by definition, focuses exclusively on NFIP-insured properties. In conclusion, the KCFCD commends the County for their commitment to developing a robust Draft Flood Plan. Although the scopes of the Draft Flood Plan and the KCFCD differ, the KCFCD recognizes the County's role as a regional government of general jurisdiction and its holistic approach to address the diverse range of flooding challenges faced by the communities of King County. It is my hope that KCFCD's feedback will contribute to the refinement of the Draft Flood Plan, thus increasing its effectiveness in safeguarding our shared communities against flood risks. Please be assured, the KCFCD remains committed to a strong partnership with the County and all of our service providers and interested parties to ensure the resilience and sustainability of our collaborative flood mitigation efforts. By working together, we can achieve the mutual ambition of reducing risk to people and property from flooding and channel migration while supporting resilient communities and ecosystems
		Response: Thank you for your comments. Comments on the Draft Flood Plan were considered in development of the Final Flood Plan.
Mike Mactutis, City of Kent	7-1	**Comment**: Jason, This email is intended to provide comments on the 2024 King County Flood Management Plan Draft Programmatic Environmental Impact Statement (PEIS). Thank you for this opportunity to provide comments; the PEIS is a critical outreach tool describing how the County will prepare for and address flood events. Flooding in King County affects everyone in some capacity either directly or indirectly, and it is of vital importance that the county has a plan in place that is current in its science, analyses and methodology. Regarding Section 2.3 Alternative 2: Adopt the King County Flood Management Plan, subsection 2.3.1, the last part of that subsection states that “It would also include activities within incorporated areas of the county and activities that would be implemented by entities other than King County.” It is unclear how the Plan and its policies, programs and projects would interact with local agencies policies and priorities, however. Please explain how the Plan alternatives’ impacts, avoidance, minimization and mitigation measures would apply specifically to incorporated areas. The City’s comments on the draft Plan (copied below) are incorporated in our comments on the PEIS as well.

Commenter	Comment #	Comments and Responses
		Comments submitted on Friday, March 15, 2024, related to the Draft 2024 King County Flood Management Plan: Jason, This email is intended to provide comments on the Draft 2024 King County Flood Management Plan (Plan). Thank you for this opportunity to provide comments; the Plan is a critical tool describing how the County will prepare for and address flood events. Flooding in King County affects everyone in some capacity either directly or indirectly, and it is of vital importance that the county has a plan in place that is current in its science, analyses and methodology. There are areas of significant overlap where cities have property ownership and responsibilities related to flood planning and mitigation implementation and the County has easements on the same area. For example, along the lower Green River in Kent, many reaches of the river are lined with properties that are owned by the city, with easements to King County for levee and riverbank operation and maintenance, but with the work funded by the King County Flood Control District with either the County or the City as the service provider. In addition, there is a regional trail along many of the levees that is maintained by the City, but within the County easements for levee/riverbank maintenance and operation. There are brief references to the relationships with the cities in section 1.3 - Relationship of Flood Plan to other Jurisdictions, and section 5.2 - Advancing Integrated and Multi-Benefit Floodplain Management under the subsections External Coordination and Consultation, and Capital Project Planning and Development. However, the Plan does not address the priorities or policies of the cities and the desired approach to applying policies on County facilities within cities or when the work being done on County easements that is funded by the Flood Control District or being done and funded by cities. Regarding flooding from tributaries, and urban flooding, Kent staff participated in the Partner Planning Committee and we, along with other committee members, provided a number of projects that are mitigation for flooding from tributaries or in urban areas. Sections 4.5 Comprehensive Risk Management Strategy – Capital Projects, and 4.6 King County Action Plan, include projects along or very close to rivers within cities. The remainder of the projects were only included in the appendices in the notes for the committee meetings. Please explain why riverine projects within cities were included in the Plan, but tributary and urban flooding projects were not. A technical comment in Section 2.4 Green/Duwamish River Watershed, Overview, identified Mill Creek-Kent as a major tributary in the Lower Green River watershed, but it, along with Garrison Creek, flow first into Springbrook Creek, which is not identified as a major tributary. This should be corrected in the Plan. Section 2.7 Summary of Countywide Flood Hazard and Risks, Impacts of Past Floods, January – February 2020, did not include discussion of the impacts of that event on the Green River. During the 2020 flood event, the Green River peaked at its highest water surface elevation at the USGS gage in Auburn since the construction of the Howard Hanson Dam 58 years before. The high-water level carried downstream through Kent, resulting in a large area of the Agriculture Production District between Kent and Auburn being significantly flooded for approximately two weeks. Despite the high-water surface elevations, the river flows were quantified lower than in some past storms, however, due to a change in the rating curve at the USGS gage that happened the day the storm peaked in February 2020. This highlights the need for continual monitoring during storms and adaptive management for flood planning and mitigation due to changing analysis of river behavior and response to storms. Several Green River levees were damaged during this 2020 event which are still in the process of being repaired. Thank you again for the opportunity to provide comments, and don't hesitate to contact me with any questions.
		Response: Thank you for your comments. Comments on the Draft Flood Plan were considered in development of the Final Flood Plan. Section 2.3 of the Final Programmatic EIS was revised to provide additional details on how implementation of actions in incorporated areas of King County under Alternative 2 would function and how King County or other entities would interact with local jurisdictions in relation to implementing actions under Alternative 2.

Commenter	Comment #	Comments and Responses
Michael Lin	8-1	**Comment**: Please share your insights how to collect and use rainwater. Financial assistance to start one. Sorry, unable to find the “welcome” tab. Thanks
		Response: Thank you for your comment. Stormwater management and drainage technical assistance for landowners are recommended activities in the Flood Plan that could result in guidance for site-specific solutions such as rainwater collection and reuse. Drainage and stormwater management assistance for landowners are addressed in Chapters 3 and 4 of the Flood Plan.